

PROJECT TITLE DAM SAFETY BOOMS

 TRENT-SEVERN WATERWAY

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END OF SECTION



END OF SECTION

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Part 1 - General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises general construction of safety booms, located at Glen Ross Dam, Hastings Dam and Healey Falls Dam.

1.2 CONTRACT METHOD

- .1 Construct Work under stipulated price contract.
- .2 Relations and responsibilities between Contractor and subcontractors are as defined in Conditions of Contract. Assigned Subcontractors must, in addition:
 - .1 Furnish to Contractor, bonds covering faithful performance of subcontracted work and payment of obligations thereunder.
 - .2 Purchase and maintain liability insurance to protect Contractor from claims for not less than limits of liability which Contractor is required to provide to Consultant.

1.3 WORK BY OTHERS

- .1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from Departmental Representative.
- .2 Co-ordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to Departmental Representative, in writing, any defects which may interfere with proper execution of Work.

1.4 WORK SEQUENCE

- .1 Construct Work in stages to accommodate Owner's continued use of premises during construction.
- .2 Co-ordinate Progress Schedule and co-ordinate with Owner occupancy during construction.
- .3 Work at 3 contract sites is to be completed in sequence such that work is substantially complete at one site before moving to the next. Shoreline anchors may be installed in advance to prepare for in-water installations work.
- .4 Maintain fire access/control.

1.5 CONTRACTOR USE OF PREMISES

- .1 The Contractor may use grounds at each dam for access to site, parking and as staging area to complete work within the water. Contractor is to use areas as specified on drawings only and as otherwise approved by Departmental Representative.
- .2 Limit use of premises for Work, storage, and access, to allow:
 - .1 Owner occupancy.
 - .2 Partial owner occupancy.

- .3 Work by other contractors.
- .3 Co-ordinate use of premises under direction of Consultant.
- .4 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
- .5 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .6 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Departmental Representative.
- .7 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.6 OWNER OCCUPANCY

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.
- .3 Dams must remain continuously accessible to Parks Canada and any service providers it employs during work for regular operation of gates and urgent maintenance needs.

1.7 PRE-PURCHASED EQUIPMENT

- .1 Parks Canada is supplying all boom floatation units and buoys required in contract. This includes all individual floatation units and associated interconnectors and chain as well as buoys. All purchase of material and hardware related to anchorages and all other items is responsibility of contractor. Refer to drawings for further details of owner purchased items.
- .2 Purpose for pre-purchasing this equipment is to ensure delivery to site within required project completion schedule. Obtain necessary shop drawings from Departmental Representative and proceed to co-ordinate details for installation, expedite, receive, unload, install, connect and test specified equipment, and be responsible for warrantee.
- .3 Contractor is responsible for pick-up of boom floatation units and buoys from Parks Canada storage location and safe delivery to site. Schedule pick-up and delivery to site times with Departmental Representative. Coordinate to minimize time on site and avoid temporary storage of materials on site where possible. Attempt to deliver same day as installation. Refer to drawings for site staging and access.
- .4 Request Departmental Representative in writing at least 7 calendar days in advance of date on which materials and equipment are required.
 - .1 Pick up materials and equipment on date requested.
 - .2 In the event of inclement weather notify Departmental Representative 24 hours in advance of any cancellations and request reschedule.

1.8 OWNER FURNISHED ITEMS

- .1 Owner Responsibilities:
 - .1 Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.
 - .2 Deliver supplier's bill of materials to Contractor.
 - .3 Inspect deliveries jointly with Contractor.
 - .4 Arrange for replacement of damaged, defective or missing items.

- .2 Contractor Responsibilities:
 - .1 Designate submittals and delivery date for each product in progress schedule.
 - .2 Review shop drawings, product data, samples, and other submittals. Submit to Consultant notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
 - .3 Pick-up owner purchased products from Parks Canada storage facility. Deliver to site.
 - .4 Inspect deliveries jointly with Owner; record shortages, and damaged or defective items.
 - .5 Handle products at site, including uncrating and storage.
 - .6 Assemble, install, connect, adjust, and finish products.
 - .7 Provide installation inspections required by public authorities.
 - .8 Repair or replace items damaged by Contractor or subcontractor on site (under their control). Protect all plastic items including floatation units and buoys from fossil fuels and other oil or petroleum based or otherwise caustic, corrosive or chemically reactive fluids and substances.

- .3 Schedule of Owner furnished items:
 - .1 Plastic shelled foam filled boom floatation units.
 - .2 Floatation units interconnecting steel shackles and galvanized steel chain segments.
 - .3 Plastic Shelled foam filled restricted area buoys

1.9 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy each document as follows:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed Shop Drawings.
 - .5 List of Outstanding Shop Drawings.
 - .6 Change Orders.
 - .7 Other Modifications to Contract.
 - .8 Field Test Reports.

- .9 Copy of Approved Work Schedule.
- .10 Health and Safety Plan and Other Safety Related Documents.
- .11 Other documents as specified.

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 ACCESS AND EGRESS

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.2 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
- .2 Maintain existing access to site.
- .3 Where security is reduced by work provide temporary means to maintain security.
- .4 Contract to provide temporary sanitary facilities for use by Contractor's personnel. Keep facilities clean.

1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING SITE

- .1 Execute work with least possible interference or disturbance to operations, public and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.

1.4 SECURITY

- .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.

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 REFERENCES

- .1 Owner-Contractor Agreement.

1.2 PROGRESS PAYMENT

- .1 No measurement for progress payment will be made for any and all work. Contract shall be paid as single firm fixed price (lump sum) for all work including furnishing of all labour, materials, tools, equipment, administration, travel, etc.
- .2 No progress payments shall be made.
- .3 Final Payment shall be made upon certification and final acceptance of all work.

1.3 FINAL PAYMENT

- .1 Submit application for final payment when Work is completed.
- .2 Department Representative will, no later than 10 days after receipt of application for final payment, review Work to verify validity of application. Department Representative will give notification that application is valid or give reasons why it is not valid, no later than 7 days after reviewing Work.
- .3 Final Payment shall be made upon certification and final acceptance of all work. Department Representative will issue final certificate for payment when application for final payment is found valid.

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 ADMINISTRATIVE

- .1 Schedule and administer project meetings throughout the progress of the work at the call of Departmental Representative.
- .2 Provide physical space and make arrangements for meetings.
- .3 Preside at meetings.
- .4 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

- .1 Within 7 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Senior representatives of Departmental Representative, Consultant, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement prior to signing.

1.3 PROGRESS MEETINGS

- .1 During course of work schedule and attend any progress meetings scheduled by Parks Canada.
- .2 A progress meeting is to be held 72 hours in advance of commencing work at each of the 3 project sites.
- .3 Contractor, major Subcontractors involved in Work, Departmental Representative are to be in attendance.
- .4 Notify parties minimum 7 days prior to meetings.
- .5 A meeting shall be held at completion of all work to jointly assess final completion status.

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 ADMINISTRATIVE

- .1 Submit to Departmental Representative (Consultant) submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2 Do not proceed with Work affected by submittal until review is complete.
- .3 Present shop drawings and product data, in SI Metric units.
- .4 Where items and information are not produced in SI Metric units, converted values are acceptable.
- .5 Review submittals prior to submission to Departmental Representative (Consultant). This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Departmental Representative (Consultant) in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are co-ordinated.
- .8 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.
- .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative (Consultant) review.
- .10 Keep one reviewed copy of each submission on site.

1.2 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit shop drawings and product data sheets for all new installations.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 5 days for Departmental Representative (Consultant) review of each submission.

- .5 Adjustments made on shop drawings by Departmental Representative (Consultant) are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative (Consultant) prior to proceeding with Work.
- .6 Make changes in shop drawings as Departmental Representative (Consultant) may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative (Consultant) in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .8 Submissions include:
 - .1 Interconnector assemblies
 - .2 Chain and connectors for anchors
 - .3 Concrete mix designs
 - .4 Rebar drawings for anchors
 - .5 Epoxy adhesive grout
 - .6 Date and revision dates.
 - .7 Project title and number.
 - .8 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .9 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .10 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Relationship to adjacent work.
- .9 After Departmental Representative (Consultant)'s review, distribute copies.

- .10 Submit an electronic copy and 3 prints of shop drawings for each requirement requested in specification Sections and as Departmental Representative (Consultant) may reasonably request.
- .11 Submit 3 copies and an electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative (Consultant) where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit 3 copies and an electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative (Consultant).
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within 3 years of date of contract award for project.
- .13 Submit 3 copies and an electronic copy of certificates for requirements requested in specification Sections and as requested by Departmental Representative (Consultant).
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit 3 copies and an electronic copy of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental Representative (Consultant).
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit 3 copies and an electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative (Consultant).
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit 3 copies and an electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative (Consultant).
- .18 Delete information not applicable to project.
- .19 Supplement standard information to provide details applicable to project.
- .20 If upon review by Departmental Representative (Consultant), no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

- .21 The review of shop drawings by Parks Canada Agency (PCA) is for sole purpose of ascertaining conformance with general concept.
 - .1 This review shall not mean that PCA approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.3 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
- .2 Submit transcription of insurance immediately after award of Contract.

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 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Province of Ontario
 - .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990, c.0.1, as amended and O. Reg. 213/91 as amended - Updated 2011.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Use Parks Canada Safety Template. Form attached as appendix item.
- .3 Submit 3 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative weekly.
- .4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .5 Submit copies of incident and accident reports.
- .6 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 47 15 - Sustainable Requirements: Construction and Section 02 81 01 - Hazardous Materials.
- .7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within 5 days after receipt of comments from Departmental Representative.
- .8 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .9 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 Consultant.
- .10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.
- .11 Complete and Submit Parks Canada Attestation and Proof of Compliance with Occupational Health and Safety. Form attached as appendix item.

1.3 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.
- .2 Contractor shall be responsible and assume the Principal Contractor role for each work zone location. Contractor shall provide a written acknowledgement of this responsibility with 3 weeks of contract award, or prior to beginning work, whichever is sooner.

- .3 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.4 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

1.5 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.6 REGULATORY REQUIREMENTS

- .1 Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

1.7 PROJECT/SITE CONDITIONS

- .1 Work at site will involve contact with:
 - .1 Parks Canada staff.
 - .2 Local property owners and watercourse users.
 - .3 Contract work involves working within high flow watercourse and in proximity to upstream intakes of water control dams. Workers shall wear appropriate personal protective equipment at all times including Transport Canada Approved Personal Floatation Devices (PFDs) or life jackets. An adequate supply of Transport Canada approved life preserver rings with sufficient life rope must also be on hand, accessible and at ready at all times. Do not rely on Parks Canada life rings posted on dam.
 - .4 Work is in close proximity to upstream intake to water control dams. Do not allow watercraft to navigate further downstream and closer to dam than new boom anchor locations.
 - .5 Minimize working from water where possible.

1.8 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.9 RESPONSIBILITY

- .1 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.
- .2 Contractor will be responsible and assume the role Constructor as described in the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.
- .3 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.10 COMPLIANCE REQUIREMENTS

- .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990, c. 0.1 and Ontario Regulations for Construction Projects, O. Reg. 213/91.

1.11 UNFORESEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Ontario and advise Consultant verbally and in writing.
- .2 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, advise Safety Officer and follow procedures in accordance with Acts and Regulations of Ontario and advise Departmental Representative verbally and in writing.

1.12 HEALTH AND SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
 - .1 Have site-related working experience specific to activities associated with marine work.
 - .2 Have working knowledge of occupational safety and health regulations.
 - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
 - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - .5 Be on site during execution of Work and report directly to and be under direction of site supervisor.

1.13 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Ontario, and in consultation with Departmental Representative.

1.14 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.15 BLASTING

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

1.16 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

Part 2 - Products

2.1 NOT USED

- .1 Not used.

Part 3 - Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Attestation and Proof of Compliance with Occupational Health and Safety (OHS)

Submission of this completed form, satisfactory to Parks Canada, is a condition of gaining access to the work place.

Instructions:

Prime contractor must sign this form for all projects undertaken at Parks Canada work places.

This form is to be administered by the Project Manager and completed by the Prime Contractor (Consultant) AFTER contract award.

Parks Canada recognizes that federal OHS legislation places certain specific responsibilities upon Parks Canada as owner of the work place. In order to meet those responsibilities, Parks Canada is implementing a contractor safety regime that will ensure that roles and responsibilities assigned under Part II of the *Canada Labour Code* and the *Canada Occupational Health and Safety Regulations* are implemented and observed when involving contractor(s) to undertake works in Parks Canada work places.

Parks Canada Responsible Authority/Project Lead	Address	Contact Information
Contractor (Consultant)		
Subcontractor(s) (add additional fields as required)		

Location of Work

General Description of Work to be Completed

Mark "Yes" where applicable.

	A meeting has been held to discuss hazards and access to the work place and all known and foreseeable hazards have been identified to the contractor and/or subcontractor(s)
	The contractor and/or its subcontractor(s) will comply with all federal and provincial/territorial legislation and Parks Canada's policies and procedures, regarding occupational health and safety.
	The contractor and/or its subcontractor(s) will provide all prescribed safety materials, equipment, devices and clothing.
	The contractor and/or its subcontractor(s) will ensure that its employees are familiar with and use all prescribed safety materials, equipment, devices and clothing at all times.

	The contractor and/or its subcontractor(s) will ensure that its activities do not endanger the health and safety of Parks Canada employees.
	The contractor and/or its subcontractor(s) has inspected the site and has carried out a hazard assessment and has put in place a health and safety plan and informed its employees accordingly, prior to the commencement of the work.
	Where a contractor and/or its subcontractor(s) will be storing, handling or using hazardous substances in the work place, it will place warning signs at access points warning persons of the presence of the substances and any precautions to be taken to prevent or reduce any hazard of injury or death.
	The contractor and/or its subcontractor(s) will ensure that its employees are instructed in respect of any emergency procedures applicable to the site.

I, _____ (contractor/consultant), certify that I have read, understood and attest that my firm, employees and all sub-contractors will comply with the requirements set out in this document and the terms and conditions of the contract.

Name _____ Signature _____

Date _____

Part 1 - General

1.1 REFERENCES

- .1 Definitions:
 - .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.
 - .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedure.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements, and 01 35 43 - Environmental Procedures.
- .3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.
- .4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .5 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .6 A Basic Level Impact Assessment under the 2012 Canadian Environmental Assessment Act (CEAA) has been undertaken by Parks Canada and Transport Canada environmental officers. Refer to attached report and List of Mitigations related to construction activities and ensure all mitigations are adhered to.
- .7 Include in Environmental Protection Plan:
 - .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
 - .3 Names and qualifications of persons responsible for training site personnel.
 - .4 Descriptions of environmental protection personnel training program.
 - .5 Erosion and sediment control plan identifying 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.

- .6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, and sanitary facilities. Note that no stockpiles of excess or spoil materials are permitted on site.
- .7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
 - .1 Plans to include measures to minimize amount of material 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.
 - .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
- .9 Spill Control Plan to include 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, are contained on project site.
- .12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- .13 Waste Water Management Plan identifying methods and procedures for 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.

1.3 FIRES

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

1.4 DRAINAGE

- .1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include 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.
- .2 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .3 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.

- .4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
- .5 At minimum a double row of straw bales wrapped in geotextile fabric shall be used as a filter for excavation water being pumped into watercourse. Refer to 1.6 for additional requirements related to work adjacent to waterways.

1.5 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants on site and adjacent properties as indicated.
- .2 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.
 - .1 Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.
- .5 All disturbed areas of ground are to be restored to existing or better condition than documented prior to construction. At Hastings all disturbed areas of lawn must be restored by re-grading and restoring lawn with minimum 100mm of topsoil and sod. This includes all excavations and tire ruts for which a minimum 300mm wide row of topsoil and sod is to be placed along tire ruts in surface. At other sites seeding will generally be accepted. All watering of new grass is responsibility of Contractor until such time new grass has rooted. Sod rooting will be based on 'tug test'. Seeded areas rooting will be based on 25mm blade growth and 98% coverage of restored area. Burned sod must be replaced within 2 weeks. Water may be drawn from adjacent watercourse for lawn watering. Remove lawn watering equipment at end of each visit. Do not draw water for any other purposes such as concrete mixing or cleaning of equipment, etc. Use only fertilizer. Pesticides and herbicides are strictly prohibited.

1.6 WORK ADJACENT TO WATERWAYS

- .1 Construction equipment to be operated on land only.
- .2 Use waterway beds for borrow material only after written receipt of approval from Departmental Representative.
- .3 Waterways to be kept free of excavated fill, waste material and debris.
- .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 Erect silt fencing along shoreline and perimeter of all excavations proximate to waterway. Securely anchor to guard against failure due to erosion.
- .8 Install floating debris curtain in water maximum 1.8m off shore. Curtain is intended as a secondary defense in addition to silt fence on shore. Weight curtain and securely anchor to shoreline accounting for river flows. Ensure no silt and debris associated with surface runoff from excavation areas is allowed to pass through curtain.

- .9 No stockpiling of material is permitted on site. All material to be excavated must be removed and placed directly into trucks or containers for immediate transport from site. New material such as backfill material must be transported to site and taken directly from truck or container and immediately placed in intended location.

1.7 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
 - .1 Provide temporary enclosures where directed by Departmental Representative.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.8 NOTIFICATION

- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
 - .1 Take action only after receipt of written approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

Part 2 - Products

2.1 NOT USED

- .1 Not Used.

Part 3 - Execution

3.1 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Bury rubbish and waste materials on site where directed after receipt of written approval from Departmental Representative.
- .3 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.

- .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .5 Waste Management: separate waste materials for reuse/recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION



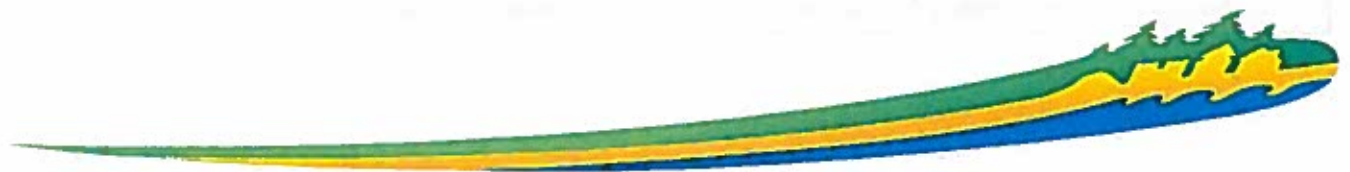
parcscanada.gc.ca
parkscanada.gc.ca

Basic Impact Analysis

Southern Sector Safety Boom Installation

Trent-Severn Waterway

October 21, 2014



Parks
Canada

Parcs
Canada

Canada



1. PROJECT TITLE	Southern Sector Safety Boom Installation	
2. PROJECT LOCATION (Park, Site, Canal, NMCA)	Trent-Severn Waterway	
3. PROJECT SITE(S)	Hastings Dam at Lock 18, Healey Falls Dam at Lock 17 and Glen Ross Dam at Lock 7	
4. PROPONENT	Scott Gauthier	
5. PROPONENT CONTACT INFORMATION	PO Box 24030 (Barriefield PO) Kingston, ON K7L 0B4 Telephone: (613)530-3305 Email: Scott.Gauthier@pc.gc.ca	
6. PROJECT DATES	Commencement: July 1, 2015	Completion: March 14, 2016
7. INTERNAL PROJECT FILE #		
8. PROJECT DESCRIPTION (For help completing this section see instructions at end of document)		
<p>The project consists of installing a floating barrier system otherwise known as a safety boom upstream of 3 dams within the southern sector of the Trent Seven Waterway (TSW), at Hastings Dam (Lock 18), Healey Falls Dam (Lock 17) and Glen Ross Dam (Lock 7). The aim of the project is to improve public safety; a floating safety boom upstream of a dam provides protection from drowning hazards associated with the dam.</p> <p>This project requires approval from Transport Canada under the <i>Navigation Protection Act</i>. This BIA report has been prepared to meet the requirements outlined under section 67 of the <i>Canadian Environmental Assessment Act, 2012</i>.</p> <p>See Appendix 2 for a description of the scope of work and outline of the planned execution of work.</p>		
9. ENVIRONMENTAL COMPONENTS LIKELY TO BE AFFECTED (For help completing this section see instructions at end of document)		
<p>The components that could potentially be affected by the proposed project are the following (see Appendix 1 – Effects identification Matrix):</p> <ul style="list-style-type: none"> -Water resources related to the installation of one or more sonotubes on the shoreline -Floral and faunal resources related to the installation of concrete blocks on the canal bed. <p>The historic value of the concrete dam at Hastings and the concrete canal wall at Healey's Falls could potentially be affected by the installation of concrete anchors on these structures.</p> <p>Other components related to natural and cultural resources and visitor experience are unlikely to be affected. Terrestrial and aquatic Species at Risk are not known specifically from the proposed work sites. The Earth Science ANSI (Area of Natural and Scientific Interest) located adjacent to the Healey's Falls dam will not be affected.</p>		
10. IMPORTANT EFFECTS IDENTIFIED (For help completing this section see instructions at end of document)		





The installation of one or more sonotubes on the shoreline could impact localized water resources via soil/silt particles entering the water from heavy equipment usage, excavating and backfilling. Soil/silt entering the water could also produce negative effects for fish habitat.

The permanent installation of concrete blocks on the canal bed may have an impact on the aquatic plants and fish habitat of the local area.

The historic value of the concrete dam at Hastings and the concrete canal wall at Healey's Falls could potentially be affected by the installation of concrete anchors on these structures, which are considered cultural resources of other heritage value (formerly called level 2 cultural resources).

This project will not affect the normal navigation of vessels on the Trent-Severn Waterway. Aerial cables are already in place to restrict access to the dams; however the new booms will be highly visible and easily seen by boaters in the vicinity. The boom line will also be marked with restricted area buoys and conforms with Transport Canada's recommendations.

11. MITIGATION MEASURES (For help completing this section see instructions at end of document)

Mitigation measures related to the natural resource aspect of the proposed project are included in Appendix 3.

Mitigation measures related to potential effects to cultural resources are below:

-Undertake the minimal amount of disturbance necessary for this intervention, or preferably locate the intervention where the dam has already been impacted (for instance where repairs have been completed in the past and new material was added).

12. IMPACT SIGNIFICANCE (For help completing this section see instructions at end of document)

With the application of the mitigation measures outlined above, the proposed project is unlikely to produce negative effects on water resources and insignificant effects to aquatic plants/fish habitat in the vicinity of the concrete blocks. There is unlikely to be any residual effects or cumulative effects produced by the proposed project. The project also offers the positive benefit of increasing public safety around the three dams.

13. SITE INSPECTION (For help completing this section see instructions at end of document)

Site inspection not required

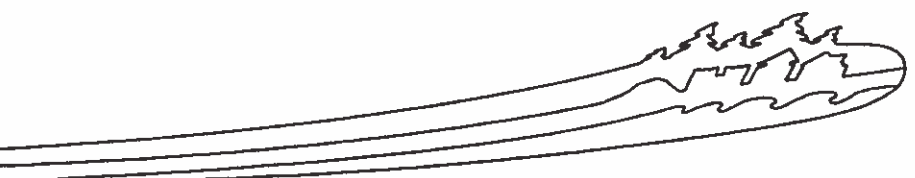
Site inspection required

Site Inspection program details

N/A

14. EXPERTS CONSULTED (Including PC Experts)

Department/Agency/Institution	Parks Canada Agency
Contact Information	Kerry Fitz-Hardy (Visitor Services Team Leader, Rideau Canal)
Date of Request	2014-09-10
Expertise Requested	Requested expertise as former VE staff whether this project would constitute a concern from a VE perspective.





Response	Advised that the project does not constitute a concern given that the sites are not safe for public usage. Also advised that there is one person working in VE for the TSW but is focused on the visitor centre.	
Department/Agency/Institution	Parks Canada Agency	
Contact Information	Susan Millar (Planner, Ontario Waterways)	
Date of Request	2014-09-10	
Expertise Requested	Requested expertise on potential effects on cultural resources	
Response	Advised that the concrete wall and dam in question are considered cultural resources and provided a mitigation measure (see Section 11).	
Department/Agency/Institution	Transport Canada	
Contact Information	Ana Hamid (Environmental Officer)	
Date of Request	2014-09-15	
Expertise Requested	Requested review of draft BIA document	
Response	Advised the document is sufficient from their perspective and gave suggestions of a few items to add.	
15. PUBLIC PARTICIPATION	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	N/A
16. DECISION		
Taking into account implementation of mitigation measures outlined in the analysis, the project is:		
<input checked="" type="checkbox"/>	Not likely to cause significant adverse environmental effects.	
<input type="checkbox"/>	Likely to cause significant adverse environmental effects.	
SIGNATURES AND APPROVAL Note: Please see Appendix 4 for additional signatures and approvals (Transport Canada)		
EA Author		
Name: Hillary Knack	Title: Resource Management Officer	
Signature <i>Hillary Knack</i>	Date <i>Oct 21, 2014</i>	
REVIEW BY		
Name: Harry Szeto	Title: Environmental Assessment Officer (Rideau Canal)	
Signature <i>[Signature]</i>	Date <i>Oct 21, 14</i>	
DECISION APPROVAL		
Name: Jewel Cunningham	Title: Director, Ontario Waterways Unit	
Signature <i>Jewel Cunningham</i>	Date <i>NOV 5/14</i>	
17. REFERENCE LIST		
N/A		
18. ATTACHMENTS LIST		





Appendix 2 – Project description and outline of execution of work
Appendix 3 – Mitigation Measures
Appendix 4 – Signature page for Transport Canada

19. ADDITIONAL CONSIDERATIONS / COMMENTS

N/A





Appendix 1: Effects Identification Matrix (use and include when useful)

EFFECTS IDENTIFICATION MATRIX														
Use the following matrix to identify if your project may have potential impacts on components of the environment		Components of Environment and Mandate Elements Affected by Environmental Change												
		Natural Resources					Cultural Resources		Visitor Experience					
		Air	Soil	Water	Flora	Fauna	Historic Value	Character defining elements	Viewscape	Visitor appreciation & access	Recreational/other opportunities	Public Safety	Unique character & connection to place	
Phases	Examples of Associated Activities													
Project Components	Construction/Preparation	Supply and storage of materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Burning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Clearing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Demolition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Disposal of waste	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Blasting/ Drilling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Dredging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Drainage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Excavation	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Grading	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Backfilling	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Use of machinery	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Transport of materials/ equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Building of fire breaks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Use of Chemicals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Set up of temporary facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Other...	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	Operation/Implementation Decommissioning	Waste disposal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Wastewater disposal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Maintenance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Use/Removal of temporary facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Use of Chemicals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Active fire stage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Prescribed burn cleanup	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Planting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Vehicle Traffic		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Installation of concrete anchors on dam/canal wall	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Blocks on canal bed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			



Trent Severn Waterway Southern Sector Safety Booms

Prepared by: Scott Gauthier, Parks Canada Project Manager, amended by Hillary Knack

September 9, 2014

Project Description

The project consists of installing a floating barrier system otherwise known as a safety boom upstream of 3 dams within the southern sector of the Trent Seven Waterway (TSW).

Project Intent

The aim of the project is to improve an important public safety aspect of the dams. A floating safety boom upstream of a dam provides protection for the public from drowning hazards associated with the dam. The boom will protect against the risk of users upstream of the dam such as disabled watercraft drifting downstream or unwary swimmers from being drawn into the dam's sluices and subjected to dangerous flows, undertow and the risk of being pulled through the dam spillways and into the discharge.

Site Locations

The 3 dams are Hastings Dam at Lock 18, Healey Falls Dam at Lock 17 and Glen Ross Dam at Lock 7 as follows:

Hastings Dam

Hastings Dam is located in the Village of Hastings. The main dam is 6 m high and approximately 150 m wide. The dam consists of 8 stop log sluices and two radial (tainter) gate sluices.



Hastings Dam – Note aerial cable upstream of structure. Cable will remain. Boom will be upstream of cable.

Healey Falls Dam

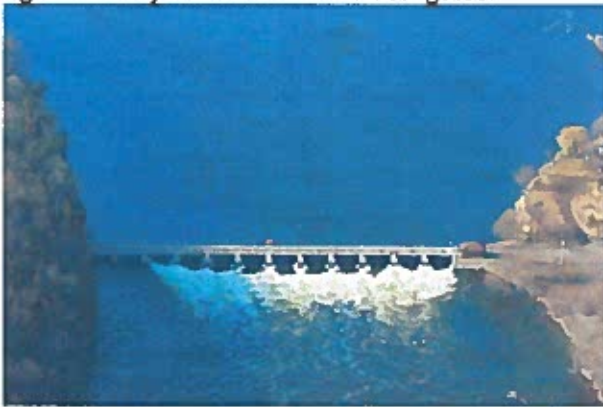
Healey Falls Dam is located 10 km north of Cambellford. The main dam is approximately 155 m long 4.2 m high. The dam consists of 15 total sluices including a combination of vertical gates and stop logs sluices.



Healey Falls Dam

Glen Ross Dam.

Glen Ross Dam is located 17 km north of Trenton ON. The main dam is approximately 120 m long 12 m high. The day consists of 12 vertical gates.



Glen Ross Dam

Scope of Work

A floating barrier otherwise known as a safety boom will be installed upstream of each dam. The floating barrier will consist of log shaped plastic floatation units and floating restricted area buoys at anchor points. The floatation units are manufactured items that consist of a one piece hard plastic shell filled with closed cell polyurethane foam as a core. They are coloured safety yellow with black lettering. The floats are tied together with steel pin shackles at their ends and laid in sequence to form a continuous floating barrier with only a short gap between each individual float. The buoys are similar foam filled plastic shell construction likely with a weighted ballast on the bottom.

The line of floats forming the safety boom are anchored to the river bed via steel chains tied to pre-cast reinforced concrete anchor blocks. The number and positioning of anchors is determined based on loading requirements as well as the geometry of the intended layout (ie. An anchor is needed wherever the boom must change direction.) The size of anchors is also determined by loading requirements. The safety boom is then anchored at its ends at defined termination points which are typically the shoreline, face of dam or end of canal wall or dam wing wall. In this project we will have all 3 scenarios.

At Glen Ross, the boom is anchored to the shoreline at one side using an existing concrete anchor block. At the other end it will be an in-water anchor just off the shoreline similar to any of the other in-water anchors along its length.

At Healey Falls, the boom will be anchored to the shoreline line at one side using an existing concrete anchor block and at the other it will be fastened to the face of the concrete dam.

At Hastings, one end of the boom will be anchored to the end of the concrete canal wall. At the other end it will utilize a new concrete sono-tube anchor on the shoreline. This will consist of a large diameter, likely 36" or 914mm or greater, concrete pier at least 1.2m (4ft) into the ground.

The dimensions of the concrete anchor blocks are currently unknown, however the largest size would be approximately 36"x36"x36" (914x914x914mm). Concrete blocks will be various sizes to suit loading conditions as well as installation procedure specific to each site. Each dam has a different flow velocity. The greater the flow and distance between anchors, the bigger the drag force on the anchor. Anchors depend on self weight so the bigger the force, the bigger the anchor that is needed. Also if an anchor is very large and it needs to be dropped in from a work boat, a single anchor could actually be the sum of a number of smaller anchors tied together so it's actually possible to lift them and drop them in place.

Execution of work

The work will mostly be completed from the water using a work boat of sorts.

The in-water anchors, quantity varying at each site, will be pre-fabricated off site. They will then be transported to site and dropped into the water down to the river bed from a boat or from a crane staged on the shoreline depending on the size of the anchors and access logistics on site.

Chain of sufficient lengths, having been attached to the concrete anchors via steel eyelets prior to dropping into the water, is then connected to a safety boom float at the water surface above each anchor location. A restricted area buoy is also connected to the chain at each anchor location. The buoys serve as both visual warning devices as well as to keep the anchor chains afloat should the boom break due to forces such as ice loading.

The shoreline anchor points are then installed.

In the case of an existing concrete shoreline anchor in the ground or new anchor in an existing face of the dam or in an appurtenant wall, the work is similar and consists of attaching a mechanical anchor to the concrete. This typically would consist of drilling a hole in the concrete and adhering a steel eyelet with epoxy or anchoring a steel post with sliding contraption to allow for movement of the boom up and down with water level as it fluctuates.

Where a new concrete sono-tube anchor is needed, such as at Hastings, an excavation near the shoreline will be made. A high density paper fibre sono-tube would be used as a form. Steel reinforcement bars would be placed and concrete subsequently poured. Concrete mixing would occur offsite and delivered via a ready mix truck. Quantities may have allowed for concrete mixing on site, however, the unavailability of potable water at the sites makes on-site mixing non-feasible. The excavation would be backfilled and compacted likely with new crushed gravel and topped with topsoil and seeded (or sodded) on grass areas.

The installation of sonotube(s) will be restricted to public property. The local Municipality at the Hastings site will be contacted to arrange permissions to install a sonotube on Municipal property.

Material stockpiling would not be permitted. Removed soil and excess concrete would be placed directly in a truck for transport off site. New backfill material would be immediately placed. In the case of Hastings, the property is not owned by Parks Canada. The owner of the land (Town of Hastings) will be approached prior

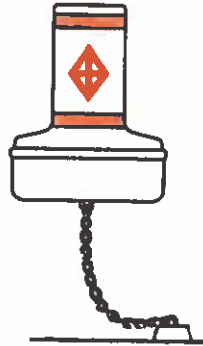
to construction to confirm acceptability. The new anchor will not change the function nor impair access to adjacent land.

With anchors in place the remaining safety boom floats are then connected to the anchored floats to connect the dots and form a continuous barrier completing the installation.

Photos and Figures



Photo of Safety Boom Floats stored in yard



Example of restricted area buoy

Proposed Layouts (also see 33% design plan drawings)

Parks Canada Hastings Dam at Lock 18

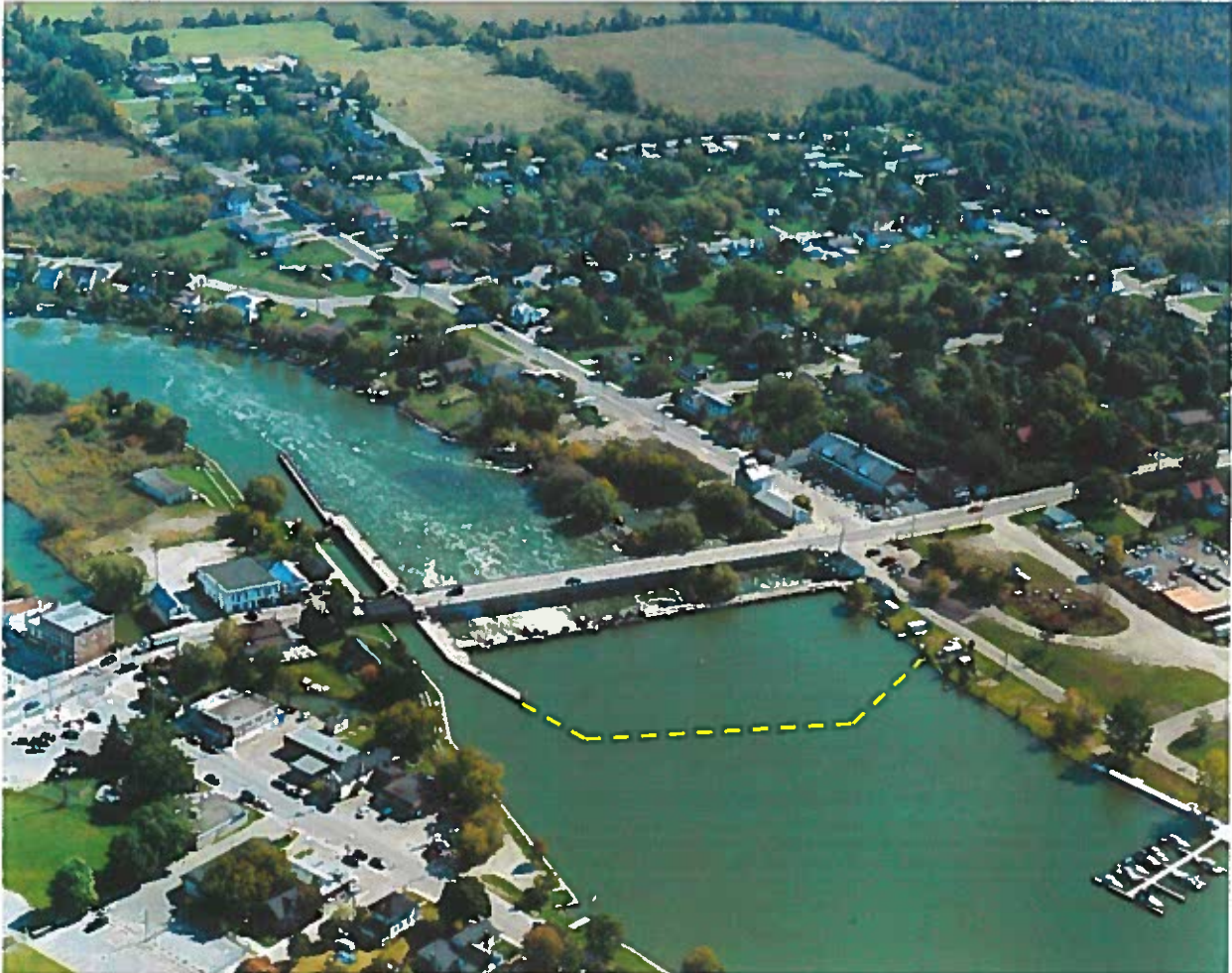


Photo 1 - Aerial Photo of Hastings Dam at Lock 18 looking downstream. Dam is to the right of Lock 18. Approximate proposed boom location is shown as yellow dashed line. Intent is to direct watercraft away from dam and towards lock. An inverted v-shape layout is proposed to promote self rescue. The boom is further set back upstream off the end of existing canal cut wall away from dam to protect against draw of main tainter gates. Currently an existing aerial cable exists upstream of dam. It is seen (lightly) in photo between dam and proposed new boom.



Photo 2 - Aerial Photo of Hastings Dam looking upstream. Approximate proposed boom location is shown as yellow dashed line. Note a small dock shown in the photo at left just upstream of dam is abandoned and not permitted by by the TSW. The landowner has been contacted and the dock should be removed in the near future.

Parks Canada Glenn Ross Dam at Lock 7



Photo 1 - Aerial Photo looking upstream. Glen Ross dam is seen at top left. Approximate proposed boom location shown as yellow dashed line. Glen Ross Lock 7 is to the right in photo. Intent of boom is to keep watercraft away from dam and directed towards lock. An angled layout is proposed to promote self rescue.



Photo 2 - Aerial Photo looking downstream. Glen Ross dam is seen at right. Approximate proposed boom location shown as yellow dashed line. Glen Ross Lock 7 seen to the left is accessed via a canal cut. Intent of boom is to keep watercraft away from dam and directed towards lock.



Photo 3 - Aerial Photo looking downstream. Approximate proposed boom location shown as yellow dashed line. Note that just upstream of the proposed boom at the left side is a legacy public boat launch that will remain accessible. The boom is therefore proposed to be located immediately downstream anchored at existing aerial cable anchor point. An in-water anchor will be used near the shoreline instead of approaching the private owner about using his land to install a land based anchor. With the proposed layout, the boat launch serves as a practical and safe self rescue escape point for disabled watercraft.

Parks Canada Healey Falls Dam at Lock 17



Photo 1 - Aerial Photo looking downstream. Healey Falls Dam seen at left. Lock 17 is seen to right of dam. Approximate proposed boom location shown as yellow dashed line. Intent is to direct watercraft away from dam and towards the lock. An inverted v-shape layout is proposed to promote self rescue.

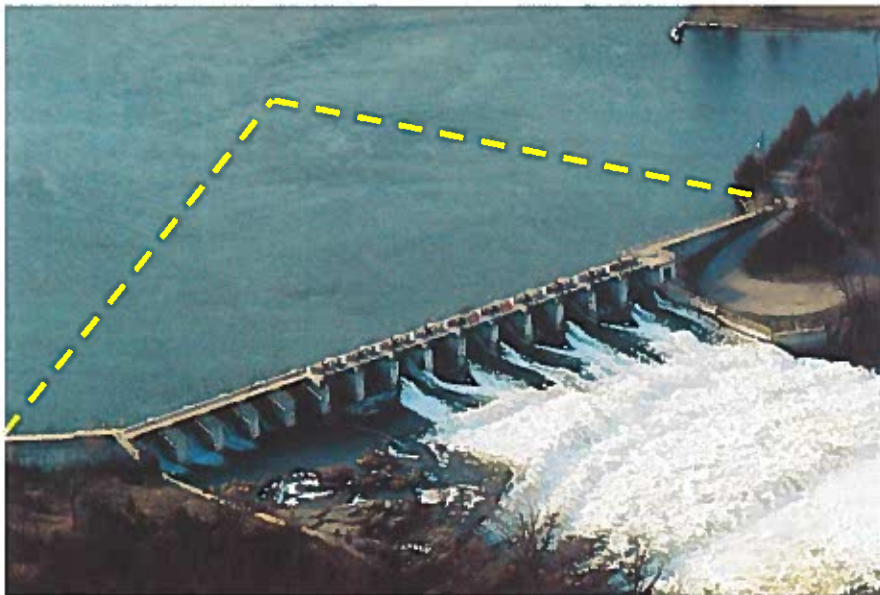


Photo 2 - Aerial Photo of Healey Falls Dam looking upstream. Currently an aerial cable exists upstream of the dam. Approximate proposed boom location shown as yellow dashed line. Intent is to direct watercraft away from dam and towards the lock. Note that property implications effect the anchorage locations for the boom. Existing dam aerial cable anchor locations are proposed to be used to anchor the proposed boom.

Appendix 3. Mitigation Measures for the Proposed Installation of Safety Booms, Southern Sector, TSW.

The mitigation measures provided here are general mitigations applicable to the proposed project, as well as those outlined for usage of heavy equipment and shoreline excavation within the Replacement Class Screening for Routine In-Water Works on the Rideau Canal and Trent-Severn Waterway.

Safety Standards

- The Canadian Occupational & Safety Regulations and all approved Parks Canada Safe Work Practices will be strictly adhered to during all stages of work perform, in order to ensure safety of staff and others at all times. Contact Yves Racine (Yves.racine@pc.gc.ca, 613-692-2581 or 613-290-7573) for more detail.
- Meet or exceed the requirements of all applicable federal and/or provincial health and safety legislation, regulations, and permits.
- Ensure all workers wear protective gear (for example, safety work boots, hard hats, etc.) in accordance with the Occupational Health and Safety Act and regulations.
- Restrict public access to active work areas to minimize potential accidents.

Work Restriction Periods; Migratory Bird Nesting and Fish Spawning Periods

- Do not schedule removal of vegetation between April 15 - July 31 to avoid destruction of active migratory bird nests, breeding, migration/staging, hibernation or nursing periods.
- No in-water work permitted between March 31-July 01.
- Conduct disruptive (i.e. noise generating) activities outside of breeding season, sensitive migration, hibernation, or nursing periods.

Noise Restrictions

- Adhere to local noise by-laws, notify residents of planned activities that may cause disturbance and schedule them to avoid sensitive time periods and ask them to stay clear of site.
- Conduct work during normal business hours.
- Monitor and mitigate public complaints by keeping a record of complaints and addressing issues raised by the public should they arise.

Heavy Equipment & Machinery

- Use new or well-maintained heavy equipment and machinery, preferably fitted with fully functional emission control systems/muffler/exhaust system baffles, engine covers, etc.
- Check equipment and machinery prior to entering site to ensure they are clean; if not, clean them before entering site.
- Minimize vehicle idling and minimize vehicle traffic on exposed soils.
- Ensure refuelling and handling of contaminants are located off-site where possible.
- Refuel equipment off slopes and away from aquatic habitats/water bodies.
- Stabilize high traffic areas with clean gravel surface layer or other suitable cover material, minimize vehicle traffic on exposed soils.
- Instruct workers and equipment operators on dust control methods and take actions to suppress dust as necessary.
- Vehicle and equipment re-fueling and/or maintenance activities should be conducted off-site. Where it is not feasible to do so, activities should be conducted at a minimum distance of 30 metres from the watercourse and under controlled conditions.
- Prior to the pouring of concrete, all concrete forms shall be thoroughly inspected to ensure that formwork is fully secured and sealed to prevent the release of concrete or concrete contaminated water into the river
- Containment facilities shall be provided at the site for the wash-down water from concrete delivery trucks, concrete pumping equipment, and other tools and equipment, as required

Sediment Control

- Prior to commencement of work, install sediment and erosion control measures, such as, rock or straw bale flow checks, silt fences, drainage swales, or other methods necessary to prevent silt or sediment from entering the watercourse.
- These measures shall be maintained throughout the project lifespan to prevent entry of sediment into the water.
- All sediment and erosion control measures shall be inspected daily to ensure they are functioning properly and maintained and upgraded as required.
- In the event the sediment and erosion control measures are not functioning, the supervisor shall order the work stopped. No further work shall be carried out until the sediment control plan is adjusted to address the sediment problem.
- Erosion and sediment control measures shall remain in place and maintained until project activity is completed and the site has been stabilized.
- Remove accumulated sediments prior to removing erosion control measures.
- Following completion of work, and prior to removal of sediment and erosion control measures all disturbed surfaces and shorelines shall be stabilized and re-vegetated with native species only, as soon as possible.

Erosion Control

- Avoid activity during wet weather conditions and ensure that a consistent access route is used and maintained.
- Direct runoff and overland flows into adequately vegetated areas, away from waterbodies, working areas and areas of exposed soils.
- Should conditions at the work site indicate that there are unforeseen negative impacts to fish or their habitat, all work shall cease until the problem has been corrected and/or DFO are consulted.

Staging Area

- An emergency spill kit shall be kept at the site and deployed immediately should a spill occur. In the case of a spill contact your supervisor, Ontario Spill Action Center shall be notified immediately at 1-800-268-6060, all provincial and federal regulations are to be adhered to. Maintain an adequate supply of clean up materials on-site.
- Store all oils, lubricants, fuels and chemicals in secure areas on impermeable pads.
- There shall be no discharge of chemicals and cleaning agents in or near aquatic habitats, all such substances shall be disposed of at a facility licensed to receive them.
- Refuelling of equipment and maintenance shall be conducted off slopes and away from water bodies on impermeable pads or buried liners to allow full containment of spills at a recommended distance of 30 meters from any watercourse.
- No tools, equipment, temporary structures or parts thereof, used or maintained for the purpose of this project, shall be permitted to remain at the site or enter the water after completion of the project.
- Upon completion of the work all debris shall be completely removed and the area restored to its original state or better. Repair all damages to property due to project activities.

Spill Response Procedure

- Once a spill (regardless of severity) has been identified, it is the responsibility of the Site Supervisor to ensure that the MOEE is notified through its Spills Action Centre (1-800-268-6060); Parks Canada (Harry Szeto (harry.szeto@pc.gc.ca, 613-283-7199 ext. 274) will also be notified. In addition, any spill which is greater than 5L must be reported to the appropriate Provincial authority and to the NCC.
- Proper spill control equipment/items (spill kits, MSDSs, absorbents, containers, caution sign/tape, etc) will be readily available in areas where large quantities of hazardous materials are to be stored.
- In case of small spills less than 2 feet in diameter, a trained employee shall quickly control the spill by securing the spill source, whether it be by standing up a tipped-over container or using absorbent pads to soak up spilled material. The spilled material shall then be secured in a container and disposed of in accordance with the recommendations stated on the MSDSs or as directed by a member of MOE.

- In the case of medium size spills (2 to 6 feet in diameter), immediate action shall be taken to contain the spill by up righting a container or covering it with a lid. In the event that the spill cannot be quickly contained, MOE's Spill Action Centre shall be alerted immediately and the area should be evacuated at that point. The area outside of the spill area shall be evaluated to determine if any equipment (engines, generators, power equipment, etc) needs to be turned off. Once the spill area has been evacuated, it should not be entered back into. When emergency responders have arrived and successfully contained the spill, the employee should be in position to provide prompt assistance from outside the spill area by providing them with MSDSs, absorbents, and containers.
- For larger spills (over 6 feet in diameter) where a continuous flow of hazardous chemical is observed at the source of the spill and cannot be stopped, or in cases where the spill involves a flammable liquid, the area should be evacuated immediately and the Spills Action Centre should be alerted immediately. Specific information shall be provided as to the location, and the type and approximate quantity of chemical spilled. The supervisor/employee shall make available MSDS information for the emergency responders to use, and advise them of the location of any power sources that will need to be shut off. The emergency responders shall also be informed of the location of any absorbents, containers or other spill control equipment that is available. It is a point of emphasis to our employees that in such scenarios they may not re-enter the premises until the area has been deemed all clear by the emergency response team. The worker shall cooperate by providing any information that is necessary for reporting to their supervisor and emergency responders.

Waste Disposal

- Implement construction, renovation, and demolition (CRD) waste measures for solid, non-hazardous material generated during construction, demolition, and/or upgrades as per Chapter 9 of the PWGSC document entitled, *The Environmental Responsible Construction and Renovation Handbook (PWGSC, 2000)*.
- Waste generated will be disposed according to regulations (i.e., O. Reg. 102/94 and O. Reg. 558/00, R.R.O. 1990, 347).
- A solid waste management program will be implemented for typical debris handling and disposal.
- Comply with the requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials and regarding labelling and the provision of material safety data sheets acceptable to Labour Canada.

Drill Waste Material

- Stabilize waste materials removed from the worksite to prevent them from entering the watercourse.
- Install effective sediment and erosion control measures before starting work to prevent entry of sediment or materials into the watercourse.

Appendix 4. Additional Signatures and Approvals

SIGNATURES AND APPROVAL	
Transport Canada	
Name: David Zeit	Title: Senior Environmental Officer, Transport Canada
Signature <i>David Zeit</i>	Date <i>Oct 29, 2014</i>

Part 1 - General

1.1 REFERENCES AND CODES

- .1 Perform Work in accordance with CSA, ASTM, and Transport Canada guidelines, such as: Canadian Coast Guard -Canadian Aids to Navigation System (TP 968), Transport Canada – An Owner's Guide to Private Buoys (TP 14799E), including all amendments up to bid closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply. See Section 033000 for CSA and ASTM standards regarding concrete. See Section 051223 for CSA and ASTM standards regarding structural steel.
- .2 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.

1.2 HAZARDOUS MATERIAL DISCOVERY

- .1 Stop work immediately and notify Departmental Representative if materials which may contain designated substances are discovered in course of work.

1.3 NAVIGATION BUOYS AND MARKERS

- .1 Navigation hazard buoys and markers used on this project are to conform to the Canadian Coast Guard -Canadian Aids to Navigation System (TP 968) and to the Transport Canada – An Owner's Guide to Private Buoys (TP 14799E).
- .2 Provide a Navigation Plan for temporary works related to the dewatering and diversion as approved by Transport Canada and acceptable to the Agency and Departmental Representative. Construct signage to the requirements of Section 10 14 55. Install and maintain signage and buoys during the course of construction

1.4 WATER QUALITY

- .1 The contractor shall not impact the quality of surface water or groundwater.
- .2 The contractor shall obtain all respective permits and approvals to be able to undertake the work.

1.5 TAXES

- .1 Pay applicable Federal, Provincial and Municipal taxes.

1.6 EXAMINATION

- .1 Examine existing conditions and determine conditions affecting work.

1.7 MUNICIPAL PERMITS

- .1 A road allowance occupancy permit from Township of Trent Hills is required to complete work on south shore at Hastings Dam. The applicable permit form is attached to these specifications. Contractor is responsible for completing permit application process including all submissions, correspondence and payment of associated fees to Trent Hills Township. Copy Parks Canada on all permit applications.

Part 2 - Products

2.1 NOT USED

- .1 Not Used.

Part 3 - Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

The Corporation of the



Municipality of Trent Hills

66 Front Street South, P. O. Box 1030, Campbellford, ON K0L 1L0
Phone: (705) 653-1900 Fax: (705) 653-5904

MUNICIPALITY OF TRENT HILLS ROAD OCCUPANCY PERMIT By-law #2002 Schedule "C"

Date: _____

Permit# _____

I, _____ of _____ Phone# _____
(Name) (Address)

hereby make application to occupy the municipal road allowance on the (North, South, East, West) side
of _____ municipal road name in _____ ward.

I do hereby agree to save and hold harmless the Municipality of Trent Hills and its staff or agents from all loss, charges, damages, liens, costs, legal fees, expenses and liabilities from any claim or demand arising from the issuance of said permit.

I will provide insurance coverage for the said work in the amount of \$2 million to cover claims. Ensure protected access for pedestrian traffic is maintained at all times.

Drawing

Date: _____

Applicant: _____
(Signature)

Date: _____

Permit Issued: _____
(Signature)

Date: _____

Inspected/Approved: _____
(Signature)

FEE: \$100.00 _____

The information on this form is being collected under the authority of section 4 of the Municipal Freedom of Information and Protection of Privacy Act. This information will be used for the purpose of processing an access request under the Act. Enquiries regarding the collection of this information should be directed to the Office of the Clerk/Freedom of Information Coordinator, Municipality of Trent Hills, 66 Front St. S., Campbellford, ON K0L 1L0, (705)653-1900.

Part 1 - General

1.1 INSPECTION

- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.2 INDEPENDENT INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.
- .2 Provide equipment 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 Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and re-inspection.

1.3 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.

1.4 PROCEDURES

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

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

1.5 REJECTED WORK

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, 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 Departmental Representative.

1.6 REPORTS

- .1 Submit 4 copies of inspection and test reports to Departmental Representative.
- .2 Provide copies to Subcontractor of work being inspected or tested, manufacturer or fabricator of material being inspected or tested.

1.7 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.

1.8 MOCK-UPS

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .2 Remove mock-up at conclusion of Work or when acceptable to Departmental Representative.
- .3 Mock-ups may remain as part of Work.

1.9 MILL TESTS

- .1 Submit mill test certificates as requested.

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 ACTION AND INFORMATIONAL SUBMITTALS

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

1.2 INSTALLATION AND REMOVAL

- .1 Provide temporary utilities controls in order to execute work expeditiously.
- .2 Remove from site all such work after use.

1.3 DEWATERING

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.4 WATER SUPPLY

- .1 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.
- .2 Pay for utility charges at prevailing rates.

1.5 TEMPORARY POWER AND LIGHT

- .1 Arrange for connection with appropriate utility company. Pay all costs for installation maintenance and removal and on going utilization cost.

1.6 TEMPORARY COMMUNICATION FACILITIES

- .1 Not applicable.

1.7 FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted on site.

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 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1 - 09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CAN/CSA-Z321-96(R2006), Signs and Symbols for the Occupational Environment.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

1.3 INSTALLATION AND REMOVAL

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Identify areas which have to be gravelled to prevent tracking of mud.
- .3 Indicate use of supplemental or other staging area.
- .4 Provide construction facilities in order to execute work expeditiously.
- .5 Remove from site all such work after use.

1.4 SCAFFOLDING

- .1 Not applicable.

1.5 HOISTING

- .1 Provide, operate and maintain hoists/cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
- .2 Hoists/cranes to be operated by qualified operator.

1.6 SITE STORAGE/LOADING

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.7 CONSTRUCTION PARKING

- .1 Parking will be permitted on site, provided it does not disrupt performance of Work.
- .2 Provide and maintain adequate access to project site.

1.8 SECURITY

- .1 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

1.9 OFFICES

- .1 Not applicable

1.10 EQUIPMENT, TOOL AND MATERIALS STORAGE

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.11 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.
- .3 When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures. Permanent facilities may be used on approval of Departmental Representative.

1.12 CONSTRUCTION SIGNAGE

- .1 Do not erect any signs on site other than those related to Health and Safety, traffic control and site access unless approved otherwise by Departmental Representative. This includes Contractor construction site sign boards.
- .2 All signs are to be temporary erections and free standing. Do not excavate or install posts into ground unless approved otherwise.

1.13 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Do not obstruct access to roadways and access lanes. Do not relocate or divert site access routes unless approved otherwise.
- .2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.
- .3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
- .4 Protect travelling public from damage to person and property.
- .5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

- .6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.
- .7 Construct access and haul roads necessary.
- .8 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.
- .9 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .10 Dust control: adequate to ensure safe operation at all times.
- .11 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.
- .12 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.
- .13 Provide snow removal during period of Work.
- .14 Remove, upon completion of work, haul roads designated by Departmental Representative.

1.14 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.
- .4 Stack stored new or salvaged material not in construction facilities.

Part 2 - Products

2.1 NOT USED

- .1 Not Used.

Part 3 - Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to sediment and erosion control plan, specific to site, that complies with requirements of authorities having jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

Part 1 - General

1.1 REFERENCES

- .1 Ontario Provincial Standard Specifications (OPSS) and Ontario Provincial Standard Drawings (OPSD).
- .2 Ontario Ministry of Transportation, Book 7 of the Ontario Traffic Manual – Temporary Conditions.

1.2 INSTALLATION AND REMOVAL

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

1.3 ACCESS TO SITE

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

1.4 PUBLIC TRAFFIC FLOW

- .1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.5 FIRE ROUTES

- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.6 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

- .1 Protect surrounding private and public property from damage during performance of Work.
- .2 Be responsible for damage incurred.

1.7 WASTE MANAGEMENT AND DISPOSAL

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

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 REFERENCES

- .1 Within text of specifications, reference may be made to reference standards.
- .2 Conform to these standards, in whole or in part as specifically requested in specifications.
- .3 Conform to latest date of issue of referenced standards in effect on date of submission of bids, except where specific date or issue is specifically noted.

1.2 OPSS Ontario Provincial Standard

- .1 Whenever OPSS Ontario Provincial Standard Specifications and OPSD Ontario Provincial Standard Drawings are been quoted in these specifications, any standards, specifications or publications which are referred to within the specified OPSS or OPSD form an integral part of those documents and thus form an integral part of these specifications, unless specifically otherwise mentioned.
- .2 OPSS Ontario Provincial Standard Specifications and OPSD Ontario Provincial Standard Drawings quoted in these specifications are available online at <http://www.raqsa.mto.gov.on.ca/techpubs/ops.nsf/OPSHomepage>

1.3 QUALITY

- .1 Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) for purpose intended. If requested, furnish evidence as to type, source and quality of Products provided. Salvage materials as identified for reuse shall be safely and securely stored.
- .2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .3 Should any dispute arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item.
- .5 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions.
- .6 Quality control shall be provided by the Departmental Representative as set out in Section 01 45 00.

1.4 AVAILABILITY

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.5 STORAGE, HANDLING AND PROTECTION

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
- .8 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.6 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of Work.
- .2 Transportation cost of products supplied by Owner will be paid for by Contractor. Unload, handle and store such products.

1.7 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.8 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.9 CO-ORDINATION

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.10 REMEDIAL WORK

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.11 EXISTING UTILITIES

- .1 Do not disturb any existing utilities. Conduct underground utility locates prior to digging. Be mindful of any suspended in water utilities cables and conduit runs. Coordinate work around existing utilities. Where new work is to interfere with existing utilities, stop work and notify Departmental Representative immediately.

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 REFERENCES

- .1 Owner's identification of existing survey control points and property limits.

1.2 SURVEY REFERENCE POINTS

- .1 Existing base horizontal and vertical control points are designated on drawings.
- .2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Departmental Representative.
- .4 Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

1.3 SURVEY REQUIREMENTS

- .1 Establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
- .2 Establish lines and levels, locate and lay out, by instrumentation.

1.4 EXISTING SERVICES

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.
- .2 Protect any line encountered during construction.

1.5 RECORDS

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.
- .3 Record locations of maintained, re-routed and abandoned service lines.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit name and address of Surveyor to Departmental Representative.
- .2 On request of Departmental Representative, submit documentation to verify accuracy of field engineering work.
- .3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.7 SUBSURFACE CONDITIONS

- .1 Promptly notify Departmental Representative in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.
- .2 After prompt investigation, should Departmental Representative determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

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 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .3 Clear snow and ice from project site and staging areas. Temporary bank/pile snow within work limits and/or remove from site as required.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .7 Dispose of waste materials and debris off site.
- .8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .9 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

1.2 FINAL CLEANING

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris other than that caused by Owner or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

1.3 WASTE MANAGEMENT AND DISPOSAL

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

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 WASTE MANAGEMENT GOALS

- .1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss PCA's Waste Management Plan and Goals.
- .2 PCA's Waste Management Goal is for 75 percent of total Project Waste to be diverted from landfill sites. Provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.
- .3 Accomplish maximum control of solid construction waste.
- .4 Preserve environment and prevent pollution and environment damage.

1.2 STORAGE, HANDLING AND PROTECTION

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Protect structural components not removed for demolition from movement or damage.
- .6 Separate and store materials produced during dismantling of structures in designated areas.
- .7 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off-site processing facility for separation.
 - .3 Provide waybills for separated materials.

1.3 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste into waterways, storm, or sanitary sewers.

1.4 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises.
- .2 Maintain security measures established by existing facility.

1.5 SCHEDULING

- .1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

Part 2 - Products

2.1 NOT USED

- .1 Not Used.

Part 3 - Execution

- .1 Not Used.

END OF SECTION

Part 1 - General

1.1 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Departmental Representative's inspection.
 - .2 Departmental Representative's Inspection:
 - .1 Consultant to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Work: complete and ready for final inspection.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Departmental Representative.
 - .2 When Work incomplete according to Owner/Departmental Representative, complete outstanding items and request re-inspection.
 - .5 Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
 - .6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
 - .7 Final Payment:
 - .1 When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
 - .2 When Work deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.
 - .8 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.2 FINAL CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

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 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, four final copies of maintenance manuals in English.
- .3 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
- .4 Provide evidence, if requested, for type, source and quality of products supplied.

1.2 FORMAT

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .4 Arrange content by under Section numbers and sequence of Table of Contents.
- .5 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .6 Text: manufacturer's printed data, or typewritten data.
- .7 Drawings: provide with reinforced punched binder tab.
 - .1 Bind in with text; fold larger drawings to size of text pages.

1.3 CONTENTS - PROJECT RECORD DOCUMENTS

- .1 Table of Contents for Each Volume: provide title of project;
 - .1 Date of submission; names.
 - .2 Addresses, and telephone numbers of Departmental Representative and Contractor with name of responsible parties.
 - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 Typewritten Text: as required to supplement product data.

- .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.4 AS -BUILT DOCUMENTS AND SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction.
 - .1 Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
 - .1 Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.

1.5 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of black line opaque drawings, and in copy of Project Manual.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Field changes of dimension and detail.
 - .2 Changes made by change orders.
 - .3 Details not on original Contract Drawings.
 - .4 References to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:

- .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
- .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications/inspection certifications/field test records required by individual specifications sections.
- .7 Provide digital photos, if requested, for site records.

1.6 MAINTENANCE MATERIALS

- .1 Spare Parts:
 - .1 Provide spare parts, in quantities specified in individual specification sections.
 - .2 Provide items of same manufacture and quality as items in Work.
 - .3 Deliver to site; place and store.
 - .4 Receive and catalogue items.
 - .1 Submit inventory listing to Departmental Representative.
 - .2 Include approved listings in Maintenance Manual.
 - .5 Obtain receipt for delivered products and submit prior to final payment.
- .2 Extra Stock Materials:
 - .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
 - .2 Provide items of same manufacture and quality as items in Work.
 - .3 Deliver to site; place and store.
 - .4 Receive and catalogue items.
 - .1 Submit inventory listing to Departmental Representative.
 - .2 Include approved listings in Maintenance Manual.
 - .5 Obtain receipt for delivered products and submit prior to final payment.
- .3 Special Tools:
 - .1 Provide special tools, in quantities specified in individual specification section.
 - .2 Provide items with tags identifying their associated function and equipment.
 - .3 Deliver to site; place and store.
 - .4 Receive and catalogue items.
 - .1 Submit inventory listing to Departmental Representative.
 - .2 Include approved listings in Maintenance Manual.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
- .2 Store in original and undamaged condition with manufacturer's seal and labels intact.
- .3 Store components subject to damage from weather in weatherproof enclosures.
- .4 Store paints and freezable materials in a heated and ventilated room.

- .5 Remove and replace damaged products at own expense and for review by Departmental Representative.

1.8 WARRANTIES AND BONDS

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.
- .3 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
 - .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
 - .4 Verify that documents are in proper form, contain full information, and are notarized.
 - .5 Co-execute submittals when required.
 - .6 Retain warranties and bonds until time specified for submittal.
- .4 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .5 Conduct joint 4 month and 9 month warranty inspection, measured from time of acceptance, by Departmental Representative.
- .6 Respond in timely manner to oral or written notification of required construction warranty repair work.
- .7 Written verification to follow oral instructions.
 - .1 Failure to respond will be cause for the Owner/Departmental Representative to proceed with action against Contractor.

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 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 Reference Standards:
 - .1 CSA International
 - .1 CSA-S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
 - .2 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Meetings:
 - .1 See Section 01 31 19.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

1.4 QUALITY ASSURANCE

- .1 Regulatory Requirements: Ensure Work is performed in compliance with applicable Provincial/Territorial and Municipal regulations.

1.5 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 and as directed by Departmental Representative.
- .8 Protect trees, plants and foliage on site and adjacent properties where indicated.
- .9 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.
- .10 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

1.6 EXISTING CONDITIONS

- .1 If material resembling spray or trowel applied asbestos or other designated substance listed as hazardous be encountered in course of demolition, stop work, take preventative measures, and notify Departmental Representative immediately. Proceed only after written instructions have been received from Departmental Representative.
- .2 Structures to be demolished are based on their condition at time of examination prior to commencement of work.
 - .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 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 jurisdiction.
 - .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, services, walks, paving, trees, landscaping, adjacent grades, properties.
 - .1 Provide bracing, shoring as required.

- .2 Repair damage caused by demolition as directed by Departmental Representative.
- .3 Support affected structures and, if safety of structure being demolished 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.

3.2 DEMOLITION

- .1 Do demolition work in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
- .2 Blasting operations not permitted during demolition.
- .3 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.
- .4 Prior to start of Work remove contaminated or hazardous materials as directed by Departmental Representative from site and dispose of in safe manner and in accordance with applicable requirements.
- .5 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as work progresses.
- .6 At end of each day's work, leave Work in safe and stable condition.
- .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.

3.3 CLEANING

- .1 Waste Management: separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Designate appropriate security resources / measures to prevent vandalism, damage and theft.
- .3 Stockpiling materials on site is prohibited.

END OF SECTION

Part 1 - General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CAN/CSA-O86.1-01(R2006), Engineering Design in Wood
 - .3 CSA-O86.1 S1-05, Supplement No. 1 to CAN/CSA-O86-01, Engineering Design in Wood.
 - .4 CSA-O121-08, Douglas Fir Plywood.
 - .5 CSA-O151-09, Canadian Softwood Plywood.
 - .6 CSA-O153-M1980(R2008), Poplar Plywood.
 - .7 CAN/CSA-S269.3-M92(R2008), Concrete Formwork, National Standard of Canada

1.2 SUBMITTALS

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

Part 2 - Products

2.1 MATERIALS

- .1 Formwork materials:
 - .1 Use wood and wood product formwork materials to CAN/CSA-O86.
- .2 Tubular column forms: round, internally treated with release material.
 - .1 Spiral pattern not to show in hardened concrete.
- .3 Form ties:
 - .1 For concrete not designated 'Architectural', use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.
- .4 Form liner:
 - .1 Plywood: Douglas Fir to CSA-O121, Canadian Softwood Plywood to CSA-O151 square edge, 16 mm thick.
- .5 Form release agent: non-toxic, biodegradable, low VOC.
- .6 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene, with viscosity between 15 to 24 mm²/s at 40 degrees C, flashpoint minimum 150 degrees C, open cup.

Part 3 - Execution

3.1 FABRICATION AND ERECTION

- .1 In-water anchors are to be pre-cast off site. All formwork and concrete work related to in-water anchors must be completed off site. Only cast-in-place shoreline anchors may be completed on site due to environmental restrictions on project. Refer to drawings for locations and quantities.
- .2 Verify lines, levels and centres before proceeding with formwork and ensure dimensions agree with drawings.
- .3 Obtain Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.
- .4 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .5 Do not place shores and mud sills on frozen ground.
- .6 Provide site drainage to prevent washout of soil supporting mud sills and shores.
- .7 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.
- .8 Align form joints and make watertight.
 - .1 Keep form joints to minimum.
- .9 Use 25 mm chamfer strips on external corners, unless specified otherwise.
- .10 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .11 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.
- .12 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

3.2 REMOVAL AND RESHORING

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
 - .1 3 days
- .2 Remove formwork when concrete has reached 75% of its design strength or minimum period noted above, whichever comes later.
- .3 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

END OF SECTION

Part 1 - General

1.1 PRICE AND PAYMENT PROCEDURES

- .1 Measurement and Payment:
 - .1 No measurement will be made under this Section.

1.2 REFERENCES

- .1 American Concrete Institute (ACI)
 - .1 SP-66-04, ACI Detailing Manual 2004.
- .2 ASTM International
 - .1 ASTM A775/A775M-07b, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
- .3 CSA International
 - .1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A23.3-04(R2010), Design of Concrete Structures.
 - .3 CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .4 CSA-W186-M1990(R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .4 Reinforcing Steel Institute of Canada (RSIC)
 - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

1.3 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.
 - .1 Indicate placing of reinforcement and:
 - .1 Bar bending details.
 - .2 Lists.
 - .3 Quantities of reinforcement.
 - .4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.
 - .2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise indicated.

1.4 QUALITY ASSURANCE

- .1 Submit in accordance with Section 01 45 00 - Quality Control and as described in PART 2 - SOURCE QUALITY CONTROL.
 - .1 Mill Test Report: upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel.
 - .2 Submit in writing to Departmental Representative 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 in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .3 Develop Waste Reduction Workplan related to Work of this Section.

Part 2 - Products

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by Departmental Representative.
- .2 Reinforcing steel: billet steel, grade 400, deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Cold-drawn annealed steel wire ties: to ASTM A82/A82M.
- .4 Deformed steel wire for concrete reinforcement: to ASTM A82/A82M.
- .5 Welded steel wire fabric: to ASTM A185/A185M.
- .6 Epoxy Coating of non-prestressed reinforcement: to ASTM A775/A775M.
- .7 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.
- .8 Mechanical splices: subject to approval of Departmental Representative.
- .9 Plain round bars: to CSA-G40.20/G40.21.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 SP-66 Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
 - .1 SP-66 unless indicated otherwise.
- .2 Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA-W186.

- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.
 - .1 Ship epoxy coated bars in accordance with ASTM A775A/A775M.

2.3 SOURCE QUALITY CONTROL

- .1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 2 weeks prior to beginning reinforcing work.
- .2 Upon request inform Departmental Representative of proposed material source.

Part 3 - Execution

3.1 FIELD BENDING

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.
- .2 When field bending is authorized, bend without heat, applying slow and steady pressure.
- .3 Replace bars, which develop cracks or splits.

3.2 PLACING REINFORCEMENT

- .1 Place reinforcing steel in accordance with CSA-A23.1/A23.2.
- .2 Use plain round bars as slip dowels in concrete.
- .3 Prior to placing concrete, Departmental Representative's approval of reinforcing material and placement is required.
- .4 Ensure cover to reinforcement is maintained during concrete pour.
- .5 Protect epoxy coated portions of bars with covering during transportation and handling.

3.3 FIELD TOUCH-UP

- .1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcing steel with compatible finish to provide continuous coating.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 - General

1.1 PRICE AND PAYMENT PROCEDURES

- .1 Measurement and Payment:
 - .1 Measurement Procedures: in accordance with Section 01 29 00 - Payment Procedure.
 - .2 Concrete will not be measured but will paid for as fixed price item.

1.2 REFERENCES

- .1 Abbreviations and Acronyms:
 - .1 Portland Cement: hydraulic cement, blended hydraulic cement (XXb - b denotes blended) and Portland-limestone cement.
 - .1 Type GU, GUb and GUL - General use cement.
 - .2 Type MS and MSb - Moderate sulphate-resistant cement.
 - .3 Type MH, MHb and MHL - Moderate heat of hydration cement.
 - .4 Type HE, HEb and HEL - High early-strength cement.
 - .5 Type LH, LHb and LHL - Low heat of hydration cement.
 - .6 Type HS and HSb - High sulphate-resistant cement.
 - .2 Fly ash:
 - .1 Type F - with CaO content less than 15%.
 - .2 Type CI - with CaO content ranging from 15 to 20%.
 - .3 Type CH - with CaO greater than 20%.
 - .3 GGBFS - Ground, granulated blast-furnace slag.
- .2 Reference Standards:
 - .1 ASTM International
 - .1 ASTM C260/C260M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.
 - .2 ASTM C309-07, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - .3 ASTM C494/C494M-10a, Standard Specification for Chemical Admixtures for Concrete.
 - .4 ASTM C1017/C1017M-07, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
 - .5 ASTM D412-06ae2, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
 - .6 ASTM D624-00(2007), Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.
 - .7 ASTM D1751-04(2008), Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

- .8 ASTM D1752-04a(2008), Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-37.2-M88, Emulsified Asphalt, Mineral Colloid-Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.
- .3 CSA International
 - .1 CSA-A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-A283-06, Qualification Code for Concrete Testing Laboratories.
 - .3 CSA-A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide testing/inspection results for review by Departmental Representative, do not proceed without written approval when deviations from mix design/parameters are found.
- .3 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.
- .4 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.
- .5 Provide two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.4 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.
- .2 Provide Departmental Representative minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.
 - .1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.
- .3 Minimum 4 weeks prior to starting concrete work, provide proposed quality control procedures for review by Departmental Representative on following items:
 - .1 Hot weather concrete.
 - .2 Cold weather concrete.
 - .3 Curing.
 - .4 Finishes.
 - .5 Formwork removal.

.6 Joints.

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

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements:
- .1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.
 - .1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA-A23.1/A23.2.
 - .2 Deviations to be submitted for review by Departmental Representative.
 - .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA-A23.1/A23.2.
- .2 Packaging Waste Management: remove for reuse in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 - Products

2.1 DESIGN CRITERIA

- .1 CSA-A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

2.2 PERFORMANCE CRITERIA

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Consultant and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.

2.3 MATERIALS

- .1 Portland Cement: to CSA-A3001, Type GU.
- .2 Blended hydraulic cement: Type GUb to CSA-A3001.
- .3 Portland-limestone cement: Type GUL to CSA-A23.1.
- .4 Water: to CSA-A23.1.
- .5 Aggregates: to CSA-A23.1/A23.2.
- .6 Admixtures:
 - .1 Air entraining admixture: to ASTM C260.
 - .2 Chemical admixture: to ASTM C494 ASTM C1017. Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.

2.4 MIXES

- .1 Performance Method for specifying concrete: to meet performance criteria to CSA-A23.1/A23.2.
 - .1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as in Quality Control Plan.
 - .2 Provide concrete mix to meet following plastic state requirements:
 - .1 Uniformity: no segregation.
 - .2 Workability: free of surface blemishes, loss of mortar, colour variations, segregation.
 - .3 Finishability: to satisfaction of Departmental Representative.
 - .4 Set time: to conditions of pour and to satisfaction of Departmental Representative.
 - .3 Provide concrete mix to meet following hard state requirements for shoreline anchors:
 - .1 Durability and class of exposure: F-1.
 - .2 Compressive strength at 28 days: 35 MPa minimum.
 - .3 Intended application: shoreline anchor.
 - .4 Aggregate size 20 mm maximum.
 - .4 Provide concrete mix to meet following hard state requirements for in-water anchors (see Section 03 41 00 for Pre-Cast Concrete):
 - .1 Durability and class of exposure: C-3.
 - .2 Compressive strength at 28 days: 35 MPa minimum.
 - .3 Intended application: submerged anchor
 - .4 Aggregate size 20 mm maximum.
 - .5 Provide quality management plan to ensure verification of concrete quality to specified performance.
 - .6 Concrete supplier's certification: both batch plant and materials meet CSA-A23.1 requirements.

Part 3 - Execution

3.1 PREPARATION

- .1 Obtain Departmental Representative's written approval before placing concrete.
 - .1 Provide 24 hours minimum notice prior to placing of concrete.
- .2 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 re-handling, and without damage to existing structure or Work.
- .4 Pumping of concrete is permitted only after approval of equipment and mix.

- .5 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .6 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.
- .7 Protect previous Work from staining.
- .8 Clean and remove stains prior to application for concrete finishes.
- .9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .10 In locations where new concrete is dowelled to existing work, drill holes in existing concrete.
 - .1 Place steel dowels and pack solidly with shrinkage compensating grout or epoxy grout to anchor and hold dowels in positions as indicated.
- .11 Do not place load upon new concrete until authorized by Departmental Representative.

3.2 INSTALLATION/APPLICATION

- .1 Do cast-in-place concrete work to CSA-A23.1/A23.2.
- .2 Anchor bolts:
 - .1 Set anchor bolts to templates in co-ordination with appropriate trade prior to placing concrete.
 - .2 Grout anchor bolts in preformed holes or holes drilled after concrete has set only after receipt of written approval from Departmental Representative.
 - .1 Drilled holes: to manufacturers' recommendations, 25mm minimum diameter larger than bolts used.
 - .3 Protect anchor bolt holes from water accumulations, snow and ice build-ups.
 - .4 Set bolts and fill holes with an epoxy acrylate and hardener adhesive anchoring system, with material properties as follows:
 - .1 Compressive Strength – 72 MPa
 - .2 Tensile Strength – 12 MPa
 - .3 Water Adsorption – 2.4%
 - .4 Electrical Resistance – 5.1×10^{11} ohm in.
 - .5 Installation Temperature Range – 23 °C to 30 °C.
- .3 Grout under base plates using procedures in accordance with manufacturer's recommendations which result in 100 % contact over grouted area.
- .4 Finishing and curing:
 - .1 Finish concrete to CSA-A23.1/A23.2.
 - .2 Use procedures as reviewed by Departmental Representative or those noted in CSA-A23.1/A23.2 to remove excess bleed water. Do not damage surface.
 - .3 Use curing compounds compatible with applied finish on concrete surfaces. Applied finish on concrete: float. Provide written declaration that compounds used are compatible.

- .4 Provide float finish unless otherwise indicated.

3.3 FIELD QUALITY CONTROL

- .1 Site tests: Owner to conduct tests as follows, in accordance with Section 01 45 00 - Quality Control.
 - .1 Concrete pours.
 - .2 Slump.
 - .3 Air content.
 - .4 Compressive strength at 7 and 28 days.
 - .5 Air and concrete temperature.
- .2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Departmental Representative for review to CSA-A23.1/A23.2.
 - .1 Ensure testing laboratory is certified to CSA-A283.
- .3 Ensure test results are distributed for discussion at pre-pouring concrete meeting.
- .4 Departmental Representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .5 Non-Destructive Methods for Testing Concrete: to CSA-A23.1/A23.2.
- .6 Inspection or testing by Departmental Representative will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

3.4 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management: separate waste materials for reuse/recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Divert unused concrete materials from landfill to local quarry/facility after receipt of written approval from Departmental Representative.
 - .2 Provide appropriate area on job site where concrete trucks to be safely washed.
 - .3 Divert unused admixtures and additive materials (pigments, fibres) from landfill to official hazardous material collections site as approved by Departmental Representative.
 - .4 Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.
 - .5 Prevent admixtures and additive materials from entering drinking water supplies or streams.
 - .6 Using appropriate safety precautions, collect liquid or solidify liquid with inert, non-combustible material and remove for disposal.
 - .7 Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

END OF SECTION

Part 1 - General

1.1 MEASUREMENT PROCEDURES

- .1 Measure precast elements in units supplied, delivered, stored and erected.
- .2 Precast elements measured as individual units, will include cost, supply, delivery, and installation.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A185/A185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
 - .2 ASTM A775/A775M-07b, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
 - .3 ASTM C260/C260M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.
 - .4 ASTM D412-06ae2, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension.
 - .5 ASTM D2240-05, Standard Test Method for Rubber Property - Durometer Hardness.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.40-97, Anticorrosive Structural Steel Alkyd Primer.
 - .2 CAN/CGSB-1.181-99, Ready Mixed Organic Zinc-Rich Coating.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA-A23.4-09 (R2014), Precast Concrete - Materials and Construction.
 - .3 CAN/CSA-A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .4 CAN/CSA-G40.20/G40.21-04 (R2009), 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.

1.3 DESIGN REQUIREMENTS

1.4 PERFORMANCE REQUIREMENTS

- .1 Tolerance of precast elements to CSA-A23.4.
- .2 Length of precast elements not to vary from design length by more than plus or minus 50 mm.
- .3 Cross sectional dimensions of precast elements not to vary from design dimensions by more than plus or minus 50 mm.
- .4 Deviations from straight lines not to exceed 5 mm in 1 m.

- .5 Precast elements not to vary by more than plus or minus 50 mm from true overall cross sectional shape as measured by difference in diagonal dimensions.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit shop drawings in accordance with CSA-A23.4 and include following items:
 - .1 Design calculations for items designed by manufacturer.
 - .2 Details of prestressed and non-prestressed members, reinforcement and their connections.
 - .3 Camber.
 - .4 Finishing schedules.
 - .5 Methods of handling and erection.
 - .6 Openings, sleeves, inserts and related reinforcement.
- .3 Submit 3 copies of detailed calculations and design drawings for typical precast elements and connections for review by Departmental Representative 4 weeks prior to manufacture.
- .4 Shop Drawings: submit drawings stamped and signed by qualified professional engineer registered or licensed in Province of Ontario, Canada.

1.6 QUALITY ASSURANCE

- .1 Quality Control Plan: submit written report, as described in PART 3 - VERIFICATION, to Departmental Representative verifying compliance that concrete provided meets performance requirements of concrete as established in PART 2 - PRODUCTS.

1.7 QUALIFICATIONS

- .1 Fabricate and erect precast concrete elements by manufacturing plant certified in appropriate categories according to CSA-A23.4.
- .2 Precast concrete manufacturer to be certified in accordance with CSA's certification procedures for precast concrete plants prior to submitting tender.
- .3 Only precast elements fabricated in such certified plants to be acceptable to Departmental Representative and plant certification to be maintained for duration of fabrication, erection until warranty expires.
- .4 Welding companies certified to CSA-W47.1.

1.8 DELIVERY, STORAGE AND HANDLING

- .1 Store and manage hazardous materials in accordance with Section 01 47 15 - Sustainable Requirements: Construction.
- .2 Deliver, handle and store precast/prestressed units according to manufacturer's instructions.
- .3 Protect unit corners from contacting earth to prevent from staining.
- .4 Waste Management and Disposal:

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

1.9 WARRANTY

- .1 Contractor warrants that precast element will not spall or show visible evidence of corrosion of embedded steel and cracking, except for normal hairline shrinkage cracks, for 5 years.
- .2 Contractor warrants that precast elements will not spall or show visible evidence of cracking, except for normal hairline shrinkage cracks for 12 months warranty period.

Part 2 - Products

2.1 MATERIALS

- .1 Cement to CAN/CSA-A3001, Type GU.
- .2 Blended hydraulic cement: type GUb to CAN/CSA-A3001.
- .3 Water: to CSA-A23.1/A23.2.
- .4 Reinforcing steel: to CAN/CSA-G30.18, epoxy coated.
- .5 Hardware and miscellaneous materials: to CSA-A23.1/A23.2.
- .6 Forms: to CSA-A23.4.
- .7 Anchors and supports: to CAN/CSA-G40.21 as indicated on drawings.
- .8 Galvanizing: hot dipped galvanizing with minimum zinc coating of 610 g/m² to CAN/CSA-G164.
- .9 Epoxy coating: to ASTM A775/A775M.
- .10 Air entrainment admixtures: to ASTM C260.

2.2 MIXES

- .1 Concrete:
 - .1 Provide concrete mix to meet following hard state requirements:
 - .1 Durability and class of exposure: C-3.
 - .2 Minimum compressive strength at 28 days: 35 MPa.
 - .3 Intended application: submerged anchors.
 - .4 Surface texture: steel trowel finish.
 - .5 Aggregate Size: 20mm maximum.
 - .2 Provide quality management plan to ensure verification of concrete quality to specified performance.
 - .3 Concrete supplier's certification – both batch plant and materials meet CSA-A23.1 requirements.

2.3 MANUFACTURED UNITS

- .1 Manufacture units in accordance with CSA-A23.4.

- .2 Mark each precast unit to correspond to identification mark on shop drawings for location with date cast on part of unit not to be exposed.
- .3 Provide hardware suitable for handling elements.
- .4 Anchor hooks to be Stainless Steel (316).

2.4 FINISHES

- .1 Finish units to commercial grade to CSA-A23.4.

2.5 SOURCE QUALITY CONTROL

- .1 Provide Departmental Representative with certified copies of quality control tests related to this project as specified in CSA-A23.4.
- .2 Provide records from in-house quality control programme based upon plant certification requirements to Departmental Representative for inspection and review.
- .3 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel supplied, showing physical and chemical analysis.
- .4 Precast plants should keep complete records of supply source of concrete material, steel reinforcement, prestressing steel and provide to Departmental Representative for review upon request.

Part 3 - Execution

3.1 ERECTION

- .1 Do precast concrete work in accordance with CSA-A23.].
- .2 Do welding in accordance with CSA-W59, for welding to steel structures and CSA-W186, for welding of reinforcement.
- .3 Erect precast elements within allowable tolerances as specified.
- .4 Non-cumulative erection tolerances in accordance with CSA-A23-4.
- .5 Set elevations and alignment between units to within allowable tolerances before connecting units.

3.2 VERIFICATION

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established in PART 2 - PRODUCTS, by Departmental Representative and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.

3.3 CLEANING

- .1 Use cleaning methods as reviewed by Departmental Representative before cleaning soiled precast concrete surfaces.

END OF SECTION

Part 1 - General

1.1 REFERENCES

- .1 ASTM International Inc.
 - .1 ASTM A36/A36M-08, Standard Specification for Carbon Structural Steel.
 - .2 ASTM A193/A193M-11a, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature or High-Pressure Service and Other Special Purpose Applications.
 - .3 ASTM A307-10, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .4 ASTM A325-09, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 - .5 ASTM A325M-09, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength.
 - .6 ASTM A490M-04ae, Standard Specification for High-Strength Steel Structural Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-85.10-99, Protective Coatings for Metals.
- .3 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers Association (CPMA).
 - .1 Handbook of the Canadian Institute of Steel Construction.
 - .2 CISC/CPMA Standard 2-75, Quick-Drying Primer for use on Structural Steel.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20/G40.21-04 R2009, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CAN/CSA-S16-01(R2007), Limit States Design of Steel Structures.
 - .4 CAN/CSA-S136-07, North American Specifications for the Design of Cold Formed Steel Structural Members.
 - .5 CSA-W47.1-09, Certification of Companies for Fusion Welding of Steel.
 - .6 CSA-W48-06, Filler Metals and Allied Materials for Metal Arc Welding.
 - .7 CSA-W55.3-08, Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
 - .8 CSA-W59-03 R2008, Welded Steel Construction (Metal Arc Welding).
- .5 Master Painters Institute
 - .1 MPI-INT 5.1-08, Structural Steel and Metal Fabrications.
 - .2 MPI-EXT 5.1-08, Structural Steel and Metal Fabrications.
- .6 The Society for Protective Coatings (SSPC) and National Association of Corrosion Engineers (NACE) International
 - .1 NACE No. 3/SSPC SP-6-06, Commercial Blast Cleaning.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
 - .1 Provide drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.
- .3 Erection drawings:
 - .1 Submit erection drawings indicating details and information necessary for assembly and erection purposes including:
 - .1 Description of methods.
 - .2 Sequence of erection.
 - .3 Type of equipment used in erection.
 - .4 Temporary bracings.
- .4 Fabrication drawings:
 - .1 Submit fabrication drawings showing designed assemblies, components and connections are stamped and signed by qualified professional engineer licensed in Ontario, Canada.
- .5 Fabricator Reports:
 - .1 Provide structural steel fabricator's affidavit stating that materials and products used in fabrication conform to applicable material and products standards specified and indicated.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials in manufacturer's original, undamaged containers with identification labels intact.
- .2 Packaging Waste Management: remove in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 - Products

2.1 DESIGN REQUIREMENTS

- .1 Shear connections:
 - .1 Select framed beam shear connections from an industry accepted publication such as "Handbook of the Canadian Institute of Steel Construction" when connection for shear only (standard connection) is required.
 - .2 Select or design connections to support reaction from maximum uniformly distributed load that can be safely supported by beam in bending, provided no point loads act on beam, when shears are not indicated.
- .2 For composite construction select or design minimum end connection to resist reaction resulting from factored movement resistance as tabulated in the "Handbook of the Canadian Institute of Steel Construction" assuming 100% shear connection with depth of steel deck and/or slab shown on drawings.

- .3 Submit sketches and design calculations stamped and signed by qualified professional engineer licensed in Ontario, Canada for non standard connections.

2.2 MATERIALS

- .1 Structural steel: to CSA-G40.20/G40.21 Grade 350W.
- .2 Anchor bolts: Stainless Steel Type 316, to ASTM 193 Grade B8, and ASTM A194 Grade 8 unless otherwise specified.
- .3 Bolts, nuts and washers: to ASTM A325, Type 1.
- .4 Welding materials: to CSA-W48 Series and certified by Canadian Welding Bureau.
- .5 Hot dip galvanizing: galvanize steel, where indicated, to ASTM A123/A123M , minimum zinc coating of 600 g/m².

2.3 FABRICATION

- .1 Fabricate structural steel in accordance with CAN/CSA-S16 and in accordance with approved shop drawings.

Part 3 - Execution

3.1 APPLICATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 GENERAL

- .1 Structural steel work: in accordance with CSA-S16.
- .2 Welding: in accordance with CSA-W59.
- .3 Companies to be certified under Division 1 or 2.1 of CSA-W47.1 for fusion welding of steel structures and/or CSA-W55.3 for resistance welding of structural components.

3.3 CONNECTION TO EXISTING WORK

- .1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Consultant for direction before commencing fabrication.

3.4 MARKING

- .1 Mark materials in accordance with CSA-G40.20/G40.21. Do not use die stamping. When steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.
- .2 Match marking: shop mark bearing assemblies and splices for fit and match.

3.5 ERECTION

- .1 Erect structural steel, as indicated and in accordance with CSA-S16.
- .2 Field cutting or altering structural members: to approval of Consultant.

- .3 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.
- .4 Continuously seal members by continuous welds where indicated. Grind smooth.

3.6 FIELD QUALITY CONTROL

- .1 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by Departmental Representative.
- .2 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by Departmental Representative.
- .3 Submit test reports to Departmental Representative within 4 weeks of completion of inspection.

3.7 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management: separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 - General

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM A53/A53M-07, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
 - .2 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .2 CSA International
 - .1 CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA-S16-09, Design of Steel Structures.
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.2 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for plates/bolts and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
 - .1 For finishes, coatings, primers, and paints applied on site: indicate VOC concentration in g/L.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.
 - .2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.3 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 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 Store materials off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.

Part 2 - Products

2.1 MATERIALS

- .1 Steel sections and plates: to CSA-G40.20/G40.21, Grade 350W.
- .2 Steel pipe: to ASTM A53/A53M standard weight, black finish.
- .3 Welding materials: to CSA-W59.
- .4 Welding electrodes: to CSA-W48 Series.
- .5 Bolts and anchor bolts: to ASTM A307.
- .6 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

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 600g/m² to CAN/CSA-G164.

Part 3 - Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 ERECTION

- .1 Do welding work in accordance with CSA-W59 unless specified otherwise.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Provide suitable means of anchorage acceptable to Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5 Supply components for work by other trades in accordance with shop drawings and schedule.
- .6 Make field connections with bolts to CSA-S16.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse/recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 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 MEASUREMENT PROCEDURES

- .1 No measurement for excavated materials.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C117-04, Standard Test Method for Material Finer than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D422-63 2002, Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³).
 - .5 ASTM D1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-m/m³).
 - .6 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.
 - .2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
 - .1 CSA-A3001-08, Cementitious Materials for Use in Concrete.
 - .2 CSA-A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

1.3 DEFINITIONS

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
 - .1 Rock : solid material in excess of 1.00 m³ and which cannot be removed by means of heavy duty mechanical excavating equipment. Frozen material not classified as rock.
 - .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.
- .3 Topsoil:

- .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
- .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.
- .4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .6 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.
- .7 Unsuitable materials:
 - .1 Weak, chemically unstable, and compressible materials.
 - .2 Frost susceptible materials:
 - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 ASTM C136 : Sieve sizes to CAN/CGSB-8.1, CAN/CGSB-8.2.
 - .2 Table:

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45 - 100
0.02 mm	10 - 80
0.005 mm	0 - 45

- .3 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality Control: in accordance with Section 01 45 00 - Quality Control:
 - .1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.
 - .2 Submit for review by Consultant proposed dewatering methods as described in PART 3 of this Section.
 - .3 Submit to Consultant written notice at least 7 days prior to excavation work, to ensure cross sections are taken.
 - .4 Submit to Departmental Representative written notice when bottom of excavation is reached.
 - .5 Submit to Departmental Representative testing & inspection results as described in PART 3 of this Section.
- .3 Preconstruction Submittals:
 - .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.

.2 Submit records of underground utility locates, indicating: location plan of existing utilities as found in field, clearance record from utility authority, location plan of relocated and abandoned services, as required.

.4 Samples:

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

1.5 QUALITY ASSURANCE

.1 Qualification Statement: submit proof of insurance coverage for professional liability.

.2 Submit design and supporting data at least 2 weeks prior to beginning Work.

.3 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Ontario, Canada.

.4 Keep design and supporting data on site.

.5 Do not use soil material until written report of soil test results are reviewed and approved by Departmental Representative.

.6 Health and Safety Requirements:

.1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.6 WASTE MANAGEMENT AND DISPOSAL

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

1.7 EXISTING CONDITIONS

.1 Buried services:

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

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

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

.4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.5 Prior to beginning excavation Work, notify Departmental Representative, establish location and state of use of buried utilities and structures. Authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.

.6 Confirm locations of buried utilities by careful test excavations.

.7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.

.8 Where utility lines or structures exist in area of excavation, obtain direction of Consultant before removing or re-routing.

.9 Record location of maintained, re-routed and abandoned underground lines.

- .10 Confirm locations of recent excavations adjacent to area of excavation.
- .2 Existing buildings and surface features:
 - .1 Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.
 - .2 Where required for excavation, cut roots or branches as directed by Departmental Representative.

Part 2 - Products

2.1 MATERIALS

- .1 Type 1 and Type 2 fill: properties to the following requirements:
 - .1 Crushed, pit run or screened stone, gravel or sand.
 - .2 Gradations to be within limits specified when tested to sieve sizes in CAN/CGSB-8.1.
 - .3 Table:

Sieve Designation	% Passing	
	Type 1	Type 2
75 mm	-	100
50 mm	-	-
37.5 mm	-	-
25 mm	100	-
19 mm	75-100	-
12.5 mm	-	-
9.5 mm	50-100	-
4.75 mm	30-70	22-85
2.00 mm	20-45	-
0.425 mm	10-25	5-30
0.180 mm	-	-
0.075 mm	3-8	0-10

- .2 Type 3 fill: selected material from excavation or other sources, approved by Departmental Representative for use intended, unfrozen and free from rocks larger than 75mm, cinders, ashes, sods, refuse or other deleterious materials.
- .3 Shearmat: honeycomb type bio-degradable cardboard 100 mm thick, treated to provide sufficient structural support for poured concrete until concrete cured.

Part 3 - Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .4 Do not allow shoreline to erode into watercourse. Exercise caution when excavating proximate to shoreline.

3.2 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.3 PREPARATION/PROTECTION

- .1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .5 Protect buried services that are required to remain undisturbed.

3.4 STRIPPING OF TOPSOIL

- .1 Begin topsoil stripping of areas as directed by Departmental Representative after area has been cleared and removed from site.
- .2 Strip topsoil to depths as directed by Departmental Representative.
 - .1 Do not mix topsoil with subsoil.
- .3 Dispose of unused topsoil off site as directed by Departmental Representative.

3.5 STOCKPILING

- .1 Stockpiling materials on site is strictly prohibited on project. See also part 1.7 of environmental procedures Section 01 35 43.

3.6 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

- .1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Health and Safety Act for the Province of Ontario.
 - .1 Where conditions are unstable, Departmental Representative to verify and advise methods.
- .2 Obtain permit from authority having jurisdiction for temporary diversion of watercourse.
- .3 During backfill operation:

- .1 Do not remove bracing until backfilling has reached respective levels of such bracing.

3.7 DEWATERING AND HEAVE PREVENTION

- .1 Keep excavations free of water while Work is in progress.
- .2 Avoid excavation below groundwater table if quick condition or heave is likely to occur.
 - .1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.
- .3 Protect open excavations against flooding and damage due to surface run-off.
- .4 Dispose of water in manner not detrimental to public and private property, or portion of Work completed or under construction.
 - .1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.
- .5 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas.

3.8 EXCAVATION

- .1 Advise Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.
- .2 Excavate to lines, grades, elevations and dimensions as indicated.
- .3 Excavation must not interfere with bearing capacity of adjacent foundations.
- .4 Do not disturb soil within branch spread of trees or shrubs that are to remain.
 - .1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .5 Dispose of surplus and unsuitable excavated material off site.
- .6 Do not obstruct flow of surface drainage or natural watercourses.
- .7 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .8 Notify Departmental Representative when bottom of excavation is reached.
- .9 Obtain Departmental Representative approval of completed excavation.
- .10 Correct unauthorized over-excavation as follows:
 - .1 Fill under bearing surfaces and footings with concrete specified for footings compacted to not less than 100% of corrected Standard Proctor maximum dry density.
 - .2 Fill under other areas with Type 2 fill compacted to not less than 95 % of corrected Standard Proctor maximum dry density.
- .11 Hand trim, make firm and remove loose material and debris from excavations.

- .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

3.9 FILL TYPES AND COMPACTION

- .1 Use types of fill as indicated or specified below.
 - .1 Under concrete slabs: provide 150 mm compacted thickness base course of Type 1 fill to underside of slab. Compact base course to 100 %.
 - .2 Place unshrinkable fill in areas as indicated.

3.10 BACKFILLING

- .1 Do not proceed with backfilling operations until completion of following:
 - .1 Departmental Representative has inspected and approved installations.
 - .2 Departmental Representative has inspected and approved of construction below finish grade.
 - .3 Inspection, testing, approval, and recording location of underground utilities.
 - .4 Removal of concrete formwork.
 - .5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .5 Backfilling around installations:
 - .1 Place bedding and surround material as specified elsewhere.
 - .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
 - .3 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 1 m.
- .6 Consolidate and level unshrinkable fill with internal vibrators.

3.11 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris and correct defects as directed by Departmental Representative.
- .2 Replace topsoil and grass as per Section 01 35 43 and as directed by Departmental Representative.
- .3 Reinstate lawns to elevation which existed before excavation.
- .4 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .5 Clean and reinstate areas affected by Work as directed by Departmental Representative.

- .6 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.
- .7 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

Part 1 - General

1.1 SECTION INCLUDES

- .1 This section specifies requirements for safety booms as part of the safety requirements for navigation as set out by Transport Canada Navigable Waters.

1.2 MEASUREMENT PROCEDURES

- .1 There will be no separate measurement for payment for safety booms anchors, assembled safety boom and navigation warning marking for in-water anchors used as part of the permanent works. Include cost in Contract Lump sum Price.
 - .1 Hastings Dam
20 boom units with the English graphics and 20 units with French graphics (plus 5 buoy units) shall be supplied by Owner and installed by Contractor as indicated on Contract drawings.
 - .2 Healey Falls Dam
28 units with the English graphics and 28 units with French graphics (plus 5 buoy units) shall be supplied by Owner and installed by Contractor as indicated on Contract drawings.
 - .3 Glen Ross Dam
21 units with the English graphics and 21 units with French graphics (plus 4 buoy units) shall be supplied by Owner and installed by Contractor as indicated on Contract drawings.
 - .4 Parks Canada's storage location will be one single location for all 3 contract sites and within 100km of all sites (in Campbellford, Ontario).
- .2 Payment shall be made as set out in Section 01 22 01 and shall be included in applicable item of work for safety booms and temporary works

1.3 REFERENCES

- .1 American Society for Testing and Materials International (ASTM) ASTM D1505-68, Standard Test Method for Density of Plastics by the Density-Gradient Technique
- .2 ASTM A572, Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
- .3 ASTM C578, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.

1.4 DESCRIPTION OF SAFETY BOOM SYSTEM

- .1 Floatation units shall be new units not previously used.
- .2 Floatation units shall consist of an external encasement, internal foam fill and internal structural steel channel through which all external inter boom connections are attached.
- .3 Each floatation unit shall be approximately cylindrical in shape.
- .4 The nominal diameter shall be 406 mm diameter and 3.05 m in length.
- .5 Each floatation log shall be designed to have a minimum buoyancy of 317kg.
- .6 Each floatation unit shall be designed to maintain its original buoyancy even if it is structurally damaged or punctured.

PART 2 - PRODUCTS

2.1 BOOM UNITS AND BUOYS

- .1 PCA is supplying booms and buoys for this contract. The specifications for the boom floats and buoys are attached as appendix items.

2.2 INTER BOOM AND ANCHOR CONNECTION HARDWARE

- .1 All connecting hardware between floatation units and anchor shall consist of:
 - .1 Bottom steel connector plate,
 - .2 Load-rated safety clevis (shackle) and
 - .3 Load-rated welded links (chain).
- .2 The connections between floatation units shall be engineered to minimize wear and maximize load-bearing capacity.
- .3 Structural steel: ASTM 572, Grade 50 steel, or approved equivalent.
- .4 Galvanizing: all fabricated component and hardware under this section are to have hot dipped galvanizing to ASTM A123/A123M. Galvanization grade and weight to be in accordance with the manufacturer's recommendation.
- .5 Bolts, nuts and washers: to ASTM A325/A325M, hot dipped galvanized to ASTM A153/A153M, unless otherwise approved.
- .6 Connection clevis (shackle) shall:
 - .1 Have a minimum pin diameter of 3/4-inch, be of a safety type with a heavy-hex style castle nut, lock washer and stainless steel cotter pin.
 - .2 Have a Working Load Limit of not less than 4.3 tonnes. The Working Load Limit rating shall be clearly identified on the body of each clevis.
- .7 Chain: Hot dipped galvanized, grade 30 proof coil, size as indicated on the contract drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 The Contractor shall be responsible to place and align all field placed shoreline and in-water anchors.
- .2 Install in accordance with manufacturer's instructions and as indicated on the Contract drawings.
- .3 Do not make alteration to system components without written permission of Departmental Representative.
- .4 Individual section of boom shall be connected to shoreline anchor or in-water anchor with separate clevis (shackle), unless otherwise indicated.
- .5 Ensure the warning message facing upstream for the upstream boom, and facing downstream for the downstream boom. Alternatively place boom units with English and French warning message.

3.2 CONSTRUCTION

- .1 Comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.
- .2 For installation of anchors, provide sediment control measures acceptable to the Departmental Representative. Do not spill concrete into open water.

3.3 FIELD QUALITY CONTROL

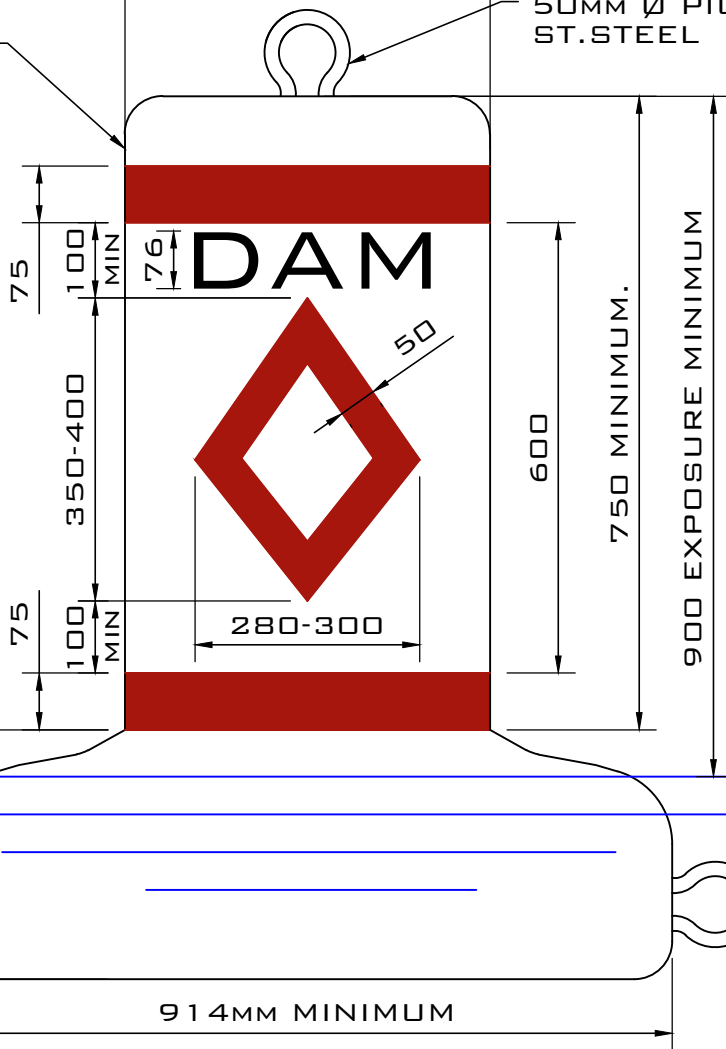
- .1 Site Tests/Inspections - Inspect boom floatation units and buoys at time of pick-up for any defects. Notify Departmental Representative immediately of any defects so that they can be replaced if required. Further inspect in conjunction with Departmental Representative on site prior to installation. Any units damaged by contractor during delivery, handling or installation beyond their control are to be replaced by contractor
- .2 Evidence of units having a lack of buoyancy, or are damaged, as determined by the Departmental Representative, will be cause for rejection.

END OF SECTION

FLOAT COLLAR CAN BUOY C/W INTERNAL CONCRETE BALLAST. SEE SPECS

450 MIN.
500 MAX.

50MM Ø PICK-UP RING
ST.STEEL



BUOY COLOURS



INTERNATIONAL ORANGE

CMYK 0/88/94/27

RGB 186/22/12

HSL 3,88,39

HEXIDECIMAL #BA160C

US FED STD 595 - COLOUR 12197



BACKGROUND WHITE

CMYK 0/0/0/0

RGB 255/255/255

HEXIDECIMAL #FFFFFF

WATER

305
MINIMUM

914MM MINIMUM

13MM THICK X 50MM Ø SIDE
ATTACHMENT RING.
ST.STEEL



Project title / Titre du projet

STANDARDS FOR PUBLIC SAFETY ITEMS AT DAMS

Drawn by/ Dessiné par

S.Gauthier

Date

DEC.2014

Drawing title / Titre du dessin

STANDARD BUOY FOR UPSTREAM OF DAM AT BOOM

Checked by/ Vérifié par

Asset No.

Dwg.no.

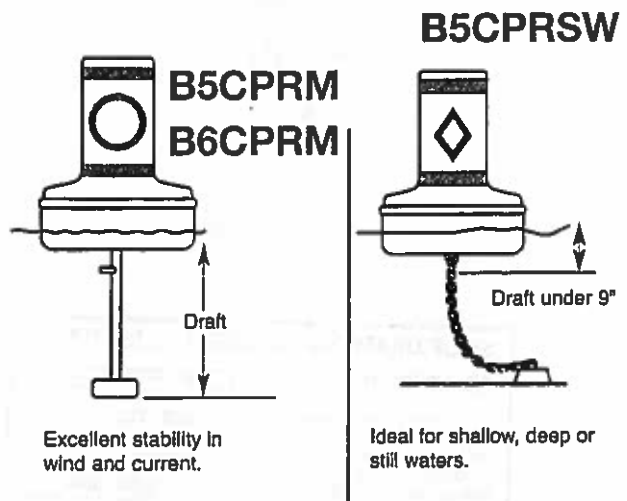
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Canada

PARCS CANADA
EXECUTIVE DIRECTOR'S OFFICE, WATERWAYS

Can Buoys • General Purpose

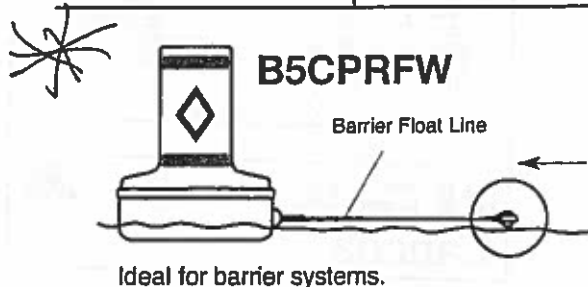
FLOAT COLLAR TYPE ABS



Features

- Easy reconditioning of weather-worn buoys with excellent adhesion of restoration materials. See page 18.
- ABS exterior, completely urethane foam filled
- Self-righting without tackle.

Model		B6CPRM ½ Mile Buoy	B5CPRM 1 Mile Buoy	B5CPRFW B5CPRSW
Can Dia. & Ht.	In.	12x21	19x33	19x33
Collar Dia. & Ht.	In.	28x12	38x13	38x13
Overall Ht.	In.	56.3	84.5	50
Daymark w/o Mooring	Sq. Ft.	3.5	7.5	—
Buoyancy/In. Submerged	Lbs.	22.2	41	39
Draft	In.	24	39	9
Submerged Buoyancy	Lbs.	287	815	700
Net Wt.	Lbs.	83	124	164
Shipping Wt.	Lbs.	90	140	209



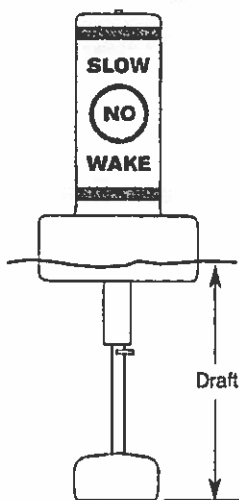
B5CPRSW – Internal ballast – bottom attachment

B5CPRFW – Internal ballast – side attachment

B6CPRM – Heavy duty – external ballast

B5CPRM – (1 mile buoy)

SUPER-TOUGH CAN BUOYS



Features

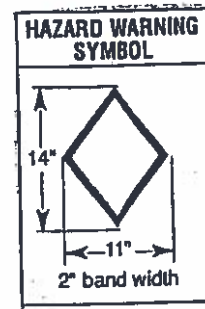
- Super-tough white LLDPE shell. Ultraviolet inhibited.
- Completely urethane foam filled. Virtually unsinkable.
- Self-righting without tackle.
- Replaceable white vinyl wrapper.
- Standard bands, symbols, messages included.
- 1½" sch. 40 galvanized pipe through buoy.
- 10" dia. galvanized steel plate at top (can).

Model		B2413UL
Can Dia. & Ht.	In.	13x30
Collar Dia. & Ht.	In.	24x10
Overall Ht.	In.	75
Exposure w/o Tackle	In.	36
Submerged Buoyancy	Lbs.	240
Net Wt.	Lbs.	116
Shipping Wt.	Lbs.	125

Available Options

- Solar light (see page 11).





SHOP DRAWING / SUBMITTAL REVIEW



REVIEWED REVIEWED WITH CHANGES NOTED


REVISE AND RESUBMIT REJECTED

SUBMITTAL WAS REVIEWED FOR GENERAL CONFORMANCE TO DESIGN AND CONTRACT DOCUMENTS ONLY. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING DIMENSIONS AT JOB SITES FOR TOLERANCES, CLEARANCES, QUANTITIES, FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATION OF WORK WITH TRADES AND FULL COMPLIANCE WITH CONTRACT DOCUMENTS.

REVIEWED BY: John Gaudin

DATE: Jan 16, 2015

 Parcs Canada  Parcs Canada

Canada 

3" ORANGE REFLECTIVE BAND AT TOP
3' ORANGE REFLECTIVE BAND AT BOTTOM
ORANGE REFLECTIVE 11" x 14" HAZARD SYMBOLS TWO SIDES
3" BLACK LETTERS TWO SIDES

Note 1- REFLECTIVE BANDS & SYMBOLS ARE 3M ENGINEER GRADE REFLECTIVE TAPE OR EQUAL.

MODEL B5CPRFW BUOYS WHITE
WITH SIDE SS MOORING EYE (1/2" DIA. 3" I.D.)
WITH 1/2" DIA. SS VERTICAL ROD THRU SS SWIVEL PICK-UP EYE AT TOP (APPROX. 1 1/4" I.D.)

15 EA

1-16-14
ROLYAN BUOYS
W68N158 EVERGREEN BLVD
CEDARBURG WI 53012
TOLL FREE 1 888-269-2869
FAX 866-790-3298

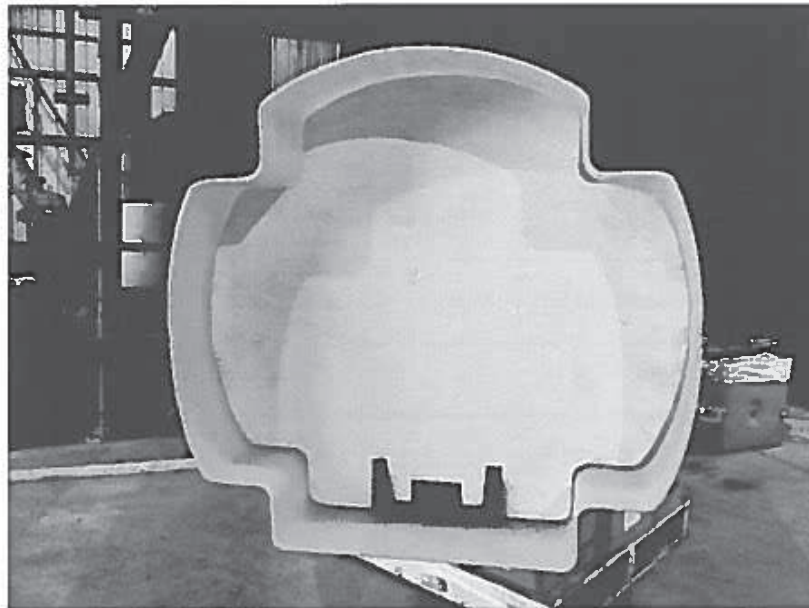
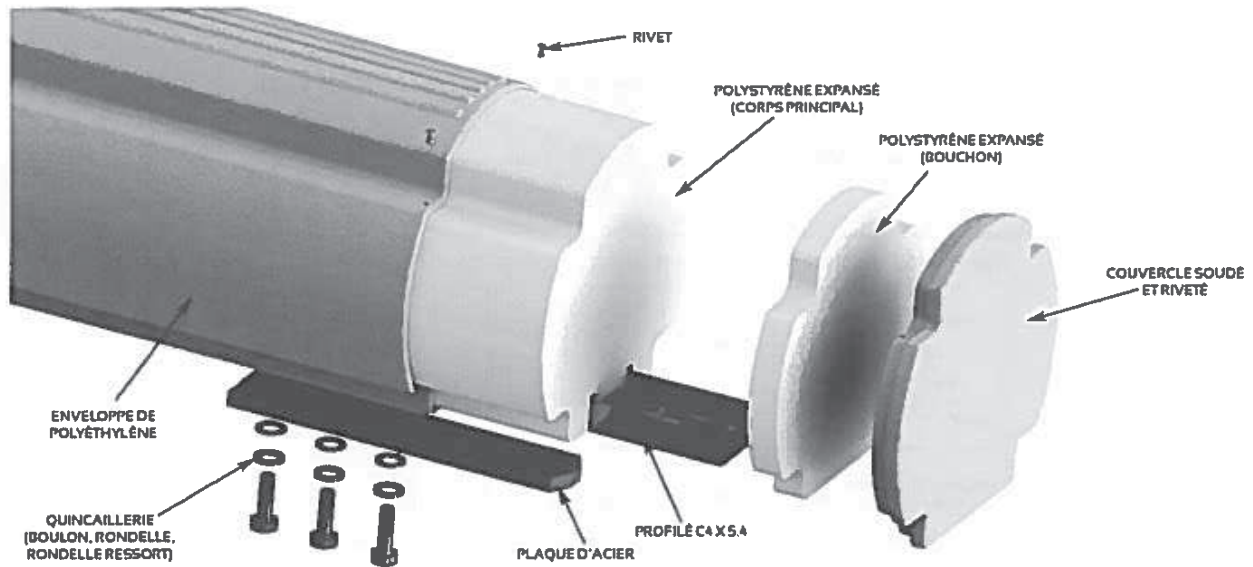
RFP

PRÉSENTÉ PAR : ROTOPLAST 2000 INC.



Annexe 5

Composition d'une unité de flottaison



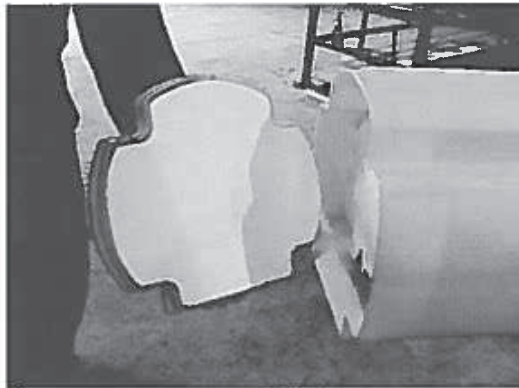
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PRÉSENTÉ PAR : ROTOPLAST 2000 INC.



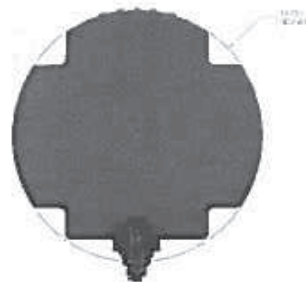
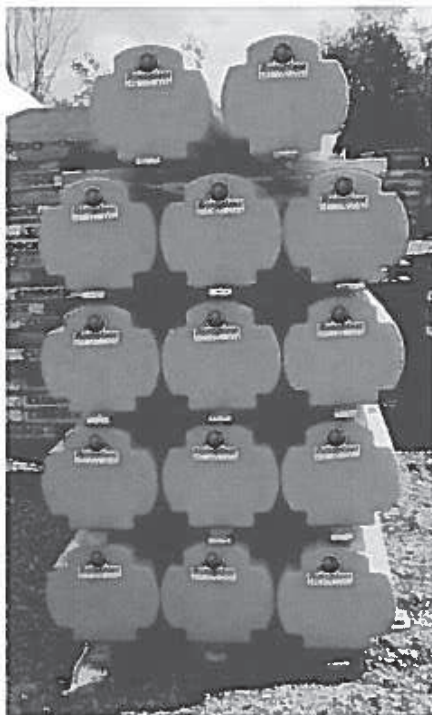
Annexe 7

La garniture de mousse occupe 95,4% du volume intérieur.



Annexe 8

Forme de l'unité de flottaison quasi cylindrique



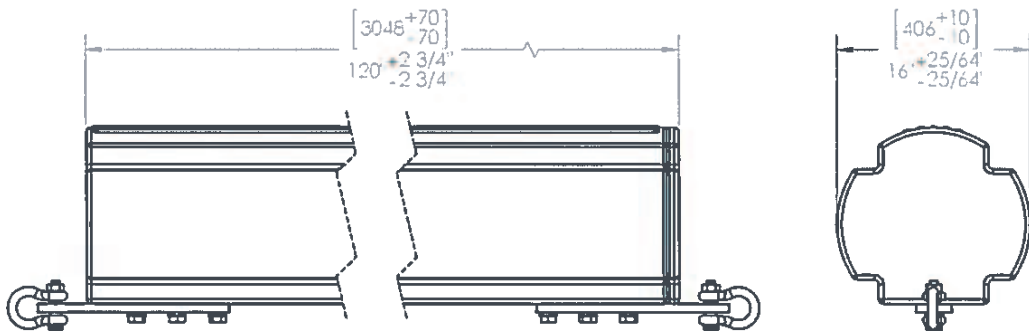
RFP

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Annexe 9

Longueur et diamètre de l'unité de flottaison



FIGURES, UNITÉS AND CARRÉS POUR TOUTE L'INFORMATION CONTENUE DANS CE DROUILLAGE, IS THE RESULT OF PRELIMINARY DESIGN AND PRODUCTION. IT IS NOT TO BE USED FOR CONSTRUCTION OF ANY STRUCTURE OR EQUIPMENT WITHOUT THE WRITTEN APPROVAL OF ROTOPLAST 2000 INC.

<p>Rotoplast</p> <p>DO NOT SCALE DRAWING</p>	DRAWN: SOB MATERIAL: FINISH:	DATE: 2016/02/09	CLIENT: ROTOPLAST
	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	TITLE: ESTACADE HORS TOUT	SIZE DWG. NO: A
ANGLE: ± 1° X II: ± 2° X XXX: ± 1/32° X XXXX: ± 1/64°	REV: RT1	SCALE: 1:10 WEIGHT	SHEET 1 OF 1

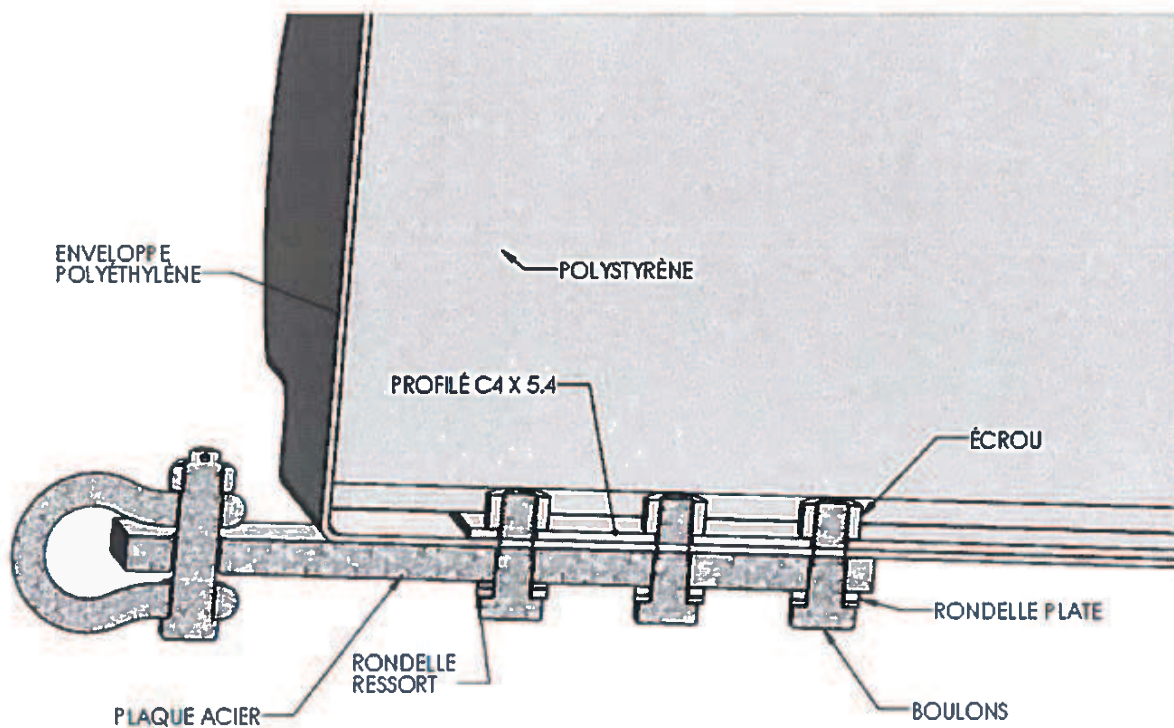
RFP

PRÉSENTÉ PAR : ROTOPLAST 2000 INC.



Annexe 13

Intégration du profilé d'acier en U à l'unité de flottaison



RFP

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Annexe 14

Composantes de fixation en acier et entièrement galvanisées à chaud

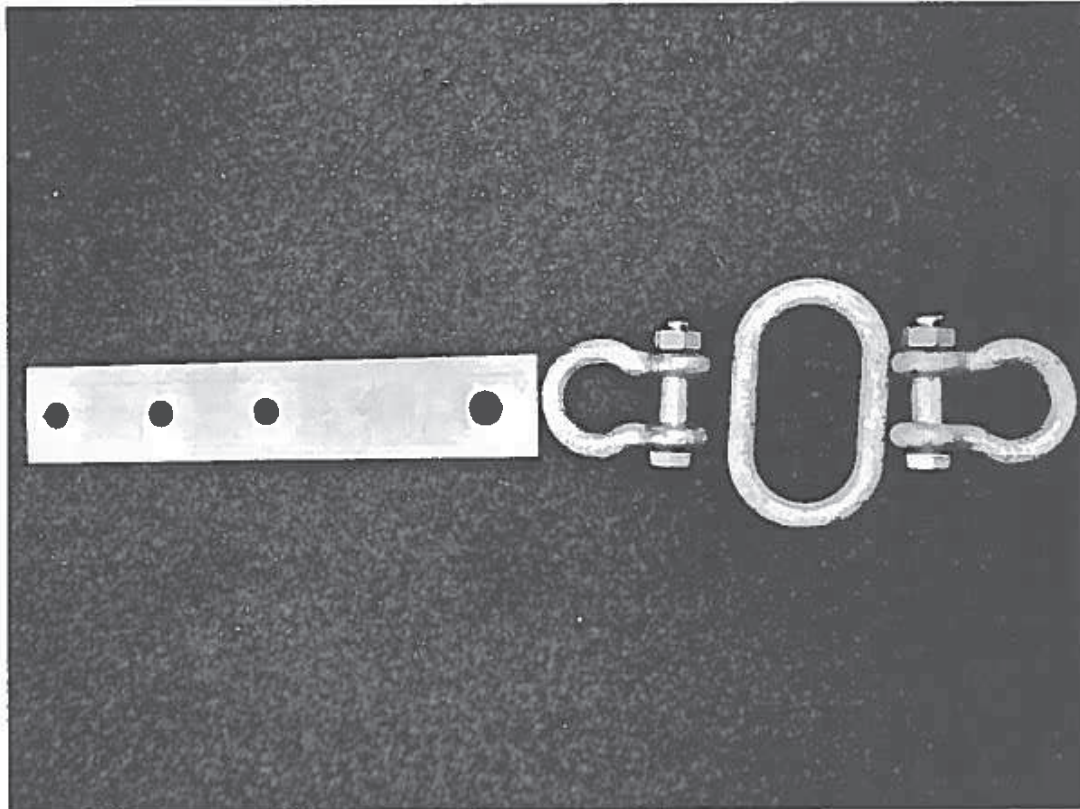


Photo à titre indicatif seulement. Les items peuvent différer.

Chaine galvanisée à chaud est aussi disponible.

RFP

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Annexe 15

Éléments textuels et graphiques

- 50% des unités seront en anglais, hauteur des lettres 100mm, police Arial, centré vue de face.



- 50% des unités seront en français, hauteur des lettres 100mm, police Arial, centré vue de face.



- Décalques Parcs Canada / Parks Canada, Hauteur des lettres 75mm, police Arial, centré vue arrière.



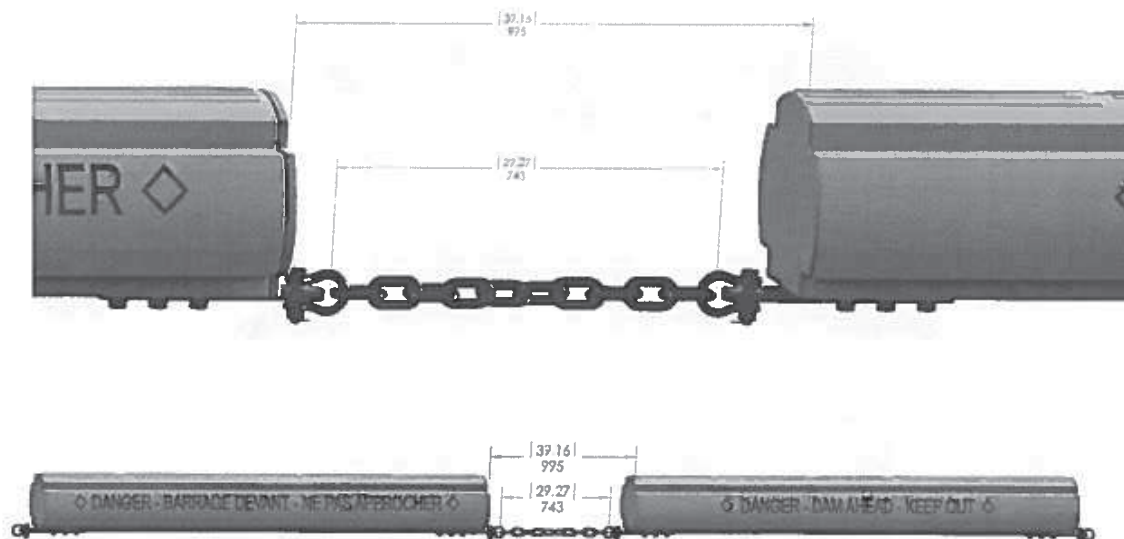
RFP

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Annexe 16

Espacement entre les estacades lorsque déployées



Le déploiement du dispositif de connexion permet un espacement maximal de 995mm entre les estacades.

Annexe 17

Dispositif permettant un mouvement d'au moins 90 degré



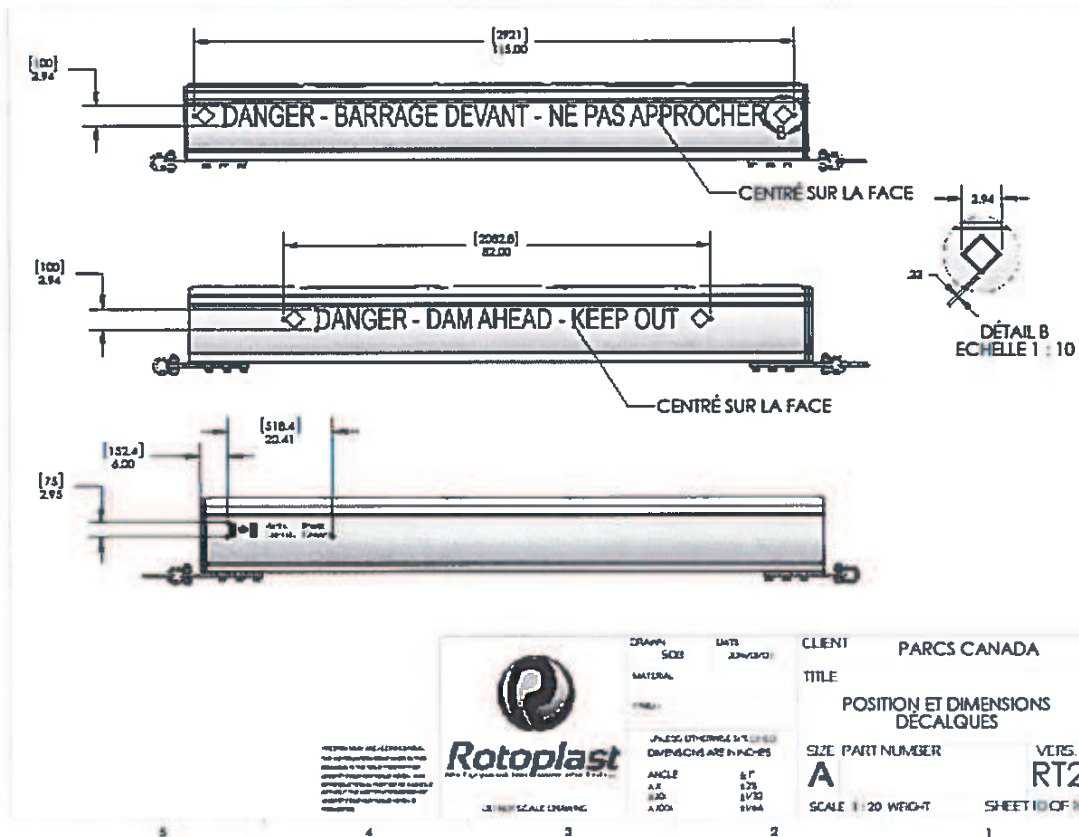
RFP

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Annexe 18

Dessins d'atelier détaillant des éléments textuels et graphiques



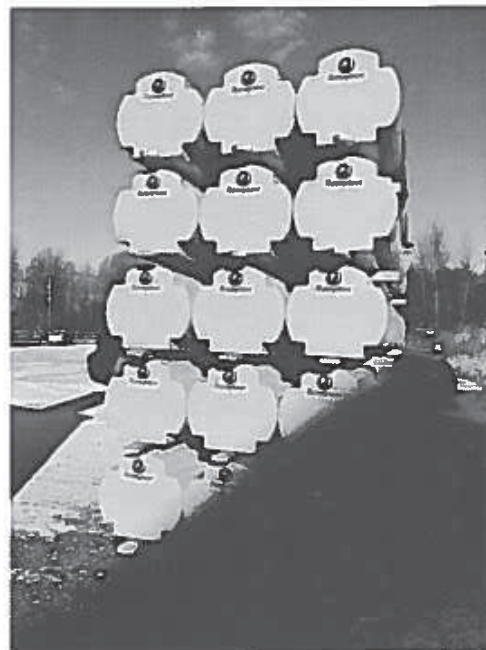
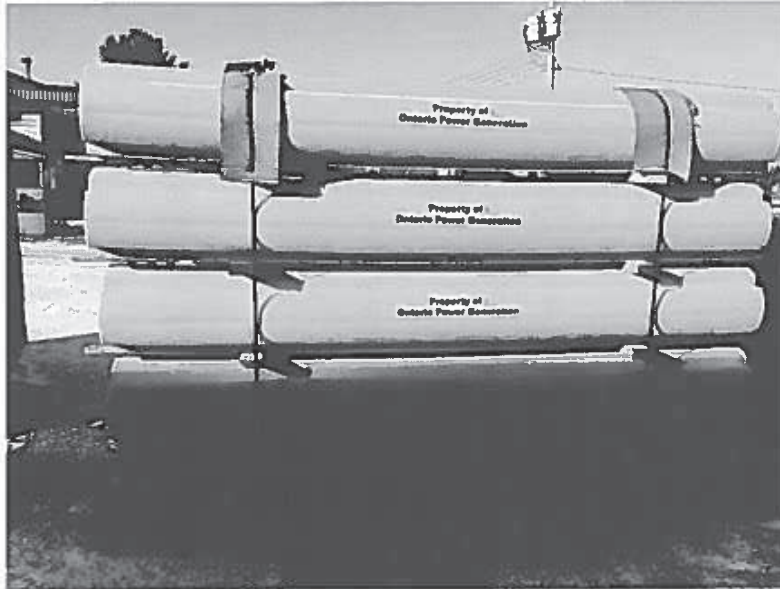
RFP

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Annexe 19

Méthode d'emballage éprouvée sur palette de bois et enveloppé avec un film thermo-rétractable.



Part 1 - General

1.1 ENVIRONMENTAL REQUIREMENTS

- .1 Operation of construction equipment in water is prohibited.
- .2 Design and construct temporary crossings to minimize environmental impact to watercourse.
- .3 Constructing temporary crossings of watercourses where spawning beds are indicated is prohibited.
- .4 Dumping excavated fill, waste material, or debris in watercourse or wetland is prohibited.
- .5 Underwater blasting is not permitted.

1.2 REFERENCES

- .1 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Sustainable Design Submittals:
 - .1 Erosion and Sedimentation Control: submit copy of erosion and sedimentation control plan in accordance with authorities having jurisdiction.

Part 2 - Products

2.1 NOT USED

- .1 Not Used.

Part 3 - Execution

3.1 EXISTING CONDITIONS

- .1 Maintain existing flow pattern in natural watercourse systems.
- .2 In natural systems maintain existing riffle pool and step pool patterns.
- .3 In wetland systems, maintain existing hydrological conditions.

3.2 SITE RESTORATION

- .1 All disturbed areas of ground are to be restored to existing or better condition than documented prior to construction. At Hastings all disturbed areas of lawn must be restored by re-grading and restoring lawn with minimum 100mm of topsoil and sod. This includes all excavations and tire ruts for which a minimum 300mm wide row of topsoil and sod is to be placed along tire ruts in surface. At other sites seeding will generally be accepted. All watering of new grass is responsibility of Contractor until such time new grass has rooted. Sod rooting will be based on 'tug test' Seeded areas rooting will be based on 25mm blade growth and 98% coverage of restored area. Burned sod must be replaced within 2 weeks. Water may be drawn from adjacent watercourse for lawn watering. Remove lawn watering equipment at end of each visit. Do not draw water for any other purposes such as concrete mixing or cleaning of equipment, etc. Use only fertilizer. Pesticides and herbicides are strictly prohibited.
- .2 All other areas of disturbance on site and along access routes as a result of contractor forces and/or work are to be restored to conditions equal to existing or better than documented prior to mobilization.
- .3 Take site photographs of all intended works areas and along access routes prior to mobilization and ongoing during work as necessary. Photos serve as a reference for potential surface defect repairs and other damages made during or at completion of work. Departmental Representative will do same. Photos will also serve as a means of settling disputes regarding damages on site.
- .4 Photograph, document and notify Departmental Representative immediately when it is noticed that any disturbances are being made as a result of work or by natural causes such as wind or erosion due to rainfall surface run-off, etc.

END OF SECTION