



**PARKS CANADA AGENCY
ONTARIO WATERWAYS**

SPECIFICATION

Bobcaygeon Lock 32
Painting

Duncan Manser
Designer

Brett McLellan
Reviewer

PF No: 4272-42-30027490
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Picture 1: Site access and laydown area looking east from parking lot at Lock 32



Picture 2: Site Access and laydown area looking west at parking lot at Lock 32.



Picture 3: Picture of upstream side of lower gates. Note: Gates will be removed from lock chamber.



Picture 4: Picture showing downstream side of lower gates and railings. Railing and deck will be removed. Gate will be removed from lock chamber and set in laydown area on timbers.



Picture 5: Picture of downstream side of upper gates. Note: gates will be removed from lock chamber by Parks Canada. Railings and deck will be removed from gate by Parks Canada.



Picture 4: Picture showing downstream side of upper gates railings and deck. Railing and deck will be removed by Parks Canada. Gate will be removed from lock chamber by Parks Canada and set in laydown area on timbers.



Picture 7: Picture of downstream side of lower gates showing water demarcation line. All non-submerged portions of gate to receive urethane finish.



Picture 8: Picture showing typical condition of gate. Note: grease lines shown will be removed by Parks Canada.



Picture 9: Picture of typical gate deck and railing. Decks and mounting brackets to be painted, railings to be replaced.



Picture 10: Picture of typical gate deck and railing. Decks and mounting brackets to be painted, railings to be replaced.



Picture 11: Picture of typical trench cover plates to be galvanized. Embedded steel to be painted with System 2.



Picture 12: Picture of typical trench cover plates to be galvanized. Embedded steel to be painted with System 2. Railings to be replaced.

Trent-Severn Waterway
Bobcaygeon Lock 32
Gate Painting
Project # 4272-42-30027490

BID BREAKDOWN

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Item No.	Item Description	Unit of Measurement	Quantity	Price Per unit \$/unit	TOTAL PRICE \$
1	Mobilization on site	Lump Sum	1		
2	Temporary Enclosures and Barriers	Lump Sum	1		
3	Cleaning and Stripping of Upper Gates	Lump Sum	1		
4	Cleaning and Stripping of Lower Gates	Lump Sum	1		
5	Disposal of Nonhazardous Abrasive	Lump Sum	1		
6	Painting of Upper Gates	Lump Sum	1		
7	Painting of Lower Gates	Lump Sum	1		
8	Manufacture and install of Gate Deck Handrails	Lump Sum	1		
9	Cleaning and Galvanizing of Existing Trench Cover Plates	Lump Sum	1		
10	Cleaning and Painting of all Embedded Steel and gate hardware.	Lump Sum	1		
11	Cleaning and Painting of all lock gate decks.	Lump Sum	1		
12	Guide rail and gates	Lump Sum	1		
13	Site Restoration	Lump Sum	1		
14	Demobilization	Lump Sum	1		

Total Price:

\$ _____

Provisional Item

15	Disposal of hazardous Abrasive	Lump Sum	1		
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PART 1 - GENERAL

- 1.1 PRECEDENCE .1 Division 1 Sections take precedence over technical sections in other Divisions of this Specification.
- 1.2 SUMMARY OF WORK .1 This specification covers all labour, materials, tools, equipment, plant, power, systems, transportation, and supervision necessary to paint the gates, and associated steelwork on the Bobcaygeon Lock.
- .2 Work includes but is not necessarily limited to:
- .1 Design, installation, maintenance and subsequent removal of scaffolding, enclosure and containment, heating, ventilation, and lighting of Workspace.
- .2 Power washing to remove dirt, moss, and other debris.
- .3 High pressure abrasive blasting and hand tool cleaning of steel (gates and some lock appurtenances.
- .1 Upper gate to be removed off site and refinished in climate controlled paint facility.
- .2 Lower gates will be removed from lock chamber and located on timber rests adjacent to the lock station.
- .4 Abrasive blasting of steel in paint shop (railings).
- .5 Steel fabrications (any repairs)
- .6 Applying new paint to all cleaned surfaces.
- .7 Remove existing trench cover plates and have them shop blasted and galvanized.
- .8 Clean-up site at completion to existing or better condition.
- .3 The two sets of lock gates can be worked on at one time or in two phases. Work done to removed items and other in-situ painting can be scheduled at any convenient time in the contract period.
- .4 There are other contracts in place at the site. Work area must be fenced to provide separate work space
- .5 Parks Canada staff will be conducting repairs to the gates prior to, and post refinishing of the gates. Gates will be removed from lock by Parks Canada ready for contractor to remove from site or house and hoard on site. It is anticipated that site will be available November 1, 2015. Refinishing Work must be completed by March 31, 2016.
- .6 Experience at other locks has shown that there is likely to be some steel repairs required to the gates.

The extent of this work cannot be defined until the area is dewatered. Do not price this work at time of tender: it will be paid during the contract as extra work.

- 1.3 LOCK LOCATION .1 Bobcaygeon Lock 32 is located at 15 Bolton Street in Bobcaygeon ON, north of Peterborough ON. By car, it is about three quarters of an hour north-west of Peterborough. By water, it is at about the halfway point along the Trent-Severn system.
- 1.4 LOCK DESCRIPTION .1 The lock consists of an upper and lower set of gates. The lock is 155 feet long, 32 feet wide and the average lift is 5.4 feet.
- 1.5 LOCK ACCESS .1 Vehicular access: From the left lock wall (left when facing downstream). Pedestrian access: from left lock wall.
.2 Contractor parking: There is a small parking lot available near the west end of the lock. Do not park on roadway. A laydown area will be approved prior to starting construction.
- 1.6 EXAMINATION OF SITE BEFORE BIDDING .1 A site visit will be organized to allow Bidders to examine site, surroundings, and condition of existing coating system before submitting a bid.
.2 Visit site before submitting tender.
.3 Examine site, adjacent premises, means of access, and make investigations in order to be fully informed about nature and extent of Work, difficulties in performing Work, facilities available for delivery, placing, operating plant and for delivery and handling of materials.
.4 Be completely familiar with every detail and intent of this Specification and scope of work to be performed, and regulatory requirements governing this Work.
- 1.7 TRENT-SEVERN WATERWAY OPERATION DATES .1 End of Navigation: Wednesday after Thanksgiving.
.2 Start of Navigation: Friday before Victoria Day.

- 1.8 FIRE SAFETY REQUIREMENTS
- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.
 - .2 Do not burn rubbish or light other fires on site.
 - .3 Retain all fire safety documents and standards on site.
- 1.9 CODES
- .1 Reference is made to CGSB, ASTM, CSA, CHBDC, AASHTO and other National and International standards. When quoted, these form an integral part of and are to be read in conjunction with the specification as if reproduced herein. If reference has no edition specified then latest edition is applicable.
 - .2 Meet or exceed requirements of:
 - .1 contract documents;
 - .2 specified standards, codes and referenced documents.
- 1.10 ABBREVIATIONS AND DEFINITIONS
- .1 Abbreviations used are:
 - .1 ASTM:- American Society for Testing Materials.
 - .2 CAEAL:- Canadian Association for Environmental Analytical Laboratories.
 - .3 CAN, CAN3, CAN/CGSB:- National Standards of Canada (published by Canadian General Standards Board).
 - .4 CGSB: - Canadian General Standards Board.
 - .5 CPM:- Critical Path Method. Bar chart construction schedule format.
 - .6 CSA:- Canadian Standards Association.
 - .7 MSDS:- Material Safety Data Sheet.
 - .8 SSPC:- Steel Structures Painting Council, former name of Society for Protective Coatings.
 - .9 TCLP:- Toxicity Characteristic Leaching Produce.
 - .10 WHMIS:- Workplace Hazardous Material Information System.
 - .2 Unless context clearly indicates otherwise, the following expressions have the interpretations noted:
 - .1 Plans: drawings listed in "List of Drawings".
 - .2 Specification - subject matter listed in "Index to Specification", additionally addenda, and all relative written communication sent by Departmental Representative to Contractor in connection with Work.
 - .3 Department - Ontario Waterways Field Unit - Parks Canada.
 - .4 Agency - Parks Canada Agency.
- 1.11 DATUM
- .1 That established by the Geodetic Survey of Canada.

1.12 INITIAL SUBMITTALS

- .1 Within 2 weeks of Award submit COST BREAKDOWN OF LUMP SUM. Use these categories to permit calculation of progress payment amounts.
 - .1 Mobilization
 - .2 Demobilization
 - .3 Health & Safety Requirements
 - .4 Environmental Protection
 - .5 Scaffolding & Access structures
 - .6 Containment & Ventilation
 - .7 Heating
 - .8 Waste Disposal
 - .9 Hazardous Waste Disposal
 - .10 Cleaning and Painting
 - .11 Site Restoration
- .2 Within 2 weeks of award, submit SITE LAYOUT DRAWING showing:
 - .1 Contractor's trailers
 - .2 Waste handling area(s).
 - .3 Storage areas for equipment, tools, and supplies.
- .3 Within 2 weeks of award, submit CONSTRUCTION PROGRESS SCHEDULE showing in bar chart format which operations are taking place at what time.
 - .1 Describe crew size for each operation and equipment needed.
 - .2 Show hours allocated for all operations.
 - .3 Ensure sufficient time required for moving and handling equipment within each subdivision.
 - .4 Include at least following operations. Include other operations you feel are necessary to fully explain your work approach and how you intend to meet the deadlines required:
 - .1 Removal and return of items to be painted off site.
 - .2 Erection of scaffolding, building of housing, provision of enclosure/containment, installation of heating/ventilating equipment.
 - .3 Steel repairs: allow 1 week to effect steel repairs of various natures to the gates whilst dewatered.
 - .4 Abrasive blasting.
 - .5 Clean up removed paint.
 - .6 Application and curing time for:
 - .1 full coat primer.
 - .2 stripe coat primer.
 - .3 top coat.
 - .7 Disassembly of housing and enclosure, and moving it to next set of gates complete with moving heating/ventilating equipment.
 - .8 Final demobilization.
 - .9 Lock Handrails in advance of fabrication

PART 2 - PRODUCTS

2.1 ACCEPTANCE OF MATERIALS.1

Where materials are specified to CSA, CGSB, ASTM, or similar standards, submit a written request to Departmental Representative for approval of relevant items. Include relevant test data bearing a recent date of test, manufacturer's details and other documents, which will substantiate its quality, conformance and cost. Submit to Section 01 33 00 - SUBMITTAL PROCEDURES.

- .2 Do not use materials or products in Work until written approval has been received from Departmental Representative.
- .3 Bear cost of additional work and modifications to design due to use of alternatives.
- .4 Base tender on exact material and equipment specified. Alternatives may be submitted for consideration during contract by following same procedure as for submittal of materials specified to ASTM, CGSB, or other standards.

2.2 RECTIFICATION OF EXISTING SURFACES AND MATERIALS

- .1 Repair, replace and/or refinish, to Departmental Representative's approval existing surfaces and materials damaged by Contractor in connection with Work.
- .2 Repaired, replaced and/or refinished items to be at least equal to those that existed immediately before damage occurred.
- .3 Rectify staging area after completion of work to at least the condition it was before start of work.

PART 3 - EXECUTION

3.1 WORK AREA

- .1 Work area must be secure and there must be no access by unauthorized persons. Therefore, provide temporary fencing around whole work site. Use modular free-standing fencing: galvanized, minimum 1.8m high, chain link or welded steel mesh, pipe rail. Provide one lockable truck entrance gate and at least one pedestrian door as directed. Equip all gates with locks and keys. Maintain fence in good repair.
- .2 Smaller, heated, hoarding around items being painted: to Section 01 56 00 - TEMPORARY BARRIERS AND ENCLOSURES.
- .3 Staging area to be located on the left bank (left when facing downstream).

3.2 WORK LAYOUT

- .1 Verify and lay out Work in accordance with dimensions and elevations shown on drawings.
- .2 Be responsible for rectification of errors resulting from un-verified dimensions.

3.3 PROTECTION & RECTIFICATION

- .1 Before starting Work, visit job site with Departmental Representative and observe pre-construction condition. Take a series of photographs representing pre-construction condition of all features in and around Work area. Note turning radii and all overhead and other obstructions, which will affect use of cranes.
- .2 Provide a duplicate set of prints (or a CD of digital images) to Departmental Representative for reference.
- .3 Protect surrounding private and public property from damage during performance of Work. Be responsible for damage incurred to surrounding properties to satisfaction of Departmental Representative.
- .4 Repair restore, or replace any and all utilities damaged due to Work or activities in connection with Work.
- .5 Repaired, replaced, or refinished items to be at least equal to those that existed immediately before damage occurred.
- .6 Special protection measures in advance of surface preparation and painting are described in Section 09 97 02 - PAINTING: HYDRAULIC STRUCTURES.

3.4 TEMPORARY UTILITIES

- .1 Provide and maintain for the duration:
 - .1 Temporary light, power and potable water to fulfill the requirements of construction.
 - .2 Sufficient portable chemical toilet conveniences in a sanitary condition for use of all persons on-site. Do not place toilets on lock deck.

- Locate toilets in staging area and minimum 5 metres from water's edge.
- .2 Contractor is not permitted to take electric power from the lock.
- .3 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.
- .4 Pay for utility charges at prevailing rates.
- 3.5 TEMPORARY OFFICES
- .1 Contractor's Office: Maintain an office on-site.
- .2 Office may be located either in the staging area or in the parking area.
- .3 Office shall be suitable for holding site meetings, with adequate tables and seating.
- 3.6 SECURITY
- .1 Be responsible for all security required at Work Site.
- .2 Be responsible for storage of all materials and equipment.
- 3.7 CONTRACTOR'S SIGN
- .1 Contractor is not permitted to install an advertisement sign on Site.
- .2 Departmental Representative will supply a project identification sign for this Work. Install where directed. Return sign to Departmental Representative at demobilization.
- 3.8 TAXES
- .1 Pay all taxes properly levied by law, Federal, Provincial and Municipal.
- 3.9 FEES, PERMITS, CERTIFICATES
- .1 Pay all fees and obtain all permits before starting Work. Provide authorities with plans and information for acceptance certificates. Provide inspection certificates as evidence that Work meets requirements of authority having jurisdiction.
- 3.10 WORK PROGRESS MEETINGS
- .1 Every 2 weeks from start of work to final demobilization prepare and distribute meeting minutes within 3 days of meeting.
- .2 Submit 48 hours before each progress meeting:
- .1 All information required by Departmental Representative or relevant to agenda for upcoming progress meeting.
- .2 Updated Schedule showing progress to date Show

revised projections of progress and completion.
Identify problem areas, anticipated delays, and impact
on schedule. Departmental Representative will review
Work progress based on approved Work schedule.

- .3 At every Progress Meeting:
 - .1 Review previous minutes,
 - .2 Record entries on as-built drawings.

1 DESCRIPTION

- .1 This section describes format to use and procedures to follow for all submittals wherever specified in Contract Documents.

2 DEFINITIONS

- .1 SHOP DRAWINGS: Original drawings, or modified standard drawings provided by Contractor, to illustrate details of portions of work, which are specific to project requirements.
- .2 PRODUCT DATA: Manufacturers catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.

3 TIMELINESS

- .1 Submit promptly and in orderly sequence so as to not cause delay in work and to meet work schedule.
- .2 Do not proceed with work until relevant submissions are reviewed by Departmental Representative.

4 FORMAT

- .1 Submit as PDF files via e-mail with copies to all parties. Departmental Representative will provide names and e-mails of all parties at kick-off meeting.
- .2 In all cases, do not proceed with work affected by submittal until submission review is complete.

5 PROCEDURE

- .1 Submit product data sheets, and/or brochures to completely describe each item of Work for which submittals apply.
- .2 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of contract documents stating reasons for deviations.
- .3 Allow 10 working days for Departmental Representative's review of each submission.
- .4 Accepted submissions:
 - .1 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed.

- .2 After Departmental Representative's review, distribute copies. Keep one reviewed copy of each submission on site.
- .5 Rejected Submissions:
 - .1 Departmental Representative will annotate and return copies of rejected submissions. Make all changes in submissions which Departmental Representative requires. Resubmit as directed by Departmental Representative.
 - .2 When resubmitting, notify Departmental Representative in writing of any revisions other than those requested.
 - .3 Fabrication and installation work shall commence only after the review of such corrected shop drawings.
- .6 Adjustments made on shop drawings, samples, and mock-ups by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

6

RESPONSIBILITY

- .1 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
- .2 Contractor's responsibility for deviations in submission from requirements of contract documents is not relieved by Departmental Representative's review of submission, unless Departmental Representative gives written acceptance of specific deviations.
- .3 The review of shop drawings by Parks Canada, Trent-Severn Waterway (PC, TSW) is for sole purpose of ascertaining conformance with general concept. This review shall not mean that PC approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

7 SHOP DRAWINGS & PRODUCT DATA

- .1 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed.
- .2 Cross-reference shop drawing information to applicable portions of Contract Documents.
- .3 Delete information not applicable to project.
- .4 Supplement standard information to provide details applicable to project.

8 SAMPLES AND MOCK-UPS

- .1 Submit for review samples and mock-ups as requested in respective specification Sections.
- .2 Label samples with origin and intended use.
- .3 Where colour, pattern or texture is a criterion, submit full range of samples or mock-ups.
- .4 Prepare samples and construct mock-ups for work specifically requested in specifications.
- .5 Construct mock-ups in locations specified or as Departmental Representative directs.
- .6 Prepare samples and mock-ups with reasonable promptness and in an orderly sequence, so as not to cause any delay in work.
- .7 Failure to prepare samples and mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .8 If requested, Departmental Representative will assist in preparing a schedule fixing dates for samples and mock-ups.
- .9 Make changes in samples and mock-ups, which Engineer may require, consistent with Contract Documents.
- .10 Reviewed and accepted samples and mock-ups become standard of workmanship and material against which installed Work will be verified.

End of Section

1 RELATED WORK

- .1 Section 01 33 00 - SUBMITTAL PROCEDURES.
- .2 Section 01 56 00 - TEMPORARY BARRIERS AND ENCLOSURES.
- .3 Section 09 97 02 - PAINTING: HYDRAULIC STRUCTURES.

2 REFERENCES

- .1 Province of Ontario:
 - .1 Ministry of Labour, Occupational Health and Safety Branch, Guideline: Lead on Construction Projects, September 2004.
 - .2 Workplace Safety and Insurance Act, 1997.
 - .3 Municipal statutes and authorities.
- .2 Fire Commissioner of Canada (FCC):
 - .1 FC-301 Standard for Construction Operations.
 - .2 FC-302 Standard for Welding and Cutting, June 1982.

Labour Program
Fire Protection Engineering Services
4900 Yonge Street 8th Floor
Willowdale, Ontario M2N 6A8

and copies may be obtained from:

Human Resources and Social Development Canada
Labour Program
Fire Protection Engineering Services
Ottawa, Ontario K1A 0J2

3 SUBMITTALS

- .1 Submit site-specific Health and Safety Plan: Within 14 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site-specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for each site task and operation.
 - .3 On-site contingency and emergency response standard operating procedures to be implemented during emergency situations.
 - .4 Measures and controls to be implemented to address identified safety hazards and risks, including recognition of symptoms and signs which might indicate overexposure hazards.
 - .5 Fire Safety Plan specific to work location.
 - .6 Contractor's and Sub-contractors' Safety Communication Plan.
 - .7 Personnel training requirements.

.8 Names of personnel and alternates responsible for site safety and health, hazards present on site, and use of personal protective equipment.

.9 Work practices by which personnel can minimize risks from hazards, safe use of engineering controls and equipment on site, medical surveillance requirements, including recognition of symptoms and signs which might indicate overexposure to hazards, and elements of site-specific Health and Safety Plan.

.10 Personal protective equipment (PPE) program addressing:

.1 Donning and doffing procedures.

.2 PPE selection based upon site hazards.

.3 PPE use and limitations of equipment.

.4 Work mission duration, PPE maintenance and storage.

.5 PPE decontamination and disposal. PPE inspection procedures before, during, and after use.

.6 Evaluation of effectiveness of PPE program, and limitations during temperature extremes, and other appropriate medical considerations.

.11 Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment.

.12 Procedures dealing with heat and/or cold stress.

.2 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative.

.3 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.

.4 Submit records of Contractor's Health and Safety meetings.

.5 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, weekly.

.6 Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.

.7 Submit copies of incident and accident reports.

.8 Submit Material Safety Data Sheets (MSDS).

.9 Submit Workplace Safety and Insurance Board (WSIB)-Experience Rating Report.

4 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities before starting Work.

5 SAFETY ASSESSMENT

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

6 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative before starting Work.

7 REGULATORY REQUIREMENTS

- .1 Comply with the Acts and regulations of the Province of Ontario.
- .2 Comply with specified standards and regulations to ensure safe operations at site.

8 PROJECT/SITE CONDITIONS

- .1 Work at site will involve contact with:
 - .1 Garbage and debris
 - .2 Old and new paint. Some lead-containing.
 - .3 Lead containing paint:
 - .1 Yellow deck handrails
 - .2 Blue undercoat on deck hand rails
 - .3 Grey trench covers
 - .4 Brown handrail
 - .5 Lock gates
 - .4 Guano (bird droppings)
- .2 Work at site will involve:
 - .1 Work around open flowing water
 - .2 High pressure abrasive blasting
 - .3 Isolation and lock out/tagout of systems and equipment.
 - .4 Solvent-containing atmospheres.
 - .5 Working in cold
 - .6 Working in temporary heated housing

9 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 either accepting or requesting improvements.
- .3 Relief from or substitution for any portion or provision of minimum Health and Safety standards specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing.

10 COMPLIANCE REQUIREMENTS

- .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990 Chapter 0.1, as amended.

11 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 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.
- .3 Where applicable the Contractor shall be designated "Constructor", as defined by Occupational Health and Safety Act for the Province of Ontario.

12 UNFORESEEN HAZARDS

- .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work and advise Departmental Representative verbally and in writing.
- .2 Follow procedures in place for Employees Right to Refuse Work as specified in the Occupational Health and Safety Act for the Province of Ontario.

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 Province of Ontario, and in consultation with Departmental Representative.
 - .1 Contractor's Safety Policy.
 - .2 Constructor's Name.
 - .3 Notice of Project.
 - .4 Name, trade, and employer of Health and Safety Representative or Joint Health and Safety Committee members (if applicable).
 - .5 Ministry of Labour Orders and reports.
 - .6 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.
 - .7 Address and phone number of nearest Ministry of Labour office.
 - .8 Material Safety Data Sheets.
 - .9 Written emergency Response Plan.
 - .10 Site Specific Safety Plan.
 - .11 Valid certificate of first aider.
 - .12 WSIB "In Case of Injury At Work" poster.
 - .13 Location of toilet and cleanup facilities.

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.

15 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.
- .2 Assign responsibility and obligation to Competent Supervisor to stop or start Work when, at Competent Supervisor's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

1 DESCRIPTION

- .1 This Section describes requirements for the protection of environment that apply to the Work. These requirements apply to all Sections of this Specification, without limiting the conditions and approvals imposed by statute.
- .2 Control Work to provide effective environmental, waterbody, and fish habitat protection.
- .3 Departmental Representative will monitor environmental protection measures and will identify whenever such protection is found to be ineffective. Change protective measures or work procedures as directed by Departmental Representative to ensure environmental, waterbody and fish habitat protection.
- .4 Work not included in this section:
 - .1 Details of Containment system for cleaning and painting operations are described in Section 01 56 00 - TEMPORARY BARRIERS AND ENCLOSURES.
 - .2 Protection of workers from environmental hazards, which is described in Section 01 35 29.06 - HEALTH & SAFETY REQUIREMENTS.

2 RELATED WORK

- .1 Section 01 33 00 - SUBMITTAL PROCEDURES.
- .2 Section 01 35 29.06 - HEALTH & SAFETY REQUIREMENTS.
- .3 Section 01 56 00 - TEMPORARY BARRIERS AND ENCLOSURES.

3 SUBMITTALS

- .1 ENVIRONMENTAL PROTECTION PLAN. Submit within 7 days of award of Contract and before starting work. Discuss methods and procedures for the protection of environment during Work. Address topics at level of detail commensurate with Work.
 - .1 PART 1 - Identification of all types and sources of contaminating or polluting materials that will be present on site during course of work. Currently known materials include but are not limited to:
 - .1 Abrasive blasting residue
 - .2 Solid wastes including used protective clothing, rags, brushes, cloths, etc.
 - .3 Fuels for generators and compressors.
 - .4 Paints and paint thinners.
 - .5 Movement of trucks and equipment around existing trees.
 - .6 All other materials and hazards you foresee using for this Work.
 - .2 PART 2 - Measures and controls to prevent these materials from entering or damaging surrounding

environment. This will include shop drawings and product information for:

- .1 Containment: Submitted under Section 01 56 00 - TEMPORARY BARRIERS AND ENCLOSURES.
 - .2 Vacuuming, filtering and all other methods for the collection of paint chips and surface preparation residue.
 - .3 Collection and removal of abrasive blasting material and paint residue.
 - .4 Storage of paint, thinner, degreasers, fuel: minimum 15m from water's edge.
 - .5 Re-fueling procedures for all equipment (re-fuelling must be done 15m away from water's edge).
 - .6 All other measures and controls for protection of the environment that you foresee for this Work.
- .3 PART 3 - Emergency Procedures. Contact Manufacturers of products you will be using and ascertain hazards involved, precautions required, and measures used in spill cleanup or mitigating action. Design spill response and stock spill response materials that are compatible with type of material being handled. Include in Plan:
- .1 Fuel spill procedures
 - .2 Paint/solvent spill procedures.
 - .3 All other emergency procedures you foresee for this work.
- .4 PART 4 - Waste Disposal. Describe methods, equipment, and frequency of work involved in gathering, storing, and disposal of wastes from site.

- .1 Environmental Protection Act, Ontario Regulations O.Reg. 102/94 and O. Reg. 103/94. Regulations made under Ontario Environmental Protection Act, R.S.O. 1990, c. E.19.
 - .1 O. Reg. 347 Amended to O. Reg. 395/07 "General - Waste Management."
 - .2 O. Reg. 224/07 "Spill Prevention and Contingency Plans."
 - .3 R.R.O. 1990, Reg. 360 "Spills."
- .2 Workplace Hazardous Materials Information System (WHMIS).
- .3 Fisheries Act, (R.S., 1985, c. F-14).
- .4 Canadian Council of Ministers of Environment (CCME) Documentation.
- .5 Canadian Environmental Protection Act, 1999 (CEPA 1999).
- .6 National Fire Code of Canada, 2005.
- .7 Transportation of Dangerous Goods Act (TDG Act), 1992 c. 34.

- .8 Transportation of Dangerous Goods Regulations (TDG Regulations), T-19.01-SOR/2003-400.

5 DEFINITIONS

- .1 DELETERIOUS MATERIAL: Any substance that, if added to a waterbody, could degrade water quality or impact fish, fish habitat and aquatic wildlife. This includes, but is not limited to:
 - .1 Oil, diesel, or gasoline
 - .2 Earth, silt, mud
 - .3 Paint (chips and liquid)
 - .4 Solvents
- .2 DRIPLINE: Location on ground surface directly beneath a theoretical line described by tips of outermost branches of trees.
- .3 BARRIER: Fence consisting of approved material, supported by steel posts and being a minimum of 1.2 m high, without breaks or unsupported sections.

6 FIRES

- .1 Do not burn rubbish or light other fires on site.

7 WORK ADJACENT TO WATERWAYS

- .1 Do not release any Deleterious Material into waterway.
- .2 Ensure all equipment and temporary access structures such as scaffolding placed in waterbodies is free of earth material, and excess, loose or leaking fuel, lubricants, coolant and other Deleterious Material that could enter waterbody.
- .3 Storage of fuels, paints, thinners, or other products on the pedestrian bridge or deck around the lock is not permitted.

8 DUST PROTECTION AND EROSION CONTROL

- .1 Before starting work which will create dust, (hand and power tool cleaning, sweeping of deck around lock, etc.), install effective mitigation techniques for dust. Maintain these protective measures at all times, including shut down periods.
- .2 Install and maintain for the duration of work a 1 metre high silt fence between equipment staging area and the watercourse. Keep on hand a supply of silt fence material in order to effect repairs immediately if so required.
- .3 Cover or wet down dry materials and rubbish to prevent

blowing dust and debris.

9 PLANT & TREE REMOVAL AND PROTECTION

- .1 All trees and branches must be protected and may not be damaged during Work.
- .2 Provide Barrier around trees which may be affected by Work. Locate Barrier 1 metre beyond Dripline. Barrier to consist of a protective wood framework covered with plastic construction fence material, extending from grade level to a height of 2 metres. Maintain Barriers in good repair throughout the duration Work. Remove these upon completion of Work.
- .3 Damage to trees as a result of Contractor's operations:
 - .1 Broken branches 25 mm or greater in diameter: cut back cleanly at break, or to within 10 mm of their base, if a substantial portion of branch is damaged. Departmental Representative will direct.
 - .2 Exposed roots 25 mm or larger: cut back cleanly to soil surface within five calendar days of exposure.
 - .3 Damaged bark: neatly trim back to un-injured bark, without causing further injury, within five calendar days of damage.

10 NOISE CONTROL

- .1 Comply with local Noise By-laws.

11 OPERATION & MAINTENANCE OF EQUIPMENT

- .1 Provide drip trays to prevent discharge of oil, grease, antifreeze, or any other materials into ground or onto deck around lock.
- .2 All equipment: meet or exceed all applicable emission requirements.
- .3 Leave machinery running only while in actual use, except where extreme temperatures prohibit shutting machinery down.
- .4 Prevent any and all hydrocarbons from entering watercourse. Do not refuel, perform oil changes, or any and all other maintenance on equipment parked or placed within 5 metres of water. Remove it to farther away from the watercourse before undertaking these operations.

12 WHMIS REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Human Resources Social Development Canada, Labour Program.

13 SPILLS

- .1 Be prepared to mitigate, intercept, clean up, and dispose of spills or releases that may occur whether on land or water.
- .2 Maintain materials and equipment required for cleanup of spills or releases readily accessible on site. Materials may include but are not limited to containers, adsorbent floating boom/skimmer, shovels, and personal protective equipment. Make spill response materials available at all times in which hazardous materials or wastes are being handled or transported.
- .3 Follow procedures described in reviewed Site-Specific Environmental Protection Plan.
- .4 Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.
- .5 Using appropriate safety precautions, collect liquid or solidify liquid with an inert, noncombustible material and remove for disposal.
- .6 Be responsible for all costs of cleaning up any spills to satisfaction of the Departmental Representative.
- .7 Spill kit as described in Site-Specific Environmental Protection Plan must be on-site at all times.
- .8 Reporting: Promptly report spills and releases potentially causing damage to environment to:
 - .1 Departmental Representative
 - .2 Ministry of the Environment SPILL Coordinator (Telephone No. 1-800-268-6060).
 - .3 Authority having jurisdiction or interest in spill or release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.
 - .4 Owner of pollutant, if known.
 - .5 Person having control over pollutant, if known.

14 DAILY CLEAN-UP

- .1 Clean up work area as work progresses. At the end of each work period, and more often if ordered by Departmental Representative, remove debris from site, neatly stack material for use, and clean up generally.
- .2 Permit no undue amounts of debris, trash or garbage to accumulate.
- .3 Neither bury nor burn rubbish on site.

- .4 Separate and recycle all materials that can be recycled.
- .5 Dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner by taking them to a special designated waste facility licensed to receive it. Do not dump these into waterways, storm or sanitary sewers.
- .6 Ensure all emptied containers are sealed and stored safely for disposal away from children.
- .7 Prevent chemicals (e.g. cleaning agents) from entering drinking water supplies or waterway. Using appropriate safety and environmental precautions, collect liquid or solidify liquid with an inert, noncombustible material and remove for disposal.
- .8 Dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner by taking them to a special designated waste facility. Do not dump these into waterways, storm or sanitary sewers.
- .9 At completion of Work remove all scaffolding, temporary protection and surplus materials, tools, plant, rubbish and debris and dispose of them in an approved manner off Crown property.
- .10 Place materials defined as hazardous or toxic waste in designated containers.
- .11 Clean areas under contract to a condition at least equal to that previously existing and to approval of Departmental Representative.

15 STORAGE AND HANDLING OF WASTE

- .1 Store all waste minimum 10 metres from watercourse. Handle wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
- .2 Store and handle flammable and combustible wastes in accordance with current National Fire Code of Canada requirements.

16 TESTING WASTE AND PLANNING WASTE DISPOSAL

- .1 Engage and pay for a CAEAL-accredited laboratory to conduct individual TCLP leachate tests to Ontario Regulation 347 as amended to Ontario Regulation 395/07 for representative samples of residue from various surfaces being cleaned. Bear cost of this testing.
- .2 Use these results to develop a plan for disposing of cleaning residues.
- .3 Be responsible for all co-ordination and paperwork required to comply with proper waste disposal to Ontario Regulation 347 made under the Environmental Protection Act.
- .4 For tender purposes, assume all paint and cleaning

residues are suitable for regular land fill.

17 TRANSPORTING WASTE MATERIALS

- .1 All waste subject to Regulation 347 Amended to Regulation 395 of the Ontario Environmental Protection Act must be transported with a valid "Certificate of Approval for a Waste Management System" to a site approved by Ontario Ministry of the Environment to accept that waste.

18 QUALITY ASSURANCE

- .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 and Health and Safety Plan.
- .2 After receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions will be granted for such suspensions.

1 INDEPENDENT INSPECTION AGENCIES

- .1 Departmental Representative will engage independent Inspection/Testing Agencies for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Crown. On this project, this is expected to include:
 - .1 Coatings inspector
 - .2 Welding inspector
- .2 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

2 ACCESS TO WORK

- .1 Allow Departmental Representative and Inspectors access to work whenever and wherever it is in progress. Provide equipment required for access and executing inspection and testing by appointed agencies such as (but not limited to) ladders, lights, and confined space access equipment.
- .2 Co-operate to provide reasonable facilities for such access.

3 PROCEDURES

- .1 Notify Departmental Representative 2 days in advance of requirement for tests.
- .2 Submit samples and/or materials required for testing as listed 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.

4 INSPECTION

- .1 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. Pay costs for retesting and reinspection.
- .2 If Contractor covers or permits to be covered Work that has been designated for inspections before these are made, uncover such work, have inspections or tests satisfactorily completed and make good such work.
- .3 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 will authorize payment of the cost of examination and replacement.

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 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.

6 MILL TESTS

- .1 Submit mill test certificates as requested.

PART 1 - GENERAL

1.1 DESCRIPTION

- .1 This section specifies requirements for designing, supplying, installing, inspecting, maintaining, and removing:
 - .1 All temporary structures used to access Work.
 - .2 Housing and containment systems.
 - .3 Heating and ventilating Workspaces.
 - .4 Lighting of Workspaces.
 - .5 Construction Fencing
- .2 Work not included in this section:
 - .1 Temperature and humidity requirements for painting operations, which are described in Section 09 97 02 - PAINTING: HYDRAULIC STRUCTURES.
 - .2 Provision of separate air supply for workers which is part of Contractor's responsibility under Health & Safety regulations for construction.
- .3 Intent: housing, heating and ventilating must be sufficient to:
 - .1 ensure safe working environment.
 - .2 withstand wind pressure and snow loading
 - .3 facilitate progress of Work in an efficient manner.
 - .4 protect areas adjacent to Work during procedures which may be damaged as a result of Work.
 - .5 protect Work and products against dampness and cold.
 - .6 prevent moisture condensation on surfaces.
 - .7 provide ambient temperatures and humidity levels for storage, installation and curing of materials.

1.2 RELATED WORK

- .1 Section 01 33 00 - SUBMITTAL PROCEDURES.
- .2 Section 01 35 29.06 - HEALTH & SAFETY REQUIREMENTS.
- .3 Section 01 35 43 - ENVIRONMENTAL PROCEDURES.
- .4 Section 09 97 02 - PAINTING: HYDRAULIC STRUCTURES.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-S269.2-M1987 (R2003), Access

- Scaffolding for Construction Purposes.
- .2 Steel Structures Painting Council (SSPC)
 - .1 SSPC-Guide-6 Guide for Containing Debris Generated During Paint Removal Operations.
 - .2 SSPC-Guide-12 Guide for Illumination of Industrial Painting Projects.
- .3 Province of Ontario
 - .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990 as amended, O. Reg. 213/91 as amended.
 - .2 Air Pollution - Local Air Quality (O. Reg. 419/05)

1.4 SUBMITTALS

- .1 Shop drawings showing:
 - .1 All concrete anchors and points of connection with existing structure, ground surface.
 - .2 Type and construction of housing and enclosures, connections with scaffolding, existing structure and ground surface, and method of sealing.
 - .3 Ventilation fan location and capacity.
 - .4 Heater numbers, types, locations, and capacities. Size of drip trays provided with all liquid-fuelled heaters.
 - .5 Number and location of fire extinguishers associated with heating equipment.
 - .6 Number, type, strength, of all lighting provided within enclosure.
- .2 All shop drawings: sealed and signed by Professional Engineer(s) responsible for design. Designers must visit site to inspect the installation of equipment/structures they have designed and issue a letter saying these have been built/installed according to their design.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Subject to approval by Departmental Representative as to type, materials and detail: Use:
 - .1 New materials;
 - .2 Salvaged/recycled materials in good condition; or,
 - .3 Prefabricated portable components in a good, safe condition.

PART 3 - EXECUTION

3.1 GENERAL

- .1 Carry out all work to:
 - .1 Ontario Occupational Health and Safety Act and Regulations.
 - .2 Approved Site-Specific Safety Plan.
 - .3 Approved Site-Specific Environmental Protection Plan.

3.2 SITE ACCESS

- .1 Provide construction fencing around entire work area.
- .2 Ensure Departmental Representative and Consultant have access to work site.

3.3 SCAFFOLDING

- .1 Make all changes to scaffolding required by Ministry of Labour officials.
- .2 Ensure transition area from ladder(s) to scaffolding is clear of obstructions and cross bracing.
- .3 Make periodic inspections of scaffolding as Work progresses.
- .4 Do not load or permit to load any part of Work or any temporary access structure with a weight or force that will endanger Work or labourers.
- .5 Do not weld to steel parts of the lock.
- .6 Patch holes made by concrete anchors (if any) after scaffolding is removed.

3.4 HOUSING AND CONTAINMENT

- .1 Intent: to control debris from abrasive blasting and to provide a micro-climate more suitable to application and curing of paint.
- .2 Provide strong and durable housing and containment for portions of Work to be protected, heated, and/or ventilated during Work.
 - .1 Housing to be strong enough to withstand rain, wind and snow loads.
 - .2 Housing to be insulated against cold.
 - .3 Electrical wiring, lights, and other equipment located inside enclosure: explosion-proof type. Illumination to SSPC-Guide 12 Guide for Illumination of Industrial Painting Projects.

3.5 HEATING

- .1 Provide temporary heating required during construction period, including Watchkeeping attendance, maintenance, and fuel.
- .2 Be responsible for damage to work due to failure in providing adequate heat and protection during construction.
- .3 Ensure no water, including condensation water, can drip onto prepared surfaces during painting operations.
- .4 Temperature and relative humidity requirements: to Section 09 97 02 - PAINTING: HYDRAULIC STRUCTURES.
- .5 Fire protection requirements: to Section 01 35 29.06 - HEALTH AND SAFETY REQUIREMENTS.
- .6 Use only heating equipment types acceptable to Departmental Representative.
- .7 Heating fuels: indirect fired heaters. Do not re-fuel on deck around lock or pedestrian bridge.
- .8 Fuel Storage: to requirements of Fire Commissioner of Canada and Section 01 35 43 - ENVIRONMENTAL PROTECTION.
- .9 Provide and maintain temporary fire protection equipment during performance of Work commensurate with fuel source selected.
- .10 Ensure that heating requirements are met by providing, at optimum efficiency of equipment, a capacity of 125% of heat requirement and a sufficient number of standby heaters ready for use at Site.
- .11 Vent exhausts of heating equipment outside of housing, well clear of combustible materials and fresh air intake.

3.6 VENTILATING EQUIPMENT

- .1 Intent of ventilation:
 - .1 To ensure required air temperature and quality in all parts of enclosure.
 - .2 To remove solvents air inside containment, and thus allow for proper paint curing.
 - .3 To enhance health & safety of workers.
- .2 Minimum air exchange rate during painting: to Occupational Health & Safety regulations described in Section 01 35 29.06 - HEALTH & SAFETY REQUIREMENTS or SSPC-Guide 6 (2004) Guide for Containing Debris Generated During Paint Removal Operations, whichever is more strict.
- .3 Depending upon configuration of enclosure, it may be necessary to install both a mechanical supply and exhaust ventilation system to effect adequate air changes within confined space. Locate air-moving

- devices in a manner that assures that airflow is not restricted or short circuited and is supplied in proper direction and does not interfere with Work.
- .4 Continue operation of exhaust ventilation system after painting process to assure removal of harmful contaminants during paint drying and curing.
 - .5 Ventilate storage spaces containing hazardous or volatile materials.
 - .6 Ventilation system must be vented to take advantage of prevailing winds.

3.7 FIELD QUALITY CONTROL & WATCHKEEPING

- .1 Provide and post at approved locations within housing, one maximum/minimum thermometer per approximately 10 square metres of plan area of housing.
- .2 Ensure continuity of protection by providing a Watchkeeper to make periodic checks at all times when work is not in progress.
- .3 Watchkeeper's qualifications, under this section of specification, are to be sufficient to perform such duties as:
 - .1 Maintain strict supervision of operation of temporary heating and ventilating equipment.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes due to mis-use of heating and ventilating equipment.
 - .5 Undertake preventive maintenance and re-fueling.
 - .6 Complete emergency repairs of minor complexity.
 - .7 Place standby items in service.
- .4 Record maximum and minimum temperature at each thermometer on a daily basis, and re-setting thermometers as necessary.
 - .1 Make temperature records available to Departmental Representative on a daily basis.
 - .2 Provide certified written records to Departmental Representative on a weekly basis.

1 RECORD DRAWINGS

- .1 Take measurements and photographs of all work
- .2 Record at least the following information:
 - .1 Location and type of welding repairs completed.
 - .2 Other information as requested by Engineer.
 - .3 Submit as PDF files, to print clearly and create as-built sketches legibly on ledger-sized paper.

PART 1 - GENERAL

1.1 RELATED
SECTIONS

- .1 Section [01 33 00 - Submittal Procedures].

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
- .1 ASTM A123/A123M-09, Specification for Hot-Dipped, Zinc-Coating on Iron and Steel Products.
 - .2 ASTM A 307-10, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .3 ASTM C881/C881M-13, Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
 - .4 ASTM C882/C882M-13a, Standard Test Method for Bond Strength of Epoxy-Resin Systems Used With Concrete By Slant Shear.
 - .5 ASTM D570-98(2010)e1, Standard Test Method for Water Absorption of Plastics.
 - .6 ASTM D638-10, Standard Test Method for Tensile Properties of Plastics.
 - .7 ASTM D695-10, Standard Test Method for Compressive Properties of Rigid Plastics.
 - .8 ASTM D698-12e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³)).
 - .9 ASTM F593-13a, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
 - .10 ASTM F594-09e1, Standard Specification for Stainless Steel Nuts.
 - .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.40-[97], Anti-corrosive Structural Steel Alkyd Primer.
 - .2 CAN/CGSB-1.181-[92], Ready-Mixed, Organic Zinc-Rich Coating.
 - .2 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-G40.20/G40.21-[98], General Requirements for Rolled or Welded Structural Quality Steel.
 - .2 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CAN/CSA-S16-09 Design of Steel Structures.
 - .4 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).

.5 CSA W59-13, Welded Steel Construction (Metal Arc Welding).

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

.1 Material Data Sheets (MSDS).

1.3 SUBMITTALS

.1 Submit in accordance with section 01 33 00

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature, specifications for sections plates pipe tubing bolts and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings

.1 Submit shop drawings stamped and signed by professional engineer registered in the Province of Ontario.

.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

.3 Shop drawings must be reviewed and approved by Departmental Representative prior to start of fabrication.

.4 Drawings to identify all onsite interferences including trench cover plates.

.5 At no time shall an anchor point sit on top of a removable plate.

1.4 QUALITY ASSURANCE

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

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

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

1.5 MEASUREMENET
PROCEDURES

- .1 Guard rail including both fixed and removable sections shall be measured by the linear meter and shall include all labour, equipment necessary to fabricate, supply and install. All lock rails shall be galvanized. All deck rails shall be painted per section 09 97 02
- .2 Guard rail gates shall be measured by the each gate and shall include all labour, material and equipment necessary to fabricate, supply and install.

1.6 DELIVERY,
STORAGE, AND
HANDLING

- .1 Deliver, store, handle and protect materials in accordance with manufacturer's written instructions.
- .2 Storage and Protection:
 - .1 Store material off ground in a dry location in accordance with manufacturer's recommendations in clean dry well ventilated area
 - .2 Replace all defective or damage material with new.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 350W.
- .2 Steel pipe: to ASTM A 53/A 53M extra strong.
- .3 Welding materials: to CSA W59.
- .4 Welding electrodes: to CSA W48 Series.
- .5 Bolts and anchor bolts: to ASTM A307 galvanized.
- .6 Epoxy adhesive: 2 component, solvent free high modulus, moisture insensitive, usable underwater, high strength structural epoxy suitable for use in cracked or uncracked concrete, conforming to ASTM C881 Type IV Grade 2 and 3 Class A, B and C with the following characteristics:

- .1 Bond strength 12.4 MPa at 2 days to ASTM C881-91
- .2 Compressive strength: 82.7 MPa to ASTM D695-96.
- .3 Tensile strength 43.5 MPa at 7 days to ASTM D638-97.

2.2 FABRICATION

- .1 Examine existing field conditions and obtain measurements and dimensions required to fabricate. Advise Departmental representative of any adjustments and conditions affecting the work.
- .2 Confirm fit and field measurements prior to commencing fabrication of all items.
- .3 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .3 Where possible, fit and shop assemble work, ready for erection.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.
- .5 Ensure post base plates are not placed on trench cover plates. Consult with Department Representative regarding relocated post location prior to fabrication.

2.3 FINISHES

- .1 Lock rails and gates Galvanizing: hot dipped galvanizing with zinc coating 610 g/m², Coating to ASTM A123/A123M.
- .2 Deck railings Painting: Type 2 Paint System per section 09 97 02 Colour: Yellow

2.4 SHOP PAINTING

- .1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.
- .2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 degrees C.
- .3 Clean surfaces to be field welded; do not paint.

- 2.5 LOCK RAIL AND GATES .1 HSS Steel pipe: of dimensions indicated on Parks Canada Standard drawings for railings formed to shapes and sizes as indicated determined by:
- .1 Standard lengths indicated on Parks Canada standard drawings or
 - .2 Custom lengths and shapes as determined by field measurement and shop drawings.
- .2 Galvanize HSS railings and gates after fabrication.
-
- 2.6 LOCK GATE DECK RAILINGS .1 HSS Steel pipe: of dimensions indicated on Parks Canada Standard drawings for railings formed to shapes and sizes as indicated determined by:
- .1 Field verify lengths indicated on Parks Canada standard drawings and/or
 - .2 Custom lengths and shapes as determined by field measurement and shop drawings.
- .3 Painting: Type 2 Paint System per section 09 97 02 Colour: Yellow.

PART 3 - EXECUTION

- 3.1 ERECTION .1 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Supply components for work by other trades in accordance with shop drawings and schedule.
- .4 Make field connections as indicated.
- .5 Touch-up, field welds, bolts and burnt or scratched surfaces of painted surfaces, after completion of erection, with primer and finish coats.

- .6 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.2 LOCK RAILINGS AND GATES

- .1 Install lock guide rails and gates to details indicated.
- .2 Install posts with anchor bolts set into concrete with epoxy adhesive as indicated.
- .3 Grout under guide rail post base plates and provide level surface and full contact between base plate.

3.3 LOCK GATE DECK RAILS

- .1 Install lock gate deck rails to details indicated.
- .2 Re-use anchors removed for finishing to existing anchor locations.

3.4 TRENCH COVER PLATES

- .1 Remove all trench covers and replace after having them cleaned, stripped and galvanized.
- .2 Provide temporary covers over trenches while cover plates are removed.
- .3 Reinforce existing plates as required to resist warping during galvanizing process. Warped plates will be rejected and replaced with new at contractors expense

3.5 TRENCH CHANNEL FRAMES

- .1 Refinish all trench/channel frames to 09 97 00.

3.6 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

Trent-Severn Waterway

Metal Fabrications

Section 05 50 00

Bobcaygeon Lock 32

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Gate Painting

Project # 4272-42-30027490

September 11, 2015

PART 1 - GENERAL

1.1 DESCRIPTION

- .1 This section includes re-painting all existing painted steel surfaces, whether painted in-situ or in the shop.
- .2 The existing trench cover plates shall be removed from site, cleaned and hot dipped galvanized.
- .3 The embedded steel which supports the trench cover plates shall be cleaned and painted.
- .4 All sides of gates are to be painted.
- .6 All surfaces below water level to SSPC-SP-10.
- .5 Do not paint items which are hot dipped galvanized or which were not previously painted.

1.2 RELATED WORK

- .1 Section 01 56 00 - TEMPORARY BARRIERS & ENCLOSURES.
- .2 Section 01 35 43 - ENVIRONMENTAL PROTECTION.
- .3 Section 01 35 29.06 - HEALTH & SAFETY REQUIREMENTS.

1.3 REFERENCES

- .1 Society for Protective Coatings (Formerly known as Steel Structures Painting Council abbreviated SSPC):
 - .1 Surface preparation standards:
 - .1 SSPC-SP-1 Solvent Cleaning.
 - .2 SSPC-SP-2 Hand Tool Cleaning.
 - .3 SSPC-SP-3 Power Tool Cleaning.
 - .4 SSPC-SP-6 Commercial Blast Cleaning.
 - .5 SSPC-SP-10 Brush of Blast Finish
 - .6 SSPC-SP-11 Power Tool Cleaning to Bare Metal.
 - .2 Standards for visual inspection of surface preparation:
 - .1 SSPC-Vis-1 Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning.
 - .2 SSPC-Vis-3 Visual Standard for Power- and Hand-Tool Cleaned Steel
 - .3 SSPC-PA-02 Measurement of Dry Coat Thickness with Magnetic Gauges.
 - .4 SSPC-AB-1 Mineral and Slag Abrasives.
- .2 Manufacturer's current product data sheets must be used in conjunction with and form part of this specification.
- .3 General Air Pollution Regulation (O. Reg. 346/90).
- .4 CSA G-164-M92 Hot Dipped Galvanizing of Irregularly Shaped Articles, Metals and Metal Products.

1.4 DEFINITIONS

- .1 CAEAL: Canadian Association for Environmental Analytical Laboratories.
- .2 STRIPE COAT: A coat of paint applied only to sharp edges of structure being painted such as edges of plates and rolled sections with sharp profile and all bolt heads. Stripe coats increase film thickness of coating around sharp edge where surface tension of liquid coating tends to thin it. All drying time and recoat conditions must be complied with as with other coats of paint.
- .3 TCLP: Toxicity Characteristic Leaching Produce.

1.5 SUBMITTALS

- .1 Product data for coatings and other documents that prove proposed products will meet performance requirements of specification.
- .2 All purchase orders, invoices for purchased products.
- .3 Paint colour chips.
- .4 Copies of manufacturer's instructions for mixing, straining, thinning, and applying coatings.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Blast Cleaning Abrasive in shop: To SSPC-AB-1, Mineral and Slag Abrasives. Non-metallic, non-silica, angular abrasive capable of producing surface profile or 2 mils minimum and to give angular anchor tooth pattern.
- .2 PAINT SYSTEM 1: ALL SURFACES OF GATES
 - .1 Primer and Stripe Coats: Self-priming epoxy phenalkamine suitable for use over abrasive blasted surfaces with low temperature curing capabilities and moisture tolerance during application. Colour: Light Blue. Dry film thickness 8 mils as per SSPC PA2. Acceptable product: Bar-Rust 235 by Devoe Coatings.
 - .2 Topcoat: Self-priming epoxy phenalkamine suitable for use abrasive blasted surfaces with low temperature curing capabilities, moisture tolerance during application. Colour: light. Submit paint chips showing full range of colours available and Departmental Representative will choose. Acceptable Products: Bar-Rust 235 by Devoe Coatings. Dry film thickness 8 mils as per SSPC PA2.
 - .3 Urethane Coat: TSW requires an additional coating of urethane over the topcoat to the sections of the

steel lock gates that are not submerged in order to protect paint from ultra violet light rays. Acceptable Product: Devthane 379. Dry film thickness 3 mm.

- .5 Other manufacturers may be acceptable if they meet criteria above. All components used in individual paint systems must be the products of a single manufacturer.
- .6 PAINT SYSTEM 2: FOR ALL OTHER ITEMS
 - .1 Primer: Universal, surface-tolerant, alkyd primer to CGSB-1-GP-48. Colour: any. Dry film thickness 2.0-2.5 mils or as per manufacturer's recommendation. Acceptable product: Devguard 4160 Tank and Structural Primer by Devco Coatings.
 - .2 Topcoat: Silicone alkyd. Dry film thickness 1.5-2.5 mils or as per manufacturer's recommendation. Colour: Yellow for pipe railing. Grey for embedded steel for trench cover plates. Blue for everything else. Yellow items take two or three topcoats. Lightly sand between first and second topcoat to improve adherence. Acceptable product: Devshield 877 by Devco Coatings.
 - .3 Other manufacturers may be acceptable if they meet criteria above. All components used in individual paint systems must be the products of a single manufacturer.

PART 3 - EXECUTION

3.1 QUALITY CONTROL

- .1 Departmental Representative will check degree of cleanliness of surfaces against SSPC-Vis 1 and SSPC-Vis 4.
- .2 Advise Departmental Representative immediately of any damages, cracks or fractures uncovered in the gates after blasting of the surface, to allow for inspection and repair.
- .3 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.
- .4 Departmental Representative will check each coat of paint after it is applied and before next is applied. Acceptance criteria:
 - .1 Correct type and colour of paint.
 - .2 Correct dry film thickness.
 - .3 Coating is free from gross defects such as (but not limited to) holidays, pinholes, bubbles, runs, skips, drops, ridges, waves, laps, mudcracking, excessive or unsightly brush marks, and all variations in colour, texture, and gloss.

- .5 Departmental Representative will pay particular attention to edges, corners, crevices, seams, joints, welds, corrosion pits, and all other such surface irregularities to ensure they have received special attention in providing adequate thickness of paint and quality of application.
- .3 Bear cost of rectifying defects. This may include, when so directed by Departmental Representative, the removal of all defective paint, re-cleaning of surfaces, and re-painting in accordance with these specifications.
- .4 For each coat, do not apply subsequent coats until dry painted surface has been accepted by Departmental Representative.
- .5 Claims against Crown for delays in completion of project will not be entertained for reasons of failures of surfaces or coatings to pass examinations.

3.2 SITE EXAMINATION

- .1 Before starting work, examine lock with Departmental Representative and confirm scope of Work and degree and type of protection required for mechanical parts and adjacent concrete.

3.3 PREPARATIONS

- .1 Remove, protect, and re-install items that are not intended to be painted at the Direction of the Departmental Representative.
- .2 Remove by hand all solid garbage (coffee cups, soft drink cans, etc., etc.) from on and around the gates and dispose of to landfill site.

3.4 SCAFFOLDING, HOUSING AND HEATING

- .1 To Section 01 56 00 - TEMPORARY BARRIERS & ENCLOSURES.
- .2 Environmental conditions: maintain from start of priming to end of curing period of top coat:
 - .1 Air temperature: between 10 and 20 degrees Celsius.
 - .2 Metal temperature: 5 degrees above dew-point to 20 degrees Celsius
 - .3 Relative humidity: between 20 and 60%.
 - .4 Metal surface: out of direct sunlight.
- .3 Departmental Representative will monitor environmental conditions to ensure these are being maintained at all times.

3.5 PAINTING GATES

- .1 Upper gates to be shipped to climate controlled painting facility.
- .2 Lower gates will be on timber sleepers on land. Contractor to rotate gates to enable complete surface preparation and refinishing.
- .3 Protection: Protect the following features that are retained with gates during surface preparation and painting:
 - .1 Electrical cables
 - .2 J-seals
 - .3 Hinges (bearings)
 - .4 Limit switches
 - .5 Running surfaces on gains
 - .6 Pier concrete
 - .7 Hydraulic Cylinders and Seals
 - .8 Threads for bolted connections
 - .9 Bearing surfaces
 - .10 Access cover plates
 - .8 Other items identified by Departmental Representative.
 - .9 Protection may include but is not limited to: Heavy gauge plastic wrapped over and around items and secured with duct tape. Protection provided must be sufficient in Departmental Representative's opinion to fulfill function required.
 - .10 Protection must remain in place until after final coat of paint has been applied. Departmental Representative will not give permission to proceed until these items have been satisfactorily protected.
 - .11 Repair damage as directed by Departmental Representative at no additional cost.
- .4 Surface Preparation: All unsubmerged surfaces to minimum SSPC-SP-6/NACE 3. Submerged surfaces to SSPC-SP-10/Nace 2. Do not use detergents or inhibitors in the water.
 - .1 In areas exhibiting rust, clean to SSPC-SP-11 Power Tool Cleaning to Bare Metal.
- .5 Apply Paint System numbers 1, and 2 to their respective surfaces.
- .6 Handling spent blast material:
 - .1 Capture/recovery of blast residues must be undertaken at frequent intervals to prevent dispersal by abrasive blasting operations or wind.
 - .2 Arrange and cover all costs for testing of spent material to determine method of disposal.
 - .3 Provide copies of test results
 - .2 A containment system must be utilized enclosing the entire work area to capture all deleterious material and may include:

- .1 total structure enclosure
- .2 negative pressure containment
- .3 ground covers and tarps.
- .4 vacuum collection
- .3 Inspect daily all control measures, such as filtration area and shrouding during surface preparation. Effect modifications required for continued protection of water quality. Stop work if this is necessary whilst effecting repairs/modifications.
- .4 Dispose of collected deleterious materials at a designated waste facility, licensed to receive it and provide copies of waste disposal certificates.
- .5 Refer to Section 01 35 43 - ENVIRONMENTAL PROCEDURES.

3.6 SHOP FINISHING OF ALL OTHER ITEMS

- .1 The following are to be removed, cleaned & painted/galvanized in shop (all surfaces), then re-installed on site:
 - .1 Trench cover plates.
- .2 Supply new nuts, bolts, and washers to replace existing wherever required.
- .3 Surface Preparation: To SSPC-SP-6 Commercial Blast
- .4 The trench covers shall be blasted clean and hot dipped galvanized. Reinforce cover plates as required to prevent warping from galvanizing process. Warped plates will be rejected and replaced with new. No compensation will be provided for new plates as a result of rejection.
- .5 For other items, apply Paint System 2.

3.7 PROTECTION OF CLEANED SURFACES (GENERAL)

- .1 Prevent contamination of cleaned surfaces before prime coat is applied and between applications of remaining coats of paint.
- .2 Clean surfaces again to original specification if rusting occurs after completion of surface preparation.
- .3 Apply first coat of primer maximum 6 hours after surface has been cleaned and inspected by Departmental Representative and before deterioration of surface occurs.

3.8 PREPARING COATINGS FOR APPLICATION

- .1 Follow manufacturer's instructions for mixing, straining, and thinning paint. In addition to Manufacturer's instructions: Do not dilute or thin paint for brush application: use as received from manufacturer.
- .2 Do not mix or keep paint in suspension by means of air bubbling through paint.

3.9 COATING APPLICATION (ALL)

- .1 Apply paint by spraying except in areas of difficult access. Brushing, using sheepskins or daubers is only acceptable when no other method is practical such as in places of difficult access and for areas to be spot-primed.
- .2 Penetrating sealer (If required): apply only by brush/dauber. Apply generously, allowing joints to absorb as much product as possible.
- .3 Provide and maintain spray equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
- .4 Provide traps or separators to remove oil and water from compressed air and drain periodically during operations.
- .5 Keep paint ingredients properly mixed in spray pots or containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
- .6 Apply paint in uniform layer, with overlapping at edges of spray pattern.
- .7 Brush out immediately all runs and sags.
- .8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
- .9 Apply each coat of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .10 Clean paint application equipment in a location and manner such that there is no entry of dirty water into the waterway.

3.10 SUBSEQUENT COATS

- .1 Do not handle painted metal until paint has dried and cured to manufacturer's recommended time before overcoating.
- .2 Scrape off and touch up paint which is damaged during Work, with same number of coats and kinds of paint as were previously applied to metal.

- .3 Avoid scuffing newly applied paint.
- .4 All coats of all painted surfaces shall be un-scarred and completely integral at time of application of succeeding coats.
- .5 Ensure enough lapsed time between successive coats to allow them to dry properly for recoating, lest solvent entrapment occur. Follow manufacturer's instructions in this regard. If none are provided, paint shall be considered dry for recoating when it feels firm, is not sticky, cannot be deformed by fingernail, and application of another coat of paint does not cause film irregularities such as lifting or loss of adhesion of the undercoat.
- .6 Departmental Representative may request this period of time be modified as necessary to suit adverse drying and curing conditions.
- .7 At time of application of each successive coat, undercoats shall be cleaned of dust, grease, overspray, or foreign matter by means of airblast, solvent cleaning, or other suitable means.
- .8 Undercoats of high gloss shall, if necessary for establishment of good adhesion, be scuff sanded, solvent wiped, or otherwise treated prior to application of a succeeding coat.

3.11 DRYING TIME PRIOR TO IMMERSION IN WATER

- .1 Minimum drying periods after final coat and prior to immersion: 7 days. This drying period is essential to proper performance of immersed surfaces and shall not be reduced.
- .2 At Departmental Representative's discretion, this minimum drying time will increase up to twofold if the temperature during curing and drying is below 15 degrees Celsius.
- .3 Continue housing, hoarding, heating and ventilating for painted surfaces until the full drying period of final coat is complete and Departmental Representative has authorized their discontinuance.
- .4 Do not handle, work on, or otherwise disturb painted surfaces until end of this period.