

## Specifications



# Table of Contents

## Contents

Part 1	Summary of work .....	1
1.1	Objective .....	1
1.2	Execution .....	1
Part 2	LIST OF DRAWINGS .....	3
Part 3	GENERAL INSTRUCTIONS .....	4
3.1	TIME OF COMPLETION .....	4
3.2	ACCESS TO THE SITE .....	4
3.3	CANAL REGULATIONS .....	4
3.4	RELICS AND ANTIQUITIES .....	4
3.5	MINIMUM STANDARDS .....	4
3.6	ABBREVIATIONS .....	5
3.7	DEFINITIONS .....	5
3.8	BENCH MARK .....	5
3.9	WATER LEVELS .....	5
3.10	REQUIREMENTS OF REGULATORY AGENCIES .....	5
3.11	PROTECTION OF EXISTING UNDERGROUND UTILITIES .....	6
3.12	CONTRACTOR'S OFFICE .....	6
3.13	EXCAVATION .....	6
3.14	EXAMINATIONS .....	6
3.15	CLEAN-UP .....	6
3.16	FEES, PERMITS AND CERTIFICATES .....	6
3.17	FIRE SAFETY REQUIREMENTS .....	7
3.18	FIELD QUALITY CONTROL .....	7
3.19	HAZARDOUS MATERIALS .....	7
3.20	TEMPORARY UTILITIES .....	7
3.21	REMOVED MATERIALS .....	7
3.22	PROTECTION .....	8
3.23	CUT, PATCH AND MAKE GOOD .....	8
3.24	SIGNS AND SAFETY DEVICES .....	8
3.25	USE OF SITE AND FACILITIES .....	8
3.26	GRANULAR PATHWAY THROUGH WORK ZONE .....	8
3.27	SNOW CLEARING .....	9
3.28	TEMPORARY FACILITIES .....	9
3.29	ACCESS AND EGRESS .....	9
3.30	TEMPORARY ACCESS, SUPPORT AND ENCLOSURES .....	9
3.31	CONTRACT DOCUMENTS .....	10
3.32	TESTING AND LABORATORY SERVICES .....	10
3.33	SCHEDULING .....	10
3.34	LAYOUT OF THE WORK .....	11
3.35	COST BREAKDOWN .....	11
Part 4	COST AND MEASUREMENT .....	12
4.1	APPLICATIONS FOR PROGRESS PAYMENT .....	12
4.2	SCHEDULE OF VALUES .....	12

4.3	PREPARING SCHEDULE OF UNIT PRICE TABLE ITEMS .....	12
4.4	COST DETAILS AND MEASUREMENT .....	13
Part 5	SUBMITTAL PROCEDURES .....	15
5.1	GENERAL .....	15
5.2	SUBMISSION REQUIREMENTS .....	15
5.3	SHOP DRAWINGS .....	16
5.4	PRODUCT DATA .....	16
5.5	SAMPLES.....	17
5.6	SHOP DRAWING REVIEW .....	17
Part 6	HEALTH & SAFETY REQUIREMENTS .....	18
6.1	REFERENCES .....	18
6.2	SUBMITTALS.....	18
6.3	FILING OF NOTICE .....	19
6.4	MEETINGS .....	19
6.5	REGULATORY REQUIREMENTS .....	19
6.6	PROJECT AND SITE CONDITIONS.....	19
6.7	GENERAL REQUIREMENTS .....	20
6.8	RESPONSIBILITY .....	20
6.9	UNFORSEEN HAZARDS .....	21
6.10	HEALTH AND SAFETY COORDINATOR .....	21
6.11	POSTING OF DOCUMENTS .....	21
6.12	CORRECTION OF NON-COMPLIANCE .....	21
6.13	BLASTING.....	22
6.14	POWDER ACTUATED DEVICES.....	22
6.15	WORK STOPPAGE .....	22
Part 7	TRAFFIC CONTROL .....	23
7.1	REFERENCE STANDARD .....	23
7.2	TRAFFIC PLAN.....	23
7.3	PROTECTION OF PUBLIC TRAFFIC .....	24
7.4	INFORMATIONAL AND WARNING DEVICES .....	24
7.5	CONTROL OF PUBLIC TRAFFIC .....	24
7.6	OPERATIONAL REQUIREMENTS .....	25
Part 8	ENVIRONMENTAL PROCEDURES .....	26
8.1	DESCRIPTION.....	26
8.2	SUBMITTALS.....	26
8.3	EXPLOSIVES .....	27
8.4	FIRES.....	27
8.5	DEFINITIONS .....	27
8.6	REMOVED MATERIALS .....	27
8.7	TURBIDITY CONTROL AND DRAINAGE WATER .....	27
8.8	WORK ADJACENT TO WATERWAYS.....	28
8.9	SEDIMENT, DUST AND EROSION PROTECTION.....	29
8.10	PLANT AND TREE PROTECTION .....	29
8.11	OPERATION, MAINTENANCE AND CLEANING OF EQUIPMENT .....	29
8.12	HAZARDOUS MATERIALS .....	30
8.13	CLEAN-UP .....	30
8.14	TRANSPORTING WASTE MATERIALS .....	31

8.15	HISTORICAL / ARCHAEOLOGICAL CONTROL.....	31
8.16	NOTIFICATION.....	31
Part 9	QUALITY CONTROL .....	32
9.1	INDEPENDENT INSPECTION AGENCIES .....	32
9.2	ACCESS TO WORK .....	32
9.3	PROCEDURES.....	32
9.4	TESTING BY DEPARTMENTAL REPRESENTATIVE .....	32
9.5	REJECTED WORK .....	33
Part 10	TEMPORARY BARRIERS AND ENCLOSURES .....	34
10.1	REFERENCES .....	34
10.2	SUBMITTALS.....	34
10.3	CONTAINMENT ENCLOSURES .....	34
Part 11	CONSTRUCTION/DEMOLITION WASTE MANAGEMENT AND DISPOSAL .....	36
11.1	CONSTRUCTION DEMOLITION WASTE .....	36
11.2	CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT .....	36
Part 12	PROJECT RECORD DRAWINGS .....	37
12.1	RECORD DRAWINGS .....	37
12.2	INFORMATION TO BE RECORDED .....	37
12.3	REVIEW .....	37
Part 13	GENERAL COMMISSIONING REQUIREMENTS .....	38
13.1	COMMISSIONING OVERVIEW .....	38
13.2	BRIDGE BALANCING .....	38
13.3	Execution .....	38
13.3.1	GENERAL EXECUTION .....	38
13.4	STAGE 1 – CONTRACTOR’S FIELD TESTING .....	39
13.5	STAGE 2 – ENDURANCE TESTING.....	39
Part 14	REMOVALS.....	40
14.1	ELECTRICAL REMOVALS FOR RE-COATING WORK .....	40
14.2	MECHANICAL REMOVALS FOR RE-COATING WORK .....	40
14.3	OTHER REMOVALS FOR RE-COATING .....	40
Part 15	PAINTING EXTERIOR METAL SURFACES .....	41
15.1	REFERENCES .....	41
15.2	SUBMITTALS.....	41
15.3	EXTENT OF COATING WORK .....	41
15.4	DISPOSAL OF SPENT ABRASIVE BLAST MEDIA .....	42
Part 16	PRODUCTS.....	44
16.1	MATERIALS.....	44
Part 17	EXECUTION.....	46
17.1	MANUFACTURER'S INSTRUCTIONS .....	46
17.2	REMOVALS.....	46
17.3	CONTAINMENT ENCLOSURE .....	46

17.4	PROTECTION .....	46
17.5	SITE MEETING .....	47
17.6	SURFACE PREPARATION – GENERAL.....	47
17.7	SURFACE PREPARATION FOR ZINC-EPOXY-POLYURETHANE SYSTEM .....	47
17.8	SURFACE PREPARATION FOR TRAFFIC BARRIERS .....	47
17.9	SURFACE PREPARATION OF EXISTING RAILINGS OFF THE BRIDGE (Item No. 10) ..	48
17.10	MIXING .....	48
17.11	APPLICATION.....	48
17.12	FIELD QUALITY CONTROL .....	52
17.13	FIELD QUALITY ASSURANCE .....	52
17.14	CLEANING .....	53
Part 18	SODDING.....	54
18.1	DESCRIPTION .....	54
18.2	PRELIMINARY INSPECTION .....	54
18.3	SOURCE QUALITY CONTROL .....	54
18.4	DELIVERY AND STORAGE.....	54
18.5	SCHEDULING OF SODDING WORK .....	54
Part 19	PRODUCTS .....	55
19.1	TOPSOIL .....	55
19.2	SOD.....	55
Part 20	EXECUTION.....	56
20.1	PREPARATION OF TOPSOIL SUB-GRADE .....	56
20.2	PLACING AND SPREADING TOPSOIL .....	56
20.3	ACCEPTANCE OF TOPSOIL GRADING.....	56
20.4	SURPLUS TOPSOIL MATERIAL .....	56
20.5	SODDING.....	56
20.6	SOD PLACEMENT.....	57
20.7	MAINTENANCE OF SODDED AREAS .....	57
20.8	ACCEPTANCE OF SOD MATERIAL .....	57
20.9	SODDING ON SLOPES GREATER THAN THREE TO ONE .....	57
Part 21	ASPHALT.....	58
21.1	REFERENCES .....	58
21.2	SUBMITTALS.....	58
Part 22	PRODUCTS.....	59
22.1	MATERIALS .....	59
Part 23	EXECUTION .....	60
23.1	EQUIPMENT.....	60
23.2	EXCAVATION .....	60
23.3	PREPARATION .....	60
23.4	MIXING AND HANDLING .....	60
23.5	PLACING .....	60
23.6	COMPACTION .....	61
23.7	FIELD QUALITY ASSURANCE .....	61

Part 24	IMAGES OF BRIDGE .....	62
24.1	West view of bridge .....	62
24.2	East view of bridge.....	63
24.3	Side walk.....	64
24.4	Underneath side walk .....	65
24.5	Railing .....	66
24.6	Rest pads (live load shoes) .....	67
24.7	Pintle and balance wheels.....	68
24.8	Pintle .....	69
24.9	Wedge cylinder .....	70
24.10	Counter weight box .....	71
24.11	South abutment.....	72
24.12	North abutment.....	73
24.13	West traffic barrier .....	74
24.14	East traffic barrier.....	75
24.15	Operator's panel .....	76

## **Part 1            Summary of work**

This summary is intended to be a broad description of the work; it is not intended to be a comprehensive description. It is the contractor's responsibility to understand the complete extent of the work by looking at the bridge and site prior to submitting bid to establish its work breakdown structure of the project.

### **1.1            Objective**

Repaint bridge to its original state, repave surface and execute minor repairs.

Location of project: Merrickville lock station in Merrickville-Wolford, Ontario.

### **1.2            Execution**

1.     Mobilisation,
2.     Provide traffic management plan,
3.     Fencing off site: provide fencing to close construction site and maintain control of access,
4.     Sanitary installation and office trailer: Provide sanitary units on site. Have them serviced on a weekly basis,
5.     Environmental protection: Provide protection as per EA to contain debris and allow for retrieval,
6.     Lock out bridge,
7.     Traffic control measures including precast barriers, wireless traffic lights (and maintenance on a daily basis) and signs,
8.     Pedestrian pathway including temporary railing on upper lock gates and signage. Railing shall be made of wood (2x4), be 42" high with an intermediate rail and a kick plate,
9.     Scaffolding: Install required scaffolding to allow work on section of bridge overhanging basin,
10.    Hoarding: provide design of enclosure approved by a Professional Engineer.
11.    Hoarding: Build enclosure over bridge to allow winter work as per specs and allowing single lane traffic on the bridge (provide precast concrete barrier for safety along the lane through the enclosure; The width of the lane will be 12',
12.    Heating/dehumidifying (as required): Have indirect heaters and dehumidifiers to maintain ambient air conditions as per paint system requirements,
13.    Air filtration: Have a mobile filtration unit on site in order to remove dust from ambient air. The location of the unit will be discussed with the departmental representative for approval,
14.    Remove all existing boards and sole plate on sidewalk and disposal,
15.    Chip and remove asphalt along curbs to allow cleaning and repainting,
16.    Removal of balance wheels (6),
17.    Removal of limit switches,

18. Protection of mechanical & electrical components including pintle, live load pads and wedges: Protect components left on and in the vicinity of work in order to prevent dust and paint on these which could be compromising their functionality,
19. Straighten steel lattices on railing as required,
20. Sand blasting of steel on bridge and hand tool preparation other components not blasted: Clean steel as per specifications,
21. Cleaning steel: Remove dust from steel prior to painting,
22. Repair steel where perforation has occurred during surface preparation (unit cost item),
23. Painting of steel: Paint bridge and other components including barriers mechanisms, railings and control panel,
24. Reinstallation of mechanical and electrical components,
25. Re-deck Sidewalk with new nailing sole plates made of composite boards matching existing dimensions and with 2x6 pressure treated Douglas fir (Crown upward). Fasten with galvanised nails,
26. Masonry veneer: Reinstall two veneer stones presently resting on top of North abutment,
27. Asphalt removal down to bridge deck,
28. Water proofing of deck to OPSD-3489.02 (formerly 508.02),
29. Re-paving and line painting,
30. Note: Re-paving activities will be done in such a way to maintain traffic with minimum disruption/waiting time.
31. Removal of hoarding and scaffolding,
32. Cleaning of site: Clean site of all debris and material resulting from construction project,
33. Commissioning: With the assistance of Parks Canada operator swing the bridge in order to make sure of proper operation (adjust balance as required),
34. Removal of temporary installations,
35. Reinstall grounds,
36. Snow removal from temporary pedestrian pathway.
37. Demobilisation.



## **Part 2            LIST OF DRAWINGS**

<b>Drawing number</b>	<b>Title</b>
CORCM 86/R37 (sheet 9)	Site plan – (Not for Detour but for general view of site)
CORCM 86/R37 (sheet 4)	Bridge Superstructure
CORCM 86/R37 (sheet 5)	Sections & Details
CORCM 86/R37 (sheet 10)	Mechanical Equipment G.A.
CORCM 86/R37 (sheet 11)	Mechanical details
CORCM 86/R37 (sheet 13)	Electrical G.A.

## **Part 3            GENERAL INSTRUCTIONS**

### **3.1            TIME OF COMPLETION**

Commence work in accordance with notification of acceptance of your offer and complete the work within the dates outlined in the contract.

### **3.2            ACCESS TO THE SITE**

The site is located in Merrickville-Wolford, Ontario, on Mill Street over the Rideau Canal.

Within the Canal and Parks Canada lands, access to the work, limits of work and staging areas to be as shown on the drawings or as directed by the Departmental Representative.

Remove any temporary access and support structures and restore the access and work areas to the original condition upon completion of the work, at the contractor's expense, except where noted.

For the portion of the access by public roads, make all arrangements, obtain any required permits and confine activities to such routes and load limits as the authorities having jurisdiction may require.

Secure the work areas in an approved manner. This includes using a minimum 1.8 m high welded-wire construction fence to prevent public access to any areas where construction activities occur and construction material is stored, and to protect public safety.

Refer also to Part 7.

### **3.3            CANAL REGULATIONS**

The "Canal Regulations" apply to and govern the work of this Contract. Copies may be obtained from the Rideau Canal Office, 34 Beckwith St. S., Smiths Falls, Ontario, K7A 2A8, telephone 613-283-7199.

### **3.4            RELICS AND ANTIQUITIES**

Corner stones and their contents, buried artifacts, the remains and evidence of ancient persons and peoples, commemorative plaques and other objects of historic value and worth remain the property of the Crown. Any and all such objects shall be protected and immediately brought to the knowledge of the Departmental Representative.

### **3.5            MINIMUM STANDARDS**

Materials shall be new and work shall conform to the minimum applicable standards of the Canadian General Standards Board, the Canadian Standards Association, CSA S6-06 Canadian Highway Bridge Design Code (CHBDC), Ontario Provincial Standard Specifications (OPSS), ASTM standards, applicable Provincial and Municipal codes, and all other national and international standards.

- Unless otherwise indicated, the most recent version of CSA, ASTM, OPSS and other standards shall apply to this Contract.
- In the case of conflict or discrepancy the most stringent requirement shall apply.

### **3.6 ABBREVIATIONS**

Abbreviations used are:

ASTM - American Society for Testing and Materials.  
ACI - American Concrete Institute.  
ANSI - American National Standards Institute.  
CSA - Canadian Standards Association.  
CWB - Canadian Welding Bureau.  
NBC - National Building Code of Canada.  
CPM - Critical Path Method.  
CGSB - Canadian General Standards Board.  
GC - General Conditions.  
MNR - Ministry of Natural Resources  
MOE - Ministry of the Environment  
OPSS - Ontario Provincial Standard Specifications  
PCA- Parks Canada Agency

### **3.7 DEFINITIONS**

Unless the context clearly indicates otherwise, the following definitions apply:

- Canal - the Rideau Canal.
- Plans and/or Specifications:
  - Plans - the drawings listed in the "List of Drawings".
  - Specifications - the subject matter listed in the "Table of Contents", addenda to the specifications, and all relative written communications sent by the Departmental Representative to the Contractor in connection with the Work.

### **3.8 BENCH MARK**

Shall be included in the Natural Resources Canada, Geodetic Survey Division data report.

Refer to plans for station marker information and location.

### **3.9 WATER LEVELS**

The water level in the Canal will be reduced by mid November such that work in the bed of the Canal can take place with low water levels. The bed of the Canal cannot be expected to be in a completely dry condition. It is anticipated that there will be some water running through the stop logs (leakage) and along the floor of lock/basin. The water levels will be raised again at the beginning of May, 2015.

### **3.10 REQUIREMENTS OF REGULATORY AGENCIES**

Adhere to Village of Merrickville-Wolford by-laws.

Dispose of all unwanted materials at a location off Canal lands approved by the Ontario Ministry of the Environment.

### **3.11 PROTECTION OF EXISTING UNDERGROUND UTILITIES**

Prior to excavating, locate and expose existing underground utilities. Shore and protect (including winter protection) exposed utilities until such time that these protective devices are ordered removed by the Departmental Representative.

Repair, restore and/or replace to the Departmental Representative's approval any and all utilities damaged due to the work, or activities in connection with the work.

### **3.12 CONTRACTOR'S OFFICE**

Provide an office at the site location, open during regular working hours and large enough to accommodate site meetings for up to 10 people.

### **3.13 EXCAVATION**

No excavation beneath the bridge is permitted unless written approval is obtained from the Departmental Representative.

### **3.14 EXAMINATIONS**

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

Provide photographs of surrounding properties, objects and structures liable to be damaged or be the subject of subsequent claims.

### **3.15 CLEAN-UP**

Clean and tidy the premises including the bed of the Canal on a daily basis. Do not permit the accumulation of debris, trash and/or garbage.

Rubbish, debris and garbage from all construction activities is to be removed off site on a weekly basis.

At the completion of the work remove all surplus materials, tools, plant, rubbish and debris and dispose of them in an approved manner off Canal property.

Clean up work area as work progresses. At the end of each work period and more often if ordered by the Departmental Representative, remove debris from site, neatly stack material for use, and clean up generally.

Upon completion, remove scaffolding, temporary protection and surplus materials. Make good defects noted at this stage.

Clean areas under contract to a condition at least equal to that previously existing and to approval of the Departmental Representative.

### **3.16 FEES, PERMITS AND CERTIFICATES**

Pay all fees and obtain all permits. Provide authorities with plans and information for acceptance Certificates. Provide inspection certificates as evidence that work conforms to requirements of Authority having jurisdiction.

### **3.17 FIRE SAFETY REQUIREMENTS**

Comply with the National Building Code of Canada 2005 (NBC) for fire safety in construction and the National Fire Code of Canada 2005 (NFC) for fire prevention, fire fighting and life safety.

Comply with the following Human Resources and Social Development Canada (HRSDC), Fire Commissioner of Canada (FCC) standards. These are available from HRSDC or may be downloaded from the internet at: [www.hrsdc.gc.ca](http://www.hrsdc.gc.ca):

- No. 301: Standard for Construction Operations.
- No. 302: Standard for Welding and Cutting.
- No. 374: Fire Protection Standard for General Storage (Indoor and Outdoor).

Welding and cutting:

- A fire watcher as described in FC 302 shall be assigned when welding or cutting operations are carried out in areas where combustible materials within 10 m may be ignited by conduction or radiation.

### **3.18 FIELD QUALITY CONTROL**

Carry out Work using qualified licensed workers or apprentices in accordance with Provincial Act respecting man-power vocational training and qualification.

Permit employees registered in the Ontario apprenticeship program to perform specific tasks only if under direct supervision of qualified licensed workers.

Determine permitted activities and tasks by apprentices, based on level of training attended and demonstration of ability to perform specific duties.

### **3.19 HAZARDOUS MATERIALS**

Comply with the requirements of the 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 (MSDS) acceptable to Human Resources Development Canada, Labour Program.

### **3.20 TEMPORARY UTILITIES**

Make all required arrangements with utility providers in order to provide temporary light, telephone, power and water to fulfill the requirements of construction.

No light, telephone, power or water services will be available from Parks Canada facilities.

### **3.21 REMOVED MATERIALS**

Unless otherwise specified, materials for removal become the Contractor's property and shall be taken from site.

### **3.22 PROTECTION**

Protect finished work against damage until take-over.

Protect the work from damage by ice, flooding and/or other adverse climatic conditions.

Protect adjacent work and property against the spread of dust, dirt, painting over-spray and other deleterious substances beyond the work areas.

- Contractor will be responsible for repairing damage due to spread of deleterious substances.

Protect workers, other users of the site and the public from all hazards.

### **3.23 CUT, PATCH AND MAKE GOOD**

Repair, replace and refinish, to the Departmental Representative's approval, existing surfaces and items damaged in connection with the work, at the contractor's expense.

The repaired, replaced and refinished items shall be at least equal to those that existed immediately before damage occurred.

### **3.24 SIGNS AND SAFETY DEVICES**

Provide common-use signs and safety devices related to traffic control, information, instruction, use of equipment, public safety devices, in both official languages or by the use of commonly-understood graphic symbols to the Departmental Representative's approval.

Signage will be required for pedestrian and vehicular traffic moving through the site, in accordance with Part 7.

No advertising will be permitted on this project.

### **3.25 USE OF SITE AND FACILITIES**

Execute work with least possible interference or disturbance to the normal use of premises and traffic flow on surrounding streets. This includes vehicular, pedestrian and cyclist traffic.

The existing pedestrian sidewalk on the east side of the bridge will be closed during construction. A temporary pedestrian pathway will be required through the work zone, crossing the upper set of gates. The pedestrian pathway must be kept unobstructed. The Contractor is responsible for installing and removing the pathway in accordance with the Contract Documents and will install temporary railing on the upper gates for safety of pedestrians.

Where security is reduced by the work, provide temporary means to maintain security.

### **3.26 GRANULAR PATHWAY THROUGH WORK ZONE**

A granular pathway for pedestrian through the work zone shall be supplied, installed and removed by the Contractor. The pathway shall consist of a granular 'A' bed, as follows:

- Install geotextile fabric over the grassed area, at least as wide as the bottom of the granular bed, plus 1 metre.

- Supply and compact granular 'A' material over the geotextile, with 2 horizontal to 1 vertical side slopes.
- Maintain the pathway for the duration of the Work by adding granular 'A' in potholes and depressions and re-grading as required.
- At the end of the Work, remove and dispose of all granular material and geotextile and re-sod the area in accordance with Part 18.

### **3.27 SNOW CLEARING**

The Contractor is responsible for any snow removal required in the work zone to facilitate their operations, including snow removal in the bed of the Canal if required.

The Contractor is responsible for clearing snow from the temporary pedestrian pathway.

Any snow clearing of Parks Canada parking lot near the Block House is the responsibility of the Contractor for its own use.

### **3.28 TEMPORARY FACILITIES**

Provide and maintain suitable storage facilities, of type and location approved by the Departmental Representative.

Observe and enforce all construction safety measures required by authorities having jurisdiction.

Provide and maintain all necessary enclosures, guards, guard rails, hoardings, barricades, warning signs and similar items.

Provide sufficient chemical toilet conveniences in a sanitary condition for use of all persons at the site in a location approved by the Departmental Representative.

Enclose the work and storage area with secure fencing as directed by the Departmental Representative.

### **3.29 ACCESS AND EGRESS**

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.

### **3.30 TEMPORARY ACCESS, SUPPORT AND ENCLOSURES**

Design, install, and inspect temporary access, support and enclosures required for work in accordance with relevant municipal, provincial and other regulations.

Provide design drawings, signed and sealed by qualified Professional Engineers licensed in Ontario for all temporary access, support and enclosures. These include any required scaffolding or other access measures, and the containment enclosure used during re-coating.

Additions or modifications to temporary access, support and enclosures must be approved by the Professional Engineer who designed them, in writing.

### **3.31 CONTRACT DOCUMENTS**

Drawings and specifications are complementary, items shown or mentioned in one and not in the other are deemed to be included in the contract work.

The Contractor will be responsible for printing/duplicating any required drawings or specifications for:

- Suppliers;
- Sub-contractors;
- On-site drawings & specifications;
- Project record drawings.

### **3.32 TESTING AND LABORATORY SERVICES**

The Departmental Representative will appoint and pay for costs of inspection and testing services, unless indicated otherwise.

Provide safe working areas and assist with testing procedures, including provisions for materials or services and co-ordination, as required by testing agency and as authorized by Departmental Representative.

Where tests indicate non-compliance with specifications, contractor to pay for all subsequent testing of work to verify acceptability of corrected work, as well as any removals and replacements that are required.

### **3.33 SCHEDULING**

Submit the construction progress schedule (in Critical Path Method form) within 10 days of award of contract.

Progress schedule must include the quantity of work to be accomplished within each 2 week timeframe. No progress payments will be made until the construction progress schedule is submitted and approved. Submit together with the progress schedule a cost breakdown for each lump sum payment item.

When requested by the Departmental Representative, resubmit the schedule with all revisions made to show the progress of the work and to show any changes which are required to meet the approved completion dates, within 10 working days.

Take all necessary measures to complete the work within the scheduled times approved by the Departmental Representative.

Do not make changes to the approved schedule, without the Departmental Representative's approval.

The requirements of Part 5 apply to the construction progress schedule.

Carry out work during "regular hours" Monday to Friday from 7:00 AM to 6:00 PM.

Give the Departmental Representative 48 hours notice for work to be carried out during "off hours".

Steel repairs or replacements may become necessary after abrasive blast cleaning is performed to remove existing rust/paint. Fabrication of steelwork may be required after abrasive blast cleaning.



- The Departmental Representative will review the extent of any deterioration found and will advise in writing of any repairs or replacements. Work not covered by the Contract, unit rate items will be extra to the Contract.

### **3.34 LAYOUT OF THE WORK**

Notify the Departmental Representative immediately of any discrepancies between field measurements and dimensions shown on the plans.

Be responsible for rectification of errors resulting from failure to verify dimensions, elevations and other pertinent data shown on the plans.

### **3.35 COST BREAKDOWN**

Before submitting first progress claim submit breakdown of Contract Amount in detail as directed by Departmental Representative and aggregating the Contract Amount. After approval by Departmental Representative cost breakdown will be used as the basis for progress payments.

Reference Part 4.

## **Part 4            COST AND MEASUREMENT**

### **SECTION INCLUDES**

This section covers the measurement of work for payment purposes, and the scope of work included in the pay items in the Unit Price Table.

#### **4.1            APPLICATIONS FOR PROGRESS PAYMENT**

Make applications for payment on account as provided in the Agreement.

Date applications for payment to last day of agreed monthly payment period and ensure amount claimed is for value, proportionate to amount of Contract, of Work performed and products delivered to Place of Work at that date.

Submit to Departmental Representative, at least 14 days before first application for payment: Schedule of Values for parts of Work, aggregating total amount of Contract Price, so as to facilitate evaluation of applications for payment.

Application for payment must be accompanied by a progress schedule as described in article 3.33.

#### **4.2            SCHEDULE OF VALUES**

Make Schedule of Values out in such form and supported by such evidence as Departmental Representative may reasonably direct, and when accepted by Departmental Representative, be used as basis for application for payment.

Include statement based on Schedule of Values with each application for payment.

Support claims for products delivered to place of work but not yet incorporated into work by such evidence as Departmental Representative may reasonably require establishing value and delivery of products.

#### **4.3            PREPARING SCHEDULE OF UNIT PRICE TABLE ITEMS**

Submit separate schedule of unit price items of work requested in Bid and Acceptance Form.

Make form of submittal parallel to Schedule of Values, with each line item identified same as line item in Schedule of Values. Include in unit prices only:

- Cost of material.
- Delivery and unloading at site.
- Sales taxes.
- Installation, overhead and profit.

Ensure unit prices multiplied by quantities given equal material cost of that item in Schedule of Values.

**Lump Sum Price** - For the work which is not designated in the Unit Price Table there shall be no measurement and shall be paid at the Contract Lump Sum Price. This item include all costs associated to perform the work including but not limited to material, equipment, personnel, overhead, etc. Items included in the Lump Sum Price are:

- Mobilization and demobilization.
- Site offices and washroom.
- Traffic control including implementation of restriction with associated signage and barriers and safety devices for the pedestrian pathway through the work zone.
- Temporary utilities.
- Snow removal where indicated throughout the duration of the Work.
- Construction fencing, including interlocking steel fencing and snow fencing.
- Temporary access and support measures.
- Containment enclosures including temporary heating and dehumidifying.
- Environmental protection measures.
- Installation and removal of granular pathway through the work zone, including geotextile fabric, and maintenance of pathway throughout the duration of the Work.
- Removal and replacement of sidewalk decking and sole plates.
- Removals and reinstatements of components on the bridge in preparation for re-coating work including removal of electrical components (limit switches), cabling and casters.
- Re-coating of the steelwork including surface and joint preparation.
- Re-coating of barriers, control panel and railings on east side of road.
- Sidewalk railing repair on east side of bridge.
- Asphalt removal and repaving on the bridge deck and line painting.
- Reinstatement of electrical and mechanical items.
- Site clean-up and Sodding.
- Commissioning.

**Separate prices:** These items are for “as needed” and would be subject to a change order if required. PCA is in no obligation with respect to these items until committed via change order.

**Item No. 1** – Common Excavation. Shall be paid at the contract unit price by the unit CUBIC METRE. This item shall include all work related to removal and disposal of existing fill.

**Item No. 2** – Backfilling. Shall be paid at the contract unit price by the unit CUBIC METRE. This item shall include all work related to backfilling with earth or granular, including compaction.

**Item No. 3** – Deleted

**Item No 4** – Counter weight box steel repairs: Replace bottom steel plate on counterweight box, including Tagging and removal of weights and reinstallation afterward in proper location. Shall be paid at the contract unit price.

**Item No. 5** – Patch repair to steel. Shall be paid at the contract unit price. This item shall be to cut out a piece of 1 ft x 1 ft of steel, surface preparation, patch preparation and patch welding in place and smooth finish.

**Item No. 6** – Pipe Railings repairs. Shall be paid at the contract unit price by the unit LINEAR METRE of one (1) pipe railing replaced (in kind). This item shall include all the work related to supply, installation and painting of pipe railing along the approaches of the bridge.

Item No. 7 – Partial Depth Concrete Repairs. Shall be paid at the contract unit price by the unit CUBIC METRE of new patch material. This item shall include all the work related to partial depth concrete repairs including concrete removals, abrasive blast cleaning, bonding agent, proprietary patch material, and any required heating and/or cold weather protection. This item does not include reinforcing steel. The volume of partial depth concrete repairs will be measured inside the saw-cuts around the outside of the repair area, to the average depth of the patch as determined by the Departmental Representative.

Item No. 8 – Asphalt HL-3. Shall be paid at the contract unit price by the unit TONNE. This item shall include application of tack coats to existing pavement, and line-painting.

Item No. 9 – Asphalt HL-8. Shall be paid at the contract unit price by the unit TONNE. This item shall include preparation of granular materials.

Item No. 10 – Painting of pipe railing off the bridge (other than those included in lumps sum). Shall be paid at the contract unit price by the unit LINEAR METER (of pipe). This item shall include surface preparation with hand tools and painting.

## **Part 5            SUBMITTAL PROCEDURES**

### **5.1                GENERAL**

This section specifies general requirements and procedures for Contractor's submissions of shop drawings, product data and samples to Departmental Representative for review. Additional specific requirements for submissions are specified in individual sections.

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

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

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

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

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

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.

Make any changes in submissions which Departmental Representative may require consistent with Contract Documents and resubmit as directed by Departmental Representative.

Notify Departmental Representative, in writing, when resubmitting, of any revisions other than those requested by Departmental Representative.

### **5.2                SUBMISSION REQUIREMENTS**

Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.

Allow seven (7) working days for Departmental Representative's review of each submission.

Accompany submissions with transmittal letter, indicating:

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

Submissions shall include:

- Date and revision dates.
- Project title and number.

- Name and address of:
  - Subcontractor.
  - Supplier.
  - Manufacturer.

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

Details of appropriate portions of Work as applicable:

- Fabrication.
- Layout, showing dimensions, including identified field dimensions, and clearances.
- Setting or erection details.
- Capacities.
- Performance characteristics.
- Standards.
- Operating weight.
- Wiring diagrams.
- Single line and schematic diagrams.
- Relationship to adjacent work.

After Departmental Representative's review, distribute copies.

### **5.3 SHOP DRAWINGS**

Shop drawings: original drawings, or modified standard drawings provided by Contractor, to illustrate details of portions of Work, which are specific to project requirements.

Maximum sheet size: 850 x 1050 mm.

Submit shop drawing as follows:

- Opaque diazo prints - number Contractor requires for distribution plus 2 copies which will be retained by Departmental Representative.

Cross-reference shop drawing information to applicable portions of Contract Documents.

### **5.4 PRODUCT DATA**

- Product data: manufacturers catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.
- Submit two (2) copies of product data.
- Sheet size: 215 x 280 mm, maximum of 3 modules.
- Delete information not applicable to project.
- Supplement standard information to provide details applicable to project.
- Cross-reference product data information to applicable portions of Contract Documents.

## **5.5 SAMPLES**

- Samples: examples of materials, equipment, quality, finishes, workmanship.
- Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.

## **5.6 SHOP DRAWING REVIEW**

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

## **Part 6           HEALTH & SAFETY REQUIREMENTS**

### **6.1               REFERENCES**

Health Canada/Workplace Hazardous Materials Information System (WHMIS)

- Material Safety Data Sheets (MSDS).

Province of Ontario

- Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter O.1 as amended, and Regulations for Construction Projects, O. Reg. 213/91 as amended and O. Reg. 213/91 as amended and O. Reg. 629/94 as amended, Diving Operations should diving operations be required.
- Workplace Safety and Insurance Act, 1997.
- Municipal statutes and authorities.

Fire Commissioner of Canada (FCC)

- FC-301 Standard for Construction Operations, June 1982.
- 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

### **6.2               SUBMITTALS**

Submit site-specific Health and Safety Plan: Within seven (7) days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

- Site-specific safety hazard assessment and measures to be taken to address the anticipated hazards.
- Contractor's and Sub-Contractor's Safety Communication Plan.
- Emergency Response Plan describing procedures to be followed during emergency situations including evacuating injured personnel from the site.
- Contractor's Health and Safety Policy.
- Name of Health and Safety Coordinator.



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 7 days after receipt of comments.

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.

Submit records of Contractor's Health and Safety meeting when requested.

Submit copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative monthly.

Submit Construction Safety Checklists after completion.

Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

Submit copies of incident and accident reports.

Submit WHMIS MSDS - Material Safety Data Sheets to Departmental Representative.

Submit Workplace Safety and Insurance Board (WSIB) – Experience Rating Reports.

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 certification for any new site personnel to Departmental Representative.

### **6.3 FILING OF NOTICE**

File Notice of Project with Provincial authorities prior to beginning of Work.

### **6.4 MEETINGS**

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

Complete Parks Canada Attestation and Proof of Compliance with Occupational Health and Safety (OHS) Form.

### **6.5 REGULATORY REQUIREMENTS**

Comply with specified standards and regulations to ensure safe operations at site involving hazardous or toxic materials.

### **6.6 PROJECT AND SITE CONDITIONS**

Work at the site will also involve control of the site and work near water.

The Contractor shall coordinate and comply with Parks Canada lock-out/tag-out procedures for the equipment at the site. The more stringent of the Provincial safety regulations and Parks Canada lock-out/tag-out procedures shall take precedence. Parks Canada procedures involve a multi-lock system.

Known and obvious hazards include but are not limited to:

- Contact with silica in concrete.
- Lead-based paint. A sample of coating scratching has been previously tested and resulted in a content of 14500 µg/g of lead. This must be considered by the Contractor during the course of the Work to implement proper mitigating measures.
- Mechanical and electrical systems.
- Moving equipment.
- Work on the roadway.
- Bird droppings on the structure.
- Corroded metals.
- Work near water.
- Ice.
- Work near utilities.
- Falling hazards.
- Animals and pests.
- Low temperatures.
- Air quality/vapours inside enclosures.
- Heating equipment.

## **6.7 GENERAL REQUIREMENTS**

Comply with Ontario Occupational Health and Safety Act, Canada Labour Code Part II, and Canada Occupational Safety and Health Regulations.

Develop written site-specific Health and Safety Plan based on hazard assessment prior to commencing any site work and continue to implement, maintain, and enforce plan until final demobilization from site.

Health and Safety Plan must address project specifications.

Relief from or substitution for any portion or provision of minimum Health and Safety Guidelines specified herein or reviewed site-specific Health and Safety Plan must be submitted to Departmental Representative in writing. Departmental Representative will respond in writing, either accepting or requesting improvements.

See Submittal Procedures.

## **6.8 RESPONSIBILITY**

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.

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.

Where applicable the Contractor shall be designated the “Constructor” as defined by the Ontario Act.

## **6.9 UNFORSEEN HAZARDS**

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.

Follow procedures in place for Employees Right to Refuse Work as specified in the Act for the Province of Ontario.

## **6.10 HEALTH AND SAFETY COORDINATOR**

Employ and assign to Work, a competent and authorized representative as Health and Safety Coordinator. Health and Safety Coordinator must:

- Have site-related working experience specific to activities associated with similar bridge re-coating projects.
- Have working knowledge of occupational health and safety regulations.
- 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.
- Be responsible for implementing, enforcing daily and monitoring site-specific Contractor Health and Safety Plan.
- Be on site during execution of Work and report directly to Site Supervisor.

## **6.11 POSTING OF DOCUMENTS**

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 the Departmental Representative.

Provide documents as follow and post on site:

- Contractor's (Constructor's) name.
- Name, trade and employer of Health and Safety Coordinator.
- Contractor's Health and Safety Policy.
- Site-Specific Health and Safety Plan, including Emergency Response Plan.
- Notice of Project.
- Ministry of Labour Orders and reports.
- Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.
- Material Safety Data Sheets.
- Copy of valid certificate for first-aid personnel on duty.
- WSIB "In Case of Injury" poster.
- Location of toilet and clean-up facilities.
- Any special handling or procedures specific to the site.

Comply with Provincial general posting requirements.

## **6.12 CORRECTION OF NON-COMPLIANCE**

Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.

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

Departmental Representative may stop Work if a perceived non-compliance of health and safety regulations or a potential issue is perceived to have not been immediately corrected.

#### **6.13               BLASTING**

Blasting or other use of explosives is not permitted on this project.

#### **6.14               POWDER ACTUATED DEVICES**

Use powder-actuated devices only after submittal of full justification for the requirement of their use and receipt of written permission from Departmental Representative.

#### **6.15               WORK STOPPAGE**

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

Assign responsibility and obligation to Health and Safety Coordinator to stop or start Work when, at Health and Safety Coordinator's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative or his designate may also stop work for health and safety considerations.

## **Part 7            TRAFFIC CONTROL**

### **SECTION INCLUDES**

- Informational and Warning Devices.
- Protection and Control of Public Traffic.
- Operational Requirements.

### **7.1                REFERENCE STANDARD**

Do traffic control in accordance with the Manual of Uniform Traffic Control Devices (UTCD), Ministry of Transportation, Ontario and the Ontario Ministry of Labour.

### **7.2                TRAFFIC PLAN**

The Contractor must fill out and submit a Traffic Management Plan to:

#### **Village of Merrickville-Wolford:**

Village of Merrickville-Wolford, Public works manager,  
317 Brock St W  
Merrickville, Ontario, K0G 1N0

Contact: Dave Powers,  
[publicworks@merrickville-wolford.ca](mailto:publicworks@merrickville-wolford.ca)  
Phone: 613-269-4791 x236  
Fax: 613-269-3095

And

#### **United Counties of Leeds and Grenville**

25 Central Ave. W., Suite 100,  
Brockville, Ontario, K6V 4N6

Contact: Debbie Williams  
[debbie.williams@uclg.on.ca](mailto:debbie.williams@uclg.on.ca)  
Phone: 613.342.3840  
Fax: 613.342.2101

Indicate method and implementation schedule, and include all signage, equipment and personnel to be used for traffic control. Signage for pedestrian pathway must be included in the Traffic Management Plan. Contractor will plan to have wireless traffic lights at both ends of the restriction to one lane traffic to control traffic. Contractor will provide sufficient signage around Village to control traffic adequately.

Traffic Management Plan must be approved by the Village prior to commencing work. Provide adequate time to allow Village's representative to review Plan. Submit Plan and Village's written approval to Departmental Representative.

Submissions to be in accordance with Part 5.

### **7.3 PROTECTION OF PUBLIC TRAFFIC**

Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out work or haul materials or equipment.

When working on travelled way:

- Place equipment in position to present minimum of interference and hazard to traveling public.
- Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
- Do not leave equipment on travelled way overnight.

Do not close any lanes of road without approval of Departmental Representative and Village of Merrickville-Wolford.

### **7.4 INFORMATIONAL AND WARNING DEVICES**

Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from project work which requires road user response.

Provide adequate illumination to all detour/warning signs and temporary fencing blocking existing sidewalk.

Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in the UTCD manual.

Place signs and other devices in locations recommended in UTCD manual.

Meet with Departmental Representative prior to commencement of Work to prepare list of signs and other devices required for project. All traffic signs and devices must conform to the approved Traffic Management Plan. If situation on site changes, revise list to approval of Departmental Representative.

Continually maintain traffic control devices in use by:

- Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.
- Removing or covering signs which do not apply to conditions existing from day to day.

### **7.5 CONTROL OF PUBLIC TRAFFIC**

Provide competent flag persons, trained in accordance with, and properly equipped as specified in, UTCD manual in following situations:

- When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.

- When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.
- When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.
- Where temporary protection is required while other traffic control devices are being erected or taken down.
- For emergency protection when other traffic control devices are not readily available.
- In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.

Delays to public traffic due to contractor's operations: maximum 5 minutes.

## **7.6 OPERATIONAL REQUIREMENTS**

The work shall be performed under a road restriction of Mill Street at the site, with the bridge having a single lane accessible..

Temporary concrete barriers may be placed at each end of the work area in the roadway to direct vehicular traffic, if required.

Steel construction fencing at least 1.8 m high shall be placed around the staging area as indicated in the Contract Documents, except in the Canal where it is not required. Fencing shall be interlocking, continuous and secure against unauthorized access during off hours.

The sidewalk on the east side of the bridge will not be accessible to users due to the bridge being enclosed for work. A temporary pedestrian route is required west of the bridge over the upper lock gates. Sufficient signage is to be provided to inform pedestrian users of the sidewalk closure and the presence of the alternate pathway

## **Part 8 ENVIRONMENTAL PROCEDURES**

### **8.1 DESCRIPTION**

This Section describes requirements for the protection of the environment that apply to the Work. These requirements apply to all Sections of this Specification, without limiting the conditions and approvals imposed by statute.

Control Work to provide effective environmental, water body, and fish habitat protection. 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

### **8.2 SUBMITTALS**

Submittals to be in accordance with Part 5.

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

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

Environmental Protection Plan to include:

- Names of persons responsible for ensuring adherence to Environmental Protection Plan.
- Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
- Names and qualifications of persons responsible for training site personnel.
- Descriptions of environmental protection personnel training program.
- Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- Drawings showing locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
- Traffic control plan including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.
- Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.
- Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- Non-hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.



- Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.
- Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
- Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
- Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.
- Pesticide treatment plan: to be included and updated, as required.

### **8.3 EXPLOSIVES**

Blasting or other use of explosives is not permitted on this project.

### **8.4 FIRES**

Fires and/or burning of rubbish are not permitted on this project.

### **8.5 DEFINITIONS**

“Deleterious Materials” – any substance that, if added to a water body, could degrade water quality or impact fish, fish habitat and aquatic wildlife. This includes, but is not limited to:

- Concrete dust.
- Soils (clay, silt)
- Oil, diesel or gasoline.
- Chipped or fresh concrete and admixtures.
- Alkali water resulting from fresh concrete or cementitious grout.
- Salt.
- Solvents.

“Drip line” – means the location on the ground surface directly beneath a theoretical line described by the tips of the outermost branches of the trees.

“Barrier” – means fence consisting of approved material, supported by steel posts and being a minimum of 1.8 m high, without breaks or unsupported sections.

### **8.6 REMOVED MATERIALS**

Unless otherwise specified, materials designated for removal become the Contractor’s property. Remove these from the site.

### **8.7 TURBIDITY CONTROL AND DRAINAGE WATER**

Control turbidity of all water released during the Work.

- Do not pump water directly into the waterway. Send all discharge to a settling pond or filtration area after being released into the waterway.

- Provide a marine grade turbidity curtain across all areas where sediments can enter the watercourse. Turbidity curtain to be anchored or weighted down along its length to form a continuous seal on the Canal bed with adequate flotation at water surface to prevent over-spills of turbid water. Mechanical filtration of turbid water is also acceptable.
- In the event of significant silting or debris caused by construction activities, contractor must take appropriate measures to confine work and install additional turbidity curtains.

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

Sediment, debris and erosion control measures must be inspected daily to ensure that they are functioning properly and are maintained and upgraded as required.

If the sediment, debris or erosion control measures are not functioning properly, no further work will be permitted until the sediment/erosion problem has been rectified.

Sediment, debris and erosion control measures must be left in place until all disturbed areas within the work area have been stabilized and any sediments in the water have settled. Removal will be permitted only after written approval from the Departmental Representative.

## **8.8 WORK ADJACENT TO WATERWAYS**

Do not use waterway beds for borrow material.

Do not dump excavated fill, waste material or debris in waterways.

Do not release any Deleterious Material in waterways.

Do not use salt as a de-icer near the Canal. In areas where ice is a safety concern, the use of sand will be permitted, but it must not be allowed to enter the watercourse.

Ensure all equipment and temporary access structures such as scaffolding placed in water bodies are free of debris, fuel, lubricants, coolant and other Deleterious Material that could enter the water body.

Should conditions at the site indicate that there are unforeseen negative impacts to fish or their habitat, all works shall cease until the problem has been corrected and/or any required input can be obtained from the Department of Fisheries and Oceans/Ministry of Natural Resources.

Any concrete wash water shall be directed to a collection basin or vegetated area to effectively remove all suspended solids, dissipate velocity and prevent deleterious substances from entering the watercourse. Control turbidity of all water released to watercourse during work, in the event of silting or turbidity caused by construction activity, contractor shall stop work and install additional silt barriers as necessary to ensure watercourse is protected.

Stockpile excavated or fill materials must be stored and stabilized away from the water. Runoff from the excavated or fill material must be contained from entering the waterway.

## **8.9 SEDIMENT, DUST AND EROSION PROTECTION**

Before starting work that will create dust or debris, such as concrete sawing and removal, excavation, backfilling etc., install effective mitigation techniques for sediment, dust, debris and erosion control to the satisfaction of Departmental Representative. Maintain these protective measures at all times.

Provide a 1 metre high silt fence barrier in all areas where, due to construction activities, silt or debris may enter the Canal or water. This includes, but is not limited to, a silt barrier installed around staging and work areas, and on the Canal bed (or ice surface) parallel to the Canal concrete retaining wall.

Maintain a standby supply of pre-fabricated silt fence barrier, or an equivalent ready-to-install sediment control device.

Excavation to cease during periods of heavy rainfall, unless runoff is contained from entering waterway. Cover or wet down dry materials and rubbish to prevent blowing dust and debris.

## **8.10 PLANT AND TREE PROTECTION**

Protect trees and plants on site and adjacent properties where indicated.

Protect roots of designated trees to drip line during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

Restrict clearing, grubbing, tree-branch removal and tree removal to areas of work or access indicated on approved shop drawings, or designated by the Departmental Representative.

Provide Barrier around trees which may be affected by the work, including staging areas. Locate Barrier 1 metre beyond drip line. 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.

Damage to trees as a result of Contractor's operations:

- Broken branches 25 mm or greater in diameter: cut back cleanly at the break, or to within 10 mm of their base, if a substantial portion of the branch is damaged. Departmental Representative will direct.
- Exposed roots 25 mm or larger: cut back cleanly to the soil surface within five calendar days of exposure.
- Damaged bark: neatly trim back to uninjured bark, without causing further injury, within five calendar days of damage.

Reduce soil displacement and compaction by using heavy machinery in designated areas and on existing vehicle paths. Replace damaged lawn to pre-construction state with topsoil and sod.

Avoid using heavy machinery on saturated ground.

Use equipment of low bearing weight and low psi tires wherever possible.

## **8.11 OPERATION, MAINTENANCE AND CLEANING OF EQUIPMENT**

Do not operate heavy equipment in waterway, except when operated from a barge or during full drawdown.

Provide drip trays to prevent the discharge of oil, grease, antifreeze, or any other materials into the ground. Equipment and heavy machinery used to meet or exceed all applicable emission Requirements. Leave machinery running only while in actual use, except where extreme temperatures prohibit shutting machinery down.

All vehicle/equipment maintenance and refuelling must be conducted over impermeable/absorptive material situated at a designated site that is located at least 15 m away from the nearest water body. In the case of fuel heaters that will be located nearer than 15 m from the Canal, a large drip pan to contain any leakage from heater or re-fueling operations. Absorptive material must also be placed at the bottom of drip pan as an added measure.

Use trigger-operated spray nozzles for water hoses when cleaning concrete equipment.

Departmental Representative will designate a cleaning area for equipment and tools to limit water use and runoff. The cleaning area will be sufficiently far away from the watercourse to prevent contamination. Where no safe cleaning area is available, contractor will be required to provide a settling pond where the equipment can be cleaned. All alkali water is to be disposed of in accordance with federal, provincial, and local authority requirements.

## **8.12 HAZARDOUS MATERIALS**

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

Comply with the requirements of the 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 (MSDS) acceptable to Human Resources Development Canada, Labour Program.

Store Hazardous Materials in secure areas on impermeable pads, provide berms if necessary

## **8.13 CLEAN-UP**

Clean up work area as work progresses. At the end of each work period, and more often if ordered by the Departmental Representative, remove debris from site, neatly stack material for use, and clean up generally.

Permit no undue amounts of debris, trash or garbage to accumulate.

Do not bury rubbish on site.

Separate and recycle all materials that can be recycled.

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.

Ensure all emptied containers are sealed and stored safely for disposal away from children.

Spills:

- Report all spills immediately to the Departmental Representative and to the Ontario Spills Action Centre (Telephone No. 1-800-268-6060).

- Using appropriate safety precautions collect liquid or solidify liquid with an inert, non-combustible material and remove for disposal.
- Be responsible for all costs of cleaning up any spills to the satisfaction of the Departmental Representative.
- Must have an environmental emergency response plan in place and a spill kit readily available.

Remove all scaffolding, temporary protection and surplus materials, tools, plant, rubbish and debris and dispose of them in an approved manner off Crown property at the following times:

- At the completion date of the work for all areas.

Clean areas under contract to a condition at least equal to that previously existing and to approval of Departmental Representative.

#### **8.14 TRANSPORTING WASTE MATERIALS**

All waste subject to Regulation 558 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 the Ontario Ministry of the Environment to accept that waste.

Be responsible for obtaining all Waste Generator Numbers, permits, manifests, and all other Paperwork necessary to comply.

#### **8.15 HISTORICAL / ARCHAEOLOGICAL CONTROL**

Provide historical, archaeological, cultural resources, biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in area are discovered during construction.

Plan: include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and the Departmental Representative.

#### **8.16 NOTIFICATION**

The Departmental Representative will notify the 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.

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

The Departmental Representative may issue stop order of work until satisfactory corrective action has been taken.

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

## **Part 9            QUALITY CONTROL**

### **9.1                INDEPENDENT INSPECTION AGENCIES**

Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of Quality Assurance only, that is, verifying Contractor's Quality Control processes for concrete, steel surface preparation and coatings, welding, environmental protection etc. Cost of such services will be borne by Departmental Representative, except as specified.

Contractor is responsible for all Quality Control. Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with the Contract Documents.

### **9.2                ACCESS TO WORK**

Allow Departmental Representative 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.

Co-operate to provide reasonable facilities for such access. Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

### **9.3                PROCEDURES**

Notify Departmental Representative in advance of requirement for tests .

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.

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

### **9.4                TESTING BY DEPARTMENTAL REPRESENTATIVE**

Departmental Representative will perform inspection/testing on a random basis for auditing purposes. Correct defect and irregularities as advised by Departmental Representative at no cost. Pay costs for re-testing and re-inspection

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.

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.

**9.5****REJECTED WORK**

Remove defective Work whenever this is found, either through Contractor Quality Control procedures or through Departmental Representative's Quality Assurance. Replace or re-execute in accordance with Contract Documents

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.

## **Part 10            TEMPORARY BARRIERS AND ENCLOSURES**

### **10.1                REFERENCES**

Province of Ontario

- Occupational Health and Safety Act, R.S.O. 1990 Updated 2005.

### **10.2                SUBMITTALS**

Shop drawings for containment enclosures shall be submitted to the Departmental Representative for information at least three (3) weeks prior to starting erection.

- Shop drawings shall include details of the enclosure materials and assembly as well as the erection procedures.
- Shop drawings shall be sealed by a qualified Professional Engineer licensed in Ontario.

### **10.3                CONTAINMENT ENCLOSURES**

A full enclosure with negative pressure shall be provided during abrasive blast cleaning and during spray application of coating.

- The enclosure shall enclose the entire bridge structure.

Temporary heating and/or dehumidification inside the enclosure shall be used as required to maintain the conditions required for coating application and curing, in accordance with the coating manufacturer's instructions.

Containment enclosures, air quality inside enclosures, and safety equipment used by personnel inside the enclosures, shall be in accordance with all applicable safety standards and regulations including the Occupational Health and Safety Act.

Enclosures shall be installed, operated, and maintained to limit the random escape of material. When openings or tears occur in the enclosure, surface preparation operations shall cease until repairs have been made.

The enclosures shall be removed from the site at the completion of the work.

Work platforms and the ground surface, where work is being conducted from the ground, shall be covered with tarps with overlapping sealed edges or other means to protect the ground from contamination and to permit recovery of the spent material.

Deck drains shall be fully sealed when the deck surface forms the floor of the enclosure. Where the enclosure extends below the deck, deck drains shall be temporarily extended or redirected to avoid road run off discharging into the enclosure.

There shall be no escape of dust or materials while dismantling or moving the enclosure. Walls, floors, and joints of the enclosure shall be cleaned by vacuuming prior to moving or dismantling it. All dust and material not previously accessible or found in cracks and joints during dismantling shall be immediately vacuumed.



Full enclosures with negative pressure shall consist of the full enclosure equipped with a mechanical ventilation system capable of effecting complete air change for the enclosure in less than one minute. The mechanical ventilation system shall be in operation during abrasive blast cleaning, clean-up activities, and surface blow down or other high dust generating surface preparation operations to ensure effective removal of dust and other materials from the air inside the enclosure.

Air evacuated from an enclosure shall be conveyed in fully sealed conduits to a dust collector appropriately sized for the material and airflow. There shall be no escape of materials from conduits and dust collectors.

When spent abrasive material is recycled, there shall be no escape of dust or material during the mobilization, operation, clean-up, or demobilization of abrasive recyclers, conduits, dust collectors, and associated equipment. The collectors and filters should arrive on site undamaged, empty, and free of all dust and debris.

Spent materials and dust in the immediate vicinity of the area where structural steel is to be coated shall be removed prior to paint coat application. Spent materials from an enclosure shall be collected daily. Spent material from recycling equipment and dust collectors shall be collected on a regular basis to maintain the effective performance of the equipment. All spent material shall be stored in rigid containers with tight sealing lids. The containers shall be made of steel, rigid plastic, or similar material and shall be in sound condition. The containers shall keep the material dry at all times and prevent its escape. There shall be no escape of material during transfers to and from containers, enclosures, recycling equipment, or dust collectors.

Measures shall be taken to prevent vandalism of stored spent material.

If the Contractor parks or stores any equipment or materials on the bridge deck, approaches, or adjacent surfaces, the surfaces under such equipment shall be covered with tarps to contain any spills or leaks from the equipment or operations involving the equipment.

Tarps shall be sufficiently overlapped, impervious to water, and free of holes and openings.

All spills accumulated on the tarps shall be prevented from escaping onto the surrounding surface and be cleaned up immediately.

Remedial work related to the environmental protection shall be carried out to rectify work that does not meet the requirements specified in the Contract Documents. A remedial work scheme shall be submitted to the Departmental Representative and work shall not proceed until written permission to do so is received from the Departmental Representative.

## **Part 11 CONSTRUCTION/DEMOLITION WASTE MANAGEMENT AND DISPOSAL**

### **11.1 CONSTRUCTION DEMOLITION WASTE**

Carefully deconstruct and source separate materials/equipment and divert from landfill to maximum extent possible. Target for this project is 50% diversion from landfill. Reuse, recycle, compost, anaerobic digest or sell material for reuse except where indicated otherwise. On site sales are not permitted.

Source separate waste and maintain waste audits in accordance with the Environmental Protection Act, Ontario Regulation 102/94 and Ontario Regulation 103/94.

- Provide facilities for collection, handling and storage of source separated wastes.
- Source separate the following waste:
  - Portland cement concrete.
  - Asphalt.
  - Steel.
  - Existing fill.

Submit a waste reduction work plan indicating the materials and quantities of material that will be recycled and diverted from landfill.

Submit proof that all waste is being disposed of at a licensed land fill site or waste transfer site. A copy of the disposal/waste transfer site's license and a letter verifying that said landfill site will accept the waste must be supplied to Departmental Representative prior to removal of waste from the demolition site.

### **11.2 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT**

Environment Canada  
4905 Dufferin Street  
Toronto, ON, M3H 5T4

Phone: 416-739-4826  
Fax: 416-739-4776  
Email: [environinfo@ec.gc.ca](mailto:environinfo@ec.gc.ca)

## **Part 12            PROJECT RECORD DRAWINGS**

### **12.1               RECORD DRAWINGS**

The Contractor is responsible for reproducing drawings for their use and their Sub-Contractors' use. One full-size set and one 11x17 set of drawings will be provided by the Departmental Representative at the start of the Work. The Contractor is required to have two sets of drawings for record drawings purposes, as described below.

Maintain project record drawings and record accurately all deviations from the Contract Documents. Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

Record changes in red ink. Mark ongoing changes on one set of prints. Then, at the completion of the project and before final inspection, neatly transfer notations to the second set. Submit both sets to the Departmental Representative.

### **12.2               INFORMATION TO BE RECORDED**

Record the following information:

- Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.
- Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
- Field changes of dimension and detail.
- Changes made by Change Order or Field Order.
- Details not on original Contract Drawings.
- References to related shop drawings and modifications.
- Additional Requirements: as specified in individual specifications sections.

### **12.3               REVIEW**

Be prepared to review As-Built Drawings with Departmental Representative at least weekly, to ensure that level of detail being recorded is acceptable. Be advised that during periods of high activity, Departmental Representative may review As-Built Drawings even more frequently than weekly.

## **Part 13            GENERAL COMMISSIONING REQUIREMENTS**

### **13.1            COMMISSIONING OVERVIEW**

Commissioning to be a line item of Contractor's cost breakdown.

Stage 2 - "Endurance Testing" Allowance to be a line item of Contractor's cost breakdown.

Commissioning is conducted in concert with activities performed during all stages of project delivery.

Commissioning identifies issues in early project stages to ensure the swing bridge mechanical, power and control systems are proven to operate satisfactorily under weather, environmental and usage conditions to meet functional and operational requirements as they were prior to project implementation.

Departmental Representative will issue Certificate of Substantial Performance only after completed commissioning documentation has been received, reviewed for suitability and approved by Departmental Representative.

### **13.2            BRIDGE BALANCING**

The existing bridge is balanced about the pivot bearing so that when it is swung open (out of service), most of the weight of the bridge is supported by the pivot bearing, with minimal load on the stabilizer wheels (casters) that are supported on the circular rail.

The work is expected to affect the balancing of the bridge because:

The counter-weighting may be affected if bottom steel plate is replaced.

The entire process could result in a change to the state of equilibrium of the bridge.

After repair work is complete, the Contractor will be responsible for ensuring that the bridge is properly balanced. This will be accomplished by:

- Adjusting the number and location of steel ingots inside the weight box.

Correct balancing of the bridge is achieved when:

- The wheel stabilizers run smoothly on the circular rail as the bridge is swung open and closed.

Parks Canada staff will be present on site during bridge balancing to verify that correct balancing has been achieved.

### **13.3            Execution**

#### **.1            GENERAL EXECUTION**

The work under this item is to demonstrate that all the bridge electrical and mechanical systems have been correctly installed and function properly.

The Contractor shall provide all test equipment, safety equipment, personnel and monitoring devices necessary to show each piece of equipment has been installed, operates properly, is in proper operating condition, and integrated into the bridge control system.

### **13.4 STAGE 1 – CONTRACTOR’S FIELD TESTING**

The Contractor shall adjust, calibrate and test all mechanical and electrical equipment affected by the rehabilitation work.

The Contractor shall demonstrate that the completed system functions properly by performing at least four (4) consecutive complete bridge swings, including operation of swing gates and traffic signals, without failure or any adjustments. The Contractor shall deliver a report describing results of the Contractor's field tests, diagnostics, and calibrations including written certification that the installed complete system has been calibrated, tested, and is ready to begin Stage 2 – Endurance Testing. The report shall also include a copy of the approved Stage 1 - Contractor's Field Testing procedure.

### **13.5 STAGE 2 – ENDURANCE TESTING**

During Stage 2 testing the bridge will be available for public use.

Endurance testing shall start after successful execution of stage 1 and hand over to the owner has been accepted; the Departmental Representative will notify the Contractor, in writing, that the Stage 1- Contractor’s Field Testing has been completed and correction of all outstanding deficiencies has been satisfactorily completed and the span has been opened to vehicular traffic.

(Owner Operation): After Stage 1 (Hand Over), bridge operation will be ceded from the Contractor to Parks Canada. Parks Canada will now operate the bridge with the Contractor on-call should there be any system failure. Operation During this period the Contractor must provide the Departmental Representative with an emergency telephone number to be used for notifications in the case of a failure during this period. The number must be in operation and be answered 24 hours a day, including weekends and holidays. In the case of a failure the Departmental Representative will contact the Contractor at the contact number. The Contractor must respond to the notification, by return telephone call to the Departmental Representative, within one hour of notification. The Contractor must then have appropriate labour, equipment and materials on site and commence repairs within 4 hours of the original notification. Following the original notification if the Contractor does not respond to the original notification within 1 hour, or if the Contractor does not arrive on site within 4 hours, then Parks Canada will mobilize their work crew to undertake any needed repairs. Parks Canada will then back-charge the Contractor for any costs incurred, even if the Contractor subsequently responds and/or arrives on site and takes part in or completes the repairs, with the monies being taken against the “Stage 2-Endurance Testing” Allowance. Stage 2 will be considered complete once Parks Canada has operated the bridge without failure for 7 consecutive days, including holidays. The Contractor's warranty will remain in effect even if Parks Canada performs any work on the bridge as a result of the Contractor's failure to respond to a notification.

## **Part 14        REMOVALS**

### **14.1            ELECTRICAL REMOVALS FOR RE-COATING WORK**

Existing electrical components on the bridge are to be removed in preparation for re-coating.

### **14.2            MECHANICAL REMOVALS FOR RE-COATING WORK**

The existing mechanical components that obstruct access to areas requiring re-coating or that cannot be protected adequately are to be removed and re-instated after coating work is complete.

Note:

- Wheels will have to be marked to their location prior to removal.
- The Contractor is responsible for re-installing the wheels to the structure.

Coated surfaces of support brackets are to be cleaned and re-coated.

The live load bearings at the end of the loading girder are to be left on the girder and surfaces which are presently coated are to be cleaned and re-coated.

The pivot bearing is to be left in place during re-coating work. Working surfaces of the bearing are to be completely protected from dust, sand, grit and other debris and damage throughout construction. Non-working surfaces of the bearing that are currently coated shall be cleaned and re-coated.

The wedges are to be protected during construction. Any surfaces coated in the existing condition are to be cleaned and re-coated. Wedges counter parts (fixed to the pier) are to be protected as well.

Surfaces of mechanical components and bearings not being re-coated shall be completely protected from dust, sand, grit and other debris and damage throughout construction. Any cleaning of these components necessary as a result of inadequate protection will be performed by the Contractor at no additional cost.

Parks Canada and the Departmental Representative will determine whether or not cleaning of mechanical components by the Contractor is reasonably required due to inadequate protection.

### **14.3            OTHER REMOVALS FOR RE-COATING**

All items to be removed and re-instated on the bridge shall be tagged or stamped with durable markings that will enable reinstatement in the correct locations. The Contractor is responsible for correct marking/tagging and ensuring proper locations.

All support steelwork for mechanical components is to remain in place and be cleaned and re-coated.

The existing caulking, if any, between the joints of constituent members of the bridge is to be removed prior to repainting. Such joints will be re-caulked after painting with an approved material.

## **Part 15            PAINTING EXTERIOR METAL SURFACES**

### **15.1            REFERENCES**

#### **The Society for Protective Coatings (SSPC).**

- SSPC-SP-2-00, "Hand Tool Cleaning"
- SSPC-SP-3-00, "Power Tool Cleaning"
- SSPC-SP-6/NACE No. 3-00, "Commercial Blast Cleaning"
- SSPC-Vis-1-89, "Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning"
- SSPC-SP-10/NACE No. 2-00, "Near White Blast Cleaning"
- SSPC-PA-02, "Measurement of Dry Coat Thickness with Magnetic Gauges"
- SSPC "Good Painting Practices", Volume 1, 4th Edition.
- SSPC-Guide 19, "Selecting coating for use over galvanized substrate"
- SSPC AB 1, "Mineral and Slag Abrasives"

### **15.2            SUBMITTALS**

Submit manufacturer's printed product data including application instructions for each coating system to be used.

Submit colour samples of top coats prior. Do not order material before getting approval from Departmental Representative.

Submit WHMIS MSDS (Material Safety Data Sheets) for each coating system to be used.

Before commencement of the coating application, the Contractor shall supply the Departmental Representative with written certification from the coating manufacturer stating that all materials supplied are as specified in the Contract Documents and the manufacturer's current product data sheets.

Prior to abrasive blasting, the Contractor shall supply the Departmental Representative with written certification from a laboratory certified by an organization accredited by the Standards Council of Canada stating that the abrasive blast media meets the specified material requirements.

The Contractor shall arrange and pay for laboratory testing of spent abrasive blast material. Laboratory test results shall be provided to the Departmental Representative a minimum of 2 days prior to shipment of spent material.

- The laboratory shall be accredited by the Canadian Association for Environmental Analytical Laboratories (CAEAL).
- The test results shall include:
  - Laboratory name and address and identification of the individual responsible for accuracy of test results.
  - Sample identification, including project number and date sampled.
  - Laboratory report of analysis containing the analytical results.
  - Methodology used for each parameter, and instrumentation.
  - The test results with upper and lower limits.

### **15.3            EXTENT OF COATING WORK**

The surfaces to be cleaned and re-coated with a three-coat zinc, epoxy and polyurethane system include:

- The pivot beam, intermediate beams, end beams, floor beams, under deck, supports, braces and all their components and connections.
- The steelwork constituting the sidewalk.
- The sidewalk and bridge railings.
- The surfaces of the steel curbs on the bridge.
- Other accessible steelwork on and under the bridge.

The new surfaces to be coated with a three-coat zinc, epoxy and polyurethane system include:

- Any other new steel on or around the bridge.

The surfaces to be cleaned and re-coated with an epoxy-polyurethane system include:

- The sidewalk railings on the east side of both approaches of the bridge (from the church to the fix bridge and along the stairs to the electrical room),
- The operator control panel,
- The traffic barriers on both ends of the bridge.

## **15.4 DISPOSAL OF SPENT ABRASIVE BLAST MEDIA**

The Contractor is solely responsible for management of spent material including sampling, testing, documenting, transporting, and disposing of (or recycling) spent material.

Spent material that is tested to be leachate toxic (i.e., waste class 146 T) shall be managed as subject waste according to the Contract Documents.

Spent material that is tested to be non-leachate toxic (i.e., non-hazardous solid) shall be managed by disposal as non-hazardous solid industrial waste or by re-use or recycling according to the Contract Documents.

Prior to transportation from the work site, samples of spent material shall be collected and submitted to an analytical laboratory for analysis by the Contractor.

Samples taken to determine waste classification shall be representative of the spent material to be managed, such that they accurately characterize the variation that may exist throughout the waste pile or container (e.g., vertically and horizontally). This may be achieved by collecting multiple samples using a grain sampler, auger, or other similar sampling equipment or technique.

One 500 gram representative composite sample of spent material shall be prepared for the first 12 cubic metres or less of material. An additional sample is required for every additional 12 cubic metres or less of material.

The Contractor shall notify the Departmental Representative a minimum of 24 hours prior to collecting each sample of spent material.

Samples shall be prepared as follows:

- Prior to each sampling, the sampling equipment shall be thoroughly cleaned with a detergent solution; rinsed with clean water, preferably distilled water; and allowed to air dry.
- For every 12 m<sup>3</sup> or less of spent material, a minimum of one 500 gram sub-sample shall be collected from each container (e.g., drums and barrels) of waste that represents the specified volume to be tested. For larger size containers (e.g., luger bins) a minimum of two 500 gram sub-samples shall be collected (i.e., one from the centre and one from either end).



- A composite sample of the specified volume of material to be tested shall be prepared by combining individual sub-samples into a clean plastic or steel bucket.
- The combined sample shall be thoroughly mixed.
- The sample shall be piled into a cone while placing it on a clean plastic sheet. As the material is emptied from the bucket, it shall be placed at the cone's apex and allowed to run down the sides of the cone.
- The cone shall be flattened into a rough circle of uniform thickness. The circle shall be divided into four quarters and two opposite sides shall be rejected.
- The procedure of coning and quartering (i.e., steps 5 and 6) shall be repeated to obtain a single composite 500 gram sample for analysis.
- Each composite sample shall be divided into two halves and placed into laboratory cleaned jars or zip sealed plastic bags and labelled with the following information:
  - Sample ID (i.e., spent material from abrasive blasting of structural steel).
  - Sample number.
  - Date sampled.
  - Name of sampler.
  - Name of contractor.
  - Project number.

One half of each sample shall be submitted to the analytical laboratory, and the other half shall be retained by the Departmental Representative in a secure location.

The samples shall be tested according to the Toxicity Characteristic Leaching Procedure under Ontario Regulation 347 to determine the concentration of arsenic, barium, boron, cadmium, chromium, lead, mercury, selenium, silver, and any other parameter specified by Ontario Regulation 347 that may be associated with any previous use of the blasting medium.

Management of spent material shall be based on the laboratory test results and shall be subject to the approval of the Departmental Representative.

## **Part 16            PRODUCTS**

### **16.1            MATERIALS**

The coating system for steel surfaces on the bridge shall be one of the following three-coat systems:

- **Carboline System:**
  - Inorganic zinc primer: Carbozinc 11 HS.
  - Epoxy mid-coat: Carboguard 893.
  - Polyurethane top-coat: Carbothane 134 HG.
  - Bolt holes touch-up: Carbomastic 15 FC.
  - Contact: Pedro Escudero, Tel. 877-393-3303, Cell 613-531-1331.
- **PPG Amercoat System:**
  - Organic zinc primer: Amercoat 68 HS – C.
  - Epoxy mid-coat: Amercoat 370 Fast Dry Multi-Purpose Epoxy.
  - Polyurethane top-coat: Amercoat 450H Aliphatic Polyurethane.
  - Bolt holes touch-up: Amerlock 400 with Amercoat 861 accelerator.
  - Contact: Gilles Masse, Tel. 514-333-1164, Cell 514-949-2492.
- **Devcoe System:**
  - Organic zinc primer: Catha-Coat 315.
  - Epoxy mid-coat: Bar-Rust 231.
  - Polyurethane top-coat: Devthane 379 UVA.
  - Contact: Stan Walker, Tel. 705-733-4883.

The colours of the primer and mid-coat to be different from each other, and both approved by the Departmental Representative prior to ordering material.

The finish colour of the top coat for all systems shall be light grey to match the colour of the existing coatings.

- Colour to be approved by the Departmental Representative prior to ordering of material.

The coating system for the new traffic barrier and for existing handrails off the bridge shall be one of the following two systems:

- **Carboline System:**
  - Epoxy base coat: Carbomastic 15 FC.
  - Polyurethane top-coat: Carbothane 134 HG.
- **PPG Amercoat System:**
  - Epoxy base coat: Amerlock 400 with Amercoat 861 accelerator.
  - Polyurethane top-coat: Amercoat 450H Aliphatic Polyurethane.

The finish colour of the top coat for all systems shall be black or silver to match the colour of the existing coatings.

- Colour to be approved by the Departmental Representative prior to ordering of material.

Abrasive blast media for use on bridge structure shall be in accordance with SSPC AB 1 and:

- Abrasive media shall have a conductivity not exceeding 1,000 microsiemens, when tested according to ASTM D 4940.
- Except for abrasive blast cleaning of galvanized surfaces, the abrasive media shall have a hardness of 6 or greater on the Mohs scale. There shall be no presence of oil.
- The testing for hardness and presence of oil shall be according to SSPC AB 1.
- The maximum moisture shall be 0.5% by weight, when tested according to ASTM C 566.

Compressed air:

- Compressed air used during all work operations shall be clean, dry, and free from oil residues, when tested according to ASTM D 4285.

Penetrating sealer used during surface preparation of steel bridge components shall be:

- Rustbond Penetrating Sealer (by Carboline), or
- Approve sealer compatible with coating system being used.

Caulking used to seal joints in steel bridge components shall be:

- An exterior-grade urethane caulking approved by the Departmental Representative, or
- An approved urethane caulk compatible with the coating system being used.

## **Part 17            EXECUTION**

### **17.1                MANUFACTURER'S INSTRUCTIONS**

Comply with manufacturer's written product data and instructions for storage, handling, mixing, application and curing of coatings.

Where there is a conflict between the manufacturer's recommendations and the Contract Documents, the more stringent requirements shall apply as determined by the Departmental Representative.

### **17.2                REMOVALS**

Removal of mechanical and electrical components and other removals must be performed in accordance with **Error! Reference source not found.** prior to starting abrasive blast cleaning.

### **17.3                CONTAINMENT ENCLOSURE**

A full containment enclosure with negative pressure must be constructed around the bridge in accordance with Part 10 prior to starting abrasive blast cleaning.

Heating and/or dehumidification shall be provided as required to maintain conditions inside the enclosure for coating application and curing in accordance with the coating manufacturer's instructions.

### **17.4                PROTECTION**

Protect surfaces not to be coated and if damaged, clean and restore such surfaces as directed by the Departmental Representative.

Apply primer, coating, or pre-treatment after surface has been cleaned and before deterioration of surface occurs.

Clean surfaces again if rusting occurs after completion of surface preparation.

Prevent contamination of cleaned surfaces by salts, acids, alkalis, corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats of coat. Remove contaminants from surface and apply coat immediately.

Protect cleaned and freshly coated surfaces from dust to approval of the Departmental Representative.

The coated areas of the structure coming into contact with rollers, clamps, and other parts of the scaffolding and access facilities shall be protected using rubber or other material to prevent damage to the coating.

All components coated off-site shall be protected from handling or shipping damage by using padded slings, separators, and tie downs or other similar devices. Loading procedures shall be designed to protect coated surfaces from any possible damage to the coating.

Mechanical and electrical components and working surfaces of bearings shall be completely protected from sand, dust, grit and other debris and damage. Any cleaning of these components necessary as a result of inadequate protection will be performed by the Contractor at no additional cost.

## **17.5 SITE MEETING**

After enclosure and protection measures are in place, the Departmental Representative will arrange a site meeting with the Contractor, coating inspector and Parks Canada to review and discuss the surface preparation, coating application procedures, and contract quality assurance procedures, to be used. Surface preparation shall not proceed until after meeting is held.

## **17.6 SURFACE PREPARATION – GENERAL**

Surface preparation of existing and new steel surfaces to be coated shall be performed in accordance with the coating manufacturer's instructions and this specification. The manufacturer's instructions shall govern in case of conflict.

Fins, slivers, burred, sharp edges, weld spatter and slag shall be removed by power grinding prior to the surface preparation and coating application.

Sharp edges of structural steel specified to be cleaned and coated shall be ground to a smooth radius of at least 3 mm by hand or power tools prior to abrasive blast cleaning.

Faying surfaces of existing and new structural steel components to be connected by bolts shall be cleaned to the surface preparation standard required for the coating system specified.

## **17.7 SURFACE PREPARATION FOR ZINC-EPOXY-POLYURETHANE SYSTEM**

Steel surfaces in the bridge to be re-coated shall be abrasive blast-cleaned in accordance with SSPC-SP10/NACE No. 2 Near White Blast Cleaning, to remove rust, loose mill scale, welding slag, dirt, oil, grease and foreign substances.

- The abrasive blast cleaning shall provide a surface profile height compatible with the coating system to be applied.

The temperature, moisture, and humidity limitations do not apply to interim surface preparation (surface preparation that is not the final surface preparation). The Departmental Representative shall be notified of the Contractor's intention to do interim surface preparation work prior to commencement of the work.

Final surface preparation for coating application shall only be carried out when the temperature, moisture, and humidity satisfy the criteria specified in SSPC-PA 1 for coating application, or as specified by the coating manufacturer, whichever is more stringent as determined by the Departmental Representative.

Compressed air to be free of water and oil before reaching nozzle.

Remove traces of blast products from surfaces, pockets and corners to be coated by brushing with clean brushes, by blowing with clean dry compressed air, or by vacuum cleaning.

Prior to commencing coating application, the degree of cleanliness of surfaces to be in accordance with SSPC-V is 1.

## **17.8 SURFACE PREPARATION FOR TRAFFIC BARRIERS**

Surface preparation of traffic barrier components for coatings to be in accordance with coating manufacturer's instructions.

No passivation agents shall be used on galvanized surfaces prior to application of coatings.

#### **17.9 SURFACE PREPARATION OF EXISTING RAILINGS OFF THE BRIDGE (Item No. 10)**

Steel surfaces of existing railings off the bridge to be re-coated shall be cleaned in accordance with SSPC-SP-2 Hand Tool Cleaning and/or SSPC-SP-3 Power Tool Cleaning to remove loose, cracked, brittle or non adherent coatings, rust, loose mill scale, welding slag and dirt. Oil, grease and any other foreign substances shall also be removed by suitable means.

No passivation agents shall be used on galvanized surfaces prior to application of coatings.

#### **17.10 MIXING**

All coating systems shall be stored, thinned, handled, mixed, and applied according to SSPC-PA 1 and the manufacturer's instructions. The manufacturer's instructions shall govern in case of conflict.

Do not dilute or thin coat for brush application unless permitted by the manufacturer.

Mix ingredients in container before and during use and ensure breaking up of lumps, complete dispersion of settled pigment, and uniform composition.

Do not mix or keep coatings in suspension by means of air bubbling.

Thin coatings for spraying according to manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to the Departmental Representative.

The agitators in the spray pot shall extend to within 25 mm of the bottom of the pot to ensure proper mixing of coating components prior to spray application.

#### **17.11 APPLICATION**

The Departmental Representative shall be notified by the Contractor 48 hours in advance of mixing and applying a coat coating or coating system.

The Departmental Representative shall be informed when the surface preparation and each subsequent phase of work of coating application are completed and ready for inspection. Subsequent work shall not commence until the Departmental Representative has completed the inspection of the work completed and given permission in writing to proceed

Apply coating by spraying, brushing, or combination of both, except where the application method is restricted by the manufacturer. Use sheepskins or daubers when no other method is practical in places of difficult access.

Apply each coat as continuous film of uniform thickness. Re-coat thin spots or bare areas before next coat is applied.

Apply coatings only within the temperature and relative humidity restrictions specified by the manufacturer.

Each successive coat shall be a different colour.

Brush application:

- Work coating into cracks, crevices and corners and coat surfaces not accessible to brushes by spray, daubers or sheepskins.
- Brush out runs and sags.

Spray application:

- Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing coating to be applied, and equipped with suitable pressure regulators and gauges.
- Provide traps or separators to remove oil and water from compressed air and drain periodically during operations.
- Keep coating ingredients properly mixed in spray pots or containers during application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
- Apply coating in uniform layer, with overlapping at edges of spray pattern.
- Brush out immediately runs and sags.
- Use brushes to work coating into cracks, crevices and places which are not adequately coated by spray. In areas not accessible to spray gun, use brushes, daubers or sheepskins.
- Remove runs, sags and brush marks from finished work and re-coat.

New steel surfaces in the bridge structure to be coated with:

- Zinc primer.
- Epoxy mid-coat.
- Polyurethane top-coat.
- Minimum dry film thicknesses to be in accordance with the manufacturer's instructions.

Existing steel surfaces of the bridge structure to be re-coated with:

- Zinc primer.
- Liberal application of penetrating sealer brushed into connections and joints.
- One striping coat of epoxy mid-coat on sharp edges such as plate corners and bolt threads, applied after the penetrating sealer has reached dry-to-touch condition.
- Epoxy mid-coat.
- A bead of urethane caulking on all joints between constituent pieces after the mid-coat has reached dry-to-recoat condition.
- One striping coat of polyurethane top-coat applied after mid-coat has reached dry-to-recoat condition.
- Polyurethane top-coat.
- Minimum dry film thicknesses to be in accordance with the manufacturer's instructions.

Traffic barriers (and existing railings off the bridge referred to in item No. 10 under part 4.4, if requested by PCA) to be coated with:

- Epoxy base coat.
- Polyurethane top coat
- Minimum dry film thicknesses to be in accordance with the manufacturer's instructions.

Coatings shall be smooth, continuous and free of runs and sags. No pinholes or holidays of coatings shall be allowed.

When there is a drop in temperature after the coating has been applied, the recoat time period shall be according to the manufacturer's recommendations for the lower temperature.

Exterior surfaces of bolted connections within a distance of 25 mm around the edge of the bolt holes and against which the bolt head or washer is going to be bearing shall receive only the prime coat. Any exposed areas of primer not covered by the bolt head or washer after the installation of the bolts, shall be touched up with the second and third coats of the specified coating system.

Bearing shoe plates or bevelled plates or both at girder locations where coating of the girders has been specified shall also be coated using the specified coating system.

For each coat of coat the initial pass of the spray gun shall be directed at the outside edges of the steelwork prior to completely coating all surfaces.

All runs and sags shall be brushed out as the application progresses.

Application related failures in coatings, as described in the Coating Failures chapter of the SSPC Coating Manual, shall be corrected prior to application of a subsequent coat and, in the case of the top coat, after the application of the top coat.

Where excessive coating thickness produces "mud cracking" in zinc rich coating materials, the coating shall be scraped back and sanded to a soundly bonded coating and the area recoated to the required thickness.

All dry spray shall be removed by sanding and the coating re-applied as specified.

Do not apply coatings before undercoat has sufficiently cured in accordance with the manufacturer's instructions.

Provide cover when coatings must be applied in damp or cold weather. Protect, shelter, or heat surface and surrounding air to comply with the specified temperature and humidity requirements. Protect until coating is dry or until weather conditions are suitable.

Remove coatings from areas which have been exposed to unsuitable temperature, humidity, moisture or other damaging conditions. Prepare surface again and re-coat.

#### Shop coating:

- The maximum time between final surface preparation and prime coat application inside the shop shall be 24 hours. Structural steel subjected to outdoor exposure after final surface preparation shall be prime-coated within 10 hours, or as directed by the coating manufacturer.
- All coats of the specified coating system shall be shop-applied.
- Prior to assembly, surfaces not in contact with other steel surfaces but that are inaccessible after assembly shall have all coats applied.
- Surfaces inaccessible for coating after erection shall be coated prior to erection.
- At least 100 mm of bare metal and 100 mm of each coat of the new system shall be left exposed for lapping of subsequent coats, where the continuous application of coat or final surface preparation is interrupted in a section.
- Do shop coating after fabrication and before damage to surface occurs from weather or other exposure.



- Spray coat contact surfaces of field assembled, bolted, friction type joints with primer coat only. Do not brush primer after spraying.
- Do not coat metal surfaces which are to be embedded in concrete.
- Coat metal surfaces to be in contact with wood with either full coat coats specified or three shop coats of specified primer.
- Do not coat metal within 50 mm of any edge to be welded. Give unprotected steel one coat of boiled linseed oil or other approved protective coating after shop fabrication is completed.
- Remove weld spatter before coating. Remove weld slag and flux by methods as specified.
- Protect machine finished or similar surfaces that are not to be coated but that do require protection, with coating of rust inhibitive petroleum, molybdenum disulphide, or other coating approved by the Departmental Representative.
- Copy previous erection marks and weight marks on areas that have been shop coated.
- The Contractor shall allow access by the Departmental Representative to the galvanizing and coating shops where components are being cleaned and coated, during all hours of work.

#### Field coating:

- Except for metalizing and hot dip galvanizing, the maximum time between final surface preparation and the prime coat application shall be 10 hours or as directed by the coating manufacturer.
- When work operations require bolt connections of structural steel components, faying surfaces of existing structural steel shall have only the prime coat applied, prior to the assembly.
- When tying into existing coatings, that portion of the existing coating within 300 mm of the edge of the new coating shall be power washed using potable water to remove all contaminants. The edges of the existing coating shall be feathered into areas cleaned to bare steel so that at least 4 mm of each coat of the existing coating is exposed.
- Coat steel structures as soon as practical after erection.
- Touch up metal which has been shop coated with same type of coating and to same thickness as shop coat. This touch-up to include cleaning and coating of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective coat and rusted areas.
- Field coat surfaces (other than joint contact surfaces) which are accessible before erection but which are not to be accessible after erection.
- Do not apply final coat until concrete work is completed, except as directed by the Departmental Representative. If concreting or other operations damage the coating, clean and re-coat damaged area. Remove concrete splatter and droppings before coating is applied.
- Where coating does not meet with requirements of specifications, and when so directed by the Departmental Representative, remove defective coating, thoroughly clean affected surfaces and re-coat in accordance with these specifications.

#### Handling coated metal:

- Do not handle coated metal until coating has cured, except for necessary handling for coating or stacking for drying.
- Scrape off and touch up coating which is damaged in handling, with same number of coats and kinds of coatings as were previously applied to metal.

#### Repair of coatings on new and existing structural steel.

- Damaged areas of coated surfaces shall be prepared to the original surface preparation standard specified and by feathering the edges of sound coatings. For damaged areas of less than 100 cm<sup>2</sup>, power tool cleaning to SSPC SP 11 may be used for surface preparation. The prepared surfaces shall be recoated with the originally applied materials, except for inorganic zinc primer, which

shall be recoated with an epoxy zinc primer from the same manufacturer. The dry film thickness of all the three coats in the repair area shall be as specified for the initial application.

## **17.12 FIELD QUALITY CONTROL**

The Contractor is responsible for ongoing quality control of the cleaning and coating application operations, including measurements of temperature, humidity, dew point, surface profile, and coating thickness.

Quality control measurements shall also include monitoring of the air change and the existence of negative pressure within the enclosure for projects that require surface preparation by abrasive blast cleaning or other high dust generating methods.

The Contractor shall demonstrate the existence of negative pressure within the enclosure by instrument measurements or by visual assessment as often as requested by the Departmental Representative.

Surface profile measurements shall be made using a spring micrometer and an extra coarse pressure sensitive replica tape according to ASTM D 4417, Method C.

Written documentation of measurements taken, including dry film thickness (DFT) measurements taken using Type 2 constant pressure probe magnetic gauges, shall be provided to the Departmental Representative on a weekly basis, minimally, or more often as requested by the Departmental Representative.

The magnetic gauge shall be calibrated according to the procedures in SSPC-PA 2. To facilitate the calibration procedure, the Contractor shall mask off a 75 x 75 mm area of the prepared steel at a location selected by the Departmental Representative. After all tests are completed, this area shall be coated as specified in the Contract Documents.

As an alternative to calibrating the Type 2 magnetic gauge on the prepared surface, the Contractor may provide an uncoated 300 x 300 mm reference plate sample of steel of similar composition; thickness,  $\pm 10\%$ ; and surface preparation for gauge calibration.

## **17.13 FIELD QUALITY ASSURANCE**

The Departmental Representative will arrange and pay for ongoing quality assurance of surface preparation and coating work on an on-going, sampled basis.

Acceptability of the surface preparation by the Departmental Representative shall be based on the applicable SSPC surface preparation specifications and pictorial standards given in SSPC-VIS 1 and SSPC-VIS 3.

Surface profile measurements shall be made by the Departmental Representative on a random basis using a spring micrometer and an extra coarse pressure sensitive replica tape according to ASTM D 4417, Method C.

The work shall be randomly tested by the Departmental Representative for cleanliness to determine contamination of surfaces by the presence of visible dust, oils, grease, or other foreign matter. Random testing of ambient and surface temperature, relative humidity, and dew point by the Departmental Representative shall be done by means of a thermometer, surface thermometer, or recording hygrothermograph and digital or sling psychrometer with recognized psychometric tables.

Measurement of the coating thickness shall be made by the Departmental Representative. The dry film thickness shall be measured by Type 2 constant pressure probe magnetic gauges according to SSPC-PA 2.

Determination of the acceptability of the dry film thickness of each coat shall be made according to SSPC-PA 2.

The specified maximum dry film thickness used to determine acceptability of coating thickness according to SSPC-PA 2 shall be the manufacturer's recommended maximum, as shown in the submitted product data sheets.

The Contractor shall be present when the Owner's magnetic gauges are being calibrated by the Departmental Representative.

Paint coatings may be tested for adhesion at the discretion of the Departmental Representative.

#### **17.14            CLEANING**

Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

## **Part 18        SODDING**

### **18.1            DESCRIPTION**

This section specifies the requirements for reinstating damaged landscaped areas within the work zone delineated in the Contract Documents. This work includes:

- Supplying, placing and finish-grading of top-soil beds.
- Supplying and placing nursery sod.
- Maintaining sodden areas until acceptance.

### **18.2            PRELIMINARY INSPECTION**

Establish the existing condition of sodden areas in conjunction with the Departmental Representative before starting work. Record condition with photos and provide copies of photos to Departmental Representative.

### **18.3            SOURCE QUALITY CONTROL**

At least two weeks before starting final topsoil work, advise the Departmental Representative of proposed sources of topsoil and sod. Provide the Departmental Representative with access to the sources for inspection, sampling and testing.

When proposed sources are approved, use no other sources without written authorization from the Departmental Representative.

### **18.4            DELIVERY AND STORAGE**

Schedule deliveries in order to keep storage at the job site to a minimum without causing delays.

Deliver, unload and store rolled sod on pallets only.

Deliver sod to site within 24 hours of being lifted and lay sod within 36 hours of being lifted.

Do not deliver small, irregular or broken pieces of sod. Departmental Representative will reject these.

During wet weather, allow sod to dry sufficiently to prevent tearing during lifting and handling.

During dry weather, protect sod from drying. Water sod as necessary to ensure its vitality and prevent dropping soil in handling. The Departmental Representative will reject dried-out sod.

Supply sod in standard-sized units and of a uniform thickness, rolled for easy handling.

### **18.5            SCHEDULING OF SODDING WORK**

Schedule sod-laying operations to coincide with final topsoil operations.

Obtain Departmental Representative's approval of the schedule for sodding before proceeding.

## **Part 19            PRODUCTS**

### **19.1            TOPSOIL**

New topsoil to be a friable sandy-clayish loam of good humus content, suitable for supporting sod growth, free from:

- Debris and stones over 50 mm diameter.
- Coarse vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

Approval of topsoil materials subject to soil testing and analysis. Testing of topsoil will be carried out by Departmental Representative. Departmental Representative will pay for costs of tests.

### **19.2            SOD**

Nursery sod: to CNTA “Canadian Standards for Nursery Sod”, Canadian Nursery Trades Association, 2001, C17.0, Ontario Sod Association, Specifications for Turf grass Sod in Ontario, classification Number One Grade Turf grass Nursery Sod, cultivated turf grass sod.

- Number 1 Kentucky Bluegrass/Fescue sod grown from minimum 40% Kentucky Bluegrass, 30% Creeping Red Fescue.

## **Part 20            EXECUTION**

### **20.1                PREPARATION OF TOPSOIL SUB-GRADE**

Verify that grades are correct. If discrepancies occur, notify Departmental Representative and do not start other landscape work in that area until instructed to do so in writing by the Departmental Representative.

Grade soil, eliminating uneven areas and low spots, ensuring that new sodden surfaces will be faired-off to the existing sodden areas with no sharp transition.

Remove debris, roots and branches, stones in excess of 50 mm diameter and other deleterious materials. Remove debris which protrudes more than 75 mm above the surface. Dispose of unwanted material off site.

Coarse cultivate entire area which is to receive topsoil to depth of 100 mm. Coarse cultivate those areas where equipment used for hauling and spreading has compacted soil.

### **20.2                PLACING AND SPREADING TOPSOIL**

Place topsoil after Departmental Representative has accepted sub-grade.

Spread topsoil to 150 mm minimum depth after settlement and 80% compaction. Keep final elevation 15 mm below finished grade to allow room for sod.

Manually spread topsoil around trees, shrubs and obstacles.

Grade to eliminate rough spots and low areas and ensure positive drainage. Prepare loose friable bed by means of cultivation and subsequent raking.

Consolidate topsoil to required bulk density using equipment approved by Departmental Representative. Leave surfaces smooth, uniform and firm enough to resist deep footprints.

### **20.3                ACCEPTANCE OF TOPSOIL GRADING**

Departmental Representative will inspect topsoil in place and determine acceptance of depth of topsoil and finish grading.

### **20.4                SURPLUS TOPSOIL MATERIAL**

Dispose of materials not required off site.

### **20.5                SODDING**

Obtain Departmental Representative's approval of topsoil grade and depth before starting sodding.

Loosen surface of topsoil where it has become compacted.

Protect all sodden areas against any damage until sod has been fully established. Supply and install required protective apparatus as required.

## **20.6 SOD PLACEMENT**

Lay sod within 18 hours of being lifted if air temperature exceeds 20 degrees C.

Lay sod sections in rows with joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.

Roll sod as directed by the Departmental Representative. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

## **20.7 MAINTENANCE OF SODDED AREAS**

Maintain sodden and seeded areas until accepted by Departmental Representative.

Apply water to ensure establishment and continuous growth of grass. Apply sufficient water to ensure moisture penetration of 200 mm into soil below sod.

Cut grass when it reaches a height of 80 mm. Cut grass thereafter frequently enough to be kept at a height of 80 to 100 mm. Allow clippings to remain.

## **20.8 ACCEPTANCE OF SOD MATERIAL**

Approval of material at its source does not prevent subsequent rejection on the job site.

Sod will be approved when:

- Growth of sodden areas has been properly established.
- Turf is free of bare and dead spots.
- No surface soil is visible when grass has been mowed to a height of 80 mm.
- Grass has been cut a minimum of two times by the Contractor.

## **20.9 SODDING ON SLOPES GREATER THAN THREE TO ONE**

Lay sod sections perpendicular to slopes greater than 3:1 (run to rise) and secure with stakes. Place stakes 3 per square metre, 100 mm below top edge to prevent shifting of sod and drive stakes flush with top of sod soil.

## **Part 21            ASPHALT**

### **21.1                REFERENCES**

#### **Ontario Provincial Standard Specifications (OPSS).**

- OPSS 310, Construction Specification for Hot Mix Asphalt.
- OPSS 914, Construction Specification for Waterproofing Bridge Decks with Hot-Applied Asphalt Membrane.
- OPSS 1003, Material Specification for Aggregates - Hot Mix Asphalt.
- OPSS 1010, Material Specification for Aggregates - Base, Sub-base, Select Sub-grade, and Backfill Material.
- OPSS 1101, Material Specification for Performance-Graded Asphalt Cement.
- OPSS 1103, Material Specification for Emulsified Asphalt.
- OPSS 1150, Material Specification for Hot-Mix Asphalt.
- OPSD-3489.02 (previously 508.02) Bridge deck waterproofing (drawing).

### **21.2                SUBMITTALS**

Inform Departmental Representative of proposed source of aggregates for granular road sub-base and base materials and provide access for sampling at least 4 weeks prior to commencing installation.

A minimum of 10 working days prior to the start of paving, the proposed mix design and job-mix formula for hot-mix asphalt shall be submitted in writing to the Department Representative. Approval shall be obtained prior to paving.

Submit proposed product data sheets for waterproofing system for deck asphalt patch for approval prior to installation.



## **Part 22            PRODUCTS**

### **22.1                MATERIALS**

Granular B Type II sub-base materials shall comply with OPSS 1010.

Granular A base materials shall comply with OPSS 1010.

Tack coat shall consist of SS-1 emulsified asphalt diluted with an equal volume of water. The undiluted material shall be according to OPSS 1103.

Hot-mix asphalt shall comply with OPSS 1150.

- Bridge pavement shall consist of:
  - Top lift: 35 mm HL-3.
  - Bottom lift: 50 mm HL-8.
- Performance-grade PG 58-34 asphalt cement in accordance with OPSS 1101 shall be used.
- Aggregates for asphalt shall conform to OPSS 1003.

Waterproofing membrane for bridge deck:

- Prepare surface, apply primers and sealants in accordance with the manufacturer's recommendations.
- Install protection board over membrane.

## **Part 23            EXECUTION**

### **23.1            EQUIPMENT**

Equipment for laying asphalt shall comply with OPSS 310.

### **23.2            EXCAVATION**

Do not undermine existing curbs, sidewalks and pavements that are being maintained. Maintain 2:1 slopes maximum of supporting fill from bottom edges of elements to be supported.

Frost tapers shall be incorporated in the approach excavations in accordance with the drawings.

Dispose of materials in accordance with Part 11.

### **23.3            PREPARATION**

The existing fill materials beneath the new road sub-base shall be proof-rolled with a large steel drum roller, or otherwise suitably compacted in an approved manner. Departmental Representative to approve surfaces and compaction prior to backfilling.

Approach pavements sub-base layer to consist of 500 mm of compacted Granular B Type II.

Granular B materials to be laid in 200 mm maximum lifts and compacted to 98 percent of standard Proctor maximum dry density.

Approach pavements base layer to consist of 150 mm of compacted Granular A.

Preparation for laying asphalt shall conform to OPSS 310.

Paving shall not be carried out if the road bed is frozen.

The granular grade shall be free of standing water at the time of asphalt placement.

### **23.4            MIXING AND HANDLING**

Mixing, handling and transportation of asphalt shall be in accordance with OPSS 310.

### **23.5            PLACING**

Placing of asphalt shall be in accordance with OPSS 310.

The temperature of the asphalt (all lifts) immediately after spreading and prior to initial rolling shall not be less than 120 °C.

Binder courses shall not be placed, unless the air temperature at the surface of the road is a minimum of 2 °C and rising.

Surface course shall not be placed, unless the air temperature at the surface of the road is at least 7 °C and rising.

Vertical surfaces at which joints are made shall be tack coated with a thin uniform and continuous coating of tack coat material.

### **23.6                    COMPACTION**

Compaction of asphalt shall be in accordance with OPSS 310.

### **23.7                    FIELD QUALITY ASSURANCE**

The Departmental Representative shall arrange and pay for geotechnical services relating to excavations, compaction and asphalt. Contractor to allow access and provide material and samples as required.

Any materials that are found to not meet specified criteria shall be removed and replaced at no additional cost.

**Part 24      IMAGES OF BRIDGE**

**24.1      West view of bridge**



































**24.13 West traffic barrier**











**-END OF SPECIFICATIONS-**