

PWGSC ONTARIO	SPECIFICATION	SECTION 00 00 00
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NUMBER R.090211.001		2019-06-13

PROJECT TITLE: BURLINGTON LIFT BRIDGE  
DECK REPAIRS AND WELDING

PROJECT NUMBER: R.090211.001

PROJECT DATE: 2019-06-13

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SEALS PAGE

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2019-06-13

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA  
BURLINGTON LIFT BRIDGE  
DECK REPAIRS AND WELDING


SIGN-OFF SHEET

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RECORD OF REVISIONS AND ISSUES		
REVISION NO.	DATE	DESCRIPTION OF THE MODIFICATION AND/OR OF THE ISSUE
00	2018-09-14	Issued For Review
01	2018-10-19	Issued For Tender
02	2019-06-13	Re-Issued For Tender

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

- .1 Title and description of Work.
- .2 Work Covered by Contract Documents.
- .3 Contract Method.
- .4 Cost Breakdown.
- .5 General Requirements.
- .6 Work Sequence.
- .7 Contractor Use of Premises.
- .8 Owner occupancy.

### 1.2 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises Steel Deck Grating Repairs at Burlington Lift Bridge, located at Hamilton, Ontario.
- .2 General items of work include but are not limited to:
  - .1 Re-welding of existing cracked button welds.
  - .2 Restoring broken connections between steel grating members.
  - .3 Grating Panel Replacement.
  - .4 Holding repair of M-beams with cracked webs
- .3 The timing of this work will be at the full discretion of the Departmental Representative.

### 1.3 DEFINITIONS

- .1 Scheduled Repair Call means repair work under a permitted traffic plan, following a call from the Departmental Representative.
  - .1 Work to be performed during (3) consecutive work shifts.
- .2 Unscheduled Repair Call means repair work under permitted road closures arranged by the Owner, following a call from the Departmental Representative.
  - .1 Work to be performed during single 6 hour shift.
- .3 Grating Panel Replacement means repair work under a permitted traffic plan, following a call from the Departmental Representative.
  - .1 Work to be performed during single weekend bridge closure.

### 1.4 CONTRACT METHOD

- .1 Work in this Contract will be on the following basis:
  - .1 Scheduled Repair Call. Site work shall commence within 10 days following a call from the Departmental Representative.

- .2     Unscheduled Repair Call. Site work shall commence within (24) hours following a call from the Departmental Representative.
- .3     Grating Panel Replacement (scheduled).
- .2     All necessary permits, including, but not limited to MTO Encroachment Permit, to implement the Traffic Management Plan for Repair Calls and Grating Panel Replacements shall be obtained within 40 working days of Contract Award.
- .3     Notify the Departmental Representative upon receipt and submit a copy of the permits and provide Traffic Management Plan.
- .4     First Scheduled Repair Call will occur after receipt of all necessary permits.
- .5     Unscheduled Repair Call may occur at any time after Award of Contract.
  - .1     Prior to the event of Unscheduled Repair Call the Owner will contact the Ministry of Transportation Ontario to arrange for all necessary permits required to perform the work.
- .6     Grating Panel Replacement will occur after receipt of all necessary permits.
- .7     Construct work under unit price contract as specified in Section 01 35 00 and Section 05 12 33.

#### 1.5 COST BREAKDOWN

- .1     Within 3 days of notification of acceptance of bid furnish a cost breakdown by Section aggregating contract price.

#### 1.6 GENERAL REQUIREMENTS

- .1     Take into consideration the site conditions. Perform work using accepted construction practices and methods to the satisfaction of the Departmental Representative.
- .2     Verify all dimensions on site related to the existing steel deck grating.
- .3     Supply necessary labour, material and equipment for the execution of the work shown on contract drawings.
- .4     Be responsible for all damages caused to the existing properties and repair said damage at no cost to the Owner. Keep the site clean and free of any debris at the end of each work day.
- .5     Inspect the site to view and assess features and difficulties that might affect the removal and installation work. No extra charge due to a mistaken evaluation will be accepted.

#### 1.7 WORK SEQUENCE

- .1     Construct Work in stages as directed by the Departmental Representative.
- .2     Coordinate Work Sequence and Progress Schedule under direction of Departmental Representative.

#### 1.8 CONTRACTOR USE OF PREMISES

- .1 Coordinate use of premises under direction of Owner and/or Departmental Representative.

#### 1.9 OWNER OCCUPANCY

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Cooperate with Departmental Representative in scheduling operations to minimize conflict and to facilitate Owner usage.

#### PART 2 - PRODUCTS

NOT USED

#### PART 3 - EXECUTION

NOT USED

END OF SECTION

## PART 1 - GENERAL

### 1.1 MINIMUM STANDARDS

- .1 Rules and regulations of authorities having jurisdiction.
- .2 Occupational Health and Safety Act and Regulations for Construction Projects, Revised Statutes of Ontario 1990, Chapter O.1 as amended, Workplace Safety and Insurance Act and municipal statutes and authorities.
- .3 CAN/CSA-S6-14, Canadian Highway Bridge Design Code.
- .4 CSA G40.20-13/G40.21-13 - General requirements for rolled or welded structural quality steel / Structural quality steel
- .5 CSA W59-13 - Welded steel construction (metal arc welding)
- .6 Environmental Protection Act, 1999.
- .7 Environmental Protection Act, Revised Statutes of Ontario 1990, Chapter E19 as amended, O. Reg. 102/94, Waste Audits and Waste Reduction Work Plans, and O. Reg. 103/94, Industrial, Commercial and Institutional Source Separation Programs.
- .8 MTO Ontario Traffic Manual, Book 7: Temporary Conditions and affiliated Provincial and Municipal By-Laws.

### 1.2 SAFETY PLANS

- .1 On award of Contract, submit to Departmental Representative, two copies of Contractor's and sub-contractors':
  - .1 Company Safety Plan.
  - .2 Site Specific Safety Plan.
  - .3 Safety Communication Plan.
  - .4 Emergency Procedures Plan.
  - .5 WSIB - Workplace Safety and Insurance Board Experience report.
  - .6 Traffic Management Plan.

### 1.3 CO-ORDINATION AND CO-OPERATION

- .1 Bridge site will be operational during execution of work.
- .2 Work area will not be occupied during execution of work.
- .3 Execute work with minimum disturbance to public and normal use of site.
- .4 Maintain access and exits.
- .5 Where security has been reduced by work of Contract, provide temporary means to maintain security.
- .6 Co-ordinate work on the bridge with the Bridge Master.

#### 1.4 ADDITIONAL DRAWINGS

- .1 Departmental Representative may furnish additional drawings to clarify work.
- .2 Such drawings become part of Contract Documents.

#### 1.5 FEES, PERMITS, CERTIFICATES AND LETTERS

- .1 Provide authorities having jurisdiction with information requested.
- .2 Pay fees and obtain certificates, permits and letters required.
- .3 Furnish certificates, permits and letters when requested.

#### 1.6 TEMPORARY FACILITIES AND SERVICES

- .1 Provide and maintain temporary facilities and services required to carry out work.
- .2 Remove temporary facilities and services on completion of work.
- .3 Provide and maintain temperature and enclosure required to prevent frost damage to work.

#### 1.7 METRIC SIZED MATERIALS

- .1 SI metric units of measurement are used exclusively on the drawings and in the specifications for this project.
- .2 Provide metric products in the sizes called for in the Contract Documents except where a valid claim can be made that a particular product is not available on the Canadian market.
- .3 Claims for exemptions from use of metric sized products shall be in writing and fully substantiated with supportive documentation. Promptly submit application to Departmental Representative for consideration and ruling. Non-metric sized products may not be used unless Contractor's application has been approved in writing by the Departmental Representative.

#### 1.8 MATERIAL AND EQUIPMENT

- .1 Use new products unless otherwise specified.
- .2 Deliver and store material and equipment to manufacturer's instructions with manufacturer's labels and seals intact.
- .3 When material or equipment is specified by standard or performance specifications, upon request of Departmental Representative, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.



### 1.9 CUTTING AND REMEDIAL WORK

- .1 Co-ordinate work to keep cutting and remedial work to a minimum.
- .2 Match work to adjoining construction and finishes.
- .3 Make good surfaces exposed or disturbed by work with material and finish to match existing adjoining surfaces.

### 1.10 ALTERATIONS TO EXISTING SITE

- .1 Remove and recycle or dispose of existing steel grating panel as shown on the Contract Drawings.
- .2 Fabricate, deliver and erect new steel grating panel including all appurtenances.
- .3 Remove existing railing post, store, and reinstall with new mounting hardware after grating panel replacement.
- .4 Coat top flange of stringers.
- .5 Touch up all damaged galvanized surfaces with zinc rich paint.

### 1.11 INSPECTION AND TESTING

- .1 When initial tests and inspections reveal work not to Contract requirements, pay for tests and inspections required by Departmental Representative on corrected work.
- .2 Remove existing damaged grating panel, grind down remnants pre-existing welds on the stringer flanges, and perform magnetic particle tests to confirm existing stringer integrity. The weld inspector shall be certified as a weld inspection organization by the Canadian Welding Bureau under CSA standard W178.1. Inspection technicians shall be certified visual welding inspectors under CSA standard W178.2 by the CWB and shall be certified to perform magnetic particle, liquid penetrant, and ultrasonic inspection under CGSB standards. All inspections shall be carried out under the direction of a professional engineer competent in the inspection of steel structures.

### 1.12 SCHEDULING

- .1 The Contractor shall schedule the panel replacement in one weekend from Friday night to Monday early morning. The bridge must be re-opened to existing four lanes of traffic operating within 48 days from the time of closure.
- .2 In the event of a closure of the adjacent Burlington Skyway structure(s), the Burlington Lift Bridge becomes a critical detour route for traffic on the QEW. The Contractor shall accommodate such an event as specified elsewhere in the Contract Documents.

### 1.13 COST BREAKDOWN

- .1 Within 7 days of notification of acceptance of bid furnish a cost breakdown by Section aggregating Contract amount.
- .2 Within 7 days of acceptance of bid submit a list of subcontractors.

#### 1.14 CLEANING

- .1 Maintain site free of accumulated waste and rubbish.
- .2 Final cleaning:
  - .1 Remove temporary protection.
  - .2 Remove dust, dirt and foreign matter from surfaces.

#### 1.15 CONSTRUCTION AND DEMOLITION WASTE

- .1 Carefully deconstruct and source separate materials/equipment and divert from D&C waste destined for landfill to maximum extent possible. Reuse, recycle or sell material off site for reuse except where indicated otherwise. On site sales are not permitted. Target for this project is 75% diversion from landfill.
- .2 Submit a waste reduction work plan indicating the materials and quantities of material that will be recycled and diverted from landfill.
  - .1 Indicate how material being removed from the site will be reused or recycled.
- .3 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.

#### 1.16 DESIGNATED SUBSTANCES

- .1 The work area has been surveyed for the presence of designated substances referred to in the Occupational Health and Safety Act and Regulations for Construction Projects, O. Reg. 213/91 as amended.
- .2 The list of designated substances present at the work area is attached at the end of this section.
- .3 Provide copies of this list to each prospective subcontractor prior to entering into a Contract with them.
- .4 Post prominent notices identifying and warning of the hazardous agent in the part of the workplace in which the agent is found or used. Notices shall be in English and other languages prescribed under the Act.

#### 1.17 SPECIAL PROTECTION AND PRECAUTIONS

- .1 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 acceptable to ESDC - Labour Program.

- .2 A watchman shall be stationed to stop all welding in the event of any watercraft being in the vicinity of welding sparks.

#### 1.18 POLLUTION CONTROL

- .1 Spills of deleterious substances:
- .1 Immediately contain, limit spread and clean up in accordance with provincial regulatory requirements.
  - .2 Report immediately to Ontario Spills Action Centre: 1-800-268-6060.
  - .3 Further information on dangerous goods emergency cleanup and precautions including a list of companies performing this work can be obtained from the Transport Canada 24-hour number (613) 996-6666 collect.

END OF SECTION

## PART 1 - GENERAL

### 1.1 RELATED REQUIREMENTS

- .1 Section 01 11 00.
- .2 Section 01 11 06.
- .3 Section 05 12 33.

### 1.2 PRICE AND PAYMENT PROCEDURES

- .1 Unit Price Contract according to Section 01 11 00.
- .2 Traffic Management Plan, MTO Encroachment Permit and all other necessary permits needed to perform the work will be paid by lump sum.
- .3 The lift bridge may be raised at any time to permit navigation and causing work stoppage.
  - .1 A nominal number of bridge lifts expected per night shift is three (3).
  - .2 Each event is expected to be approximately 20 minutes duration.
  - .3 In the event of bridge lift notifications will be provided by Departmental Representative no more than 30 minutes prior to lifts accommodating commercial shipping.
  - .4 Vacate Bridge immediately upon receiving notice from Departmental Representative.
  - .5 Reoccupy Bridge immediately after receiving notice from Departmental Representative.
  - .6 Bridge Lift Delay events to accommodate commercial shipping will be paid by each, according to the restrictions in the Unit Price Form.
  - .7 During daylight the lift bridge may be raised for recreational watercraft every 30 minutes.
  - .8 Bridge lift delay events to accommodate recreational watercrafts will not be paid.

### 1.3 GENERAL REQUIREMENTS

- .1 Comply with requirements of Acts, Regulations and affiliated Provincial and Municipal 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.
- .2 Comply with MTO Ontario Traffic Manual, Book 7: Temporary Conditions.
- .3 On award of Contract, prepare Traffic Management Plan and submit to Departmental Representative.
- .4 Obtain MTO Encroachment Permit and all other necessary permits needed to perform the work.
- .5 Night work is permitted.
- .6 No road closures or lane restrictions are permitted during peak traffic hours (0700

to 0900 and 1500 to 1700 hours).

- .7 In the event of Unscheduled Repair Call and Grating Panel Replacement full bridge closure may be implemented by the Owner.
- .8 The Contractor must notify the City of Hamilton and the City of Burlington prior to mobilization of traffic controls.
  - .1 For scheduled repairs, notifications must be provided at least one week in advance.
  - .2 For unscheduled repairs, notifications must be provided within 24 hours of, and no later than 6 hours before, the closure.

#### 1.4 PROTECTION OF PUBLIC TRAFFIC

- .1 When working on travelled way:
  - .1 Place equipment in position to minimize interference and hazard to public.
  - .2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
  - .3 Do not leave equipment on travelled way unattended.
  - .4 Where required, provide Mobile Work Zone Barrier to protect work area.
  - .5 Where required, Provide Buffer Vehicle to protect work area.
  - .6 When working immediately adjacent to open traffic, provide watchman to stop or divert traffic.
- .2 Close lanes of road only after receipt of written approval from Departmental Representative.
  - .1 Before re-routing traffic, erect suitable signs and devices as per Ontario Traffic Manual, Book 7: Temporary Conditions.
- .3 Provide and maintain road access and egress to property fronting along Work under the Contract and in other areas as indicated, except where other means of road access exist that meet approval of Departmental Representative. Provide and maintain protection for pedestrians and cyclists on the existing bridge sidewalk as directed by Departmental Representative.
- .4 Provide and maintain protection for pedestrians and cyclists on the existing bridge sidewalk as directed by Departmental Representative.
- .5 Provide welding shields to protect the public from arc flash.

#### 1.5 INFORMATIONAL AND WARNING DEVICES

- .1 Provide and maintain signs, and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.
- .2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as per Ontario Traffic Manual, Book 7: Temporary Conditions.
- .3 Place signs and other devices in locations recommended in Ontario Traffic Manual, Book 7: Temporary Conditions.
- .4 For panel replacement, provide Temporary Programmable Variable Message Board Signs on both approaches, one week in advance of the proposed work, to inform the Public of the traffic delays.

- .5 Remove or cover signs which do not apply to conditions existing from day to day.
- .6 Meet with Departmental Representative prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of Departmental Representative.
- .7 Continually maintain traffic control devices in use:
  - .1 Check signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.

#### 1.6 CONTROL OF PUBLIC TRAFFIC

- .1 Flagging personnel shall not control traffic when the traffic signals are in operation.
- .2 Provide competent flag personnel, trained in accordance with, and properly equipped to Ontario Traffic Manual, Book 7: Temporary Conditions for situations as follows:
  - .1 When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.
  - .2 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.
  - .3 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.
  - .4 Where temporary protection is required while other traffic control devices are being erected or taken down.
  - .5 For emergency protection when other traffic control devices are not readily available.
  - .6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.
  - .7 At each end of restricted sections where pilot cars are required.
  - .8 Delays to public traffic due to Contractor's operators: 20 minutes maximum.
  - .9 Where two-way traffic is restricted to one lane on the bridge.

#### 1.7 OPERATIONAL REQUIREMENTS

- .1 Maintain existing conditions for traffic throughout period of contract except that, when required for construction under contract and when measures have been taken as specified and approved by Departmental Representative to protect and control public traffic, existing conditions for traffic to be restricted as follows:
  - .1 Traffic lanes may be closed during off-peak hours to accommodate active work on the bridge subject to MTO permit requirements.
- .2 Provide temporary illumination for night works where required.
- .3 Ensure a working window with no snow in the weather forecast to avoid interference with snow ploughing operation.
- .4 Maintain existing conditions for traffic crossing right-of-way.
- .5 The lift bridge may be raised at any time to permit navigation. All vehicles, small tools and loose materials shall be removed immediately upon receiving notification from Departmental Representative.

- .6 In emergency cases where the Burlington Skyway at QEW is fully closed to public traffic, traffic configuration is as follows:
  - .1 For scheduled and unscheduled deck repairs, under the direction of the Departmental Representative reconfigure the work zone and move the work zone barriers to allow a minimum of two lanes of traffic in same direction
  - .2 For grating replacement work, under the direction of the Departmental Representative reconfigure the work zone and move the work zone barriers to allow a maximum of one lane of traffic, with appropriate flagging.

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not Used.

## PART 3 - EXECUTION

### 3.1 NOT USED

- .1 Not Used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 REFERENCES

- .1 National Building Code 2015 (NBC):
  - .1 NBC 2015, Division B, Part 8 Safety Measures at Construction and Demolition Sites.
- .2 National Fire Code 2015 (NFC):
  - .1 NFC 2015, Division B, Part 5 Hazardous Processes and Operations, subsection 5.6.1.3 Fire Safety Plan.
- .3 Province of Ontario:
  - .1 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.
  - .2 O. Reg. 490/09, Designated Substances.
  - .3 Workplace Safety and Insurance Act, 1997.
  - .4 Municipal statutes and authorities.
- .4 Treasury Board of Canada Secretariat (TBS):
  - .1 Treasury Board, Fire Protection Standard April 1, 2010  
<http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=17316>

### 1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 11 06.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
  - .1 Results of site specific safety hazard assessment.
  - .2 Results of safety and health risk or hazard analysis for site tasks and operation.
  - .3 Measures and controls to be implemented to address identified safety hazards and risks.
- .3 Provide a Fire Safety Plan, specific to the work location, in accordance with NBC, Division B, Article 8.1.1.1.3 prior to commencement of work. The plan shall be coordinated with, and integrated into, the existing Building, Facility and Tenant's Emergency Procedures and Evacuation Plan in place at the site. Departmental Representative will provide Building, Facility and Tenant's Emergency Procedures and Evacuation Plan. Deliver two copies of the Fire Safety Plan to the Departmental Representative not later than 14 days before commencing work.
- .4 Contractor's and Sub-contractors' Safety Communication Plan.
- .5 Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations. Coordinate plan with existing Building, Facility and procedures provided by Departmental Representative.
- .6 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



3 days after receipt of comments from Departmental Representative.

- .7 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.
- .8 Submit names of personnel and alternates responsible for site safety and health.
- .9 Submit records of Contractor's Health and Safety meetings when requested.
- .10 Submit 1 copy of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative daily.
- .11 Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.
- .12 Submit copies of incident and accident reports.
- .13 Submit Material Safety Data Sheets (MSDS).
- .14 Submit Workplace Safety and Insurance Board (WSIB)- Experience Rating Report.

### 1.3 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to commencement of Work.
- .2 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

### 1.4 SAFETY ASSESSMENT

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

### 1.5 MEETINGS

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

### 1.6 REGULATORY REQUIREMENTS

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

### 1.7 PROJECT/SITE CONDITIONS

- .1 Work at site may involve contact with:
  - .1 Lead in paint
  - .2 Guano in deck steel grating panels.

### 1.8 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns either accepting or requesting improvements.
- .3 Relief from or substitution for any portion or provision of minimum Health and Safety standards specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing.
- .4 Contractor shall have all required Personal Protective Equipment (PPE) while working on site, in accordance with Occupational Health and Safety Act and Regulations for Construction Projects.

### 1.9 COMPLIANCE REQUIREMENTS

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

### 1.10 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .3 Where applicable be the designated "Constructor", as defined by Occupational Health and Safety Act and Regulations for Construction Projects for the Province of Ontario.

### 1.11 UNFORSEEN HAZARDS

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

### 1.12 HEALTH AND SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. In accordance with subsection 1.15.2, Health and Safety Co-ordinator must:
  - .1 Have site-related working experience specific to activities associated with abatement of lead and asbestos containing materials.
  - .2 Have working knowledge of occupational safety and health regulations.
  - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training

- are not permitted to enter site to perform Work.
- .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
- .5 Be on site during execution of Work and report directly to and be under direction of Registered Occupational Hygienist, Certified Industrial Hygienist and site supervisor.

### 1.13 POSTING OF DOCUMENTS

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

### 1.14 CORRECTION OF NON-COMPLIANCE

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

### 1.15 WORK STOPPAGE

- .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.
- .2 Assign responsibility and obligation to Competent Supervisor to stop or start Work when, at Competent Supervisor's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.
- .3 Provide a safety watcher for small boats passing through the canal under the work area.

## PART 2 - PRODUCTS

### 2.1 NOT USED

.1 Not used.

## PART 3 - EXECUTION

### 3.1 NOT USED

.1 Not used.

END OF SECTION

## PART 1 - GENERAL

### 1.1 RELATED REQUIREMENTS

- .1 Section 01 11 06.
- .2 Section 05 12 33.

### 1.2 DEFINITIONS

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

### 1.3 REFERENCES

- .1 U.S. Environmental Protection Agency (EPA)/Office of Water
  - .1 EPA 832/R-92-005-[92], Storm Water Management for Construction Activities, Chapter 3.
- .2 EPA General Construction Permit (GCP) [2012].

### 1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
  - .1 Submit 2 copies of WHMIS MSDS.
- .2 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review by Departmental Representative.
- .3 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.
- .4 Address topics at level of detail commensurate with environmental issue and required construction task[s].
- .5 Include in Environmental Protection Plan:
  - .1 Name[s] of person[s] responsible for ensuring adherence to Environmental Protection Plan.
  - .2 Name[s] and qualifications of person[s] responsible for manifesting hazardous waste to be removed from site.
  - .3 Name[s] and qualifications of person[s] responsible for training site personnel.
  - .4 Descriptions of environmental protection personnel training program.

- .5 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.
  - .1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
- .6 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- .7 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
- .8 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

## 1.5 FIRES

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

## 1.6 WORK ADJACENT TO WATERWAYS

- .1 Construction equipment to be operated on the structure and approach roadways only.
- .2 Waterways to be kept free of waste material and debris.
- .3 Use netting or other means necessary to prevent materials, tools, etc. from falling into the Burlington Canal, or onto roadways, pathways, sidewalks, staging areas, etc.

## 1.7 POLLUTION CONTROL

- .1 Control emissions from equipment and plant in accordance with local authorities' emission requirements.
- .2 Prevent extraneous materials from contaminating air and waterways beyond application area.
  - .1 Provide temporary enclosures as directed by Departmental Representative.
- .3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.
- .4 Spills of deleterious substances:
  - .1 Immediately contain, limit spread and clean up in accordance with provincial regulatory requirements.
  - .2 Report immediately to Ontario Spills Action Centre: 1-800-268-6060.
  - .3 Further information on dangerous goods emergency cleanup and precautions including a list of companies performing this work can be obtained from the Transport Canada 24-hour number (613) 996-6666 collect.

## 1.8 NOTIFICATION

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

## PART 2 - PRODUCTS

### 2.1 NOT USED

- .1 Not Used.

## PART 3 - EXECUTION

### 3.1 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 11 06.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 11 06.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 11 06.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
- .4 All work including containment of debris and cleaning activities shall be done in accordance with the requirements of Section 01 11 06 and Section 01 35 43.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

- .1 Inspection and testing, administrative and enforcement requirements.

### 1.2 INSPECTION

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

### 1.3 INDEPENDENT INSPECTION AGENCIES

- .1 The Owner may retain and pay an Independent Testing Agency to conduct material testing and confirm material and procedures meet the specified requirements.
- .2 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .3 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and re-inspection.

### 1.4 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work.
- .2 Co-operate to provide reasonable facilities for such access.

### 1.5 REJECTED WORK

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.



- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in the opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative may deduct from Contract Amount difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Departmental Representative.

#### 1.6 MILL TESTS

- .1 Submit mill test certificates as required in specification Sections.

#### PART 2 - PRODUCTS

##### 2.1 NOT USED

- .1 Not Used.

#### PART 3 - EXECUTION

##### 3.1 NOT USED

- .1 Not Used.

END OF SECTION

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## PART 1 - GENERAL

### 1.1 SUMMARY

- .1 Comply with requirements of this Section when performing following Work: Type 1 Operation.
  - .1 Removal of lead-containing coatings from structural steel stringers below the grating panel designated for replacement using a power tool with an effective dust collection system equipped with a HEPA filter.

### 1.2 REFERENCES

- .1 Ontario Ministry of Labour
  - .1 Occupational Health and safety Branch, Guideline Lead on Construction Projects, September 2004, and O .Reg. 490/09 respecting Designated Substances - Lead made under the Occupational Health and Safety Act as amended by O. Reg. 148/12 and O. Reg. 149/12.
- .2 Department of Justice Canada
  - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .3 Health Canada
  - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .4 Human Resources and Social Development Canada (HRSDC)
  - .1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.
- .5 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .6 U.S. Environmental Protection Agency (EPA)
  - .1 EPA 747-R-95-007-1995, Sampling House Dust for Lead.
- .7 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (NIOSH)
  - .1 NIOSH 94-113 - NIOSH Manual of Analytical Methods (NMAM), 4th Edition (1994).
- .8 U.S. Department of Labour - Occupational Safety and Health Administration (OSHA) - Toxic and Hazardous Substances
  - .1 Lead in Construction Regulation - 29 CFR 1926.62-1993.
- .9 Underwriters' Laboratories of Canada (ULC)
- .10 Report of the Royal Commission on Matters of health and Safety Arising from the Use of Asbestos in Ontario, 1984.
- .11 Report: Lead-Containing Coatings at Burlington Lift Bridge, Burlington, Ontario dated November 8, 2013 (attached at the end of this section).

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### 1.3 DEFINITIONS

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .2 Authorized Visitors: Departmental Representative or designated representatives.
- .3 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects over cuts and tears, and elsewhere as required to provide protection and isolation. For protection of underlying surfaces from damage and to prevent lead dust entering in clean area.
- .4 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for scope of work.
- .5 Action level: employee exposure, without regard to use of respirators, to airborne concentration of lead of 50 micrograms per cubic meter of air (50 ug/m<sup>3</sup>) calculated as 8-hour time-weighted average (TWA). Minimum precautions for lead abatement are based on airborne lead concentrations less than 0.05 milligrams per cubic meter of air for removal of lead based paint by methods noted in paragraph 1.1.
- .6 Competent person: individual and Departmental Representative capable of identifying existing lead hazards in workplace taking corrective measures to eliminate them.
- .7 Lead dust: wipe sampling on vertical surfaces and/or horizontal surfaces, dust and debris is considered to be lead contaminated if it contains more than 40 micrograms of lead in dust per square foot.

### 1.4 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Provide submittals in accordance with Section 01 11 06.
- .2 Provide proof satisfactory to Departmental Representative] that suitable arrangements have been made to dispose of lead based paint waste in accordance with requirements of authority having jurisdiction.
- .3 Provide proof of Contractor's General and Environmental Liability Insurance.
- .4 Quality Control:
  - .1 Provide Departmental Representative necessary permits for transportation and disposal of lead based paint waste and proof that lead based paint waste has been received and properly disposed.
  - .2 Provide proof satisfactory to Departmental Representative that employees have had instruction on hazards of lead exposure, respirator use, dress, and aspects of work procedures and protective measures.
- .5 Provide proposed layout of decontamination systems and enclosures.

### 1.5 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial and

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local requirements pertaining to lead paint, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.

.2 Health and Safety:

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.
- .2 Safety Requirements: worker and visitor protection.
  - .1 Protective equipment and clothing to be worn by workers and visitors in work Area include:
    - .1 Respirator NIOSH approved and equipped with replaceable HEPA filter cartridges with an assigned protection factor of 10, acceptable to Authority having jurisdiction. Suitable for type of lead and level of lead dust exposure. Provide sufficient amount of filters. It should be noted that respirators should not be necessary if general work procedures are followed and if the level of lead in the air is less than 0.05 mg/m3.
    - .2 Half mask respirator: half-mask particulate respirator with N, R, P - series filter, and 95, 99, 100 % efficiency could be provided.
  - .2 Eating, drinking, chewing, and smoking are not permitted in work area.
  - .3 Ensure workers wash hands and face when leaving work area. Facilities for washing are to be provided by the Contractor.
  - .4 Visitor Protection:
    - .1 Provide approved respirators to Authorized Visitors to work areas.
    - .2 Instruct Authorized Visitors procedures to be followed in entering and exiting work area.

## 1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 11 06
- .2 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
- .3 Disposal of lead waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of lead waste in sealed double thickness 0.15 mm bags or leak proof drums. Label containers with appropriate warning labels.
- .4 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

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## 1.7 EXISTING CONDITIONS

- .1 Reports and information pertaining to lead based paint to be handled, removed, or otherwise disturbed and disposed of during this Project are available at the end of this section.
- .2 Notify Departmental Representative of lead based paint discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

## 1.8 SCHEDULING

- .1 Not later than two days before beginning Work on this Project notify the following in writing:
  - .1 Appropriate Regional or Zone Director of Medical Services Branch, Health Canada.
  - .2 Provincial Ministry of Labour.
  - .3 Disposal Authority.
- .2 Inform sub trades of presence of lead-containing materials identified in Existing Conditions.
- .3 Provide Departmental Representative copy of notifications prior to start of Work.
- .4 Hours of Work: perform work involving existing paint removal located at existing panel to be removed during specified working hours. Include in Contract Sum additional costs due to this requirement.

## 1.9 PERSONAL TRAINING

- .1 Provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of lead exposure, in personal hygiene, in aspects of work procedures, and in use, cleaning, and disposal of respirators.
- .2 Instruction and training related to respirators includes, at minimum:
  - .1 Proper fitting of equipment.
  - .2 Inspection and maintenance of equipment.
  - .3 Disinfecting of equipment.
  - .4 Limitations of equipment.
- .3 Instruction and training must be provided by competent, qualified person.
- .4 Supervisory personnel to complete required training.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Polyethylene 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.

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- .2 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under cold, dry conditions and wet conditions using amended water.
- .3 Lead waste containers: metal or fibre type acceptable to dump operator with tightly fitting covers and 0.15 mm thickness sealable polyethylene liners.
  - .1 Label containers with pre-printed bilingual cautionary Warning Lead clearly visible when ready for removal to disposal site.

## PART 3 - EXECUTION

### 3.1 SUPERVISION

- .1 One Supervisor for every ten workers is required.
- .2 Supervisor must remain within work area during disturbance, removal, or handling of lead based paints.

### 3.2 PREPARATION

- .1 Remove and store items to be salvaged or reused.
  - .1 Protect and wrap items and transport and store in area specified by Departmental Representative.
- .2 Work Area:
  - .1 Provide containment to Class 1P requirements of SSPC Guide 6 with polyethylene shrouding around work area.
  - .2 Pre-clean steel stringers within work area, using HEPA vacuum and cover and seal with polyethylene sheeting and tape.
  - .3 Clean work area using HEPA vacuum. If not practicable, use wet cleaning method. Do not raise dust.
  - .4 Where water application is required for wetting lead containing materials, provide temporary water supply appropriately sized for application of water as required.
  - .5 Provide electrical power and shut off for operation of powered tools and equipment. Provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical cables and equipment.
- .3 Do not start work until:
  - .1 Arrangements have been made for disposal of waste.
  - .2 Tools, equipment, and materials waste containers are on site.
  - .3 Arrangements have been made for building security.
  - .4 Notifications have been completed and preparatory steps have been taken.

### 3.3 LEAD ABATEMENT

- .1 Removal of lead-containing coatings using power tools with an effective dust collection system equipped with a HEPA filter.
- .2 Remove lead based paint in small sections and pack as it is being removed in sealable 0.15 mm plastic bags and place in labelled containers for transport.

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- .3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to staging area. Clean external surfaces thoroughly again by wet sponging. Wash containers thoroughly pending removal to outside. Ensure containers are removed by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .4 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.
- .5 After wire brushing and wet sponging to remove visible lead based paint, and after encapsulating lead containing material impossible to remove, wet clean entire work area, and equipment used in process. After inspection by Departmental Representative and when dry apply primer coat to surfaces of work area in accordance with Section 09 79 19.

### 3.4 INSPECTION

- .1 Perform inspection to confirm compliance with specification and governing authority requirements. Deviations from these requirements not approved in writing by Departmental Representative will result in work stoppage, at no cost to Owner.
- .2 Departmental Representative will inspect work for:
  - .1 Adherence to specific procedures and materials.
  - .2 Final cleanliness and completion.
  - .3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

### 3.5 FINAL CLEANUP

- .1 Remove polyethylene sheet by rolling it away from walls to center of work area. Vacuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum.
- .2 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and sealed labelled waste containers for transport.
- .3 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.

### 3.6 RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS

- .1 Repair or replace objects damaged in course of work to their original state or better, as directed by Departmental Representative.

END OF SECTION

## PART 1 - GENERAL

### 1.1 REFERENCES

- .1 Ontario Health and Safety Act and Regulations for Construction Projects, Revised Statutes of Ontario RSO 1990, Chapter O.1 as amended, O. Reg. 838/90 (Asbestos -Construction) as amended by O. Reg. 510/92 as amended.
- .2 Canada Labour Code 1985 Canada Occupational Safety and Health Regulations.
- .3 Environmental Protection Act RRO 1990, O. Reg. 347 as amended.

### 1.2 OUTLINE OF WORK

- .1 Cleanup steel stringer surfaces in the work area and decontaminate.
- .2 Removal of guano shall follow Type 1 asbestos removal process in accordance with Ontario Regulation 838 under the Occupational Health and Safety Act as modified in this Section.
- .3 Removal, disposal and cleanup must proceed slowly and carefully in a systematic manner.

### 1.3 DEFINITIONS

- .1 HEPA Filter: a high efficiency particulate aerosol filter that is at least 99.97% efficient in collecting a 0.3 micrometer aerosol.
- .2 HEPA vacuum: vacuum equipment utilizing HEPA Filters.
- .3 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape seals along all edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide a continuous polyethylene membrane to protect underlying surfaces from water damage, and to prevent escape of spores through sheeting into clean areas.
- .4 Authorized visitors: Departmental Representative or designated representatives, Clerk-of-Works, and persons representing regulatory agencies.
- .5 Work areas: where actual removal of guano and sealing of surfaces takes place.
- .6 Amended water: water with a non-ionic surfactant wetting agent added to reduce water tension to allow thorough wetting of guano.

### 1.4 REGULATORY AGENCIES

- .1 Comply with Federal, Provincial, and local requirements, provided that in any case of conflict among these requirements or with these specifications the more stringent requirement shall comply.



### 1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Before commencing work:
  - .1 Obtain from the appropriate agency and submit to Departmental Representative all necessary permits for transporting and disposal of waste. Ensure that dump operator is fully aware of hazardous nature of material being dumped and proper methods of disposal. Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to receive and properly dispose of waste. In Ontario, this means that the wastes shall be handled and disposed of under the requirements of Ontario Regulation 347.
  - .2 Submit proof satisfactory to Departmental Representative that all employees have had instruction on the hazards of the work, respirator use, dress, use of showers, entry and exit from work areas, and all aspects of work procedures and protective measures. The Contractor's Superintendent shall have attended an asbestos abatement course, of not less than two days duration, approved by the Departmental Representative. Submit proof of attendance in the form of a certificate.
  - .3 Submit layout of proposed scaffolding and enclosures to Departmental Representative for review.
- .2 Work must be carried out by an experienced asbestos removal company that is familiar with the hazard controls required for such an operation. Submit an outline of experience.

### 1.6 WORKER PROTECTION

- .1 Instructions: Before commencing work instruct workers in use of respirators, dress, showers, entry and exit from work areas, and all aspects of work procedures and protective measures.
- .2 Respirators: Provide workers with personally issued and marked respiratory equipment. Equipment must be powered air purifying positive pressure dust respirators with HEPA filters. An acceptable example is the Breathe-Easy 1 system by RACAL. This equipment must be worn at all times. Filters must be replaced daily. All respiratory protective devices shall be acceptable to the Occupational Health Branch of Ministry of Labour. No supervisor, worker or authorized visitor shall wear facial hair which affects seal between respirator and face.
- .3 Protective Clothing: Provide workers with full body coveralls including head covers. Once coveralls are worn in the work area, they must be treated as contaminated waste and disposed of. Provide safety shoes and other protective apparel required by Ministry of Labour construction regulations.
- .4 Eating, drinking, chewing, and smoking are not permitted in the Guano Work Area.
- .5 Before leaving Guano Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for guano waste, impervious to guano, identified as guano waste, cleaned with a damp cloth or a vacuum equipped

with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.

- .6 Facilities for washing hands and face shall be provided within or close to the Guano Work Area.
- .7 Ensure workers wash hands and face when leaving Guano Work Area. Facilities for washing are to be provided by the Contractor.
- .8 Ensure that no person required to enter a Guano Work Area has facial hair that affects seal between respirator and face.

### 1.7 VISITOR PROTECTION

- .1 Provide protective clothing and approved respirators to authorized visitors to work areas.
- .2 Instruct authorized visitors in the use of protective clothing and respirators.
- .3 Instruct authorized visitors in proper procedures to be followed in entering into and exiting from work areas.

### 1.8 NOTIFICATION

- .1 Not later than ten (10) days before commencing work on this project notify the following in writing:
  - .1 The appropriate Regional or Zone Director of Medical Services Branch, Health and Welfare Canada.
  - .2 Regional Office of Labour Canada.
  - .3 Provincial Department of Labour.
  - .4 Disposal Authority.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Polyethylene: minimum 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.
- .2 FR polyethylene: minimum 0.15 mm thick, woven fibre reinforced fabric bonded both sides with polyethylene.
- .3 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.
- .4 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether, or other material approved by Departmental Representative, mixed with water in a concentration to provide adequate penetration and wetting of material to be removed.
- .5 Receptors: Receptors for the disposal of waste materials contaminated with guano shall comply with Section 14 of Ministry of Environment Regulation 309. Use a "double bagging" system with the first container consisting of minimum

0.15 mm thick sealable polyethylene bag; second container to be rigid sealable metal or fibre drum with tightly fitting cover and 0.15 mm thickness sealable, polyethylene liner or a rigid, sealable, impermeable cardboard box. Containers must be acceptable to disposal site selected and Ministry of the Environment. Labelling shall refer to "Pigeon Guano" rather than "Asbestos".

- .6 Bleach: Undiluted household bleach, approximately 5% sodium hypochlorite.
- .7 Sprayer: garden reservoir type, low velocity, capable of producing mist or fine spray.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- .1 Before beginning Work, isolate Guano Work Area using, minimum, preprinted cautionary guano warning signs in both official languages that are visible at access routes to Guano Work Area.
  - .1 At each access to work areas install warning signs in upper case "Helvetica Medium" letters reading as follows: "CAUTION GUANO HAZARD AREA (25mm) NO UNAUTHORIZED ENTRY (19mm) WEAR ASSIGNED PROTECTIVE EQUIPMENT (19mm) BREATHING GUANO DUST MAY CAUSE SERIOUS BODILY HARM (7mm)".
- .2 Prevent spread of dust from Guano Work Area using measures appropriate to work to be done.
  - .1 Supply and erect steel scaffolding system under work area to gain access to steel stringers.
  - .2 Obtain approval from the Ontario Ministry of Labour, Construction Safety Branch, prior to allowing workmen access to scaffolding system.
  - .3 Use FR polyethylene drop sheets over flooring in Guano Work Area where dust and contamination cannot otherwise be safely contained. Drop sheets are not to be reused.
  - .4 Use polyethylene sheeting with taped seals to create an enclosure around the perimeter of Guano Work Area to contain dust.
- .3 Guano Removal work shall not commence until:
  - .1 Arrangements have been made for disposal of waste.
  - .2 Work areas are effectively segregated.
  - .3 Tools, equipment and materials waste containers are on hand.
  - .4 Warning signs specified are displayed where access to contaminated areas is possible.
  - .5 Scaffolding has been approved.
  - .6 All notifications have been completed and other preparatory steps have been taken.

### 3.2 GUANO REMOVAL

- .1 All work must proceed slowly and carefully.
- .2 Remove dead birds prior to removal of guano.

- .3 Apply the amended water in a fine mist using the pump type sprayer until the guano is just damp. Apply with care so that water does not drip from surfaces but only dampens them.
- .4 Remove guano in small sections and place gently in first container. Limit the weight of material in each bag to prevent breakage.
- .5 Start guano removal from steel stringers. Dampen guano and scrape off surfaces carefully into containers. Work from top of stringers downwards. Clean stringers at completion of this stage.
- .6 Complete the removal with HEPA vacuum equipment, ensuring that guano is removed from all cracks and openings. Use vacuum only on dampened surfaces; dry vacuuming is NOT permitted.
- .7 Wipe the entire attic area clean with household bleach. Workers must wear the proper gloves when working with bleach. (Contractor should note that this work can be done only over short time periods due to the strong odour). Application of bleach must be sufficient to dampen the surface but not cause bleach to drip from the surface. Ensure coverage on rough surfaces by using a mist spray or a brush. Do not use bleach on plaster ceiling. Allow sufficient time for surfaces to dry before applying sealer.
- .8 After all guano removal, disinfecting of surfaces, wet clean the equipment used in the process.

### 3.3 DISPOSAL

- .1 As containers are filled with waste material, seal and place in second container and seal second container. Remove to staging area, clean and store in Holding Room.
- .2 Dispose of waste materials in accordance with O. Reg. 347 and Section 01 11 06.
- .3 Although the guano is not considered to be "Hazardous Waste" as defined by the Ministry of the Environment, caution must be taken to avoid damage to the containers prior to burial. Do NOT label as "Hazardous Waste".
- .4 Ensure that each shipment of containers transported to dump is accompanied by Contractor's representative who shall ensure that dumping is done in accordance with governing regulations.

### 3.4 FINAL CLEANUP

- .1 Following cleaning specified above, proceed with final cleanup.
- .2 Remove polyethylene sheet by rolling it away from walls to center of work area. Vacuum all visible particles observed during cleanup, immediately, using HEPA vacuum equipment.
- .3 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in plastic bags and sealed labelled waste containers for transport.

- .4 Work areas and other enclosures that may be contaminated shall be included in the clean-up.
- .5 Sealed waste containers and all equipment used in the work shall be included in the cleanup and shall be removed from work areas, via the Container and Equipment Decontamination Enclosure System, at an appropriate time in the cleaning sequence.
- .6 A final check shall be carried out to ensure that no dust or debris remains on surfaces as a result of dismantling operations.

END OF SECTION

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## PART 1 - GENERAL

### 1.1 RELATED REQUIREMENTS

- .1 Section 01 11 06

### 1.2 DEFINITIONS

- .1 Engineer: means a professional engineer licensed to practice in the province of Ontario.
- .2 Fracture Critical Member: means a member, including attachments, in a single load path structure that is subject to tensile stress and whose failure could lead to collapse of the structure.
- .3 New Steel: means structural steel that has not previously been used.
- .4 Grating Panel: means new structural steel deck grating panel that has not previously been used.

### 1.3 PRICE AND PAYMENT PROCEDURES

- .1 The following items of work will be paid based on the actual quantities measured on site and unit price quoted in the Bid and Acceptance Form. For measurement purposes of the following items, a count shall be made of the number (each) of the completed repairs.
  - .1 Structural Steel Repair Type A.
  - .2 Structural Steel Repair Type B.
  - .3 Structural Steel Repair Type C.
  - .4 Structural Steel Repair Type D.
  - .5 Structural Steel Repair Type E.
  - .6 Grating Panel Replacement.
  - .7 Grating Panel M-Beam Web Crack Repair
- .2 The fixed price items detailed in the Contractor's cost breakdown, and the unit price items listed in the Bid and Acceptance Form shall be composite items for all costs to complete the work in accordance to the contract documents, including but not limited to:
  - .1 Access including all access equipment and/or access works;
  - .2 Field measurements;
  - .3 Preparation and submission of all documents associated to the work;
  - .4 Protections required to allow the execution of works in the grating.
  - .5 Grinding off existing welds as required;
  - .6 Marking of steel components;
  - .7 Preparation, supply, fabrication and installation of new steel pieces;
  - .8 Removal of existing steel Grating Panels;
  - .9 Preparation, supply, fabrication and installation of new steel Grating Panels;
  - .10 Removal, storage and subsequent re-installation of any railings and appurtenances associated with panel replacement.
  - .11 Welding of structural steel components;
  - .12 All costs related to the work execution (e.g. supervision, security, shelter, lighting, heating, overtime, etc.) depending of the allowed working hours (day, night and/or weekends);
  - .13 Replacement of missing grating members;

- .14 Management and disposal of excess materials. In the event that the spent material is tested to be leachate toxic, payment of any costs for the disposal of the spent material as hazardous waste, that are additional to those for disposal as non-hazardous solid industrial waste, shall be paid as Extra Work after receipt of disposal weight ticket(s).
  - .15 Handling, transportation, and delivery costs including of road signs and/or flagmen required upon delivery of equipment, materials and equipment;
  - .16 Management and administration fees related to the prescribed work;
  - .17 Any other labor, equipment or materials required to complete the work required as described herein, and reflected in the contract documents.
- .3 Consult the plans in the present contract and all other existing plans made available, and visit the site to establish own quantities and costs.
- .4 All costs, including the cost of access, inspection, and testing, associated with the correction or repairs of rejectable defects are the responsibility of the Contractor.
- .5 Progress payments will only be made after:
- .1 Completion of work in conformance with the contract documents.
  - .2 Completion of required Quality Control Inspections by the Contractor associated to the work being paid;
  - .3 Submission and acceptance of all documentation required in this specification associated to the work being paid.

#### 1.4 REFERENCES

- .1 CSA International (CSA)
- .2 CSA S6-14 - Canadian Highway Bridge Design Code.
- .3 CSA G40.20-13/G40.21-13 - General requirements for rolled or welded structural quality steel / Structural quality steel
- .4 CSA W48-14 - Filler metals and allied materials for metal arc welding
- .5 CSA W59-13 - Welded steel construction (metal arc welding)
- .6 CSA W47.1-09 (R2014) - Certification of companies for fusion welding of steel
- .7 CSA W178.1-14 - Certification of welding inspection organizations
- .8 CSA 178.2-14 - Certification of welding inspectors
- .9 CAN/CSA-ISO 14341:11 (R2016) - Welding consumables - Wire electrodes and weld deposits for gas shielded metal arc welding of non-alloy and fine grain steels - Classification (Adopted ISO 14341:2010, second edition, 2010-02-15)
- .10 CAN/CSA-W117.2-12 - Safety in welding, cutting, and allied processes
- .11 CSA S269.1-16, Falsework and Formwork
- .12 ANSI/NAAMM MBG 532-09 Heavy Duty Metal Bar Grating Manual - Fifth edition

#### 1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Convene pre-installation meeting one week prior to beginning work of this Section, with Departmental Representative:
- .1 Verify project requirements.
  - .2 Review installation and substrate conditions.
  - .3 Confirm repair locations with the Departmental Representative.
  - .4 Co-ordination with other subtrades.
  - .5 Review manufacturer's written installation instructions and warranty requirements.

- .2 Prior to start of Work arrange for site visit with Departmental Representative to examine existing site conditions.
- .3 Ensure key personnel attend.
- .4 Departmental Representative will provide written notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.
- .5 Site Meetings: as part of Manufacturer's Services described in PART 3.8 - FIELD QUALITY CONTROL, schedule site visits, to review Work.

## 1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 11 06.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for structural steel and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.
- .3 Welding Procedures
  - .1 Submit the welding procedures to the Departmental Representative at least 14 days prior to commencement of welding work.
  - .2 Prior to making a submission, the seals and signature of a professional Engineer licensed in the provinces in Ontario shall be affixed on the welding procedures verifying that the details and procedures are consistent with the Contract Documents.
  - .3 Non-standard or non-prequalified welding procedures to be stamped and signed by a welding engineer licensed in the province of Ontario.
- .4 Shop Drawings - Grating Panel:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
  - .2 Indicate shop and erection details including shop splices, cuts, connections, holes, bearing plates, threaded fasteners, rivets and welds. Indicate welds by CSA W59, welding symbols.
  - .3 Proposed welding procedures to be stamped and approved by Canadian Welding Bureau.
  - .4 Submit description of methods, temporary bracing and strengthening, sequence of erection and type of equipment proposed for use in erecting structural steel.
- .5 Installation sequence and plan for review by Departmental Representative.
  - .1 Ensure coordination with marine traffic operations.
  - .2 Indicate duration and inter-relation of all tasks to be performed.
- .6 Submit experience of site foreman, minimum of 10 years of construction practice with open decks on steel bridges required.
- .7 Mill Test Certificates
  - .1 Prior to the use of any material, a copy of the mill test certificates for that material shall be submitted to the Departmental Representative, confirming that the material is according to the Contract Documents.
  - .2 When mill test certificates originate from a mill outside of Canada or the United States of America, have the information on the mill test certificate verified by testing at a Canadian laboratory. This laboratory shall be



certified by an organization accredited by the Standards Council of Canada to comply with the requirements of ISO/IEC 17025 for the specific tests or type of tests required by the material standard specified on the mill test certificate. The mill test certificates shall be stamped with the name of the Canadian laboratory and appropriate wording stating that the material is according to the specified Contract requirements. The stamp shall include the appropriate material specification number, testing date (i.e., yyyy-mm-dd), and the signature of an authorized officer of the Canadian laboratory.

- .8 As-Built Drawings
  - .1 Within 14 days of completion of each Scheduled Repair Call, Unscheduled Repair Call, or Grating Panel Replacement, submit As-Built Drawings.
  - .2 As-Built Drawings must be prepared concurrently with progress of work.
  - .3 As-Built Drawings must provide information related to location and type of repairs.
- .9 Return of Submissions
  - .1 Each submission will be returned by the Departmental Representative as one of the following:
    - .1 Returned with the wording that allows for permission to construct. In this case, work can commence on receipt of the procedures by the Contractor.
    - .2 Returned with the wording that allows for permission to construct as noted. In this case, work can commence on receipt of the procedures by the Contractor. The procedures shall be updated as noted and shall be sealed and signed by an Engineer stating the procedures have been revised according to the noted comments.
    - .3 Showing only required changes. In this case, the procedures shall be updated as required and the submission process repeated.

## 1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 11 06 and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
  - .1 Ensure Departmental Representative has delivery schedules 7 days minimum prior to shipping.
- .3 Storage and Handling Requirements:
  - .1 Provide protective blocking for lifting, transportation and storing.
    - .1 Exercise care during fabrication, transportation and erection so as not to damage Grating Panel.
    - .2 Do not notch edges of members.
    - .3 Do not cause excessive stresses.
- .4 Mark mass on members weighing more than 3 tonnes.
- .5 Protect unpainted weathering steel, before erection, with waterproof covering.
- .6 Ensure that no portion of steel comes into contact with ground.
  - .1 Replace defective or damaged materials with new.
  - .2 Do not cause excessive stresses.

## 1.8 QUALITY ASSURANCE

- .1 The Departmental Representative may choose to conduct visual inspection, non-destructive testing, and sampling in the fabricating shop and in the field to confirm the material supplied, fabrication, and erection has been done as specified in the Contract Documents.
- .2 Supply electric power, scaffolding, protection from the weather, and free access for inspection and testing of material, to all aspects of the fabrication, delivery, and erection of the structural steel.
- .3 Assume all costs associated to providing access and to loss of productivity caused by Quality Assurance inspections. The costs are deemed to be included in the overall cost of the contract.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Grating Panel shall be weathering steel open grid bridge decking suitable for heavy truck loadings. Acceptable suppliers include:  
  
L. B. Foster Company  
Construction Products - Bridge Group  
415 Holiday Drive, Pittsburgh, PA 15220  
Phone: (412) 928-3452  
Attn: Mike Riley, Marketing Manager, E-mail: mriley@lbfooster.com
- .2 New Grating Panel shall match the properties of the existing grating panel as specified on the Contract Drawings.
- .3 All other structural steel: to CSA G40.20/G40.21, as specified on the Contract Drawings.
- .4 Welding electrodes: to CSA W48 series.
- .5 Ensure sufficient materials are brought to the repair site to cover all repairing process to prevent delays.

### 2.2 SOURCE QUALITY CONTROL

- .1 Steel producer qualifications: certified in accordance with CSA G40.20/G40.21.
- .2 Provide suitable facilities and co-operate with Departmental Representative in carrying out inspection and tests required.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for structural steel installation

in accordance with manufacturer's written instructions.

- .1 Carry out magnetic particle testing of tops of stringers after grinding down remnants of existing welds in accordance with Section 01 11 06.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

### 3.2 OPERATIONAL CONSTRAINTS

- .1 Miscellaneous steel components:
  - .1 Do not remove any existing structural steel element not specifically designated on the drawings for removal without the Departmental Representative's written authorization.

### 3.3 PREPARATION

- .1 Clean steel surfaces as directed by Departmental Representative when staining or defacing occurs.
- .2 Verify location of structural units before erection of structural steel; report discrepancies to Departmental Representative.
- .3 Restrict drifting during assembly to minimum required to bring parts into position without enlarging or distorting the openings, and without distorting, kinking or sharply bending metal of any existing grating unit.

### 3.4 FABRICATION

- .1 The fabrication shall be according to CSA S6, Clause A10.1.4, and to the requirements of this specification. Where there is contradiction with the requirements of this specification, this specification shall take precedence.
- .2 For the purpose of detailing and fabrication, "typical" or "similar" does not necessarily mean "identical".
- .3 The Departmental Representative will identify any Grating Panel to be replaced.
- .4 The Contractor is responsible to field measure and prepare shop drawings for Grating Panels to be replaced. Submit three (3) copies of shop drawings at least five (5) working days prior to fabrication.
- .5 The Contractor shall confirm panel measurements for fit before removing the existing panels, and shall re-measure corresponding fabricated panels prior to commencing removal of the existing panel.
- .6 Provide cope in panel to suit truss member location as shown on drawings.

### 3.5 INSTALLATION

- .1 Provide traffic control in accordance with Section 01 35 00

- .2 Do falsework in accordance to CSA S269.1.
- .3 Prior to grating installation, Contractor shall inspect supports for correct alignment and conditions for proper attachment and support of the gratings. Any inconsistencies between Contract drawings and supporting structure deemed detrimental to grating placement shall be reported in writing to the Departmental Representative prior to placement.
- .4 Clean top flange of stringers, removing all lead paint, and grind smooth all previous welds flush with the top of the stringer. Perform magnetic particle testing of stringer flanges before commencing with any further work. Submit test report to the Department Representative and remedy defects found as directed by the Department Representative prior to installing the new Grating Panel. Removals from stringer tops shall be by mechanical means only. Thermal removal methods (such as torch or plasma cutting) shall not be permitted.
- .5 Install grating in accordance with shop drawings and standard installation clearances as recommended by ANSI/NAAMM MBG-532-09 Metal Bar Grating Manual.
- .6 Do erection of structural steel in accordance with CAN/CSA-S6.
- .7 Grating anchorage shall be as shown on the Contract drawings.
- .8 High strength bolting: in accordance with CAN/CSA-S6 CSA S16. Use 'turn-of-nut' tightening method.
- .9 Finish: members true to line, free from twists, bends, open joints, sharp corners and sharp edges.
- .10 Allowable tolerance for bolt holes:
  - .1 Matching holes for bolts to line up so that dowel 2 mm less in diameter than hole passes freely through assembled members at right angles to such members.
  - .2 Finish holes not more than 2 mm in diameter larger than diameter of rivet or bolt unless otherwise specified by Departmental Representative.
  - .3 Centre-to-centre distance between any two holes of group to vary by not more than 1 mm from dimensioned distance between such holes.
  - .4 Centre-to-centre distance between any two groups of holes to vary not more than maximum of the following:
 

Centre-to-Centre distance in metres	Tolerance in plus or minus mm
less than 10	1
10 to 20	2
20 to 30	3
  - .5 Correct mispunched or misdrilled members only as directed by Departmental Representative.
- .11 Shop or field splices not permitted.
- .12 Span length tolerances:
  - .1 Girders and beams: plus or minus 6 mm
  - .2 Centre-to-centre of bearing stiffeners and bearing plates: plus or minus 3 mm.
- .13 Mark members in accordance with CSA G40.20/G40.21.

- .1 Do not use die stamping.
- .2 Place marking at locations hidden when viewed from exterior after erection when steel is to be left in unpainted condition.
- .14 Match marking: shop mark bearing assemblies and splices.
- .15 Following Grating Panel installation, re-paint the top surfaces of the stringers supporting the new Grating Panel with a paint system in accordance with Section 09 79 19.

### 3.6 WELDED CONSTRUCTION

- .1 General:
  - .1 All welded construction shall be according to CSA W59 and Clause A10.1.5 of CSA S6, and to the requirements of this specification. Where there is contradiction, this specification shall take precedence.
  - .2 All welding shall be carried out by welders having a CSA W47.1 identification card valid for the type of welding to be done (i.e. mode, class, material, and process) and for the duration of the welding work.
  - .3 Any company undertaking welded fabrication or erection or both shall be certified according to CSA W47.1, Division 1 or 2.
  - .4 Weld only at locations indicated.
  - .5 All welds that are to be made on any structural steel member in locations other than indicated are subject to approval by the Departmental Representative. "All welds" is defined as any weld placed from initiation of fabrication to final acceptance including fabrication, transportation, erection, and construction.
  - .6 All welds shall be continuous unless otherwise noted on the plans.
  - .7 For CSA G40.20/G40.21, grade 350WT steel, deposited weld metal to have Charpy V-Notch value not lower than that of parent steel.
  - .8 Do welding in shop unless otherwise permitted by Departmental Representative.
  - .9 Welding shall not be done when the ambient temperature is lower than -18°C except with the express consent of the owner engineer.
  - .10 Steel round bar to be used shall be Grade 350W and comply with CSA G40.20-13 and G40.21-13.
- .2 Processes (CSA S6, Clause A 10.1.5.2)
  - .1 All welds shall be made by manual shielded metal arc or semi-automatic and automatic submerged arc welding processes. Electroslag welding will not be permitted.
- .3 Filler metal
  - .1 All welding shall be performed by electrodes and fluxes that produce filler metal with chemical and physical properties that match the base metal or the new material. All welding procedures and filler metal shall be approved by the Departmental Representative.
- .4 Fillet Welds
  - .1 The minimum fillet weld shall be as specified on the Drawings.
- .5 Drawings. Altering the Sweep of Fracture-Critical Members
  - .1 The use of heat to alter the sweep of fracture critical members shall be subject to approval by the Departmental Representative, prior to the application of heat.
- .6 Submissions for Repair Procedures

- .1 Canadian Welding Bureau (CWB) accepted welding procedure specifications, data-sheets, and repair procedures for prequalification, signed and sealed by an Engineer licensed in Ontario, shall be submitted for approval to the Departmental Representative 14 Days prior to commencement of work.
- .7 Assembly for Welding shall be according to CSA W59-13.
- .8 Profile of Welds shall be according to CSA W59-13.
- .9 Temporary Welds
  - .1 Temporary tack welds are not permitted.
  - .2 Temporary welds shall not be used on fracture-critical members.
  - .3 Temporary welds shall not be used on flange material in compression, unless approved by the Departmental Representative.
  - .4 Temporary welds shall not be used on existing members.

### 3.7 WELDING CORRECTIONS AND REPAIRS FOR FRACTURE-CRITICAL MEMBERS

- .1 General
  - .1 The fabrication weld metal requirements, base metal repairs, and repairs of weld in fracture critical members shall be according to CSA S6, Clause 10.23.5, and to the requirements of this specification. Where there is contradiction, this specification shall take precedence.
  - .2 All repair procedures requiring approval shall be submitted to the Departmental Representative at least 14 Days prior to commencement of the work.
  - .3 Repair procedures shall be according to CSA S6, Clause 10.23.5.
- .2 Repair of Welds
  - .1 Any section of weld that does not meet the acceptance standards shall be removed, re-welded, and re-examined.

### 3.8 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
  - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, protecting and cleaning of steel.
  - .2 Submit manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
  - .3 Ensure manufacturer's representative is present before installation, during critical periods of installation and during testing.
  - .4 Schedule site visits:
    - .1 After delivery and storage of products, and when preparatory Work, or other Work, on which the Work of this Section depends, is complete but before installation begins.
    - .2 During progress of Work.
    - .3 Upon completion of the Work, after cleaning is carried out.

### 3.9 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 11 06.
  - .1 Leave Work area clean at end of each day.

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- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 11 06.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 11 06.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

- .1 Surface preparation of stringer flanges for structural steel coating.
- .2 Structural steel coating of stringer flange surfaces.

### 1.2 REFERENCES

- .1 The Master Painters Institute (MPI)
  - .1 Exterior Structural Steel and Metal Fabrications, 07.
    - .1 EXT 5.1D, Alkyd
    - .2 EXT 5.1G, Polyurethane, Pigmented (over epoxy zinc rich primer and high build epoxy).
    - .3 EXT 5.4, Aluminum.
- .2 Federal Standard (FS)
  - .1 FED-STD-595B-[89], Colours Used in Government Procurement.
- .3 The Society for Protective Coatings (SSPC)
  - .1 SSPC-SP 1-82(R2004), Solvent Cleaning.
  - .2 SSPC-SP 2-82(R2004), Hand Tool Cleaning.
  - .3 SSPC-SP 3-82(R2004), Power Tool Cleaning.
  - .4 SSPC-SP 6/NACE No. 3-07, Commercial Blast Cleaning.
  - .5 SSPC-SP 7/NACE No. 4-07, Brush-off Blast Cleaning.
  - .6 SSPC-Vis-1-89, Visual Standard for Abrasive Blast Cleaned Steel (Standard Reference Photographs) Editorial Changes September 1, 2000 (Steel Structures Painting Manual, Chapter 2 - Surface Preparation Specs.).
  - .7 SSPC-Vis-3-11, Guide and Reference Photographs for Steel Surfaces Prepared By Power and Hand Tool Cleaning
  - .8 SSPC-SP 10/NACE No. 2-07, Near White Blast Cleaning.
  - .9 SSPC-PA 2-04, Measurement of Dry Coat Thickness with Magnetic Gauges.
  - .10 SSPC Good Painting Practices, Volume 1, 4th Edition.

### 1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 11 06.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for painting exterior metal surfaces and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit 2 copies of WHMIS MSDS.
- .3 Samples:
  - .1 Upon request, Departmental Representative will furnish qualified products list of paints.
  - .2 Submit for review and acceptance 1 L of each unit to the Department Representative for analysis and acceptance prior to commencing work.



- .3 Mark samples with name of project, its location, paint manufacturer's name and address, name of paint, MPI standard number and manufacturers paint code number.
- .4 Enable Departmental Representative to take 1 L samples of each paint delivered to site, one sample from manufacturer's containers and one sample from painters' pot.
- .4 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .5 Test Reports:
  - .1 Submit test reports showing compliance with specified performance characteristics and physical properties.

#### 1.4 QUALITY ASSURANCE

- .1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- .1 Paint:
  - .1 Primer shall be a urethane modified two components epoxy. The coating shall be aluminum pigmented and of low temperature curing mastic design for cold weather applications down to 0 °F ( -18 °C). The Primer shall comply with the following performance characteristics:

Parameter	Test Method	Result
Adhesion	ASTM D 4541	> 1500 psi
Elongation	ASTM D 522 Conical (73 °F)	½ inch (40%)
Salt Spray	ASTM B117	2000 Hours No blistering
Dry film thickness		125-200 microns

Carbomastic 242 Epoxy - Urethane Hybrid manufactured by the Carboline Company satisfies these requirements.

- .2 Intermediate Coat: Same as Primer
- .3 Top Coat shall be an aliphatic acrylic polyurethane high gloss coating. The coating shall offer a smooth and durable finish that offer excellent resistance to corrosion, abrasion and chemical exposure. The coating system shall comply with the requirements of SSPC Paint Specification No. 36 Level 3. The Top Coat shall comply with the following performance characteristics:

Parameter	Test Method	Result
Adhesion	ASTM D 4541	> 2500 psi
Abrasion	ASTM D4060	70 mg. loss after 1000 cycles, CS17
Accelerated Weathering	ASTM D4587	No rusting, blistering or loss of adhesion; less than 5% gloss loss after 3000 hours
Salt Fog	ASTM B117	No rusting, blistering, loss of bond after 3000 hours.
Dry film thickness	Single Coat	50-100 microns

Carbothane 134HG Aliphatic Polyurethane manufactured by the Carboline Company satisfies these requirements.

- .4 Paint components shall comprise a coating system from a single manufacturer, suitable for cold weather application to steel surfaces.
- .5 Colours: Grey on the top of stringer top flanges, match existing paint colour where painting of sides/underside of stringer top flange is required.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for painting exterior metal surfaces installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

### 3.2 PREPARATION

- .1 Remove existing loose and rusted paint from exterior metal surfaces.
- .2 Metal surfaces to be repainted:
  - .1 Clean surfaces by removing loose, cracked, brittle or non-adherent paint, rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with following.
    - .1 Power tool cleaning with vacuum shrouding: to SSPC-SP 3.

- .2 Scrape edges of old paint back to sound material where remaining paint is thick and sound, feather exposed edges.
- .3 Compressed air to be free of water and oil before reaching nozzle.
- .4 Remove traces of loose paint after cleaning from surfaces, pockets and corners to be painted by: brushing with clean brushes, by blowing with clean dry compressed air, or by vacuum cleaning.
- .5 Apply paint after prepared surfaces have been accepted by Departmental Representative.
- .6 Prior to starting paint application ensure degree of cleanliness of surfaces is to SSPC-Vis3.
  - .1 Apply primer, paint, or pre-treatment after surface has been cleaned and before deterioration of surface occurs.
  - .2 Clean surfaces again if rusting occurs after completion of surface preparation.
- .7 Mixing paint:
  - .1 Do not dilute or thin paint for brush application.
  - .2 Mix ingredients in container before and during use and ensure breaking up of lumps, complete dispersion of settled pigment, and uniform composition.
  - .3 Do not mix or keep paint in suspension by means of air bubbling through paint.
  - .4 Thin paint for spraying according to manufacturer's written instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Departmental Representative.
- .8 Number of paint coats:
  - .1 One primer coat to minimum dry film thickness of 125 microns to bare and power tool cleaned areas.
  - .2 One intermediate coat to minimum dry film thickness of 125 microns per coat.
  - .3 One top coat to a minimum dry film thickness of 50 microns.

### 3.3 APPLICATION

- .1 Manufacturer's Instructions: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Apply paint by brushing or spraying. Use sheepskins or daubers when no other method is practical in places of difficult access.
- .3 Use dipping or roller coating method of application when specifically authorized by Departmental Representative in writing.
- .4 The Contractor shall provide enclosures and indirect (dry) heat to maintain air and surface temperatures within the manufacturer's prescribed limits during painting and curing operations both to maintain adequate conditions for coating / curing and to ensure curing is completed within the available working time.

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- .5 Do not apply paint when:
  - .1 Fog or mist occur at site; it is raining or snowing; there is danger of rain or snow; relative humidity is above 85%.
  - .2 Surface to be painted is wet, damp, frosted, or contaminated with dirt or chlorides.
  - .3 Previous coat is not dry.
- .6 Adequate ventilation shall be provided to ensure proper curing and a safe working environment.
- .7 Supply cover when paint must be applied in damp or cold weather. Supply, shelter, or heat surface and surrounding air to comply with temperature and humidity conditions specified. Protect until paint is dry or until weather conditions are suitable.
- .8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
- .9 Apply each coat of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .10 Brush application:
  - .1 Work paint into cracks, crevices and corners and paint surfaces not accessible to brushes by spray, daubers or sheepskins.
  - .2 Brush out runs and sags.
  - .3 Remove runs, sags and brush marks from finished work and repaint.
- .11 Spray application:
  - .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
  - .2 Provide traps or separators to remove oil and water from compressed air and drain periodically during operations.
  - .3 Keep paint ingredients properly mixed in spray pots or containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
  - .4 Apply paint in uniform layer, with overlapping at edges of spray pattern.
  - .5 Brush out immediately runs and sags.
  - .6 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray. In areas not accessible to spray gun, use brushes, daubers or sheepskins.
  - .7 Remove runs, sags and brush marks from finished work and repaint.
- .12 Field painting:
  - .1 Paint steel structures as soon as practical after erection.
  - .2 Touch up metal which has been shop coated with same type of paint and to same thickness as shop coat. This touch-up to include cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas.
  - .3 Field paint surfaces (other than joint contact surfaces) which are accessible before erection but which are not to be accessible after erection.
  - .4 Apply final coat of paint after concrete work is completed or as directed by Departmental Representative. If concreting or other operations damage paint, clean and repaint damaged area. Remove concrete spatter and droppings before paint is applied.

.5 Where painting does not meet with requirements of specifications, and when so directed by Departmental Representative remove defective paint, thoroughly clean affected surfaces and repaint in accordance with these specifications.

.13 Handling painted metal:

- .1 Handle painted metal after paint has dried, or when necessary for handling for painting or stacking for drying.
- .2 Scrape off and touch up paint which is damaged in handling, with same number of coats and kinds of paint as were previously applied to metal.

### 3.4 FIELD QUALITY CONTROL

.1 Site Tests, Inspections:

.1 Upon completion of the painting procedures test for dry film reading and evaluate the results as per SSPC-PA 2. Submit results to the Department Representative within 72 hours.

### 3.5 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 11 06.

.2 Cleaning of top surface of grating: Prior to permitting traffic on the new grating panel, the Contractor shall remove all paint and paint residue from the top surface of the grating panel to bare steel.

.3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 11 06.

.4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 11 06

- .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### 3.6 PROTECTION

.1 Protect painted surfaces from damage during construction.

.2 Protection of surfaces:

- .1 Protect surfaces not to receive paint.
- .2 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 paint. Remove contaminants from surface and apply paint immediately.
- .3 Protect cleaned and freshly painted surfaces from dust to approval of Departmental Representative.

.3 Repair damage to adjacent materials caused by painting exterior metal surface application installation.

END OF SECTION