

## **ANNEX I – SPECIAL PROVISIONS - STRUCTURE**

### **SPST. 1 ENVIRONMENTAL PROTECTION FOR STRUCTURE**

#### **1.0 General**

All materials and equipment used for site preparation, general execution of the work and project completion shall be stored and operated in such a manner that prevents any deleterious substances from entering the natural environment not limited to the water courses and the rock embankment.

Vehicle and equipment refueling and / or maintenance shall be conducted away from the water course. Any part of a vehicle and / or equipment entering the water shall be free of fluid leaks and externally cleaned / degreased to prevent deleterious substances from entering the water.

Provide environmental protection to the wetland areas and tributaries, for all substructure construction works including excavation for piles and footings, installation of piles, construction of footings and constriction of substructure over footings, in accordance with OPSS 182.

Dewatering for substructure works such as installing piles and constructing footing and pier stems, shall be completed in accordance with best management practise required to protect the environment from deleterious materials.

Environmental protection measures shall be as shown on the Contract Drawings and in accordance with applicable legislation and the Contract Documents.

#### **2.0 Measurement and Payment**

Costs for environmental protection measures shall be included in all applicable tender items requiring the use of environmental protection measures as specified in the Contract Documents or by applicable legislation.

### **SPST. 2 SITE ACCESS**

#### **1.0 General**

Under all circumstances the Contractor shall take reasonable measures to not damage the existing embankment. No excavation of the existing embankment for the purposes of site access or protection measures will be permitted.

Any damage created to the existing embankment due to access and protection measures will be returned to a preconstruction condition at the Contractor's expense.

Filling in the creek, building any obstructions in the creek (with the exception of approved dewatering measures for the east pier) or bridging of the creek will not be permitted.

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Take reasonable measures and provide security to protect the work areas from unauthorized access and prevent unauthorized persons from climbing / walking across the unfinished superstructure during the stages of progressive installation and construction not limited to overnight security personnel.

Works zones for piers shall be protected with appropriate temporary fencing that prevents the general public from entering the areas and at the same time does not impede vehicular traffic on John Counter Boulevard.

### **2.0 SUBMISSIONS**

The Contractor shall submit a Site Access Plan for approval. Plans shall be submitted to the Contract Administrator for approval and shall be submitted 14 days prior to mobilizing forces to execute the work. The Site Access Plan shall describe in detail, the steps and measures that will be taken to access each location of the work including ground preparation, existing utility protection measures, temporary fencing, drainage measures and equipment.

### **3.0 UTILITIES**

Known buried utilities that exist along the edges of the existing tracks are fibre optic and signalling wiring; known aerial (electrical) utilities within the construction zone belong to Hydro One and Utilities Kingston.

### **4.0 ACCESS POINTS**

#### **4.1 West Pier & West Abutment**

Access for the west pier (north side of the tracks) and west abutment will be via the western entrance of the west embankment off Old Mill Road. Access shall not access the site west of the at-grade crossing via John Counter Boulevard.

#### **4.2 East Pier and East Abutment**

Access to the eastern pier will be via the CN entrance located between Portsmouth Avenue and the creek (along the west toe of slope of the east embankment). Access to the east abutment will be via the above noted entrance and the existing embankment entrance just east of Portsmouth Avenue.

### **5.0 MEASUREMENT FOR PAYMENT**

#### **5.1 Site Access**

No measurement for payment shall be made as the above tender item shall be based on a Lump Sum price.

### **6.0 BASIS OF PAYMENT**

**6.1 Site Access – Item**

Payment at the Contract Price for the above tender items shall be full compensation for all labour, equipment and materials to complete the full project scope of work such as, temporary granular pads or ramps for access or installation, temporary fencing, security personnel,

**SPST. 3 ACCESS AND PROTECTION**

OPSS 928 shall apply except as may be amended or extended herein.

**928.01 SCOPE**

Section 928.01 is deleted in its entirety and replaced with the following:

This specification covers the requirements for temporary access, work platforms, and scaffolding, as required to complete the full project scope of work, including but not limited to the following:

1. Pier and Abutment Works;
2. Installation of new concrete deck including reinforcing;
3. Installation of new concrete parapet walls including embedded works and railings;  
and
4. Protection of the CN Railway right-of-way.

**928.02 REFERENCES**

Section 928.02 shall be amended with the addition of the following:

**Provincial Statute**

*Occupational Health and Safety Act*

R.S.O. 1990, Chapter O.1, as amended

*Ontario Regulation 213/91 – Construction Projects, as amended*

**928.04 DESIGN AND SUBMISSION REQUIREMENTS**

**928.04.01 Design Requirements**

Subsection 928.04.01 is amended by the addition of the following:

Temporary access measures, debris, and work platforms shall comply with the *Occupational Health and Safety Act, Ontario Regulation 213/91 – Construction Projects.*

**928.04.02 Submission Requirements**

**928.04.02.01 General**

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Subsection 928.04.02.01 is deleted and replaced with the following:

Detailed Working Drawings shall be submitted for all temporary access, work platforms, and scaffolding systems. Working Drawings for a given area shall be submitted to the Contract Administrator at least two (2) weeks prior to commencement of work in that area, for information purposes only. The submission shall include five (5) copies and shall be sealed and signed by a Design Engineer and a Checking Engineer licensed in the Province of Ontario.

The Working Drawings shall clearly indicate all design and construction details including design loads, elevations and dimensions.

When other authorities are involved, 1 set of working drawings shall be submitted for each authority at least 5 weeks prior to the commencement of installation. The requirements of each authority shall be satisfied prior to commencement of installation.

Canadian National Railway (CNR) and the Cataraqui Region Conservation Authority shall be deemed to be "other authorities" in this specification.

Before putting any temporary access, work platforms, and scaffolding systems into service, a letter of inspection signed by the Engineer responsible for its design shall be submitted to the Contract Administrator. The Certificate shall certify that the engineer has reviewed the installation and it has been constructed in conformance with the Working Drawings. A given installation shall not be considered to be fully erected until a letter of inspection has been issued.

### **928.09 MEASUREMENT FOR PAYMENT**

Section 928.09 is amended by the addition of the following:

#### **928.09.02 Access to Work Area, Work Platform, and Scaffolding**

No measurement for payment shall be made as the above tender item shall be based on a Lump Sum price.

### **928.10 BASIS OF PAYMENT**

Subsection 928.10.02 is deleted in its entirety and replaced with the following:

#### **928.10.02 Access to Work Area, Work Platform, and Scaffolding – Item**

Payment at the Contract Price for the above tender items shall be full compensation for all labour, equipment and materials to complete the full project scope of work.

Payment shall be based upon the following schedule:

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- a) 40% upon satisfactory submission of detailed working drawings and erection of the temporary access, work platforms, and scaffolding system;
- b) 40% pro-rated into equal payments over the construction duration that the temporary access, work platforms, and scaffolding is installed for; and
- c) 20% upon successful removal of the temporary access, work platforms, and scaffolding and clean up.

**SPST. 4 EARTH EXCAVATION FOR STRUCTURE**

OPSS 902 shall apply except as may be amended and extended here.

**902.04.02.01 Preconstruction Survey**

Subsection 902.04.02.01 is amended by the addition of the following:

The Contractors proposed location for stockpiling of excavated material shall be shown on the preconstruction survey.

When other authorities are involved, 1 set of the survey drawings shall be submitted for each authority at least 5 weeks prior to the commencement of excavation. The requirements of each authority shall be satisfied prior to commencement of excavation.

Canadian National Railway (CNR) and the Cataraqui Region Conservation Authority shall be deemed to be “other authorities” in this specification.

**902.07.05 Excavation**

Excavated material shall be handled, stockpiled, re-used and/or disposed of as specified elsewhere in the Contract Documents.

Excavate material may include broken pavement, concrete, boulders and historical garbage. These materials shall be treated the same as earth and no extra payment will be made to the Contractor for the excavation or disposal of material containing these items.

Subsection 902.07.09 is deleted and replaced by the following:

**902.07.09 Management of Excess Material**

Excess material shall be disposed of as specified elsewhere in the Contract Documents for Waste Management.

**902.09 MEASUREMENT FOR PAYMENT**

**902.09.01 Actual Measurement**

**902.09.01.01 Earth Excavation for Structure**

Subsection 902.09.01.01 is amended by deleting the second paragraph and replacing it with the following:

Measurement of excavation for footings shall be based on the neat dimensions to the depth of the bottom of the footing, mud slab, or granular pad.

**902.10 BASIS OF PAYMENT**

**902.10.01 Earth Excavation for Structure - Item**

Subsection 902.10.01 is amended by deleting the first paragraph and replacing it with the following:

Payment at the contract price for the above tender item shall be full compensation for all labour, equipment and material required to do the work, including protection of adjacent works and management of any surplus or unsuitable excavated material, including the cost of disposal areas or re-use onsite including grading, all according to the requirements of this specification.

**SPST. 5 UNWATERING STRUCTURE EXCAVATIONS**

OPSS 902 shall apply except as may be amended and extended here.

**902.03 DEFINITIONS**

Section 902.03 is amended by the addition of the following:

**Uncontaminated Water** means any water that does not contain any deleterious substances or class of substances as defined under Section 34(1) of the Fisheries Act, and will not degrade the quality of the receiving water.

**902.04 DESIGN AND SUBMISSION REQUIREMENTS**

**902.04.01 Design Requirements**

**902.04.01.01 Dewatering**

Subsection 902.04.01.01 is amended by the addition of the following:

The Contractor is advised that there may be significant groundwater inflow into the excavations particularly near the east pier. Dewatering may require well points and cut off walls.

The design of temporary structures or protection systems for dewatering shall be according to OPSS 539 and the Contract Documents.

**902.04.02                      Submission Requirements**

Subsection 902.04.02 is amended by the addition of the following:

**902.04.02.03                  Working Drawings**

At least two (2) weeks prior to commencement of the dewatering operations, three (3) sets of Working Drawings of the dewatering scheme shall be submitted to the Contract Administrator.

When other authorities are involved, 1 set of working drawings shall be submitted for each authority at least 5 weeks prior to the commencement of erection or mobilization of erection equipment. The requirements of each authority shall be satisfied prior to commencement of excavation or installation of dewatering measures, whichever occurs first.

Canadian National Railway (CNR) and the Cataraqui Region Conservation Authority shall be deemed to be “other authorities” in this specification.

Working drawings for protection systems shall be according to OPSS 539.

**902.07                              CONSTRUCTION**

**902.07.04                      Dewatering Structure Excavation**

**Subsection 902.07.04 is amended in that control of water shall be according to OPSS 518 and as specified elsewhere in the Contract Documents:**

**518.07.01                      Discharge of Water**

Subsection 518.07.01 is deleted and replaced by the following:

**Management including storage, discharge or disposal of contaminated and uncontaminated water shall be as specified elsewhere in the Contract Documents.**

**902.10                              BASIS OF PAYMENT**

Subsection 902.10.02 is deleted and replaced with the following:

**902.10.02                      Unwatering Structure Excavations - Item**

Payment at the contract price for the above tender item shall be full compensation for all labour, equipment and material required to do the work, such as, dewatering structure excavations, management of water, all in accordance with the Contract Documents.

Payment shall be based upon the following schedule:

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1. 25% upon satisfactory submission and installation of the dewatering scheme;
2. 50% pro-rated into equal payments over the dewatering period which ends when the footings are cast; and
3. 25% upon successful completion and removal of the dewatering scheme.

### **SPST. 6 TEMPORARY PROTECTION SYSTEMS**

OPSS 539 shall apply except as may be amended and extended herein.

#### **539.04 DESIGN AND SUBMISSION REQUIREMENTS**

539.04.01 Design

##### **539.04.01.01 General**

Subsection 539.04.01.01 of OPSS 539 is amended by deleting the first paragraph and replacing it with the following:

The protection system shall be designed to meet the requirements of Performance Level 2.

##### **539.04.02 Submissions**

###### **539.04.02.01 Working Drawings**

The first paragraph of Subsection 539.04.02.01 is deleted and replaced with the following:

Detailed Working Drawings shall be submitted for all temporary shoring and protection systems. Working Drawings for a given system shall be submitted to the Contract Administrator at least two (2) weeks prior to commencement of the protection system or shoring work, for information purposes only. The submission shall include five (5) copies and shall be sealed and signed by a Design Engineer and a Design-Checking Engineer licensed in the Province of Ontario, verifying that the drawings are consistent with the Contract Documents.

#### **539.07 CONSTRUCTION**

##### **539.07.01 General**

Section 539.07 is amended by the addition of the following:

As required during the excavation and construction work, the Contractor shall install temporary protection systems, including at, but not limited to, the following locations:

- Protection system over the CNR, outside of the railway clearance envelope to facilitate installation of the bridge superstructure include all miscellaneous elements.



**539.09 MEASUREMENT FOR PAYMENT**

**539.09.01 Temporary Protection Systems**

There will be no measurement for payment for Temporary Protection Systems as cost for the work shall be deemed to be included in individual contract items indicated elsewhere in the Contract Documents.

**SPST. 7 PILING**

OPSS 903 shall apply except as may be amended and extended herein.

**903.04 DESIGN AND SUBMISSION REQUIREMENTS**

**903.04.02 Submission Requirements**

**903.04.02.04 Installation**

Subsection 903.04.02.04.01 is amended by the addition of the following:

- i) Submit Preliminary Pile Driving Criteria, update and resubmit the criteria where changes in the piling operation occur due to vibration management requirements (reduced energy).
- j) Submit a vibration monitoring procedure identifying as a minimum, number, equipment, method and location of vibration monitors.

**903.07 CONSTRUCTION**

**903.07.02 Driven Piles**

**903.07.02.01 Pile Driving Requirements and Restrictions**

Subsection 903.07.02.01 is amended by the addition of the following:

**Vibration**

The work of managing vibrations associated with pile driving while achieving the necessary pile capacities shall be completed by a geotechnical Engineer retained by the Contractor with a minimum of ten (10) years experience in the design and construction of piling systems or through the demonstration of 5 past successfully complete projects of similar scope and complexity.

The Contractor shall continuously monitor the vibrations at the level of the signal wiring and fibre optic cables while driving piles. The results of the vibration monitoring shall be shared with the site inspector during the pile driving operations for continuous vibration recording.

The measured vibrations shall not exceed 50 mm/s (peak particle velocity) for the fibre optic cables (Bell 360) along the south side of the tracks.

The measured vibrations shall not exceed 100 mm/s (peak particle velocity) for the CN signal wiring along the north side of the tracks.

The method, equipment and location of installation of the monitors shall be determined by the Contractor and approved by the Contract Administrator and CN. Monitors shall be installed as close to the fibre optic cable(s) and signal wiring as possible. Vibration instrumentation shall be installed as part of flagging operations for clearing and grubbing. The piles furthest from the vibration monitors shall be driven first to assess the vibration levels as well as the relationship between the capacity of the piles determined from PDA and vibrations observed. The Contractor shall update and resubmit Pile Driving Criteria based on the results of the assessment.

If vibration readings exceed the criteria above, the Contractor shall alter driving procedures and set criteria as necessary to bring the vibration criteria within the limits.

The Contractor should reduce the hammer energy when the pile tip is approaching the bedrock surface elevation to reduce vibrations.

CAPWAP (PDA) analysis shall be carried out for piles that are required to be set using reduced energy.

If the CAPWAP analysis indicate that the full capacity of the pile cannot be obtained, additional piles may be required with written direction of the Contract Administrator.

#### **903.07.02.03.03     H-Piles, Tube Piles, and Sheet Piles**

The second paragraph of subsection 903.07.02.03.03 is deleted and replaced with the following:

A maximum of two splices per pile will be allowed. No splice length less than 3.0m will be allowed.

Subsection 903.07.06 is deleted in its entirety and replaced with the following:

#### **903.07.06                    Dynamic Piles Load Test**

Dynamic pile load test shall be carried out at three (3) piles per sub-structure at the end of drive. The testing shall be according to ASTM D 4945-08. The Contract Administrator shall witness the pile load test. The Contractor shall submit all records and results of the pile load test to the Contract Administrator.

The Contractor shall provide all necessary personnel, equipment, and material to make adjustments during the tests and shall have at least one skilled worker present for the

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complete duration of each test. This worker shall have demonstrated experience in dynamic load testing of piles.

The Contractor shall do all necessary grading work to ensure a level dry working area at the test location and shall erect an adequate enclosure sufficient to provide complete protection from adverse weather conditions for the complete duration of the tests, including all temporary work required to obtain access to the site for the personnel, equipment, and materials.

On completion of the tests, the Contractor shall clear and restore the site to the satisfaction of the Contract Administrator.

Piles that will be dynamically tested using PDA shall be of sufficient length to accommodate the installation of sensors.

CASE method estimates of the capacities should be provided for all piles tested. These estimates should be provided by means of a field report on the day of testing. As well, CAPWAP analyses should be carried out for at least one third of the piles tested, with the results provided no later than one week following testing. The final report should be stamped by a Professional Engineer licensed in the province of Ontario.

Piles for testing will be identified by the Contract Administrator. Piles to be tested should be selected to obtain a representative sample for each sub-structure. However, the Contract Administrator may direct that a specific pile or specific piles be tested. The testing company and personnel must be approved by the Contract Administrator.

### 903.10 BASIS OF PAYMENT

#### 903.10.01 Supply Equipment for Installing Driven Piles – Item

Subsection 903.10.01 is amended by the addition of the following:

The above tender item shall be paid only once, regardless if the equipment must be or is moved from abutment to abutment, pier to pier, abutment to pier, or any combination thereof, or if multiple pieces of equipment are used, mobilized or demobilized.

Subsection 903.10.02 is amended by the addition of the following:

#### Steel 'H' piles – **HP310x110** – Item

Payment at the Contract price for the above tender item shall be full compensation for all labour, equipment, supplies and material to do the work such as, splices and vibration monitoring.

Piles installed at the abutments will be driven through a granular core contained in the embankments. All costs associated with driving piles through this material, including any specialized equipment shall be considered included in the unit price of the piles.

## **Dynamic Piles Load Test - Item**

Payment at the Contract price for the above tender item shall be full compensation for all labour, equipment, supplies and material to do the work.

### **SPST. 8 CONCRETE**

OPSS 904, shall apply except as may be amended and extended herein:

#### **904.04 DESIGN AND SUBMISSION REQUIREMENTS**

##### **904.04.01 Submission Requirements**

##### **904.04.01.01 Notification of Placement of Structural Concrete**

Section 904.04.01.01 is amended by the addition of the following:

The size of bearings which will be installed for the structure and the bearing seat elevations of the concrete pedestals shall be submitted in writing to the Contract Administrator at least three (3) weeks prior to placing concrete in the substructure.

If the size of the bearings to be installed is different from the bearing size shown on the Contract Drawings, the proposed adjustment to the bearing seat elevations of the pedestals and reinforcing steel layout shall also be submitted.

##### **904.04.01.02 Bridge Deck Placement Plan**

Section 904.04.01.02 is amended by the addition of the following:

When other authorities are involved, 1 set of erection diagrams and erection procedure drawings shall be submitted for each authority at least 5 weeks prior to the commencement of erection or mobilization of erection equipment. The requirements of each authority shall be satisfied prior to commencement of erection or mobilization of erection equipment.

Canadian National Railway (CNR) and the Cataraqui Region Conservation Authority shall be deemed to be "other authorities" in this specification.

#### **904.05 MATERIALS**

##### **904.05.01 Concrete**

Subsection 904.05.01 is amended with the addition of the following:

The concrete mix for all concrete in contact with native soil, shall be designed to provide high sulphate resistance corresponding to CSA Exposure Class S-1, with a minimum compressive strength of 35MPa at 56 days.

The concrete mix for all other concrete shall correspond to CSA Exposure Class C-1 with a minimum compressive strength of 35MPa at 28 days, unless otherwise noted.

**904.10 BASIS OF PAYMENT**

The following items are deleted from section 904.10.01:

**Concrete in Footings – Item  
Concrete in Substructure - Item**

Section 904.10 is amended by the addition of the following:

**904.10.07 Concrete in Substructure – Item**

Payment at the Contract price for the above tender item shall be full compensation for all labour, materials and equipment required to do the work, including but not limited to the following:

- Concrete in abutment walls, piers, wingwalls, and ballast walls;
- Asphalt impregnated fibre board, joint sealing, and waterstops in concrete; and,
- Wall drains, clear stone wrapped in geotextile, and subdrain pipe sleeves in abutment walls.

Payment for supply and installation of reinforcing steel shall be made under separate items.

Surface cavities greater than 50 mm and honeycombing shall be repaired at no cost to the Owner.

**904.10.08 Concrete in Footings – Item**

Payment at the Contract price for the above tender item shall include full compensation for all labour, materials and equipment required for concrete in abutment footings, and pier footings.

Payment for supply and installation of reinforcing steel shall be made under separate items.

Surface cavities greater than 50 mm and honeycombing shall be repaired at no cost to the Owner.

**904.10.09 Concrete in Sidewalks – Item**

Payment at the Contract price for the above tender item shall include full compensation for all labour, materials and equipment required, including but not limited to the following:

- Concrete in deck sidewalks; and

- Concrete in approach sidewalks.

Payment for supply and installation of reinforcing steel shall be made under separate items.

Surface cavities greater than 50 mm and honeycombing shall be repaired at no cost to the Owner.

#### **904.10.10 Concrete in Mud Slab – Item**

Payment at the Contract price for the above tender item shall include full compensation for all labour, equipment and material required for concrete mud-slabs, including but not limited to:

1. Supply, placing, and compacting clear stone and Granular 'A' bedding if shown on the Contract Drawings;

Payment for dewatering shall be made under the applicable tender item.

### **SPST. 9 STRUCTURAL STEEL**

OPSS 906 shall apply except as may be amended and extended herein.

#### **1.0 SCOPE**

This specification covers the construction requirements for the fabrication, delivery, and erection of structural steel for the Jean-Counter Boulevard CNR/ Cataraqui River bridge.

#### **906.02 REFERENCES**

Section 906.02 of OPSS 906 is amended by deleting S6-06, Canadian Highway Bridge Design Code under CSA Standards and replacing it with S6-14, Canadian Highway Bridge Design Code.

#### **906.04 DESIGN AND SUBMISSION REQUIREMENTS**

##### **906.04.01.02 Welding**

Clause 906.04.01.02 of OPSS 906 is amended by deleting the second paragraph in its entirety and replacing it with the following:

Welding procedures shall be according to CSA W47.1 and CSA W59, except where modified by CAN/CSA-S6, Clause A10.1.5.

##### **906.04.02 Submissions**

The first paragraph of subsection 906.04.02.02 is deleted and replaced by the following:

**906.04.02.02            Shop Drawings**

The Contractor shall submit 3 sets of the shop details and welding procedures to the Contract Administrator at least 14 Days prior to commencement of fabrication, for information purposes only. Prior to making a submission, an Engineer's seal and signature shall be affixed on the shop details and welding procedures verifying that the details and procedures are consistent with the Contract Documents.

Item h) in subsection 906.04.02.02 is deleted and replaced by the following:

- h)     Details of all welds including referencing the Weld procedures for each weld on the details.

Subsection 906.04.02.02 is amended by the addition of the following:

"As-Built" shop drawings shall be submitted in electronic form as soon as the shop fabrication is completed. Electronic form shall be submitted on a CD disk to the Contract Administrator in two different formats: ADOBE ACROBAT "PDF" and AUTOCAD "DWG". As-built shop drawings to including references to MTR for all components and reference NDT inspection reports.

**906.04.02.03            Erection Diagrams and Erection Procedure Drawings and Calculations**

The first paragraph of subsection 906.04.02.03 is deleted and replaced by the following:

The Contractor shall submit 3 sets of the erection diagrams and erection procedure drawings and calculations to the Contract Administrator at least 28 Days prior to commencement of erection or mobilization of erection equipment, for information purposes only. Prior to making a submission, an Engineer's seal and signature shall be affixed on the erection diagrams and erection procedure drawings and calculations verifying that the erection diagrams and erection procedure drawings and calculations are consistent with the Contract Documents.

Subsection 906.04.02.03 is amended by the addition of the following:

One (1) set of erection diagrams and erection procedure drawings shall be submitted to Canadian National Railway (CNR) at least 5 weeks prior to the commencement of erection or mobilization of erection equipment. The requirements of each authority shall be satisfied prior to commencement of erection or mobilization of erection equipment.

**906.04.02.04            Mill Test Certificates**

Subsection 906.04.02.04 is amended by the addition of the following:

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Material samples/coupons for the purpose of verifying mill test certificates originating from a mill outside of Canada or the United States of America shall be taken once the material has arrived in Canada. Coupons/samples shall be marked with the Contract Number, Contractor, and Heat Number and stored in a location accessible to the Contract Administrator.

Section 906.04.02 is amended by the addition of the following:

### **906.04.02.06 Fabrication Schedule**

The Contractor shall submit a detailed fabrication schedule in increments of not more than one week at least 14 Days prior to start of fabrication. The detailed schedule shall be in clear, concise, bar charts form and shall clearly indicate the fabrication periods and sequences of operations of each item of work in sufficient detail so that the Contract Administrator or the appointed inspector can monitor the progress of work and plan Quality Assurance work.

Interim reviews of work progress based on the schedule submitted by the Contractor shall be conducted every 2 weeks by the Contractor or at a closer interval when requested by the Contract Administrator and the fabrication schedule shall be updated accordingly.

### **906.05 MATERIALS**

#### **906.05.01 Steel**

Subsection 906.05.01 of OPSS 906 is deleted in its entirety and replaced with the following:

Structural steel shall be new and of the grade and category specified in the Contract Documents and shall be according to CSA G40.20/G40.21.

ASTM A 588 may be substituted when either of the following steel grades have been specified:

- a) CSA G40.20/G40.21, Grade 350A.
- b) CSA G40.20/G40.21, Grade 350AT, when the Charpy impact energy requirements are verified by the submission of test documentation.

Substitution of other material for size and grade is not permitted unless approval is received from the Contract Administrator.

Material testing shall confirm that all structural steel to be used in welded fabrication contains less than 0.0008% boron. Boron content shall be reported on the mill test certificate. When verification by testing at a Canadian laboratory is required as outlined in the Mill Test Certificate clause, the boron content shall also be verified and reported.

The steel shall be identified as specified in the Control of Material clause.

#### **906.05.03 Electrodes**



Subsection 906.05.03 of OPSS 906 is amended by deleting the second paragraph in its entirety and replacing it with the following:

The weld metal shall meet the Charpy V notch impact energy requirements of CAN/CSA-S6, Table 10.13 for fracture-critical members and Table 10.12 for primary tension members.

**906.07 CONSTRUCTION**

**906.07.01 Fabrication**

**906.07.01.01 General**

Clause 906.07.01.01 of OPSS 906 is amended by deleting the first paragraph in its entirety and replacing it with the following:

The fabrication shall be according to CAN/CSA-S6, Clause A10.1.4.

The steel fabricator shall hold a CISC *Steel Bridge Certification* for Complex Steel Bridges

**906.07.01.07 Welded Construction**

**906.07.01.07.01 General**

Clause 906.07.01.07.01 of OPSS 906 is amended by deleting the first paragraph in its entirety and replacing it with the following:

All welded construction shall be according to CSA W59 and Clause A10.1.5 of CAN/CSA-S6.

**906.07.01.07.06 Preheat, Interpass Temperature, and Heat Input Control**

Clause 906.07.01.07.06 of OPSS 906 is amended by deleting it in its entirety and replacing it with the following:

When making welding repairs to fracture-critical and primary tension members, the preheat requirements shall be according to CAN/CSA-S6, Table 10.14.

**906.07.06 Inspection Reports**

Section 906.07.06 is amended by the addition of the following:

Inspection reports shall be submitted on a weekly basis to the Contract Administrator.

**906.07.01.07.15.01 General**

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Clause 906.07.01.07.15.01 of OPSS 906 is amended by deleting the first paragraph in its entirety and replacing it with the following:

Bolted construction shall be according to CAN/CSA-S6, Clause A10.1.6.

### **906.07.01.07.16.01 Dimensional and Workmanship Tolerances**

Clause 906.07.01.07.16.01 of OPSS 906 is amended by deleting it in its entirety and replacing it with the following:

Dimensional and workmanship tolerances shall be according to CSA W59 and Clause A10.1.7 of CAN/CSA-S6.

### **906.07.03.01 General**

Clause 906.07.03.01 of OPSS 906 is amended by deleting the first sentence of the first paragraph in its entirety and replacing it with the following:

Erection shall be according to CAN/CSA-S6, Clause A10.1.10.

### **906.07.04.01 General**

Clause 906.07.04.01 of OPSS 906 is amended by deleting the first sentence of the first paragraph in its entirety and replacing it with the following:

Quality control shall be according to CAN/CSA-S6, Clause A10.1.8.

### **906.07.04 Quality Control**

#### **906.07.04.01 General**

Subsection 906.07.04.01 is amended by the addition of the following:

Prior to fabrication, provide the Contract Administrator with three (3) copies of steel producer certificates, in accordance with CSA G40.20 (ASTM A6) for all steel supplied by the Contractor.

Provide the Contract Administrator with three (3) copies of Charpy V-notch certified test reports at least three (3) weeks prior to start of fabrication.

All quality control documents including weld test reports to be submitted to the Contract Administrator upon completion of the component fabrication and prior to erection. Submit copies of all inspection reports to the Contract Administrator on a weekly basis. Inspection reports to bear the seal and signature of an Engineer licensed in the province of Ontario.

## **906.08 QUALITY ASSURANCE**

Section 906.08.01 is amended by the addition of the following:

Upon completion of fabrication of the components, and prior to erection, the Contract Administrators inspector will conduct an interim inspection of the work to verify that the fabrication of components has been carried out in general conformance with the shop details, welding procedures, and contract documents and issue the fabricator written permission to proceed with the work.

**906.10                   BASIS OF PAYMENT**

**906.10.01               Fabrication of Structural Steel - Item**

Subsection 906.10.01 is amended by the addition of the following:

Payment for cleaning and application of painted coatings on the ends of the span shall be made under a separate tender item.

**SPST. 10     STRUCTURAL STEEL COATINGS**

OPSS 911 and OPSS 1704 shall apply except as may be amended or extended herein.

**911.01                   SCOPE**

The first paragraph of Section 911.01 is deleted and replaced with the following:

This specification covers the requirements for the surface preparation and coating of structural steel to the limits shown on the Contract Drawings.

Section 911.07 is amended by the addition of the following:

**911.07.10               Performance Warranty for Coating of Structural Steel**

**911.07.10.01         Warranty**

The Contractor shall warrant unconditionally that the coating system has been applied in accordance with the Contract Specifications, and will be free from defects, as defined herein, for a period of 24 months from the date of the Certificate of Substantial Performance of the Work.

The coating system will be considered defective if any of the following conditions exist, as defined by SSPC Painting Manual, Volume 1, Good Painting Practice, Fourth Edition, 2002, pp. 553-567:

- a) Visible corrosion products (except at locations defined in the contract as difficult to access), blistering, bubbling, checking, cracking, wrinkling, cratering, delaminations, dry spray, pinholes, sagging, flaking, mud cracking, peeling, scaling, or undercutting.

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- b) Coating applied over dirt, debris, blasting debris, corrosion products not removed during surface preparation, or steel projections.
- c) Incomplete coating.
- d) Damage to the coating caused by the Contractor's operations; or excessive blast dust on the finish coat.

**911.07.10.02      Warranty Inspection**

In the 22nd or 23rd months of the warranty period, the Owner will inspect the coatings for the defects listed above. The Contractor will be given a minimum of 72 hours notice, and shall be present during this inspection.

**911.07.10.03      Corrective Work**

All defective areas identified by the inspection shall be repaired by the Contractor in accordance with OPSS 911 and the original Contract Documents. All repair work shall be done within eight weeks of the Contractor being notified of the results of the inspection, unless prevented by seasonal shutdown, in which case the work shall be done in the first four weeks of the following construction season.

**SPST. 11      BRIDGE DECK WATERPROOFING**

OPSS 914 shall apply except as may be amended or extended herein.

Section 914.01 is deleted and replaced with the following:

**914.01              Scope**

This specification covers the requirements for waterproofing of the Riverside Drive Overpass and Southeast Transitway Overpass bridge decks with hot applied asphalt membrane.

**914.07.08.01      Delivery of Samples**

Clause 914.07.08.01 is deleted in its entirety and replaced by the following:

Samples of the waterproofing membrane, waterproofing membrane reinforcement, joint compound, tack coat, and the protection board shall be delivered to the Contract Administrator.

**SPST. 12      REINFORCING STEEL**

OPSS.PROV 905 shall apply except as may be amended or extended herein.

## **SPST. 13     RAILWAY FENCE MODIFICATIONS**

### **1.0                    SCOPE**

This specification covers the work to relocate the existing chain-link fence along the perimeter of the railway right-of-way and to provide a new temporary fence during the works.

### **3.0                    MATERIALS**

Materials for chain-link fence construction shall be in accordance with OPSS 772 and the Contract Drawings.

Concrete barriers for the temporary chain-link fence shall be as specified on the Contract Drawings.

### **4.0                    CONSTRUCTION**

Construction of the chain-link fence shall be in accordance with OPSS 772 and the Contract Drawings.

Installation of temporary concrete barriers shall be as shown on the Contract Drawings.

### **4.0                    MEASUREMENT FOR PAYMENT**

#### **4.1                    Temporary Chain-link Fence – Item Relocate Chain-link Fence – Item**

Measurement of the above tender items shall be by length in metres along the contour of the ground for the actual length installed and shall include gate openings to the extents shown on the Contract Drawings.

### **4.0                    BASIS OF PAYMENT**

#### **4.1                    Temporary Chain-link Fence – Item**

Payment at the Contract price for the above tender item shall be full compensation for all labour, materials and equipment required to do the work, including but not limited to the following:

- Supply, install and remove concrete barrier base for chain link fence;
- Supply, install and remove chain link fence on top of concrete barrier; and,
- All hardware associated with the installation of the works including tie-in to existing fence to remain.

Payment shall be based upon the following schedule:

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- d) 40% upon satisfactory submission of detailed working drawings and installation of the temporary chain link fence including tie-ins and concrete barriers;
- e) 40% pro-rated into equal payments over the construction duration that the temporary chain-link fence is installed for; and
- f) 20% upon successful removal of the temporary chain-link fence and clean up.

### **4.2 Relocate Chain-link Fence – Item**

Payment at the Contract price for the above tender item shall be full compensation for all labour, materials and equipment required to do the work, including but not limited to the following:

- Remove, salvage and store existing chain link fence;
- Supply of new hardware; and
- Reinstall chain-link fence in new location with new hardware.

Payment shall be based upon the following schedule:

- a) 50% for removal and storage of the existing chain-link fence; and
- b) 50% for reinstallation of the chain-link fence with associated new hardware.

### **SPST. 14 CREEK RESTORATION**

OPSS 511 shall apply except as may be amended or extended herein.

Section 511.01 is deleted and replaced by the following:

#### **511.01 SCOPE**

This specification covers the requirements for the supply and installation of rip-rap, including geotextile, for the reconstruction of the creek banks disturbed in the vicinity of the east pier to the limits shown on the Contract Drawings.

#### **511.05 MATERIALS**

##### **511.05.01 Rip-Rap, Rock Protection, and Granular Sheeting**

Section 511.05.01 is amended by the addition of the following:

Stone for Rip-Rap shall be rounded river stone, 75 to 125 mm in size.

##### **511.05.02 Geotextile**

Section 511.05.02 is deleted and replaced by the following:

Geotextile shall be type 270R by Terrafix or approved equivalent.

**511.07 CONSTRUCTION**

**511.07.02.02 Rip-Rap**

Section 511.07.02.02 is amended by the addition of the following:

Rip-rap shall be placed to a minimum thickness of 300 mm in depth, keyed into the creek bottom an additional 250 mm as shown on the contract drawings.

Place topsoil to fill the voids of rip-rap such that it will be suitable for plantings.

**4.0 MEASUREMENT FOR PAYMENT**

**4.1 Creek Restoration – Item**

Measurement of the above tender items shall be by projected horizontal area in square metres to the limits shown on the Contract Drawings.

**4.0 BASIS OF PAYMENT**

**4.1 Creek Restoration – Item**

Payment at the Contract price for the above tender item shall be full compensation for all labour, materials and equipment required to do the work, including but not limited to the following:

- River bank preparation including keying the rip-rap and geotextile into the river bed;
- Supply, installation of rip-rap;
- Supply, installation of geotextile; and,
- Supply and installation of topsoil to the top of the stone layer.

**END OF PART VI G**