AMENDMENTS TO OPSS 911 (NOV 90) – CONSTRUCTION SPECIFICATION FOR COATING STRUCTURAL STEEL [1]

OPSS 911.03 is amended by the addition of the following:

Abrasive: means a solid substance capable of grinding or breaking down. It shall be of a low free silica type (1% free silica or less).

Escape: means any visible emission or settlement of dust or debris including abrasive media, paint chips and coating overspray.

Removed Coating Material: means removed coating material that has been separated from spent blasting medium, and includes material collected in dust collectors.

Spent Blasting Medium: means material that is a mixture of spent abrasive and coating material from the steel components of the structure, and includes recyclable blasting medium which is to be managed by reuse in other products or by disposal as waste.

Interim Surface Preparation: any method of treating a surface in preparation for coating that does not meet the requirements for the final surface preparation standard.

Final Surface Preparation: the surface preparation standard(s) (e.g. SSPC-SP5, SSPC-SP6, SSPC-SP10, SSPC-SP11) specified in the Contract Documents. All references to these specifications shall refer to the latest (current) edition.

The definition for **Structural Steel** is deleted and amended to:

Structural Steel: means steel used in structures and includes lamp standards, bearing assemblies, deck drains, structural steel piles and all other steel appurtenances, except railing systems.

OPSS 911.04 is amended by the addition of the following to subsection 911.04.01.01:

1. **All references to OPS specifications that have been amended (as noted in LIST T1) are superseded by references to the replacement City of Toronto specifications (as given in LIST T1).**

A minimum of two weeks prior to the commencement of the Work, the Contractor shall provide the Commissioner with a description of the proposed method for management of removed coating material and spent blasting medium.

OPSS 911.04.01.01 is amended as follows:

The third paragraph is replaced by:

The written notice shall include working drawings showing the location and magnitude of all applied construction loads. The load drawings shall state that the bridge can safely support all loads including construction loads in accordance with the latest edition of the Ontario Highway Bridge Design Code (OHBDC), and shall bear the seal and signature of two professional Engineers in accordance with the requirements of OHBDC.

OPSS 911.04.02 is superseded by:

911.04.02 Restrictions on Construction Loads Imposed on Existing Structure

Unless otherwise indicated in the specifications* the Contractor shall retain two professional Engineers who would act as the evaluation Engineer and the checker to carry out structural evaluation for construction loads imposed on the existing structure which are in excess of:

- for slab on girder structures, 400 kg per support point with a maximum of support points loaded per girder per span or a U.D.L. per linear metre of the girder specified elsewhere in the contract;*

OR

- for truss and arch structures, 400 kg per panel point with a maximum of two panel points loaded on a truss or arch or a load per panel point designated in the contract.*

The evaluation shall ensure that the bridge can safely support all loads in accordance with the latest edition of OHBDC, including construction loads imposed on the bridge based on the Contractor's method of construction. The evaluation shall include a synopsis, detailed calculations and notes, and shall bear the stamps of both the evaluation Engineer and the checker. The Contractor shall retain documentation of such evaluation for a period of six years after the Commissioner has issued a Certificate of Completion.

OPSS 911.04 is amended by the deletion of subsection 911.04.03, Pre-Start Material Sample.

* Note to the Designer: Determine if Contractor is to be responsible for evaluation of existing bridge. Provide this information in the form of a Special Provision.

OPSS 911.04 is amended by the addition of the following:

911.04.04 Documentation for Reuse and Disposal

911.04.04.01 Test Results

Test results shall be provided to the Commissioner a minimum of 2 working days prior to shipment of the material tested.

For each sample tested, original documentation shall be provided by the selected laboratory indicating the following:

(a) laboratory name and address, and identification of the individual responsible for accuracy of test results;

(b) sample identification, including the contract number and date sampled;

(c) laboratory report of analysis, containing the analytical results;

(d) a certificate specifying the analysis performed, the methodology used for analysis of each parameter, and the instrumentation; and

(e) a quality control certificate indicating:

(i) the test result;
(ii) the upper and lower limits for process percent recovery and matrix spike recovery; and
(iii) a statement indicating the test results is acceptable relative to the upper and lower limits.

A record of all test sample numbers and sample dates shall be kept and made available to the Commissioner upon request. All such testing is the responsibility of the Contractor who shall bear all costs associated therewith.

911.04.04.02 MOE Permission for Reuse in Other Products

Where the Contractor chooses to manage spent blasting medium through reuse in products other than blasting medium, written permission shall be obtained from the Ministry of the Environment, and a copy shall be provided to the Commissioner a minimum of 2 weeks prior to commencement of the work. The MOE permission shall include the following:

(a) confirmation that the material and reuse meets the regulatory definition of a recyclable material; and

(b) confirmation that MOE finds the receiving site to be acceptable.

911.04.04.03 Waste Management Documentation/Manifesting

For disposal as waste, a copy of the carrier's Certificate of Approval for a Waste Management System and the disposal site's Certificate of Approval for a Disposal Site shall be provided to the Commissioner a minimum of two weeks prior to the commencement of the work.

For each shipment of removed coating material or spent blasting medium that is tested as a non-hazardous solid waste, a copy of the weigh ticket(s), receipt(s), or where such documentation is not available, written documentation from the operator of the disposal site that the waste has been received shall be submitted to the Commissioner a maximum of two weeks after disposal activities are complete.

For each shipment of removed coating material or spent blasting medium that is tested as a leachate toxic solid waste, the carrier shall present a Regulation 309 Form 1 manifest for "Part A" completion by the Commissioner. The Commissioner shall be notified a minimum of two weeks prior to the first shipment, and a minimum of 24 hours prior to each subsequent shipment.

OPSS 911.05 is amended by the addition of the following:

All coating systems shall conform to OPSS 1704, November 1990, amended as follows:

1704.02 References

Section 1704.02 of OPSS 1704 is amended by the addition of the following under "American Society for Testing and Materials":

ASTM D3960-93 Standard Practice for Determining Volatile Organic Compound Content of Paint and Related Coatings

1704.05.01 General

Subsection 1704.05.01 of OPSS 1704 is amended by the addition of the following:

(c) To qualify as a low volatile compound (VOC) coating, a product shall contain not more than 350 grams per litre of VOCs as defined in ASTM D3960-93.

Table 1 in OPSS 1704 is amended by the addition of the following:

	CGSB 1-GP-71 Method	ASTM	SSPC	Tolerances
VOC Content	n.a.	D 3960-93	n.a.	± 10% but total not to exceed 350 g/L

Material shall be delivered to the job site or the fabrication shop in the manufacturer's sealed containers bearing the manufacturer's labels conforming to OPSS 1704.

1704.05.02 Colour

Subsection 1704.05.02 of OPSS 1704 is amended by deleting the second paragraph and replacing it with the following:

Successive coats shall be formulated to show distinct colour difference. The colour of the top coat shall be as identified in the special specifications.*

Table 1 of OPSS 1704 is amended by the deletion of the tolerances for gloss:

Physical Tests	CGSB 1-GP-71 Method
Gloss	13.1

OPSS 911.07.01.01 is amended by the addition of the following:

When coating new structural steel, all structural steel including diaphragms, but excluding surfaces in contact with concrete and the contact surfaces of bolted joints, shall be cleaned to the requirements of SSPC-SP10 for a distance of 3000 mm from the ends of the girders.

When coating steel railing system(s), steel handrails shall be cleaned to the requirements of SSPC-SP8 (Pickling). If steel posts, caps and panel anchorages are to be metallized, they shall be cleaned to the requirements of SSPC-SP5 (White Metal Blast Cleaning) if the anchorages in concrete posts are to be coated with the epoxy-zinc/epoxy/polyurethane system, the steel panel anchorages, on concrete posts, shall be cleaned to the requirements of SSPC-SP10 (Near-White Blast Cleaning).

* Note to Designer: Provide this information in the form of a Special Provision

When coating existing structural steel other than steel railings, the areas of structural steel shall be cleaned to the requirements of:

- SSPC-SP11 (Power Tool Cleaning to Bare Metal) for overcoating systems.
- SSPC-SP10 (Near-White Blast Cleaning) for all coating systems except hot dip galvanizing and metallizing.
- SSPC-SP8 (Pickling) for hot dip galvanizing.
- SSPC-SP5 (White Metal Blast Cleaning) for metallizing.
- SSPC-SP1 (Solvent Cleaning) if oil or grease are noticed on the surface.

OPSS 911.07.01.01.04 is amended by deleting the first paragraph and replacing it with the following:

The final surface preparation operations shall not be carried out in the following conditions as detailed in SSPC-PA1:

- Clause 6.1 “Temperature”
- Clause 6.2 “Moisture”

The limitations do not apply to interim surface preparation.

OPSS 911.07.01.02.01 is amended by deleting the fourth paragraph and replacing it with the following:

Except for the bolts, nuts and washers in clause 911.07.03.02.02, all rivets, bolts, nuts and washers shall be prime coated and finish coated by brush. When the inorganic zinc primer is specified, brushing shall be carried out with the epoxy-zinc primer from the low volatile organic compound system after the spray application. The finish coat shall be brush applied prior to spray application.

OPSS 911.07.01.02.01 is amended by the addition of the following:

When coating new structural steel with the epoxy-zinc/epoxy/polyurethane system, all structural steel including diaphragms, but excluding surfaces in contact with concrete and the contact surfaces of bolted joints, shall be cleaned to the requirements of SSPC-SP10 for a distance of 3000 mm from the ends of the girders.

When coating steel railing system(s) the area of structural steel in the handrail panels is provided in the Special Specifications.* When the steel posts, cap and panel anchorages are to be metallized, the area of structural steel to be cleaned and metallized is also provided in the Special Specifications.* Furthermore, when the anchorages in the concrete posts that are to be coated with the epoxy-zinc/epoxy/polyurethane system, the area of structural steel in the panel anchorages to be cleaned and coated is provided in the Special Specifications.*

When coating existing structural steel, the area of structural steel to be cleaned and coated is estimated in the Special Specifications.* The surfaces that shall be cleaned and coated are identified in the Special Specifications.* The coatings previously applied to the surface are identified in the Special Specifications*.

The coating system to be used shall be as specified in the Special Specifications.*

OPSS 911.07.01.02.02 to 911.07.01.02.05 are deleted.

OPSS 911.07.01.02.01 is amended by the addition of the following:

Low Volatile Organic Compound (VOC) Coating Systems

A) Epoxy-Zinc Water Based Acrylic/Water Based Acrylic System

The epoxy-zinc/acrylic system consists of three coats and shall conform to Table 6.

TABLE 6

Coat	Dry Film Thickness
Prime	75 µm minimum
Second	90 µm minimum
Third	90 µm minimum

B) Epoxy-Zinc/Epoxy/Polyurethane System

The epoxy-zinc/epoxy/polyurethane system consists of three coats and shall conform to Table 7.

* Note to Designer: Provide this information in the form of a Special Provision.

TABLE 7

	Amercoat Canada	Corrosion Service Co. Ltd.
Coat	Dry Film Thickness	Dry Film Thickness
Prime	75 µm minimum	75 µm minimum
Second	100 µm minimum	75 µm minimum
Third	50 µm minimum	75 µm minimum

C) Inorganic-Zinc/Water Based Acrylic/Water Based Acrylic System

The inorganic-zinc/acrylic system consists of three coats and shall conform to Table 8.

TABLE 8

Coat	Dry Film Thickness
Prime	75 µm minimum
Second	90 µm minimum
Third	90 µm minimum

D) Inorganic-Zinc/Epoxy/Polyurethane System

The inorganic-zinc/epoxy/polyurethane consists of three coats and shall conform to Table 9.

TABLE 9

Coat	Dry Film Thickness
Prime	75 µm minimum
Second	75 µm minimum
Third	75 µm minimum

OPSS 911.07.01.02.09 is superseded by:

911.07.01.02.09 Seal Coating of Metallized Surfaces

All metallized surfaces shall be coated with the epoxy mid-coat from one of the low volatile organic compound (VOC) systems. The minimum dry film thickness shall be 50 µm. The colour of the seal shall be a semi-gloss equivalent of 501-107 grey (1-GP-12C).

OPSS 911.07.01.02.10 is superseded by:

911.07.01.02.10 Touch-Up

Damaged areas of coated surfaces shall be cleaned of all rust and other contaminants and recoated with the same materials except for inorganic zinc primers which shall be recoated with an epoxy zinc primer from the low VOC systems. The minimum dry film thickness shall be 75 µm.

The damaged areas of hot dip galvanized and metallized surfaces shall be cleaned of all rust and other contaminants and shall be recoated with two coats of zinc-rich coating. Each coat shall be 75 µm minimum thickness. Where metallized surfaces have been seal coated, the seal coat shall be applied over the zinc-rich coating to a minimum dry film thickness of 50 µm. The zinc-rich coating used to touch-up the metallic coatings shall be from the zinc-rich touch-up systems.

OPSS 911.07.01.02.11 is amended by the addition of the following:

As an alternative to calibrating the magnetic gauge on the prepared surface the Contractor may provide an uncoated reference sample of similar steel and surface preparation for gauge calibration.

OPSS 911.07.02.01 is amended by the addition of the following:

Areas that are difficult to access are described in the Special Provisions.*

OPSS 911.07.02.02 is superseded by:

Except for metallizing and hot dip galvanizing, the maximum time between final surface preparation and the prime coat application shall be 10 hours.

* Note to Designer: Provide this information in the form of a Special Provision

OPSS 911.07 is amended by the addition of the following subsection:

911.07.02.03 Pre-Tender Trial Operations

Tenderers may conduct such trial blasting methods as they require, but subject to the same requirements as specified in the proposed contract, to ascertain effectiveness and rate of production of equipment and abrasive intended to be employed.

The Tenderer may select, subject to Commissioner's approval, any area of structural steelwork within the identified contract limits.

Tenderers must inform the Commissioner of their testing intentions and obtain approval for a specific time framework.

All materials, labour and equipment deemed necessary by the Tenderer, shall be supplied at the Tenderer's expense.

The site shall be cleaned after the trial period so that it is returned to a state equivalent to the original state.

OPSS 911.07.03.02.01 is superseded by:

All three (3) coats shall be applied in the shop.

OPSS 911.07.05 is superseded by:

911.07.05 Environmental Protection During Coating of Structural Steel and Railing System(s)

911.07.05.01 Full Enclosures

A full enclosure with a negative pressure shall be installed and maintained around all surface preparation activities where abrasive blasting is used. The negative pressure system shall evacuate air from the enclosure to a dust collector and shall be operated during all abrasive blasting and cleanup activities, including surface blowdown prior to coating.

At work areas where vacuum abrasive blasting/filtration or other similar vacuum/filtration surface preparation equipment is used, a full enclosure with negative pressure system is not required, provided the vacuum blasting equipment can satisfy the escape limits stipulated in this special provision.

At work areas where grinding, or other low dust generating surface preparation equipment is used, a full enclosure that prevents any escape of material shall be installed and maintained.

Where coating material is applied with spray equipment, a full enclosure that prevents any escape of material, shall be installed and maintained.

Where the application of coatings is undertaken without spray equipment, an enclosure is not required provided the escape of coating material is prevented.

Random escapes from operations shall be limited to a cumulative duration of 3 percent of the work day (e.g. 15 minutes per 8 hour shift). Operations shall cease immediately in the event that random escapes exceed 3 percent of the work day, or extend beyond the right-of-way, and shall not resume until remedial action has been undertaken.

The work platform, or the ground surface if work is being conducted from the ground, shall be covered with tarps with overlapping edges, or otherwise covered.

There shall be no escapes while dismantling or moving the full enclosure. Prior to dismantling or moving the enclosure, the walls, floor, and joints of the enclosure shall be cleaned by vacuuming. All dust and debris not previously accessible and found in cracks and joints during dismantling shall be immediately vacuumed.

911.07.05.02 Dust Collector

Air evacuated from the enclosure shall be conveyed in conduits directly to a dust collector appropriately sized for the particulate matter and air flow. There shall be no escapes from conduits or dust collectors.

911.07.05.03 Recycling Equipment

Where spent abrasive is recycled there shall be no escape of materials during mobilization, operation, clean-up, or demobilization of abrasive recyclers, conduits and associated equipment.

911.07.05.04 Waste Storage

Spent materials from the enclosure shall be collected daily. Spent materials from recycling equipment and dust collectors shall be collected on a regular basis so as to maintain the effective performance of the equipment. All spent materials shall be stored in rigid containers with tight sealing lids. The containers shall be made of steel, rigid plastic, or similar material and shall be of sound condition. The containers shall keep the material dry at all times and prevent their escape. There shall be no escape of materials during transfers to and from containers, enclosures, recycling equipment, or dust collectors.

OPSS 911.07 is amended by the addition of the following:

911.07.06 Management of Spent Blasting Medium

Management of removed coating material and spent blasting medium shall include collection, sampling, testing, on-site storage, documentation/manifesting, transportation, and recycling/reuse/disposal.

Removed coating material shall be managed separately from spent blasting medium.

Spent blasting medium shall be managed by one or a combination of:

(a) on-site recycling;

(b) reuse in other products; and/or

(c) disposal as waste.

Removed coating material shall be managed by disposal as waste.

Removed coating material and spent blasting medium shall be stored in a containment system located in an on-site isolated area until either on-site recycling is performed, or the materials are removed from the site for reuse or disposal.

Approval by the Commissioner shall be obtained prior to shipment of removed coating material and spent blasting medium from the project site.

It is the Contractor's responsibility to obtain approvals, releases, and agreements, and conditions of same, that are required to implement the Contractor's strategy for the management of removed coating material and spent structural blasting medium.

911.07.06.01 Sampling and Testing

Prior to transportation from the project site, each shipment of removed coating material and spent blasting medium that is managed by reuse in other products or by disposal as waste shall be subject to sampling and testing by an analytical laboratory in compliance with the following:

(a) Laboratory test results are subject to the approval of the Commissioner.

(b) The Contractor shall notify the Commissioner a minimum of 24 hours prior to collecting each waste sample.

(c) One 500 g representative composite sample of spent blasting medium shall be prepared for the first 12 cubic metres, or less, or material. An additional sample is required for each additional 12 cubic metres, or less, of material.

(d) One 500 g representative composite sample of removed coating material shall be prepared for the first 12 cubic metres, or less, of material. An additional sample is required for each additional 12 cubic metres, or less, of material.

(e) Each sample shall be divided into two halves, with each half clearly labelled with the contract number and sample date. One half of each sample shall be submitted to the analytical laboratory and the other half shall be retained in a secure location by the Commissioner.

(f) Samples shall be taken in compliance with direction received from the Commissioner and the procedure outlined in the document titled, "Sampling Protocol For Removed Coating Material and Spent Blasting Medium" dated December, 1994.

(g) The sample shall be tested in compliance with the Ontario Regulation 347 leachate extraction analysis procedure to determine the concentration of arsenic, barium, boron, cadmium, chromium, lead, mercury, selenium, silver, and any other parameter specified by Ontario Regulation 347 that may be associated with any previous use of the blasting medium.

(h) The test equipment shall be either Inductively Coupled Argon Plasma (ICAP) Spectrophotometry, or Atomic Adsorption (AA) Spectrophotometry, however, all samples from this Contract shall be tested using the same type of equipment.

911.07.06.02 On-Site Recycling of Blasting Medium

Recycling of spent blasting medium shall be performed within the right-of-way.

911.07.06.03 Reuse of Spent Blasting Medium in Other Products

Spent blasting medium that is to be reused in other products shall be transported directly from the project site to the MOE approved receiving site.

911.07.06 Disposal of Spent Blasting Medium and Removed Coating Material as Waste

911.07.07.01 Management of Removed Coating Material and Spent Blasting Medium as Non-Hazardous Solid Industrial Waste

For removed coating material and spent blasting medium that has tested as a non-hazardous solid industrial waste, the following shall apply:

(a) The material shall be transported to a waste disposal site with a Certificate of Approval for a Waste Disposal Site valid for non-hazardous solid industrial or commercial waste.

(b) For each shipment of the material from the project site, the carrier shall be one of the following.

(i) a hauler who also undertook a portion of the cleaning/coating without a Certificate of Approval for a Waste Management System, provided the material is transported directly from the project site to a certified disposal site; or

(ii) any other hauler, provided the hauler has a Certificate of Approval for a Waste Management System valid for non-hazardous solid industrial or commercial waste.

911.07.07.02 Management of Removed Coating Material and Spent Blasting Medium as Class 146 Leachate Toxic Solid Waste

For removed coating material and spent blasting medium that has tested as an Ontario Waste Class 146 leachate toxic solid waste, the following shall apply:

(a) The materials shall be transported to a waste disposal site with a Certificate of Approval for a Waste Disposal Site valid for Ontario Waste Class 146 leachate toxic solid waste.

(b) For each shipment of the material from the project site, the carrier shall have a Certificate of Approval for a Waste Management System valid for Ontario Waste Class 146 leachate toxic solid waste.

OPSS 911.07.07.03 Certified Carrier Requirements and Responsibilities

A Certificate of Approval for a Waste Management System shall be valid for all of the following:

(a) the entire period of the work;

(b) the entire area within the limits of the work and the entire haul route;

(c) the equipment to be utilized; and

(d) the waste classification of the material being transported.

Responsibilities of certified carriers shall include, but not be limited to, the following:

(a) transportation of waste materials produced by the work in accordance with Certificate of Approval; and

(b) waste manifesting for Class 146 leachate toxic solid waste.

OPSS 911.08.01 is superseded by:

Each phase of the work will require inspection by the Commissioner before proceeding to the next phase. Acceptance of the surface preparation will be based on the applicable SSPC surface preparation specifications and pictorial standards given in SSPC-VIS1 and SSPC-VIS3.

OPSS 911.08.02 is superseded by:

Surface profile measurements will be made on a random basis by use of a spring micrometer and extra coarse, pressure sensitive replica tape.

OPSS 911.08.03 is amended by the addition of the following:

Prior to installation of the steel railing system(s) components, the Contractor shall submit two copies of the galvanizer's dry film readings to the Commissioner.

OPSS 911.08.06 is superseded by:

Each batch of coating material shall be field sampled at the request and in the presence of the Commissioner. Sample containers will be supplied by the Commissioner.

OPSS 911.10 is amended by the addition of the following:

Payment at the contract price for the above tender items shall be full compensation for all labour, equipment and materials for the management of spent blasting medium and removed coating material with the following exception.

Payment of any costs for the disposal of removed coating material and the disposal of spent blasting medium, not including recyclable blasting medium, as a Class 146 leachate toxic solid waste, that are additional to those for disposal as a non-hazardous solid industrial waste, shall be in accordance with the Extra Work provisions of the Contract.

No separate payment shall be made for testing of spent blasting medium. All such testing is the responsibility of the Contractor who shall bear all costs associated therewith.