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| Version | Date | Description of Revisions |
| 1 | August 30, 2006 | Approved final document. |
| 2 | November 13, 2009 | Modified ‘Related Section’ and approved suppliers |
| 3 | March 15, 2011 | Minor changes from Legal |
| 4 | June 27, 2012 | Addition of References and Replacement Parts sections on this page |
| 5 | July 11, 2012 | Reformatted to Reduce White Space |
| 6 | April 23, 2015 | General formatting |
| 7 | September 30, 2015 | First draft review Phase 1 (AV) |
| **8** | **December 14, 2015** | **Updated, Finalized Specification – Legal Reference eDOCS #6324306 v4 (AV)** |
| 9 | January 9, 2017 | Complete technical revamp incorporating the latest acceptable 09960 technical specifications based on previous successful projects. Also updated standards references and incorporated requirement for receiving an Affidavit of Compliance from Contractor. (AV) |
| 10 | May 2, 2017 | Posted to Toolkit (AV) |

NOTE:

This is a CONTROLLED Document. Any documents appearing in paper form are not controlled and should be checked against the on-line file version prior to use.

**Notice:** This Document hardcopy must be used for reference purpose only.

**The on-line copy is the current version of the document.**

# GEneral

## Related Sections

### *[Under "Related Sections", identify other Sections that are related to, and/or dependent on, the work results or information specified elsewhere. The list should be limited to Sections with specific information that the reader might expect to find in this Section, but is specified elsewhere. For example, if hardware for aluminum entrances is specified in the aluminum entrance Section, a cross-reference would be appropriate in the finish hardware Section. The purpose of this cross-referencing is for information only, to aid in finding those other requirements—not to define the scope of the Section.*

### *Cross-referencing here may also be used to coordinate assemblies or systems whose components may span multiple Sections and which must meet certain performance requirements as an assembly or system.*

### *Contractor is responsible for coordination of the Work.*

### *This Section is to be completed/updated during the design development by the Consultant. If it is not applicable to the section for the specific project it may be deleted.]*

### *[List Sections specifying installation of products supplied but not installed under this Section and indicate specific items.]*

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Execution requirements for ...[item]... specified under this Section.

### *[List Sections specifying products installed but not supplied under this Section and indicate specific items.]*

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Product requirements for ...[item]... for installation under this Section.

### *[List Sections specifying related requirements.]*

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: [Optional short phrase indicating relationship].

#### Section 01750 – Disinfection and Testing of Water Retaining Structures and Process Piping

#### **Section 02137 – Lead Paint Removal and Management**

## References

### ASTM International:

#### ASTM A532/A532M-10 (2014), Standard Specification for Abrasion-Resistant Cast Irons.

#### ASTM B117-16, Standard Practice for Operating Salt Spray (Fog) Apparatus

#### ASTM D2244-16, Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates

#### ASTM D4060-14, Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser

#### ASTM D4141/D4141M-14, Standard Practice for Conducting Black Box and Solar Concentrating Exposures of Coatings

#### ASTM D4214-07(2015), Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films

#### ASTM D4541-09e1, Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers

#### ASTM D4585/D4585M-13, Standard practice for Testing Water Resistance of Coatings Using Controlled Condensation

#### ASTM D4587-11, Standard Practice for Fluorescent UV-Condensation Exposures of Paint Related Coatings

#### ASTM D523-14, Standard Test Method for Specular Gloss.

#### ASTM D870-15, Standard Practice for Testing Water Resistance of Coatings Using Water Immersion

#### ASTM G95-07(2013), Standard Test Method for Cathodic Disbondment Test of Pipeline Coatings (Attached Cell Method)

### American National Standards Institute/NSF International:

#### ANSI/NSF 61, Drinking Water System Components – Health Effects.

### American Water Works Association:

#### AWWA D100-11, Welded Carbon Steel Tanks for Water Storage.

#### AWWA D102-14, Coating Steel-Water Storage Tanks.

#### AWWA C210-15, Liquid-Epoxy Coating and Lining for the Steel Water Pipe and Fittings.

#### AWWA C652-11, Disinfection of Water-Storage Facilities.

### NACE International:

#### NACE RP-01, Design, Fabrication and Surface Finish of Metal Tanks and Vessels.

#### NACE 6A192, Dehumidification, Temperature Control, Surface Preparation, Application, Curing Coatings/Linings, Steel Tanks, Vessels, Enclosed Spaces.

#### NACE SP0178-2007 (formerly RP0178) Standard Practice, Design, Fabrication, and Surface Finish Practices for Tanks and Vessels to Be Lined for Immersion Service.

#### NACE SP0188-2006 (formerly RP0188), Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.

#### NACE 6A192/SSPC TR 3, Dehumidification and Temperature Control During Surface Preparation, Application, and Curing for Coatings/Linings of Steel Tanks, Vessels, and Other Enclosed Spaces.

### Occupational Safety and Health Act, R.S.O.1990 c. O.1, and Regulations for Construction Projects.

### Environmental Protection Act, R.S.O. 1990 c. E.19, Regulations with regard to abrasive blast cleaning and painting procedures.

### The Society for Protective Coatings (SSPC):

#### SSPC AB 2, Cleanliness of Recycled Ferrous Metallic Abrasives

#### SSPC Guide 6, Guide for Containing Debris Generated During Paint Removal Operation.

#### SSPC Guide 7, Guide for the Disposal of Lead Contaminated Surface Preparation Debris.

#### SSPC Guide 12, Guide for Illumination of Industrial Painting Projects

#### SSPC PA 1, Shop, Field, and Maintenance Painting of Steel.

#### SSPC PA 2, Procedure for Determining Conformance to Dry Coating Thickness Requirements.

#### SSPC PA 3, A Guide to Safety in Paint Application.

#### SSPC SP 1, Solvent Cleaning.

#### SSPC SP 10/NACE No. 2, Joint Surface Preparation Standard: Near-White Metal Blast Cleaning.

#### SSPC SP 11, Power Tool Cleaning to Bare Metal.

#### SSPC SP 2, Surface Preparation Specification No. 2: Hand Tool Cleaning, Includes Editorial Revisions (2004).

#### SSPC SP 5/NACE No. 1, Joint Surface Preparation Standard: White Metal Blast Cleaning.

#### SSPC SP 6/NACE No. 3, Joint Surface Preparation Standard: Commercial Blast Cleaning.

#### SSPC TR3/NACE 6A192, Dehumidification and Temperature Control During Surface Preparation, Application, and Curing for Coatings/Linings of Steel Tanks, Vessels, and Other Enclosed Spaces.

#### Steel Structures Painting Manual Vol. 2 – Systems and Specifications published by SSPC – Steel Structures Painting Council, 1982.

## Definitions

### Terms used in this Section:

#### Coverage: Total minimum dry film thickness in microns.

#### Micron (µm) = 1 micron = 10 6 m = 0.0393701 mil, 1 mil = 25.4 microns.

#### Mil = 25.4 microns (µm) = 0.0254 millimeter

#### MDFT: Minimum Dry Film Thickness, microns.

#### MDFTPC: Minimum Dry Film Thickness Per Coat, microns.

## Intent

### It is the intent of this specification that all steel surfaces be cleaned and coatings applied so that a sound, continuous coating system exists in all areas.

## Design Requirements

### Containment systems are to be designed by a professional engineer licensed in the Province of Ontario. The engineer’s professional seal and signature must be affixed to shop drawings for such items.

## Damage or Contamination

### The Contractor shall adequately protect, shield, or cover all structures, stores, machinery, equipment, and openings, as identified by the Contractor or as required by the Consultant, to prevent damage or contamination from the Work procedures involved. The Contractor shall be responsible for any such loss or damage.

## Submittals

### Data Sheets:

#### For each coating system, provide three copies of the coating paint manufacturer's technical data sheets, and the coating colours available (where applicable) for each Product used in coating that demonstrates compliance with specification.

#### Submit the required information on a system-by-system basis.

#### Provide copies of coating system submittals to the coating applicator.

#### Indiscriminate submittal of manufacturer's literature only is not acceptable.

#### Product and Safety Data Sheets: Submit three copies of data sheets for each product.

#### Provide a detailed chemical and gradation analysis for each proposed abrasive material.

#### Provide proof that the coating system meets requirements of NSF 61.

#### Provide details on the coating system and reports confirming that the system meets or exceeds the performance requirements listed in this specification.

### Colour Samples:

#### Submit the manufacturer's colour samples showing the full range of standard colours.

### Manufacturer's Quality Assurance:

#### Submit the manufacturer's certification that coatings comply with specified requirements and are suitable for intended application.

### Affidavit of Compliance or Certificate of Compliance from the manufacturer or constructor that the materials and work furnished complies with the applicable AWWA standards (AWWA D100-11 subsection 14.5, D102-14 subsection 6.3, and C210-15 subsection 6.3).

### Written proposal outlining method for protection of the adjacent areas to prevent damage or contamination from the work procedures involved.

### Written proposal outlining the methods and sequence for surface preparation and application of coatings. Do not commence any surface preparation or coating application until the review is complete.

### Written proposals shall contain, but not be limited to, description of:

#### Ventilation system, including forced air.

#### Dehumidification systems.

#### Blast abrasive recovery systems.

#### Containment systems.

## Quality Assurance

### Qualifications:

#### Coating Manufacturer's Qualifications:

##### Specializes in the manufacture of coatings with a minimum of 10 years of successful experience in the application of the specified Product.

##### Capable of demonstrating successful performance on comparable projects.

#### Applicator Qualifications:

##### Experienced in the application of specified coatings for a minimum of 5 years on projects of similar size and complexity to this Work.

##### Applicator's Personnel: Applicator employs persons trained for the application of the specified coatings.

### Quality Assurance-Pre Application Meeting:

#### Convene a pre-application meeting one week before commencing the application of the coating systems. Attendance of the parties directly affecting the work of this Section, including the Contractor, Consultant, applicator, and manufacturer's representative, shall be required. The following items shall be reviewed at the pre-application meeting:

##### Health and safety requirements.

##### Protection of surfaces not scheduled to be coated.

##### Material storage and Material Safety Data Sheets (MSDS’s) for all applicable products.

##### Surface preparation.

##### Application.

##### Repair.

##### Field quality control including inspection requirements, testing and reports.

##### Hold points or check points that require the Work to be inspected by the Consultant prior to moving to the next step of the Work.

##### Cleaning.

##### Protection of coating system.

##### Disinfection in accordance with AWWA C652-11 specifying the disinfection method.

##### One year inspection and inspection report.

##### Two year inspection and inspection report (end of warranty period).

##### Coordination with the Work.

### Submit a report of alternative recommendations for any adverse conditions encountered.

### Arrange with the paint manufacturer to visit the Site at intervals during the surface preparation and painting operations to ensure that the proper surface preparation has been completed, that the specified paint products are being used, that the proper number of coats are being applied and that the agreed finishing procedures are being used, and that the paint manufacturer regularly submits written reports to the Contractor after each Site visit. Submit these reports to the Consultant when received from the coating manufacturer.

### Perform surface preparation and painting in accordance with recommendations of the following:

#### Paint manufacturer's instructions.

#### SSPC PA 3, Guide to Safety in Paint Applications.

#### Federal, provincial, and local agencies having jurisdiction.

### Regulatory Requirements:

#### Meet all regulations established by the Ministry of Labour under the Occupational Health and Safety Act, R.S.O. 1990 c. O.1, and Regulations for construction projects, and by other government authorities, including those regulations pertaining to the handling of hazardous paints and solvent materials.

#### Meet federal, provincial and local requirements limiting the emission of volatile organic compounds.

## Workmanship

### All work performed by the Contractor shall be of the best quality throughout and in accordance with the requirements of SSPC PA 1, unless otherwise specified in the Contract Documents. Any dispute or difference of opinion as to the interpretation of these specifications or regarding the quality of material or workmanship shall be left to the decision of the Consultant, whose decision shall be final and binding.

## Access

### The Contractor shall provide free and safe access to the Work area at all times for the benefit of the Consultant and inspection staff.

### Operational activities at the facility will take precedence over construction activities.

### Region-owned antennas are located on the top of the elevated tank. The Region shall notify the Contractor prior to accessing any antennas and communication equipment within the elevated tank.

## Details of Work

### Any particulars of the Work provided herewith are given only for the guidance of the Contractor who will be held responsible for securing all necessary dimensions and details. The intent of these specifications is to provide for a quality coating system in the areas specified in the Contract Documents.

### The Contractor, at its option, may take additional coating samples and provide testing of these samples for its use and information in determining the level of containment required and air quality standards necessary to meet MOECC, OHSA, and other requirements associated with this Work. All costs associated with additional sampling and testing shall be borne by the Contractor.

## Exceptions

### There shall be no departure from these specifications unless otherwise directed by the Consultant. The Consultant has the right, during the performance of the Work, to make alterations, provided that such alterations are instituted before the particular work requiring the change is commenced, and also provided that such alterations will not increase the Contractor's cost. Any exceptions required by the Contractor must be presented in writing to the Region prior to the commencement of the Work.

## Delivery, Storage, and Handling

### Shipping:

#### Protect shop painted surfaces during shipment and handling by suitable provisions including padding, blocking, and use of canvas or nylon slings.

### Storage:

#### Deliver paint materials to the Site in sealed, labeled containers with the manufacturer's labels intact. Store products in a protected area that is heated or cooled to maintain temperatures within the range recommended by paint manufacturer.

#### Do not expose primed surfaces to weather for more than 2 months before being top-coated, or less time if recommended by the coating manufacturer.

## Project Conditions

### Environmental Requirements:

#### Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the coating product manufacturer.

#### Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the coating product manufacturer.

#### Minimum application temperatures shall be as required by the manufacturer's instructions.

#### Provide lighting level equivalent to 80 foot candles (861 lux) measured mid height at substrate surface in accordance with SSPC Guide 12.

#### Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the coating manufacturer during application and drying periods.

#### Painting shall be suspended when wind velocities exceed that which will allow for a quality application of exterior coatings and where coating could be carried off Site by the wind.

#### Adequate illumination and ventilation shall be provided in all areas where painting operations are in progress. Forced air ventilation shall be supplied to tank interior for a continuous period until at least 48 hours after the final coat has been applied. Ventilation, at a minimum, shall be in accordance with AWWA D102-14. If supplemental heating or dehumidification is required to aid in curing the coatings, the Contractor shall furnish and operate the equipment at its own expense as necessary and required to assist in the curing of the coatings.

#### In addition to any air monitoring requirements of the MOECC and the OHSA, the Consultant may determine that additional air monitoring is required to ensure that air quality in other parts of the structure is within acceptable levels. At the Consultant's request, the Contractor shall provide additional air monitoring equipment and services as necessary, and at its own expense, to verify acceptability of the air quality within the tank.

#### *[Consultant Note: Section 1.14.9 to 1.14.17 to be replaced if testing definitive that no lead paint or primer exists on tank]*

#### [Containment Structure: Containment systems and structures shall be in accordance with Section 02137 - Lead Paint Removal and Management.

#### All waste materials resulting from abrasive blast cleaning and coating removal operations shall be cleaned up by vacuuming. Sweeping, shoveling, or other mechanical means to remove the waste materials will not be allowed.

#### The Contractor shall ensure that the containment, collection and storage of waste materials is done in strict accordance with all current federal, provincial, and local regulations with respect to waste handling and disposal.

#### When abrasive blast cleaning is used, the Contractor shall consider all areas which are subject to any abrasive blast cleaning to be of a containment nature, and which shall be subject to all health and safety standards and practices set forth by any and all federal, provincial, and local agencies, authorities, departments, or governing body involved.

#### All waste materials shall be recovered and removed from the Site, and disposed of in accordance with all applicable local, provincial, and federal laws, regulations, and codes. Removed coating, cleaning debris, and abrasive blast cleaning materials shall be cleaned up daily and stored in leak proof covered containers for disposal.

##### Tank interior blast residue shall be stored separately from exterior blast residue and containers labelled as such. Containers shall be designed to keep water from entering the containers.

##### Collection, handling, and disposal of these materials shall be in accordance with OHSA, EPA, and all other governing laws, rules, and regulations. The cost of all disposals under this Contract shall be the responsibility of the Contractor. The Contractor shall consider all waste materials as hazardous unless proven otherwise by additional testing. The Contractor shall make all arrangements and pay all associated laboratory costs necessary to determine if the materials are classified as hazardous waste and shall make necessary arrangements, based upon these results, for the proper disposal of the materials. Copies of all testing results shall be sent to the Consultant prior to the removal of any debris from the Site.

#### The Contractor shall furnish copies of all manifests, chain of custody forms, testing results, etc. to the Consultant for all materials removed from the Site and disposed of prior to the Total Performance of the Work.

#### The Contractor shall provide the name of the treatment or disposal facility to the Consultant for approval prior to the removal of any materials from the Site.

#### All materials removed from the Site shall be transported to a treatment or disposal facility. The treatment or disposal facility shall be approved by the Consultant prior to removal of any materials from the Site. The transporter shall obtain the necessary insurances and permits required for the transportation of the materials which shall be submitted to the Consultant for approval prior to removal and transporting of materials from the Site.

#### All waste materials that remain on the collector system shall be removed at least once a Day or more frequently if directed by the Consultant.]

#### Unless otherwise permitted by the Consultant, all coatings shall be applied by roller, brush, air or airless spray on interior work. Intermediate coats on interior work shall be applied according to the manufacturer's recommendations. Where containment is used for abrasive blast cleaning of the exterior surfaces of tanks, and coating overspray will not affect the performance of the containment material, conventional or airless spray will be allowed on the exterior with containment in place. When spraying is used, all welds, edges, inside corners, and structural members shall be painted first using a brush (stripe coated) in a manner not to exceed the maximum DFT for the product being applied and the maximum DFT of the total system as recommended by the coating manufacturer.

### Status of Existing Coatings:

#### The following information on existing coatings or substrate conditions is provided for information only, and is generally believed to be accurate, but is not guaranteed. The Contractor shall perform any additional tests required to verify the accuracy of this information:

##### ***[Consultant to amend if testing confirms definitively that no lead exists on tank***

##### **The Contractor is to assume the existing coating system contains lead. Analytical results of coating samples are contained in Appendix [Consultant to amend with proper reference] of the Contract. Refer to Section 02137 – Lead Paint Removal and Management for further information and requirements. ]**

## Warranty and Repair

### Warranty

#### Warranty Period: Provide a 2-year Warranty (24 months), commencing at the date of Total Performance of the Work.

##### If the 2-year warranty period ends between June 15 and September 15, extend the warranty period until November 15 to allow the Region to drain the tank and inspect the Work.

#### Submit the manufacturer's warranty against material deterioration due to system incompatibility, peeling, blistering, uneven fading or colour change, excessive surface erosion or weathering or other forms of coating failure which can be directly attributed to an abnormal coating system breakdown (the "Manufacturer's Warranty"). The Manufacturer's Warranty shall include loss of gloss which shall be less than 24 units as measured by a gloss meter in accordance with ASTM 532/A532M-10 (2014) with 60 degree geometry. Exterior coating system shall not chalk in excess of a rating of 8 as measured in accordance with ASTM D4214-07(2015), Method A. Change colour more than five dE Hunter units as determined in accordance with ASTM D2244-16 by comparing the affected exposed coating cleaned with water and a soft cloth with the unexposed Original Project Colour Standards maintained by the manufacturer and the Region.

#### Submit the Contractor's warranty against system deterioration due to defects in surface preparation or coating application due to faulty workmanship, or failure to follow the specifications and/or the manufacturer's instructions as set forth in the manufacturer's data sheets, for the warranty period.

#### The Contractor's warranty shall warrant against product failures and include the repair of product failures unless incorporated in the Manufacturer's Warranty.

#### The coating warranties outlined in Section 09960 – Painting of Steel Tanks and Appurtenances shall be provided by the Contractor in its entirety for the minimum duration indicated. Any damage to the coating caused by third party works during the warranty period will be documented and assessed by the Region to determine the impact to the coating warranties provided under this Contract.

#### The maintenance of the tank shall be in accordance with the Region's current maintenance program and will be performed by the Region.

### Warranty Inspection:

#### The Region or its authorized inspectors will perform a warranty inspection at the end of the first year and at the end of the 2-year warranty period.

#### The coating materials manufacturer and the Contractor will be invited to attend the inspection and will be advised in writing of any failure.

### It will be the Contractor's responsibility to identify the 1-year and 2-year anniversary inspections to the Region by contacting the Region's Project Manager. The Region has the option of waiving the inspection or requesting additional inspections/repairs.

#### Repair coating failures as directed by the Consultant and at a time acceptable to the Region. When requested, the Contractor shall provide a written repair procedure from or approved by the coating manufacturer for the repair of defects. The Contractor shall not commence repair operations until a repair procedure is approved by the Consultant. It will be at the Consultant's discretion if deviation from this process will result in the removal of the entire system at the defect area.

#### Repairs of greater than 15% of the surface area of either the interior or exterior shall require that the entire system be removed from the structure with reapplication of the specified system at no cost to the Region.

## Measurement and Payment

### All costs associated with the work of this Section shall be included in the price for Item Nos. [C-2, C-2A, and C-2B] in the Bid Form.

# PRODUCTS

## Abrasive Materials

### Select abrasive type and size to produce surface profile that meets the coating manufacturer's recommendations for specific primer and coating system to be applied.

### Blasting Grit: Silica sand is a designated substance and is not to be used for the field preparation of surfaces to be coated. Environmentally safe grit shall be used for the blast preparation of surfaces.

## Paint Materials

### General:

#### Manufacturer's highest quality products suitable for intended service.

#### Compatibility: Use only compatible materials from a single manufacturer. Particular attention shall be directed to compatibility of primers and finish coats.

#### Thinners, Cleaners, Driers, and Other Additives: As recommended by coating manufacturer.

### Apply coatings to achieve dry film thickness shown in the Exterior Paint System Application Table at the end of this Section.

### Exterior Coating System: The exterior coating system shall be zinc rich primer/ aliphatic polyurethane/aliphatic fluorourethane coating system conforming to the requirements of AWWA D102-14 Outside Coating System No. 4 (OCS 4). The exterior shall be coated to the dry film thicknesses shown in the Interior Paint System Application Table at the end of this Section. The system shall be as follows:

#### Primer of inorganic or organic zinc in accordance with AWWA D102-14 OCS 4 and the Exterior Paint System Application Table at the end of this Section.

#### Mid coat of aliphatic polyurethane in accordance with AWWA D102-14 OCS 4 and the Exterior Paint System Application Table at the end of this Section.

#### Coat of aliphatic fluorourethane in accordance with AWWA D102-14 OCS 4 and the Exterior Paint System Application Table at the end of this Section.

#### The exterior coating materials shall be a system of Products from a single manufacturer.

#### The coating system must meet all the performance criteria as listed below.

##### Adhesion to Steel: ASTM D4541-09e1, 1,900 psi minimum value, Method E, Type 5.

##### Gloss Retention: ASTM D4141/D4141M-14, 96% gloss retention minimum with a 1,260 MJ/m2 exposure.

##### Colour Retention: ASTM D4141/D4141M-14, 0.18 DED Hunter Scale maximum change with a 1,260 MJ/m2 exposure.

##### Salt Spray: ASTM B117-16, Maximum 1/16 inch rust creep after 10,000 hours exposure.

##### QUV Exposure: ASTM D4587-11, 60% gloss retention minimum, UVA 340 Bulbs 8 hour UV 4 hour condensation with 25,000 hours exposure.

##### QUV Exposure: ASTM D4587-11, 1.8 DED FMCII (MacAdam Units for Total Colour Change) maximum change, UVA 340 Bulbs 8 hour UV 4 hour condensation with 25,000 hours exposure.

### Interior Coating System: The interior coating system shall be a zinc rich primer and epoxy topcoat conforming to the requirements of AWWA D102-14 Inside Coating System No. 3 (ICS 3) and the NSF 61 Standard for Tank Coatings. The maximum dry film thickness shall not exceed the maximum thickness as allowed to obtain NSF 61 approval. The interior shall be coated to the dry film thicknesses shown in the Interior Paint System Application Table at the end of this Section. The inside system shall be as follows:

#### Primer organic zinc in accordance with AWWA D102-14 ICS 3 and the Interior Paint System Application Table at the end of this Section.

#### Lining of epoxy in accordance with ICS 3 and the Interior Paint System Application Table at the end of this Section.

#### The coating system, including the primer, shall be NSF 61 certified and proof of certification shall be provided to the Consultant during shop drawing submission.

#### The following performance criteria are required for this system:

##### Adhesion to Steel: ASTM D4541-09e1 Method E, Type 5, 1,900 psi minimum.

##### Cathodic Disbondment: ASTM G95-07(2013) Method A (30 day), 5 mm maximum.

##### Abrasion Resistance: ASTM D4060-14, CS17 Wheel, 0.18 g loss maximum 1 kg weight, 1,000 revs.

##### Humidity Resistance: ASTM D4585/D4585M-13, no blistering, cracking, or delamination of the system after 2,000 hours exposure.

##### Immersion: ASTM D870-15, no blistering, cracking, or delamination of the system after 2 years continuous immersion.

##### Salt Spray: ASTM B117-16, no blistering, cracking, or delamination of the system and no more than 1/64 inch of rust creepage after 9,000 hours exposure and 1/4 inch of rust creepage after 20,000 hours exposure.

#### All coating materials systems are to be supplied by the same manufacturer.

#### Coating shall be supplied at the Site in new, unopened containers. Materials older than the manufacturer's published shelf life shall not be accepted. Damaged containers will not be accepted. If requested, the Contractor shall provide the Consultant with a 1 L sample of each different lot of material proposed for the Work. Upon the Consultant's request, the Contractor shall provide the Consultant with certified copies of the manufacturer's quality control testing records.

#### Material Lots: Different lots of material shall be kept to a minimum consistent with the manufacturer's production facilities for the Product. Material shall be delivered to the Site in new, unbroken containers bearing the designated name, specification number, colour, directions for use, manufacturer, and date of manufacture with proof of NSF 61 certification for all inside coating systems.

#### Storage of Materials: Coating, patching, and caulking materials shall be stored in a location that is protected from the elements, well ventilated, and free from excessive heat, open flame, and other sources of ignition. The storage area shall be such that the Contractor will be able to maintain ambient conditions in accordance with the manufacturers' storage requirements.

#### Old or Damaged Materials: Materials older than the manufacturer's published shelf life shall not be accepted. Previously opened and damaged containers will not be accepted. All coating materials for any system shall be supplied by the same manufacturer.

#### Material Sample: If requested, the Contractor shall provide the Consultant with a 1 L sample of each different lot or batch of material proposed for the work. Upon the Consultant's request, the Contractor shall provide the Consultant with certified copies of the manufacturer's quality control testing records.

#### Statement of Material Supplier: The Contractor shall state the coating supplier to be used at the time of tendering unless otherwise specified in this Section.

#### Material Identification: All prime, intermediate, and finish coating materials shall be supplied in different colour shades and shall be clearly marked on each container as to the material function and colour.

#### Material Suitability: The coating manufacturer shall submit confirmation in writing that their Product will not introduce toxic materials or product taste or odours into the potable water. Toxic materials shall be those materials identified from time to time by the Ministry of the Environment, Health Canada, and other pertinent regulatory authorities. Taste and odour shall be quantified by APHA/AWWA/WPCF Standard Methods (for examination of water and wastewater). The Contractor shall use a Water Operator licensed by the Ontario Water and Wastewater Certification Office to perform the sampling of water from the elevated tank prior to placing the elevated tank back into service. It will be the Contractor's responsibility to ensure the water samples meet the requirements of the Ontario Drinking Water standards. The licensed Water Operator shall deliver the water samples to a laboratory approved by the Region for testing. The Consultant must be present on Site during the sampling.

##### Salt Spray (Fog): ASTM B117-16.

## Manufacturers

### **Approved Manufacturers and Coating Systems:**

#### Tnemec Company, Inc.

##### Interior System (ICS-3):

###### Primer Coat: Series 91-H2O Hydro-Zinc.

###### Finish Coat: Series 22 Pota Pox 100 or Series FC22 Epoxoline.

##### Exterior System (OCS-4):

###### Primer Coat: Series 91-H2O Hydro-Zinc.

###### Mid Coat: Series 1074 Endurashield.

###### Finish Coat: Series 700 HydroFlon.

#### Sherwin-Williams Company

##### Interior System (ICS-3):

###### Primer Coat: Corothane I Galvacpac 2K Zinc Primer.

###### Finish Coat: SherPlate PW Epoxy with Opti-Check Technology (OAP Hardener).

##### Exterior System (OCS-4):

###### Primer Coat: Corothane I Galvacpac 2K Zinc Primer.

###### Mid Coat: Series B65-650 Acrolon 218 HS.

###### Finish Coat: Series B65-550 Fluorokem.

#### Induron Coating Inc.

##### Interior System (ICS-3):

###### Primer Coat: Indurazinc MC67.

###### Finish Coat: Perma-Clean 100.

##### Exterior System (OCS-4):

###### Primer Coat: Indurazinc MC67.

###### Mid Coat: Indurethane 6700 Flat Urethane.

###### Finish Coat: Perma-Gloss Fluorourethane.

## Mixing

### Multiple Component Coatings:

#### Prepare the coatings using each component as packaged by the paint manufacturer.

#### No partial batches will be permitted.

#### Do not use multiple component coatings that have been mixed beyond their pot life.

#### Furnish small quantity kits for touch-up painting and for painting other small areas.

#### Mix only components specified and furnished by the paint manufacturer.

#### Do not intermix additional components for reasons of colour or otherwise, even within the same generic type of coating.

### Colours: Formulate paints with colourants free of lead, lead compounds, or other materials that might be affected by presence of hydrogen sulfide or other gas likely to be present at the Site.

# EXECUTION

## General

### Provide the Consultant a minimum 7 Days advance notice prior to the start of field surface preparation work and coating application work.

### Perform the work of this Section only in presence of the Consultant, unless the Consultant grants prior approval to perform the work of this Section in the Consultant's absence.

### Schedule inspection with the Consultant in advance for cleaned surfaces and all coats prior to applying subsequent coats.

### The Contractor shall perform a primary inspection of the surface preparation and lining application work and to ensure conformance with all pertinent specifications. The Contractor's supervisor should not participate in the physical work, but should limit his activities to supervision, co-ordination and communication with the Consultant's construction Site personnel and to thorough inspection of the surface preparation and lining installation work.

### All material and equipment furnished, and items of Work performed, will be subject to rigid inspection by the Consultant, the Region, or its authorized inspectors.

### Perform thorough inspection and be satisfied that all the requirements of the specification have been met prior to requesting the Consultant's approval for any portion of the Work.

### Provide adequate facilities, including scaffolding, swing stages, ladders, lighting, etc., as required, for the inspection of all work by any representative of the Region. Ensure cooperation of all trades and provide labour as required for assistance during the inspection process.

### Manufacturer's Services:

#### Arrange for a qualified representative of the paint manufacturer to visit the Site during the period of paint application to examine surfaces to be coated, materials to be used, and methods of application. Submit a copy of the written report of each visit prepared by the manufacturer's representative to the Consultant.

#### Arrange for the manufacturer's representative to be present at the Site as follows:

##### On first day of application of any coating system: interior and exterior coating system, for a minimum of 4 hours. The Contractor shall ensure that the manufacturer's representative will observe mixing preparation and review the condition of the surface with the Contractor and Consultant prior to the application of the Product.

##### A minimum of two additional Site inspection visits, each for a minimum of 4 hours, in order to provide Manufacturer's Certificate of Proper Installation.

##### A minimum of one additional Site visit during the application of each coat layer of the interior and exterior coating system while the coating is being applied for a minimum of 4 hours, in order to provide the Manufacturer's Certificate of Proper Installation.

##### As required to resolve field problems attributable to or associated with the manufacturer's product.

##### As required to provide recommendations for the repair of coating defects.

##### To verify the full cure of the coating prior to coated surfaces being placed into immersion service.

##### As a minimum, at each of the Work stages noted below, the manufacturer must complete quality inspections and provide the Contractor with approval to proceed with the next phase of the Work in conjunction with the Region's quality assurance inspection team. The Contractor and manufacturer shall perform the necessary inspections required to ensure the proper application of the system in order to provide the warranties specified within this specification.

##### To verify full cure of coating prior to coated surfaces being placed into immersion service.

### Work Stages:

#### Specified inspections are required for each work stage. Do not proceed beyond the Work stage requiring inspection until the Consultant has made or waived inspection. Inspection may be waived only by written notice to the Contractor.

#### Provide the Consultant with a schedule detailing each Work stage and provide notice of delay during the course of the project a minimum of 48 hours prior to when delays are expected.

#### Specified inspections are required for each Work stage as follows:

##### Prior to preliminary blast.

##### Prior to surface upgrading and/or repairs.

##### After surface preparation/upgrading.

##### Prior to each phase of final blast.

##### Prior to each prime phase.

##### Prior to each intermediate coat phase.

##### Prior to each final coat application.

##### After each final coat phase.

##### After deficiency repairs.

### Defective Work:

#### Repair or remove immediately when ordered by the Consultant any defective work, whether the result of poor workmanship, use of defective materials, damage through carelessness, or any other cause resulting from actions or omissions, found to exist prior to final acceptance of the Work. Repair using procedures acceptable manner to the Consultant. Replace any removed items of Work by new work and materials conforming to the Contract Documents. This clause has full effect regardless of the fact that the defective work may have been previously overlooked by the Consultant.

#### Unsatisfactory Application:

##### If an item of Work has an improper finish colour or insufficient film thickness, clean surface and topcoat with specified paint material to obtain specified colour and coverage. Obtain specific surface preparation information from coating manufacturer.

##### Evidence of runs, bridges, shiners, laps, or other imperfections is cause for rejection.

##### Repair defects in accordance with written recommendations of coating manufacturer.

#### Damaged Coatings, Pinholes, and Holidays:

##### Feather edges and repair in accordance with the recommendations of paint manufacturer.

##### Hand or power sand visible areas of chipped, peeled, or abraded paint, and feather the edges. Follow with primer and finish coat. Depending on extent of repair and appearance, a finish sanding and topcoat may be required.

##### Apply finish coats, including touch-up and damage repair coats in a manner that will present a uniform texture and colour matched appearance.

### Dry Film Thickness:

#### Measure dry film thickness measurements using a Type I or Type II magnetic gauge according to the requirements of SSPC PA2.

#### Dry film thickness shall be measured and evaluated in accordance with the requirements of SSPC PA2, and acceptable tolerances as identified therein.

#### Verify calibration of Type I gauges before, during and after use, using NIST standard plates.

#### Verify calibration of Type II gauges before, during and after use, using either traceable standards (test blocks) or plastic shims (reference the manufacturer's instructions).

#### Calibration of magnetic gauges should be done in accordance with SSPC PA2, "SSPC method for measurement of dry paint thickness with magnetic gauges".

#### Provide dry film thickness within the range specified in the Interior and Exterior Application Tables as found within this specification Section and as measured in accordance with SSPC PA2.

### Work on Tank Interior:

#### Do not place or use any equipment within the interior of the tank without the prior written approval of the Consultant and the Region.

## Interior Tank Pre-Cleaning

### The Contractor shall pre-clean the interior of the elevated tank with a pressure water wash down.

### All water, silt/solids and any other foreign material shall be removed from the tank prior to commencing interior coating works. The Contractor shall assume a silt/solid accumulation depth of 900 mm from the lowest wet interior floor elevation of the tank. Measurements will be made at the time of initial draining. If solids are in excess of 900 mm, the Contractor will be requested to provide a quotation for the additional effort for cleaning.

### The Contractor shall utilize one or two vacuum excavation (vac-ex) trucks as appropriate, depending upon the amount of silt/solids found within the tank, for the cleaning process. Water and silt/solids from the tank interior may be directed to the overflow line and discharged to the nearest downstream manhole.

#### The Contractor shall implement the necessary measures to ensure that the silt/solids do not proceed further downstream. The silt/solids shall not be discharged to the environment.

#### The Contractor shall submit a pre-cleaning plan to the Consultant for review and approval prior to performing the work.

### Tank pre-cleaning shall be coordinated with the Region for the operation of all valves.

## Surface Preparation Preliminary

### Prepare exterior surfaces in accordance with the requirements of [Consultant to amend with appropriate replacement of the CSA B95 Surface Texture standard which has been withdrawn by CSA] and the coating manufacturer's instructions.

### Prepare interior surfaces of tanks in accordance with NACE Standard SP0178 (formerly RP0178).

### Remove accumulations of bird droppings, sediment, iron oxide precipitate, etc. by high pressure water cleaning, blast cleaning, or other suitable method approved by the Consultant.

### Correct steel and fabrication defects revealed by surface preparation.

### Ensure all welds are continuous.

### Remove all welding residue (including flux, spatter and slag).

### Round sharp edges and corners of welds to a smooth contour.

### Smooth weld undercuts and recesses.

### Grind down porous welds to pinhole-free material.

### Fill pits deeper than 5 mm with an epoxy-polyamide compound approved by the Consultant after the prime coat has cured but prior to application of the second coat. Blast cleaning may be necessary in localized areas to institute this procedure.

### Tank Maintenance/Repair:

#### Accumulation of bird droppings, sediment, iron oxide, etc., shall be removed by high pressure water cleaning, blast cleaning, and/or other suitable methods approved by the Consultant.

#### Pitted areas shall be blast cleaned to a SSPC SP 10 standard near white quality, then thoroughly inspected by the Consultant. Pits deeper than 5 mm shall be filled with a coating system manufacturer's approved epoxy polyamide compound after the prime coat has cured but prior to application of the second coat.

#### After cleaning, tank surfaces shall be upgraded to meet the requirements of NACE SP0178. Particular attention shall be given to the welds and adjacent plates. All old weld scabs and remains of old erection clips shall be removed and ground smooth.

### The Contractor shall not proceed with preliminary or final surface preparation until the installation of the antenna mast, permanent relocation of communication equipment and removal of the existing handrail and communication supports on the tank roof as described in the Contract Documents have been completed.

## Surface Preparation Final

### Oil and Grease:

#### Prior to blast cleaning remove all oil or grease contamination in accordance with the requirements of SSPC SP 1 Solvent Cleaning.

### Blast Cleaning:

#### Blast clean all interior and exterior steel surfaces in accordance with the requirements of SSPC SP10/NACE 2, Near White Blast Cleaning using clean dry abrasive to produce a surface profile of 40 to 60 microns, or profile as recommended by the coating supplier.

#### At the finish of any primer application leave a 150 mm wide strip of uncoated, blast cleaned steel between primed and un-blasted surfaces.

### Blast Cleaning – Partial Coating Replacement and Weld Preparation:

#### Blast clean all bare steel and rusted areas in accordance with the requirements of SSPC SP10/NACE 2 using clean dry abrasive which will produce a surface profile of 40 to 60 microns, or profile as recommended by the coating supplier. Extend blast cleaning around perimeter of area until sound coating is found. Feather edges of existing coatings

#### At the finish of any primer application leave a 150 mm wide strip of uncoated, blast cleaned steel between primed and un-blasted surfaces.

#### At areas where primer, intermediate or topcoats are in sound condition, clean all surfaces by high pressure water blasting or sweep blasting to remove all soil and deteriorated paint.

### Recycled Abrasive:

#### New abrasive should be used to start abrasive blasting for each Site location.

#### Recycling of new abrasive media initially used on Site is acceptable for use during abrasive blast cleaning operations when used with abrasive recycling equipment to extract all dust and foreign materials.

#### The cleanliness of the recirculated abrasive media shall be in accordance with SSPC AB 2. The Contractor shall perform tests on recirculated abrasive in the presence of the Consultant.

#### The use of the recycled abrasive shall cease when the required surface profile cannot be obtained, when it has failed test results, or when the recycler is not extracting contaminants or foreign matter.

### Reclaimed Abrasive:

#### Do not use reclaimed abrasive for any final blast cleaning operation.

### Areas where Blast Cleaning is Not Permitted:

#### In all such areas, prepare surfaces in accordance with the requirements of SSPC SP 3 Power Tool Cleaning. If permitted, apply high pressure water cleaning to remove all soil and deteriorated paint before proceeding with SSPC SP 3 cleaning.

#### The Contractor shall provide the equipment necessary for all power tooled areas to obtain the minimum surface profile as recommended by the coating manufacturer.

#### Power tool cleaning equipment is to be equipped with dust collection systems when used outside of an approved containment area.

### Contamination:

#### Exercise care to prevent contamination of any cleaned or coated surfaces prior to over-coating. Provide a rough surfaced sisal type mat at the tank entrance after surface preparation for cleaning footwear prior to entering the tank.

### Final Cleaning:

#### The Contractor shall provide the equipment and methods to obtain the acceptable level of dust accumulation of all areas prior to coating application; this includes the use of compressed air blowdown.

#### Prior to the commencement of the coating application, the assessment of dust on the steel surface shall be performed in accordance with ISO 8502-3:

##### Emersion Surface (Tank Interior): The blasted clean surface shall have a dust quantity rating of not greater than 1 with a dust size class not greater than 1 or as recommended by the coating manufacturer.

##### Dry Surface (Tank Exterior): The blasted clean surface shall have a dust quantity rating of not greater than 2 with a dust size class not greater than 1 or as recommended by the coating manufacturer.

#### Ensure that the appropriate specified degree of surface preparation exists as each coat of paint is being applied. The ambient conditions will dictate the interval between blasting and painting.

### Dew Point:

#### Do not perform cleaning operations for final surface preparation if steel temperatures are less than 3 degrees Celsius above the dew point.

## Application

### The Contractor shall not proceed with surface preparation and coating application until the installation of the antenna mast, permanent relocation of communication equipment and removal of existing handrail and communication supports on the tank roof as described in the Contract Documents has been completed.

### Depending on the condition of the existing coating and degree of surface preparation, commence the painting schedule at the appropriate stage to maintain the specified total dry film thickness. As a minimum requirement apply one full finish coat of the specified thickness over the entire surface area to be coated as indicated in the Contract Documents.

### Apply coating materials in successive coats as specified in the Paint Systems Application Table, Exterior at the end of this Section, and in accordance with the directions of the manufacturer to attain the required film thickness for each system.

### Prior to any field painting grind all welds and sharp edges, including those revealed by blast cleaning, prime, and stripe with a topcoat material of a colour contrasting with both the primer and second coat colours. Apply by brush and work in well on all rough areas that cannot be successfully ground smooth.

### If the allowable recoating period, as specified by the coating manufacturer, has elapsed since the application of the prior coat, the entire surface shall be lightly abraded in accordance with the manufacturer's recommendations (brush-off abrasive blast, power sanding, hand sanding, etc.). After light abrasion, the entire surface shall be cleaned in accordance with SSPC SP 1. The entire surface shall be cleaned to remove any surface contaminants prior to the commencement of the light abrasion in accordance with SSPC SP 1, if required.

### Prepare surfaces for over-coating in conformance with the paint manufacturer's recommendation. Use brush blasting if the recoat window has expired and the manufacturer so recommends.

### Do not mix partial paint kits. Maintain a sufficient supply of small volume kits to supply any requirement for small batches.

### Coating Uniformity:

#### Apply all coatings uniformly without sags, foreign materials contamination, or other blemishes.

#### At the discretion and direction of the Consultant remove defects and repair before proceeding with subsequent coat.

#### Thoroughly mix all ingredients in any container prior to use and agitate often enough during application to keep the pigment in suspension.

### Application Method:

#### Apply all coatings by spray according to the manufacturer's published instructions unless prohibited under the OHSA.

#### Where spray is prohibited, use roller application except that brushing will be accepted where rolling would not be effective.

#### All rollers used shall be lint free.

#### Thoroughly mix all ingredients in any container prior to use and agitated often enough during application to keep the pigment in suspension.

#### Mix and thin coatings, including plural-component materials, only in accordance with the manufacturer's instructions.

#### Keep containers closed when not in use to avoid contamination.

#### Do not use mixed coatings beyond pot life limits.

#### Use application equipment, tools, pressure settings, and techniques in accordance with the manufacturer's instructions.

### Spray Pressure:

#### Regulate pressures on the spray gun to achieve optimum atomization of the paint at the lowest possible pressure. Excessive dry spray, or overspray, will not be accepted.

### Spray Technique:

#### Overlapping (50%) vertical passes followed by overlapping (50%) horizontal passes (or vice versa) with each spray coat to obtain uniform film thickness.

#### Apply a complete wet coat in each operation.

#### If sagging occurs, use a mist coat/full coat application to obtain the desired wet film thickness per coat.

#### Coat all brackets, nozzles, irregular surfaces, etc. first and blend the surrounding regular surfaces into these areas.

### Dew Point:

#### Do not apply coating materials when the surface to be coated is less than 3 degrees Celsius above the dew point.

#### Use a surface temperature thermometer in intimate contact with the steel for monitoring purposes.

#### Apply coatings in accordance with maximum Relative Humidity (R.H.) conditions as advised by the coating manufacturer, except do not apply coating above 80% R.H. except for inorganic zinc.

#### Do not apply coating when steel temperature is above 59 degrees Celsius.

### Curing:

#### Strictly follow manufacturer's published curing schedule, and steel temperatures, rather than ambient temperatures, are to be the basis of cure times.

## Dry Riser (Access Tube)

### The access tube shall be over-coated where recoating is not possible, such as near communication cabling, conduits and fixtures. The Contractor shall review the coating of the access tube with the Consultant to confirm areas that are to be over-coated and recoated, including spot repairs, prior to proceeding with the work.

### The Contractor shall submit a proposed recoat and overcoat coating system including a procedure for surface preparation for over-coating. The coating system and procedure shall be recommended by the approved coating manufacturer and submitted to the Consultant for review and approval prior to performing the work.

### Localized spot repairs shall be performed to the bare metal in areas of significant coating deterioration. Surface preparation shall be performed in accordance with this Specification Section.

### The coating of the access tube shall be performed with the existing communication cabling in place. If the existing cabling cannot be temporarily shifted within the access tube to complete coating works, then coating works shall be performed around the stationary cabling.

### The Contractor shall implement the necessary measures to prevent damage to the existing communication cabling this includes, but is not limited to, shielding and wrapping the cabling.

## Non-Skid Coating

### A non-skid coating shall be placed on the exterior tank roof after completion of the exterior coating system.

### The non-skid coating shall be recommended by the approved coating manufacturer.

### The non-skid coating shall consist of:

#### A circular area, 6.0 m in diameter, located at the centre of the tank roof. The perimeter of the circular non-skid area shall extend a minimum of 900 mm from the perimeter of the antenna mast.

#### A path, 1.2 m wide, from the 6.0 m diameter circular area up to the painter's rail hatches located along the perimeter of the tank roof. A non-skid path shall be provided for the two painter's rail hatches located on the tank roof.

## Ventilation

### Ventilation shall conform to all applicable requirements of AWWA D102-14, Section 7.3 and the requirements of the Ontario Ministry of Labour.

### The Contractor shall design and maintain adequate and continuous forced air ventilation in addition to natural convection attained by keeping all tank hatches open during all coating operations.

### Provide continuous forced air ventilation at a rate of at least one air change every 4 hours, for a minimum of 48 hours after coating application is completed or until coating is completely cured in accordance with the paint manufacturer's recommendations.

## Dehumidification

### Furnish, install and operate appropriately sized dehumidification equipment to assist in the painting and curing of the coating systems.

### Where interior coatings are to be applied provide equipment to maintain a minimum of 6.5 degrees Celsius dew point depression between internal steel surface temperature and internal ambient air dew point temperature and a relative humidity of 40% maximum inside the tank.

### Dehumidification shall be performed in accordance with contract requirements and manufactures recommendations; whichever is more stringent and will not negatively impact the application and curing of the coating system.

### Operate dehumidification equipment 24 hours a Day on a continuous basis during cleaning, priming and painting and until the coatings have fully cured.

## Heating

### Furnish, install, and operate appropriately sized heating equipment to assist in the painting and curing of the interior coating systems when surface temperatures reach below the manufacturer's specified minimum temperature for application and curing.

### Heating equipment shall be of a forced air type and is required to increase the interior ambient temperature of the tank enough to result in an increase of the surface temperature.

### Operate heating equipment when surface temperatures are below 4 degrees Celsius or as recommended by the coating manufacturer, whichever is the higher temperature. Heating shall be in operation during cleaning, priming and painting, coating repairs and until the coatings have fully cured.

## Holiday Testing

### Check interior coatings with a wet sponge or high voltage holiday detector in accordance with NACE SP0188 (formerly RP0188) and the recommendations of the coating manufacturer. Perform all tests in the presence of the Consultant.

### Testing shall conform to all applicable requirements of AWWA D102-14, Section 5.1.

### Repair all holidays identified and re-test.

### Furnish to the Consultant upon request holiday test report conforming to the requirements of AWWA D102-14, Section 5.1.

## Clean-up

### Remove all discarded paint materials, rubbish, cans and rags from the Site at the end of each Working Day during the progress of the Work.

### Upon completion of the painting work, clean all paint-splattered surfaces.

### Remove splattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished work.

### Touch-up and restore all damaged or defaced surfaces to the satisfaction of the Consultant.

## Disinfection

### Refer to Section 01750 – Disinfection and Testing of Water Retaining Structures and Process Piping for additional requirements.

### Conform to all applicable requirements of AWWA C652-11, and as specified below.

### Disinfect the interiors of all water tanks prior to returning tanks to service.

### Disinfect tanks where interior painting has been performed as well as tanks where only exterior paint work was performed.

### Notify the Consultant a minimum of 5 Days prior to the Work being ready for disinfection.

### After the tank has been painted and interior surfaces have thoroughly dried, remove any visible dirt or contaminating materials. Disinfect the interior of the tank using Chlorination Method 2 as described in AWWA C652-11, and as specified below. The Region will provide the required disinfecting agent in order to complete disinfection. The Region and the Consultant will be present during disinfection activities.

### The Region will furnish the water for initial disinfection. The Contractor shall be responsible for properly disinfecting the tank as determined by bacteriological tests taken by the Contractor, using a Water Operator licensed by the Ontario Water and Wastewater Certification Office, in the presence of the Consultant and Region. After disinfection and filling, the Contractor shall take a minimum of two bacteriological samples (one immediately after tank is completely filled and a second one after 24 hours) for testing by an approved laboratory in accordance with the latest Ontario Drinking Water Standard requirements. The Contractor shall submit the reports to the local authorities, the Region, and the Consultant. All costs associated with cleaning shall be included and paid for by the Contractor. The Region will provide the required disinfecting agent in order to complete disinfection. The Region and Consultant will be present during disinfection activities.

### The Region will furnish the water for initial disinfection.

### The Contractor shall be responsible for obtaining proper disinfection as determined by bacteriological tests taken by Region in the presence of the Consultant and Contractor.

### After disinfection and filling, the Region shall take a minimum of two bacteriological samples (one immediately after tank is completely filled and a second one after 24 hours) for testing by an approved laboratory in accordance with latest Ontario Drinking Water Standard requirements.

### The Region shall submit the reports to the local authorities, the Contractor, and the Consultant. All costs associated with cleaning shall be included and paid for by the Contractor.

### At the same time as the second bacteriological test, one water sample shall be collected by the Region in the presence of the Consultant and Contractor and sent to a Region approved laboratory to be analyzed for VOCs as outlined in subsection 3.13 below and the Ontario Drinking Water Standards.

### In addition, while taking samples on the second Day, the Region will collect one water sample which shall be analyzed for free chlorine residual. The free chlorine residual level in the water shall be greater than 0.5 mg/L and less than 1.5 mg/L prior to placing tank back into service.

### If additional disinfection is required, or an objectionable taste and odour in the tank water exist due to painting operations, the Contractor shall pay the Region for the additional chemicals required, water chemistry analysis and additional water required, at a cost to be computed from the Region's current rate schedule and laboratory invoices. Such additional disinfection shall be carried out at no additional cost to the Region, until bacteria free samples, acceptable taste and odour free samples are obtained and the requirements of the Ontario Drinking Water Standards are satisfied.

## VOC Monitoring

### After the tank has been filled but prior to placing it in service arrange with the Region for testing the water for volatile organic contaminant (VOC). Conduct analysis by an approved laboratory, which is specifically approved for the work to be performed and approved by the Region. The cost for such testing will be borne by the Region.

### Perform monitoring for vinyl chloride and 52 principal organic contaminants including drinking water volatile hydrocarbons and drinking water volatile aromatics in accordance with the Environmental Laboratory Approval Program.

### Analyze Hydrocarbons by EPA Method 524.2 with a detection limit of 0.5 mg/l or less.

### Analyze aromatics will by EPA Method 524.2 with a detection limit of 0.5 µg/l or less.

### Do not place the tank into service until VOCs are below the MCL for drinking water.

### If VOC levels exceed Ontario Drinking Water Standards for drinking water, drain the tank, refill, disinfect, and retest. The cost for any retesting will be at the Contractor's sole expense.

## Existing Communication Equipment

### Communication Equipment:

#### The existing communication equipment shall remain in operation during construction.

#### Details of the type of communication equipment, location of equipment and cabling can be viewed in Appendix 2: NIR Measurements Report and Safety Code 6 Analysis.

### Specialist Relocation Contractor:

#### Trilinks Communications Inc. ("Specialized Relocation Subcontractor") shall perform the relocation of all communication equipment on the elevated tank.

#### The cost to complete the relocation shall not be incurred by the Contractor. The Contractor shall not carry a cost to complete the relocation but only for coordination with the Specialized Relocation Subcontractor. The cost for the coordination of the work shall be included in the price for Item No.[ A-2 ]in the Bid Form.

### Relocation:

#### The temporary and permanent relocation of all communication equipment will be performed by Trilinks Communications Inc. The Contractor shall coordinate the relocation of communication equipment as specified in the Contract Documents with the Specialized Relocation Subcontractor. The Contractor shall aid in the resolution of conflicts or concerns between relocation of communication equipment and coating operation, including scheduling concerns.

#### Communication equipment shall be relocated as follows:

##### Temporary relocation (as required) and permanent relocation of all communication equipment from the centre of the elevated tank to newly installed antenna mast shall be completed prior to commencing any recoating activities. The duration of this work shall be a maximum of 10 Working Days.

#### Refer to Appendix 1 of the Contract for conceptual design drawings of the antenna mast which include details of existing communication equipment.

#### Coordination meeting(s) with the communication equipment carriers to review schedule, requirements (Contractor and Carriers), and other considerations shall be scheduled prior to the permanent relocation of equipment.

### Safety:

#### The Contractor shall execute all works to comply with Safety Code 6 – Radiation Safety Institute of Canada.

## Lead Abatement and Controls *[Consultant to delete/ amend if testing confirms definitively that no lead exists on tank*

### Refer to Section 02137 - Lead Paint Removal and Management for additional requirements.

### The elevated tank contains lead based coatings.

## Coating System Application Tables

### The following tables outline each coating layer of the specified coating system. Material details and performance requirements are listed in Part 1 and Part 2 of this Specification Section.

## Graphics

### The Contractor shall provide a price under Item Nos. [C-2A and C-2B] in the Bid Form for the following graphics applied to the exterior of the vertical wall of the tank:

#### the text "York Region" and the York Region logo on two sides of the tank, and

#### Local Area Municipality Text “Kleinburg” and logo on two sides of the tank.

### Unless instructed otherwise by the Region, the Local Municipality text shall be in Times bold typeface and small caps, the small caps being 80% of the height of the full size upper case letters. The text height shall be approximately 90% of the tank's vertical face. Text height shall be finalized through shop drawing reviews. The Contractor shall provide proofs of the following tank graphics for review and approval by the Region and shall allow a period of 30 Days for the Region to complete its review process.

#### The proof shall include an overhead view drawing of the tank with dimension of the tank, length of each logo and space between each logo with north arrow and orientation requested by the Region.

## Colour

### Interior: The colour of the interior of the tank shall be white or as light and reflective a colour as is available from the approved manufacturer (e.g., eggshell, beige, silver). The Contractor shall provide colour samples for each finished coating colour on the interior surface for the Region's review and approval before ordering Product.

### Exterior: The colour of the exterior background, vertical surfaces, roof of the tank shall be white. The lower cone portion shall be a blue tone specifically in Pantone Matching System (PMS) 072. The Contractor shall provide colour samples for each finished coating colour on the interior and exterior surface for review and approval before ordering the Product.

### Graphics: The Local Municipality's text and the York Region word mark shall be in Pantone Matching System (PMS) 072. The stylized trillium and rising star in the Region's logo are officially designated as PMS 072 screened 30 percent.

### All large colour samples of actual paint system shall be provided to the Region for review and approval. Minimum size of sample is 200 mm by 250 mm. The minimum quantity of samples provided shall be four.

#### EXTERIOR PAINT SYSTEM APPLICATION TABLE

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Description | | Application Temperature | | Max. Relative Humidity (R.H.) | | Dry Film Thickness | |
| Zinc Rich Primer | | As directed by the manufacturer | | As directed by the manufacturer | | 65µm to 100 µm | |
| Epoxy Tie Coat | | As directed by the manufacturer | | As directed by the manufacturer but not greater than 80% | | 75µm to 125 µm | |
| Aliphatic Polyurethane | | As directed by the manufacturer | | As directed by the manufacturer but not greater than 80% | | 50µm to 88 µm | |
| **Total Thickness** | |  | |  | | **190µm to 301 µm** | |

INTERIOR PAINT SYSTEM APPLICATION TABLE

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Description | | Application Temperature | | Max. Relative Humidity (R.H.) | | Dry Film Thickness | |
| Zinc Rich Primer | | As directed by the manufacturer | | As directed by the manufacturer | | 65µm to 100 µm | |
| Epoxy or 100% Solids Epoxy applied in one or two coats | | As directed by the manufacturer | | As directed by the manufacturer but not greater than 80% | | 500 µm to 625 µm | |
| **Total Thickness** | |  | |  | | **565 µm to 725 µm** | |

**END OF SECTION**