

**Construction Administrative Inspection Specification for Corrosion Protection of New and Existing Watermains**

**442.01 SCOPE**

This CAIS covers the construction administration and inspection requirements for providing corrosion protection to watermains and their metallic components, valves and fittings using galvanic anodes, or a microcrystalline wax and petrolatum tape coating system, including corrosion monitoring for concrete pressure pipe.

**442.02 REFERENCES**

This CAIS refers to the following, standards, specifications, or publications:

**Ontario Provincial Standard Specifications, Construction:**

OPSS 442 Corrosion Protection of New and Existing Watermains

**Construction Administration and Inspection Specifications (CAIS):**

CAIS 441 Watermain Installation in Open Cut  
CAIS 490 Site Preparation for Pipeline, Utilities, and Associated Structures  
CAIS 492 Site Restoration Following Installation of Pipelines, Utilities, and Associated Structures

**442.03 DEFINITIONS**

For the purpose of this CAIS, the definitions shall be as specified in OPSS 442.

**442.04 DESIGN AND SUBMISSION REQUIREMENTS**

Administrative Activities:

1	-	Check that all manufacturer’s instructions are submitted prior to commencing of the work as listed in OPSS 442.04.	25%
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**442.05 MATERIALS**

**442.05.01 Anode Packaging**

**442.05.01.01 General**

Inspection Activities:

1	-	Check that anode castings and overall weight requirements meet the requirements specified in Table 1 of OPSS 442.	25%
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#### **442.05.02                    Microcrystalline Wax and Petrolatum Tape Coating Systems**

##### **442.05.02.01                General**

Inspection Activities:

1	-	Check that the Microcrystalline Wax and Petrolatum Tape Coating Systems components meet the requirements of AWWA C217.	25%
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#### **442.05.03                Miscellaneous Materials**

Inspection Activities:

1	-	Check that the miscellaneous materials meet the requirements specified in OPSS 422.05.03.	25%
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#### **442.05.04                Test Stations**

Inspection Activities:

1	-	Check that the mounting of test stations meet the requirements specified in OPSS 422.05.04.	25%
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#### **442.05.05                Thermite Welds**

Inspection Activities:

1	-	Check that the thermite weld material meet the requirements listed in OPSS 422.05.05.	25%
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#### **442.05.06                Wires**

Inspection Activities:

1	-	Check that all wires materials meet the requirements listed in OPSS 422.05.06.	25%
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#### **442.05.07                Zinc and Magnesium Anodes**

Inspection Activities:

1	-	Check that all anode castings meet the requirements listed in OPSS 422.05.07.	25%
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**442.07 CONSTRUCTION**

**442.07.01 General**

Inspection Activities:

1		Check that the methods for corrosion protection is as specified in the Contract Documents	25%
2		Check that anodes are installed complete with their cardboard tube container and enclosed anode chemical packing.	25%
3		Check that anodes are wetted prior to backfill.	25%

**442.07.02 Site Preparation**

As specified in CAIS 490.

**442.07.03 Transporting, Unloading, Storage, and Handling Material**

Inspection Activities:

1		Check that anodes and other materials are stored in a clean dry secured enclosure until installation.	25%
2		Check that anodes are not carried or lowered by their lead wires.	25%
3		Check that all components of a tape coating system are transported, unloaded, stored, and handled according to the manufacturer's recommendations.	25%

**442.07.04 Anode Installation**

**442.07.04.01 Existing Metallic Watermains - Over Pipe Method**

Inspection Activities:

1		Check and approve prior to installation the location for each anode and that the test station is marked with a white stake or white paint on paved areas.	25%
2		Check that anodes for existing metallic watermains by over pipe method are of the type and installed as specified in OPSS 442.07.04.01.	25%

**442.07.04.02 Existing Metallic Watermains – Anode Bank Method**

Inspection Activities:

1	Check that anodes for existing metallic watermains for anode bank method are of the type as specified in OPSS 442.07.04.02.	25%
2	Check that anodes for existing metallic watermains by anode bank method are installed as specified in OPSS 442.07.04.02.	25%

**442.07.04.03 Existing Metallic Watermains – Exposed Pipe or Service Method**

Inspection Activities:

1	Check that anodes for existing metallic watermains for exposed pipe or service method are of the type as specified in OPSS 442.07.04.03.	25%
2	Check that anodes for existing metallic watermains by exposed pipe or service method are installed as specified in OPSS 442.07.04.03.	25%

**442.07.04.04 New Metallic Watermains and Copper Services**

Inspection Activities:

1	Check that anodes for new metallic watermains and copper services are of the type as specified in OPSS 442.07.04.04.	25%
2	Check that anodes for new metallic watermains and copper services are installed as specified in OPSS 442.07.04.04.	25%

**442.07.04.05 New Polyvinyl Chloride Watermains with Metallic Components**

Inspection Activities:

1	Check that anodes for new polyvinyl chloride watermains with metallic components are of the type as specified in OPSS 442.07.04.05.	25%
2	Check that anodes for new polyvinyl chloride watermains with metallic components are installed as specified in OPSS 442.07.04.05.	25%

**442.07.04.06 New Watermains with Metallic Components**

Inspection Activities:

1	Check that metallic components are protected using corrosion protection methods specified in the Contract Documents.	25%
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**442.07.05 Corrosion Monitoring for Concrete Pressure Pipe**

Inspection Activities:

1		Check that corrosion monitoring for concrete pressure pipe is as specified in OPSS 442.07.05.	25%
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**442.07.06 Tape Coating System Installation**

**442.07.06.01 General Surface Preparation Requirements**

Inspection Activities:

1		Check that surface preparation requirements are followed as specified in OPSS 442.07.06.01.	25%
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**442.07.06.02 Watermains, Valves and Fittings**

Inspection Activities:

1		Check that tape coating system installation requirements are followed as specified in OPSS 442.07.06.02.	25%
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**442.07.07 Test Station Installation**

**442.07.07.01 General**

Inspection Activities:

1		Check that test station installation requirements are followed as specified in OPSS 442.07.07.01.	25%
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**442.07.07.02 Test Station Connections for New Metallic Watermains**

Inspection Activities:

1		Check that test station connections for new metallic watermains are as specified in OPSS 442.07.07.02.	25%
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**442.07.07.03 Test Station Connections for Anode Banks**

Inspection Activities:

1		Check that test station connections for anode banks are as specified in OPSS 442.07.07.03.	25%
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#### **442.07.07.04 Test Station Connections for Corrosion Monitoring**

Inspection Activities:

1		Check that test station connections for corrosion monitoring are as specified in OPSS 442.07.07.03.	25%
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#### **442.07.08 Thermite Weld Connections**

Inspection Activities:

1		Check that thermite weld connections are as specified in OPSS 442.07.08	25%
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#### **442.07.09 Thermite Weld Protection**

Inspection Activities:

1		Check that thermite weld protection is as specified in OPSS 442.07.09	25%
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#### **442.07.10 Anode and Header Wire Splicing and Waterproofing**

##### **442.07.10.01 General**

Inspection Activities:

1		Check that anode and header wire splicing is accomplished as specified in OPSS 442.07.10.01 and by the method specified in the Contract Documents.	25%
2		Check that waterproofing protection is as specified in OPSS 442.07.10.01.	25%

##### **442.07.10.02 C Tap Splices**

Inspection Activities:

1		Check that C Tap splices are installed and inspected as specified in OPSS 442.07.10.02.	25%
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##### **442.07.10.03 Direct Bury Lug Splices**

Inspection Activities:

1		Check that splices using direct bury lugs are performed as specified in OPSS 442.07.10.03	25%
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**442.07.10.04 Soldered Splices**

Inspection Activities:

1		Check that soldered connections are performed as specified in OPSS 442.07.10.04	25%
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**442.07.11 Electrical Bonding of Joints**

**442.07.11.01 New Metallic Pipe**

Inspection Activities:

1		Check that all new metallic pipe joints, valves, and components are connected together as specified in OPSS 442.07.11.01	25%
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**442.07.11.02 Existing Metallic Pipe**

Inspection Activities:

1		Check that bond wires are installed as specified in OPSS 442.07.11.02	25%
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**442.07.12 Wire Connections to Copper Services**

Inspection Activities:

1		Check that wire connections are installed as specified in OPSS 442.07.12	25%
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**442.07.13 Anode Backfilling**

Inspection Activities:

1		Check that prior to backfilling, the entire cathodic protection system is inspected by a certified cathodic protection specialist in the presence of the Contract Administrator.	25%
2		Check that backfilling is performed as specified in OPSS 442.07.13	25%

**442.07.14 Material Sampling and Testing**

**442.07.14.01 Testing and Evaluation**

Inspection Activities:

1		Check that testing and evaluation is performed as specified in OPSS 442.07.14.01.	25%
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Administrative Activities:

1		Review the report on testing data and associated recommendations pertinent to the continued effectiveness of the cathodic protection system prepared by a certified cathodic protection specialist.	25%
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**442.07.15 Site Restoration**

As specified in CAIS 492.

**442.07.16 Management of Excess Material**

Inspection Activities:

1	-	Check that management of excess material is performed as specified in the Contract Documents.	25%
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**442.08 QUALITY ASSURANCE**

**442.08.01 Anodes**

Inspection Activities:

1	-	Check that anode quality assurance is performed as specified in OPSS 442.08.01.	25%
2	-	If warranted, randomly select samples of supplied anodes for testing by an independent laboratory.	25%
3	-	Check that any batch of anodes found not to meet the requirements of this specification is replaced immediately and no additional work takes place until such time that the anodes are approved and accepted.	25%

Administrative Activities:

1	-	Prior to installing each shipment of anodes, receive and review a copy of a certificate from the anode manufacturer indicating that the shipment of anodes complies with the requirements of this specification.	25%
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**442.08.02                      Tape Coating Systems**

Inspection Activities:

1	-	Check that tape coating system supplied meet the requirements of OPSS 442.	25%
2	-	Check that any tape coating system found not meeting the requirements of OPSS 442 is removed and replaced.	25%

**442.09                              MEASUREMENT FOR PAYMENT**

Administrative Activities:

1	-	Measurement for payment shall be as specified in OPSS 442.	-
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**442.10                              BASIS OF PAYMENT**

Administrative Activities:

1	-	Basis of payment shall be as specified in OPSS 442.	-
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WARRANT: Always with OPSS 442, Construction Specification for Corrosion Protection of New and Existing Watermains.