

**MINISTRY OF NATURAL RESOURCES AND FORESTRY**

**KAWAGAMA LAKE DAM**

**STRUCTURE REPAIRS AND WEIR MODIFICATIONS**

**Contract No. X**

**TECHNICAL SPECIFICATIONS**

Technical specifications for this Contract include Special Provisions – Tender Items and Ontario Provincial Standard Specifications including the 100 Series General Specifications and the following:

**ONTARIO PROVINCIAL STANDARDS SPECIFICATIONS**

OPSS 127	Schedule of Rental Rates for Construction Equipment Including Model and Specification Reference (April 2015)
OPSS 182	General Specification for Environmental Protection for Construction in Waterbodies and on Waterbody Banks (November 2012)
OPSS 201	Construction Specification for Clearing, Close Cut Clearing, Grubbing and Removal of Surface and Piled Boulders (November 2011)
OPSS 206	Construction Specification for Grading (November 2013)
OPSS 301	Construction Specification for Restoring Unpaved Roadway Surfaces (November 2013)
OPSS 314	Construction Specification for Untreated Granular, Subbase, Base, Surface Shoulder and Stockpiling (November 2013)
OPSS 501	Construction Specification for Compacting (November 2014)
OPSS 504	Construction Specification for Preservation, Protection and Reconstruction of Existing Facilities (November 2009)
OPSS 510	Construction Specification for Removal (November 2006)
OPSS 511	Construction Specification for Rip-Rap, Rock Protection and Granular Sheeting (November 2013)
OPSS 517	Construction Specification for Dewatering of Pipeline, Utility and Associated Structure Excavation (November 2010)
OPSS 518	Construction Specification for Control of Water from Dewatering Operations (November 2011)
OPSS 539	Construction Specification for Temporary Protection Systems (November 2014)
OPSS 565	Construction Specification for the Protection of Trees (November 2007)
OPSS 577	Construction Specification for Temporary Erosion and Sediment Control Measures (November 2006)
OPSS 902	Construction Specification for Excavating and Backfilling – Structures (November 2010)
OPSS 905	Construction Specification for Steel Reinforcement for Concrete (November 2014)
OPSS 904	Construction Specification for Concrete Structures (April 2010)
OPSS 906	Construction Specification for Structural Steel for Bridges (November 2012)
OPSS 907	Construction Specification for Structural Wood Systems (April 2011)
OPSS 908	Construction Specification for Metal Traffic Barriers and Metal Railings for Structures (November 2014)
OPSS 911	Construction Specification of Coating Structural Steel Systems (November 2014)

OPSS 919	Construction Specification for Formwork and Falsework (November 2011)
OPSS 928	Construction Specification for Structure Rehabilitation – Concrete Removal (April 2012)
OPSS 930	Construction Specification for Structure Rehabilitation – Concrete Patches and Overlays (November 2014)
OPSS 932	Construction Specification for Crack Repair – Concrete (November 2009)
OPSS 942	Construction Specification for Prestressed Soil and Rock Anchors (November 2009)

## **SPECIAL PROVISIONS – TENDER ITEMS**

### **General Requirements**

### **Item No. 1**

The lump sum price for this item shall include all labour, equipment and materials to meet the general requirements of the Contract. This item shall include bonds, insurance, securities, mobilization, demobilization, administration, management, quality control and other miscellaneous work necessary to carry out the work in accordance with the Contract Documents which is not specifically accounted for under other tender items.

This item shall also include costs associated with the following, as required for the duration of the Contract:

- Traffic Control and Construction Signage
- Erosion and Sediment Control
- Portable Washroom Facilities
- Temporary Fencing
- Preparing/Restoring Contractor Staging Areas
- Removal/Installation of Owner Supplied Dam Safety Signage
- Snow Clearing on the Dam Access Road (~400m) and Maple Ridge Drive from Kawagama Lake Road to the Dam Access Road (~10km) (Winter Construction)
- Construction of the temporary access road across the river, including the by-pass culverts. Each set of twin culverts shall be designed by the contractor to convey a minimum of the 5-year return period peak flow.

Payment for this item will be based on estimated percent completion, as determined by the Engineer.

### **Clearing and Grubbing**

### **Item No. 2**

This item includes all labour, equipment, and materials for clearing and grubbing as required to facilitate the works and as indicated on the Contract Drawings. Clearing and grubbing shall be performed according to the OPSS 201, OPSS 565 and as specified herein.

The work includes clearing and grubbing of all work areas, as required, including that for wingwalls, rock berm, contractor staging area, access road and path. The work is not limited to these areas and may include other locations as required to do the proposed repairs and work included in the contract.

Payment at the lump sum price for this item shall be full compensation for all labour, equipment and material to do the work.

**Site Grading and Restoration**

**Item No. 3**

This item includes all labour, equipment, and materials for general site grading and restoration as required to facilitate the works and as indicated on the Contract Drawings. Site grading and restoration shall be performed according to the OPSS 206, OPSS 501, OPSS 504, OPSS 565, OPSS 577 and the technical specifications.

The work includes general site grading and restoration works including granular surfacing of Maple Ridge Drive, dam access road and parking area as well as any works necessary to return the site to its original condition or better to the satisfaction of the Engineer.

Payment at the lump sum price for this item shall be full compensation for all labour, equipment and material to do the work.

**Metal Fabrication – Monorail Modifications**

**Item No. 4**

This item includes all labour, equipment, and materials for modification of the overhead monorail system, including a new fall arrest cable, as indicated on the Contract Drawings and specified herein. Work shall be performed according to the OPSS 906, OPSS 911 and the technical specifications.

The work includes replacement of the overhead monorail beam and relocation of the supports and winch storage box including grouting and concrete repairs and all associated work for a complete installation. The work also includes the replacement of the fall arrest cable.

On-site welding and cutting of galvanized metal components shall not be permitted. Any incidental damage may be touched up with zinc rich paint suitable for this application, subject to approval by the Contract Administrator.

Contractor to prepare and submit three (3) copies of shop drawings, for approval, prior to metal fabrication. Construction of the monorail modifications and fall arrest cable replacement shall be completed in accordance with the MNRF Standard Overhead Gantry and Fall Arrest System drawings, prepared by Hatch dated December 3, 2013. Contractor shall field verify all dimensions prior to metal fabrication.

Payment at the lump sum price for this item shall be full compensation for all labour, equipment and material to do the work.

**Metal Fabrication – Miscellaneous**

**Item No. 5**

This item includes all labour, equipment, and materials for the supply and installation of miscellaneous metal works including railing/fencing and gates as indicated on the Contract Drawings and specified herein. Work shall be performed according to the OPSS 510, OPSS 904, OPSS 906, OPSS 908 and the technical specifications.

The work includes removal/disposal of existing railings, supply/installation of new railing/fencing and gates including all hardware for a complete installation in accordance with the Contract Drawings.

On-site welding and cutting of galvanized metal components shall not be permitted. Any incidental damage may be touched up with zinc rich paint suitable for this application, subject to approval by the Contract Administrator.

Contractor to prepare and submit three (3) copies of shop drawings, for approval, prior to metal fabrication. Construction of the new railing shall be completed in accordance with the MNRF standard drawing for a side mounted railing system. Contractor shall field verify all dimensions prior to metal fabrication.

Payment at the lump sum price for this item shall be full compensation for all labour, equipment and material to do the work.

**Crack and Joint Repair**

**Item No. 6**

This item includes all labour, equipment, and materials for crack and joint repair including cleaning and finishing as required to facilitate the works and as indicated on the Contract Drawings. Repairs shall be performed according to the OPSS 932, manufacturer's recommendations and the technical specifications.

The Contractor shall verify the cracks and joints that are to be repaired with the Contract Administrator prior to performing the work under this item.

Horizontal cracks/joints shall be repaired using Sikaflex-1c SL and vertical joints shall be repaired using Sikadur 328LT. Contractor to provide a list of proposed materials/methods including product information and summary of proposed methods for approval.

Payment at the lump sum price shall be full compensation for all labour, equipment and material to do the work.

**Masonry Repair (Leak)**

**Item No. 7**

Work under this item shall include all equipment, labour and materials required to facilitate masonry repairs of the leak identified at the joint between the north gravity wall and Pier 1 as per the Contract Drawings and specified herein. Masonry repair work shall be performed according to OPSS 930, CSA A179 and the technical specifications.

Dam wall to be repaired to watertight condition to the satisfaction of the Engineer.

Contractor to provide a list of proposed materials/methods including product information and summary of proposed methods for approval.

Payment at the lump sum price for this item shall be full compensation for all labour, equipment and material to do the work.

**Dewatering**

**Item No. 8**

The work under this item shall include all labour, equipment and materials to design, supply, construct, monitor and maintain temporary cofferdams for dewatering to accommodate construction of the proposed weir and repair the leak at the joint between the south gravity wall and Pier 1 as per the Contract Drawings and specified herein. Dewatering operations shall be performed according to OPSS 182, OPSS 517, OPSS 518 and OPSS 539 and the technical specifications.

As such, the Contractor shall be responsible for all dewatering works necessary to carry out his operations, and allow the Engineer to inspect/assess the works. All cofferdams shall be designed by a Professional Engineer, licenced to practice in the Province of Ontario and shall require a Quality Verification Engineer Certificate.

Upstream lake / water levels shall be maintained in accordance with the MNRF Kawagama Lake Dam Operating Curve, included as **Attachment 1**.

Payment at the lump sum price for this item shall be full compensation for all labour, equipment and material to do the work.

**Cast-In-Place Concrete**

**Item No. 9**

The work for this item shall include concrete facing associated with construction of the proposed weir, concrete curbing and concrete refacing as per the Contract Drawings and specified herein. Cast-In-Place concrete work shall be performed according to OPSS 904, OPSS 905, OPSS 919 and the technical specifications.

Payment for this item shall be by lump sum, and shall include all compensation for, but not limited to, the following: shoring, excavation, removal and off-site disposal of loose concrete, preparation of mating surface, dowelling, forming, tying reinforcement, installation of drains, placing concrete, removing forms and backfilling. The lump sum price shall also include heating for winter construction

Measurements for payment will be only for areas identified, no payment will be made for concrete lost due to inadequate forming or otherwise.

Contractors will be required to provide concrete material for testing and cast cylinders for compressive strength testing as requested by the Contract Administrator. The Ministry will bear the costs for testing as long as the test results are within the specified limits. Should the test results fall outside the allowable limits, the Contractor shall bear all testing costs until the test results are within specified limits.

**Removals – Asphalt**

**Item No. 10**

This item includes all labour, equipment, and materials for the removal and disposal of asphalt as required to facilitate the works and as indicated on the Contract Drawings. Removals shall be performed according to the OPSS 128, OPSS 510, OPSS 928 and the technical specifications.

The work includes the removal of asphalt topping from the wingwalls.

Payment at the lump sum price for this item shall be full compensation for all labour, equipment and material to do the work.

**Rock Berm**

**Item No. 11**

This item includes all labour, equipment, and materials for the construction of the rock berm as indicated on the Contract Drawings. Rock berm shall be performed according to the OPSS 128, OPSS 201, OPSS 511 and the technical specifications.

The work includes the installation of the rock berm to channel flow downstream of the proposed weir including rip-rap placed on geotextile.

Payment at lump sum price for this item shall be full compensation for all labour, equipment and material to do the work.

**Rock Anchors**

**Item No. 12**

This item includes all labour, equipment, and materials for installing and testing the Rock anchors as indicated on the Contract Drawings. The work for this item shall be in accordance with OPSS 942.

The Anchor shall be 43 mm Dia. 75 KSI All-Thread Bar from Williams or approved equivalent. Contractor shall provide a list of proposed materials/methods including product information and summary of proposed methods for approval for the non-shrink grout to be used with the rock anchors.

Rock anchors shall be tested for pull-out of 45kN. The testing procedure shall safely load test the rock anchor in tension for the load of 45kN. The load shall be maintained for a minimum time of 15 minutes and until the rate of displacement is not greater than 0.25mm per hour.

Payment at the lump sum price for this item shall be full compensation for all labour, equipment and material to do the work.

Attachment 1 - Kawagama Lake Dam - Operating Curve

