NOTICE TO CONTRACTOR – WATER ELEVATIONS

Water levels shown on the Contract Documents were observed at a specific time of year. The water levels are seasonal and may fluctuate during completion of the work. The Contractor shall implement appropriate construction techniques and/or methods to complete the work based on the actual site conditions. The water level shall be reduced to 0.5 m below the proposed bottom of the abutment pile cap during pile cap construction. Continuous pumping operations, in conjunction with cofferdam installation, may be required to achieve and maintain this condition.

NOTICE TO CONTRACTOR - CONCRETE DISCHARGE TIME

For all concrete placed under this Contract, OPSS.MUNI 904, November 2023, and OPSS.MUNI 1350, November 2023, shall govern except as amended or extended as follows:

All concrete materials and mixes shall be designed for an extended discharged time from the time of initial batching. As a minimum, the mix design shall include a retarding admixture to meet a minimum discharge time of 2 hours after introduction of mixing water to cement and aggregate. These times may be further extended using a set retarder, provided the Owner approves such use.

OPERATIONAL CONSTRAINT - Notification of Emergency Service Providers, School Boards, Local Businesses & Residents

The Contractor shall notify the stakeholders below 14 days in advance of work commencing regarding the construction schedule and if any changes to traffic flow are anticipated.

All notification shall be in writing and copied to the Contract Administrator. A draft of the notification shall be submitted to the Contract Administrator for approval a minimum of five (5) days prior to distribution. The notification shall include the contact information of the Contractor and the Contract Administrator.

The Contractor shall notify the Contract Administrator of any inquiries received from the public within 48 hours. The Contractor shall prepare responses for the inquiries related to traffic staging, temporary closures and construction operation and submit them to the Contract Administrator.

Contact information is provided below:

<table>
<tr><th colspan="2">Emergency Services</th></tr>
<tr><td>OPP – opp.er.mailroom@opp.ca</td><td rowspan="3">Mohawk Police Service (AMPS) – info.amps@akwesasne.ca
AMPS Non-Emergency: 613-575-2340
AMPS Central Dispatch / Emergency: 613-575-2000</td></tr>
<tr><td>EMS – SDG – emsdutyofficer@cornwall.ca</td></tr>
<tr><td>Fire – fire@northdundas.com
Fire Chief: 613-614-2450</td></tr>
<tr><th colspan="2">School Boards and Transportation</th></tr>
</table>

Upper Canada District School Board (613-342-0371) Catholic District School Board of Eastern Ontario (613-258-7757)	Student Transportation General – transportation@steo.ca
Interest Groups/Businesses	
Cornwall Electric Manon Litalien Manon.Litalien@cornwallelectric.com (613-932-0123, ext. 4226)	Bell Chuck Trottier charles.trottier@bell.ca (613-930-5864)

OPERATIONAL CONSTRAINT - Installation and Relocation of Temporary Concrete Barrier and Energy Attenuators

Installation and relocation of temporary concrete barriers for staged construction, as indicated in the contract drawings, including end treatments, shall be carried out during one single lane closure period.

The Contractor may be required to adjust, reposition, or relocate the temporary barriers to accommodate the Contractor's own daily entry and exit from the work area. No additional payment will be made for any adjustments to the Temporary Concrete Barriers and Energy Attenuators, unless specified elsewhere in the Contract.

OPERATIONAL CONSTRAINT - Working Around Existing Utilities

The locations of all utilities shown are approximate only. Prior to proceeding with the work, the exact locations / depth of all utilities affected by the work shall be determined by the Contractor. The Contractor shall be responsible for locating the utilities and for providing protection to existing utilities during all construction operations. The locations of existing utilities within the project limits shall be determined by contacting the concerned utility companies.

The Contractor shall be aware of the following, but not limited to:

a) Overhead Hydro and overhead Bell along the north side of the bridge and east approach crossing Hamilton Island Road. Bell-owned utility poles are located on either side of Hamilton Island Road at the intersection with County 2 Road and a third pole is located near the end of the steel guide rail on the northeast side of the bridge.

Power lines are present north of the new bridge location. The Contractor shall use suitable means and methods to complete the girder removal and erection operations while maintaining all required safe clearances from the power lines. Where required, the Contractor shall make all necessary arrangements for de-energization of the power lines at no additional cost to the Owner.

OPERATIONAL CONSTRAINT – Control of Emissions

This operational constraint describes the requirements for the control of emissions including but not limited to; dust, abrasive blast medium and other debris generated from work on structures involving abrasive blast cleaning of concrete, structural steel and reinforcing steel, and the cutting and grinding of concrete.

The Contractor shall give the Contract Administrator written notice 3 working days prior to the start of abrasive blast cleaning of concrete, reinforcing steel and structural steel, and of the cutting and grinding of concrete. The Contractor shall submit with the written notice a proposal describing the procedures/plans to control the emissions of dust, abrasive blast medium and other debris from these operations.

The Contractor shall take whatever measures necessary to ensure that dust, abrasive blast medium, and other debris from work on structures involving abrasive blast cleaning of concrete, reinforcing steel and structural steel, and the cutting and grinding of concrete, do not enter any watercourse; or escape beyond the right-of-way.

The measures may include:

(a) termination of operations during periods of high wind;
(b) the use of low dust generating technologies such as vacuum abrasive blasting;
(c) vacuuming of surfaces to remove dust and debris; and
(d) the use of temporary barrier walls or enclosures.

Excess materials shall be managed as specified in the Contract Documents.

Payment for the control of emissions during work on structures involving abrasive blast cleaning of concrete, reinforcing steel and structural steel, and the cutting and grinding of concrete, shall be deemed to be included in the tender items requiring such control.

OPERATIONAL CONSTRAINT – Control Measures during Removal of Concrete, Concrete Repair/Construction, and Concrete Sawcutting

This operational constraint describes the requirements for control measures during removal of concrete, concrete repair/construction, and concrete sawcutting.

The requirements of this operational constraint are in addition to those specified elsewhere in the contract.

For materials resulting from concrete removal, and materials resulting from concrete construction, the Contractor shall take the appropriate measures and provide such protection system or systems to ensure that such materials do not:

(a) fall into or enter the waterbody;
(b) cause damage to any portion of the structure not designated for removal.

For concrete sawcutting, the Contractor shall take appropriate measures and provide such protection system or systems to:

(a) contain any removed material until it is disposed of; and
(b) minimize the escape of dust such that no visible dust reaches the waterbody, adjacent wetlands, or property outside the right-of-way limits.

The following work shall not commence until the Contract Administrator has given permission to proceed in writing.

(a) removal of concrete;
(b) concrete pour; and
(c) concrete sawcutting.

The Contractor shall give the Contract Administrator written notice a minimum of 14 calendar days prior to the date that permission is required to proceed with any of the above-specified work operations. The notice shall include four copies of written descriptions, drawings and schedules that provide the following:

(a) The sequence and method of control measures during:
    (i) removal of concrete;
    (ii) concrete pour; and
    (iii) concrete sawcutting

Permission to proceed with the above will be provided if the Contract Administrator determines that the details of the notice meet the requirements of this special provision.

At the conclusion of the work, the control measures shall be removed.

OPERATIONAL CONSTRAINT – Species at Risk and Wildlife Protocol

The site is deemed as low risk for encountering SAR and bird nesting. No bird nesting has been observed on the structure. No SAR have been identified at the site, however, there is habitat suitable for SAR and wildlife may be encountered within the work area The Contractor will be required to implement provisions required to prevent entry / nesting / habitancy of wildlife on the structure.

The Contractor shall implement general provisions as outlined below.

General Provisions:

- Use caution when driving to and from the work site – watch out for turtles and other small animals on the road surface and shoulder. Avoid hitting them,
- Ensure sediment and erosion control measures (i.e., silt fencing) are in place prior to beginning work. Inspect them regularly, and particularly after storm events, to ensure their effectiveness.
- Silt fencing may also be used to prevent turtles and other small animals from entering the work area. Lightweight silt fencing is preferred for this purpose (nylon netting on heavy duty silt fencing may entrap some species of wildlife). Make sure it is securely embedded at the bottom.
- Prior to beginning work each day, check for wildlife by conducting a thorough visual inspection of the work area and immediate surroundings.
- Restrict all activities, vehicles, and materials to the designated work area.
- Litter and other waste materials must be appropriately contained and disposed of.
- Do not feed any wildlife or leave food out where it could attract them.
- Avoid or minimize disturbances to any natural features adjacent to the work area to the extent possible. DO NOT cut or damage any trees (of any size) unless the absence of Butternut (which is protected under the Endangered Species Act, 2007) has been confirmed by an expert.

Wildlife Encounters:

- Do not harass or harm any wildlife.
- Turtles are among the most likely animals to occur on or adjacent to roads, especially during the spring.
- Eastern Musk, Painted, Map and Snapping Turtles are protected under the Fish and Wildlife Conservation Act, 1997. If one is encountered within the work area, it should be gently removed and placed in the roadside ditch at a safe distance from the work site. Wear gloves or use a broom to steer the turtle into a bucket or other container. Handle with care to avoid injury to the turtle or yourself, particularly when dealing with Snapping Turtles, which may bite or scratch. Turtles may also wet themselves when handled. Inspect the silt fencing to determine whether repairs or extensions are needed.
- Blanding's, Spiny Softshell, and Spotted Turtles are protected under the Endangered Species Act, 2007. If one is seen near the work site, all work must stop immediately. Take a photograph of the animal, if possible, to confirm the sighting, and contact the Contract Administrator.
- Barn Swallows and some other birds that nest in or around culverts and bridges are protected under the federal Migratory Birds Convention Act. Bank Swallows and some bats are protected under the Endangered Species Act, 2007. Bank Swallows colonies are seen nearby, or if bird nests or roosting bats are found in or on a culvert or bridge, stop work, take a photo, and contact the Contract Administrator.
- Where work has stopped due to Endangered Species Act issues, it must remain stopped until authorised to resume by the MECP. Additional mitigation measures may be required by the Ministry.
- Snakes may also be found on or adjacent to roads. Many snakes are protected under the Fish and Wildlife Conservation Act, 1997. None of the local species are venomous, so their bites are not dangerous. Some snakes will produce a foul-smelling musk when handled, instead of biting. Snakes will usually try to escape or hide when disturbed, and only defend themselves when trapped. If a snake is found in the work area, it should be gently removed or herded out to a safe location.

Turtle Identification:

Turtles are usually found in or near water. During the spring and summer, however, turtles may travel overland to find new homes, search for food, or lay their eggs. Many turtles use the soft shoulders of roads for nesting, burying

their eggs in the gravel. Eggs are usually laid in June and hatch in September, although some turtles may overwinter in the nest.

If turtles are found within the work area, the Contract Administrator shall be notified to determine if they are protected species.

Migratory Bird Nesting Prevention:
As part of the work under this item, commencing on April 1, 2027 and extending until the completion of the Contract, the Contractor shall ensure that no migratory birds nest on the bridge structure. The Contractor shall solely determine the required methodology to ensure that no migratory birds nest (e.g., bird netting, daily sweeps, etc.). Nesting prevention shall be the responsibility of the Contractor upon execution of the signed contract, should they deem appropriate for the site.

OPERATIONAL CONSTRAINT – Environmental Requirements

The preservation, protection and restoration of the local environment will form part of the Work of this Contract.

It is intended that the Work be executed in such a manner which, to the fullest possible extent, minimizes any adverse effect on the cultural and natural environment of the project area. The environmental conditions of the Contract stated herein must be complied with in all respects. It is a responsibility of the Contractor that all personnel be sufficiently instructed so that the Work is carried out in a manner consistent with minimizing environmental impact.

The requirements set out in any permits issued for the project shall form part of this Contract and shall be strictly adhered to.

The Contractor shall supply and install sediment or erosion control devices indicated on the Contract Drawings and as directed by the Contract Administrator.

Any deviation from the prescribed requirements and/or methods contained in or implied by the permits as issued and this Contract will result in a work stoppage until such time as the Contractor produces suitably approved or revised permits acknowledging the proposed deviation. All costs associated with revised work permits will be solely the responsibility of the Contractor.

The Contractor is expected to undertake the Work in such a manner that allows for the local area to be restored. It will also be required that the Contractor employ all reasonable precautions to minimize the impact of construction on the existing surrounding environments.

Refueling Areas
The Contractor shall undertake a detailed review of their proposed route of construction to plan access routes and fueling areas. Refueling and maintenance of equipment shall not be undertaken in or adjacent to a watercourse. Suitable fueling and maintenance areas shall be established away from the waterway and all maintenance and fueling activities shall be conducted in these areas. The locations of such areas are subject to review by the Contract Administrator. **Procedures for the interception and rapid clean-up and disposal of spillages that do occur shall be submitted to the Contract Administrator for review prior to starting the Work.** All materials required for clean-up of fuel spillages shall be maintained readily accessible on site.

Designated fueling and maintenance areas shall not be located within 30 m of any watercourse.

Any spills apt to cause impairment to the natural environment must be immediately reported by the Contractor to the Contract Administrator and to the local Ministry of the Environment, Conservation and Parks (MECP) District Office.

In-Water Timing Restriction

Installation of cofferdams, fish rescue, dewatering, excavation below ordinary water level, and placement of rockfill below water level shall be considered in-water work.

All in-water activity must take place between **July 16th, 2027,** to **March 14th, 2028** and **July 16th, 2028 to March 14th, 2029** to prevent disruption of spawning fish and incubating eggs. Activities outside the waterway, road reconstruction, and site restoration can be completed outside of this time range provided precautions are taken to protect the waterway.

Migratory Bird Convention Act

The Contractor must be aware of the Migratory Birds Convention Act (1994) as it relates to harming migratory birds or destroying their habitat.

If there is evidence that migratory birds are actively inhabiting an area where these nests/birds may be affected by construction, the situation shall be reported immediately to the Contract Administrator. Work on activities that can reasonably be expected to affect the nest/birds shall stop, however, other activities that do not impact the birds/nests may continue.

The Contractor should contact the Contract Administrator and/or MCA for advice and assistance. Until permission is granted to the Contractor to proceed with construction, construction activities will remain suspended on those tasks that may affect the nests/birds.

The Contractor shall be proactive in terms of preventing or discouraging any new birds from nesting once Work begins

OPERATIONAL CONSTRAINT – Seasonal Shutdown

The Seasonal Shutdown period commences upon completion of all work as per working days schedule. The Seasonal Shutdown period ends upon remobilization for second year construction. The Contractor shall suspend its operations during the Seasonal Shutdown.

Working Days will not be assessed during the Seasonal Shutdown.

The cost of demobilizing and remobilizing before and after the Seasonal Shutdown shall be included in the Contract Price.

Prior to demobilizing for the Seasonal Shutdown, the following requirements must be met:

- All excavations must be backfilled;
- The site must be left clean, tidy and safe;
- Road subgrade and/or road granulars shall not be exposed during the Seasonal Shutdown, unless approved by the Owner upon written request from the Contractor. The Work shall be scheduled such that the asphalt base course is completed on any completed road granular base prior to the Seasonal Shutdown. Gravel or milled pavement surfaces will not be permitted for the traveled roadway;
- Roadways must have temporary pavement markings and appropriate traffic signage installed in accordance with the Ontario Traffic Manual (OTM) and item “Pavement Markings – Organic”, and any construction work areas shall be properly protected from the traveled lanes;

- Cut or fill slopes left without vegetative cover or erosion control blankets shall be treated before the onset of winter with hydraulic mulch ground cover;
- Repairs to the roadway, interim drainage conditions, erosion control, signage and delineation shall be performed by the Contractor, as required, throughout the Seasonal Shutdown;
- The guide rail shall be installed.

The cost of this work shall be included in the lump sum price for Item "Site Work".

The Owner will provide snow clearing and perform de-icing operations for the roads open to the public during the Seasonal Shutdown.

SP01 - SITEWORK

Payment at the Contract Lump Sum Price for the Item "Sitework" shall be full compensation for all labour, materials and equipment required to complete the following work:

- Mobilization and demobilization of equipment, material and Contractor's forces;
- Provisions for insurance;
- Site preparation for work;
- Site security;
- Obtain all necessary approvals and permits as applicable;
- Preparation of construction lay down area in location acceptable to Owner;
- Locating, protection, temporary support or temporary relocation and reinstallation of utilities, as applicable and not specified in other areas of the Contract;
- Coordination with Hydro One as required during construction particularly for de-energizing of utility line(s), guy wire removal(s), support/stabilization of hydro utility pole(s) and providing flagging/warning markers for hydro lines;
- Installation and removal of temporary barricades, hoarding and other protection required, unless specified elsewhere in the Contract;
- Installation, maintenance and removal of preventative bird netting or wildlife preventative measures;.
- Layout of Work including any required survey;
- Contractor's office;
- Supplying and maintenance of adequate sanitary facilities;
- Submission of shop drawings, product submissions etc;
- Obtaining access to private properties as required and obtaining written release from the affected property Owners. Copy to be submitted to Contract Administrator prior to entering the property.
- Maintaining and reinstatement of existing road signs, mailboxes, etc;
- Advertising of Substantial Completion in the Daily Commercial News;
- Reinstatement of the Contractor's lay down area and office sites to their original conditions;
- Localized vegetation and tree removal and reinstatement required for execution of the work, including at the southwest quadrant to facilitate girder erection;
- All driveway removal and reinstatement required for execution of the work, including the salvage and reinstatement of brick driveway;
- All incidental work not specifically mentioned in the Contract Documents but required by virtue of the work;
- All work associated with environmental protection or species at risk mitigation measures except as specifically mentioned for other Items of work;
- Quality Control testing and reporting; and

- Submission of required reports, releases, and documentation for the release of holdback.

All work is to be carried out within right of way without encroachment onto private properties, unless specified otherwise. Advise Contract Administrator where construction of work is to interfere with private property and seek direction prior to the work being undertaken.

The Contractor shall submit a Baseline Work Schedule to the Contract Administrator at the Pre-Construction Meeting and provide an updated schedule on a monthly basis or as directed by the Contract Administrator.

The Contractor is advised that no additional payment will be made for repeated mobilization and demobilization for any of the construction activities covered by this Contract, interrupted by weather, or by any other construction activity within this Contract.

BASIS OF PAYMENT

Payment for this Item shall be full compensation for all labour, materials and equipment required to carry out the work. A 30% portion shall be paid in first progress payment. Remainder will be prorated over the scheduled duration of the Contract per the approved schedule.

Contractor shall bear all immediate, subsequent and consequential costs associated with change in the schedule, staging, and methodology of the work, unless Contract Administrator requested such change.

SP02 – TRAFFIC MANAGEMENT

OPSS.MUNI 706, April 2018, shall govern except as amended or extended herein.

706.01 SCOPE

Section 706.01 of OPSS 706 is amended by the addition of the following:

Work under this tender item shall include, but not be limited to the following:

- Preparation and submission of a Traffic Control Plan (TCP);
- Supply, installation, monitoring, operation, maintenance and removal of all temporary construction signage;
- Coordination and execution of all traffic control activities required to complete the work;
- Temporary road closures. .

The Contractor shall be responsible for construction means, methods, techniques, sequences, procedures, coordination and maintenance of all requirements for traffic signing.

706.02 REFERENCES

Section 706.02 of OPSS 706 is amended by the addition of the following:

Ontario Traffic Manual (OTM): All reference in this Special Provision and the Contract Documents to the Ontario Traffic Manual will indicate the most recent version(s) of the OTM including, and not necessarily be limited to, as applicable:

Book 1 – Introduction of the Ontario Traffic Manuals
Book 5 – Regulatory Signs
Book 6 – Warning Signs
Book 7 – Temporary Conditions
Book 11 – Markings and Delineations
Book 12 – Traffic Signals.

706.03 DEFINITIONS

Section 706.03 of OPSS 706 is amended by the addition of the following:

Traffic Control Device(s) (TCD): A generic term used to describe any person, sign, signal, marking or device placed upon, over or adjacent to a roadway by or at the direction of a public authority or official having jurisdiction (such as The United Counties of Stormont Dundas and Glengarry) or their designate, for the purpose of regulating, warning, guiding or informing a vehicle operator or pedestrian of an existing condition or hazard.

Traffic Control Plan (TCP): A detailed plan for the control of traffic, including vehicular and pedestrian movements, required to allow the Contractor to fulfil all conditions of the contract, taking into account the organized, systematic safe conduct of the project. This includes, as applicable, staging sequences, work, public and emergency vehicle access and egress, public access and separation from hazardous areas, temporary barriers, removal of old pavement markings, and the selection of appropriate typical layouts and devices necessary for traffic

control. The traffic control plan shall contain the information respecting how the applicant intends to complete the work and satisfy the requirements of the Contract including but not limited to the following:

a) start and completion times of work;
b) specific location of work;
c) lane use requirements;
d) requirements for road closure;
e) public notification undertaken;
f) requirement for temporary no stopping signs;
g) traffic routing and traffic control requirements where required

Traffic Control Persons (TCP's): A person duly trained and authorized to direct traffic at a work zone through the use of the Traffic Control Sign (STOP/SLOW Paddle)

Traffic Protection Plan (TPP): A plan required by the Occupational Health and Safety Act and its regulations for the protection of workers in a work zone. The plan must contain a written description of the traffic hazards to which workers may be exposed and measures used to protect them.

706.04 DESIGN AND SUBMISSION REQUIREMENTS

706.04.01 Submission Requirements

Subsection 706.04.01 of OPSS 706 is deleted and replaced with the following:

Two (2) weeks prior to commencing construction, the Contractor shall prepare and submit to the Contract Administrator a Traffic Control Plan that details the specific traffic control layout(s) necessary for the completion of the works. The Traffic Control Plan shall be in the form of drawing(s) and written description(s) of how the Contractor intends to control traffic through and around the work zone. The TCP shall include, and not necessarily be limited to:

- Monitoring and Repair (24 hour contact number);
- Reference to Applicable OTM Book 7 Typical Layouts;
- Traffic control signs (regulatory, warning and temporary);
- Traffic control delineation;
- Traffic Control vehicles and devices (TC-12, Crash Trucks, Temporary Lighting etc.);
- Contract-specific operational requirements;
- Traffic staging and scheduling;
- Construction vehicle access/egress;
- Maintaining public access/egress for all existing entrances and side roads and for riverbank access at the structure.
- Pedestrian safety; barriers and barricades;
- Emergency Vehicle access;
- Locations for removal of existing line painting and proposed temporary pavement markings;
- Parking for Contract Administrator; and
- Any other traffic control measures.

The Contract Administrator will accept the submission of the TCP, and review it to identify any errors, omissions, or improvements as it relates to maintaining public safety and mobility. The acceptance and review of the TCP by the Contract Administrator will make no representation and/or warranty that the document is accurate, complete, or compliant with all applicable legislation. Any errors, omissions or deficiencies within the TCP will remain the sole responsibility of the Contractor. Work shall not commence until the Contract Administrator has reviewed the TCP and the Contractor has addressed all comments.

OPSS 706 is amended by the addition of Subsection 706.04.02 as follows:

706.04.02 General Requirements

The Ontario Traffic Manual supersedes all references to the Ministry of Transportation, Manual for Uniform Traffic Control Devices, or MUTCD in the Contract Documents.

The Contract Administrator reserves the right to ask for revisions to the Traffic Control Plan at submission time or reject it if the Plan does not meet the Contract language. In addition, the Contract Administrator reserves the right to instruct the Contractor to revise it at any time during the Contractor's execution of the plan, when the Contract Administrator finds that the Contractor is not providing the commitments shown in the original Traffic Control Plan submission, or the Contractor's Traffic Control Plan proves to be insufficient to address the field conditions.

The Contractor shall be required to review and modify the TCP for errors, omissions, deficiencies, or because of any new hazards that are identified and not previously addressed within the document.

It is the responsibility of the Contractor to ensure that all necessary training has been provided prior to commencement of the work.

The Contractor shall ensure that all workers, including sub-contractors, in the Working Area are aware of the importance of the Traffic Control Plan measures.

706.07 CONSTRUCTION

Section 706.07 of OPSS 706 is amended by the addition of the following subsections:

706.07.07 Additional Requirements

Prior to commencing any construction, on or adjacent to the Road, the supply and placement of all necessary temporary traffic control devices shall be performed under the sole direction of the Contractor and in accordance with the Contractors submitted/reviewed TCP. The TCP shall be developed in accordance with guidelines established by the most recent version of the OTM, the Occupational Health and Safety Act (OHSA), and the Contract Documents which details the required contents and submission of the TCP.

The Contractor shall designate a person to be responsible for traffic control and work zone safety. The designated person shall be a competent worker who is qualified because of knowledge, training, and experience to perform the duties; is familiar with Book 7 of the OTM; and has knowledge of all potential or actual danger to workers and motorists. Prior to the commencement of construction, the Contractor shall notify the Contract Administrator of the name; address; position and telephone numbers of the designated person, and update as necessary. The

designated person may not be present in the Working Area at all times but shall be available within 24 hours when requested to be on site by Contract Administrator.

The condition of all traffic control devices shall be maintained for the duration of the Contract, in accordance with the OTM.

The Contractor shall immediately repair, replace or otherwise make good the practice deemed unsafe or non-compliant when the Owner (or his delegated authority) makes the Contractor aware of any violation of the TCP (or applicable regulations). Should the Contractor disagree, the Ministry of Labour will be consulted to provide clarification of the observed deficiency.

Vehicular and pedestrian traffic control shall remain the sole responsibility of the Contractor as the County delegates this authority to the Contractor in accordance with the submitted/reviewed TCP. Notwithstanding the foregoing, the Contractor shall, at his own expense, remove any equipment or material, which in the Contract Administrator's opinion constitutes a hazard to traffic or pedestrians.

The Contractor shall be fully and solely responsible to ensure the development and implementation of a submitted/reviewed traffic control plan as specified elsewhere in the Contract. The TCP and all required traffic control devices shall be designed/installed, monitored, operated/maintained and removed by the Contractor, utilizing only competent persons and workers as defined under the OHSA.

The Contractor shall not store any equipment or materials on the road or the roadway shoulders or boulevards, unless the storage areas are identified in the TCP and appropriate traffic control devices protect the equipment or materials. The Contract Administrator shall review and approve any storage of equipment and /or materials within the right of way.

The Contractor shall remove all dirt and debris from all paved or concrete surfaces at the close of each workday, to the satisfaction of the Contract Administrator.

Lane Closures

Lane closures are permitted and shall be limited to 15 minutes. Any longer road/lane closures shall be coordinated with MCA and local property owners. The Contractor shall give forty-eight (48) hours notice to the Contract Administrator prior to the day on which the road/lane closures will be required.

Traffic Control Delineation and Operation

Prior to commencing any construction pursuant to this Contract, the Contractor shall supply and place all necessary temporary traffic control devices.

Vehicle Access to Entrances and Side Roads

The Contractor shall not block access to private entrances. Should temporary loss of access/egress be necessary to complete the work outlined in the Contract, the Contractor must provide a minimum of 24 hr prior notification to the business or resident(s), notifying them of the work being undertaken. Such notification regarding the temporary loss of access/egress is the sole responsibility of the Contractor.

This requirement will not be considered for separate payment.

Line Painting

Temporary line painting treatments required for this Contract shall be in accordance with OTM Book 7 and 11 and shall be shown in the TCP. Payment for the temporary line painting shall be paid under the appropriate item, as defined elsewhere under the Contract.

Signage

The Contractor shall be responsible for all aspects of traffic control during construction. This includes the removal, installation or modification of any necessary regulatory signage due to the requirements of the traffic control plan and the supply, installation, maintenance and removal of all temporary regulatory/construction signage.

The Contractor shall post no parking signs throughout the limits of the Construction Zone.

Project information signage will be supplied and installed by the County. The County will provide and install all regulatory signage required after the completion of construction.

The Contractor shall not make any claim for extra compensation for the cost of fulfilling the obligations set out in this Special Provision.

Notification to Concerned Bodies

The Contractor shall notify emergency services, applicable school boards and stakeholders of the construction duration and restrictions to regular traffic conditions as specified elsewhere in the Contract.

This requirement will not be considered for separate payment.

706.10 BASIS OF PAYMENT

706.10.01 Traffic Control Signing

Subsection 706.10.01 of OPSS 706 is deleted in its entirety and replaced by the following:

Payment at the Contract price for the above item shall be full compensation for all labour, equipment and material required to do the work. All research, preparation, implementation of the TCP, supply, installation, monitoring, operation, maintenance and removal of required traffic control devices, including signage, are deemed to be included with the item.

Payment shall be based upon the following schedule:

a) 25% upon satisfactory submission of the TCP and installation of the control measures; and
b) 75% pro-rated into equal payments over the term of the contract.

This payment schedule may only be modified as agreed upon in writing between the Contractor and the Contract Administrator.

SP03 – TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

OPSS.MUNI 805, November 2021, shall govern except as amended or extended herein.

805.01 SCOPE

Section 805.01 of OPSS 805 is amended by the addition of the following:

The items within this scope include the temporary cofferdams. The cofferdams must be robust and watertight.

805.04 SUBMISSION AND DESIGN REQUIREMENTS

Section 805.04 of OPSS 805 is amended by addition of the following:

Before commencing the Work, the Contractor shall submit to the Contract Administrator two (2) copies of a detailed Erosion and Sediment Control Plan (ESCP). The ESCP will consist of a written description and detailed drawings indicating the on-site activities and measures to be used to control erosion and sediment movement for each step of the Work, including provisions outlining the debris containment as part of the structure removal operations.

805.07 CONSTRUCTION

Section 805.07 is amended by the addition of the following subsection:

805.07.19 General

The Contractor acknowledges that surface erosion and sediment runoff resulting from his construction operations will have a detrimental impact to any downstream watercourse, and that all construction operations that may impact upon water quality shall be carried out in a manner that strictly meets the requirements of all applicable legislation and regulations. As such, the Contractor shall be responsible for carrying out his operations, and supplying and installing any appropriate control measures, to prevent sediment laden runoff or construction debris from entering watercourses within or downstream of the Working Area.

Where, in the opinion of the CA or Mohawk Council of Akwesasne, the installed control measures fail to perform adequately, the Contractor shall supply and install additional or alternative measures as directed by the CA or Mohawk Council of Akwesasne. As such, the Contractor shall have additional control materials on site at all times which are easily accessible and may be implemented by him at a moment's notice.

The Contractor shall ensure that all workers, including sub-contractors, in the Working Area are aware of the importance of the erosion and sediment control measures and informed of the consequences of the failure to comply with the specifications detailed herein.

The Contractor shall periodically, and when requested by the CA, clean out accumulated sediment deposits as required at the sediment control devices, including those deposits that may originate from outside the construction area. Accumulated sediment shall be removed in such a manner that prevents the deposition of this material into any watercourse and avoids damage to the control measure. The sediment shall be removed from the site at the Contractor's expense and managed in compliance with the requirements for excess earth material, as specified elsewhere in the Contract.

The Contractor shall immediately report to the Contract Administrator any accidental discharges of sediment material into a watercourse. Failure to report will constitute a breach of this specification and the Contractor may also be subject to the penalties imposed by the Mohawk Council of Akwesasne. Appropriate response measures, including any repairs to existing control measures or the implementation of additional control measures, shall be carried out by the Contractor without delay.

The sediment control measures shall only be removed when, in the opinion of the Contract Administrator, the measure or measures is no longer required. No control measure may be permanently removed without prior authorization from the Contract Administrator. All sediment and erosion control measures shall be removed in a manner that avoids the entry of any equipment, other than hand-held equipment, into any watercourse, and prevents the release of any sediment or debris into any sewer or watercourse within or downstream of the Working Area. All accumulated sediment shall be removed from the Working Area at the Contractor's expense and managed in compliance with the requirements for excess earth material, as specified elsewhere in the Contract.

805.09 MEASUREMENT FOR PAYMENT

Section OPSS 805.09 of OPSS 805 is deleted in its entirety. No measurement for payment shall be required.

805.10 BASIS OF PAYMENT

Section 805.10 of OPSS 805 is deleted in its entirety and replaced by the following:

Payment at the contract price shall be full compensation for all equipment, materials, and labour to do the work. Partial payment shall be made on the following basis:

- 15% upon receipt of SNCA approval of designed ESCP;
- 15% for the submission of the ESCP and initial installation;
- 60% for maintenance, pro-rated over the course of the project;
- 10% for removal.

Where, in the opinion of either the Contract Administrator or the Mohawk Council of Akwesasne, any of the terms specified herein have not been complied with or performed in a suitable manner, or at all, the Contract Administrator or the Mohawk Council of Akwesasne have the right to immediately suspend work at the site until appropriate measures are implemented to rectify the defaults or deficiencies at the site. No compensation will be owed or paid to the Contractor for suspension of the work resulting from noncompliance with the requirements of this specification.

SP04 – FIELD OFFICE FOR CONTRACT ADMINISTRATOR 20-34 M^2

SCOPE

Under this tender item, the Contractor shall supply and maintain a field office (20-34m^2) and its associated items for the sole use of the Contract Administrator and staff.

LOCATION

Prior to the commencement of work on this tender item, the Contractor shall receive approval from the Contract Administrator for the location of the field office and shall have the field office installed and operational.

FIELD OFFICE DIMENSIONS AND CONDITION

The field office shall have a minimum floor area as specified in the Schedule of Items and Prices. It shall have an inside minimum clearance of two (2) metres.

All doors shall be solid and capable of being locked with a 25 mm throw dead bolt lock, and two sets of keys will be supplied to the Contract Administrator.

The inside of the field office shall be moisture tight and capable of being lit to a level that is satisfactory to the Contract Administrator. It shall have adequate windows, heating and ventilating equipment capable of maintaining the working area at 21˚C during both summer and winter weather conditions.

It is the Contractor's responsibility to provide and maintain adequate sanitary facilities in accordance with Sections 28 and 29 of the Ontario Regulation 145/00 under the Occupational Health and Safety Act.

FIELD OFFICE EQUIPMENT

The Contractor shall supply for the sole use of the Contract Administrator the following furnishings for the appropriate trailer size:

Floor Area 20-34 m^2
1 desk
2 meeting tables (2 m^2 ea.)
5 chairs

The Contractor shall supply or arrange to supply a water cooler capable of maintaining a water supply at 7 deg C. Water shall be potable and supplied at a minimum rate of 18L/week.

UTILITIES

The Contractor shall provide within the floor area of the field office hydro facilities for the sole use of the Contract Administrator. The Contractor shall provide a generator large enough to power all trailer requirements.

The field office is to have a high-speed internet connection for the sole use of the Contract Administrator.

MEASUREMENT FOR PAYMENT

Measurement for the supply of a field office, its utilities, services and associated equipment shall be by the week. The Contractor shall also be paid for any portion of a week as one week. Measurement for payment will be made when all utilities and services have been provided.

BASIS OF PAYMENT

Payment at the Contract price for the tender item "Field Office for Contract Administrator" shall be full compensation for all labour, equipment and materials required to supply and maintain a field office.

The Contractor shall bear all expenses in connection with the above facilities, including but not limited to:

a) Service and connection charges for utilities and services.
b) Heating and ventilating costs.
c) All rental costs for the field office.
d) The provision of at least five (5) parking spaces adjacent to field office, with at least a gravel surface.
e) Removal of the field office, clean-up and reinstatement of the area occupied by the field office and parking area.

SP05 – FISH RESCUE

SCOPE

Under this tender item and for the Contract price bid, the Contractor shall supply all labour, materials and equipment required to retain a qualified biologist or technician with a valid "License to Collect Fish for Scientific Purposes" from the Ontario Ministry of Natural Resources and Forestry (MNRF) to remove and relocate downstream stranded fish as required from isolated instream work areas as noted on Contract Drawings. All amphibians and reptiles shall also be transferred to a safe location away from the construction area. The fish rescue must also be completed in accordance with all conditions and requirements stated in the Letter of Advice from the Department of Fisheries and Oceans Canada. Unwatering from, and work within the isolated work area, shall not commence until fish rescue has been completed. A fish collection permit will be required to complete this work and is the responsibility of the Contractor's Qualified Biologist to obtain.

BASIS OF PAYMENT

Payment shall be made at the lump sum price and shall be full compensation of all labour, equipment and materials required to complete this work. The total value of the item shall not exceed 100% of the lump sum price for this item.

SP06 – EARTH EXCAVATION, GRADING

OPSS.MUNI 206, April 2019 shall govern except as amended or extended herein.

206.01 SCOPE

The work under this item includes the excavation of existing earth and rock embankment at the project site for the removal of the existing road embankment, rock embankment, rockfill and rock protection as per contract drawings.

SP07 – ROCK EMBANKMENT

OPSS MUNI 206, April 2019, shall govern except as amended or extended herein.

206.01 SCOPE
Work under this item shall include: supply, delivery, installation and compaction of rock embankment including any necessary rock chinking in accordance with gradation requirements outlined in contract drawings.

206. MEASUREMENT FOR PAYMENT
Measurement of rock embankment shall be by weight in cubic metres (m3).

SP08 – SUPERPAVE 12.5B 58-34

OPSS.MUNI 310, November 2017 shall govern except as amended or extended herein.

The Contractor is hereby advised that the Owner invokes Appendix 310-B, November 2017 of OPSS.MUNI 310. The supplementary requirements of Appendix 310-B shall apply to the Contract.

Under this item and for the Contract Unit price, the Contractor shall supply all labour, equipment, materials and transportation necessary to complete the item.

The pavement structure on the bridge deck shall be as follows:
- Two (2) lifts of 40 mm of SP 12.5B; over
- 10 mm of waterproofing membrane.

The pavement structure on the approach slabs shall be as follows:
- One (1) lift of 40 mm of SP 12.5B; over
- One (1) lift of 50 mm of SP 12.5B.

The pavement structure beyond the approach slabs tying into the existing roadway shall be as follows:
- One (1) lift of 50 mm of SP 12.5B; over
- 150 mm of Granular ‘A’; over
- 300 mm of Granular ‘B’ Type II.

Material
1. **Asphalt: Superpave 12.5B as per OPSS.MUNI.1151: where specified in the ‘Form of Tender’**

2. Performance Graded Asphalt Cement: PG-AC 58-34 as per OPSS.MUNI.1101

Amendment to OPSS.MUNI 1101 November 2016 – Material Specification for Performance Graded Asphalt Cement

1101.04 Design and Submission Requirements

1101.04.01 Submission Requirements

1101.04.01.01 PGAC Test Documentation

Clause 1101.04.01.01 of OPSS.MUNI 1101 is amended by the addition of the following:

- Test results for the product demonstrating compliance to the requirements of Table 1.
- A two (2) litre sample of the asphalt cement for each grade of asphalt cement for possible owner testing.

The Contract Administrator shall review the test results submitted and may elect to have quality assurance testing undertaken at the same time on the sample(s) provided. No asphalt mix shall be placed until the Contract Administrator provides written confirmation of the conformance of the PGAC to the requirements of the Contract Documents based on the submitted test results and owner quality assurance testing. Within ten (10) Business Days of receipt of the Contractor samples and test results, the Contract Administrator shall provide confirmation of conformance or shall advise of any non-conformance to the Contract requirements. Confirmation of conformance to Contract requirements does not constitute any guarantee that the mix can be produced or constructed or both to Contract requirements and does not relieve the Contractor of the responsibility for ensuring the specified quality of materials and workmanship.

1101.05 Materials

Delete:
"The asphalt cement shall not contain any of the following additives added for PGAC modification: atactic polypropylene; carbon black; polyisobutylene; polyisoprene; natural rubber; alkaline bases; insoluble particulates or fibres; salts of iron, copper, manganese and/or cobalt; silicates; styrene-butadiene rubber (random copolymer latex); synthetic waxes (paraffin waxes, naphthenic waxes); synthetic and saturated oils (including but not limited to the following: vegetable oils or modified vegetable oils; (paraffin oils, polyalphaolefins (PAO), lube oils, and re-refined lube oils.); waste oils (including but not limited to the following: cracked residues, re-refined high vacuum distillate oils; tall oils, vacuum tower asphalt extenders; waste cooking oils, waste engine oils, waste engine oil residues). Asphalt cement supplier shall declare in writing that they have not added the PGAC additives listed"

And replace with:
"The asphalt cement shall not contain any of the following additives added for PGAC modification: atactic polypropylene; carbon black; polyisobutylene; polyisoprene; natural rubber; alkaline bases; insoluble particulates or fibres; salts of iron, copper, manganese and/or cobalt; silicates; styrene-butadiene rubber (random copolymer latex); synthetic waxes (paraffin waxes, naphthenic waxes); synthetic and saturated oils (including but not limited to the following: vegetable oils or modified vegetable oils; (paraffin oils, polyalphaolefins (PAO), lube oils, and re-refined lube oils.); waste oils (including but not limited to the following: cracked residues, re-refined high vacuum distillate oils; tall oils, vacuum tower asphalt extenders; waste cooking oils, waste engine oils, waste engine oil residues). The asphalt cement supplier shall declare in writing that none of the PGAC additives listed above are contained within the asphalt cement"

1101.08 Quality Assurance

1101.08.03 Sampling

1101.08.03 is amended by the addition of the following:
It shall be the responsibility of the Contractor when using RAP to ensure the liquid asphalt cement in the final mix complies with Table 1.

1101.08.04 Quality Assurance Testing

1101.08.04 is amended by the addition of the following:
The Owner reserves the right to complete quality assurance testing on asphalt cement extracted from the HMA laid in the field as part of this contract. The test results obtained from the extracted asphalt cement may be used by the owner for acceptance.
Table 1 of OPSS.MUNI 1101 is deleted in its entirety and replaced with the following:

Table 1 – Additional testing requirements and acceptance criteria for PGAC grades

PGAC Grade	Property and Attributes (Unit)		Test Method	Results Reported Rounded to the Nearest	Acceptance Criteria	Rejectable
All PGAC Grades	Ash Content, % by mass of residue (%)	PG XX-28	LS-227	0. 01	≤ 0.6	> 0.6
		PG XX-34			≤ 0.6	> 0.6
		PG XX-40			≤ 0.6	> 0.6
	Low temperature limiting grade (LTLG) (°C)		LS-308	0.5	≤ -YY	> -YY
	Grade Loss (°C)		LS-308	0.5	≤ 6.0	> 6.0
	Non-recoverable creep compliance at 3.2 kPa ($J_{nr-3.2}$) (kPa^{-1})		AASHTO T 350 For testing temperature see Note 1	0.01	< 4.5	≥ 4.5
	Average percent recovery at 3.2 kPa ($R_{3.2}$) (%)			0.1	≥ the lesser of [(29.371) $(J_{nr-3.2})^{-0.2633}$] or 50	< the lesser of [(29.371) $(J_{nr-3.2})^{-0.2633}$ -10] or 50
	CTOD, δ_t (mm)	PG XX-28	LS-299	0.1	≥ 8.0	<8.0
		PG XX-34			≥ 12.0	< 12.0

		PG XX-40			≥ 16.0	< 16.0
Notes: 1. The testing temperature shall be 58°C (Zone 2)						

Amendment to OPSS.MUNI 1150 November 2008– Material Specification for Hot Mix Asphalt

1150.04.01.01.01 Reclaimed Asphalt Pavement Proportions

Clause 1150.04.01.01.01 Reclaimed Asphalt Pavement Proportions, is amended by the addition of the following:

The use of RAP shall not be permitted in top course mixes. The use of RAP is permitted in base course mixes (where applicable) provided that it can be demonstrated that the extracted AC from the RAP conforms with OPSS MUNI 1101 (above).

Equipment Requirements

Material Transfer Vehicle
Cat AP1000 Paver (Or brand of equivalent size and capabilities)

310.07.11.04 Paving on Bridge Decks

The temperature of the HMA immediately after spreading shall not be less than 115 degrees C. The temperature of the HMA mat ahead of initial rolling shall be measured and recorded. Compaction shall be accomplished using, as a minimum,

a) a Class S roller with a minimum mass of 9 tonnes and minimum mass of 4.5 kg per mm total roll width, and

b) Class R roller with a minimum mass of 18 tonnes and minimum mass of 2,500 kg per tire.

The operating speed of Class S rollers shall not exceed 5 km/h and shall be operated in a manner to avoid undue displacement of the HMA. If Class V rollers are used, they shall be used in static mode. Rollers shall operate with the drive wheel forward in the direction of paving.

The mixture shall be uniformly compacted as soon after placing as it can support the rollers without checking or undue displacement. Rolling shall start longitudinally at the lower edge and proceed towards the higher edge of the course, overlapping on successive passes. Alternate passes of the roller shall be staggered.

Passes by the Class R roller shall overlap previous passes. The roller shall be operated to prevent pick-up of the HMA on the tires.

SP09 – TACK COAT

Tack coat Reference: OPSS.PROV 308 OPSS.MUNI 310 and 1103

Subsection 310.07.03 of OPSS.MUNI 310 is amended by the addition of the following: Tack coat shall be applied using self-propelled or tow-along pressure distributors capable of applying the product at the specified rate and in a continuous and uniform manner both longitudinally and transversely for the full lane width. The distributors shall be equipped with a volume-determining device of sufficient sensitivity to measure the quantity of tack coat

dispensed, measurable to the nearest five litres.
Also include: .1 Apply tack coat to milled pavement and previously paved surfaces prior to new paving. .2 Apply tack coat according to OPSS.MUNI 310 and Subsection 308.07.01 of OPSS.PROV 308.
Note: .1 The use of a hand-held pressure wand is acceptable only for tack coating small irregularly shaped areas such as tapers. .2 The Contractor shall consider the use of alternative products for nighttime operations and cold temperatures. The use of any alternative product requires the approval of the Contract Administrator. Contract Administrator may require, at any time, testing of the diluted emulsion.

MEASUREMENT FOR PAYMENT

.1 Measurement of tack coat shall be by area applied in square metres.
BASIS OF PAYMENT

Payment at the Contract price for the above tender item shall be full compensation for all labour, equipment, and material to do the work. .2 Payment for the tack coating of protection board shall be included under the Tack Coat tender item. .3 Payment for the tack coating of concrete surfaces completed in association with bridge deck waterproofing shall be included in the bridge deck waterproofing item according to OPSS.MUNI 914.

SP11 – GRANULAR 'A' (PAD FOR APPROACH SLAB AND ROAD BASE COURSE)

OPSS.MUNI 314, November 2023, shall govern except as amended or extended herein.

314.01 SCOPE

The work under this item includes the supply, delivery, installation and compaction of Granular 'A' below approach slabs and under the new roadway and shoulders as shown in the contract drawings.

SP12 – GRANULAR 'B', TYPE II

OPSS.MUNI 314, November 2023, shall govern except as amended or extended herein.

314.01 SCOPE

The work under this item includes the supply, delivery, installation and compaction of Granular 'B' Type II below new roadway as shown in the contract drawings.

SP13 – CONCRETE CURB AND GUTTER

OPSS.MUNI 353, November 2021, shall govern except as amended or extended herein.

All earth excavation, disposal of excess material, replacement Granular 'A', watering and compaction of all foundation materials and base preparation required to receive the new curb and gutter shall be included in this item

353.01 SCOPE

The work under this item includes the requirements and construction of concrete mountable curb and narrow gutter as shown in the contract drawings

SP14 – REMOVAL OF ASPHALT PAVEMENT – FULL DEPTH REMOVAL OF ASPHALT PAVEMENT – PARTIAL DEPTH CUTTING EXISTING PAVEMENT

OPSS.MUNI 510, November 2018, shall govern except as amended or extended herein.

510.01 SCOPE

Section 510.01 of OPSS 510 is amended by the addition of the following:

Work under the tender item 'Removal of Asphalt Pavement – Full Depth" shall include the full depth removal of the asphalt at the structure approaches to the limits detailed in the Contract Documents.

Work under the tender item "Removal of Asphalt Pavement – Partial Depth" shall include the partial depth removal of the asphalt at the limits of asphalt removal at the approaches to the limits detailed in the Contract Documents.

Work under the tender item 'Cutting Existing Pavement" shall include the following:

a) Transverse full depth saw cutting of the existing asphalt at the limits of removals at the approaches as identified in the Contract Documents; and
b) Longitudinal partial depth saw cutting of the existing asphalt on the approaches between stages.

510.07 CONSTRUCTION

510.07.06 Pavement Work

510.07.06.02 Cutting Existing Pavement

Clause 510.07.06.02 of OPSS 510 is amended by the addition of the following:

The thickness of asphalt for removals at the approaches shall be assumed to vary up to a maximum thickness of 150 mm which shall be validated by the Contractor upon commencement of saw-cutting operations.

SP15 – REMOVAL OF STEEL BEAM GUIDE RAIL

OPSS.MUNI 510, November 2018, shall govern except as amended or extended herein.

All removed materials shall become the property of the Contractor and, accordingly, shall be disposed of outside of the Contract limits at no additional cost to the Owner.

SP16 – ROCK PROTECTION

OPSS.MUNI 511, November 2019, shall govern except as amended or extended herein.

511.01 SCOPE

Under this item, the Contractor shall supply and install rock protection over the new rockfill embankment as indicated on the Drawings and as directed by the Owner.

The Contractor shall supply all materials required for this item. Stone substrate should be round (river stone) to subangular, have a gradation as specified on the Drawings, be washed and clean of all fines prior to placement. The unit price for this item shall be full compensation for the supply of the stone substrate, the hauling and placing of the stone substrate, and all items incidental to the completion of the work as shown on the Contract Drawings and in accordance with these Specifications.
At all times the Contractor shall ensure that all proper erosion and sediment controls installed are fully functional.

Work under this item shall also include any necessary excavation, shaping, re-shaping as necessary to satisfy MCA's environmental specialist, and the removal and disposal of any surplus material.

511.05.01 Rip-Rap, Rock Protection, and Granular Sheeting is amended by the addition of the following:

The stone placed under this item shall meet the following requirements:
- Be less than 10 times the Leachate Quality Criteria as defined by Schedule 4 in Reg. 347 (General – Waste Management) under the Ontario Environmental Protection Act
- Not contain any sulphides
- Have a Neutralization Potential/Acid Potential ratio greater than 5.0
- Be either a limestone, dolomitic-limestone or dolomite containing no deleterious material such as shale, sandstone, argillite, siltstone or other similar sedimentary units
- Be a well-graded fractured rock conforming to the requirements for R200 Rock Protection according to OPSS 1004
- Be free of dirt and other deleterious material
- Not be used on slope greater than 1.5:1

The Contractor shall advise the Owner of the stone source location. The Owner shall inspect and approve the source materials prior to delivery to the Site.

SP17 – SALVAGE AND REINSTATE HAZARD SIGNS
SMALL SIGN, REMOVAL
SMALL SIGN, GROUND MOUNTED, NEW
SALVAGE AND REINSTATE NO LOITERING ON BRIDGE SIGN
SALVAGE AND REINSTATE STOP SIGN

OPSS.MUNI 703, April 2019, shall govern except as amended or extended herein.

703.01 SCOPE

The Work under item 'salvage and reinstate hazard signs' shall include: The removal and storage of hazard signs at

a location determined by the contractor, followed by a reinstatement of the signs once the project is completed.

The work under the item ‘small sign removal’ shall include: the removal and disposal of small signs at the project site.

The work under the item 'salvage and reinstate no loitering on bridge signs’ shall include: the removal and storage of no loitering signs at a location determined by the contractor, followed by a reinstatement of the signs once the project is completed.

The work under the item ‘salvage and reinstate stop sign shall include: the removal and storage of the stop sign at a location determined by the contractor, followed by a reinstatement of the sign once the project is completed.

SP18 – TEMPORARY PAVEMENT MARKING, PERMANENT PAVEMENT MARKING, PAVEMENT MARKING OBLITERATING

OPSS.MUNI 710, November 2021, shall govern except as amended or extended herein.

710.01 SCOPE

Section 710.01 of OPSS 710 is amended by the addition of the following:

Work under this item ‘Pavement Marking, Temporary’, shall include all temporary pavement markings required for temporary condition, including, but not limited to, temporary removable stop bars and short-term pavement markings demarcating the travelled lanes between stages (as required).

Work under this item ‘Pavement Marking, Permanent’ shall include reinstatement of all existing pavement markings that are removed or eliminated as part of the construction activities.

Work under item ‘Pavement Marking Obliterating’ shall include the complete removal of all temporary pavement markings created.

710.07 CONSTRUCTION

Subsection 710.07.01 of OPSS 710 is amended by the addition of the following:

The Contractor shall document the location and nature of all existing pavement markings prior to construction. All existing pavement markings are to be reinstated.

SP19 – SUPPLY AND INSTALL STEEL BEAM GUIDE RAIL

OPSS.MUNI 721, April 2024, shall govern except as amended or extended herein.

721.01 SCOPE

Work under this item shall be fabrication, supply and installation of steel beam guide rail as shown on the contract drawings.

SP20 – TEMPORARY CONCRETE BARRIER ENERGY ATTENUATING TERMINAL SYSTEM

SP21 – STEEL BEAM ENERGY ATTENUATING TERMINAL SYSTEM

OPSS.MUNI 732, November 2024, shall govern except as amended or extended herein.

732.01 SCOPE
732.01.01 GENERAL

The work under this item shall include the installation of steel beam energy attenuating terminal systems at the ends of steel beam guiderails.

732.07 CONSTRUCTION
732.07.01 GENERAL

SBEAT systems shall be installed according to manufacturer's instructions at locations specified in the Contract Documents.

The contractor shall use MASH SoftStop Terminal Systems as noted in the contract drawings.

SP22 – LEAVING END TREATMENT

OPSS.MUNI 732, November 2024, shall govern except as amended or extended herein.

732.01 SCOPE
732.01.01 GENERAL

The work under this item shall include the installation of guide rail end treatments at the ends of steel beam guiderails as shown on the contract drawings.

SP23 – TEMPORARY CONCRETE BARRIER (INSTALLATION AND REMOVAL)

OPSS.MUNI 741, November 2021, shall govern except as amended or extended herein.

741.01 SCOPE

Section 741.01 of OPSS 741 is amended by the addition of the following:

Work under the tender item 'Temporary Concrete Barrier, Relocation" shall include the relocation of temporary concrete barriers from the Stage 1 alignment to the stage 2 alignment.

Work under this item shall include the supply, installation, relocation, maintenance and removal of temporary concrete barrier units required for staged construction.

741.09 MEASUREMENT FOR PAYMENT

741.09.01 Actual Measurement

741.09.01.02 Temporary Concrete Barrier, Relocation (m)

Clause 740.09.01.02 is amended by the addition of the following:

Should the Contractor be required to relocate or reposition the barriers to suit the Contractor's own daily entry and exit from the work area or for other operations not specified above, no measurement will be made for any adjustments to the Temporary Concrete Barriers.

SP24 – TOPSOIL, IMPORTED (100MM THICK)

OPSS.MUNI 802, November 2019, shall govern except as amended or extended herein.

802.05.01 Topsoil is amended by the addition of the following:

Soil quality must meet the applicable generic full depth site condition standards of O. Reg. 153/04 (Records of Site Condition) under the Ontario Environmental Protection Act.
802.07.03 Placement of Topsoil is amended by deleting the first paragraph and replacing it with the following:
Only screened topsoil is permitted unless otherwise indicated in the Contract Documents. Top soil thickness shall be as specified on the Drawings and shall be placed to the mid-point of the shoulder rounding on rural cross-sections.

802.09.01 Actual Measurement is deleted and the replaced with the following:

Measurement for payment shall be by volume in cubic metres (m3). This volume shall be calculated by multiplying the area measured for payment for seeding and/or sodding and/or erosion control blanket by the depth of topsoil specified in the Contract Documents.
Areas that have been damaged by the Contractor beyond the slope limits shall be restored with topsoil where necessary prior to carrying out sod or seed repairs. No measurement or payment will be made for this repair work. Topsoil will be free of foreign debris and waste of any nature.

SP25 – SEED AND EROSION CONTROL BLANKET

OPSS.MUNI 804, November 2014, shall govern except as amended or extended herein.

804.05.01 Seed is amended by the addition of the following:

Seed for all applications in this Contract shall consist of seeded compost material applied to a minimum depth of 5 cm using a pneumatic blower.

804.05.04.05 Erosion Control Blanket (ECB) is amended by the addition of the following:

Erosion control blanket hall contain a fibre density of at least 350 g/m2 and consist of wood or coconut based fibres/materials. Erosion control blanket shall be free of any synthetic, jute, or straw based fibres or materials.

Erosion control blankets shall not be installed over gullies, rills, stones, tree roots or any other foreign objects which protrude from the ground surface.

804.07 Construction is amended by the addition of the following:

Topsoil, seed, fertilizer and mulch or erosion control blanket shall be placed to the mid-point of the shoulder rounding on rural cross-sections.

804.07.05 Cover Applications is amended by the addition of the following:

Temporary ground cover applied to all areas that may be left without vegetative cover/erosion control blanket for more than 30 Days shall be included under Item R204 – Earth Excavation, Grading.

804.07.05.04 Erosion Control Blanket (ECB) Application is amended by the addition of the following:

Erosion control blanket shall be provided on all slopes steeper than 2:1 (H:V) and higher than 1.0 m, in accordance with OPSS.MUNI 804 and the Drawings.
Blankets shall be rolled out flat, even and smooth without stretching and be properly anchored to the sub grade.
Installation of erosion control blankets shall not take place over snow covered, frozen or saturated soils.

804.08 Quality Assurance is deleted in its entirety and replaced with the following:

804.08 Quality Assurance

Total Performance of the Contract shall not be issued until seeded areas have established growth as per the performance measures and acceptable to the Owner.

Performance Measures at Total Performance:

- The specified permanent seed species shall be at an average height of 50 mm in an evenly dispersed, uniform cover.
- There shall not be any significant bare areas, both in terms of quantity and size.
- Non-seeded, non-specified vegetation shall not exceed 20% of the seeded earth area.

The Contractor shall be responsible for the maintenance of seeded areas which shall include the repair of any seeded area with additional seeding, including the repair of the slope itself and the supply of additional topsoil, until Total Performance of the Contract.

For areas that need to be repaired, the following requirement shall be met:

- All slippages and wash-outs must be repaired with acceptable topsoil.
- Surface preparation as specified in subsection OPSS.MUNI 804.07.02 shall be carried out.
- Reseeding must be carried out as indicated in OPSS.MUNI 804.07.04 and OPSS.MUNI 804.07.05.

804.09.01 Actual Measurement is deleted in its entirety and replaced with the following:

804.09.01 Actual Measurement
Measurement for payment shall be by area in square metres (m2) as directed by the Owner. Areas where the original ground cover is damaged by the Contractor beyond the slope limits shall be restored at the Contractor's

own expense and shall not be included in the area measured for payment. Areas of overlap shall not be measured for payment.

If the Contractor requests a re-measurement of the seeded area and the re-measured area differs from the area measured for proposed payment, the re-measured area shall be used for payment.

SP26 – 150MM DIA. PERFORATED SUBDRAIN WITH RODENT GUARD

OPSS.MUNI 405, November 2017, shall govern except as amended or extended herein.

405.05.01 General is amended by deleting the first paragraph and replacing it with the following:

Subdrain pipe shall be perforated, dual wall, polyethylene pipe with a smooth inner surface, equipped with rodent guard features and having a minimum stiffness of 320 kPa. Subdrains shall also be wrapped in non-woven geotextile as specified in OPSS.MUNI 1860, Table 1 Class II Non-Woven.

405.07.06.02.02 Marking of Outlets is deleted in its entirety and replaced with the following:

405.07.06.02.02 Marking of Outlets

Each outlet location shall be marked by a 2.1 m steel fence post driven 0.6 m to 1.0 m into the ground and painted fluorescent green, paint number CGSB 603-401.

405.09.02 Plan Quantity Measurement is amended by the addition of the following:

The 150 mm diameter pipe subdrain connection into storm structures as specified in OPSD 809.010 shall be included in this item.

405.10.01 Pipe Subdrain – Item is amended by deleting the second and third paragraphs and adding the following:

The unit price for this item shall include all costs associated with the excavation and material disposal, Granular 'B', Type II, bedding and backfill, geotextile, coring into maintenance holes and catch basins where necessary and all other work as specified.
After a random 5% of the entire length of pipe subdrain is inspected the Owner will decide if an additional length will require inspection. No separate payment will be considered for this work, regardless of the amount of pipe subdrain inspected.

SP27 – REMOVAL OF BRIDGE STRUCTURE

OPSS.MUNI 510, November 2018, shall govern except as amended or extended herein.

510.01 SCOPE is amended by the addition of the following:

Work under the above tender item includes full removal of the existing superstructure and substructure, as shown in the Contract Drawings. The scope of substructure removal shall include the complete removal of the east abutment and footing (if any) including all associated elements and components such as wingwalls, concrete

ballast structures and cement pasted stones at the bridge.
Work shall include but not be limited to the following:

a) Review of reference drawings pertaining to bridge structures designated for removal and field-verification of all dimensions, details and elevations relevant to the work;
b) Design, construction, maintenance, monitoring and removal of all required temporary support systems, shoring, falsework, temporary protection systems, including protection platforms, temporary bracing and debris containment systems to suit the Contractors removal operations/sequencing.
c) Development and submission of detailed work plan as specified in Section 510.04.02.01 and amended herein.
d) Removal of steel grate deck, steel girders, bearing assemblies, steel beam guiderail and all other existing bridge structure elements to the limits shown in the Contract Documents.
e) Disposal off site of all removed materials and debris in accordance with OPSS 180.
f) Collection, containment, and disposal of effluents associated with cutting of concrete (as required).
g) Earth excavation, grading and backfilling required to facilitate structure demolition that is not specified as earth excavation elsewhere in the Contract Documents.
h) Pre-construction survey to confirm all existing and theoretical-new elevations reported in the Contract Drawings.

Where stockpiling materials on site is required, the Contractor shall submit a plan to the Contract Administrator for approval prior to construction. The stockpile plan shall detail the type of material, and location where the materials shall be stored with approximate dimensions and distances from roadways, ditches, creeks, rivers, streams, etc. The plan shall also outline the environmental mitigation measures that shall be implemented to prevent sediment and other deleterious materials from being transported beyond the stockpile boundaries.

510.07.10 Management of Excess Material is amended by the addition of the following:

Excess material resulting from the removal work or associated construction activities shall remain the property of the Contractor and shall be removed at the Contractors expense.

SP28 – SUPPLY EQUIPMENT FOR INSTALLING MICROPILES
PRE-PRODUCTION OF MICROPILES
PRODUCTION OF MICROPILES
PRODUCTION MICROPILE TESTING
GROUT FOR MICROPILES

1.0 SCOPE

This Special Provision covers the requirements for the installation and testing of grout flush, hollow bar micropiles for Hamilton Island Bridge Replacement.

1.01 Qualifications of the Contractor

The minimum pre-qualification requirements of the micropile Contractor are specified as follows:

i. The Contractor shall be fully experienced in all aspects of grout flush, hollow bar micropile construction and with the execution of pile load tests. The Contractor shall demonstrate that he has successfully completed at least three grout flush, hollow bar micropile (3) projects in the previous five (5) years of similar scope, complexity and size.

ii. The micropile superintendent, micropile project manager and the foreman driller and grout operators responsible for installation of the micropile system must have micropile installation experience on at least three (3) successfully completed grout flush, hollow bar micropile projects over the past five (5) years. The Contractor shall provide resumes of key personnel who will be present full time on site (and will be substantially involved) and who will each have at least five (5) years of relevant experience. Key personnel shall include the Contractor's Engineer.

iii. The micropile work shall be carried out in whole by a specialist Contractor having the qualifications stated above.

2.0 REFERENCES

This Special Provision refers to the following standards, specifications or publications:

Ontario Provincial Standard Specifications, General and Construction:

OPSS 180	Management of Excess Material
OPSS 903	Deep Foundation
OPSS.PROV 904	Concrete Structures
OPSS 905	Steel Reinforcement for Concrete
OPSS 906	Structural Steel for Bridges

Ontario Provincial Standard Specifications, Material:

OPSS.PROV 1002	Aggregates – Concrete
OPSS 1301	Cementing Materials
OPSS 1302	Water
OPSS 1303	Admixtures for Concrete
OPSS.PROV 1350	Concrete – Materials and Production
OPSS 1440	Steel Reinforcement for Concrete
OPSS 1442	Epoxy Coated Reinforcing Steel Bars for Concrete
OPSS 1840	Non-Pressure Polyethylene (PE) Plastic Pipe Products

Canadian Standards Association Standards, CSA:

A23.1-14/A23.2-14	Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practice for Concrete
A283-06 (R2016)	Qualification Code for Concrete Testing Laboratories
G30.18-09 (R2014)	Billet-Steel Bars for Concrete Reinforcement
G40.20-13/G40.21-13 (R2018)	General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality

	Steels
W59-18	Welded Steel Construction (Metal Arc Welding)

American Society for Testing and Materials Standards, ASTM:

A722/A722M	Uncoated High-Strength Bar for Prestressing Concrete
A252	Standard Specification for Welded and Seamless Steel Pipe Piles
C144	Standard Specification for Aggregate for Masonry Mortar
D1784	Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
D3689	Standard Test Methods for Deep Foundations Under Static Axial Tensile Load
D4380	Standard Test Method for Density of Bentonite Slurries

American Welding Society (AWS):

D1.1/D1.1M:2020	Structural Welding Code - Steel
D1.4/D.14M:2018	Structural Welding Code – Reinforcing Steel

American Society of Civil Engineers (ASCE):

ASCE 20-96	Standard Guidelines for the Design and Installation of Pile Foundations

International Organization for Standardization/International Electrotechnical Committee, ISO/IEC

DIS-17025:2017	General Requirements for the Competence of the Testing and Calibration Laboratories

Others:

Post Tensioning Institute Publications – Recommendations for Prestressed Rock and Soil Anchors – 2014.
Canadian Foundation Engineering Manual (CFEM), 4th Edition.
Federal Highway Administration Publication No. FHWA NHI–05-039: Micropile Design and Construction Reference Manual, December 2005 (FHWA 2005).

3.0 DEFINITIONS

For the purposes of this Non-Standard Special Provision, the following definitions apply:

Admixture means a substance added to the grout to either control bleed and/or shrinkage, improve flowability, reduce water content, retard setting time, or resist washout.

Alignment Load (AL) means a nominal load applied to a micropile during testing to keep the testing equipment correctly positioned.

Apparent Free Micropile Length means the length of micropile that is not bonded to the surrounding ground, as calculated from the elastic movement data during testing.

Bond Length means the length of the micropile that is bonded to the ground and capable of transferring the applied axial loads to the surrounding soil or rock.

Bond-Breaker means a sleeve placed over the reinforcement steel to prevent load transfer.

Casing means a steel pipe introduced during the drilling process to temporarily stabilize the drill hole and/or permanently reinforce the pile.

Centralizer means a device used to centrally locate the reinforcing element(s) within the casing and/or drillhole to ensure that minimum grout cover is provided.

Central Bar or Central Steel means steel reinforcing bars (solid or hollow-core) or pipes used to strengthen or stiffen the pile, excluding any left-in drill rod or casing.

Contractor's Engineer means an Engineer who has a minimum of five (5) years of experience in the field of design and/or installation of micropiles or alternatively has demonstrated expertise by providing satisfactory verification services of at least two (2) projects of similar scope to the Contract. The Contractor's Engineer shall be retained by the Contractor to certify that the work is in general conformance with the Contract Documents.

Coupler means a device used to transmit load from one partial length of reinforcement to another.

Creep Movement means the movement that occurs during the creep test of a micropile under a constant load.

Design Engineer means the Engineer retained by the Contractor who produces the Working Drawings and designs the pile load test system(s).

Design Load (DL) means the anticipated final maximum service load in the micropile. The design load includes appropriate factors to ensure that the overall structure has adequate capacity for its intended use.

Duplex Drilling means a drilling system involving the simultaneous rotation and advancement of (inner) drill rod and (outer) drill casing in which the cuttings from the inner drill rod exit the borehole via the annulus between the rod and the casing.

Elastic Movement means the recoverable movement measured during a micropile load test.

Encapsulation means a corrugated or deformed tube protecting the reinforcing steel against corrosion.

Engineer means a professional engineer, licensed by Professional Engineers, Ontario to practice in the Province of Ontario.

Flush Grout means a suitably thin Portland cement based grout that is injected through the micropile hollow-core central reinforcing bar during drilling.

Free (Unbonded) Length means the designed length of the micropile that is not bonded to the surrounding ground or grout during testing.

Low Mobility Grout means a low slump grout with a mix design that typically contains sand or a suitable admixture (thixotropic agent) in order to control its travel from its point of injection.

Micropile means a bored, cast-in-place pile containing steel reinforcement, designed to accept load (axial, bending

or lateral) directly, and transfer it to an appropriate bearing stratum.

Maximum Test Load (TL) means the maximum load to which the micropile is subjected during testing.

Overburden means a non-lithified material, natural or placed, which normally requires cased drilling methods to provide an open drillhole to underlying strata.

Post-Grouting means the injection of additional grout into the load transfer length of a micropile after the primary grout has set.

Pre-Production Micropile means a sacrificial micropile that is not part of the final foundation system and is subjected to load testing to verify the design and installation procedures.

Primary/Structural Grout means a Portland cement based grout that is injected into the micropile hole through the hollow-core central reinforcing bar after completion of drilling and installation of the reinforcement to provide the load transfer to the surrounding ground along the micropile and affords a degree of corrosion protection when the micropile is in compression.

Production Micropile means a micropile that forms part of the final foundation support system to a structure.

Proof Load Test means the incremental loading of a production micropile, recording the total movement at each increment.

Reinforcement Steel means the steel component(s) of the micropile which accepts and/or resists applied loadings. This includes the hollow-core central reinforcing bar and the permanent steel casing on this project.

Residual Movement means the non-elastic (non-recoverable) movement of a micropile measured during load testing.

Rotary Percussive Duplex (Concentric) means a drilling system involving the simultaneous rotation, percussion and advancement of an (inner) drill rod and an (outer) drill casing in which the cuttings from the inner drill rod exit the borehole via the annulus between rod and casing.

Rotary Percussive Duplex (Eccentric or Lost Crown) means a drilling system involving the simultaneous rotation, percussion and advancement of an (inner) drill rod combined with an eccentric underreaming bit and an (outer) drill casing in which the cuttings from the inner drill rod exit the borehole via the annulus between rod and casing. Previously called the Overburden Drilling Eccentric (ODEX) System.

Sheathing means a smooth or corrugated piping or tubing that protects the reinforcing steel against corrosion.

Spacer means a device used to separate elements of a multiple-element steel bar reinforcement.

Tremie Grouting means the placing of grout in a borehole via a grout pipe introduced to the bottom of the hole.

Ultimate Grout-To-Ground Bond Value means the estimated ultimate geotechnical unit grout-to-ground bond strength selected for use in design.

Verification Load Test means a pile load test performed to verify the design of the pile system and the construction

methods proposed, prior to installation of production piles.

4.0 DESIGN AND SUBMISSION REQUIREMENTS

4.01 Design Requirements

The Contractor shall be responsible for the design of the pile load testing set-up including the reaction system(s), the reaction piles/ground anchors and all loading frame connections.

The reaction piles/ground anchors and the reaction system(s) shall be designed to safely withstand the applied loads specified in the Contract Documents.

The design assumptions of the reaction piles/ground anchors, the reaction system(s) and all loading frame connections shall accurately represent the subsurface conditions prevalent at the site.

Except as specified herein, the reaction piles/ground anchors shall be designed in accordance with the design recommendations of the Post Tensioning Institute Recommendations for Prestressed Rock and Soil Anchors (2004).

4.02 Submission Requirements

4.02.01 Site Survey

One (1) week prior to commencing any work associated with the micropile operation, the Contractor shall submit to the Contract Administrator, a condition survey of property and structures that may be affected by the work. The survey shall include, but not be limited to, the locations and conditions of adjacent properties, buildings, underground structures, utility services and structures such as bridges at or adjacent to the site.

4.02.02 Working Drawings

At least four (4) weeks prior to the commencement of the micropile operations, the Contractor shall submit three (3) copies of the Working Drawings to the Contract Administrator. These Working Drawings shall bear the seal and signature of the Contractor's Engineers. The Contract Administrator will review the Work Drawings and provide written comments if changes are necessary to meet Contract requirements. The Contractor shall submit to the Contract Administrator three (3) copies of the final Working Drawing which meets all Contract requirements within one (1) week with a Request to Proceed.

The final Working Drawing shall be submitted to the Contract Administrator with a Request to Proceed. The installation of pre-production micropiles and associated load tests shall not proceed until a Notice to Proceed has been received from the Contract Administrator.

Information to be shown on the Working Drawings shall describe and illustrate the complete details of the micropile installations for each stage of construction (including traffic staging), as well as the micropile testing equipment, test set-up, and reaction system(s) for the pre-production and production test micropile(s). The information on the Working Drawings shall include the following:

a) Plans, Elevations and Sections (at each of the south and north abutments)

   i. micropile spacing

ii. orientation
iii. minimum total micropile length
iv. casing plunge length
v. uncased bond length
vi. design load
vii. a unique identification number for each micropile
viii. micropile components and details

b) Materials

i. physical properties of reinforcement steel (central bar and casing)
ii. physical properties of pile top attachment
iii. bond length grout materials and mix proportions
iv. corrosion protection material physical/mechanical properties

c) Micropile Installation

i. construction methods
ii. work restrictions
iii. schedule of major equipment resources
iv. sequence of pile installation and coordination of work
v. procedures for monitoring micropile installation
vi. type, number and location of pre-production load tests
vii. method of evaluation of load test results

d) Micropile Construction Details

i. Detailed description of the proposed construction procedures.
ii. Method of drilling the micropile holes and maintaining the stability of the holes, through artesian conditions, during the micropile installation.
iii. Method to be employed to penetrate the overburden, including cobbles and boulders, during the micropile installation.
iv. Detailed description of the drilling equipment and materials including drill bit/auger diameter and lengths, casing diameter and lengths, flush type, slurry materials or other materials to facilitate the construction of the micropile hole.
v. Method of verifying the lengths of micropile holes.
vi. Detailed description of the grout mixing procedure and the method of grout installation and placement. The description shall include the grout pressures and details of the grout mix design(s).

e) All design assumptions, loads, parameters and bond stresses used for the micropile load tests.

f) Testing records and evaluation when testing has been completed to assess bond stress and micropile movement.

4.02.03 Mill Certificates

The Contractor shall submit to the Contract Administrator at the time of delivery to the job site, one (1) copy of the certified mill test reports, indicating that the steel meets the requirements for the appropriate standards for casing

and central bar reinforcement, plates and shapes. The ultimate strength, yield strength, elongation, and material properties composition shall be included. For steel pipe used as permanent casing, or core steel, the Contractor shall submit a minimum of two (2) representative coupon tests or mill certifications on each load delivered to the project.

Where mill test certificates originate from a mill outside Canada or the United States of America, the Contractor shall have the information on the mill certificate verified by testing by a Canadian laboratory. The laboratory shall be accredited by a Canadian National Accreditation Body to comply with the requirements of ISO/IEC 17025 for the specific tests or type of tests required by the material standard specified on the mill test certificate. The mill test certificates shall be stamped with the name of the Canadian testing laboratory and appropriate wording stating that the material conforms to the specified material requirements. The stamp shall include the appropriate material specification number, the date and the signature of an authorized officer of the Canadian testing laboratory.

One copy of the stress-strain curves representative of the lots to be used shall be submitted to the Contract Administrator together with the mill test certificates detailed in OPSS 1440.

4.02.04 Grout

The Contractor shall submit to the Contract Administrator a suitable, site specific grout mix design(s), including details of all materials to be incorporated, and the procedure for mixing and placing the grout. This submittal shall include certified test results verifying the acceptability of the proposed mix design(s). The acceptability of the mixes will be further verified on site prior to production.

4.02.05 Installation Records

The Contractor shall submit micropile installation records, signed by the Contractor's Engineer, to the Contract Administrator, within three (3) business days after each pile installation (including all test piles and production piles) is completed. The installation records shall include the following information:

a) Pile identification number and location;
b) Pile drilling duration, including date of installation and start and finish time;
c) Pile drilling observations, including nature of and variation in cuttings return, penetration rates for each 0.5 m of penetration, presence of cobbles or boulders or obstructions or voids, connections between holes;
d) Information on depth of drilling and soil types encountered, including description of strata, depth to water, etc.;
e) Sequence of installation;
f) Inclination and direction;
g) Final tip elevation;
h) Casing tip elevation;
i) Cut-off elevation;
j) Length and diameters of all components;
k) Bar length, spacers/coupler details;
l) Casing length, joint location details;
m) Description of unusual installation behaviour, conditions, voids, high grout takes;
n) Any deviations from the intended parameters, exceptions and "unusual" events;
o) Grout pressures attained, where applicable;
p) Grout mix proportions;
q) Grout quantities pumped, including depths were larger than normal grout takes occur;

r) Pile materials and dimensions;
s) Micropile test records, analysis and details;
t) As-built drawings showing the location of the piles, their depth and inclination, and details of their composition shall be submitted within thirty (30) calendar days of each pier completion.

4.02.06 Micropile Load Testing

The Contractor shall submit to the Contract Administrator details of the micropile load testing, three (3) weeks prior to construction. The details shall include the following:

a) Detailed description of the proposed load testing procedures.

b) Shop drawings and structural calculations for the design of the pile load testing, including reaction system(s). The structural calculations shall confirm that the materials will meet the specified load and movement criteria.

c) Detailed plans for the set-up method proposed for testing the pre-production and production micropiles including all necessary drawings and details to clearly describe the test method, means for providing reaction, equipment proposed including independent reference beams for measuring micropile head movement. Special attention shall be paid to ensuring safety and providing adequate structural stability of the reaction piles/ground anchors and loading frame connections.

d) Calibration reports for each test jack, pressure gauge, and master pressure gauge to be used. The calibration tests shall have been performed by an independent testing laboratory and tests shall have been performed within one (1) year of the date submitted. Testing shall not commence until the Contract Administrator has approved the jack, pressure gauge and master pressure gauge calculations.

4.02.07 Quality Control

4.02.07.01 Interim Inspections During Installation of Micropiles

The Contractor's Engineer shall carry out Interim Inspections of the:

a) drilling and casing installation (including cleanliness of casing); and,
b) drilling and grouting with hollow-core central bar reinforcement steel (including depth, diameter and length of penetration).

The above shall be carried out for each individual micropile to verify that the works are constructed in general conformance with the Contract Documents and Working Drawings.

4.02.07.02 As-Constructed Drawings

As-constructed drawings shall be submitted to the Contract Administrator in a reproducible format prior to final acceptance of the work.

The as-constructed drawings shall be dated and bear the seal and signature of the Contractor's Engineer.

5.0 MATERIALS

5.01 Water

Water for mixing grout shall be according to OPSS 1302.

5.02 Admixtures

Admixtures shall be according to OPSS 1303. Admixtures which control bleed, improve or control flowability, reduce water content, and retard set may be used in the grout only if the admixture manufacturer certifies that their use will not affect the required properties of the grout. Expansive admixtures shall only be added to the grout used for filling sealed encapsulations (if used). Accelerators and admixtures with chlorides shall not be permitted. Admixtures shall be compatible with the grout and mixed in accordance with the manufacturer's recommendations.

Admixtures shall be selected by the contractor, when required, to construct the micropiles as specified in the contract documents.

5.03 Cement

All cement shall be Type GU General Use hydraulic cement conforming to OPSS 1301.

5.04 Fillers

Inert fillers, such as sand, may be used in the grout in special situations (e.g., presence of large voids in the ground) to limit grout take and travel and only if the QVE certifies that their use will not affect the required properties of the grout.

5.05 Grout

The grout mix materials and procedures for placement and testing shall conform to OPSS 1301, OPSS 1302, OPSS 1303, OPSS 1350 and CSA A23.2-1B.

The Contractor shall provide a stable, homogenous neat cement grout or a sand-cement grout. The grout shall be free of any lumps and not contain any evidence of poor or incomplete mixing. The grout shall be mixed to the supplier's specification. The water/cement grout ratio of the thin/flush grout (by weight) shall not exceed 0.90. The water/cement ratio of the structural grout (by weight) shall not exceed 0.45. The structural grout shall have the following physical properties:

a) A minimum compressive strength of 25 MPa at 7 Days.
b) A minimum compressive strength of 35 MPa at 28 Days.
c) No segregation and a bleed of less than 2% when allowed to stand for 1 hour.

5.06 Reinforcement Steel

5.06.01 Central Bar

The central bar reinforcement steel shall be a single double corrosion protected continuously threaded DYWIDAG thread bar, according to OPSS 1440, with a minimum yield strength of 520 MPa conforming to CSA G30.18 /

ASTM A615.

5.06.02 Couplers

Couplers for the central bar reinforcement steel shall be as specified by the supplier of the central bar and shall develop at least 100% of the guaranteed minimum ultimate strength of the central bar.

5.06.03 Casing

The steel casing shall meet the requirements of ASTM A252, Grade 3 with minimum yield strength of 552 MPa.

New "Structural Grade" (a.k.a. "Mill Secondary") steel pipe meeting the above but without Mill Certification is acceptable for use as permanent casing provided it is free from defects (dents, cracks, tears) and is accompanied by two (2) coupon tests per truckload confirming it meets the above requirements.

All casing joints shall be threaded or comprised of full penetration field welds. The casing joints shall develop at least the required compressive, tensile and/or bending strength used in the design of the micropile.

5.07 Plates and Shapes

Structural steel plates and shapes for pile top attachments shall be according to OPSS 906 Grade 300W.

5.08 Centralizers and Spacers

Centralizers shall be fabricated from schedule PVC pipe or tube, steel, or material that is non-detrimental to the reinforcement steel. Wood shall not be used.

6.0 EQUIPMENT

6.01 General

All equipment for the installation, testing and monitoring of the pre-production (verification) and production micropiles shall be suitable for the intended purposes and capable of working on the site under the prevailing access and clearance conditions.

The equipment used shall be capable of installing and grouting the micropiles to the prescribed depths or elevations without damage to the pile materials or to the adjacent structures.

6.02 Grouting Equipment

All grout mixers, pumps and hoses shall be of an adequate capacity and shall be sized to enable the grout to be pumped in one continuous operation, while keeping the grout in constant agitation prior to pumping, and to allow continuous grouting of an individual micropile with the final structural grout within one (1) hour.

A high speed, high shear, colloidal grout mixer with a gauge to measure the quantity of water discharged into the mixer shall be used. A paddle mixer is not acceptable.

The grout pump(s) shall be equipped with a pressure gauge to monitor grout pressures of at least 1 MPa or twice

the actual grouting pressures used, whichever is greater.

6.03 Micropile Testing Equipment

The equipment shall be capable of loading the test piles to the maximum specified test load (TL) within the rated capacity.

The equipment shall be capable of loading the pile in increments so that the load on the pile can be increased or decreased in accordance with the test procedures outlined in the Contract Documents.

Dial gauges shall have at least a 75 mm travel and longer gauge stems or sufficient gauge blocks shall be provided to allow for greater travel where required. Gauges shall have precision of at least 0.02 mm.

Dial gauges shall allow the measurement of total micropile movement at every load increment to be read to the nearest 0.02 mm increment. The gauge shall have sufficient travel to record the total pile movement at Test Load without the need to reset at an interim point.

Loading equipment shall be calibrated within an accuracy of +/-2% immediately prior to use.

Current calibration records, dated and bearing the seal and signature of an Engineer, shall be provided for all gauges and jacks.

7.0 CONSTRUCTION

7.01 General

The Contractor shall be responsible for the material, fabrication, installation, testing and monitoring of the test micropiles and the production micropiles. The Contractor shall be responsible for design parameters and the design of the reaction piles/ground anchors.

The Contractor's attention is specifically drawn to the following details:

a) The drilling, grouting and micropile installation will be carried out immediately adjacent to the existing bridge abutments. The Contractor is alerted to the limited available working space within each construction staging of the replacement bridge structure as well as the presence of overhead Hydro line(s) within the right-of-way. The Contractor shall select construction techniques that will prevent settlement or heave of the existing structure during construction.

b) The Contractor is alerted that micropiles will be installed through rockfill embankment. The lower layers may contain boulders. The factual information contained in the foundation investigation reports (that are available as specified elsewhere in the Contract) provide information on the subsurface conditions at the sites.

   The Contractor shall select drilling and grouting methods and be prepared with suitable equipment and procedures (including the use of hollow-core central steel reinforcement bars, with sacrificial drill bits, to allow the simultaneous drilling and injection of grout during installation of the micropiles) to penetrate through the overburden soils containing cobbles and boulders, prevent basal heave and soil cave in and surface ground movement at the adjacent bridge structures so as to avoid causing an unacceptable level of disturbance as defined elsewhere in the Contract Documents.

The use of rotary percussion drilling with compressed air flush to advance the micropile through the overburden soil will not be allowed.

The Contractor shall control all drilling fluids, grout, water and drill cuttings during micropile installation and upon completion of the micropile installations shall clean up, and off-site dispose of all excess fluids and cuttings in accordance with the requirements of OPSS 180.

The Contractor shall comply with all environmental provisions as specified elsewhere in the Contract Documents.

7.02 Subsurface Conditions

The "Geotechnical Investigation, Proposed Hamilton Island Bridge Replacement Report, April 2024, 2026" describes the subsurface conditions at each bridge site for the project is available, as specified elsewhere in the Contract Documents. The Ministry warrants that the information provided in the Geotechnical Investigation Report can be relied upon with the following limitations and exceptions:

a) Any interpretation of data or opinions expressed in the reports is not warranted.

b) Although the raw measured data presented is warranted, the Contractor must satisfy itself as to the sufficiency of the information presented for the intended construction purpose and obtain any updating or additional information as required to facilitate the deep foundation works.

The Contractor is alerted that the micropiles will be installed through rockfill embankment, Sand layer and Glacial Till that may contain boulders. The factual information contained in the Geotechnical Investigation Reports (that is available as specified elsewhere in the Contract Documents) provide information on the subsurface conditions at each site.

7.03 Transportation, Handling, Storage

Casings and central bar reinforcement shall be transported, stored and handled in such a manner that damage and distortion is prevented and that the strength and integrity are maintained.

All materials, including cement, additives for grout and pile reinforcement steel (central bar and casing) shall be stored off-ground, under cover and protected against moisture and directly from the elements.

Lifting of any casings and bar reinforcement shall not cause excessive bending.

7.04 Installation of Micropiles

7.04.01 General

The Contractor shall install the micropiles in accordance with the diameter, orientation and length specified in the Contract Documents and as detailed on the Working Drawings.

The micropile installation technique shall be such that it is consistent with the geotechnical, logistical, environmental, and load carrying conditions of the project.

The micropiles will be installed in close proximity to each other near the foundation of the existing bridge structures. The Contractor shall carry out the drilling and grouting works in such a manner to prevent any damage to previously installed micropiles, to prevent any loss of ground, and to prevent ground movement at the existing bridge structures. The Contractor shall monitor movements of the existing structure during the installation of the micropiles from commencement and continue through to the end of substantial completion of the Contract. The Contractor shall adopt established method(s) of monitoring such as the use of monitoring pins or electronic devices, and record and report movements and readings in general on a weekly basis, and more frequently on a daily basis during active drilling and grouting operations, with copies forwarded to the Contract Administrator. Where movements of 15 mm are observed, the Contractor shall stop work and re-evaluate and modify the micropile installation and grouting method prior to continuing work.

The available working space is limited. The Contractor shall inspect the work area to ensure that adequate access and headroom are available for the proposed equipment and procedures for the micropile installation work.

7.04.02 Drilling

The Contractor shall employ drilling equipment and methods suitable for drilling through the anticipated subsurface conditions to be encountered and cause no damage or disruption to these conditions or any overlying or adjacent structure or service. The Contractor shall use steel casing during drilling and installation. Drilling shall be conducted under full head of water. Bentonite slurries to stabilize the holes are not permitted.

The upper cased sections of the micropiles shall be drilled using duplex drilling techniques with the cuttings returning up the inside of the casing. The lower uncased sections of the micropiles shall be installed using the hollow-core central reinforcing bars with sacrificial drill bits that allow the simultaneous drilling and injection of grout.

Drilling shall be conducted in a manner that does not result in significant loss of ground beyond the hole diameter. Disposed cuttings from the upper cased sections of the micropiles shall not exceed 110% of the theoretical borehole volume based on the outside diameter of the casing. Disposed cutting from the micropile installation/grouting process shall be collected at top of the upper cased sections of the micropiles to minimize the amount of chipping/cleaning required before the construction of the pile cap.

The Contractor shall determine and schedule all installation techniques such that there will be no interconnection or damage to previously installed micropiles.

7.04.03 Reinforcement Steel

7.04.03.01 General

Pile reinforcement steel (central bar and permanent casing) shall be installed as specified in the Contract Documents and detailed on the stamped Working Drawings.

7.04.03.02 Placement

The Contractor shall be responsible for determining the number of centering devices required. As a minimum, centralizers shall be provided at 3 m centre maximum spacing on the central bar reinforcement. The uppermost centralizer shall be located a maximum of 1.5 m from the top of the micropile. Centralizers shall permit the free flow of grout without misalignment of the reinforcement.

All pile top elevations shall be checked and adjusted to ensure all installed micropiles are installed to the planned elevations.

7.04.03.03 Connections

The pile reinforcement steel connections (splices and joints) shall be constructed to develop the required design strength of the pile section. The central bar reinforcement steel connections (splices) shall be constructed using mechanical connectors only. The casing connections shall be constructed using either mechanical connectors (e.g., threaded joints) or full penetration field welds.

The proposed pile splice/connection details shall be submitted to the Contract Administrator, for information purposes, prior to use.

Reinforcement steel central bar connections shall not be in the same plane as casing connections/splices.

Secure lengths of casing and reinforcement steel central bar shall be joined in proper alignments and in such a manner that causes no eccentricity between the axes of the two joined lengths or the angle between them.

7.04.04 Grouting

7.04.04.01 General

The grout shall be installed as specified in the Contract Documents and as detailed on the stamped Working Drawings.

The Contractor shall provide systems and equipment to measure the grout quality, quantity and pumping pressure during the grouting operations.

During advancement of the hollow-core central reinforcement bar (with sacrificial drill bit), the Contractor shall continuously flush the hole using the thin flush grout. Flushing with water is not permitted.

Upon completion of drilling of the uncased section of the micropile to the design tip elevation, the Contractor shall inject the final structural grout from the lowest point of the drill hole until clean, pure structural grout flows from the top of the micropile (to be verified by specific gravity testing with a Baroid mud balance).

Subsequent to completion of grouting, all installation operations associated with completion of the micropile must ensure complete continuity of the grout column. The use of compressed air to directly pressurize the fluid grout is not permissible. The grout pressures and grout take volumes shall be controlled for each stage of each pile to prevent excessive heave or fracturing in the foundation soils or existing bridge structures. The entire micropile shall be grouted to the design cut-off level.

The grout within the micropiles shall be permitted to attain the minimum design strength prior to being loaded.

Any micropiles not installed according to the specifications shall be replaced, or otherwise remediated appropriately. The cost of replacement and any required foundation modifications are to be carried out at no additional cost to the Owner.

If necessary, the Contractor shall undertake cold weather protection requirements, preparation and protection in accordance with CSA CAN3-A23.1. The temperature of the grout during mixing and pumping shall be maintained between 10°C and 30°C.

7.04.04.02 Quality of Grout Mixture

7.04.04.02.01 General

Any grout mixture showing evidence of dampness, lumps, harden pieces, or contamination shall not be incorporated into the work.

The Contractor shall be responsible for testing of bleed, preparation and initial storage of grout cubes for determination of compressive strength, and delivery of the grout cubes to a testing laboratory designated by the Owner.

The Contractor shall employ staff from a testing company certified according to CSA A283 – Certification for Additional Tests 1B, by an organization accredited by the Standards Council of Canada, to carry out testing for bleed, making and curing of grout cubes and early strength determination.

Making of grout cubes for compressive strength test and testing of bleeding, shall be done on a level, vibration free surface.

The Contractor shall perform and record specific gravity testing using a Baroid mud balance following ASTM D4380 on the structural grout utilized for each and every micropile.

7.04.04.02.02 Bleed Requirements

The testing for bleed of the grout shall be according to CSA A23.2-1B.

Prior to the grouting operation, in the presence of the Contract Administrator, a trial batch shall be mixed and the grout tested for bleed, to ensure that the grout meets the requirements specified in the Contract Documents. The trial batch of grout shall not be used in the actual grouting operation unless it meets the requirements for bleed as specified herein.

During the grouting operation, bleeding measurements shall be performed on the grout sampled at the mixer. The measurements shall be performed and recorded at least once a day and as requested by the Contract Administrator.

The bleed test results shall be submitted to the Contract Administrator in writing at the end of each working day. The test results that indicate the grout is not meeting the requirements of the Contract Documents shall be reported immediately to the Contract Administrator and the grouting operation halted until the cause of the problem is identified and corrected.

7.04.04.02.03 Strength Requirements

Grout cubes shall be prepared as follows on site from the grout pumped into the micropile:

a) Three (3) sets of grout cubes, consisting of three (3) cubes each, shall be made each day the grouting operations are carried out.

b) The grout cubes shall be prepared and stored according to CSA A23.2-1B, and shall not be moved prior to demoulding.

c) The grout cubes shall be demoulded and transported to the laboratory within 24 hours ± 4 hours.

d) The grout cubes shall be transported in a sealed white opaque plastic bag containing at least 250 mL of water and maintained at a temperature between 15°C and 25°C.

e) Compressive strength testing shall be carried out on the grout cubes according to CSA A23.2-1B at 3, 7 and 28 days and the test results provided to the Contract Administrator.

f) The Contractor shall prepare and test additional grout cubes to determine when the grout has attained a compressive strength of 25 MPa.

7.05 Tolerances

The allowable tolerances are as follows:

a) Centreline of the installed micropiles shall not be more than 75 mm from that shown on the Contract Drawings.

b) Micropile hole alignment shall be within 2% of the total-length plan alignment.

c) Top elevation of micropiles shall be within +25 mm or -50 mm of maximum of the vertical design elevation.

d) Centreline of central bar reinforcement shall not be more than 19 mm from centerline of micropile casing.

7.06 Testing of Micropiles

7.06.01 General

Verification load tests shall be carried out on pre-production test micropile(s), and proof load tests shall be carried out on selected production micropiles. The micropile load testing shall be carried out according to the Working Drawings and as specified herein.

The Contractor shall provide to the Contract Administrator a minimum of three (3) Working Days' notice of when the load tests will be carried out. The load tests shall be conducted at a time mutually acceptable to the Contractor and Contract Administrator.

The maximum load in the reaction piles/ground anchors shall not exceed 80% of the guaranteed minimum ultimate tensile strength of the central bar reinforcement.

The testing shall not be performed until after the grout in the micropiles (or reaction piles/ground anchors) has reached a minimum seven (7) days unconfined compressive strength of 25 MPa.

The load tests shall be undertaken under the supervision of the Contractor's Engineer, and the test results recorded and submitted to the Contract Administrator. The load test results shall include a plot of the load versus deformation.

7.06.02 Reaction System

The reaction system(s) for the pre-production and production micropile load tests shall be designed by the Contractor and shall be installed as detailed on the Working Drawings.

The Contractor shall determine the number of reaction piles (or ground anchors) required for proper execution of the axial tensile load tests. The reaction piles or ground anchors shall be located no closer than 2 m to the micropile to be tested under axial tensile conditions.

The Contractor shall make provisions, as appropriate and necessary, to ensure safety and structural stability of the reaction piles, ground anchors and their connection to the load frame and load apparatus.

7.06.03 Reference System, Testing Equipment and Procedures

The layout of the reference systems and testing equipment required for testing shall be as detailed on the Working Drawings and as specified herein.

The Contractor shall supply a suitable means for providing independent reference beams for measuring micropile head movement, jack, electronic load cell, dial gauges or electronic displacement transducers, anchor extension, and any other hardware necessary to carry out the load tests. A minimum of three (3) dial gauges or electronic displacement transducers and piano wire is required. Dial gauges or displacement transducers shall have an accuracy of ±0.0254 mm (0.001 in). Load cells shall have an accuracy of ±2% of the maximum test load. The calibration curve between the jack pressure and the load shall be submitted to the Contract Administrator for information purposes.

All reference beams shall be independently supported with the support firmly embedded in the ground at a distance of not less than 2.5 m from the reaction system. Reference beams shall be sufficiently rigid to support instrumentation such that variations in readings do not occur.

All gauges, scales and reference points attached to the micropile (or reaction piles/ground anchors) shall be mounted to prevent movement relative to the micropile (or reaction piles/ground anchors) during the test.

The jacks shall be secured (with chains or other protective housing(s)) to provide adequate protection to personnel in the event of breakage of the micropile, ground anchor or loading system.

The Contractor shall perform the micropile tensile load tests according to ASTM D3689, superseded where applicable by the procedures specified in this Special Provision, and indicate the minimum following information:

a) Type and accuracy of apparatus for measuring load.

b) Type and accuracy of apparatus for applying load.

c) Type and accuracy of apparatus for measuring the micropile displacement.

d) Type and capacity of reaction load system, including sealed Working Drawings.

e) Hydraulic jack calibration report.

7.06.04 Pre-Production Micropile Load Tests

7.06.04.01 General

The Contractor shall perform pre-production tension load tests on sacrificial micropiles to verify the design assumptions and the appropriateness of the proposed construction procedures, prior to installation of production micropiles.

Upon completion of the pre-production micropile load testing, the Contractor shall submit the load test results to the Contract Administrator with a Request to Proceed. The installation of production micropiles shall not proceed until a Notice to Proceed has been received from the Contract Administrator.

7.06.04.02 Installation of Pre-Production Sacrificial Test Micropiles

The pre-production test piles will be installed near each abutment at minimum of 3 m of the proposed micropile group cap at the abutments, at a location selected by the Contract Administrator in communication with the Contractor.

The Contractor shall employ the drilling and grouting methods, casing and other reinforcement details, and depth of embedment for the test micropiles identical to those to install the production micropiles, except where specified otherwise by the Contract Administrator. In this regard, the upper portion of the pre-production test micropile, down to approximately the same elevation as bottom of new abutment footing.

The details of the test pile set-up area (including any excavation, over-drilling and/or bond-breaker) shall be submitted to the Contract Administrator.

The Contractor shall be responsible for logging the holes for the pre-production micropiles to be tested. The subsurface conditions in terms of stratigraphy at the test locations are required for proper interpretations of the load test results. The Contractor shall also make provisions, as appropriate, to facilitate the Contract Administrator in carrying out his own logging of the holes for the pre-production sacrificial micropiles and the associated reaction piles.

Upon completion of the sacrificial, pre-production micropile load tests, and prior to demobilization from the site, the test section area is to be restored to near original conditions as per the direction of the Contract Administrator.

7.06.04.03 Test Procedures and Measurement

The Contractor shall apply an Alignment Load (AL) to the piles prior to setting the movement recording devices. This Alignment Load shall be no more than 10% of the Design Load (i.e., 0.1 DL); dial gauges shall be zeroed at the first setting of the AL. For the purposes of this test, the Alignment Load shall be taken as 30 kN.

The Contractor shall carry out an axial tension load test on each of the pre-production piles in a manner that induces uplift failure, to enable assessment of the ultimate grout-to-ground bond strength. To achieve this, a minimum tension load equal to two times the axial compression load specified in the Contract Drawings shall be applied for 5 minutes.

7.06.05 Production Micropile Load Tests and Target Criteria

7.06.05.01 General

The Contractor shall carry out proof load tests (under tensile conditions) on a minimum of one (1) production micropile at each abutment (i.e. a minimum of 2 proof load tests). The Contractor shall submit to the Contract Administrator a proposal recommending the production micropile(s) to be selected for testing, however, the final selection will be up to Contract Administrator.

The selected micropiles for proof testing will be tested no sooner than seven (7) days after installation to allow the grout to reach sufficient strength. It is noted that the use of adjacent vertical micropiles as reaction anchors is acceptable, provided that the minimum spacing requirements between the reaction piles and the test pile (as defined in Section 7.06.02) can be satisfied. The reaction system, including any reaction anchors, if necessary, is to be entirely designed by the Contractor and submitted to the Contract Administrator for information purposes.

The Contractor shall set-up the reaction frame and load test set-up, complete with jacks, load cells and gauges in a manner similar to the pre-production load tests. The Contractor shall repair any previously installed production micropiles that may have been damaged during the course of proof load testing to the approval of the Contract Administrator and at no cost to the Owner.

The Contractor shall perform a production micropile proof load test no later than 25% of the production micropiles are installed at each abutment.

Upon completion of a production micropile proof load test, the Contractor shall submit the load test results to the Contract Administrator with a Request to Proceed. The load test results shall include a plot of the load versus deformation. The installation of the remaining production micropiles at each abutment shall not proceed until a Notice to Proceed has been received from the Contract Administrator.

The test procedure shall be the same as that used for the pre-production tension load test.

7.07 Management of Excess Material

Management of excess material shall be according to OPSS 180.

7.08 As-Constructed Drawings

As-constructed drawings shall be prepared by the Contractor for all installations of pre-production and production micropiles as follows:

a) For all work incorporated in the completed structure that required the submission of Working Drawings.

b) For all changes from the original Contract requirements.

The as-constructed drawings shall be submitted to the Contract Administrator in a reproducible format prior to final acceptance of the work.

The as-constructed drawings shall be dated and bear the seal and signature of the Contractor’s Engineer.

8.0 MEASUREMENT FOR PAYMENT

8.1 Pre-Production Micropile Testing

A count will be made of the number of pre-production micropiles that are load tested and satisfy the Contract requirements.

8.2 Production Micropile

Measurement will be made in metres of the micropiling left in place after cut-off.

8.3 Grouting

Measurement will be made in cubic metres of primary/structural grout pumped into the subsurface during the installation of the micropiles.

8.4 Production Micropile Testing

A count will be made of the number of production micropiles that are load tested and satisfy the Contract requirements.

9.0 BASIS FOR PAYMENT

9.1 Supply Equipment for Installing Micropiles – Item

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

It will be assumed, for payment purposes, that 20% of the work under this item has been completed when the satisfactory performance of the equipment has been demonstrated to the Contract Administrator by the installation of one (1) pre-production micropile and one (1) production micropile. The remaining 80% will be paid on the satisfactory completion of the installation.

9.2 Primary/Structural Grout for Micropiles – Item

Payment at the Contract price for the above items shall be full compensation for all Labour, Equipment and Material required to do the work.

9.3 Pre-Production Micropile – Item

Payment at the Contract price for the above items shall be full compensation for all labour, load testing, equipment and material (including flush grout) required to do the work.

No payment will be made for micropiles that fail the load test.

For pre-production micropiles that fail the load test, payment for any additional work directed by the Contract Administrator shall be made as Extra Work.

No payment will be made for additional work for pre-production micropiles that fail to meet the Design Acceptance Criteria for Pre-Production Load Tests.

9.4 Production Micropile – Item

Payment at the Contract price for the above items shall be full compensation for all labour, equipment and material (including flush grout) required to do the work.

9.5 Production Micropile Testing – Item

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

SP29 – CONCRETE IN STRUCTURES

OPSS.MUNI 904, November 2023, shall govern except as amended or extended herein.

904.01 SCOPE

Section 904.01 of OPSS 904 is amended by the addition of the following:

This specification also covers the requirements for the placement of tremie concrete on rockfill beneath the abutment footings, concrete curbs on structure, railing system concrete end walls, and EVA Foam

904.03 DEFINITIONS

Section 904.03 of OPSS 904 is amended by the addition of the following:

Ethylene Vinyl Acetate (EVA) Foam means a closed-cell, flexible cellular foam product with a low density, cross-linked copolymers, and containing ethylene vinyl acetate.

904.04 DESIGN AND SUBMISSION REQUIREMENTS

904.04.01.06 EVA Foam

Section 904.04 of OPSS 904 is amended by the addition of the following clause for the EVA foam:

A minimum of seven Days prior to installation, a product data sheet for the EVA foam to be used in the work shall be submitted to the Contract Administrator. The data sheet shall clearly identify that the supplied EVA foam meets the requirements of this specification.

904.05 MATERIALS

Section 904.05 of OPSS 904 is amended by the addition of the following subsection:

904.05.15 EVA Foam

EVA foam shall have a compression-deflection range of 34 to 90 kPa when compressed by 25% of its original thickness. The material does not require any specific resistance to the action of petroleum base oils. Adhesive shall be commercial construction grade as recommended by the EVA foam manufacturer and shall be compatible and appropriate for its intended use.

904.07 CONSTRUCTION

904.07.04.03 Pre-wetting

Clause 904.07.04.03 of OPSS 904 is amended by deleting the first paragraph in its entirety and replacing it with the following:

All concrete surfaces to receive concrete shall be maintained in a wet condition for a period of two (2) hours prior to placing any new concrete.

904.07.04.04 Bonding Agent

Clause 904.07.04.04 of OPSS 904 is deleted in its entirety and replaced with the following:

Bonding agents shall not be permitted. Existing concrete shall be saturated surface dry (SSD) at the time of placement.

Section 904.07 of OPSS 904 is amended by the addition of the following subsections:

904.07.20 Installation of EVA Foam

EVA foam shall be installed at locations specified on the Contract Drawings. EVA foam shall be uniformly attached to all fixed concrete surfaces by means of an adhesive. Adhesive for EVA foam installation shall be applied to concrete surfaces that are free of dust, dirt, debris, and loose concrete.

When EVA foam thickness specified in the Contract Drawings is greater than thickness commercially available, multiple layers of EVA foam may be used to meet the specified thickness. Multiple layers of EVA foam shall be fully bonded to each other using adhesive.

The minimum length of continuous EVA foam shall be the lesser of the element length or 1.2 m.

904.07.21 Preparation for Concrete Placement

Prior to the first concrete pour, the Contractor shall prepare appropriate concrete “wash-out” areas or sumps for discharge of extra/waste concrete and washing out of concrete delivery trucks. The location and construction of the “wash-outs” shall be subject to the approval of the Contract Administrator. The Contractor shall ensure that proper environmental controls are installed as required to ensure that concrete and cement laden wash-out water are not permitted to directly enter storm sewers, ditches or watercourses. All “wash-outs” shall be cleaned out/maintained as required with all hardened waste concrete disposed off-site. The Contractor shall ensure that all

concrete delivery truck drivers are informed of the "wash-out" areas and instructed to use them. Following completion of all concrete construction, all "wash-out" areas/sumps shall be removed and restored.

Prior to each pour, a Concrete Pour Form must be completed and signed by the Contractor, Contract Administrator, and other signatories as identified on the form. At the same time, the Contract Administrator will review with the Contractor's superintendent, the placement, finishing, curing and protection procedures to be implemented for the pour and ensure that all required materials and equipment are on-site, prepared and functioning prior to commencing pour.

No concrete shall be placed without appropriate notification to the Contract Administrator (48 hours minimum) so as to permit adequate time for proper inspection of formwork and rebar, corrections/adjustments as required and to make arrangements for appropriate inspection staff to be on-site during the pour.

No water shall be added to the concrete once it has been delivered to site unless approved by the concrete supplier, subject to the conditions of OPSS.MUNI 1350 and CAN/CSA A23.1-19. The maximum water/cement ratio for the specified exposure class of concrete is not to be exceeded. Alternatively, slump and workability of the concrete may be adjusted if required through the site addition of a super-plasticizer at the discretion of the Engineer. Maximum slump after the addition of super-plasticizer shall not exceed 200 mm unless approved by the Engineer.

904.07.22 Early Loading of Structural Concrete

Full design loads shall not be applied to the structure until the specified 28-day compressive strength has been attained. Early loading of a structural component is not permitted unless expressly stated otherwise in the Contract Documents, subject to the following conditions:

a) Prior to any early loading the Contractor shall demonstrate that the concrete has reached a compressive strength of 20MPa, by preparing, curing and transporting early strength cylinders, in addition to the cylinders required for 28-Day compressive strength, according to the Testing for Early Strength requirements of this specification.
b) Subsequent placement of reinforcement, formwork, falsework and concrete on all other structural components shall not be carried out until the concrete has reached a compressive strength of 20MPa, unless otherwise specified in the Contract Documents.
c) Early loading of concrete is not permitted where cold weather protection is required, with the exception of working slabs.
d) Construction vehicles shall not be permitted on concrete that has not reached a compressive strength of 20MPa.
e) Full curing is to be maintained at all times as specified in the Contract Documents, regardless of attainment of design strength prior to the end of the curing period.

904.08 QUALITY ASSURANCE

OPSS 904.08 is amended by the addition of the following:

The Contractor shall be responsible for field sampling and testing of concrete as follows:

- Slump, air content and temperature of plastic concrete;

- The making and curing of concrete cylinders for compressive tests;
- Transportation of the cylinders to the approved testing facilities; and
- All destructive testing including 7- and 28-day strength tests and all early breaks.

Compressive strength tests shall be undertaken at 7 and 28 days at a minimum. Any additional early strength testing shall be undertaken in accordance with OPSS 904.07.16 and this Special Provision.

Persons sampling and field-testing concrete shall have a card issued by the certifying agency in their possession verifying the status of the individual's certification.

904.10 BASIS OF PAYMENT

The heading for Section 904.10 of OPSS 904 is amended by the addition of the following:

904.10.01 Concrete in End Wall – Item

Subsection 904.10.01 is amended by the addition of the following:

Concrete placed in curbs on structures shall be considered incidental to the item Concrete in Deck.

SP30 – REINFORCING STEEL MECHANICAL CONNECTORS
REINFORCING STEEL BAR
STAINLESS STEEL REINFORCING BAR
STAINLESS STEEL MECHANICAL CONNECTORS

OPSS.MUNI 905, November 2017, shall govern except as amended or extended herein.

905.04 SUBMISSION AND DESIGN REQUIREMENTS

Subsection 905.04.01.02.01 of OPSS 905 is amended by deleting the first paragraph and replacing it with the following:
At least three (3) weeks prior to commencing fabrication of reinforcing bars, the Contractor shall submit to the Engineer for review, six (6) copies of the shop (working) drawings and bar lists, conforming to the requirements of OPSS.MUNI 905. The Working Drawings shall include at least the following: quantity, bar size, grade, mark number, location, spacing for all steel reinforcement and type if applicable.

Subsection 905.04.01.02.02 of OPSS 905 is amended by deleting the first paragraph and replacing it with the following:

At least three (3) weeks prior to commencing fabrication of reinforcing bars, the Contractor shall submit to the Engineer for review, six (6) copies of the shop (working) drawings and bar lists, conforming to the requirements of OPSS.MUNI 905. The Working Drawings shall include at least the following: quantity, bar size, grade, mark number, location, spacing for all steel reinforcement and type if applicable.

905.05 MATERIAL

Subsection 905.05.01 of OPSS 905 is deleted in its entirety and replaced with the following:

Steel reinforcement shall be according to OPSS 1440, except that the grade of all reinforcing steel bars and stainless steel reinforcing bars shall be as specified in the Contract Drawings.

SP31 – BARRIER WALL RAILING

OPSS.MUNI 908, November 2022, shall govern except as amended or extended herein.

908.07 CONSTRUCTION

Subsection 908.07.02.01 of OPSS 908 is amended by deleting it in its entirety and replacing with the following:

Anchorage assemblies for curb mounted traffic railings shall be installed before concrete placement. All railing anchorages shall be installed using plywood templates prior to placing concrete.

908.07 BASIS OF PAYMENT

The basis of payment shall be in meter installed satisfactory to Contract Administrator

SP32 – COATING NEW STRUCTURAL STEEL

OPSS.MUNI 911, November 2022, shall govern except as amended or extended herein.

911.05 MATERIAL

Subsection 911.05.01 of OPSS 911 is amended by the addition of the following:

The paint coating shall be a Low VOC, three-coat Epoxy-Zinc / Epoxy / Polyurethane (EZEP) system, and shall be listed in the Ministry of Transportation Ontario's (MTO) Designated Sources for Materials (DSM) List # 9.20.39.

911.07 CONSTRUCTION

Subsection 911.07.03.07 of OPSS 911 is amended by the addition of the following:

The faying surface of a splice plate shall only be blast cleaned to SP6 but not coated. The primed faying surfaces of the girder and the primed exposed surfaces of splice plates shall be solvent cleaned, and power-tool cleaned to SP3 immediately prior to connection. Coatings damaged by the bolting operations shall be repaired accordingly to OPSS 911.

SP33 – BRIDGE DECK WATERPROOFING

MEMBRANE REINFORCEMENT

FORM AND FILL GROOVES

OPSS.MUNI.914, November 2014 shall govern except as amended herein.

The Contractor is hereby advised that the Owner invokes Appendix 914-B, November 2014 of OPSS 914. The supplementary requirements of Appendix 914-B shall apply to the Contract.

914.07 CONSTRUCTION

914.07.05 Membrane Reinforcement

Subsection 914.07.05 is amended by the addition of the following:

Membrane reinforcement shall be placed over all construction joints in the deck and over the joint between the deck and approach slab at both ends of the structure.

914.07.07 Form and Fill Grooves

Subsection 914.07.07 is amended by the addition of the following:

Form and fill grooves shall be installed above the joint between the deck and approach slab and at both ends of the structural approach slabs as detailed in the Contract Drawings.

Forming and filling of grooves shall be performed within 14 Days of surface course asphalt placement at the location of each groove.

SP34 – BEARINGS

OPSS PROV.922, November 2020, shall govern except as amended or extended herein.

922.01 SCOPE

Section 922.01 of OPSS 922 is amended by the addition of the following:

Work under this item shall include all labour, equipment and material to install the new abutment bearings and plain elastomeric bearing strips below approach slabs as detailed on the Contract Drawings.

In addition, works under this item shall include all labour, equipment and material to install bearing assemblies steel shoe plates, pintles and associated bearing steel components.

922.02 REFERENCE

Section 922.02 of OPSS 922 is amended by the deletion of the following references:

MTO Forms:
PH-CC-701 Request to Proceed

PH-CC-702 Notice to Proceed

922.04 DESIGN AND SUBMISSION REQUIREMENTS

922.04.01 General

Subsection 922.04.01.01.01 of OPSS 922 is amended by the deletion of the first paragraph and replaced with the following:

At least three (3) weeks prior to commencing fabrication of the bearings, the Contractor shall submit to the Engineer for review, six (6) copies of the shop (working) drawings, conforming to the requirements of OPSS.MUNI 922.

A minimum of two (2) weeks prior to installation, the Contractor shall provide, from the bearing Manufacturer, all quality control documentation indicating measurements of the bearing dimensions, as well as documentation for all material tests indicated in Table 1 of the OPSS.MUNI 1202.

922.05 MATERIAL

922.05.01 Bearings

Subsection 922.05.01 of OPSS 922 is amended by the addition of the following:

All laminated elastomeric bearings shall be supplied from a manufacturer listed in the Ministry of Transportation Ontario's (MTO) Designated Sources for Materials (DSM) List # 9.15.25.

Shear Modulus testing shall be performed with the test specimen in an enclosed freezer unit capable of maintaining the specified conditioning temperature. A +/- 25 percent strain cycle shall be applied for a period of 100 seconds. The first three-quarter cycle of strain shall be discarded, and the shear modulus shall be determined by the slope of the force deflection curve for the next half cycle of loading.

922.05.02 Shoe Plates

Steel shoe plates and associated bearing steel components shall conform to CSA G40.21 Grade 350W unless otherwise specified on the Contract Drawings.

922.07 CONSTRUCTION

922.07.01 General

Subsection 922.07.01 of OPSS 922 is amended by the addition of the following:

A Request to Proceed shall be submitted to the Contract Administrator upon completion of the installation of the bearings on the substructure and prior to any loading on the bearings. Any loading on the bearings shall not proceed until a Notice to Proceed has been received from the Contract Administrator. A Request to Proceed shall be submitted to the Contract Administrator after loading of the bearings, prior to opening to traffic.

Opening the bridge to traffic shall not proceed until a Notice to Proceed has been received from the Contract Administrator.

922.08 QUALITY ASSURANCE

Section 922.08 of OPSS 922 is deleted in its entirety and replaced with the following:

922.08.01 Testing

Not required.
The number, type, and size of elastomeric bearing samples to be selected for destructive testing shall be as specified in the Contract Documents.