

SPECIAL PROVISIONS – CONTRACT ITEMS SUPPLEMENTARY

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City of Niagara Falls
Contract 2020-396-16

Whirlpool Road Multi-Use Pathway, Pedestrian Bridge, and Roadway Widening
Construction From Millennium Trail to Victoria Avenue

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A3. SITE OFFICE

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall also apply:

Office shall be equipped with one (1) drafting table, one (1) stool, one (1) 4 drawer lockable file cabinet, one (1) coat rack, one (1) 750mm x 1500mm metal desk with drawers, one (1) cushioned swivel tilt armchair with castors and 6m of shelving 300mm wide.

Site office provided shall include wall mounted electrically operated heater and air conditioner with integral thermostats capable of maintaining a room temperature of 21°C.

Supply a new plain paper multi-functioning colour scanner/photocopier/card reader/printer device. Maintain supply of consumables (i.e. paper, ink, etc.) for the duration of the contract.

Basis for Payment

As stipulated in the Niagara Peninsula Standard Contract Document.

A4. CONSTRUCTION LAYOUT

This line item shall include construction layout, photo records and record survey and drawings as described herein.

a) Construction Layout

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document and OPSS.MUNI 100 GC 7.02, the following shall also apply:

Special Provision G14 is not applicable to this contract. The Contractor is responsible for Construction Layout.

The Contractor shall include in the lump sum cost for this item; the checking of all grades and alignment with the use of batter boards and boning rods or digital survey equipment to ensure proper adherence to design; re-staking of layout lost due to destruction or removals; any additional layout within the intent of the contract for minor revisions to the road, sidewalk, sewer design, etc.

An absolute minimum of 3 layout stakes shall be provided for any single line of layout. Maximum spacing of grade stakes shall be 15 metres for all layout and at all changes of grade and/or direction.

Layout for curb and gutter shall include offset stakes placed a maximum of 2 metres behind the proposed lip of gutter. Layout for curb shall also include the drop locations for all curb depressions, the bottom of slope shall be marked out, on site, prior to curb pour.

Catchbasin layout shall consist of 3 grade stakes installed in line with the inside back wall of the catchbasin (front face of curb) a center stake representing center of catchbasin and a 3 metre offset stake to the left and right of the center line stake.

Failure to comply with the above conditions will result in a reduction in payment to this item at the Contract administrator's sole discretion.

The Owner will not supply CAD drawings for construction layout of the Bridge and retaining walls. The Contractor shall use the provided Contract Drawings for construction layout. CAD drawings, including cross sections of the shoulder widening to accommodate the slip lane, shall be available to the Contractor for the layout of the slip lane and Trail at the Contractor's request. The Contractor shall be responsible for verifying that the layout derived from the CAD Drawings complies with the Contract Drawings and shall immediately notify the Contract Administrator of any discrepancies.

All layout performed by the Contractor's layout surveyor shall be tied to the work points provided on the Contract Drawings and verified by the layout surveyor. Any errors occurring as a result of unverified work points will be rectified by the Contractor at no cost to the Owner.

All survey stakes shall be removed at the end of construction by the Contractor.

Basis for Payment

As stipulated in the Niagara Peninsula Standard Contract Document.

b) Progress and Final Record Photography

The lump sum price bid shall include all labour, material and equipment required to complete the following:

On commencement of work and at monthly intervals thereafter, supply the Contract Administrator with clearly labeled and dated digital progress photographs on CD or memory stick.

Progress photographs are to be taken **daily** to detail construction progress and must be submitted with the Contractor's monthly payment draw request. The digital photographs must have been taken with at least eight (8) megapixels of resolution. Processing of progress payments will be contingent on satisfactory receipt of the required Progress Photographs.

On completion of the works, or at a time designated by the Contract Administrator, the Contractor is to undertake a "post-construction" photographic survey of the project site and submit a digital and printed copy of same to the Contract Administrator for review and acceptance. This photographic survey will form part of the Construction Record submission, as detailed below, and subject to the same provisions regarding acceptance.

Basis for Payment

The lump sum price bid will be deemed to include any allowance to satisfy these provisions, including any revisions and resubmission of information in order to satisfy the City's requirements. For progress payment, ten percent (10%) of the lump sum bid price will be paid upon satisfactory receipt of the daily photos from the payment period. The balance will be paid upon receipt and approval of the final "post-construction" photographic survey of the project site in both digital and hard copy format.

c) Record Drawings / Markups

The lump sum price bid shall include all labour, material and equipment required to complete the following:

Keep and maintain in good condition on site a minimum of one set of construction drawings identified as the "Project Record Copy". Upon request, this drawing set is to be made available for review on-site by the Contract Administrator at any time during the project.

Record neatly and accurately, in red ink, any deviations from the contract documents as follows:

- Significant deviations from the contract documents caused by site conditions and changes ordered by the Contract Administrator;
- Horizontal and vertical location of piping, underground utilities and appurtenances referenced to permanent surface features or improvements;
- Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the structure;
- Location and elevation of all crossed utilities during piping installation;
- Field changes of dimension and detail; and
- Changes made by Change Work Order and/or field directions.

Basis for Payment

The lump sum price bid will be deemed to include any allowance to satisfy these provisions, including any revisions and resubmission of information in order to satisfy the City's requirements.

A5. CLEARING AND GRUBBING

This line item shall include removal of existing trees, stumps, brush, shrubs & vegetation, as described herein.

The Contractor's methods may impact the area to be cleared and grubbed. Therefore, the Contractor is strongly encouraged to visit the site and consider access necessary to complete the work, when bidding this item.

When hauling material from or to the site, the Contractor shall comply with the requirements of the Highway Traffic Act.

The Contractor must provide the Contract Administrator with written authorization for use of any private disposal site, including description of the key terms and condition of the authorization.

a) & b) Remove Existing Trees

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document and OPSS MUNI. 201 (April 2019), the following shall also apply:

This item shall include the complete removal and disposal of all existing trees that are not within areas of continuous vegetation, as specified on the contract drawings, or as directed by the Contract Administrator. All trunks shall be removed to 300 mm below the finished grade or, in the case where existing tree roots may interfere with the installation of works in the contract, remove the entire root system and dispose offsite. The Contractor shall restore all disturbed areas at no additional cost to the contract.

Basis for Payment

Payment shall be as per the units indicated in the Schedule of Quantities and Unit Prices for each item noted.

c) Remove Existing Stumps – Mechanical Grinding

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document and OPSS MUNI. 201 (April 2019), the following shall also apply:

This item shall include the complete removal and disposal of all existing tree stumps, as specified on the contract drawings, or as directed by the Contract Administrator. All stumps shall be removed to 300 mm below the finished boulevard grade or, in the case where existing tree roots may interfere with the installation of works in the contract, remove the entire root system and dispose offsite. The Contractor shall restore all disturbed areas at no additional cost to the contract.

Basis for Payment

Payment shall be as per the units indicated in the Schedule of Quantities and Unit Prices for each item noted.

d) Remove Existing Brush, Shrubs & Vegetation

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document and OPSS MUNI. 201 (April 2019), the following shall also apply:

This item shall include the complete removal and disposal of all existing trees, brush, shrubs and vegetation within areas of continuous vegetation, as specified on the contract drawings, or as directed by the Contract Administrator. Branch pruning as directed by the Contract Administrator is included in this item. This item shall include the removal of the

entire root system and offsite disposal. The Contractor shall restore all disturbed areas at no additional cost to the contract.

Basis for Payment

Payment shall be as per the units indicated in the Schedule of Quantities and Unit Prices for each item noted.

A6. TREE RELOCATION

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall also apply:

The existing memorial plaque shall be removed, salvaged, and reinstalled in the tree's new location to the satisfaction of the Contract Administrator.

Basis for Payment

Payment at the unit price bid for this item shall include all labour, materials, and equipment necessary to complete the work.

A7. INSTALL, MAINTAIN AND REMOVE SILT CONTROL DEVICES

This line item shall include catchbasin silt bags, light duty silt fence barriers, straw bale check dams and rock check dams, as described herein.

The Contractor shall place additional erosion protection as directed by the Contract Administrator or the Niagara Peninsula Conservation Authority.

a) Supply, Deliver, Install, Maintain, and Remove Temporary Single Filtrexx Ditch Chexx– 600 mm – OPSS MUNI. 805 (Nov 2018)

Scope

Under this item the Contractor shall supply, deliver, install, maintain, and remove single Filtrexx Ditch Chexx check dams for use in stormwater ditches and small channels to slow concentrated directional flow velocity of storm runoff. The check dam installations are required in order to reduce erosion in ditch bottoms and remove sediment pollutants in stormwater runoff.

Material

Check dams shall meet Filtrexx Canada Filtersox material specifications and use certified Filtrexx Filter media.

Installation

The Contractor shall retain a Filtrexx certified installer as determined by Filtrexx Canada. Filtrexx® check dams shall be placed in the locations indicated on the Contract Drawings and as directed/specified by the Contract Administrator on-site. Check dams shall be installed in a pattern that reduces runoff velocity and ditch erosion, and allows for deposition of sediment and filtration of pollutants.

Check dams may be manufactured on-site at the time of application or pre-manufactured and delivered to the Site for installation.

The installed check dams shall exceed the width of the normal ditch/channel flow line by a minimum of 1.2 m on both banks to ensure water flows through and over the device and not around it.

The center of the check dams shall be a minimum of 150 mm lower than the sides of the ditch/ channel.

Check dams may be stacked on top of each other if additional height is required.

If check dams are specified as an “^” construction design, the angle of the check dam must be configured to a 90-degree angle with the apex of the device in the center of the ditch/channel bed with the open end facing down-channel. The ends of check dams shall extend to the bed and bank interface or to the maximum flow line of the ditch/channel. Stakes shall be used to stabilize the ends of the check dam.

Stakes shall be installed on the backside of the check dam, relative to the flow of the ditch) on 1.5 m centers, using 50 mm by 50 mm by 1 m wooden stakes.

The staking depth for sand and silt loam soils shall be 300 mm, and 200 mm for clay soils.

Check dams may be installed on top of rolled erosion control blankets and turf reinforcement mats.

Maintenance

The Contractor shall maintain the check dams in a functional condition at all times and the check dams shall be routinely inspected by the Contractor.

If a check dam is damaged, it shall be repaired or replaced if beyond repair.

The Contractor shall remove sediment at the base of the upslope side of the check dam when accumulation has reached 1/2 of the effective height of the check dam, or as otherwise directed by the Contract Administrator. Material removed shall be disposed of off-site. As an alternative, and at the sole discretion of the Contract Administrator, another check dam may be installed adjacent, and parallel, to the upslope side of the original check

dam in order to increase the sediment storage capacity. Check dam and sediment backup in the center of the ditch/channel shall remain lower than the sides.

If the check dam becomes clogged with debris and sediment, the Contractor shall immediately remove the debris and sediment in order to assure proper drainage and water flow through the ditch or channel. Storm runoff overflow of the check dam is acceptable.

Check dams shall be maintained until the disturbed area around the device has been permanently stabilized and construction activity has ceased.

The FilterMedia™ may be dispersed on-site once the disturbed area has been permanently stabilized and construction activity has ceased, or as determined by the Contract Administrator.

Measurement for Payment

Measurement for payment shall be by the length in metres (m) along the centreline of the single or stacked Filtrexx Ditch Chexx installed.

Basis of Payment

Payment will be made at the unit price for each metre of check dam constructed, maintained and removed as follows:

20% when the check dams are constructed
60% for cleaning and maintaining during construction; the actual amount to be decided by the Contract Administrator
20% for the satisfactory removal of the check dam
100%

The Contractor must clean out the silt deposits if the check dams become more than 50% full at any time. The Contractor's cleaning and maintenance activities will be documented to assess the value of payment each month. Failure to clean and maintain the check dams to the satisfaction of the Contract Administrator may result in less than 100% payment for this item at the end of the Contract in the event that the Town deems that the Contractor did not perform adequate cleaning and maintenance.

Payment at the unit price shall be full compensation for all labour, equipment and materials required to complete this work as specified in the Contract Documents.

b) Supply, Deliver, Install, Maintain and Remove Temporary Single Filtrexx Sediment/Perimeter Control (SiltSoxx) – 600 mm - OPSS 805 (Nov 2018)

Scope

Under this item the Contractor shall supply, deliver, install, maintain, and remove Filtrexx Sediment Barrier/Perimeter Control (SiltSoxx) (a tubular runoff and erosion control device) adjacent to embankment slopes prior to and during construction.

Material

Sediment Barrier/Perimeter Control (SiltSoxx) used for control of sediment and soluble pollutants in storm runoff shall meet Filtrexx Soxx Material Specifications and use Filtrexx Certified FilterMedia.

Installer

The Contractor shall retain a Filtrexx certified installer as determined by Filtrexx Canada. SiltSoxx shall be placed in the locations indicated on the Contract Drawings and as directed by the Contract Administrator on-site. SiltSoxx shall be parallel to the base of the slope or other disturbed area.

The effective height of SiltSoxx shall be 600mm.

Stakes shall be installed on the backside of the SiltSoxx, relative to the flow of run-off, on 3 m centers, using 50 mm by 50 mm by 1 m wooden stakes.

The staking depth for sand and silt loam soils shall be 300 mm, and 200 mm for clay soils.

Loose FilterMedia™ shall be backfilled along the upslope side of the SiltSoxx, filling the seam between the soil surface and the device, improving filtration and sediment retention.

Maintenance

The Contractor shall maintain the SiltSoxx in a functional condition at all times and the SiltSoxx shall be routinely inspected by the Contractor.

If the SiltSoxx becomes damaged it shall be repaired, or replaced if beyond repair.

The Contractor shall remove sediment at the base of the upslope side of the SiltSoxx when accumulation has reached 1/2 of the effective height of the Slope Interruption Soxx™, or as otherwise directed by the Contract Administrator. Material removed shall be disposed of off-site.

SiltSoxx shall be maintained until disturbed area above the device has been permanently stabilized and construction activity has ceased.

The SiltSoxx FilterMedia will be dispersed on site once disturbed area has been permanently stabilized, construction activity has ceased, or as determined by the Contract Administrator. The SiltSoxx wrapping will be removed and disposed off off-site.

Basis of Payment

Basis of payment at the unit price shall be by the length in metres (m) along the centreline of the SiltSoxx installed and shall be full compensation for all labour, equipment and material required to complete this work as specified in the Contract Documents.

c) Light Duty Silt Fence Barrier

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document and OPSS MUNI. 805 (Nov 2018), the following shall also apply:

At the direction of the Contract Administrator, the Contractor shall place Temporary Silt Fence so as to prevent sediment carried by sheet flow from leaving the site and entering natural drainage ways and/or the storm sewer system. The Contractor shall install silt fences as indicated on the contract drawings, deemed appropriate in the field and as directed by the Contract Administrator.

During construction, the Contractor shall place Temporary Silt Fence at the base of stockpiled native and imported materials.

Basis for Payment

Basis of payment at the unit price shall be by the length in metres (m) along the centreline of the Light Duty Silt Fence Barrier installed and shall be full compensation for all labour, equipment and material required to complete this work as specified in the Contract Documents. This is a provisional item that shall only be utilized at the written direction of the Contract Administrator.

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, OPSD 219.110, and OPSS MUNI 805, the following shall also apply:

The work of this item shall include the following:

- Supply, installation, maintenance, and removal of temporary light duty silt fence barriers.
- Design, supply, installation, maintenance, and removal of watercourse protection devices, as required.
- Supply, installation, maintenance, and removal of all other silt control devices.

The Contractor shall make allowance for silt control devices as required to prevent sediment passage from within the construction zone to local water courses and beyond the limits of construction.

d) Watercourse Protection

Silt Control Plan

Prior to the start of construction, the Contractor shall develop a silt control plan for each stage of the Contractor's work. The plan shall be submitted to the Contract Administrator for review and approval prior to the start of construction. The Contractor shall review the silt control plan on a regular basis throughout construction and make adjustments to the silt control devices as required. In the event that the Contract Administrator notes inadequate silt control devices, the Contractor shall make adjustments to the silt control devices as directed by the Contract Administrator.

Prior to the start of construction, the Contractor shall place silt control devices. The Contractor shall make allowance for relocating or installing new silt control devices for the Contractor's various construction stages.

During construction, the Contractor shall place Temporary Silt Fence at the base of stockpiled native and imported materials.

At all times, the Contractor's operations shall be controlled so as to prevent the entry of deleterious materials to the watercourses. Controls shall include, but not be restricted to, the following:

- a) Erosion and sedimentation control, and protection of the environmentally sensitive area, shall be in compliance with requirements specified in the Contract.
- b) Watercourses shall not be diverted, or blocked, and temporary watercourse crossings shall not be constructed or utilized, unless otherwise specified in the Contract.
- c) Construction material, excess material, construction debris, and empty containers shall be stored away from watercourses and watercourse banks.
- d) All equipment maintenance and refuelling shall be controlled so as to prevent any discharge of petroleum products. Vehicular maintenance and refuelling shall be conducted away from watercourses and watercourse banks.

Operation of Contractors equipment shall:

- a) be kept to the minimum necessary to perform the specified work.
- b) comply with operational constraints specified in the Contract.
- c) proceed in a continuous fashion so as to minimize the duration of work.

In addition, the Contractor shall take measures and provide such protection system or systems to ensure the following:

- a) water flow shall be isolated from the work area; and
- b) materials that result from the work or that are disturbed by the same, shall be prevented from entering the open portion of watercourses.

The protection system or systems shall cover the following:

- a) all phases of work, and transitions between phases of the work.
- b) installation, operation, and removal of the protection system.
- c) interfaces between the permanent watercourses and temporary water passage systems;
- d) stabilisation of disturbed fill and earth materials, until treatment with the specified cover material (seed and cover, rip rap etc.)

The Contractor shall submit to the Contract Administrator written notice a minimum of 14 calendar days prior to the date that permission is requested to proceed with this work. The notice shall be comprehensive, and shall provide descriptions, and working drawings and schedules that detail the sequence of this work.

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 supplemental special provision. Whenever the proposals with which the Contractor was permitted to proceed with the work are found by the Contract Administrator to be ineffective, changes shall immediately be made so as to ensure watercourse protection.

Basis of Payment

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

The Contractor shall be allowed to invoice fifty (50) percent of the lump sum Contract price once the silt control devices are constructed and all protection measures are in place. The balance will be prorated over the remainder of the work period.

A8. CONSTRUCTION SIGNS, TRAFFIC CONTROL & TRAFFIC MANAGEMENT PLAN

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, GC7.06 and OPSS MUNI. 706 (April 2018), the following shall also apply:

Interference with normal flow of traffic shall be kept to a minimum. The Contractor shall be prepared to supply and erect any barricades and signs which may be required for complete control of both pedestrians and vehicular traffic including competent flag persons in accordance with Ontario Manual of Uniform Traffic Control Devices. The Contractor shall further provide a Traffic Control and Management Plan in accordance with the most recent amendments to the Occupational Health and Safety Act. The Traffic Control and Management Plan shall include drawings, plans, sketches, etc., illustrating the layout of typical signage. The lump sum price shall be deemed to have included this provision.

The Contractor shall also be responsible for supplying their hired help with any necessary safety and/or protective equipment required to perform the work safely.

A minimum of one lane of traffic shall be maintained at all times during construction. Two lanes of traffic shall be maintained at all other times. The Contractor's proposed sequencing and staging of works and operations is to make due allowance for this requirement. Work within intersections shall also be staged such that a minimum of one lane of traffic is maintained on the cross streets.

On **Whirlpool Road and Niagara Parkway**, one lane of traffic may be closed to traffic during construction, in accordance with the "Traffic Control Manual for Roadway Work Operations". At all other times, all lanes of traffic shall be maintained. Road closures of any kind will only be allowed on an exception basis, and only upon approval of the Project Manager. The Contractor must submit potential road closure requests to the City, in writing, at least one (1) week prior to implementation, for review and approval. Allowances for such operations must be made in the Contractor's Traffic Control and Management Plan; all associated costs will be the Contractor's responsibility.

It is of critical importance that all planned construction activities be coordinated with the City's Operational, Traffic, Parking and Transit Departments, the Niagara Parks Commission and Ontario Power Generation. Notification on at least a weekly basis of planned works (schedule) will be required to ensure that the necessary detour signage, parking accommodations, bus routing and maintenance activities account for the active work zones within the project area. The Contractor must also work closely with the City's Construction Inspector and Contract Administrator to keep affected property owners informed of potential impacts to their properties and to minimize disruption to access and servicing of properties by planned construction activities.

Winter Maintenance

The successful Contractor will be responsible for winter control maintenance in compliance with Provincial minimum maintenance standards for snow clearing, storage and removal, salting and sanding activities within the construction work zones during the course of the contract, including maintaining the sidewalks and trails within the project area. All unit prices bid will be deemed to have included allowance for these provisions.

Property Access

Pedestrian access to all businesses and residences is to be maintained at all times whenever possible. Access closures are to be scheduled at least two (2) business days in advance between the City, the Contractor and the Business owner and/or Residents, including the type and form of any temporary access provisions. Any disruption to pedestrian access is to be kept to a minimum duration.

On **Whirlpool Road and Niagara Parkway**, the Contractor will be required to backfill all their trench cuts and install temporary restoration in accordance with the Regional Municipality of Niagara specifications at the end of the day's operations so that all lanes of two-way traffic can be maintained at night. All hazards and obstructions shall be properly barricaded and delineated with flashers in accordance with the Ontario Manual of Uniform Traffic Control Devices.

Communications

The contractor will be responsible to communicate and coordinate with OPG on a regular basis in order to maintain access to their maintenance and rescue areas.

It will be the Contractor's responsibility to inform the various businesses and residences of, and/or the placement of no parking signs the day before, in order to reduce/eliminate any problems with parked vehicles that may interfere with their operations. Access to the abutting businesses and residences must be maintained at all times.

The Contractor shall advise the Police Department, Fire Department and Niagara Emergency Medical Service on a daily basis, with current status of the construction as it pertains to the passage of traffic within the contract limits.

The Contractor shall co-ordinate with Niagara Falls Transit to ensure minimum interruption to their bus schedules on **Whirlpool Road and Niagara Parkway**. Niagara Transit, school buses and garbage service vehicles will be given priority to maintain their schedule.

The Contractor shall also maintain/provide existing pedestrian access at all times to the businesses and residents during all phases of construction in an acceptable manner.

The traffic control signage requirements shall include the following:

Supply, locate, erect, operate, maintain, relocate as necessary and remove all necessary traffic signs, construction signs, including delineators, barricades and flashing lights, in accordance with the Ontario Traffic Manual (OTM) Book 7 and the latest edition of the "Traffic Control Manual for Roadway Work Operations - Field Edition".

The Contractor is responsible for the installation, daily maintenance and removal of all construction signage throughout the contract.

Regulatory signs and street name signs cannot be removed without approval from the City.

Any existing signs removed by the Contractor to accommodate construction shall be kept operational by placement on a temporary support.

All regulatory signs and street name signs will be replaced permanently by City forces.

Contract Signs

In addition to the requirements noted in the Special Provisions - General, Item G29, Project Sign Board, the following shall also apply to this item:

Prior to the start of construction the City will order two (2) Contract Signs for the project, prepared in accordance with Dwg No. NFS-A04. The Contractor must pick-up the signs from a location provided by the City, install the signs in locations as directed by the Contract Administrator, and then will be responsible for daily maintenance of the signs throughout the Contract. After contract completion, the Contract Signs are to be returned to the

Municipal Service Centre on Stanley Avenue. Any costs incurred by the City to restore, repair or replace the Contract Signs due to damages or losses occurring during the period while the signs are on-site, will be the Contractor's responsibility. From time to time during the contract, the Contractor may be required to move the sign locations, as directed by the Contract Administrator.

Basis for Payment

In addition to the payment provisions noted in the Niagara Peninsula Standard Contract Document, the final ten percent (10%) of the lump sum price bid for this item will be held until project completion, contingent on the return of the Contract Signs in a condition satisfactory to the Contract Administrator. The lump sum price bid shall be deemed to include full compensation for all the provisions noted herein.

A9. CONTINGENCY ALLOWANCE

The Contractor shall include in their tender the indicated contingency allowance in the Form of Tender.

Basis for Payment

Payment from this item will only be made for additional work approved in writing by the Contract Administrator. Work completed before receipt of written approval will not be compensated.

B1. TEST PITS (PROVISIONAL ITEM)

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall also apply:

Exploratory test holes shall be at locations and depths as directed by the Contract Administrator and must be witnessed by the Contract Administrator or assigned delegate.

Backfill shall be Granular 'A', compacted to 100% Standard Proctor Maximum Dry Density. Alternatively, clear stone may be used as backfill material where hydrovac excavation equipment is used. Disposal of the excavated material shall be in accordance with Special Provisions – Contract Items Supplementary, Item B2.

The purpose of these test holes shall be to verify existing underground infrastructure where a design change is required or as determined by the Contract Administrator.

Basis for Payment

Payment at the unit price bid for this item shall include all labour, materials, equipment and Granular 'A' or clear stone backfill, necessary to complete the work.

This item is provisional. Prior written approval must be provided by the Contract Administrator. Compensation will not be considered if written approval is not sought in advance.

B2 EXCAVATION

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, OPSS.MUNI 206 (April 2019) and OPSS.MUNI 510 (Nov 2018), the following shall also apply:

Work under this item will also include the removal of asphalt, concrete, brick pavers and excavations of full road allowance / trail widths as described herein.

The Contractor is responsible for sawcutting, excavating, separating and delivering any concrete or asphalt material to an approved recycling facility. Thickness of the concrete and asphalt will vary; however, no additional compensation will be made for the various depths. The removal of interlocking brick pavers shall also include removal of any concrete and/or granular base.

All asphalt and concrete must be sawcut. Sawcutting shall be to the limits shown on the construction drawings or as directed by the Contract Administrator.

Roadway / trail excavation shall be inclusive of all required excavation from property line to property line on all roadways and include any additional quantities, as shown on the contract drawings. Plotted cross-sections, where not included within the Issued for Tender drawing set, shall be available upon request.

Native organic materials (i.e. topsoil) shall be stockpiled onsite for reuse as backfill subsequent to the construction of the road base. No additional payment will be made for the stockpiling, reuse of stockpiled material, or the disposal off site of surplus material.

Basis for Payment

Payment at the unit price bid for this item shall include all labour, materials and equipment including sawcutting, and disposal of surplus or unsuitable excavated materials, necessary to complete the work as noted on the contract drawings or as directed by the Contract Administrator.

Excavation for Structure

The work under this item shall include excavation, redistribution of material, grading, and disposal of all surplus material of whatever nature in the following locations:

- New bridge foundations
- Embankment slopes around the bridge abutments
- Rip-rap placement
- Subdrain installation
- All other areas requiring excavation for the bridge

Materials excavated under this item shall be disposed of offsite by the Contractor at an approved landfill site, in accordance with the General Requirements and item B35.

When hauling rubble, excavated materials or fill from or to the site, the Contractor shall comply with requirements of the Highway Traffic Act.

The Contractor shall ensure that the excavations are kept dry and make the necessary arrangements for installing pumps and discharge points, if necessary.

The Contractor shall make provisions to work around existing utilities during excavation work.

All as shown on the Contract Drawings.

Basis of Payment

Payment at the unit price bid for this item shall include all labour, equipment, and materials necessary to complete the work including saw-cutting and disposal of surplus or unsuitable excavated materials to a licensed landfill site, necessary to complete the work as noted on the Contract Drawings or as directed by the Contract Administrator.

B3. GRANULAR MATERIAL

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, OPSS MUNI. 314 (Nov 2019), MUNI. 401 (Nov 2018), and MUNI. 402 (2016), the following shall also apply:

All granular materials shall conform to the requirements of OPSS.MUNI 1010 (Nov 2013).

The unit price bid shall be complete compensation for the supply, hauling, placement, grading and compaction to the specified Standard Proctor Maximum Dry Density of Granular 'A', 'B', 'M', or Limestone Screenings.

This item will be utilized for the Granular 'A' material for bedding, cover and backfill of all items for the water distribution system, sanitary sewer and storm sewer system when specified in the contract or indicated on the contract drawings. Only virgin Granular 'A' will be accepted for pipe bedding and cover.

This item will be utilized for the Granular 'A' or Granular 'B' under roads, driveways, trails, concrete pads, and sidewalks and shall be placed at a depth specified in the contract or as indicated on the contract drawings. Only virgin Granular 'A' will be accepted for road base.

This item will be utilized for the Granular 'M' for shoulder restoration and shall be placed at a depth as specified in the contract or as indicated on the contract drawings

This item will be utilized for the Limestone Screenings for shoulder restoration and shall be placed at a depth as specified in the contract or as indicated on the contract drawings.

Granular 'A' or Granular 'B' must be installed on all road and sidewalk trenches to the existing grade to provide safe access. Granular 'M' must be installed on shoulders to the

existing grade to provide safe access. Limestone Screenings must be installed on shoulders to the existing grade to provide safe access.

The Contractor will be responsible for maintaining granular surfaces until the restoration work is carried out. The Contractor must include in this unit price bid all labour and equipment to remove the excess granular from the trenches prior to final restoration, and delivery of the granular to a location specified by the Contract Administrator. The Contractor is responsible to remove the granular in a manner that avoids contamination of the granular with asphalt, concrete or native material. Any contaminated material shall be removed at the Contractor's expense. Any cost for these requirements must be included in the unit price bid for the granular.

The unit price bid for this item shall include the fine grading and compaction of the sub-base immediately preceding the placement of granular road base material. No roadway granular is to be placed until the subgrade elevation has been checked by the City's Inspector.

Payment for all material quantities shall be determined by net weight as recorded by a Government certified weigh scale. The supplier will be responsible for providing suitable scales for all materials to be weighed. Weigh bills (tickets), shall be provided for each load of granular in accordance with SPGS G32.

Weigh tickets received after the monthly Progress Payment has been finalized, for deliveries made within that month's Progress Payment period **will NOT be accepted.**

The onus shall be on the Contractor to ensure that the City's Inspector is furnished with all weigh tickets on a daily basis, since these will form the method of measurement.

Basis for Payment

As stipulated in the Niagara Peninsula Standard Contract Document and priced as per the breakdown of items as indicated in the Schedule of Quantities and Unit Prices.

Recycled Material

Recycled concrete (RCM) and asphalt (RAP) will not be permitted on this project.

Under no circumstances will recycled material of any kind be permitted for use as pipe bedding, pipe cover or road base material.

Recycled Granular

Consideration may be given for the use of recycled granular for deep trench backfill.

Where recycled material is imported as a substitution for virgin granular material, the cost savings will be shared between the Contractor and the Owner.

The successful Contractor shall submit a written proposal to utilize recycled granular to the Contract Administrator at the pre-construction review meeting. The Contractor must include with the written proposal certified copies of laboratory testing results confirming that the proposed recycled granular material conforms to the provisions of OPSS.MUNI 1010 for both composition (physical properties) and gradation as specified for Granular 'A'.

The City reserves the right to undertake any additional confirmatory testing it deems necessary, prior to approving the use of recycled material on this project. Therefore, access to the Contractor's recycled material stockpile(s) is to be made available for sampling and testing by a QA/QC testing company retained by the City to verify compliance with the above noted provision. The provisions of NPSCD General - Item G8 will apply to payment for testing in this regard.

Basis for Payment

Measurement for payment for recycled granular will be by the tonne (t).

Payment for all recycled granular quantities shall be determined by net weight as recorded by a Government certified weigh scale. The supplier will be responsible for supplying suitable scales for all recycled granular to be weighed. Triplicate numbered weigh bills shall be provided by the representative for each load of material as soon as delivery has been accepted.

Tenderers shall note that weigh bills for recycled granular materials will only be accepted for payment when delivery is made in the presence of the City's Inspector. Tenderers are advised to familiarize themselves with the Inspector's normal work hours.

All weigh tickets pertaining to all materials paid for by weight must show either "Tare and Net" or "Gross and Net" weights, if printimatic tickets are used. If printimatic tickets are not used, then the "Gross", "Net" and "Tare" must be given, otherwise the tickets will not be considered for payment.

No deliveries of recycled material to the site are to be made until written approval is received from the Contract Administrator. Approval will be subject to confirmation that the material complies with quality criteria and that cost savings will be shared between the Contractor and the Owner.

B6. SUBDRAIN

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document and OPSS MUNI 405, the following shall also apply:

The work in this item shall cover the supply and installation of 150mm diameter perforated high density polyethylene ASTM Class 210 flexible pipe subdrains with filter wrap, including the following:

- 19mm Clear Stone Type II surround, wrapped in Geotextile Class II.

- Galvanized wire mesh (maximum opening 6mm) and filter fabric to cover the ends of the drains or similar galvanized rodent trap.

All as shown on the Contract Drawings and typical for all subdrains.

The Contractor shall make allowance in this item for tying in the west abutment subdrain with the subdrain for the precast concrete block retaining wall, and outletting the subdrain through the precast concrete block retaining wall.

Basis of Payment

Payment at the unit Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

B9. CONCRETE SIDEWALKS

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document and OPSS.MUNI 353, the following shall also apply:

The unit price bid shall include all necessary equipment, materials and labour to excavate to subgrade, form, finish and cure 32 MPa concrete sidewalks to the specified thickness, and the 125mm Granular A base.

The unit price bid shall also include provisions for cold weather work as noted in OPSS 351.

Any and all provisions and protections for the placement of concrete in cold weather shall be included in the unit price bid including but not limited to winter heat charges, curing blankets, etc.

A flat obstacle free surface is desired, therefore, do not apply a trowel finish at the joints or provide 'Dummy' joints.

Expansion joints shall be set in place prior to pouring and shall be full depth, spaced 30.0m c/c maximum. Contraction joints shall be spaced 2.5m c/c maximum and are to be saw cut to 1/4 thickness of the slab. The City will not accept any variance in the joint spacing beyond a 50mm tolerance from that specified. Panels with a greater variance will be removed and replaced at the Contractor's expense.

Private concrete sidewalks will be constructed to match the existing or minimum 125mm depth, whichever is greater, and paid for under this item.

The Contractor is to adjust the sidewalk crossfall where required to allow for positive drainage from the driveway and housewalks. Where the new sidewalk has caused ponding, the Contractor shall remove and replace the sidewalk at no additional cost to the contract. The Contractor shall include the supply and installation of a bond breaker (either plastic or tar paper) when a new sidewalk is installed adjacent to the concrete curb. An expansion joint at this location is not required.

The Contractor shall take due precaution to protect the finished surface of freshly laid concrete sidewalk from being damaged, marred or defaced. In the event that the freshly placed concrete is marred or damaged in any way, the Contractor shall break out and replace the damaged sections. Patching or grinding of damaged, marred or defaced concrete will not be accepted. The unit price bid shall be deemed to have allowed for this contingency.

The unit price bid shall include drop sidewalk ramps at driveways as per OPSD 310.050 and at crossings.

Basis for Payment

Granular 'A' for sidewalk base shall be paid for under the appropriate B3 item in the Schedule of Quantities and Unit Prices.

B10. SAWCUTTING PAVEMENT (PROVISIONAL ITEM)

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Documents, the following shall also apply:

This item shall also apply to additional sawcutting of asphalt and/or concrete where approved by the Contract Administrator and not otherwise referenced within the contract, the Special Provisions – Contract Items Supplementary specifications or noted on the contract drawings.

Basis for Payment

Measurement for payment will be made per linear metre as measured in the field. Payment will be made at the unit price bid in the Schedule of Quantities and Unit Prices.

All other sawcutting costs shall be included in the appropriate item as specified in NPSCD General - Item G13.

This item is provisional and requires prior written approval by the Contract Administrator. Compensation will not be provided if written approval is not sought in advance.

B11. ASPHALT MILLING

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Documents, the following shall also apply:

Asphalt millings shall be delivered to the Municipal Works Service Centre at 3200 Stanley Ave, as directed by the Contract Administrator at no additional cost to the contract. Deliveries to the Service Centre must be made between 8:00 am - 4:00 pm, Monday to Friday.

Should the City choose not to receive the millings, the contractor shall dispose of the millings at an approved facility at no additional cost to the contract.

The unit price bid shall be deemed to have made due allowance for this requirement.

Basis for Payment

As stipulated in the Niagara Peninsula Standard Contract Document and priced as per the breakdown of items as indicated in the Schedule of Quantities and Unit Prices.

B14. SUPPLY AND PLACE HOT MIX ASPHALT

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Documents and OPSS 310 (Nov 2017), the following shall also apply:

Clause 14.09 of the NPSCD for price adjustment provisions is not applicable under this contract.

Clause 14.07.3 of the NPSCD for Use of Paving Equipment – Paving in Echelon is not applicable under this contract

Clause 14.07.4 of the NPSCD for Use of Asphalt Material Transfer Vehicle is not applicable under this contract

Clause 14.07.5 of the NPSCD for Use of Re-Heating and Compaction of Longitudinal Joints is not applicable under this contract

All materials shall conform to the requirements of OPSS.MUNI 1003 (Nov 2013) and OPSS MUNI. 1150 (Nov 2018).

At the limits of the proposed road works, the base asphalt thickness shall be increased to match the existing top course asphalt over distance of 2 metres. This provision shall be included in the unit price bid.

No extra payments will be made for any hand work involved in spreading or compacting the hot mix asphalt around radius, intersections, trench areas, areas between the existing asphalt and new gutters, curbs.

The unit price bid for Item B14a) shall include any hand work required to form a temporary asphalt curb to match the concrete curb and gutter at catchbasin sections where the concrete curb and gutter is not installed.

The unit price bid for Item B14a) shall also include the placement of temporary ramping at all wheelchair depressions and other areas as instructed by the Contract Administrator.

Asphalt trench restoration shall be required once the granular backfill is completed. The restoration shall consist of a minimum of 130mm of HL8 HS for all trenches.

Basis for Payment

As stipulated in the Niagara Peninsula Standard Contract Document and priced as per the breakdown of items as indicated in the Schedule of Quantities and Unit Prices.

B15. ASPHALT WALKWAYS & DRIVEWAYS

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, OPSS.MUNI 311, OPSS.MUNI 314, and Special Provisions – Contract Items Supplementary, Item B14, the following shall also apply:

Existing asphalt driveway depths are to be matched if thickness is greater than that specified in the Niagara Peninsula Standard Contract Document, which are deemed to be the minimum requirement.

The unit price bid for this item shall be complete compensation for the preparation and additional handwork that may be required to restore driveway aprons and driveways, as necessary, and as directed by the Contract Administrator.

The Contractor is to adjust the driveway gradient where required to allow for positive drainage from the driveway and housewalks. Where the restored driveway has created or caused ponding, the Contractor shall adjust and restore the driveway and gradient at no additional cost to the contract. Driveway gradient adjustments must not negatively impact vehicle access.

The Contractor must take all due precaution not to disturb any areas outside the limits required to complete the proposed works safely. Areas disturbed outside these limits will be repaired in accordance with the specifications outlined in this contract at the Contractor's own expense and solely at the discretion of the Contract Administrator.

Winter Work

The Contractor shall make due allowance in the unit price bid for the additional effort required to maintain asphalt driveways during winter construction.

The extent of the driveway restoration will be in accordance with the initial sawcut limit as approved by the Contract Administrator, prior to the asphalt driveway removal. Any subsequent asphalt damage, maintenance and/or repair will be the Contractor's responsibility at no additional cost to the contract. Once any part of the asphalt is removed to facilitate construction, the Contractor must inspect the driveway on a daily basis to remove any broken asphalt pieces and maintain an even granular surface so as to minimize the risk of damage to pedestrians, vehicles, snowploughs and/or snow blowers.

Services

Where the installation of sanitary services, cleanouts or water services requires the excavation of existing asphalt driveway, the entire driveway bay shall be removed from edge to edge and from the back of curb or sidewalk to a neat straight sawcut line behind the new installation. The sawcut line shall be made prior to all excavation or removals and shall be perpendicular to both edges of the driveway. The sawcut shall be made sufficiently behind the cleanout or curb stop to allow for the safe installation of the new service so as to provide a neat finished match line. Should this matchline become damaged, a new

sawcut limit will be required and shall be completed at no additional cost to the contract (or Property Owner).

Curb boxes are to be set flush with the new driveway surface.

Trenches in the driveways shall be completely backfilled with Granular 'A' with all granular material compacted to 100% SPMDD.

Cleanouts in asphalt shall be installed to the finished asphalt grade complete with a flat cleanout cap flush with the finished surface.

Basis for Payment

The unit price bid shall include all necessary labour, materials and equipment to complete the work in accordance with the specifications of this contract including, but not limited to, sawcutting, removals, disposals, surface preparation, backfilling, grading, compaction, bond breaker and tack coat.

In addition to the above, the unit price bid will cover any required restoration work between the contract limits (property line) and building face, where directed by the Contract Administrator.

Payment for the supply and installation of cleanout caps, supply and placement of Granular 'A' and supply and placement of Hot Mix Asphalt shall be paid for separately under the appropriate item in the Schedule of Quantities and Unit Prices.

B16. CONCRETE SPLITTER ISLAND

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document and OPSS 350 (Mar 1998), the following shall also apply:

The proposed concrete median splitter shall be a minimum thickness of 200mm and shall be inset into the existing asphalt pavement by 50mm. The unit price bid shall include all removals, inclusive of milling, sawcutting, and granular shoulder removal, disposal of all excess material, the compaction, and placement of a minimum of 300mm of Granular A outside of the existing asphalt pavement, layout and all required forming, and 200mm PVC sleeves (2) inset into the ground by 1.2m, including backfilling with sand, to be inserted into the concrete island to accommodate the stop sign and the hazard sign.

The Contractor must take all due precaution not to disturb any areas outside the limits required to complete the proposed works safely. Areas disturbed outside these limits will be repaired in accordance with the specifications outlined in this contract at the Contractor's own expense and solely at the discretion of the Contract Administrator.

Any and all provisions and protections for the placement of concrete in cold weather shall be included in the unit price bid including but not limited to winter heat charges, curing blankets, etc.

Basis for Payment

The unit price bid shall include all necessary labour, materials and equipment to complete the work in accordance with the specifications of this contract including, but not limited to, sawcutting, removals, disposals, surface preparation, backfilling, grading, compaction, and bond breaker.

In addition to the above, the unit price bid will cover any required restoration work between the contract limits (property line) and building face, where directed by the Contract Administrator.

Payment for the supply and installation of cleanout caps shall be paid for separately under the appropriate item in the Schedule of Quantities and Unit Prices.

Payment for the supply and placement of Granular 'A' shall be paid for separately under the appropriate items in the Schedule of Quantities and Unit Prices.

B19. REGRADING OF DITCHES AND SWALES

In addition to the conditions stipulated in the Niagara Peninsula Contract Document and OPSS.MUNI 206 (April 2019), the following shall also apply:

This item shall be used for:

a. Existing Ditches and Swales

Cut and/or fill of existing ditches/swales in accordance with the contract drawings, regardless of cut/fill depths; and

b. New Ditches and Swales

Cut of new ditches/swales in accordance with the contract drawings, regardless of cut depths.

The work shall include excavating, hauling, handling and placing in embankments, shaping, compacting, trimming of earth material and the management of excavated material.

Excess and/or unsuitable excavated material related to cut/fill of existing and new ditches/swales shall be removed from site at no additional cost to the contract.

Basis for Payment

Measurement for payment will be per linear meter, measured along the centreline of the ditch or swale.

The unit price bid for this item shall be complete compensation to complete the work and includes removal and disposal of excess or unsuitable excavated material.

B20. HAND LAID RIPRAP WITH FILTER CLOTH

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document and OPSS MUNI 511 the following shall also apply:

The work of this item shall include the following:

- Supply and placement of R-50 Rip-Rap (OPSS MUNI 1004, Table 5) placed to a minimum depth of 450mm at both ends of the new bridge.
- Supply and placement of geotextile Class II underlying all Rip-Rap.

Wherever Rip-Rap is to be placed, the ground is to be over-excavated, so that the finished surface of the Rip-Rap is even with the adjacent surface.

All as shown on the Contract Drawings.

Basis of Payment

Payment at the unit Contract price for this item shall be full compensation for all labour, equipment and material necessary to complete the work.

B21. TOPSOIL AND SOD

In addition to the conditions stipulated in the Niagara Peninsula Contract Document, OPSS MUNI. 802 (Nov 2019) and OPSS MUNI. 803 (Apr 2018), the following shall also apply:

All areas to be sodded shall be graded to provide proper drainage. Any areas on private property shall also be included.

All unnecessary damage to front lawns, boulevards or grass areas caused by the Contractor's carelessness shall be reinstated at his/her own expense.

Topsoil

Topsoil shall be screened a PREMIUM BLEND, weed free, and naturally sterilized through composting.

The blend shall consist of:

- 50% Triple Mix (30% mixture of topsoil, sands, and shredded wood mulch/30% mixture of black organic compost and manure/30% mixture of peat loam); and
- 50% Premium Topsoil (50% mixture of topsoil, sands, and shredded wood mulch/ 25% mixture of black organic compost/ 25% mixture of composted cow manure).

In general, the resulting topsoil mix should meet the following parameters:

pH:	6.5 – 7.5
Potassium:	100 – 120 ppm
Phosphorous:	15 – 30 ppm
Magnesium:	100 – 120 ppm
Organic Matter:	≥ 3%

Unless otherwise specified, the minimum depth of applied Premium Blend Topsoil shall be 100 mm.

Basis for Payment

Measurement for payment shall be square metre of area topsoiled and sodded.

The unit price bid shall include all materials, equipment and labour necessary to complete the work and shall include grading and the supply and application of fertilizer and water necessary to ensure growth within the one year maintenance period.

B22. TOPSOIL, SEED AND MULCH

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, Special Provisions – Contract Items Supplementary, Item B21, OPSS MUNI. 802 (Nov 2019) and OPSS.MUNI 804 (Nov 2014), the following shall also apply:

All areas to be seeded shall be graded to provide proper drainage. Any areas on private property shall also be included.

All unnecessary damage to front lawns, boulevards or grass areas caused by the Contractor's carelessness shall be reinstated at his/her own expense.

Topsoil

Topsoil shall be a PREMIUM BLEND, weed free, and naturally sterilized through composting.

The blend shall consist of:

- 50% Triple Mix (30% mixture of topsoil, sands, and shredded wood mulch/30% mixture of black organic compost and manure/30% mixture of peat loam); and
- 50% Premium Topsoil (50% mixture of topsoil, sands, and shredded wood mulch/ 25% mixture of black organic compost/ 25% mixture of composted cow manure).

In general, the resulting topsoil mix should meet the following parameters:

pH:	6.5 – 7.5
Potassium:	100 – 120 ppm
Phosphorous:	15 – 30 ppm
Magnesium:	100 – 120 ppm
Organic Matter:	≥ 3%

Unless otherwise specified, the minimum depth of applied Premium Blend Topsoil shall be 100mm.

Hydraulic Seed & Mulch

Hydraulic seed and mulch shall be placed in accordance with OPSS.MUNI 804.

The seed mix shall meet the requirements of the “Standard Roadside Mix” outlined in Appendix Table A-1 of OPSS.MUNI 804. Quality Assurance and specifically Performance Measures will be per OPSS.MUNI 804.08.01.

Basis for Payment

Measurement for payment shall be square metre of area topsoiled and seeded.

The unit price bid shall include all materials, equipment and labour necessary to complete the work and shall include grading and the supply and application of fertilizer and water necessary to ensure growth within the one year maintenance period.

B24. APPLICATION OF WATER FOR DUST CONTROL (PROVISIONAL ITEM)

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall also apply:

Filling of water application vehicles from municipal hydrants will no longer be permitted. The City has installed a smart card water filling station, located across from the Service Centre located at 3200 Stanley Avenue.

The station is equipped with new technology allowing Contractors to pre-pay for water credit on a swipe card system that can be refilled once the card has been emptied. The cost of the swipe card is \$15.00 and may be purchased at the Service Centre. To set up a water filling account please contact Environmental Services at 905-356-7521, Extension 6322.

Water shall be applied by means of approved equipment capable of uniform and controlled distribution.

Basis for Payment

Water will be measured in cubic metres.

Payment at the unit price bid in the Schedule of Quantities and Unit Prices shall be deemed full compensation for all water, carrying, application and any other costs involved with this dust control operation.

This item is provisional. Prior written approval must be provided by the Contract Administrator. Compensation will not be provided if written approval is not sought in advance.

B27. REMOVAL OF ITEMS (EXISTING OPG FENCE & HONEYCOMB FRAME AND RIP)

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall also apply:

Existing OPG fence shall be removed as required and the area shall be kept secure. Time between removal of existing fence and construction of new fence shall be minimized. All requirements of the Ontario Power Generation Contract Technical Specifications For Fencing Installation shall be met.

Basis for Payment

Payment at the unit prices bid in the Schedule of Quantities and Unit Prices shall be deemed full compensation for all removal and off-site disposal of existing fencing and the honeycomb frame and rip as required.

B35. PREMIUM TO DISPOSE EXCAVATED CONTAMINATED SOILS (PROVISIONAL)

The Contractor shall follow OPSS MUNI. 180 (Nov 2016) and OPSS MUNI. 510 (Nov 2017) except as amended herein:

General

The removal of all excess or unsuitable material shall be in accordance with OPSS MUNI. 510 and OPSS MUNI. 180 except as indicated otherwise in this section. At the preconstruction meeting and before any earthworks start the Contractor shall submit to the Contract Administrator for review a "Soil Management Plan" and an "Excess Fill Management Plan". The Contractor must receive written authorization to use this item from the Contract Administrator in advance of the disposal of any contaminated material. The disposal of any contaminated material before written authorization from the Contract Administrator shall not be considered for payment.

The Contractor shall be responsible for finding a suitable site for the disposal of excess or unsuitable fill material, including excess topsoil, removed as part of excavation works.

This is a provisional item and estimated quantities are provided for bidding purposes only.

Basis of Payment

Payment shall be on the basis of tonnes (t) of material removed off site, and shall be full compensation for all labour, equipment and materials to complete the work.

Payment for earth excavation will not be made until the Soil Management Plan and the Excess Fill Management Plan are submitted by the Contractor and reviewed by the Contract Administrator. Based on net weight as recorded by certified weigh scale @ disposal site - Weigh Tickets must be provided

B36. REMOVE, STORE AND REINSTATE

This item shall be used for the careful removal, storage and reinstatement of items noted on the contract drawings. Any item damaged for any reason shall be replaced at the expense of the Contractor as directed by the owner. **It should be noted that the Owner may not be the City of Niagara Falls.**

Signs

This item shall be used for the careful removal, storage and reinstatement of signs, other than traffic or regulatory signs, as noted on the contract drawings. Where the sign is not the property of the City of Niagara Falls, the Contractor shall seek the Owner's permission before removal.

This item shall include all labour, materials and equipment necessary to remove the sign, store the sign for the required duration, and complete the reinstatement of the sign to existing or better condition. Reinstatement will include any underground/aboveground support and/or base requirements as directed by the Owner.

If the sign is damaged, the Contractor shall notify the Owner. The Contractor shall repair or replace the sign in accordance with the Owner's requirements at no additional cost to the contract.

Street Furniture (Bench)

This item shall be used for the careful removal, storage and reinstatement of street furniture (furniture) as noted on the contract drawings. Street furniture may include benches, refuse containers, planters, bike racks, bollards, or any other object within the construction limits. Where the furniture is not the property of the City of Niagara Falls, the Contractor shall seek the Owner's permission before removal.

This item shall include all labour, materials and equipment necessary to remove the furniture, store the furniture for the required duration, and complete the reinstatement of the furniture to existing or better condition. Reinstatement will include any underground/aboveground support and/or base requirements as directed by the Owner.

If the furniture is damaged, the Contractor shall notify the Owner. The Contractor shall repair or replace the furniture in accordance with the Owner's requirements at no additional cost to the contract.

Landscape Items

This item shall be used for the careful removal, storage and reinstatement of landscape items as noted on the contract drawings. Landscape item may include bushes, hedges, fences (any material), boulders, bird baths, or any other item within the construction limits. Where the landscape item is not the property of the City of Niagara Falls, the Contractor shall seek the Owner's permission before removal.

This item shall include all labour, materials and equipment necessary to remove the landscape item, store the landscape item for the required duration, and complete the reinstatement of the landscape item to existing or better condition. Reinstatement will include any underground/aboveground support and/or base requirements as directed by the Owner.

If the landscape item is damaged, the Contractor shall notify the Owner. The Contractor shall repair or replace the landscape item in accordance with the Owner's requirements at no additional cost to the contract. In the case of living vegetation such as bushes, hedges, etc., the Contractor shall replace the item at no additional cost to the contract over the duration of the maintenance period if it does not survive transplant.

Basis for Payment

Payment shall be as per the units indicated in the Schedule of Quantities and Unit Prices for each item noted.

B37. LINE PAINTING

In addition to the conditions stipulated in OPSS 710 (Nov 2010) the following shall also apply:

This specification covers the requirements for the application of pavement markings onto the top course asphalt and shall include surface preparation, pre-marking and placement of markings that will remain visible until such time that the top lift of asphalt is applied; typically the following construction season.

Markings that are faded will be required to be reapplied at no additional charge to the contract to ensure the safety of the motoring public.

Only traffic paint approved by the Ministry of Transportation of Ontario shall be used.

- Organic Solvent Based Traffic Paint shall be in accordance with OPSS 1712;
- Water-Borne Traffic Paint shall be in accordance with OPSS 1716; and
- Traffic Paint Reflectoring Glass Beads shall be in accordance with OPSS 1750.

Spray equipment shall be used for the application of the both the solvent based or water-borne traffic paint, specifically a self-propelled lane line marking machine capable of producing top quality marking with true edges free from waviness or variations and

conforming to the MUTCD. The equipment shall also be provided with a glass bead dispenser to apply overlay glass beads at the recommended rate.

The pavement surface must be at least 5°C (for solvent based paint) or 10°C (for water borne paint) and the paint temperature shall be between 40°C and 70°C at the time of application.

The rate of application for overlay glass beads per litre of traffic paint shall be:

% Volume Solids of Traffic Paint	Glass Beads Required (kg)
40-56	0.7
57-70	0.8

Only traffic markings containing 150g/l of VOC's or less will be permitted between May 1, through to October 15. Therefore, the type of paint used will be determined by the date of application.

Pavement pre-marking shall be undertaken by the Contractor and approved by the Owner prior to the application of permanent markings. The unit price bid shall be deemed to have made allowance for these processes.

It is the Contractor's responsibility to coordinate a field review of the pre-markings through the City's Manager of Transportation Engineering directly.

Mathew Bilodeau

Manager of Transportation Engineering, City of Niagara Falls
Transportation Services;
905-356-7521, ext. 5204
mbilodeau@niagarafalls.ca

Basis for Payment

The unit price bid shall be full compensation for all necessary labour, materials and equipment to complete the work in accordance with the specifications.

B38. LANE DELINEATOR SYSTEM

The Lane Delineator System shall be comprised of "Cycle Lane" delineators by Traffic Logix and flexible lane delineator posts as shown on the Contract Drawings.

The Contractor shall install flexible lane delineators in accordance with OPSD 984.105 and OPSS 705 (Nov 2014) and at the spacing shown on the Contract Drawings.

The Contractor shall install "Cycle Lane" lane delineators at the spacing shown on the Contract Drawings securely to the asphalt. Fastening of the lane delineators shall meet the minimum requires as specified within OPSS 705 and as specified by the manufacturer (whichever is greater). Installation of the "Cycle Lane" lane delineators shall meet the

minimum requirements of the manufactures specifications unless otherwise noted herein. Information pertaining to this delineator can be found using the following link:

<https://trafficlogix.com/cycle-lane/>

Basis for Payment

Measurement for payment will be made per linear metre for lane delineator system installed. The unit price bid shall be full compensation for all necessary labour, materials and equipment to complete the work in accordance with these specifications and as shown on the Contract Drawings.

C1. SEWERS

ITEM C2.2 (STORM)

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document and OPSS 410, the following shall apply:

Materials

Unless otherwise specified, sewer pipe may be PVC or concrete as follows:

- a. Polyvinyl chloride (P.V.C.) pipe - smooth wall (CSA B182.2) - 100mm - 600mm inclusive;
- b. Non-Reinforced - CAN/CSA257.1 - 100mm - 600mm; and/or
- c. Reinforced - CAN/CSA257.2

All PVC fabricated and moulded fittings shall be C.S.A. Certified.

Open Trench

It is strongly recommended that the Contractor use a trench box to install the watermain, sanitary sewer, storm sewer catchbasin leads, water services and any other pipes. The width of the trench box shall conform to OPSD 802.010 for Flexible Pipe, and OPSD 802.020 and OPSD 802.031 for Rigid Pipe. The height of the trench box shall be from 150mm below the bottom of the pipe to the level of the existing ground.

If the Contractor does not use a trench box as described above, then payment for the Granular 'A' material will be based on theoretical dimensions as follows:

Width: Follow OPSD 802.010, OPSD 802.030 and OPSD 802.031 as applicable

Height: From 150mm below the pipe to the level of the existing ground surface.

Length: Equal to the pipe length

Therefore, to calculate Granular 'A' weight (tonnes):

$$\text{Granular 'A' (tonnes)} = 2.4 \times (\text{Width} \times \text{Height} \times \text{Length} - (\pi \times D^2 \times L) / 4)$$

where,

D = Pipe OD

L = Length of Pipe

π = 3.1416

When a trench box is used to support the wall of a trench its removal shall be as per clause 404.07.03 in OPSS 404.

During sewer installations, the Contractor shall be responsible to maintain the proper functioning of each sanitary, storm and water service lateral located in the field or shown on the construction drawings, at no additional cost to the contract.

Should the Contractor choose to make temporary connections to ensure the same, these connections shall be removed in full and at no additional cost to the contract.

The Contractor is to note that full Granular 'A' will be used for backfill in shoulders, driveways, sidewalks and travelled roadways unless otherwise noted by the Contract Administrator. Native material may be used in all other areas with the written approval of the Contract Administrator. Where native material is used, the Contractor is to include in their price for all handling, hauling, stockpiling, placement and compaction.

Bedding and Cover

Bedding and cover shall always be Granular 'A' material; recycled materials will not be accepted for this purpose.

Leads/Laterals & Connections

Kor'n Seal adapters or an approved equivalent shall be used in all cases where PVC pipe is to be connected to a concrete structure (excluding catchbasins and ditchinlet catchbasins).

Where concrete pipe is used, a concrete cradle shall be required at each structure in addition to a Kor'n Seal connector.

The price bid for PVC catchbasin leads shall include connections to the sewer main using approved saddles or manufactured tees for pipe size less than 600mm diameter, all bends, proper couplings at maintenance holes and catchbasins, manufactured plug or cap at property lines, and reconnecting existing rear yard catchbasin leads using appropriate reducers and couplings.

The price bid for CSP culvert extensions shall include connections to the existing road crossing culvert using proper couplings. Payment for the coupling shall be included within the connections item within this contract.

The price bid for PVC culvert extensions shall include connections to the existing road crossing culvert using proper couplings. Should the road crossing culvert not be PVC the contractor shall install a 300mm (Min.) wide concrete collar at the connection between the two pipes. The collar shall extend a minimum of 150mm either side of the connection and shall completely surround the pipe at a uniform thickness of 200mm (Min.). Payment for the concrete collar shall be included within the connections item within this contract.

Where the new pipe installation crosses or is adjacent to an existing pipe or structure, the Contractor shall support the existing pipe or structures. In the event the existing pipe or structure becomes disturbed, the Contractor shall replace or repair the same regardless of the material and at no additional cost to the contract.

Where the new pipe or lateral installation crosses a pipe which is abandoned, or is to be abandoned and requires removal, the abandoned pipe sections remaining shall be plugged and sealed on either side of the new pipe at no additional cost to the contract.

The unit price bid for this item shall include all sawcutting required.

Basis for Payment

The unit price bid under this item in the Schedule of Quantities and Unit Prices shall be full compensation for all labour, equipment and material to complete the work including disposal of surplus excavated material and **removal and disposal of existing pipes and sewers**.

The supply and placement of Granular 'A', sewer connections, and the removal and disposal of existing asphalt and concrete shall be paid for separately under the appropriate item in the Schedule of Quantities and Unit Prices.

C5. FLUSH AND T.V. INSPECT (& TEST)
ITEM C5.2 (STORM)

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall apply:

SEWERS Flushing (Cleaning) and TV Inspection

Upon completion, all new mainline sewers shall be cleaned and flushed using a high pressure, low volume hydraulic sewer flusher truck, after which the sewers shall be video inspected.

The Contractor will be fully responsible for the materials supplied and workmanship, including the submission of a written report and digital CCTV video following the completion of the inspection. The written report shall include a photograph at every service connection.

Two copies of each report and digital video shall be supplied to the Contract Administrator for review and shall remain the property of the City. Any and all defects discovered during this inspection shall be immediately repaired, flushed clean and re-inspected, to the satisfaction of the Contract Administrator.

LATERALS TV Inspection

All laterals shall be video inspected prior to the expiration of the one (1) year maintenance period, but not sooner than eight (8) months after construction completion. The Contractor shall notify the Contract Administrator in advance of the scheduled date in order to coordinate City inspection on-site.

The Contractor will be fully responsible for the materials supplied and workmanship, including the submission of a written report and digital CCTV video following the completion of the inspection.

Two copies of each report and digital video shall be supplied to the Contract Administrator for review and shall remain the property of the City. ***Allow a minimum of thirty (30) days for City review and approval.***

Any and all defects discovered during this inspection shall be immediately repaired, flushed clean and re-inspected, to the satisfaction of the Contract Administrator. Maintenance hold back payments shall not be released until this requirement has been satisfied.

Mandrel Testing

Deflection testing is mandatory for all newly installed flexible sewer mainline and shall be performed by pulling a mandrel through each length of the pipe.

The mandrel shall have a diameter equal to 95% of the inside diameter of the pipe system being tested. Deflection tests shall first be performed not sooner than 30 days after completion of placement and densification of backfill. **The pipe shall be cleaned and inspected for offsets and obstructions prior to testing.**

The mandrel shall be:

- a. Certified by the Contract Administrator prior to use;
- b. A rigid, nonadjustable, odd number of legs (9 legs minimum), mandrel having an effective length not less than its nominal diameter; and
- c. Fabricated of steel, fitted with pulling rings at each end, stamped or engraved on some segment other than a runner indicating the pipe material specification, nominal size and be furnished in a suitable carrying case labelled with the same data as stamped or engraved on the mandrel.

The mandrel shall be pulled through the pipe by hand to ensure that maximum allowable deflections have not been exceeded. Use of an uncertified mandrel or a mandrel altered or modified after certification will invalidate the test.

If the mandrel fails to pass, the pipe will be deemed over-deflected. Over-deflected pipe shall be uncovered and, if not damaged, reinstalled. Damaged pipe shall not be reinstalled, but shall be removed from the work site. Any pipe subjected to any method or process other than removal, which attempts, even successfully, to reduce or cure over-deflection, shall be uncovered, removed from the work site and replaced with new pipe. The replaced pipe shall then be tested for deflection not sooner than 30 days after installation.

VERIFYING Lateral Connections

The Contractor is advised that not all laterals are shown on the contract drawings and those that are shown are approximate only. Furthermore, all laterals are not necessarily connected to a particular residence, used for sanitary sewer purposes and may either be used, unused or abandoned.

CCTV camera inspections and dye testing may be used to locate and/or verify use of existing laterals that cannot be located during the mainline sewer installations; and shall be paid for separately under the respective items within the Schedule of Quantities and Unit Prices.

CCTV Camera Inspections

The unit price bid to camera laterals from each house or building shall include all labour, material and equipment required to carry out the work at the direction of the Contract Administrator. **No additional payment will be made for delay.** The Contractor shall arrange to TV inspect the lateral from the building to the sewer mainline.

Dye Testing

The unit price bid to dye test each house or building shall include all labour, material and equipment required to carry out the work at the direction of the Contract Administrator. **No additional payment will be made for delay.** Different coloured dyes will be flushed into the sewer from toilets, sinks and/or laundry tubs in the house or building to determine if any existing lateral is live or abandoned.

**C6. PRECAST CONCRETE MAINTENANCE HOLES, CATCHBASINS & DITCH
INLETS**

ITEM C6.2 (STORM)

In addition to the conditions stipulated in the Niagara Peninsula Standard Contract Document, the following shall apply:

All structures shall be founded on a 300mm (min.) thick layer of compacted Granular 'A'. All Granular material shall be placed in maximum 300mm loose lifts and compacted to 100% of Standard Proctor Maximum Dry Density (SPMDD) at optimum moisture content.

Excavation, removal and disposal of surplus excavated materials shall be included in the unit price. The removal and disposal of any existing structure shall be paid under the appropriate item.

The Contractor shall make due allowance in the unit prices tendered for any bypass pumping, dewatering, sheathing, shoring and bracing to complete the work.

Kor'n Seal adapters or an approved equivalent shall be used in all cases where PVC pipe is to be connected to concrete structures (excluding catchbasin connections). Where concrete pipe is used, a concrete cradle shall be required at each structure connection in addition to Fernco large diameter manhole connectors.

Structure rim elevation shall be set to blend with the surrounding **base** asphalt grade.

Under no circumstance shall HDPE adjustment units be used.

Ditch Inlets (DB)

The frame and grating shall be in accordance with OPSD 403.010.

The DI shall provide for a minimum 1.5m depth to invert of DI lead unless otherwise specified and the placement of a minimum 100mm to a maximum 300mm of concrete adjustment units, per OPSD 705.040. The Contractor shall verify in the field the invert of the extended culvert and shall include within the unit bid price of this item the cost to core a hole large enough for the culvert extension, connect the extended culvert into the DI, and parge any gaps between the culvert and the DI.

Basis for Payment

The unit price bid for this item shall be complete compensation for all labour, equipment and material (including frame, covers and/or grates) to do the work as specified in OPSS 407.10.01 and these specifications.

The supply and placement of Granular 'A' shall be made separately under the appropriate item in the Schedule of Quantities and Unit Prices.

C8. REMOVE & DISPOSE OF MAINTENANCE HOLES, CATCHBASINS AND PLUG SEWER LATERALS

ITEM C8.2 (STORM)

Granular 'A' backfill compacted to 100% Standard Proctor Maximum Dry Density shall be utilized to fill the resulting void, but SHALL NOT be included in the unit price bid; compensation for granular backfill shall be in accordance with the appropriate item in the Schedule of Quantities and Unit Prices.

The existing pipes shall be cut and plugged at all open ends including leads for catchbasins that are removed.

All existing frames and covers (grates) shall be salvaged and delivered to the City's Service Centre on Stanley Avenue. The unit prices bid shall be deemed to include this requirement.

The hours of operation at the Service Centre are 8:00 am to 4:00 pm Monday to Friday.

Basis for Payment

Payment for work under this item shall only apply where specifically noted on the Contract Drawings. The unit price bid shall be complete compensation for all labour, equipment and material necessary to do the work.

The supply and placement of Granular 'A' shall be made separately under the appropriate item in the Schedule of Quantities and Unit Prices.

Payment shall be made at 50% upon completion of the removal and disposal of the structure and 50% upon receipt of the salvaged frame and cover (or grate) to the City's Service Centre.

C10. SEWER AND/OR STRUCTURE CONNECTIONS

ITEM C10.2 (STORM)

The provisions of OPSS 407 (Nov 2015), OPSS 410 (Nov 2015) and OPSS 412 (Nov 2018) apply as amended herein.

This item shall be used for connection of a new sewer to an existing structure or sewer and the reconnection of an existing sewer or forcemain to a new structure.

Kor'n Seal adapters or an approved equivalent shall be used in all cases where PVC pipe is to be connected to concrete structures (excluding catchbasin connections). Where concrete pipe is used, a concrete cradle shall be required at each structure connection. The unit bid price shall have made due allowance for these requirements.

The price bid for CSP culvert extensions shall include connections to the existing road crossing culvert using proper couplings.

City of Niagara Falls
Contract 2019-396-16

Whirlpool Road Multi-Use Pathway, Pedestrian Bridge, and Roadway Widening
Construction From Millennium Trail to Victoria Avenue

The price bid for PVC culvert extensions shall include connections to the existing road crossing culvert using proper couplings. Should the road crossing culvert not be PVC the contractor shall install a 300mm (Min.) wide concrete collar at the connection between the two pipes. The collar shall extend a minimum of 150mm either side of the connection and shall completely surround the pipe at a uniform thickness of 200mm (Min.).

Basis for Payment

The unit price bid for this item shall be full compensation for all labour, material and equipment required to complete the connection including excavation, backfilling, structure coring and re-benching where required.

The supply and placement of Granular 'A' shall be made separately under the appropriate item in the Schedule of Quantities and Unit Prices.

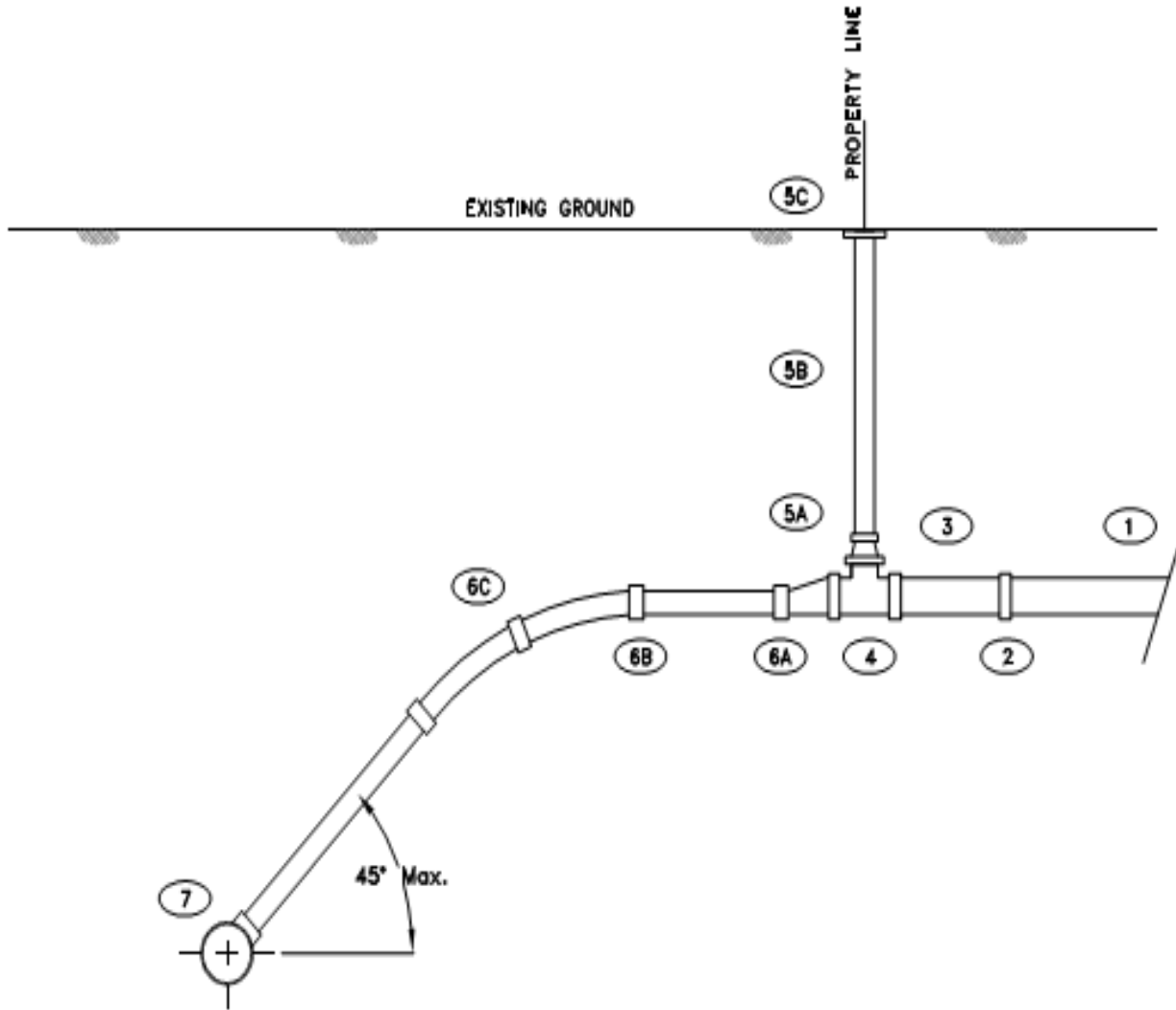




FIGURE C1 – City Approved Lateral Connections
(Read in conjunction with TABLE C1)

TABLE C1 – City Approved Sanitary Lateral Connections

PRIVATE SIDE LATERAL			CLEANOUT @ PROPERTY LINE				CITY LATERAL			Assumes 250mm (10') Dia. Sewer	
Existing Lateral	Transition Couplings	New PVC Pipe	Tee	Vertical			To Mainline			@ Mainline	
1	2	3	4	5a	5b	5c	6	If Needed 6a	6b	7a	
Asbestos Cement (AC)	100mm (4")	FERNCO 1051-54	125mm (5") PVC Pipe	125mm (5") PVC Tee	125mmx100mm (5"x4") PVC Reducer	100mm (4") PVC Pipe	100mm (4') PVC Cap (bds Threaded Adapter & Plug)	125mm (5") PVC Pipe	125mm (5") PVC Gasket Coupling	125mm (5") PVC Sweep	250mmx125mm (10"x5") PVC Tee
	125mm (5")	FERNCO 1051-55	125mm (5") PVC Pipe	125mm (5") PVC Tee	125mmx100mm (5"x4") PVC Reducer	100mm (4") PVC Pipe	100mm (4') PVC Cap (bds Threaded Adapter & Plug)	125mm (5") PVC Pipe	125mm (5") PVC Gasket Coupling	125mm (5") PVC Sweep	250mmx125mm (10"x5") PVC Tee
	150mm (6")	FERNCO 1051-66	150mm (6") PVC Pipe	150mmx100mm (6"x4") PVC Tee	N/A	100mm (4") PVC Pipe	100mm (4') PVC Cap (bds Threaded Adapter & Plug)	150mm (6") PVC Pipe	N/A	150mm (6") PVC Sweep	250mmx150mm (10"x6") PVC Tee
Acrylonitrile Butadiene-Styrene (ABS)	100mm (4")	125mm x 100mm (5'x4') ABS/PVC Gasket Adaptor	125mm (5") PVC Pipe	125mm (5") PVC Tee	125mmx100mm (5"x4") PVC Reducer	100mm (4") PVC Pipe	100mm (4') PVC Cap (bds Threaded Adapter & Plug)	125mm (5") PVC Pipe	125mm (5") PVC Gasket Coupling	125mm (5") PVC Sweep	250mmx125mm (10"x5") PVC Tee
Vitrified Clay (VC)	100mm (4")	FERNCO 1002-46	150mm (6") PVC Pipe	150mmx100mm (6"x4") PVC Tee	N/A	100mm (4") PVC Pipe	100mm (4') PVC Cap (bds Threaded Adapter & Plug)	150mm (6") PVC Pipe	N/A	150mm (6") PVC Sweep	250mmx150mm (10"x6") PVC Tee
	150mm (6")	FERNCO 1002-66	150mm (6") PVC Pipe	150mmx100mm (6"x4") PVC Tee	N/A	100mm (4") PVC Pipe	100mm (4') PVC Cap (bds Threaded Adapter & Plug)	150mm (6") PVC Pipe	N/A	150mm (6") PVC Sweep	250mmx150mm (10"x6") PVC Tee
Orangeburg (Black Tar)	100mm (4")	FERNCO 1051-54	125mm (5") PVC Pipe	125mm (5") PVC Tee	125mmx100mm (5"x4") PVC Reducer	100mm (4") PVC Pipe	100mm (4') PVC Cap (bds Threaded Adapter & Plug)	125mm (5") PVC Pipe	125mm (5") PVC Gasket Coupling	125mm (5") PVC Sweep	250mmx125mm (10"x5") PVC Tee
	125mm (5")	FERNCO 1051-55	125mm (5") PVC Pipe	125mm (5") PVC Tee	125mmx100mm (5"x4") PVC Reducer	100mm (4") PVC Pipe	100mm (4') PVC Cap (bds Threaded Adapter & Plug)	125mm (5") PVC Pipe	125mm (5") PVC Gasket Coupling	125mm (5") PVC Sweep	250mmx125mm (10"x5") PVC Tee

 i. Where **Cleanout is within a granular driveway**, the Tee and Vertical Riser shall be **ABS pipe and fittings (not PVC)** and at no additional cost to the contract.

 ii. **Soft Surface (Grass/Soil) Installations** shall include: Standard PVC Cap specifically bds Threaded Adaptor (EMCO#SKU 6012213) & bds Threaded Plug (EMCO#SKU 6015263) Where, Cap Top is 50mm below finished grade.

iii. **Hard Surface (Asphalt/Concrete/Granular) Installations** shall include: C.I. Flat Cap (EMCO# DF44) c/w Gasketed Adaptor (IPEX#043724); Where, Flat Cap is flush with finished asphalt/concrete grades and 75mm below finished granular grades.

E1. STREET LIGHTING AND ELECTRICAL WORKS GENERAL SPECIFICATIONS

Scope

The works consists of the supply of all labour, materials, plant and equipment required to install temporary light standard poles with arms and luminaires and connect electrical underground ducts and wiring as required all as per the drawings and specifications. All temporary electrical work shall be installed and made ready for operation prior to opening the associated traffic lanes or sidewalks that the work is intended to serve. Existing lighting systems are to remain in operation until new or temporary systems are in operation. There will be no compensation for delays in procuring the required hardware and equipment to install the street lighting.

The works shall also include all costs to excavate, remove and dispose or salvage of all existing lighting equipment including, poles, luminaires, arms, pole bases, concrete footings, ducts or any other plant no longer in use as a result of the proposed works. Excavation shall be backfilled with acceptable native material or Granular A and compacted.

The Contractor shall obtain and pay for all permits and certificates as required, provide shop drawings and salvage of the removed poles and any materials designated by the Project Manager or his designate and there shall be no separate payment for these services.

Before submitting Tenders, the Contractor shall carefully examine the specifications and drawings having a bearing on the work, visit the site and thoroughly familiarize themselves with all conditions to be met in carrying out the work. Each Contractor shall satisfy themselves that the work can be carried out without any changes to the drawings or specifications. No Contract adjustments shall be allowed for anything which would have been revealed in the course of such an examination.

Streetlighting and auxiliary services will be maintained continuously without interruption. If an interruption to services is unavoidable, it will be confined to periods of time to be designated by the Project Manager. The Contractor shall include in the prices submitted all costs for temporary connections, overtime labour charges, and such related allowances in order to conform with these conditions.

When proceeding with the street lighting installation, The Contractor shall comply with the requirements in the Section 7 Street Lighting Design and Construction Guidelines from the City of Niagara Guidelines and OPSS 106 unless otherwise specified.

Design and Submission Requirements

In addition to the conditions stipulated in the Section 7 Street Lighting Design and Construction Guidelines and OPSS 106, the following shall also apply:

The Contract Drawings indicate general location of equipment. Exact locations shall be determined in the field based on formal utility locates and any changes shall be discussed and verified with the Project Manager and/or other City representatives.

The Contractor shall mark on prints, as the work progresses, all changes from that originally shown. The Contractor shall turn over these prints to the City on project completion.

Product Shop Drawings

The Contractor will be required to submit shop drawings.

Contractor shall submit four (4) copies of shop drawings for each product specified for review and approval by the Project Manager (or designate), prior to manufacture.

Shop drawings shall be drawn to a minimum scale of 1:20 metric or 1/2" = 1ft. imperial and shall show all details, dimensions and descriptions of materials, apertures, attachment methods and fasteners.

The Contractor shall submit test results and guarantees confirming that all poles, arms and brackets meet all loading and EPA requirements under these specifications and applicable codes.

The Contractor shall submit complete parts list and maintenance instructions for all products supplied.

Materials

In addition to the conditions stipulated in the Section 7 Street Lighting Design and Construction Guidelines and OPSS 106, the following shall also apply:

Product protection

All poles, arms, luminaires and associated equipment shall be adequately protected to prevent damage to the products and finish during shipping and handling. The City will not accept any damaged products and will charge for damages to City-supplied products (if any). Failure to comply with these specifications shall be grounds to refuse any delivery without cost to the City

The contractor shall be responsible for receiving, unloading, storing and delivering all lighting products.

The Contractor shall provide all required security to prevent damage or loss of products until installed on the job site.

Protection & Storage of Materials

The Contractor shall be responsible from receiving time to final acceptance of complete work, for any damage to materials and equipment.

Construction

In addition to the conditions stipulated in the Section 7 Street Lighting Design and Construction Guidelines and OPSS 106, the following shall also apply:

The work and equipment covered in these Contract documents shall be complete and operating fully. All labour and materials not herein specifically mentioned, but which may be found necessary to supply, deliver, install, stage, complete, perfect, test and warrant/maintain the goods and services covered, intended or implied in these Contract documents to the satisfaction of the Project Manager, shall be included.

All materials and labour provided shall meet the Canadian Electrical Code and all other Federal, Provincial or Municipal codes, regulations, acts and by-laws covering said goods and services. If any conflict arises between the codes, regulations, acts or by-laws and these Contract documents, the codes, regulations, acts and by-laws shall take precedence and govern, except when, in the sole opinion of the Project Manager these Contract documents exceed the requirements of the codes, regulations, acts or by-laws.

The Contractor shall, at its own expense, immediately correct or replace any or all portions of the goods and services provided if, in the sole opinion of the Project Manager, said goods and services pose physical or electrical hazards to the public, are untidy, visually or audibly objectionable, or do not conform to the terms or intent of the Contract documents or any relevant codes, regulations, acts or by-laws.

The Contractor shall ensure that its bid is reasonable enough to take into account the site conditions and any encumbrances which may be encountered. Extras to the Contract shall only be awarded if, in the sole opinion of the Project Manager the required work was not requested, intended or implied in the Contract documents. Unit prices for extras shall be submitted in the schedule of quantities and prices as described therein. All pricing shall include enough labour and material to provide the particular unit connected and fully operational in accordance with the contract documents and to the satisfaction of the Project Manager. Where unit pricing is not in accordance with the specified instructions, extras shall not be awarded for the work.

Extras may or may not be awarded to the Contractor. The Project Manager reserves the right to award extra work to the best advantage of the City. If the quality of the extra work and materials is satisfactory to the Project Manager, said extra work and materials shall not affect the warranty for the goods and services specified in the Contract documents.

The Contractor shall be responsible for arranging all permits, inspections, utility disconnects, moves, reconnects or initial services. The Contractor shall also be responsible for assigning workers with the appropriate credentials and experience when working close to or within the Limits of Approach when necessary. All prices submitted shall include permits, inspections or utility work as stated above and all applicable taxes or statutory levies, unless stated otherwise in the Contract documents.

The Contractor shall leave the job site clean making only those changes necessary to complete the work.

In Contracts where the City has opted to supply material, the Contractor shall examine all items supplied and assure himself they are in good condition. With the exception of electrical defects the Contractor shall thereafter be responsible for all damage and breakage. In any case the Contractor is responsible to supply all labour and miscellaneous materials to replace any electrically damaged materials supplied by the City at its own expense. Said installation shall be in accordance with the Contract documents and to the satisfaction of the Project Manager.

Qualification of Workers

In addition to the conditions stipulated in the Section 7 Street Lighting Design and Construction Guidelines and OPSS 106, the following shall also apply:

The City requires qualified and skilled workers to undertake work on its behalf. Contractors having a minimum of five (5) years of experience in the construction and maintenance of street lighting systems may be considered for approval by the City subject to a further review of their experience and past performance.

Workers shall be competent and certified/authorized to install or work on/alter electrical systems contained within the project scope as required by the Occupational Health & Safety Act, Canadian Electrical Code, Ontario Electrical Safety Code, Local Distribution Companies and any other rules or legislation as applicable. It is the electrical contractor's responsibility to ensure that its workforce is suitable to carry out work assigned as per the project scope. Where the electrical contractor does not directly employ workers with the competencies required to complete specific work, such as work on utility structures, then it is the responsibility of the electrical contractor to sub-contract workers who do meet the competencies at no extra cost to the contract.

Quality Control

Tests and inspections on electrical equipment shall be according to Section 7 Street Lighting Design and Construction Guidelines from the City of Niagara Guidelines, OPSS 106 and the appropriate specifications and sections of the Canadian Electrical Code that governs the performance of the work, the following shall also apply:

The Contractor shall provide the Contract Administrator with 48 hours written notice prior to such inspections. All items shall be inspected at the sole discretion of the Contract Administrator before any cover is placed over the work, which would conceal it from view. If the Contractor fails to provide the Contract Administrator notice and opportunity to inspect and/or witness the testing of the works, he will be required, at the sole discretion of the Contract Administrator and at its own expense, to remove the cover and provide the Contract Administrator with the opportunity; the Contractor shall then be required to restore the cover to its proper state at its own expense. All tests detailed or required by this specification shall be the Contractors responsibility. All labour and materials required to perform the tests to the satisfaction of the Contract Administrator shall be the responsibility of the Contractor.

Permits and Fees

The Contractor will file the contract drawings with proper authorities and obtain all necessary approvals of installation and permits for the same before proceeding with work. The Contractor will prepare and submit necessary detailed shop drawings as required by Authorities.

The Contractor will pay all fees in connection with examination of drawings, permits, inspections and final certificate of approval.

Record Drawings and Specification

The Contractor will maintain record revisions and furnish record drawings for work of this Division. The Contractor will obtain for this purpose at least two sets of white prints. The record drawings may be submitted at a reduced size (11x17 – tabloid) only if the drawings are completely legible when printed and/or reproduced.

The Contractor will show on record drawings, all deviations in the work; exact locations for all electrical services buried below pavement and lawns; concealed junction or pull boxes; access panels. Locates for exterior buried work will be dimensioned from lighting poles and other fixed objects and/or established property lines. Dimensioning is required on the record drawings for all buried electrical works and shall be accurate to allow for future locating.

The Contractor will obtain approval for all provisions for future extension and establish verification before these are concealed.

The Contractor will provide "As Built" Record Drawings together with other documents required upon completion of the work. "As Built" notation shall be clearly identified on the record drawings for reference purposes.

It is required that record drawings clearly and accurately show all underground street lighting services installed under this contract as per the installed

conditions. Underground services shall be dimensioned on the drawings to above ground reference points (such as curbs and poles).

System Energization

The electrical Contractor must coordinate the system energization with the project schedule. Notification, including utility service layouts (as required), in reference to the desire to energize must be made in advance – ideally shortly after contract award. The City will not permit energization without ESA inspection certification and until the City has inspected and satisfied that all contract and design requirements have been met. The prime/electrical Contractor will be held responsible for any delays if the contract conditions have not been met or if energization has not been coordinated to meet the needs of the project schedule.

Upon the completion of the installation (and when energization of the system is required) the Contractor shall submit an energization request, including the ESA inspection certificate(s), to energize in writing to the City. The City's representative will conduct a site inspection and authorize energization with the utility if the installation is deemed acceptable.

The contractor shall be responsible to coordinate energization with the utility once authorized to do so.

Where the site inspection identifies deficiencies, authorization to energize shall not be given until remediation has been satisfactorily completed.

All costs associated with energization are to be included in the unit prices bid for the electrical items.

E2. STREET LIGHTING SALVAGES AND REMOVALS

OPSS 610 shall apply as amended or extended herein. Subsection 610.07.09.03 of OPSS 610 is amended with the addition of the following:

The Contractor shall remove and dispose of all streetlighting conductors. Equipment shall be returned to the City's Service Centre as shown on the contract drawings.

The Contractor must contact the City and make arrangements for delivery of salvaged materials.

Salvaged lighting poles, luminaires and arms shall be delivered to the City's Street Light Maintenance Contractor's yard, as directed by the Contract Administrator at no additional cost to the contract. Should the City opt not to salvage the existing lighting poles and related equipment, the contractor shall dispose of these items at no additional cost to the contract.

All other excess materials shall be managed as non-hazardous solid industrial or commercial waste, as specified in OPSS 180.

Payment for street lighting removals will be at the contract price as outlined in the SCHEDULE OF QUANTITIES AND UNIT PRICES and include all equipment and labour to remove, salvage and transport to regional site, or dispose of at approved site. No additional payment will be made for hazardous material disposal.

E3. PRECAST ELECTRICAL HANDHOLES

Work for this item shall be completed in compliance with Section 7 Street Lighting Design and Construction Guidelines, OPSS 602 and the Contract Drawings.

The Contractor shall supply and install precast 460mm diameter pre-cast concrete handholes in the locations as indicated on the Contract Drawings.

Electrical chambers supplied / constructed shall be as follows:

Size:	460mm Diameter
Type:	Precast Concrete.
Manufacturer:	USI (or approved equivalent)
Notes:	N/A

The handholes are not to be constructed until after the proposed curb and gutter has been placed.

The Contractor shall remove all sono-tube and debris from the inside of the handholes prior to final inspection by the Agency.

Handholes covers shall be securely bolted down when work at the handhole has been completed and The Contractor is leaving the place of the work.

Anti-seize compound shall be applied to all bolts for fastening the handhole cover to the handhole frame.

Payment

Measurement for Payment

Payment shall be made at the contract unit price for each handhole supplied and installed.

Basis of Payment

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

E4. RIGID CONDUIT, DIRECT BURIED IN BOULEVARD

Work for this item shall be completed in compliance with Section 7 Street Lighting Design and Construction Guidelines and OPSS 603.

The Contractor shall supply and install conduit as specified on the Contract Drawings.

The conduits shall be located to a depth of 1 m below the grade of the new road. All joints shall be made waterproof by means of couplers using solvent weld cement. Any unused ducts shall be plugged with plastic plugs for future use. Ducts shall have standard "bell" ends.

The Contractor shall supply and place through each duct sufficient fish line for purposes of pulling in the necessary cable for street lighting. The Contractor shall leave extra fish line in duct for future cable pulling.

The Contractor shall reinstate all areas disturbed during this installation. The Contractor shall install electrical caution tape at least 300 mm above installed duct. The Contractor shall supply and install flexible conduit from the rigid PVC ducts into the pole wiring aperture (below grade) as indicated on the Contract drawings.

Ducts supplied shall be as follows:

Size:	50 mm dia.
Type:	Rigid PVC, CSA C22.2 No. 211.2
Manufacturer:	IPEX (or Approved Equal)
Cat. No.:	032120 / 032121

- Notes:
1. Fittings and accessories required to complete duct installation as specified, shall be of the same manufacturer as the duct supplied and installed.
 2. Ducts shall be supplied with bell ends.
 3. At no time shall DB Type 2 duct be used

Payment

Measurement for Payment

The unit price for these items shall include all labour, equipment, and materials required to complete the work as specified including excavation, pavement removal, backfilling and compaction, all fittings, breaking into existing concrete handwells/manholes, parging where required, and installation under existing sidewalks where specified.

Basis of Payment

Payment at the unit price per meter for the above tender items shall be full compensation for all labour, equipment and Material to do the work.

E5. DIRECTIONAL DRILLING FOR ROADWAY CROSSING

The Operating Authority shall give consideration for the installation of the roadway crossings by the directional bore method. The Contractor shall notify the Operating Authority prior to commencing with construction of the conduit systems and consideration shall be given for the installation of the conduit by this method.

All directional drilling within the Operating Authority right of way shall conform to the requirements of OPSS 450, Section 7 Street Lighting Design and Construction Guidelines and NASTT Horizontal Directional Drilling Good Practices Guidelines (3rd Edition). Where existing utilities allow, pits for directional bore installation operations shall be set back a minimum 1.0m back from the existing or proposed curb. Bore holes shall only be 25mm larger in diameter than the conduit being installed. High Density Polypropylene (HDPE SDR13.5 minimum) conforming to TC-7-200 may be used for directional bore applications. Transition between HDPE to Rigid PVC conduit shall be completed with the HDPE duct being inserted and cemented into a Bell end section of rigid PVC conduit with a solvent suitable for connection of HDPE duct and rigid PVC conduit.

In situations where the Contractor makes three attempts to directional bore across a roadway section and is unsuccessful, the Contractor shall notify the Operating Authority so that the Operating Authority may verify the boring attempts and consider alternatives. Should it be determined that boring is not possible, the Contractor shall provide an open-cut crossing at the same bid price.

Payment

Measurement for Payment

The unit price for these items shall include all labour, equipment, and materials required to complete the work as specified including excavation, pavement removal, backfilling and compaction, all fittings, breaking into existing concrete handwells/manholes, parging where required, installation under existing sidewalks, and restoration of all surfaces.

Basis of Payment

Payment at the unit price per meter for the above tender items shall be full compensation for all labour, equipment and material to do the work.

E6. LOW VOLTAGE CABLES IN DUCTS

Work for this item shall be completed in compliance with Section 7 Street Lighting Design and Construction Guidelines, OPSS 604 and the following SP.

The Contractor shall supply and install cables in ducts in the locations as indicated on the Contact Drawings.

Street light cable supplied shall be as follows:

Size:	1/C, #6 AWG
Type:	RW90 (-40°C), XLPE, Insulated (Black) stranded copper (Cu), UV resistance OUTDOOR use, 600V 90°C, CSA C22.2 No. 38
Manufacturer:	Nexans (or Approved Equal)
Cat. No.:	N/A
Notes:	1. All cables exposed to direct rays of the sun shall be approved for exposure to direct rays of the sun and shall be marked as such according to the Ontario Electrical Safety Code (e.g., SR and Sunlight Resistant).

Payment

Measurement for Payment

Payment shall be made at the Contract unit price per metre of cable installed, measured from centre to centre of poles.

Basis of Payment

Payment at the unit price for the above tender items shall be full compensation for all labour, equipment and Material to do the work.

E7. LOW VOLTAGE AERIAL CABLES

Work for this item shall be completed in compliance with Section 7 Street Lighting Design and Construction Guidelines, OPSS 604 and the following SP.

The Contractor shall supply and install aerial cables in the locations as indicated on the Contact Drawings.

The Contractor shall supply and install neutral conductor and all associated mounting hardware, as indicated on the street lighting drawings and in accordance with OPSD 2235.01 and OPSD 2242.02.

Street light cable supplied shall be as follows:

Size:	3-1/C, #4 AWG,
Type:	NS75-FT1, XLPE, Quadruplex, insulated stranded aluminium (Al) conductors cabled around a neutral conductor, 600V 90°C, CSA C22.2 No. 129
Manufacturer:	Nexans (or Approved Equal)
Cat. No.:	N/A
Notes:	1. Cables must be rated and marked for outdoor usage. 2. Fittings and accessories required to complete installation as specified, shall be of the same manufacturer as the cable supplied and installed.

Street lights riser wire supplied shall be as follows:

Size:	3/C, #12 AWG,
Type:	NS75-FT1, XLPE, Quadruplex, insulated stranded aluminium (Al) conductors cabled around a neutral conductor, 600V 90°C, CSA C22.2 No. 129
Manufacturer:	Nexans (or Approved Equal)
Cat. No.:	N/A

Anti-oxidizing gel to be used at all connection points.

Payment

Measurement for Payment

Payment shall be made at the Contract unit price per metre of cable installed, measured from centre to centre of poles.

Basis of Payment

Payment at the unit price for the above tender items shall be full compensation for all labour, equipment and Material to do the work.

E8. GROUND WIRE

Work for this item shall be completed in compliance with Section 7 Street Lighting Design and Construction Guidelines, OPSS 609 and the following SP.

The Contractor shall supply and install ground cables in the locations as indicated on the Contact Drawings.

A #6 AWG RWU90, XLPE, Green, stranded copper (Cu) cable shall be installed to run continuously throughout the entire duct system as indicated on Contract Drawings.

Poles with ground electrodes are to be connected to the grounding system by a #6 AWG, Bare, Copper ground cable.

Power pedestals with ground electrodes are to be connected to the grounding system by a #2 AWG, Bare, Copper ground cable.

Ground cable supplied shall be as follows:

- A) Size: 1/C, #6 AWG
Type: RWU90 (-40°C), XLPE, insulated (Green) stranded copper, 1000V 90°C, CSA C22.2 No. 38-05
Manufacturer: Nexans (or Approved Equal)
Cat. No.: N/A
Notes: 1. Cables must be rated and marked for outdoor usage.
- B) Size: 1/C, #6 AWG
Type: Stranded copper, Bare
Manufacturer: Nexans (or Approved Equal)
Cat. No.: N/A
Notes: 1. Cables must be rated and marked for outdoor usage.

Payment

Measurement for Payment

Measurement for payment shall be made at the contract unit price per meter.

Basis of Payment

Payment at the unit price for the above tender items shall be full compensation for all labour, equipment and Material to do the work.

E9. GROUND ELECTRODES

Work for this item shall be completed in compliance with Section 7 Street Lighting Design and Construction Guidelines, OPSS 609 and as extended herein.

The Contractor shall supply and install 20mm x 3m copper clad ground rods in the locations as indicated on the Contract Drawings. The ground rods shall be driven into the ground adjacent to the temporary poles. The ground rods driven into the ground shall be buried so that the top of the ground rods are 600mm below the finished grade and they shall be left uncovered until they have been inspected by the Agency.

Connection to the ground rods shall be made with Thermit Weld connectors.

Payment

Measurement for Payment

Payment shall be made at the contract unit price for each ground rod installed and shall be full compensation for all labour, materials, and equipment required to complete the work as specified in the Contract Documents.

Basis of Payment

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

E10. CONCRETE POLES, DIRECT BURIED

Work for this item shall be completed in compliance with Section 7 Street Lighting Design and Construction Guidelines, OPSS 615 and the following SP.

The Contractor shall supply and install new poles at locations indicated on the contract drawings and as per City of Niagara Falls Standards.

Poles are to be installed without luminaires or arms attached. Pole installation is to comply with OPSD 2410.00. Poles are to be installed level and plumb.

Poles supplied shall be as follows:

Size:	35 feet
Type:	Round Class C Spun Concrete Pole
Manufacturer:	StressCrete (or approved equivalent)
Cat. No.:	E-350-CPR-G
Notes:	N/A

Payment

Measurement for Payment

Payment shall be made at the contract unit price for each pole supplied and installed.

Basis of Payment

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

E11. ROADWAY LIGHTING LUMINAIRES

Work for this item shall be completed in compliance with Section 7 Street Lighting Design and Construction Guidelines, OPSS 617 and the following SP.

The Contractor shall supply and install new luminaires at locations indicated on the Contract Drawings.

Luminaires shall be mounted on poles / arm brackets as indicated on the contract drawings.

Luminaires supplied shall be as follows:

Size:	122W
Type:	LED
Colour / Finish:	Standard
Manufacturer:	General Electric
Cat. No.:	ERLH 0 14 C3 40 A GREY (or approved equivalent)
IES FILE No.:	ERLH_14C340

Luminaires shall be installed c/w photocells, fuses, lamps and riser wires to be located in pole as follows:

Photocell:	120V, 1000W Time Delay, Fisher Pierce – Cat. No. 7571B-EBBA (or approved equivalent)
FuseHolder:	30A, 600V, non-breakaway unit, EATON (Bussman) – Cat. No. HEBA A (or approved equivalent)
Lamp:	Solid State LED
Fuse:	10A, EATON Bussman - Cat. No. FNM-10 (or approved equivalent)
Riser Wires:	#12 AWG Copper (Cu), Solid, 600V: NMWU 10-12-2

Payment

Measurement for Payment

The unit price shall include each luminaire, photocell, fuse, wattage sticker, riser wires from the pole handhole to the luminaire, and all labour and equipment pertaining to the

installation, mounting, wiring and adjustments of the street lighting equipment to achieve operational status. The Contractor should note that existing illumination must be maintained at all times until new illumination is in service. Extras for coordination time/conflicts, delays and errors will not be considered.

Basis of Payment

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

E12. ROADWAY LIGHTING ELLIPTICAL BRACKET ASSEMBLIES

Work for this item shall be completed in compliance with Section 7 Street Lighting Design and Construction Guidelines, OPSS 617 and the following SP.

The Contractor shall supply and install new elliptical brackets at locations indicated on the Contract Drawings.

It is the Contractor's responsibility to meet the qualifications outlined by EUSA/ ESA should there be any work done on or near Hydro equipment. The Contractor shall also be responsible to have authorized workers if working within the Limit of Approach is necessary.

Luminaire arm brackets supplied shall be as follows:

Size:	2.4m (8ft) Arm
Type:	Aluminium
Manufacturer:	Aluminous
Colour / Finish:	Standard
Cat. No.:	ALS-RE8M (or Approved Equal)
Notes:	N/A

Payment

Measurement for Payment

The unit price shall include each bracket and all labour and equipment pertaining to the installation, mounting and adjustments of the street lighting equipment to achieve operational status. The Contractor should note that the existing illumination must be maintained at all times. Extras for coordination time/conflicts, delays and errors will not be considered.

Basis of Payment

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

F1 ACCESS TO WORK AREA, WORK PLATFORMS, AND SCAFFOLDING

The work of this item shall consist of creating access and providing temporary work platforms at various locations to allow access for the following work:

- Installation of piles
- Formwork and falsework
- Construction of footings, abutments, and ballast walls
- Placement of granular materials and rip-rap
- Installation of the new bridge superstructure and associated components
- To facilitate the Contract Administrator to all areas of the structure
- All other work requiring access, platforms, and scaffolding

The purpose of the working platforms is to provide safe working conditions for the Contractor's personnel and Contract Administrator, to reach the installation areas, and for effective debris collection. It may be assumed that the working platforms are erected from the ground.

Ground mounted platforms shall be constructed by components lowered down by a crane or carried down manually. Transporting the platform components by mechanized equipment down the embankment slopes shall not be allowed.

Construction

Two weeks before erecting the platforms, the Contractor shall submit drawings showing the proposed location and details of the platforms to the Contract Administrator for review. The drawings shall bear the seal of a professional engineer licensed in Ontario.

Each platform shall have a minimum dimension of 1,600 mm x 2,500 mm. The floor of the platform shall consist of planks put closely together and the perimeter of platform shall be fitted with a guardrail composed of toe board, mid-rail and top rail.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work. For the progress payment, thirty (30) percent of the lump sum price will be paid on the initial progress payment. The remaining balance will be pro-rated over the duration of the project.

F2 CRANE PADS

The work of this item shall include:

- The supply, installation, and removal of crane pads for supporting pile driving equipment
- The supply, installation, and removal of crane pads for supporting bridge erection equipment

The Contractor shall make note of the soil conditions outlined in the Geotechnical Investigation Report (included in the Contract Documents).

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F3 SUPPLY EQUIPMENT FOR INSTALLING DRIVEN PILES

In addition to the conditions stipulated in OPSS MUNI 903, the following shall also apply:

The work of this item shall include the supply of equipment for the installation of driving piles, as well as any work required for setting up and removing the equipment.

The pile driving equipment shall be appropriate to the driving conditions and capable of delivering a minimum specified energy of 50 kJ per blow.

All as shown on the Contract Drawings.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F4 H-PILES – HP 310 X 110

In addition to the conditions stipulated in OPSS MUNI 903, the following shall also apply:

The work of this item shall include the supply and installation of HP 310 x 110 steel H-Piles for the east and west abutments, including:

- Submissions as per OPSS MUNI 903 with the seal and signature of an Engineer experienced in the field of deep foundations
- Driving all piles to bedrock, including penetrating the rock points into the rock as per OPSS MUNI 903
- Carefully monitoring and controlling the pile driving operations
- Producing pile driving records of each pile

Steel H-Pile shall be according to CSA G40.20/G40.21, Grade 350W, or ASTM A572 Gr. 50.

Piles are to be driven in accordance with Standard SS103-11 (included in the Contract Drawings) and in accordance with the Geotechnical Investigation Report (included in the Contract Documents).

All as shown on the Contract Drawings.

Measurement for this item shall be the length in metres of the H-Piles left in place after final cut-off.

Basis of Payment

Payment at the unit Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F5 ROCK POINTS

In addition to the conditions stipulated in OPSS MUNI 903, the following shall also apply:

The work of this item shall include:

- Supply and installation of Oslo Point rock points as per OPSD 3000.201 on the ends of all H-Piles

All as shown on the Contract Drawings.

Basis of Payment

Payment at the unit Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F6 PILE DYNAMIC LOAD ANALYSIS

In addition to the conditions stipulated in OPSS MUNI 903, the following shall also apply:

The work of this item shall include a complete pile dynamic load analysis (PDA) of the first pile at both abutment locations, including site preparation, components, equipment, testing apparatus, and method of measurement and recording.

The Contractor shall submit the results of the dynamic load analysis results to the Contract Administrator immediately after the installation of the first pile at both abutments.

The ultimate pile capacity and set shall be confirmed prior to driving any subsequent piles, as per Standard SS103-11 (included in the Contract Drawings) through the results of the dynamic load analysis.

All as shown on the Contract Drawings.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F7 RETAPPING PILES (PROVISIONAL)

Work under this item is provisional and therefore must be approved by the Contract Administrator and Owner prior to commencement of work for this item.

In addition to the conditions stipulated in OPSS MUNI 903, the following shall also apply:

The work of this item shall include:

- Retapping each of the H-piles 24 hours following installation of the piles

All as shown on the Contract Drawings.

Basis of Payment

Payment at the unit Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F8 CONCRETE IN FOOTINGS

In addition to the conditions stipulated in OPSS MUNI 904, the following shall also apply:

The work of this item shall include:

- Supply and placing of concrete for the west and east footings.

The estimated total volume of concrete for this item is 18 m³. The Contractor shall verify the concrete quantity.

All as shown on the Contract Drawings.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F9 CONCRETE IN SUBSTRUCTURE

In addition to the conditions stipulated in OPSS MUNI 904, the following shall also apply:

The work of this item shall include:

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- Supply and placing of concrete for the west and east abutments
- Supply and placing of concrete for the west and east ballast walls
- Supply and installation of hot dip galvanized L51x51x6.4 angles embedded on the tops of the ballast walls. Prior to hot-dip galvanizing, 12mm diameter anchors shall be welded to each angle and expansion joint steel profiles shall be welded to the inside angles.

The estimated total volume of concrete for this item is 14 m³. The Contractor shall verify the concrete quantity.

The Contractor shall review, coordinate, and verify the abutment layout with the steel truss bridge manufacturer.

All as shown on the Contract Drawings.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F10 REINFORCING STEEL

In addition to the conditions stipulated in OPSS MUNI 905, the following shall also apply:

The work of this item shall include supply and placement of black reinforcing steel at the following locations:

- Bridge footings
- Bridge abutments
- Bridge ballast walls

All as shown on the Contract Drawings.

Basis of Payment

Payment at the unit Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F11 BEARINGS

In addition to the conditions stipulated in OPSS MUNI 922, the following shall also apply:

The work of this item shall include:

- Supply and installation of Goodco Z-Tech Series EF cotton duck fabric reinforced bearing pads (or approved equal) at the west abutment bearing locations.

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- Supply and installation of Goodco Z-Tech Series ETF sliding bearing pads (EF pad with 1.5mm PTFE surface, or approved equal) at the east abutment bearing locations.
- Attaching all of the bearings to the abutments using Normac 900R adhesive (or approved equal).
- Supply and installation of 300mm x 300mm x 1.5mm thick 304 stainless steel #8 mirror finish plates, continuously welded to the undersides of the east bearing plates
- Supply and installation of 1" diameter galvanized ASTM A36 threaded anchor rods, galvanized nuts, and galvanized washers at each bearing location. The anchor rods shall be grouted into the abutments using Simpson Strong-Tie "AT" adhesive, or approved equal.

All as shown on the Contract Drawings.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F12 STEEL TRUSS BRIDGE - FABRICATION

In addition to the conditions stipulated in OPSS 906, the following shall also apply:

The work of this item shall include the fabrication of the steel truss pedestrian bridge, including the following:

- Submission of design drawings, shop drawings, and welding procedures
- The complete fabrication of the three sections of the steel truss bridge
- The supply of all associated hardware for the steel truss bridge superstructure, including galvanized bolts, galvanized nuts, and galvanized washers

The Contractor shall allow access for the Contract Administrator to inspect the steel truss bridge at the fabricator's yard during the fabrication process.

The Contract shall fully assemble the three sections of the steel truss bridge together in the fabricator's yard to ensure proper fit-up of the sections prior to delivery of the sections.

Materials

Both structural steel bottom chords are fracture critical members and shall be Grade 350AT Category 2 in accordance with CSA G40.20-13 / G40.21-13.

All diagonal steel members on both faces of the truss are primary tension members and shall be grade 350AT Category 1 in accordance with CSA G40.20-13 / G40.21-13.

The carbon steel deck shall be Grade 350W in accordance with CSA G40.20-13 / G40.21-13.

All other structural steel shall be Grade 350A in accordance with CSA G40.20-13 / G40.21-13.

All welding shall be in accordance with CSA Standard W59-2018. Electrode classification shall be E49XX. For the fracture critical members and primary tension members, the weld metal shall meet the notch-tough steel requirements for a 27J impact energy and -30°C test temperature

Structural steel shall conform to CSA G40.1-M 350A (self-weathering steel). Welding of structural steel shall conform to CSA Standard W590M1989.

Submission Requirements

Design drawings, shop drawings, and welding procedures shall be submitted for the bridge. A digital copy (PDF) of all these documents shall be submitted to the Contract Administrator for approval a minimum of fourteen (14) days before commencing fabrication. The proposals shall bear the seal and signature of a Professional Engineer licensed by the Association of Professional Engineers of Ontario. Fabrication shall not proceed until the design drawings, shop drawings, and welding procedures have received the Contract Administrator's approval in writing.

Appendix 906-B, November 2012 is invoked by the Owner for the work under this item.

All as shown on the Contract Drawings.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F13 STEEL TRUSS BRIDGE - DELIVERY

In addition to the conditions stipulated in OPSS 906, the following shall also apply:

The work of this item shall include the delivery of the steel truss pedestrian bridge, including the following:

- Co-ordinating delivery with the steel truss bridge fabricator
- The complete delivery of the three sections of the steel truss bridge
- The complete delivery of all associated hardware for the steel truss bridge superstructure, including galvanized bolts, galvanized nuts, and galvanized washers

Appendix 906-B, November 2012 is invoked by the Owner for the work under this item.

All as shown on the Contract Drawings.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F14 STEEL TRUSS BRIDGE - ERECTION

In addition to the conditions stipulated in OPSS 906, the following shall also apply:

The work of this item shall include the erection of the steel truss pedestrian bridge, including the following:

- Submission of erection diagrams, erection procedure drawings, and erection calculations
- Layout and preparation of the bearings to ensure that the abutments are clean and level and ready to accept the steel truss pedestrian bridge
- The complete erection of the three sections of the steel truss bridge
- The complete installation of all associated hardware for the erection of the steel truss bridge, including galvanized bolts, galvanized nuts, and galvanized washers
- Field welding to create a continuous seal in the steel plate deck and C250x30 channels at all splice locations

Submission Requirements

Erection diagrams, erection procedure drawings, and erection calculations shall be submitted for the bridge. A digital copy (PDF) of these documents shall be submitted to the Contract Administrator for approval a minimum of fourteen (14) days before commencing erection. The proposals shall bear the seal and signature of a Professional Engineer licensed by the Association of Professional Engineers of Ontario. Erection shall not proceed until the erection diagrams, erection procedure drawings, and erection calculations have received the Contract Administrator's approval in writing.

Appendix 906-B, November 2012 is invoked by the Owner for the work under this item.

All as shown on the Contract Drawings.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F15 COATING NEW STRUCTURAL STEEL

In addition to the conditions stipulated in OPSS MUNI 911, the following shall also apply:

The work of this item shall include the following:

- Paint coating the underside of the steel plate deck of the steel truss bridge, prior to delivery of the steel truss bridge

The coating system shall be a 3-coat system and shall be in accordance with OPSS MUNI 911. The coating system materials shall be on the MTO's Designated Source of Materials (DSM) list.

The colour of the finish coat shall be equivalent to 10045 brown according to Federal Standard 595C Colors.

Mixing and application of the coating system shall be in strict accordance with the manufacturer's product sheets including the following:

- Recommended maximum dry film thickness and minimum coat thickness
- The mixing and thinning directions, including pot life
- The recommended spray nozzles and pressures
- The acceptable humidity levels and temperature range for application
- The minimum acceptable recoat time period for temperatures in the intervals of 5°C from -7°C to 27°C, including the acceptable range of relative humidity for each temperature interval. If the acceptable recoat time is exceeded, the Contractor shall abrade all surfaces to be coated, following the manufacturer's recommendations.

Appendix 911-B, November 2014 is invoked by the Owner for the work under this item. The location of sample delivery is to be confirmed by the Contract Administrator.

All as shown on the Contract Drawings.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F16 COATING TOP OF BRIDGE DECK

In addition to the conditions stipulated in OPSS MUNI 911, the following shall also apply:

The work of this item shall include coating the top of the entire bridge deck with a continuous waterproofing & wearing course membrane system, including the following:

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- Shot blast cleaning of the top of the carbon steel deck immediately prior to the application of the membrane coating system
- Collection, removal, and disposal of all spent shot blast cleaning material, of whatever nature
- Supply and application of Tremco Matacryl WS (Pedestrian Bridge – flexible membrane with aluminum oxide aggregate) Flex Coating to the top surface of the entire carbon steel deck

The shot blasting shall be fully contained and all dust and materials shall be contained from entering the watercourse.

Shot Blasting – Surface Preparation

The top of the carbon steel deck shall be shot blast cleaned to a near-white surface according to the requirements of SSPC-SP 10/NACE No. 2. The shot blast cleaning shall provide a surface profile height of a minimum of 25 µm and a maximum of 75 µm, and when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining. Staining shall be limited to no more than 5 percent of each square centimeter of surface area and may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint.

Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.

The maximum time between final surface preparation and prime coat application shall be 10 hours.

Tremco Matacryl WS (Pedestrian Bridge) Flex Coating on Deck

Application of the coating system shall be in strict accordance with the manufacturer's application procedures and requirements.

The colour of the aluminum oxide aggregate shall be dark grey or black.

The coating system on top of the deck shall be applied after the splice locations in the deck have been continuously sealed with field welds.

The Contractor shall comply with all Safety Data Sheet and Occupational Health and Safety Act recommendations when working with the coating system. As a minimum precaution, all workers within the environmental protection system shall be equipped with appropriate, properly fitted organic vapour/particulate respirator, protective gloves and eye protection.

The Contractor shall also supply the Contract Administrator with the appropriate respiratory, skin and eye protection.

Appendix 911-B, November 2014 is invoked by the Owner for the work under this item. The location of sample delivery is to be confirmed by the Contract Administrator.

All as shown on the Contract Drawings.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F17 PEDESTRIAN RAILINGS ON BRIDGE

In addition to the conditions stipulated in OPSS MUNI 908 and OPSS MUNI 911, the following shall also apply:

The work of this item shall include the supply and installation of galvanized steel railings on the steel truss bridge, including the following:

- Submission of shop drawings for approval prior to fabrication
- Supply and installation of the hot-dip galvanized steel pedestrian railings on the bridge
- Supply and installation of 3mm thick neoprene rubber pads under the pedestrian railing post base plates
- Supply and installation of all associated hardware for the pedestrian railings, including galvanized bolts, galvanized nuts, and galvanized washers

Appendix 911-B, November 2014 is *not* invoked by the Owner for the work under this item.

All as shown on the Contract Drawings.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F18 CHAIN LINK MESH ON BRIDGE

In addition to the conditions stipulated in OPSS MUNI 772 and OPSS MUNI 1541, the following shall also apply:

The work of this item shall include the following:

- Submission of shop drawings for approval prior to fabrication and installation

- The supply and installation of black vinyl-coated chain link mesh on the inside of the truss bridge, on both sides and the top of the bridge.
- The supply and installation of weathering steel eyelets welded to the structural steel for connecting the chain link mesh to the truss.
- The supply and installation of wire, turnbuckles, and any other hardware required for connecting the chain link mesh to the truss.

The chain link mesh shall be securely attached to the inside of the truss to create a taut full enclosure on the inside of the steel truss bridge.

The Contractor is responsible for preparing and submitting shop drawings and installation details of the chain link mesh to the Contract Administrator for approval two weeks prior to fabrication and installation of the mesh system.

The chain link mesh shall be Type 1, Class B, black vinyl-coated, heavy (6 ga.), with 2" mesh diamond size as per OPSS MUNI 1541 and CAN/CGSB-138.1-2019. The core wire of the vinyl-coated chain link mesh shall be galvanized.

The mesh shall be securely attached to welded weathering steel eyelets at 400mm maximum spacing on the steel truss verticals and top lateral members. The mesh shall be fastened with taut top wire, bottom wire, and turnbuckles as per OPSS MUNI 1541.

The mesh on the sides of the bridge shall have knuckling at the bottom selvage and joints at every 7500mm longitudinal spacing (at every third vertical member on the steel truss).

All as shown on the Contract Drawings.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F19 DECK JOINT ASSEMBLIES

In addition to the conditions stipulated in OPSS MUNI 920, the following shall also apply:

The work of this item shall include the following:

- The supply and installation of Goodco Z-Tech Z-50 galvanized steel profiles (or approved equal), 3150mm length at both abutments (or approved equal). The steel profiles shall be welded to the end of the steel deck and to the steel angle on the ballast wall.
- The supply and installation of Goodco Z-Tech ZT-700HR strip seal (or approved equal), 3150mm length at both abutments

- The supply and installation of 5-inch wide aluminum eavestrough with end caps and downspouts on both ends of both ballast walls, including stainless steel concrete screws. The downspouts shall outlet onto the new rip-rap.
- The supply and installation of 3000mm x 500mm x 6mm thick stainless steel checker tread plate at both ballast walls, fastened to the top of the ballast wall with stainless steel tread plate fasteners

The Contractor shall install the new strip seal and associated components in strict accordance with the manufacturer's recommended installation procedures.

Two weeks prior to fabrication, the Contractor shall submit product information including fabrication shop drawings to the Contract Administrator for review and approval.

All as shown on the Contract Drawings.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F20 LIGHTING ON BRIDGE

The work of this item shall include the following:

- The supply and installation of four (4) solar-powered LED lighting luminaires with custom mounts on the top of the steel truss
- The supply and installation of all hardware associated with the lighting system
- Submission of shop drawings for approval prior to fabrication and installation
- Adjustment of the lighting settings as per the directions of the manufacturer and Contract Administrator

The Contractor shall prepare and submit details and shop drawings of the lighting system to the Contract Administrator for approval two weeks prior to installation of the lighting system.

The lighting system shall consist of LX50 solar lighting luminaires manufactured by Solar Vision Inc., and sold by Tymat Solutions (contact: Chris Dennis, chris@tymat.com).

The luminaires shall have integrated 50W solar modules, Philips LED lights, IP68 charging/lighting controllers, motion sensors, and gel batteries. The luminaire casing shall be all aluminum and shall have a black or dark grey powder coat finish.

The luminaires shall be mounted with custom clamp/tenons to the top chord of the south truss. The spacing of the luminaires shall be as per the Contract Administrator's directions.

The colour temperature of the lighting shall be 3000°K. The lighting settings shall be set by the Contractor as per the directions of the manufacturer and Contract Administrator.

All as shown on the Contract Drawings and as per the Contract Administrator's directions.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F21 OPG COORDINATION ALLOWANCE

The work of this item shall include the following:

- Allowance for the completion of all construction activities while working safely around the existing Ontario Power Generation (OPG) Hydro Canal.
- Construct, maintain, and remove any protection or containment system, as required for working around the Hydro Canal.
- Make allowance for working around, temporary support, and/or relocation of OPG fencing.
- Coordinate access through security gates with OPG.

The Contractor shall demonstrate to the Contract Administrator that they have contacted OPG and have demonstrated safe limits of approach.

OPG Contact Information is as follows:

Jo-Ann Kinnear
Niagara Property Coordinator
Ontario Power Generation
14,000 Niagara River Parkway, RR#1
Niagara-On-The-Lake, ON, L0S 1J0
905-357-6921
email: joann.kinnear@opg.com

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and materials necessary to complete the work.

F22 UTILITIES ALLOWANCE

The work of this item shall include the following:

- Allowance for the completion of all construction activities while working around the overhead utilities

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Contract 2019-396-16

Whirlpool Road Multi-Use Pathway, Pedestrian Bridge, and Roadway Widening
Construction From Millennium Trail to Victoria Avenue

- Co-ordinate any temporary protection, relocations, and/or shutdowns with the utility companies
- Make allowance for any additional work associated with the removal, temporary support, protection, and/or relocation/reinstatement of affected utilities.

The Contractor shall demonstrate to the Contract Administrator that they have contacted the utility companies and have demonstrated safe limits of approach.

OHSA requirements state that no equipment shall encroach within 3 metres of the lines to maintain safe limits of approach, also any excavation around the base of the pole should not be closer than 3 metres without having the pole properly supported.

The Contractor shall coordinate with the utility companies, as required, and allow their inspectors access to the work area for periodic inspection to ensure the plant is not in jeopardy during construction.

Any damage to the utilities shall be the responsibility of the Contractor and shall be repaired at the Contractor's expense.

In the event that the existing plant is damaged, the Contractor shall immediately notify the utility company of the damaged plant. The Contractor shall then cooperate fully with the utility company to repair the damaged plant, including, but not limited to:

- Vacating the site as required allowing access for the utility company's repair Contractor.
- Rescheduling or postponing construction activities as required for the utility company to repair the damaged plant.
- Additional excavation or exposure of the damaged plant.

Basis of Payment

Payment at the lump sum Contract price for this item shall be full compensation for all labour, equipment, and, materials necessary to complete the work.

G2 CHAIN LINK FENCING

The contractor shall supply all materials, equipment and labour necessary to complete the work, in accordance with OPSS 772 and 1541, OPSD 972.132, and Ontario Power Generation Contract Technical Specifications For Fencing Installation. Where fence height changes, barbed wire shall be installed vertically or on a diagonal to ensure safety, to the satisfaction of OPG.

Posts shall be installed plumb and straight, and all scratches shall be repaired with zinc rich paint of an approved colour.

Basis for Payment

Payment shall be as per the units indicated in the Schedule of Quantities and Unit Prices for each item noted.

G3 REMOVABLE STEEL PARK BOLLARD POST INSTALLATION

The contractor shall supply all materials, equipment and labour necessary to complete supply and installation of removable steel park bollard posts as per the Contract Drawings and Details.

Basis for Payment

Payment shall be as per the units indicated in the Schedule of Quantities and Unit Prices for each item noted.

G4 BENCH INSTALLATION

The contractor shall supply all materials, equipment and labour necessary to complete supply and installation of bench as per the Contract Drawings and Details.

Basis for Payment

Payment shall be as per the units indicated in the Schedule of Quantities and Unit Prices for each item noted.

G5 RETAINING WALL SYSTEM

The contractor shall supply all materials, equipment and labour necessary to complete supply and installation of retaining wall system as per the Contract Drawings and Details.

Stamped shop drawings shall be supplied for approval prior to ordering material.

Basis for Payment

Payment shall be as per the units indicated in the Schedule of Quantities and Unit Prices for each item noted.

G6 LANDSCAPING

In addition to the conditions stipulated in the Niagara Peninsula Contract Document, OPSS 802, the following shall also apply:

Payment shall be made under this item for the supply and installation of plants in accordance with the Contract Drawings.

All planting and related work shall be done by experienced, qualified personnel, under the direction and supervision of foremen with at least five (5) years of horticultural and planting experience.

All trees shall be nursery grown, true to type and structurally sound, with straight trunks and leaders intact, and be well and characteristically branched for the species, Root balls shall not be cracked, broken, or damaged. All plants shall be free of disease, insect infestation, rodent damage, sun scald, frost cracks and other abrasions or scars to the bark. They shall be densely foliated when in leaf and have healthy developed root systems. Plant names shall be in conformity with that accepted in the nursery trade.

Substitutions for the specified plants will not be accepted unless approved in writing by the Contract Administrator. The Contract Administrator reserves the right to reject any plant material, whether planted or not, which does not conform to the specifications. Do not remove any labels from plants until they have been inspected and approved by the Engineer.

All debris, clay lumps, roots and stones over 50 mm in diameter and other extraneous matter shall be removed from excavated soil to be used in backfill and disposed of offsite.

This item includes grading and reinstatement of the planting area adjacent to Shriners Creek and retaining wall.

Shredded bark mulch free of any granular and organic material will be applied over planting pit areas of trees and throughout shrub beds in accordance with the Contract Drawings. A sample of the mulch to be used shall be submitted to the Engineer for approval.

Maintain all plant material and assume full responsibility for protection of all planted areas until final acceptance of all project work. Keep planted areas free of weeds at all times. Remove all debris, broken branches, etc., and maintain planted areas in neat condition at all times. Water plants as necessary with sufficient quantities of water to moisten the entire root system.

Submit a written warranty to the effect that all materials and workmanship be guaranteed for a period of two (2) years following project completion. All plants that are dead, or not in a healthy, satisfactory growing condition, or which in any way do not meet the requirements of the specifications, shall be replaced by the Contractor at the Contractor's expense. All required replacements shall be as originally specified. The warranty on replacement plant material shall be extended for a period equal to the original warranty period.

Final inspection of all plantings shall be made at the end of the specified warranty period. Stakes and all staking material shall be removed at the end of the warranty period. The Contract Administrator or Owner reserves the right to extend Contractor's warranty responsibilities for an additional year if, at end of initial warranty period, plant condition is not sufficient to ensure future health.

PROVISIONAL ITEMS

NOTE: Provisional items have been included within this contract in an effort to receive competitive pricing in the unlikely event that they may be required during construction. These items may be related to any infrastructure works (Roads/Sewer/Watermain) within the specific Section of the Schedule of Quantities and Unit Prices and as such have been separated within these supplementary specifications.

All Provisional Items must be approved by the Contract Administrator.

P1. 32MPA CONCRETE

This concrete shall have minimum 28 day strength of 32 MPa. The price indicated in the Schedule of Quantities and Unit Prices per cubic metre (m³) shall include supply and placement of concrete in trench at any depth for whatever purpose as directed by the Contract Administrator.

P2. USE OF REGIONAL POLICE FOR TRAFFIC CONTROL

At the intersection of **Whirlpool Road and Niagara Parkway** and any of the cross streets within the project limits, in the interest of the safe movement of both vehicular and pedestrian traffic, the City or Region may require the use of Regional Police forces to undertake Traffic Control during certain Contractor operations. The need for utilization of Regional Police forces will be solely judged by the City, in consultation with the Contractor and/or Region as applicable.

This issue will be reviewed along with the Contractor's Traffic Control and Management Plan during the Pre-Construction Review Meeting. The scheduling and coordination of this work will be undertaken by the Contractor and the unit price bid shall be deemed to have made due allowance for this requirement.

P4. UNSHRINKABLE FILL

The provisions of OPSS MUNI. 1359 (Nov 2016) apply as amended herein.

All unshrinkable fill materials shall conform to the requirements of OPSS.MUNI 1350 (Nov 2019).

Basis for Payment

Payment at the unit price bid for this item shall include all labour, materials and equipment necessary to supply and place unshrinkable fill for whatever purpose as directed by the Contract Administrator.

P5. 19MM CLEAR STONE

All 19mm clear stone materials shall conform to the requirements of OPSS.MUNI 1010 (Nov. 2013).

Basis for Payment

Payment at the unit price bid for this item shall include all labour, materials and equipment necessary to complete the work for supplying and placing the 19mm clear stone as shown on the contract drawings or as directed by the Contract Administrator.

Payment will be by the tonne, based on submitted weigh tickets for same.

P8. UTILITY POLE SUPPORT DURING EXCAVATION

This item shall be used for the support and protection of utility poles during excavation and all related construction activities. Pole for the purposes of this specification shall include the pole (any material), base, underground or above ground supports (such as guy wires), cables, wires, distribution boxes, arms, luminaires, traffic signals, junction boxes, transformers, meters, or any other equipment directly attached to or associated with the pole.

It is the Contractor's responsibility to confirm and coordinate with the respective utility regarding any specific requirements necessary to support and protect the pole during excavation. The unit price bid shall have made due allowance for this requirement.

If the pole is damaged, the Contractor shall immediately cease construction and notify the utility company. All costs to repair or replace the pole shall be borne by the Contractor at no additional cost to the contract. Compensation related to down time, standby time or other delay, related to the pole repair or replacement, will not be entertained.

Basis for Payment

Payment at the unit price bid for this item shall include all labour, materials and equipment necessary to support and protect the utility pole as in accordance with the respective utility requirements.