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Electrical Standard Specifications and Standard Drawings

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CP 601.01 Electrical Work – General Specifications

OPSS.MUNI 106, April 2017 shall apply.

OPSS.MUNI 106.07.02 has been amended and extended as follows:

The contractor shall obtain unique permits for all proposed electrical services, temporary traffic signal systems and new traffic signal systems. Regarding Hydro One contracts and agreements, the contractor is responsible to obtain and request all permits and layouts as required. The City will sign and approve customer service contracts, along with initial connection permit payment with Hydro One however the contractor is responsible to perform installation as requested by Hydro One in the contract. Any additional fees in relation to work completion of this contract including but not limited to termination/cancel fees, additional trip charges etc. will be the responsibility of the contractor.

The Contractor is required to notify the Contract Administrator a minimum of three (3) business days prior to scheduled testing/inspection in accordance with CP 601.02.

A copy of all permits, inspection reports and certificates shall be submitted to the Contract Administrator prior to the commencement of work and/or the energizing of systems. The contractor will provide the following to the Contract Administrator three (3) business days prior to scheduled turn-on:

1. A copy of the invoice for initial ESA permit application;
2. Connection Authorization Verification for Hydro Service; and,
3. ESA Certificate of Inspection for new Traffic Signals and/or Beacons.

No additional payment above and beyond the items in Schedule of Unit Prices will be made for Permits or Connection Fees.

Contractor Supplied Equipment

Contractor shall supply the type of equipment as specified in the Contract Documents and the City of Peterborough Electrical Specifications. Where noted “or approved equivalent”, the contractor may submit a request to the Contract Administrator to substitute the specified equipment with a different brand, make or model. By making this request it is the sole responsibility of the contractor to provide detailed justification to deviate from the specified equipment, relevant product specifications, independent test results, and sample product for the City’s review.

If the City of Peterborough has no experience with the proposed product or has any concerns with the products performance or longevity, the City will decline the request and the Contractor shall provide the equipment as specified. If the City of Peterborough can easily satisfy themselves that the proposed substitute product is equivalent, the request may be approved. The City of Peterborough hereby reserves the right to accept or reject a request to substitute without dispute.

The Contractor shall at no time supply and install equipment that has not been specified or approved by the City of Peterborough or delay the progress of work based on a request to substitute.

CP 601.02 Quality Control

The price identified in the Schedule of Unit Prices shall be full compensation for the contractor to employ or retain one or more Professional Engineers to provide services of a Quality Verification Engineer (QVE), selected from the Ministry of Transportation's RAQ system.

The QVE shall inspect all aspects of the construction of the traffic signal electrical systems ensuring all testing and inspection are complete and passed prior to activation in accordance with OPSS and [City of Peterborough Quality Control Plan - Electrical](https://www.peterborough.ca/en/doing-business/resources/Documents/E---Electrical-quality-controls.pdf) [https://www.peterborough.ca/en/doing-business/resources/Documents/E---Electrical-quality-controls.pdf].

The inspection and testing results shall be approved and certified by the QVE Engineer.

The QVE Engineer shall issue Proof of Performance Certificates for specific electrical items as they are installed as well as a Certificate of Conformance for all the traffic signal works and equipment. The Certificate of Conformance shall indicate that all the work has been completed, inspected, tested and that the materials and installation meet the requirements of the contract, the City of Peterborough Electrical Specifications and industry standards.

The Certificate of Conformance shall also certify that the new traffic signal systems are approved for turn-on. This Certificate must be provided to the Contract Administrator prior to activation.

CP 601.03 Supply/Install Temporary Traffic Signals

OPSS.MUNI 106, April 2017 shall apply.

The unit price identified in the Schedule of Unit Prices shall include all labour, equipment and material necessary to modify, install, maintain and operate the traffic signal control device, intersection / roadway lighting and associated electrical work. The unit price bid also includes the removal of the temporary signals including all necessary restoration.

The Contractor shall assume maintenance and provide temporary signal and lighting modifications at the intersection or road section detailed in the Contract drawings. All temporary signal installation shall be in accordance with OPSD 2540.01, 2242.02 and 2245.01, as applicable.

All temporary traffic signal equipment supplied by the Contractor shall remain the Contractor's property at the end of the project. This equipment shall include:

- Temporary traffic signal heads,
- Temporary signal span wire and related mounting hardware,
- Temporary wood poles,
- Temporary back guy anchors,
- Temporary steel messenger cable and associated mounting devices,
- Temporary signal cable,
- Temporary pedestrian push buttons,
- Temporary video / radar detection cable,
- Temporary video / radar detection equipment (Provisional),
- Temporary Uninterruptible Power Supply (UPS) (Provisional),
- Temporary emergency pre-emption cable,
- Temporary ground electrodes / wire,
- Temporary luminaires and elliptical brackets,
- Temporary street lighting cable, and
- Overhead street name signs and associated mounting devices.

Note: The City of Peterborough will supply the temporary pole mount NEMA controller cabinet assembly.

The unit price identified in the schedule of unit prices shall be full compensation to install and connect the City of Peterborough supplied temporary NEMA controller cabinet assembly as shown on the contract drawings. The unit price bid shall also include but not limited to all cabinet brackets, mountings, bands, bolts, fittings, wiring connections, testing, programming, traffic control (including pay duty police) and turn-on. It is required before the cabinet is energized, the Contractor document and complete a Detailed Installation Checklist confirm all aspects of the controller cabinet installation are complete.

The contractor is required to notify the Contract Administrator three (3) business days prior to arrange receipt of the temporary controller cabinet assembly at a City facility. The contractor is required to inspect and document the City supplied controller cabinet assembly for deficiencies prior to taking possession. Once the contractor takes possession of controller cabinet assembly, the contractor is responsible for safeguarding the controller cabinet assembly prior to installation.

The contractor is required to notify the Contract Administrator a minimum of three (3) business days prior to any field testing. It is anticipated that testing should take approximately three (3) hours, if testing extends beyond three (3) hours the contractor shall be responsible for the cost of all City and police personnel in attendance. The intersection must be under the control of a pay duty police officer during field testing.

The Contractor shall arrange for the connection of electrical power with the local hydro authority to co-ordinate the service layout and the installation of steel messenger cable within the vicinity of existing overhead hydro utilities and to pay for all permits including

ESA inspection permits, licences and fees and the price for these inspections shall be included in the appropriate bid item.

A copy of all permits, inspection reports and certificates shall be submitted to the Contract Administrator prior to the commencement of work and/or the energizing of systems. ESA Certificate of Inspection for Hydro service and ESA Certificate of Inspection for new Traffic Signals and /or Beacons shall be submitted to the Contract Administrator three (3) business days prior to scheduled turn-on.

The Contractor is hereby advised that pre-marked pavement marking must be installed prior to turn-on of temporary traffic signals and pavement markings must be installed prior to signal activation/turn-on.

The Contractor will perform all routine and emergency maintenance work required for proper operation of the temporary traffic signal and roadway lighting systems during the period of construction. Routine maintenance of the temporary traffic signal control devices shall include, but not limited to weekly measurement of the traffic signal cable spans to confirm the minimum signal head mounting heights of the overhead traffic signal facilities. The Contractor shall provide a summary of the weekly measurements to the Contract Administrator for review and record. There will be no additional payment for this work.

The Contractor shall be advised that under the Contract they will need to permit the City's Maintenance Contractor access to the traffic signal cabinet assembly to conduct the scheduled traffic signal control unit routine maintenance. The City's Maintenance Contractor responsibility would be limited to the traffic signal control unit located within the cabinet while the intersection is under construction.

Under the different stages of the temporary traffic signal operations, traffic signal heads, pedestrian signal heads, emergency pre-emption detection units, and video/radar detection units may need to be relocated to the positions identified on the Contract drawings or as directed by the Contract Administrator. The Contractor shall be responsible for all costs associated with the relocation.

The Contractor shall notify the Contract Administrator three (3) working days in advance of any work needing to be completed in the traffic controller cabinet, so arrangements can be made for the City's Traffic Signal Maintenance staff to be on site.

Definitions

For the purpose of this specification, the following definitions are applicable:

Emergency Maintenance: means any activity required to bring the temporary traffic signal system to full functionality in accordance with the specifications other than Routine Maintenance activities.

Routine Maintenance: means ongoing preventive maintenance activities in accordance with the manufacturers' recommendations and includes the periodic adjustment of the

temporary traffic signal system components to correct deviations from the system specifications resulting from normal operation of the system.

System Components: means all hardware and software components, devices, parts and materials included in the temporary traffic signal system supplied and installed by the Contractor.

Equipment: means all electrical or mechanical devices and vehicles used or reasonably required for use in emergency repairs or routine maintenance and operation of the temporary traffic signal system.

Used Equipment and Materials - Temporary

Used equipment and materials, except cables and LED modules, may be used in the **maintenance and operation** of temporary installations provided that:

- All material components or completed assemblies of components have C.S.A. or UL approval,
- Complies with the requirements of the contract; and
- It is in good condition.

Used equipment and material meeting the requirements of the specifications shall be acceptable for use for the following items:

- Poles,
- Luminaires and Elliptical Brackets,
- Traffic Signal Heads and Associated Hardware,
- Temporary video / radar detection equipment (Provisional); or
- Temporary Uninterruptible Power Supply (UPS) (Provisional).

Should the Contractor elect to employ used equipment, the Contractor shall indemnify and hold the Corporation of the City of Peterborough harmless from all and every claim arising from the used of used materials.

Basis of Payment

Payment for the temporary items shall be made at the rate of 80% of the contract price upon acceptance of the installation and at the rate of 20% of the contract price upon acceptance of the removal work, in compensation for all labour, equipment and materials required to complete the work, maintain, operate, including adjustment and/or relocation of signal heads during various stages of construction. The work is subject to the provisions for advance payments for materials and hold back as given in the General Conditions of Contract.

Reference:

- OPSS.MUNI 604 – Specification for Installation of Cable

- OPSS.MUNI 610 – Specification for Removal of Electrical Equipment and Materials
- OPSS.MUNI 615 – Specification for Installation of Poles
- OPSS.PROV 622 – Specification for Installation of Traffic Signal Controllers
- CP601.01 – Electrical Work – General Specifications
- CP601.02 – Quality Control
- CP603.01 – Supply and Install Rigid PVC Conduit, Direct Buried
- CP604.02 – Supply and Install Low Voltage Cable
- CP604.03 - Supply and Install Optical Pre-Emption Detector Cable and Equipment
- CP609.01 - Supply and Install Ground Plate
- CP609.02 - Supply and Install Ground Wire
- CP620.03 – Supply and Install Pedestrian Signal with Countdown Signal Head
- CP620.04 - Supply and Install Traffic Signal Head, Led

CP 602.01 Supply and Install Precast Concrete Electrical Handwell and Cover

OPSS.MUNI 602, November 2017 shall apply except as amended and extended herein.

All unused knockout holes shall be grouted.

OPSS.MUNI 602.10 has been amended and extended as follows:

Payment at the contract price shall be full compensation for all labour, equipment and materials necessary to Supply and Install 460 mm, 600 mm, 675 mm diameter and 600 mm x 600 mm Pre-cast Electrical Handwell and Covers as shown on the Contract Drawings including backfill and covers set to proposed finished grade.

Frames and Covers:

Frame and Cover for 600 mm x 600 mm Pre-cast Electrical Handwell shall be in accordance with (OPSD 401.010 Type A) (OPSS.MUNI 407).

In addition, one 3/8" ground lug for #6 AWG stranded copper shall be attached to frame. (OPSD 2117.02)

Minimum of one (1) and a maximum of three (3) pre-cast adjustment units shall be installed. (OPSS.MUNI 407.07.15) (OPSD 704.010)

OPSD 2123.03 has been amended and extended as follows:

Duct entry holes are to be filled flush with a cement mortar mix to provide a smooth watertight finish.

Reference:

- OPSD 401.010 – Square Frame with Circular Closed Cover

- OPSD 704.010 – Precast Concrete Adjustment Units
- OPSD 2112.020 – Precast Concrete 460 mm Electrical Handhole
- OPSD 2112.030 - Precast Concrete 675 mm Electrical Handhole
- OPSD 2112.040 - Precast Concrete 600mm x 600mm Electrical Handhole
- OPSD 2117.02 – General Installation Requirements for Electrical Handholes
- OPSD 2123.01 – Electrical Maintenance Holes Entry of Direct Buried Ducts

CP 603.01 Supply and Install Rigid PVC Conduit Direct Buried

OPSS.MUNI 603, April 2021 shall apply except as amended and extended herein.

OPSS.MUNI 603.05.08 has been amended and extended as follows:

All ducts shall be PVC Rigid Duct in accordance with CSA C22.2 No. 211.2.

PVC DB2 type duct will not be accepted.

Where unshrinkable backfill is required, backfill material shall be in accordance with OPSS.MUNI 1359 and shall be placed to the underside of base asphalt.

OPSS.MUNI 603.09.01.01 has been amended and extended as follows:

Measurement for payment of duct shall be per lineal meter of duct bank.

OPSS.MUNI 603.10 has been amended and extended as follows:

Payment at the Contract price shall be full compensation for all labour, equipment and material necessary to Supply and Install Direct Buried Rigid PVC Duct as shown on the Contract Drawings: including excavation of trenches, removal and disposal of materials, bedding, backfill and compaction, supply and installation of the duct, fish line, all bends, risers, caps, spacers, connection structures and 1/C #12 AWG copper tracer wire in all empty and spare ducts, and testing.

All conduits and duct systems shall be tested/proven to be free of stones, dirt, water and other debris by pulling a test mandrel, 1/4 inch (6.4 mm) smaller in diameter than the nominal conduit or duct size and 12 inches (300 mm) in length, through each individual conduit or duct.

All sections of pipe that fail testing under City of Peterborough Electrical Quality Control Specifications shall be repaired and retested to the satisfaction of the Contract Administrator.

OPSS.MUNI 604.05.12 has been amended and extended as follows:

Fish line shall be Polyester Mule tape installed one (1) length free of joints or knots.

OPSD 2123.03 has been amended and extended as follows:

Duct entry holes are to be filled flush with a cement mortar mix to provide a smooth watertight finish. Proposed ducts within the roadway shall be installed prior to the placement of Granular 'B'.

Reference:

- OPSD 2101.01 – Duct Installation in Trenches
- OPSD 2103.02 – Duct Installation Profiles
- OPSD 2103.03 – Duct Installation in Existing Paved Area (Unshrinkable Backfill)
- OPSD 2103.04 – Duct Installation in Existing Paved Area (Granular Backfill)
- OPSD 2103.05 – Duct Installation at Utility Crossings
- OPSD 2123.01 – Electrical Maintenance Holes Entry of Direct Buried Ducts
- OPSD 2123.03 – Entry of Direct Buried and Encased Ducts

CP 604.01 Supply and Install Extra Low Voltage Cables

OPSS.MUNI 604, November 2017 shall apply except as amended and extended herein.

All cables entering the traffic signal controller cabinet shall be labeled using a permanent marking system to the satisfaction of the Contract Administrator.

OPSS.MUNI 604.07.13 has been amended and extended as follows:

Extra low voltage cable splices underground shall be completed using a cable splicing kit (Raychem GEL pack enclosure or 3M Scotch splice kit) for the connection of the loop wire to the home run cable in a Handwell and/or pole base, in the location shown on the contract drawings. The installation of each splice kit shall be in accordance with the manufacturer's requirements.

The unit price identified in the schedule of the unit prices shall include all labour, equipment and material necessary to install and connect Duplex, Simple and Diamond loop detectors using insulated crimped spade connectors to the controller.

Extra-low voltage cables for use of traffic signal actuation devices shall meet or exceed the OPSS.MUNI 2410, November 2017 and "3M" Traffic Control System Specification for Model #30003 cable.

No substitution for this cable is permitted.

Reference:

- OPSD 2530.01 – Splices for Traffic Signal Cable and Extra Low Voltage Cable

CP 604.02 Supply and Install Low Voltage Cable

OPSS.MUNI 604, November 2017 shall apply except as amended and extended herein.

All cables entering the traffic signal controller cabinet shall be labeled using a permanent marking system to the satisfaction of the Contract Administrator. Low Voltage runner cables shall be labeled by group at all splicing or termination points.

OPSS.MUNI 604.07.06 has been amended and extended as follows:

A minimum of 300 mm length of lighting, traffic signal and power cables shall be left at all accessible pulling points, splicing points, or cable termination points. A coil length of low-voltage traffic signal cable and extra low-voltage cables shall be left at all electrical maintenance hole/hand-hole and underground junction boxes so that a minimum of 1.0 m total length of cable may be pulled out above finished grade.

Low voltage connections within poles, signal heads, pedestrian heads, etc. shall be connected using appropriately sized insulated wing nut vibration proof spring connectors for all electrical connections held in place with three laps of electrical vinyl tape.

The unit price identified in the schedule of the unit prices shall include all labour, equipment and material necessary to install and connect low voltage cable including all connectors.

All traffic signal cables shall meet or exceed OPSS.MUNI 2409. **IMSA type cable will not be accepted.**

Reference:

- OPSS 2242.01 – Wooden Pole with Neutral Supported Cable
- OPSS 2242.02 – Wooden Poles with Aerial Cables Lashed on Messenger
- OPSS 2245.01 – Installation of Aerial Cable Systems
- OPSS 2245.020 – Minimum Vertical Clearances for Aerial Cable Systems
- OPSS 2530.01 – Splices for Traffic Signal Cable and Extra Low Voltage Cable
- OPSS 2545.01 – PVC Junction Box for Signal Cable Splicing

CP 604.03 Supply and Install Optical Pre-Emption Detector Cable and Optical Detector Equipment

OPSS.MUNI 604, November 2017 shall apply except as amended and extended herein.

The unit price identified in the schedule of the unit prices shall include full compensation to supply and install 3/C STROBCOM II optical pre-emption detector cable (TOMAR Model M913) from the controller cabinet in ducts to optical detectors, mast arm detector mount (BIRDMNT), TOMAR STROBECOM II optical pre-emption detectors (MODEL 4090-1-SD) as shown on the drawings.

This item shall also include, 1 – Tomar model 4140v2-2 and 1 – Tomar model 2086 Aux transit band output module or approved equivalent. This item shall also include installation, connection and testing of the pre-emption card. Each optical detector shall be connected independently.

CP 604.04 Supply and Install Pedestrian Pushbuttons and Cable

OPSS.MUNI 604, November 2017 shall apply except as amended and extended herein.

The unit price identified in the Schedule of Unit Prices shall include all labour, equipment and material necessary to Supply and Install Polara Momentary Bull Dog III (Tacel Part #PBB3BYM) with the Polera Bull Dog Cup (Tacel Part PXBDPBC1), PB Frame (Tacel part PXBF57Y), PXNGSB or MUTCD R10-3B 5"x7" Pedestrian Pushbutton sign as shown on the contract drawings. Pushbutton equipment shall be installed in accordance with the manufacturer's specifications. All phases are to be individually cabled. The pedestrian pushbuttons are to be installed and connected using Beldon two conductor #14 AWG extra low voltage cable.

Reference:

- OPSS 2530.01 – Splices for Traffic Signal Cable and Extra Low Voltage Cable
- OPSS 2545.01 – PVC Junction Box for Signal Cable Splicing

CP 604.05 Supply and Install Audible Pedestrian Pushbutton and Cable

OPSS.MUNI 604, November 2017 shall apply except as amended and extended herein.

The unit price identified in the Schedule of Unit Prices shall include all labour, equipment and material necessary to Supply and Install Polara iNS2 APS Central Control Unit Model Number *CACCUS2A* complete with the interface board and cables, (CSA Approved), *PBISAAB iN2 iNavigator* Audible pedestrian pushbutton (Yellow front/Black back) with the Canadian melody and PXNGSB pedestrian sign as shown on the contract drawings. Pushbutton equipment shall be installed in accordance with the manufacturer's specifications. All phases are to be individually cabled. The pedestrian pushbuttons are to be installed and connected using Beldon two conductor #14 AWG extra low voltage cable.

A custom message is to be added to each unit. It is the contractor's responsibility to request from the City of Peterborough the custom message phrasing from the Contract Administrator. It is the contractor's responsibility to relay the custom message phrasing to the supplier. The contractor is required to have the custom message pre-approved by the Contract Administrator and installed prior to turn-on.

Prior to turn on, the manufacturer's representative shall be available to meet with a City of Peterborough Traffic and Parking Services representative on-site to set-up and test the equipment. It is the Contractor's responsibility to arrange for this meeting and provide the Contract Administrator a minimum of three (3) business day's notification of the meeting date.

Reference:

- OPSS 2530.01 – Splices for Traffic Signal Cable and Extra Low Voltage Cable
- OPSS 2545.01 – PVC Junction Box for Signal Cable Splicing

CP 604.06 Supply and Install Fibre Optic Interconnect Cable in Ducts

OPSS.MUNI November 2017 shall apply except as amended and extended herein.

The unit price identified in the Schedule of Unit Prices shall include all labour, equipment and material necessary to Supply and Install Fibre optic cable with 1/C#12 AWG copper tracer wire.

OPSS.MUNI 604 is amended as follows:

Sub-section OPSS.MUNI 604.05 is amended by the addition of the following:

OPSS.MUNI 604.05.13 Fibre Optic COMM Cables

Fibre Optic COMM Cables for inter-connect shall be 48 strand Single Mode 1310 / 1550 nm, Gel-Free non-armored underground Fibre Optic Cable. Contractor shall leave a 20

m coil in the base section of the traffic signal controller cabinet for connection by others. Measurement for payment under this item shall be per lineal meter of cable installed.

CP 609.01 Supply and Install Ground Plate

OPSS.MUNI 609, November 2019 shall apply except as amended and extended herein.

Ground Plates shall be in accordance with OPSS.MUNI 609.05.02

Ground Connectors shall be in accordance with OPSS.MUNI 609.05.05

Ground Conductor connecting Ground Plate to grounding grid shall be #6 AWG direct buried bare copper.

The unit price identified in the schedule of unit prices shall be full compensation for the supply of all necessary labour, equipment and material necessary to Supply and Install Ground Plates including bare copper conductor. OPSS.MUNI 609 has been amended to allow clamp connections to the ground plate provided they meet all ESA specifications.

OPSS.MUNI 609.07.13 has been amended and extended as follows:

All Ground Plate installations are to be inspected by the Contract Administrator prior to backfill. The Contractor is responsible to notify the Contract Administrator that the ground plates are installed and ready for inspection 24 hours prior to backfill.

OPSS.MUNI 609.10 has been amended and extended as follows:

Payment at the Contract price shall be full compensation for all labour, equipment and materials necessary to Supply, Install and Connect Ground Plates as shown on the Contract Drawings.

CP 609.02 Supply and Install Ground Wire

OPSS.MUNI 609, November 2019 shall apply except as amended and extended herein.

Ground Connectors shall be high-pressure irreversible type copper connectors. No other type of connector will be accepted. Ground conductor for grounding grid shall be #6 AWG copper wire.

All grounding shall be resistance tested to ground as per OPSS.MUNI 609.07.13 and certified by the Quality Verification Engineer.

Ground Conductor installed within ducts shall be insulated.

OPSS.MUNI 609.10 has been amended and extended as follows:

Payment at the contract price shall be full compensation for all labour, equipment and materials necessary to Supply, Install and Connect Ground Wire as shown on the Contract Drawings.

Reference:

- OPSD 2117.01 – Electrical Maintenance Holes Installation Requirements
- OPSD 2117.02 – Electrical Handholes Installation Requirements
- OPSD 2547.01 – Traffic Signal and Illumination Grounding System

CP 610.01 Remove/Salvage Existing Streetlight/Traffic Signal Equipment

OPSS.MUNI 610, April 2017, shall apply except as amended and extended herein.

The unit price bid identified in the schedule of unit prices shall be full compensation to carefully remove and salvage the existing streetlight and traffic signal equipment as shown on the contract drawings including poles, footings, luminaries, signal heads, pedestrian crossing heads, arms and assemblies etc.

All traffic signal equipment is to be documented and photographed and to be delivered to the Public Works Yard or alternate location as directed by the Contract Administrator. A copy of all the documented material must be provided to the Contract Administrator.

Missing or un-documented material will result in non-payment of that item. All salvaged traffic signal equipment is to be carefully and neatly stacked on wood pallets. The Contractor is responsible to notify the Contract Administrator two (2) working days in advance of delivery so that the equipment may be received by a City Transportation Division representative.

CP 614.01 Supply and Install Power Supply Cabinet with Meter Base

OPSS.MUNI 614, November 2019 shall apply except as amended and extended herein.

The unit price identified in the Schedule of Unit Prices shall include the supply and installation of Model SLT power supply cabinet with meter base, part number SLT1-8-40/1-30/3-15-ASA61 manufactured by Pedestal Solutions Inc. and Model BCP 20PED pre-cast concrete base manufactured by Brooklin Concrete or approved equivalent as shown on the Contract Drawings. The power supply cabinet shall include but not be limited to circuit breakers as follows:

Number	Type	Purpose
1	2 Pole, 60A	Main
8	1 Pole, 40A	Illumination
1	1 Pole, 30A	Controller
3	1 Pole, 15A	Spare

The unit price identified in the Schedule of Unit Prices shall also include all fees for permits, inspections, approvals, and connections /disconnections necessary to energize the illumination and traffic signal systems. The contractor shall also supply and install a waterproof padlock and provide two sets of keys to the Contract Administrator once the power supply cabinet has been energized.

Cabinet Paint Colour – Polyester Powder, Baked Enamel asa 61 Grey

All cables entering into the power supply cabinet shall be labeled using a permanent marking system to the satisfaction of the Contract Administrator.

Pre-cast concrete base to be installed on a 300 mm granular 'A' bedding and shall have a minimum of 150 mm of granular 'A' backfill.

Power Supply Cabinet to be installed as per IPSTR-3010.02 or IPSTR-3010.04

OPSS.MUNI 614.10 has been amended and extended as follows:

Payment at the contract price shall be full compensation for all labour, equipment and materials necessary to Supply, Install and Connect Power Supply Cabinet as shown on the Contract Drawings including but not limited to all cabinet brackets, mountings, bands, bolts, fittings, wiring connections and aggregates.

Reference:

- IPSTR-3010.02 – Concrete Controller Pad Detail with UPS and Power Supply

- IPSTR-3010.04 – Concrete Controller Pad Detail with Future UPS and Power Supply

CP 614.02 Supply and Install Power Supply Cabinet without Metering

CP 614.01 shall apply except as amended and extended herein.

When metering the power supply cabinet is not required, the unit price identified in the Schedule of Unit Prices shall include the supply and installation of Model SL42 with 30A disconnect power supply cabinet without metering base, part number SL42X-X-XX-DS30 manufactured by Pedestal Solutions Inc. and Model BCP 20PED pre-cast concrete base manufactured by Brooklin Concrete or approved equivalent as shown on the Contract Drawings. The power supply cabinet shall include but not limited to the fusible disconnects and circuit breakers as follows:

Number	Type	Purpose
1	2 Pole, 30A	30A Fusible Disconnect Service Entrance Rated (22kA I.C.) with 2x 30A Type R Fuses
As required	1 Pole, 15A	Illumination
1	1 Pole 15A	Spare

The unit price identified in the Schedule of Unit Prices shall also include all fees for permits, inspections, approvals, and connections/disconnections necessary to energize the illumination and/or other systems. The contractor shall also supply and install a waterproof padlock and provide two sets of keys to the Contract Administrator once the power supply cabinet has been energized. This padlock and key shall match and be compatible with the City's current master key for traffic and power supply cabinets.

Cabinet Paint Colour – Polyester Powder, Baked Enamel asa 61 Grey

All cables entering into the power supply cabinet shall be labeled using a permanent marking system to the satisfaction of the Contract Administrator.

Pre-cast concrete base to be installed on a 300 mm granular 'A' bedding and shall have a minimum of 150 mm of granular 'A' backfill.

Power Supply Cabinet to be installed as per IPSTR-3010.02 or IPSTR-3010.04

OPSS.MUNI 614.10 has been amended and extended as follows:

Payment at the contract price shall be full compensation for all labour, equipment and materials necessary to Supply, Install and Connect Power Supply Cabinet as shown on

the Contract Drawings including but not limited to all cabinet brackets, mountings, bands, bolts, fittings, wiring connections and aggregates.

CP 615.01 Supply and Install Heavy Class Base Mounted Steel Pole

OPSS.MUNI 615, November 2017 shall apply except as amended and extended herein.

OPSS.MUNI 615.05.03 has been amended and extended as follows:

Steel poles shall be Heavy Class Octagonal Tapered Steel Traffic Poles as manufactured by Valmont Industries, Inc. Polefab Inc. or Spina's Steel Workers Co., Ltd. or approved equivalent. The poles shall be octagonal, non-frangible base, hot dipped galvanized steel and are to be supplied complete with galvanized hand hole covers and pole caps. Pole heights are to be as illustrated on the contract drawings.

Where poles are perforated for cables or cut for any reason, they shall be treated with a zinc rich compound and fitted with rubber grommets.

OPSS.MUNI 615.10 has been amended and extended as follows:

Payment at the contract price shall be full compensation for all labour, equipment and materials necessary to Supply and Install Steel Pole Heavy Class Base Mounted as shown on the Contract Drawings.

Handhole height to be as per IPSTR-3010.03

Reference:

- OPSD 2215.03 – Pole Mounting Details for Base Mounted Metal Pole
- OPSD 2220.01 – Pole Handhole Locations
- OPSD 2414.010 – 3.3 m Aluminum and Sectional Steel Poles, Base Mounted
- USDTR-3010.03 – Heavy Duty Class Base Mount Steel Pole

CP 615.02 Supply and Install Direct Buried Round Class C – Heavy Duty Concrete Pole

OPSS.MUNI 615, November 2017 shall apply except as amended and extended herein.

OPSS.MUNI 615.05.03 has been amended and extended as follows:

Concrete street lighter poles shall be Round Class C – Heavy Duty Poles as manufactured by StressCrete, Utility Structures Inc. (USI) or approved equivalent. Pole heights are to be as illustrated on the contract drawings.

OPSS.MUNI 615.10 has been amended and extended as follows:

Payment at the contract price shall be full compensation for all labour, equipment and materials necessary to Supply and Install Direct Buried Round Class C – Heavy Duty Concrete Pole as shown on the Contract Drawings.

Reference:

- OPSD 2225.010 – Concrete Lighting Pole, Direct Buried
- OPSD 2410.01 – Spun Concrete Pole, Class “D”

CP 615.03 Supply and Install 1.5 m Aluminum Pedestrian Pole and Concrete Footing

OPSS.MUNI 615, November 2017 shall apply except where amended and extended herein.

OPSS.MUNI 616, April 2018 shall also apply.

The unit price identified in the schedule of unit prices shall include all labour, equipment and material necessary to Supply, Install and Connect 1.5 m Aluminium Pole Straight Round for Pedestrian Push Buttons as manufactured by Sentinel Pole and Traffic Equipment or approved equivalent, including 300 mm diameter x 1200 mm depth concrete footing, 19 mm galvanized bolt type NCA pre-set anchor or approved equivalent and 50 mm rigid PVC conduit.

Payment at the contract price shall be full compensation for all labour, equipment and materials necessary to Supply and Install 1.5 m aluminum Pedestrian Pole and Footing as shown on the Contract Drawings.

Reference

- OPSD 2200.041 – Concrete Footing for 1.5m Base Mounted Pedestrian Pole
- OPSD 2558.000 – Pole for Accessible Pedestrian Signal Push Button

CP 616.01 Construct Concrete Controller Pad

OPSS.MUNI 616, April 2018 shall apply except as amended and extended herein.

The unit price identified in the schedule of the unit shall include all labour, equipment and material necessary to construct concrete controller pad for type M cabinet in accordance with IPSTR 3010.00, 3010.01, 3010.02, and 3010.04 as shown on Contract Drawings. The unit price bid shall also include the supply and installation of all ductworks between the controller pad and handwell 1, power supply, communication pole and UPS where specified. The orientation of the ductwork entering the controller pad may vary. See Contract Drawings for configuration.

Testing and sampling of concrete shall be in accordance with CP315.01.

OPSS.MUNI 616.10 has been amended and extended as follows:

Payment at the contract price shall be full compensation for all labour, equipment and materials necessary to Construct Concrete Controller Pad as shown on the Contract Drawings.

Reference:

- IPSTR-3010.00 – Concrete Controller Pad Detail
- IPSTR-3010.01 – Concrete Controller Pad Detail with UPS
- IPSTR-3010.02 – Concrete Controller Pad Detail with UPS and Power Supply
- IPSTR-3010.04 – Concrete Controller Pad Detail with Future UPS and Power Supply

CP 616.02 Supply and Install concrete Footing for Base Mounted Pole

OPSS.MUNI 616, April 2018 shall apply except as amended and extended herein.

The unit price identified in the schedule of unit prices shall include all labour, equipment and material necessary to construct footings for base mounted poles as shown on the Contract Drawings in accordance with OPSD 2200.01 and IPSTR-E1. Anchor assemblies shall be installed in accordance with OPSD 2215.02 as amended to specify a Richmond type anchor.

Testing and sampling of concrete shall be in accordance with CP351.01.

OPSS.MUNI 616.10 has been amended and extended as follows:

All pole base footings shall be augured, hydro vacuumed or hand dug. No excavator shall be used. The unit price for pole footings in grass boulevards shall also include restoration with topsoil to finish grade. No pole bases to be installed before curb and gutter are poured.

Payment at the contract price shall be full compensation for all labour, equipment and materials necessary to Supply and Install Concrete Footing for base mounted pole as shown on the Contract Drawings.

Reference:

- OPSD 2200.01 – Concrete Footing for Base Mounted Lighting and Signal Poles
- OPSD 2200.04 – Concrete Footing for 3.3 m Base Mounted Metal Pole
- OPSD 2200.03 – Concrete Foundation for Base Mounted Poles in Rock
- OPSD 2215.02 – Anchorage Assembly for Lighting and Signal Poles
- USDTR – E1 – Traffic Pole with Concrete Pole Base for 3.7m/4.6m Pole

CP 617.01 Supply/Install LED Roadway Lighting Luminaires, Aluminum Arm and Bracket Assemblies

OPSS.MUNI 617, November 2019 shall apply, except as amended and extended herein.

OPSS.MUNI 617.07.04.01 has been amended and extended as follows:

Aluminium tapered elliptical brackets on metal or concrete poles shall be fastened as per OPSD 2250.010.

Refer to contract documents and/or contract drawings for luminaire wattage and aluminium arm length.

The unit price bid identified in the schedule of unit prices shall be full compensation to supply and install LED Roadway Lighting Luminaires, Arms and Brackets as shown on the contract drawings. The unit price bid shall also include but not limited to Current Lighting – Evolve (ERNC/ERNM) Series, full cut-off luminaire, Type II or Type III distribution with light control, die cast aluminium housing, grey colour, NEMA 7-pin photocell receptacle, field adjustable module, 120VAC, CSA certified, model number. All fixtures are to be manufactured by Current (or approved equivalent) and that approved models include, but are not limited:

- ERNC-A-0-08-B1CA-30-A-GRAY-C1-V1
- ERNC-A-0-08-C1CA-30-A-GRAY-C1-V1
- ERNM-A-0-13-B1CA-30-A-GRAY-C1-V1
- ERNM-A-0-13-C1CA-30-A-GRAY-C1-V1
- ERNM-A-0-20-B1CA-30-A-GRAY-C1-V1
- ERNM-A-0-20-C1CA-30-A-GRAY-C1-V1

Aluminum arm, bracket assemblies, in-line fuse holders and fuses, lamps, #12 conductors and ground from luminaire to pole base and all connections in accordance with OPS and electrical codes.

Smart photocells shall also be used to link to gateways to convey their status to the City of Peterborough's online (DIMONOFF) application. The smart photocell required is the RME Wireless Smart Lighting Node manufactured by DIMONOFF with Model number RME-XBP-GPS. This smart node photocell includes a NEMA 7-pin ANSI C136.41 receptacle and is to be mounted externally on the light fixture.

The Smart Node Photocells maintain network communications through nearby DIMONOFF Gateways. It is the Contractors responsibility to purchase, install and connect one (1) DIMONOFF Gateway if the project has at least one (1) new or replacement light fixture being installed. The installation requires connecting to the electrical supply as well as connecting the gateways and nodes to the SCMS DIMONOFF software. All material and installation costs are to be included within the contractors bid.

The Gateway required is manufactured by DIMONOFF with model number: Gateway-G3-2.4GHz-120Vac-10x8 NEMA4-HEAT-CM. The SIM card is to be provided by the Contract Administrator or designated City Staff.

All luminaires shall be "Dark Sky Compliant".

Data Reporting

The cost of preparing and conveying the data reporting to the Contract Administrator shall be included within the unit contract price. The data reporting shall be provided to

the Contract Administrator within five (5) business days of the luminaires becoming activated. The data shall be reported in an excel spreadsheet only as follows:

Contract Luminaire Drawing # (If Applicable)	Node (Photocell) Serial # (8-digit #)	Lat	Long	Civic Address (If Applicable)	LED Fixture Model #	LED Fixture Q Setting	Connection Type
L1	15656995	44.2923	- 78.3245	275 Lake St.	XSPSM-D - HT-3ME-8L-30K7- UL-SV-N	Q5	Overhead Connection

The second row of the above table is provided as an example.

OPSS.MUNI 617.10 has been amended and extended as follows:

Payment at the contract price shall be full compensation for all labour, equipment, and materials necessary to Supply and Install LED Roadway Lighting Luminaires, aluminium arm, bracket assemblies and providing data reporting to the City's Contract Administrator as shown on the Contract Drawings and herein. Payment for this item shall not be made until the luminaires are activated and data reporting has been provided, in compliance to CP617.01, to the Contract Administrator.

Reference:

- OPSD 2420.010 – Aluminium Tapered Elliptical Bracket
- OPSD 2421.010 – Lamp Wattage Label for Luminaire
- a) OPSD 2250.010 – Aluminium Tapered Elliptical Brackets on Metal and Concrete Poles

CP 617.02 Remove/Salvage/Reinstall Existing Streetlight Equipment

OPSS.MUNI 610, April 2017 and OPSS.MUNI 617, November 2019, shall apply except as amended and extended herein.

CP617.01, shall apply except as amended and extended herein.

The unit price bid identified in the schedule of unit prices shall be full compensation to carefully remove and salvage the existing fixtures (or other streetlight types) and Smart Photocells as shown on the contract drawings.

Salvaged equipment shall be stored safely to ensure that the equipment does not become damaged. Damaged equipment shall be replaced with brand new equipment at no cost to the City.

The cost of preparing and conveying the data reporting to the Contract Administrator shall be included within the unit contract price. The data reporting shall be provided to the Contract Administrator within five (5) business days of the luminaires becoming activated. The data shall be reported in an excel spreadsheet only as follows:

Contract Luminaire Drawing # (if applicable)	Existing Node (Photocell) Serial # (8-digit #)	New Lat	New Long	New Civic Address (if applicable)
L1	15656995	44.2923	-78.3245	275 Lake St

Existing LED Fixture Model #	New LED Fixture Q Setting	Other Comments (including listing damaged components replaced with new parts)	Reason for Relocation	New Connection Types
XSPSM-D-HT-3ME8L-30K7-UL-SV-N	Q5	New node – serial number 15688888 as it was damaged during removal	Relocated as per design drawing L1 and L5	Overhead connections

The second row of the above tables is provided as an example.

In addition to the above, all existing fixtures and smart photocells are to be photographed to illustrate serial/model numbers and to be delivered to the Public Works Yard or alternate location as directed by the Contract Administrator.

Missing or un-documented material will result in non-payment of this item. All salvaged

Fixtures and Smart Photocells are to be carefully and neatly stacked on wood pallets. The Contractor is responsible to notify the Contract Administrator two (2) working days

in advance of delivery so that the equipment may be received by a City Engineering Division representative.

CP 620.01 Supply and Install Traffic Signal Arm and Double Arm Bracket

OPSS.MUNI 620, April 2018 shall apply except as amended and extended herein.

OPSS.MUNI 620.10 has been amended and extended as follows: Payment at the contract price shall be full compensation for all labour, equipment and materials necessary to Supply and Install Aluminum Single Member Arm, Bracket and Plumbizer Hangers as shown on the Contract Drawings.

OPSS.MUNI 2460.07.05 has been amended and extended as follows:

Traffic signal cushion hanger assemblies shall be Fortran HAN555 or approved equivalent.

Traffic signal adjustable mid-section hanger assemblies shall be adjustable Fortran PLU555 plumbizer and Fortran PLU451 plumbizer kit or approved equivalent.

Traffic signal dual-end hangers shall be Can-Brac “clamp” type or Can-Brac “universal” signal bracket with cable.

OPSS.MUNI 620.07.02.01 has been amended and extended as follows:

The attachment point of the mast arm on the pole shall be set to obtain 5.0 m clearance from finished grade to the bottom of the signal head/backboard and shall be no higher than 5.15 m unless approved by Contract Administrator.

Reference:

- OPSD 2250.01 – Aluminum Tapered Elliptical Brackets on Metal and Concrete Poles
- OPSD 2500.010 – 600mm Signal Arm and Signal Head
- OPSD 2500.020 – 600mm Signal Arm Attachment to Poles
- OPSD 2501.01 – Single Member Arm and Signal Head
- OPSD 2501.02 – Aluminum single Member Arm Attachment Detail
- OPSD 2502.011 – Traffic Signal Dual-End Hanger
- OPSD 2502.010 – Traffic Signal Adjustable Mid-Section Hanger
- OPSD 2522.010 – Traffic Signal Cushion Hanger

CP 620.02 Supply and Install Loop Detector Including Flexible Duct

OPSS.MUNI 620, April 2018 shall apply except as amended and extended herein.

Loops may not be installed under conditions where temperatures are below 10 degrees C. Each loop shall be completed the same day the road cut is made. Road cuts are **not** to be left open overnight.

OPSS.MUNI 604, November 2017 shall also apply except as amended and extended herein.

Loop Detector shall be installed in the top lift of base asphalt.

The conductor shall be installed with the correct number of turns, as shown on the Contract drawings.

OPSS.MUNI 604.10 has been amended and extended as follows:

Payment at the Contract price shall be full compensation for all labour, equipment and materials necessary to Supply, Install and Connect Loop Detector and Flexible Duct as shown on the Contract Drawings. The measurement shall be unit cost for each Loop Detector installation.

Reference:

- OPSD 2520.01 – Loop Detector Installation Details I
- OPSD 2520.02 – Loop Detector Installation Details II
- OPSD 2530.01 – Splices for Traffic Signal Cable and Extra Low Voltage Cable

CP 620.03 Supply and Install Pedestrian Signal with Countdown Signal Head, Type 12” LED

OPSS.MUNI 620, April 2018 shall apply except as amended and extended herein.

The unit price identified in the schedule of unit prices shall include all labour, equipment and material necessary to Supply and Install polycarbonate single pedestrian head housing, black 12” square pedestrian signal head door complete with gasket, hinge pins and yellow visor connected to polycarbonate single countdown pedestrian head housing complete with 12” square black door, yellow housing and yellow square visor (Fortran Part #P4LO640) including polycarbonate joiner and nut for joining traffic signals as shown on the contract drawings.

The unit price shall also include but not limited to Excellence Opto. Inc. 300 mm X 300 mm LED signal TRP-C30DD2C3 or approved equivalent including double arm bracket, grounding, 5/C #14 AWG conductor riser with minimum 19 strands to pole base including all connections in accordance with OPS and electrical codes.

If required this item shall include all labour, equipment and material necessary to raise the existing pedestrian signal head including the installation of a new 5/C#14 AWG conductor riser with minimum 19 strands to pole base including all connections in accordance with OPSS and electrical codes to allow for the installation of the countdown pedestrian signal head at the required height.

OPSS.MUNI 620.07.02.07 has been amended and extended as follows:

Riser cables shall be connected to LED modules with insulated wing nut vibration connectors.

The contractor is required to supply serial #'s on the City of Peterborough LED Serial No. Log Sheet provided by the Contract Administrator, typed in Excel format and a letter assigning the five (5) year manufacturer's warranty for all LED inserts to the Contract Administrator prior to turn-on. The contractor is advised that the double arm brackets may vary in length as specified on the contract drawing.

Reference:

- OPSS 2505.01 – Traffic Signal Pedestrian Head & Push Button Mounted on Pole
- b) OPSS 2524.01 – Traffic Signal Double Arm Bracket

CP 620.04 Supply and Install Traffic Signal Head, LED

OPSS.MUNI 620, April 2018 shall apply except as amended and extended herein.

OPSS.MUNI 620.07.02.07 has been amended and extended as follows:

Riser cables shall be connected to LED modules with insulated wing nut vibration connectors.

The unit price identified in the schedule of unit prices shall be full compensation to Supply and Install Traffic Signal Heads as shown on contract drawings. The unit price bid shall also include but not limited to yellow polycarbonate housing and backboard, visors, Excellence Opto. Inc. LED Modules 12" Red (TRV-R12SG-D2T), 12" Amber (TRV-Y12SG-D1T), 12" Green (TRV-G12SG-D2T), 8" Amber (TRV-Y08SG-D1T), 8" Green (TRV-G08SG-D1T), 12" Bi-modal Arrow (TRA-B12DD-1W) or approved equivalent, Fortran PLU451 plumbizer kit, grounding, 7/C#14AWG conductor riser with minimum 19 strands to pole base including all connections in accordance with OPSS.MUNI 2409.05.01.

The contractor is required to supply serial #'s on the City of Peterborough LED Serial No. Log Sheet provided by the Contract Administrator, typed in Excel format and a letter assigning the five (5) year manufacturer's warranty for all LED inserts to the Contract Administrator prior to turn-on.

Reference:

- OPSS 2501.01 – Single Member Arm and Signal Head

CP 620.05 Install Traffic Signal Controller Including Turn-On

OPSS.MUNI 620, April 2018 shall apply except as amended and extended herein.

The contractor is advised that an electrical connection must already be established prior to traffic signal cabinet assembly installation.

The unit price identified in the schedule of unit prices shall be full compensation to install and connect the City of Peterborough Supplied NEMA controller cabinet assembly onto concrete controller pad as shown on the contract drawings. The unit price bid shall also include but not limited to all cabinet brackets, mountings, bands, bolts, fittings, wiring connections, testing, programming, traffic control (including pay duty police) and turn-on. It is required before the cabinet is energized, the Contractor document and complete a Detailed Installation Checklist confirm all aspects of the controller cabinet installation are complete.

The contractor is required to notify the Contract Administrator three (3) business days prior to arrange receipt of the controller cabinet assembly at a City facility. The contractor is required to inspect and document the City supplied controller cabinet assembly for deficiencies prior to taking possession. Once the contractor takes possession of controller cabinet assembly, the contractor is responsible for safeguarding the controller cabinet assembly prior to installation.

The contractor is required to notify the Contract Administrator a minimum of three (3) business days prior to any field testing. It is anticipated that testing should take approximately three (3) hours, if testing extends beyond three (3) hours the contractor shall be responsible for the cost of all City and police personnel in attendance. The intersection must be under the control of a pay duty police officer during field testing.

Duct seal compound is to be used to adequately seal all duct ends inside the cabinet. All cables entering into the Controller Cabinet Assembly shall be labeled using a permanent marking system to the satisfaction of the Contract Administrator. Field testing shall be performed in accordance with OPSS and City of Peterborough Electrical Quality Control Specifications.

The Contractor is hereby advised that all As-Built drawings be provided and intersection related traffic signs and pavement markings must be installed prior to signal activation/turn-on to the satisfaction of the City Engineer/designate.

Reference:

- OPSD 2514.01 – Controller Cabinet on Pad

CP 620.06 Supply and Install Uninterruptible Power Supply (UPS) Equipment

OPSS 620.MUNI, April 2018 shall apply except as amended and extended herein.

The unit price identified in the schedule of unit prices shall be full compensation to Supply, Install and Connect a Battery Backup System or UPS for the traffic signal system as shown on the Contract Drawings. The unit price bid shall also include but not limited to Alpha Pad S6 enclosure (SE48 Enclosure Grey) including 8" Riser with FXM 1100(48vdc) 120V i/o w/TBs & 5-15R, Universal Automatic Transfer Switch (UATS), Battery Temperature Probe (2mtr), Alpha Guard, four (4) Battery Heater Mats, four (4) AlphaCell 240 XTV 12v 112Ah and Battery Cable Kit with 8 ft Length. UPS equipment shall be installed in accordance with manufacturer's specifications.

Duct seal compound is to be used to adequately seal all duct ends inside the cabinet.

All cables entering into the UPS shall be labeled using a permanent marking system to the satisfaction of the Contract Administrator.

New Traffic Signal System Activation and Traffic Signal System Switchover shall be in accordance with OPSS.MUNI 106.

Cabinet Paint Colour – Polyester Powder, Baked Enamel asa 61 Grey.

Testing and sampling of concrete shall be in accordance with CP351.01.

CP 620.07 Supply and Install Bicycle Signal Head, LED

OPSS.MUNI 620, April 2018 shall apply except as amended and extended herein.

OPSS.MUNI 620.07.02.07 has been amended and extended as follows:

Riser cables shall be connected to LED modules with insulated wing nut vibration connectors.

The unit price identified in the schedule of unit prices shall be full compensation to Supply, Install and Connect Bicycle Signal Heads as shown on contract drawings. The unit price bid shall also include but not limited to all black 3 X 8 polycarbonate housing and cowl visors, Excellence Opto. Inc. LED clear lens Modules 8" Red Bicycle (TRB-R08SG-D2T-C), 8" Amber Bicycle (TRB-Y08SG-D2T-C), 8" Green Bicycle (TRB-G08SG-D2T-C) or approved equivalent, Can-Brac Universal Signal Assembly, grounding, 7/C#14AWG conductor riser with minimum 19 strands to pole base including all connections in accordance with OPSS.MUNI 2409.05.01.

The Contractor is required to supply serial #'s on the City of Peterborough LED Serial No. Log Sheet provided by the Contract Administrator, typed in Excel format and a letter assigning the five (5) year manufacturer's warranty for all LED inserts to the Contract Administrator prior to turn-on.

Reference:

- OPSD 2501.01 – Single Member Arm and Signal Head
- OPSD 2502.011 – Traffic Signal Dual End Hanger

CP 620.08 Supply and Install Radar Detectors

OPSS.MUNI 620, April 2018 shall apply except as amended and extended herein.

The unit price identified in the Schedule of Unit Prices shall include all labour, equipment and material necessary to supply and install a complete Wavetronix SmartSensor Matrix detector (CSA Approved) as shown on the contract drawings.

The unit price bid shall also include but not limited to two (2) Wavetronix SmartSensor Matrix, two (2) Wavetronix Sensor Mounting Brackets, two (2) 40 ft drop cables, two (2) Wavetronix Junction Boxes, Cabinet Interface (Wavetronix CLK650), 500 ft. Wavetronix Home Run cable and Drawing / Software USB kit.

The Contractor is to install the microwave detection units as per manufacturer's recommendation and coordinate with the supplier to determine optimal mounting height and provide onsite turn on assistance and programming from a Certified Factory Technician.

CP 620.09 Install Video Detection

OPSS.MUNI 620, April 2018 shall apply except as amended and extended herein.

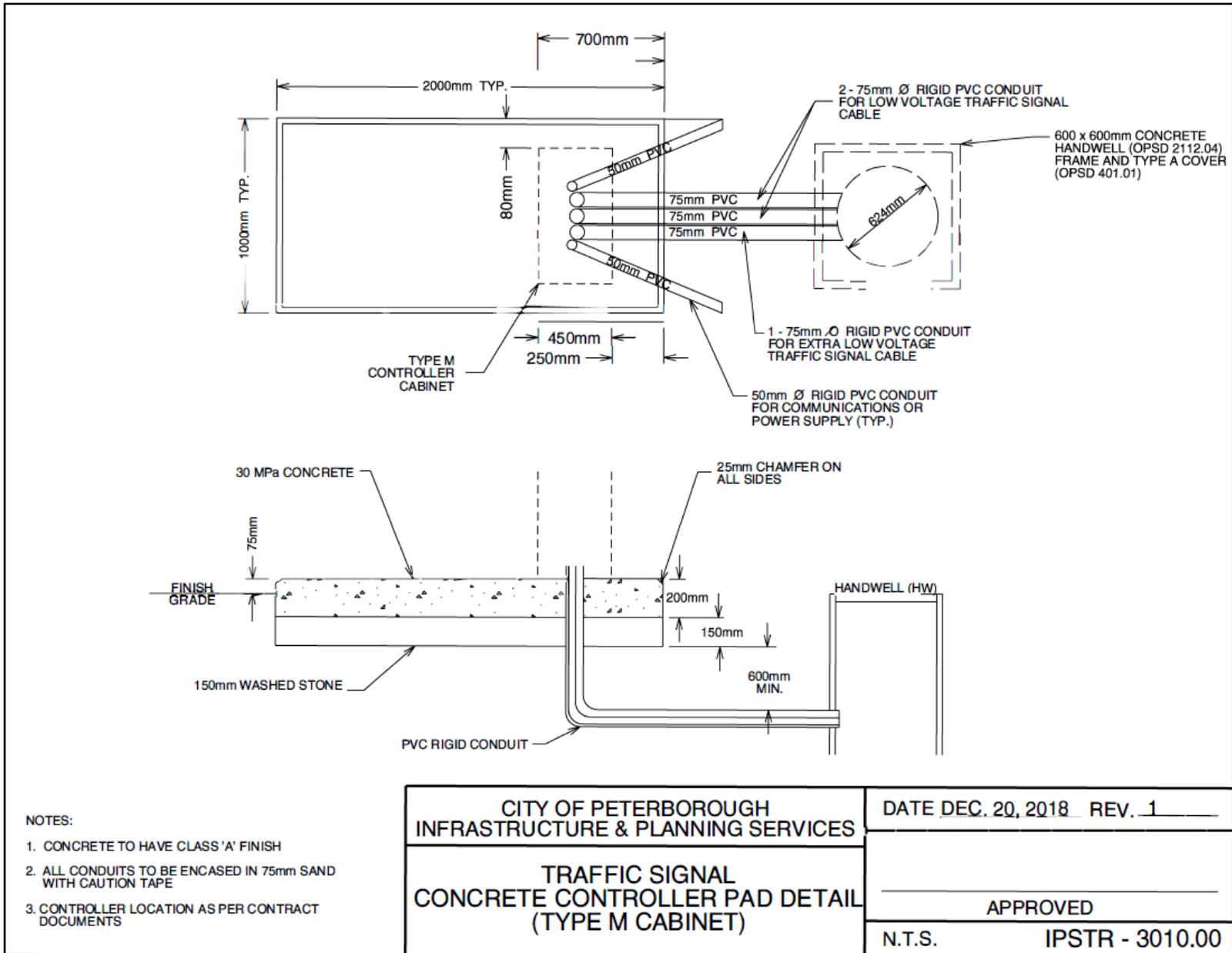
The unit price identified in the Schedule of Unit Prices shall include all labour, equipment and material necessary to install City supplied video detection system, as shown on the contract drawings.

City supplied materials is limited to detection camera(s), cabinet mount antenna, pole extension(s) and camera mount(s).

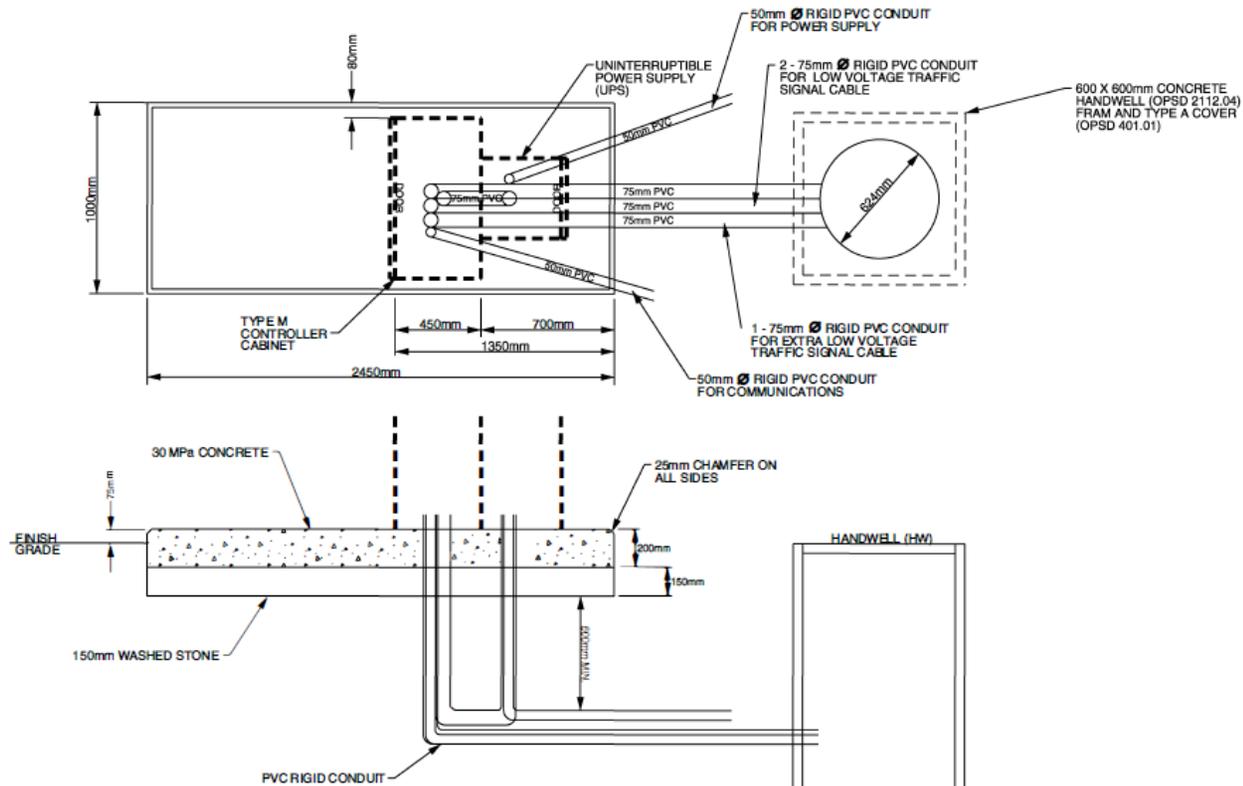
The unit price bid shall also include but not limited to all brackets, mountings, bands, bolts, fittings, shielded ethernet cable, RJ45 wiring connectors including installation and cable testing.

The contractor is required to notify the Contract Administrator three (3) business days prior to arrange receipt of the video detection equipment at a City facility. The contractor is required to inspect and document the City supplied video detection for deficiencies prior to taking possession. Once the contractor takes possession of video detection equipment, the contractor is responsible for safeguarding the video detection equipment prior to installation.

The Contractor is to install the Video Detection System as per manufacturer's recommendation and advise City Staff when in-cabinet hardware can be deployed and programmed.



Standard Drawing 1: IPSTR – 3010.00 – Traffic Signal Concrete Controller Pad Detail (Type M Cabinet)

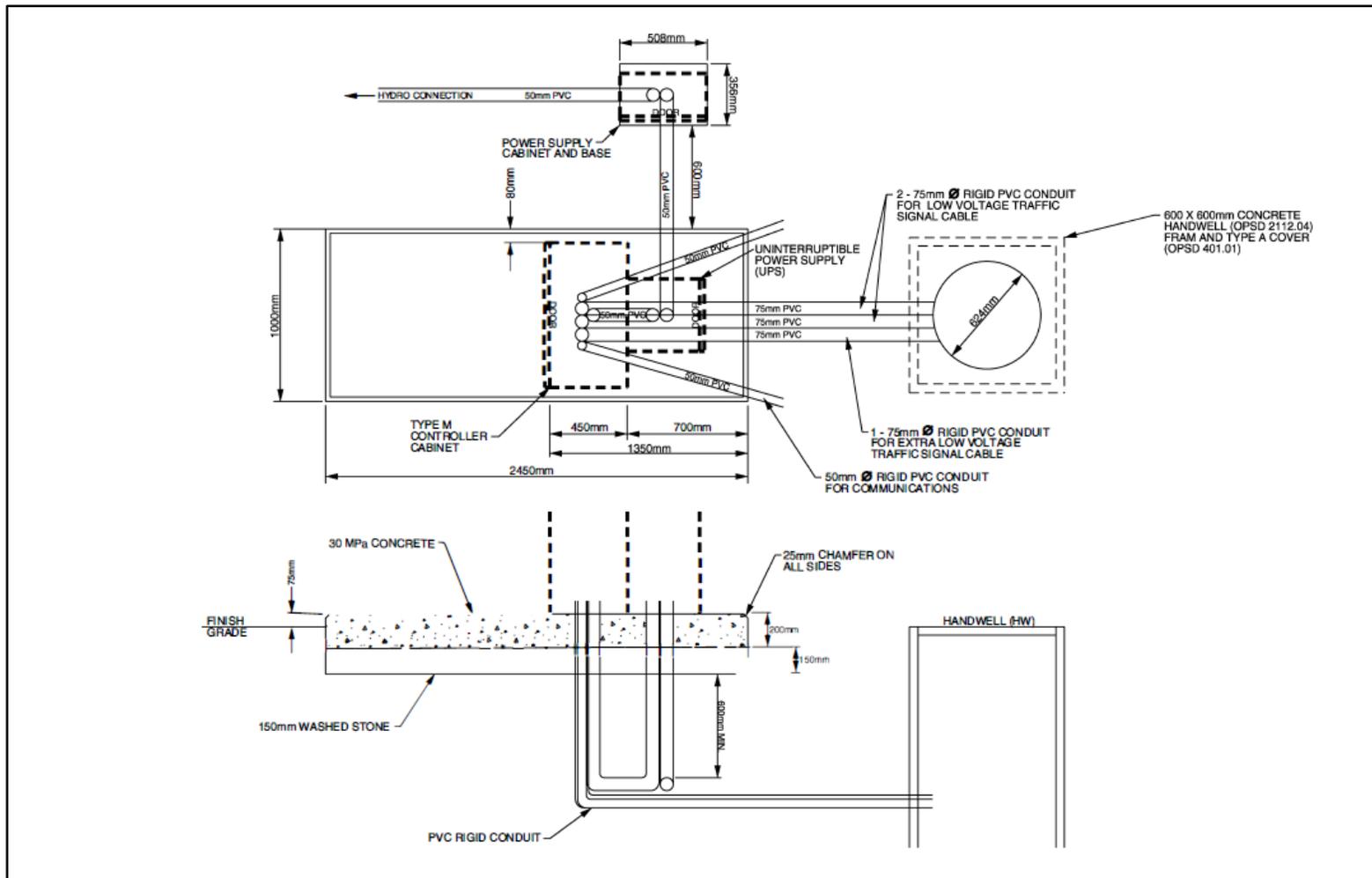


NOTES:

1. CONCRETE TO HAVE CLASS 'A' FINISH
2. ALL CONDUITS TO BE ENCASED IN 75mm SAND WITH CAUTION TAPE
3. CONTROLLER LOCATION AS PER CONTRACT DOCUMENTS

CITY OF PETERBOROUGH INFRASTRUCTURE & PLANNING SERVICES	DATE <u>DEC. 20, 2018</u> REV. <u>3</u>
TRAFFIC SIGNAL CONCRETE CONTROLLER PAD DETAIL (TYPE M CABINET WITH UPS)	_____ APPROVED
N.T.S.	IPSTR-3010.01

Standard Drawing 2: IPSTR-3010.01 – Traffic Signal Concrete Controller Pad Detail (Type M Cabinet with UPS)

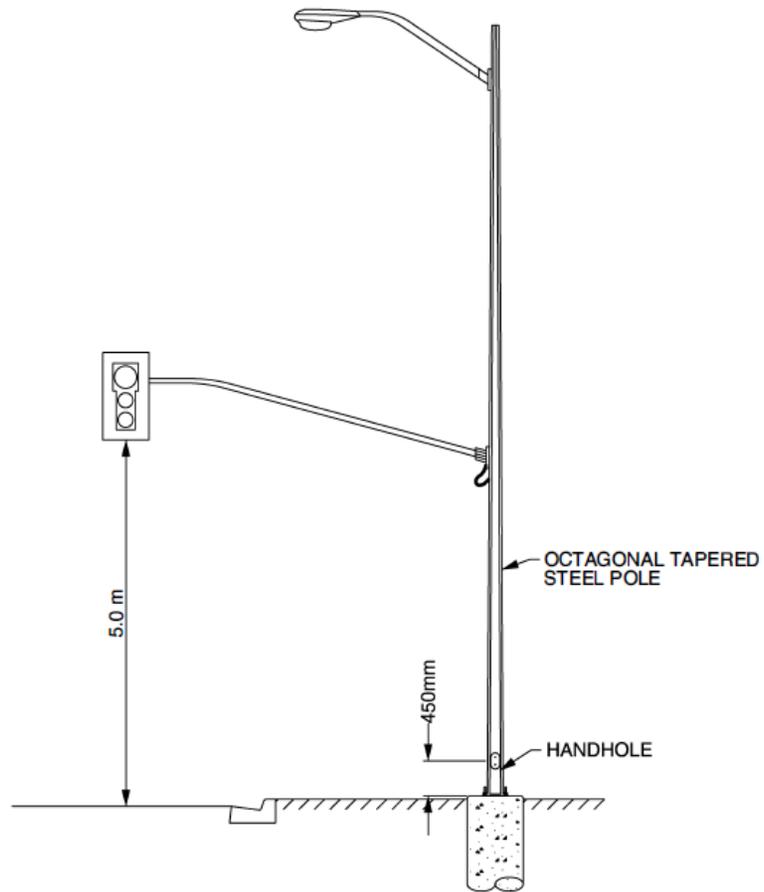


NOTES:

1. CONCRETE TO HAVE CLASS 'A' FINISH
2. ALL CONDUITS TO BE ENCASED IN 75mm SAND WITH CAUTION TAPE
3. CONTROLLER LOCATION AS PER CONTRACT DOCUMENTS

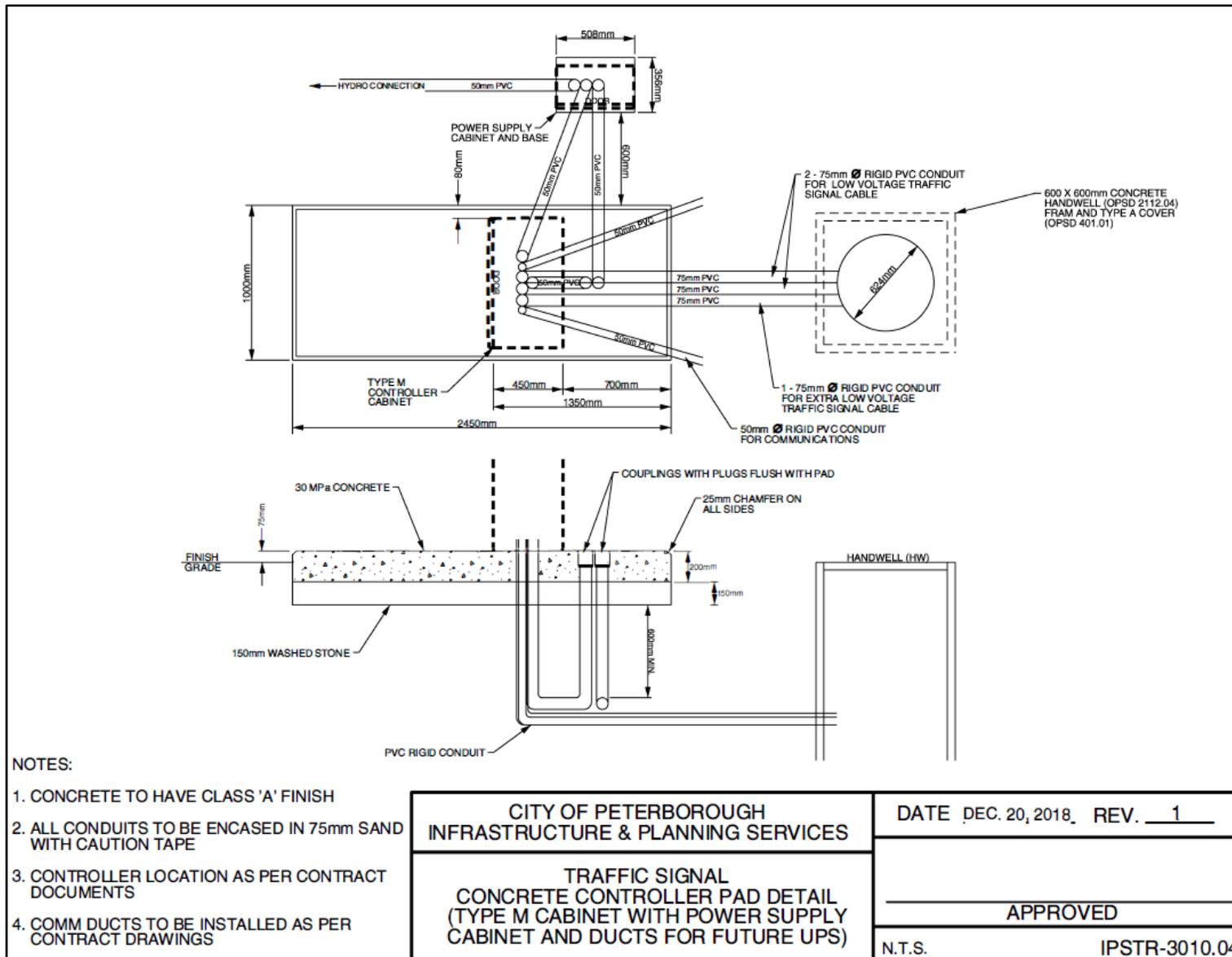
CITY OF PETERBOROUGH INFRASTRUCTURE & PLANNING SERVICES	DATE DEC. 20, 2018_ REV 3__
TRAFFIC SIGNAL CONCRETE CONTROLLER PAD DETAIL (TYPE M CABINET WITH UPS AND POWER SUPPLY CABINET)	_____ APPROVED
N.T.S.	IPSTR-3010.02

Standard Drawing 3: IPSTR-3010.02 – Traffic Signal Concrete Controller Pad Detail (Type M Cabinet with UPS and Power Supply Cabinet)

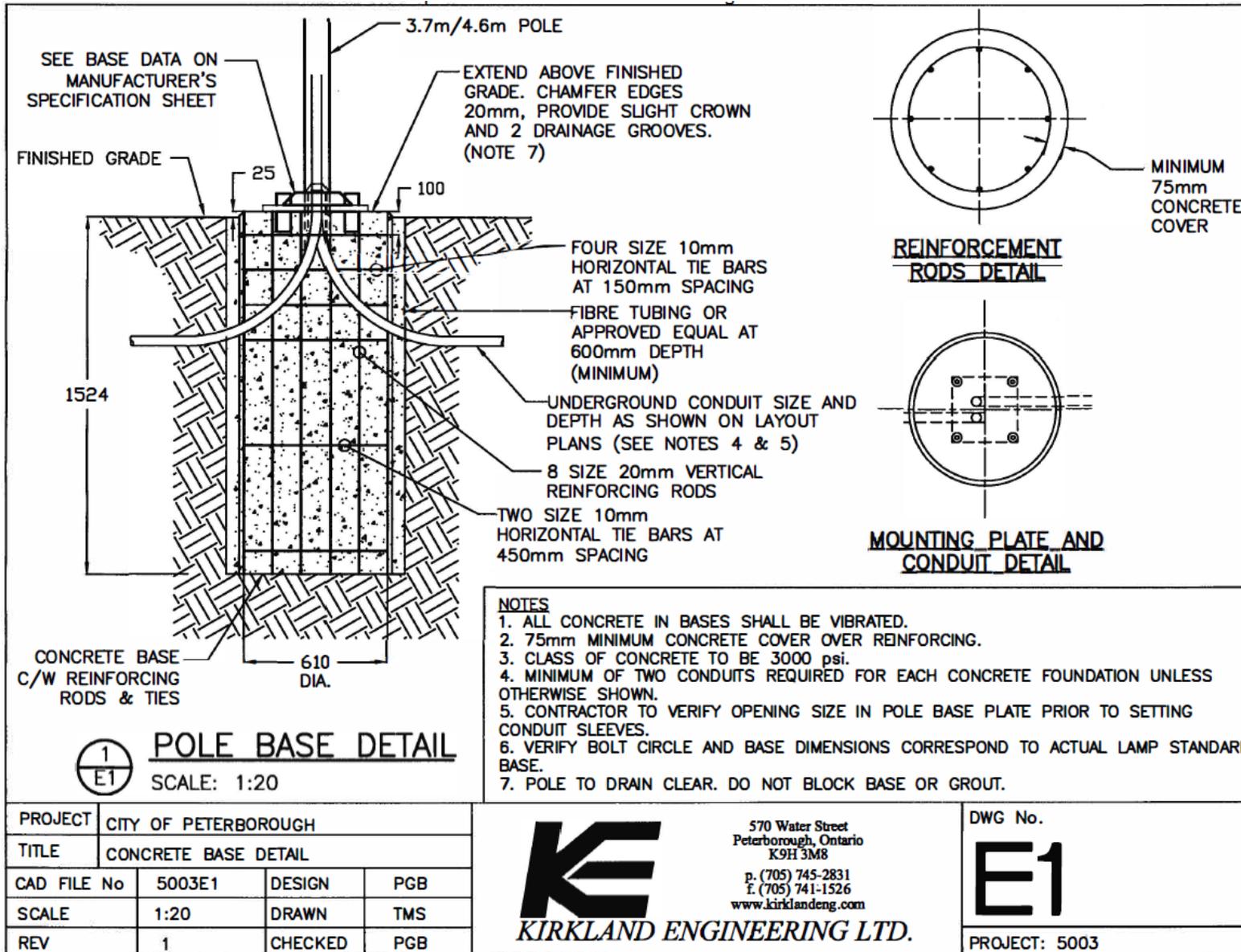


CITY OF PETERBOROUGH INFRASTRUCTURE & PLANNING SERVICES	DATE <u>DEC. 20, 2018</u> REV. <u>1</u>
HEAVY DUTY CLASS BASE MOUNT STEEL POLE	_____ APPROVED
	N.T.S. IPSTR-3010.03

Standard Drawing 4: IPSTR-3010.03 – Heavy Duty Class Base Mount Steel Pole



Standard Drawing 5: IPSTR-3010.04 – Traffic Signal Concrete Controller Pad Detail (Type M Cabinet with Power Supply Cabinet and Ducts for Future UPS)



Standard Drawing 6: E1-Pole Base Detail