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1 Introduction

This standard defines requirements for the supply and installation of road and walkway lighting. The contractor is responsible for the installation of the road and walkway lighting system as outlined in this standard by providing all necessary materials, labor, plant and equipment. This standard shall be read in conjunction with the design drawings specific to each installation.

The purpose of this document is to standardize street lighting installations.

No deviations from these standards or the design drawings will be permitted without expressed written approval from the Director of Signals, Street Lighting and Infrastructure.

This standard must be referenced to and interpreted simultaneously with all other City specifications and documents pertinent to works described herein. Such City specifications include but are not limited to the current editions of:

- Road and Walkway Lighting Design Standards
- Design and Construction Standards - General Provisions
- Design and Construction Standards - Volume 2 Roadways
- Design and Construction Standards - Volume 7 Underground Power Distribution Systems
- Edmonton Procedures for On-Street Construction Safety

Where conflicts arise between other specifications and standards referenced, this specification shall take precedence.

In this standard, any words implying male persons shall include female persons and corporations. In this manual, any words used in the plural include singular and visa versa.

1.1 Standard Drawings

These standards are to be read in conjunction with the City Standard Lighting Detail Drawings which shall form part of this standard.

1.2 Abbreviations

Abbreviations are as follows:

AASHTO	American Association of State Highway and Transportation Officials
APEGGA	Association of Professional Engineers, Geologists, and Geophysicists of Alberta
ASTM	American Society for Testing and Materials
BRZ	Business Revitalization Zone
CEC	Canadian Electrical Code
CCC	Construction Completion Certificate
CNC	Computer Numeric Control
CSA	Canadian Standards Association
FAC	Final Acceptance Certificate
IESNA	Illuminating Engineering Society of North America

IMSA	International Municipal Signals Association
NEMA	National Electrical Manufacturers Association
TAC	Transportation Association of Canada
WCB	Workers' Compensation Board

1.3 Contractor Qualifications

As a minimum any contractor undertaking work in the City shall posses a current copy the following:

- City of Edmonton business license;
- Contractors license;
- Certificate of Recognition;

The City may audit the contractor on a regular basis.

1.4 Electrical Energy Supply

Street lighting will tie into the EPCOR secondary power distribution system at the locations shown on the contract drawings. The contractor shall confirm the service points with EPCOR.

Service conductors from the pole or pad mount transformers to the street lighting control cabinet/base shall be supplied and installed by the contractor. The consultant is responsible to apply to EPCOR D&T for an un-metered load in advance to ensure energization of the street lighting system prior to opening the roadway to the public.

Primary power and transformation shall be supplied as indicated on the contract documents and drawings. The contractor shall arrange and coordinate all necessary connections to transformers with EPCOR. All service connections and disconnections will be made by EPCOR at the contractor expense.

1.5 Electrical Permits

All work shall be in strict compliance with the latest edition of the Canadian Electrical Code and the regulations of the Electrical Inspection Authority.

Contractor shall arrange for, obtain and pay for all necessary permits before commencing any work. The contractor shall also arrange for all necessary inspection of the work as required by the Electrical Inspection Authority having jurisdiction and as outlined in this document.

A copy of all permits, approvals and inspection reports shall be submitted to the Consultant or owner prior to energizing the system.

1.6 Forms, Certificates and Warranty

1.6.1 Construction Completion Certificate (CCC) Form

Construction Completion Certificate (CCC) shall be completed by the consultant and submitted to the City after the Street Lighting system has been installed and energized.

The CCC shall include the Construction Folder as per Section 2.4.7.5 in the Road and Walkway Lighting Design Manual.

The issuance of the CCC shall start the warranty period. The warranty period shall be for a minimum of twenty-four (24) months. During the warranty period the contractor shall promptly correct, at his expense and to the satisfaction of the City, defects or deficiencies from faulty products or installation. Where a pole or system is damaged by a scenario outside the contractor's control (motor vehicle accident or vandalism) the City will advise the electrical consultant to direct the required repairs.

At the expiration of the warranty period, the consultant must verify that all lights are functioning correctly, all deficiencies have been repaired and provide the City confirmation of such in writing via application of the FAC. If the system is operating with no deficiencies the City will issue the Final Acceptance Certificate (FAC). If there are still outstanding deficiencies, the City shall delay the issue of the FAC until such time all deficiencies have been rectified to the City's satisfaction.

Upon acceptance of the FAC, the City shall take over operation of the lighting and will assume all ongoing maintenance costs associated with the system.

1.7 Worker Safety

The contractor shall maintain a health and safety program and hold a valid Certificate of Recognition (COR).

Contractor shall comply with all requirements of Workers Compensation Board (WCB) including completion of applicable forms prior to working close to overhead power lines. Refer to City Standard drawing E3.14 for typical power line clearance.

1.8 Coordination

The contractor is responsible to obtain all permits required to work on the City road right-of-way.

The contractor is fully responsible for work of their sub-contractors. As well, full cooperation of other trades working on site is the responsibility of the contractor.

The consultant and / or City will not be an arbitrator to establish limits of any contracts between the contractor and their sub-contractors.

Written notification stating what is to occur to the roads and sidewalks at the work location shall be communicated to the local businesses and residents prior to undertaking the work. The notice should be a description of what is taking place, start date, estimated duration of the project, temporary accesses and clean-up, including any necessary landscaping to restore work area. A written copy of notification shall be provided to the Director of Signals, Street Lighting and Infrastructure, prior to distribution.

2 Products and Execution

The contractor is fully responsible for completing all work to the satisfaction of the City. The consultant and City may review materials, test reports and the work for conformance with the design. Any inspections and tests by the consultant or City do not relieve the contractor of their responsibility to supply the materials and perform the work as required.

These standards cover the products and the executions of the various work elements required to supply and install a road & walkway lighting system.

2.1 Products

All materials supplied shall be new and meet the requirement of these standards. These standards define specific requirements and may list specific products or recognized equivalent. Where products deviate from those listed the

contractor or supplier shall seek approval from the City of Edmonton Director of Signals, Street Lighting and Infrastructure.

Specific materials allowed on City projects must be listed on the City Recognized Lighting Product List. Specific products are as follows:

- Poles and all related components;
- Luminaires;
- Pole bases;
- Lighting control cabinets and lighting controller bases;
- Powder coating

To apply and have a product listed the supplier must submit the following to the Director of Signals, Street Lighting and Infrastructure, Transportation Department:

1. Cover letter listing the specific product(s) by supplier & model number they are requesting pre-approval for;
2. Product data sheets, shop drawings and specifications;
3. Product samples where noted.

Failure to submit the information requested above will result in non-compliance. If the specific product is deemed acceptable, it will be listed on the City's Recognized Lighting Product List and will be eligible for use on roadway lighting installations in the City. All documents submitted will be retained by the City for future reference. If a product is not acceptable a list of deficiencies will be provided & the supplier will be required to correct deficiencies & resubmit.

If other than City recognized materials are used, such materials shall be removed and replaced with recognized materials at the contractor's expense unless otherwise noted by the consultant and the City.

Where required shop drawings and product information sheets shall be submitted to and shall be reviewed by the consultant and/or the City and returned to the contractor prior to construction. **Note - Shop drawings and product data sheets will be "reviewed for general conformance" by the consultant or the City. The contractor is however responsible for confirming all requirements are met.**

The City may determine the product is not performing and may upon written notification rescind a supplier and or product pre-approval for any just reason, including the following:

1. Repeated failure of the product to fully comply with the requirements of this manual or any special contract provisions issued;
2. Failure of the Supplier to participate in any audits;
3. Failure of the Supplier to allow installation inspections;
4. Failure of the Supplier to repair, replace or redo faulty work;
5. Repeated problems with product;

Notwithstanding the use of materials indicated on the reviewed engineering drawings, the City may require certification and testing by an independent testing authority (at the contractors expense) to confirm material conforms to the specified City standards.

The Supplier shall have and maintain a quality management system. The purpose of the quality management system is to ensure that the product meets the quality requirements of the City and is delivered on time. The supplier's quality management system shall apply to all stages of the design, procurement, manufacturing, testing and delivery of the product.

2.2 Execution

The contractor shall execute the work as detailed on the reviewed engineering drawings and these specifications.

All work shall be executed in a neat, professional manner.

Location of electrical equipment and structures shown on reviewed engineering drawings is approximate only. Contractor shall layout all equipment. Any equipment not installed in the correct locations shall be adjusted at the contractor's expense.

Prior to construction, the contractor shall visit the site and examine existing conditions. The contractor is advised not all utilities maybe shown on the contract drawings. Prior to construction the contractor shall locate all utilities through Alberta One Call. The consultant shall be advised of any conflicts prior to construction.

Existing utilities and structures include, but are not limited to pipes, culverts, ditches or other items which are a part of an existing sewage, drainage or water system or which are a part of a gas, electrical, telephone, TV, telecommunications or other utility system. Also included are sidewalks, curbs, gutters, swales, poles, fences or any other structures encountered during construction.

The contractor shall be responsible for location, protection, removal, replacement or restoration of existing utilities and structures or for repair of any damage which may occur during construction. The contractor shall pay all costs and be responsible for establishing locations and state of use of all existing utilities that may affect the work. The contractor shall make satisfactory arrangements with the utilities companies involved for the locations, protection and inspection of existing utilities. Notice in writing shall be given by the contractor to the utilities companies before work commences in the vicinity of existing utilities.

The contractor shall provide for the uninterrupted flow of all water courses, sewers and drains encountered during the work. Access shall be maintained to all existing structures such as valves, hydrants, meter chambers and control structures at all times during construction. If interruption of service provided by an existing utility is necessary, the planned shutdown shall be approved by the owners of the utilities. Requests for shutdown shall be made by the contractor in writing in advance. The contractor shall notify all customers or make arrangements with the utility company to notify all customers in advance of a shutdown.

Where potential conflicts exist with overhead power lines and street light poles the contractor shall survey such lines to determine heights and contact EPCOR and consultant to review options. Where new lines are proposed the contractor shall coordinate line heights with EPCOR to avoid conflicts with road and walkway lighting.

Where tying into an existing lighting system the contractor shall confirm the make and model of existing poles and luminaires and advise the consultant of what exists where there are any discrepancies between the existing street lighting and the proposed street lighting the contractor shall notify the consultant prior to ordering luminaires. The consultant may adjust the luminaires and or pole type to match what exists.

The contractor shall notify the consultant if any trees, fences or other structures are required to be removed to perform work. Nothing shall be removed without prior expressed written permission from the property owner and the consultant. The contractor shall protect all trees, plants, fences and other items from damage during construction.

Prior to construction the contractor shall arrange a pre-construction meeting with all stakeholders.

The contractor shall maintain the working area in a clean and orderly manner as the work progresses and upon completion of construction, shall remove all waste materials and all temporary facilities from the site. Where directed the contractor shall remove, package and ship surplus or salvaged materials to the appropriate site.

The contractor shall remove and dispose of materials to an acceptable area off site.

2.3 Earthworks

Earthwork shall involve any excavations, trenching and backfilling for conduits, cables and concrete bases. Refer to City Standard Detail Drawing E1.1 for conduit and cable trench details and E2.1 to E2.11 for concrete base details.

Trenching, excavation and backfill shall meet the requirements of Section 02318 Trench and Backfill in the City Design and Construction Standards. No trenching shall be performed within 6m of a concrete base until the concrete has cured for a minimum of three (3) days. Where excavating to tie conduit or cables into pole base the contractor shall backfill around the base with import granular material compacted in accordance with Section 02318 Trench and Backfill in the City Design and Construction Standards .

Conduit and cables installed in trench shall have a 150mm wide yellow plastic marker tape indicating **"WARNING ELECTRICAL"** above the conduit or cable for the entire length of the trench. The location of marker is shown on City lighting Standard drawing E1.1 Conduit and Cable Trench Detail.

Trenches may be backfilled with excavated material unless the required compaction can not be achieved, then import material shall be used. The contractor is required to verify required compaction has been achieved by third party testing.

No trenching or backhoe work shall be completed over existing power or communication cables without the supervision of EPCOR, Telus or the Cable provider. The contractor will be required to hand excavate in these locations.

The contractor is responsible to contact Alberta One-Call or the respective utility to locate and mark existing underground facilities. Damage to these facilities will be the responsibility of the contractor.

To protect persons from injury and to avoid property damage, adequate barricades, construction signs, torches, warning lights and guards, as required, shall be placed and maintained during the progress of the work until it is safe for traffic or pedestrian use.

Temporary support, adequate protection and maintenance of all underground and surface utility structures, drains, sewers and other obstructions encountered in the progress of the work, shall be furnished by the contractor. All excavated material shall be piled in such a manner that it will not endanger the work and where practical, will avoid obstructing sidewalks, roadways and driveways. Gutters shall be kept clear for street drainage.

All excess spill material which is left over from excavations shall be cleaned up and removed from site.

Cutting asphalt and trenching of the roadway will only be considered where asphalt replacement is part of the project. Open cutting of asphalt and open trenching across existing asphalt must be specifically noted on the contract drawings and reviewed by the City of Edmonton Director of Signals, Street Lighting and Infrastructure. Where open cutting of asphalt is permitted it shall be undertaken via the appropriate asphalt and paving standards listed in City Design and Construction Standards, Volume 2, Roadways.

The contractor may cut and remove existing sidewalks and curb and gutter provided it is replaced in accordance with the standards listed in City Design and Construction Standards, Volume 2, Roadways. Where sidewalks are cut entire panels shall be removed and replaced.

All excavated and backfilled areas shall be restored to their original condition or better.

2.4 Bases (Foundations)

Bases are required to support lighting poles and lighting distribution/control cabinets. All bases shall be poured in place for poles greater than 11m (36 ft) in height. Recognized poured in place, precast or screw-in base types may be used for poles 11m (36 ft) or less. Steel screw-in type pole bases may be used where agreed to in writing by the Consultant and the City. All bases in the Engineering drawings are permitted for use with the pole height described

in the drawing title. All other base-pole combinations must be reviewed by the Director of Signals, Street Lighting and Infrastructure.

The contractor shall check for conflicts with overhead lines and any other conflicts prior to excavating for concrete bases. If it appears there may be an overhead conflict, the contractor shall contact the consultant for further instructions. If the contractor installs a concrete base in a location where the pole conflicts with overhead power lines, the contractor shall remove the pole and relocate the concrete base to a location reviewed by the consultant at the contractor's expense.

2.4.1 Concrete Bases

Concrete pole bases are defined on City Standard drawings E2.1 to 2.11. Concrete bases for Distribution/Control Cabinets are shown on City Standard drawings E4.3 and E4.4. Concrete base designs are based on assumed soil parameters shown on the Standard Drawings.

2.4.1.1 Products

All concrete shall conform to CSA A23.1-94 (to be discussed) with mix design meeting the following requirements:

- Minimum compressive strength at 28 days - **30MPa***
- Maximum nominal aggregate size - **28mm**
- Slump - **70mm to 100mm**
- Air content - **5% to 8%**
- Maximum W/C ratio by mass ratio - **0.45**
- Cement - **Type 50**

*Where time constraints exist, fast setting concrete of equivalent compressive strength may be used upon approval by the Director of Signals, Street Lighting and Infrastructure on a per project basis.

Reinforcing steel shall conform to CSA G30.18-M400R. For anchor bolts refer to Section 2.11. For Fillcrete backfill shall have a minimum compressive strength of 0.4MPa.

2.4.1.2 Execution

Backfill for pre-cast bases must be in accordance to the City Standard lighting drawing E2.10. Poured in place bases must follow the City of Edmonton's Design and Construction Standards.

The contractor, while placing concrete, shall ensure anchors remain plumb and true to required bolt circle diameter, do not float and the bolt projection is sufficient for pole attachment method required. Vibrate all concrete while being placed to eliminate air entrapment.

The contractor shall have the concrete strength (30MPa) verified, prior to installing the structure onto the base. The minimum number of concrete strength tests shall be one each week per mix design or concrete supplier. The contractor shall ensure all appropriate tests are taken at the site of the pour and provide results to the City of Edmonton.

Foundation pile concrete installation and winter protection shall conform to the latest edition of CSA CAN3-A23.

The contractor shall confirm that finished elevation of bases prior to placing concrete. Failure to confirm elevations may result in the base having to be removed and replaced at the contractor's expense.

When excavating for foundations, if high water or poor soil conditions are encountered which cause slumping in of excavations, the contractor shall pump all water out of excavations prior to placement of concrete.

Grading, landscaping and final site finish or refurbishing around pole bases shall be carried out, by the contractor, to the satisfaction of the City.

2.4.2 Steel Screw-in Pile Bases

Screw in pile bases may be considered as an alternate to concrete bases. They are not recommended in areas with rocky soils. Their usage must be reviewed by the City prior to use.

2.4.2.1 Products

The size and suitability of screw-in foundations must be determined by the supplier's structural engineer based on soils conditions present. If screw-in pile foundations are used they must be designed by a structural and geotechnical engineer registered with APEGGA.

All materials and fabrication for the steel screw-in pile bases shall meet the requirements listed in these specifications for steel poles.

After fabrication steel screw-in pile bases shall be hot-dip galvanized to the requirements of CSA G164M and shall be safeguarded against embrittlement as per CSA G164M Appendix A. Galvanizing thickness shall be a minimum of 2.77 mils.

The steel screw-in-anchor base plate shall match the size of the pole's base plate and have pre-drilled or slotted holes to match the pole's bolt circle diameter (BCD) and bolt size. The screw-in base shall be supplied with all required connection bolts, and washers.

2.4.2.2 Execution

Screw-in-anchor bases shall be installed as defined by the supplier's structural engineer.

2.5 Conduit (Tentative effective date January 1, 2011)

Conduit shall be used as a chase for new TECK or USEB cables into concrete bases, at road crossing and under driveways. Conduit shall be 50mm or larger PVC (DBII) to accommodate TECK or USEB cables.

Refer to City Standard drawing E1.1 for Cable Trench Details. Refer CEC for conduit sizing and fill requirements.

Conduit shall be installed in an open trench except where crossing under existing roadways or where trenching is deemed unsuitable due to mature trees, utility conflicts, etc. (as noted under 2.3 Earthworks) it shall be installed via a suitable trenchless technology. Conduits under existing paved roadways shall be installed via a suitable trenchless technology to avoid cutting the existing asphalt. Open cutting of asphalt will only be allowed where noted on the drawings. Schedule 40 HDPE conduits may be used when installing conduit via trenchless technology.

2.5.1 Products

Underground conduits and conduits in concrete bases shall be grey rigid DBII type conforming to CSA C22.2 No. 211.1. Conduit shall be connected using CSA certified cement. Each standard length of conduit and fitting shall bear a CSA certification mark and list the applicable CSA standard to which is was constructed to. Where installing conduit under existing asphalt via a trenchless technology, schedule 40 or better high density polyethylene conduit (black) shall be used as it has no splices and as such is designed for such applications.

All conduit mounted on concrete surfaces shall be rigid metal conduit (RMC) and shall be hot-dipped galvanized and conform to CSA C22.2 No. 45. Where expansion or movement take place flexible liquid-tight metallic conduit (FMC) conforming to CSA 22.2 No.56 shall be used. All joints shall be made with threaded couplers, adapters or conduit fittings. Conduit straps shall be galvanized steel single hole or double hole type (sized to suit conduit).

All empty conduits shall have a pull strings. Pull string shall be polypropylene with a minimum tensile strength of 1.1 kN.

2.5.2 Execution

The contractor shall layout and install conduit so it runs straight with the only 90 degree conduit bends being those tying into the base. All surface mounted conduits shall be run parallel or at right angles to structures and shall be installed in a neat, workmanlike manner.

PVC expansion and deflection joints shall be installed where conduits exit the structure into the trench to accommodate differential settlements.

Refer to Section 2.3 Earthwork for trenching and backfilling requirements.

2.6 Wiring and Cable

Cables shall be installed in an open trench or in conduit where required as defined in Section 2.4.

2.6.1 Products

All underground cables shall be TECK cable suitable for direct burial, with a HL rated jacket, unless otherwise indicated. Conductors within the TECK cable shall be stranded copper with a minimum size of #12 AWG with RW90 (XLPE), -40C, 1000V rated insulation.

For underground wiring in residential subdivisions wiring can be USEB-90 cable with stranded aluminum conductor(s), black cross-linked polyethylene insulation, color-coded PVC, 600V to CSA C22.2 No. 129 in conduit.

All surface mounted wiring in a galvanized steel conduit or flexible metallic conduit shall be a minimum of #10 RWU90 (XLPE), 600V, stranded copper wiring as indicated on contract drawing.

Wiring inside pole shall be minimum of #12 RW90 (XLPE), 600V, stranded copper or aluminum (to match conductors feeding the pole) from the fuse in the pole hand hole to the luminaire.

All conductors and cables shall be CSA listed and bare a CSA label.

2.6.2 Execution

Exercise extreme care at all times when handling electrical cables to ensure that cable and conductors are not damaged. Cable shall not be positioned beyond the allowable minimum bending radius of each particular cable.

All exposed cable ends shall be sealed by taping with a minimum of two wraps of Greenline, self-amalgamating tape or an appropriate heat shrink sleeve.

2.7 Wire Connections and Fusing in Pole Hand Holes

Wiring in pole hand holes shall be in accordance with City Standard lighting drawing E3.15.

2.7.1 Products

All wire terminations in the base of poles shall be via Burndy Unitap squid style connector or approver alternate. Each live conductor to the luminaire shall have a fused breakaway connector to safely disconnect wiring when poles are knocked down. Fused connectors shall be Tron HEB-AA type with compression connectors and breakaway feature. Fuses shall be 10A Bussmann BAN-10 type (for up to 250V) and KTK (for up to 600V).

All terminations, connectors, fuses and fuse holder shall be CSA listed and bare a CSA label.

2.7.2 Execution

All aluminum to aluminum and aluminum to copper wiring into set screw wire connections shall be coated with Penetrox anti-oxidizing compound.

Work to be executed in a neat, professional manner.

Terminators and conductors shall be arranged to permit easy access to terminations without disturbing other components or conductors.

Torque all connections to Manufacturer's recommendations.

2.8 120V Receptacles

Shall be installed on poles where noted on the contract drawings in accordance with City Standard drawing E3.16. They shall typically be used to power seasonal strings of tree lighting and decorations.

2.8.1 Products

Duplex receptacles shall be specification grade 2 pole, 3 wire grounded 5-15R type in accordance with the Canadian Electrical Code. The receptacle shall be installed in a cast FS Box and shall have a cast double spring door cover rated for wet locations. The FS Box shall be painted to match the pole colour (if applicable).

2.8.2 Execution

The receptacle box shall be securely attached to the pole at the required mounting height.

2.9 Lighting Distribution / Control Cabinets

City standard lighting distribution / control cabinets shall be:

- 120/240V - 100A or 175A lighting distribution /control cabinet
- 120/208V, 277/480V or 347/600V - 100A or 200A lighting distribution /control cabinet
- 120/240V - 30A residential lighting controller base

These cabinets and concrete bases are detailed on City Standard drawings E4.1 to E4.12.

2.9.1 Products

Lighting distribution / control cabinets and residential style lighting controller bases must be recognized to be eligible for use on projects within the City.

The supplier shall be capable of producing a premium grade product, which meets the quality, fit and finish noted in these standards. The use of CNC equipment is mandatory. The supplier's shop shall be approved to produce CSA listed products.

Cabinet complete with all electrical components shall bear the label of the CSA. The cabinet and internal components shall be designed to meet the approval of the local electrical utility and shall be designed for easy maintenance.

The lighting control system (schematic) and power distribution system (one-line diagram) shall be as noted on the City Lighting Standard Detail Drawings.

2.9.1.1 Lighting Distribution/Control Cabinet

Unless otherwise noted, the cabinet shall be fabricated from 5052-H32 sheet aluminum of at least 1/8-inch thick. All materials shall be corrosion resistant for extended life

All screws, bolts, washers, nuts, etc. shall be stainless steel. All screws shall be stainless steel pan-head machine screw type. Any bolts that are 1/4-20 or larger shall be stainless steel hex head type. No sheet metal or self tapping screws shall be used.

All exterior seams shall be of continuously welded construction. All welds shall be free of slag and spatter. All exterior welds shall be ground smooth. The supplier shall have suitable credentials to weld aluminum and shall adhere to all applicable ANSI standards. The supplier shall use a suitable welding process and materials.

Doors shall be designed for maximum strength and snug fit. It is the supplier's responsibility to design and fabricate the doors to the fit and finish required in this specification. Doors shall be fabricated out of a single sheet of aluminum and have a wrap around return for strength and fit. Doors shall also have an inner skin for additional strength. The bottom of each door shall have ventilation holes. Doors shall be fully gasketted against the cabinet. Door hinges shall be positioned so they are hidden behind the door and cannot be accessed with the door closed. A minimum of 2 hinges are required per door. Each door shall have a pneumatic return device to control the rate of door open and close and prevent opening beyond 90 degrees. Door handles shall be 3 point contact stainless steel construction. The handles shall latch to the cabinet with minimum 16 gauge stainless steel rails and rollers which shall be fabricated to provide a secure and well sealed attachment to the cabinet (see Figure 1).

Figure 1 - Cabinet Door Example

The exterior of the doors shall have continuous welds. All exterior corners shall be rounded to a minimum radius of 1/8 of an inch. All sharp edges shall be de-burred to a minimum radius of 1/64 inch in order to reduce hazards to service personnel.

The cabinet and door shall be constructed to meet NEMA 3R standards. The cabinet shall be made up of the main body, roof section and inner wall. These components shall be welded together. The cabinet shall be designed for maximum strength and proper fit to the door. The cabinet shall be designed to attach to concrete pad via Hilti style drop-in anchors, which shall be supplied with the cabinet. The exterior of the cabinet shall have continuous welds. The cabinet main body shall have a wrap around return to accept the door.

The cabinet shall be equipped with lifting brackets, which shall be removable after the installation. All exterior corners shall be rounded to a minimum radius of 1/8 of an inch. All sharp edges shall be de-burred to a minimum radius of 1/64 inch in order to reduce hazards to service personnel.

Equipment shall be mounted on an inner panel. Equipment mounting panels shall be constructed from 5052-H32 sheet aluminum at least 1/8 thick.

All equipment shall be labeled using Lamicoid or vinyl adhesive labels with ½-inch high black characters on a white background.

All panels shall be supplied with the breakers installed. The main panel boards shall be supplied based on the panel schedule on the contract drawings. Panel boards and load centers shall be securely attached to the cabinet back plane and shall be located for easy access and servicing. The main breaker shall be thermal magnetic trip, molded-case, and clamp-on type. Branch circuit breakers shall be thermal magnetic trip, molded-case, clamp-on type to suit the main panel board. The minimum fault current shall be as noted on the contract drawings.

Transformers shall be epoxy encapsulated type (Delta ET series, or Recognized Equal). Transformer size and voltage shall be as noted on the City Standard Lighting Drawings. Transformer shall be mounted and attached in a suitable location for easy access.

The grounding system shall be designed to meet all CSA standards and any codes and local utility standards. The grounding system shall be designed as part of the power distribution system.

Lighting contactors shall be mechanically latched type Cutler-Hammer Model CH A202 or Recognized Equal. Contactors shall be bolted to the back panel in the lighting control cabinet.

Terminals, etc, shall be din rail mounted. Wiring shall be routed through suitably sized Panduit wire way. All wiring shall be neatly grouped bundled and ty-rapped. All conductors shall be stranded copper RW90 insulation. Provide 8-32 inserts and ty-rap mounts for the attachment of wiring. Wiring and terminal blocks shall be labeled. All wiring shall meet CEC standards.

All products shall be labeled (inside) with the supplier's company name, model number, panel rating and the date of manufacture. The supplier shall also provide adhesive lamicoid or vinyl labels on the inside of each cabinet for each component. Each contactor and output circuit shall also be labeled in accordance with the circuits as defined on the contract drawings. All ID labels shall have 6mm to 12mm high black characters on a white background. All wiring shall be labeled with computer generated sleeve type wire markers.

The supplier shall test all equipment circuits and lighting controls prior to shipment. Test results shall be provided upon request. The consultant and City reserves the right to inspect the completed product prior to packaging and shipping. The supplier shall advise the consultant a minimum of 5 working days prior to shipping.

Each cabinet shall be lag bolted to two 4" x 4" posts along the shorter sides of the cabinet to be used for support when kiosk is being lifted or moved. Any product damaged in shipping shall be repaired or replaced at no extra cost to the Owner.

2.9.1.2 Residential Style Lighting Controller Base

For residential style street lighting controllers, all of the items found in 2.9.1 above shall apply with the following exceptions and conditions:

- The lighting controller shall be fabricated out of steel and galvanized after fabrications;
- The main disconnect will be mounted separate from the control side. The main disconnect shall be installed in a NEMA 3R service entrance enclosure mounted on one side of the enclosure. The breaker for the main disconnect shall be a 30 amp, 2 pole breaker rated at a minimum of 18 kA interrupting capacity. The breaker may be of the push-in style due to size constraints;

- The control components shall be mounted in an aluminum NEMA 3R enclosure then mounted into the opposite side of the main breaker in the enclosure;
- Provide lamacoid identification, permanently secured to power base covers identifying “control circuit” side and “main breaker” side;
- The main breaker side of the power base shall always be mounted on the down stream of traffic.

2.9.2 Execution

Work to be executed in a neat, professional manner.

The cabinet shall be mounted onto a concrete foundation and attached via anchors. Conduits shall be located to suit the cabinet and components. Conduits shall be located to run straight into panels or cabinets with minimal bends.

Seal cabinet to concrete with suitable silicone sealant. Type all circuits and device identifications onto panel schedules and locate on the panels.

All aluminum to aluminum and aluminum to copper wiring into set screw wire connections shall be coated with Penetrox anti-oxidizing compound.

Terminators and conductors shall be arranged to permit easy access to terminations without disturbing other components or conductors.

Torque all connections to Manufacturer’s recommendations.

2.10 Grounding

All grounding shall meet the requirements of the Canadian Electrical Code.

2.10.1 Products

The ground grid shall consist of a minimum of two 19mm x 3050mm copper clad ground rods. They shall be interconnected with a bare copper conductor and terminated in the service entrance enclosure.

Connectors to rods shall be screw type ground clamps.

2.10.2 Execution

All grounding shall be installed to meet CEC requirements. Following the installation of ground rods the contractor shall measure and record the resistance to ground. Resistance to ground shall not exceed 25 ohms. Where the resistance exceeds 25 ohms additional rods shall be supplied until the resistance is 25 ohms or less. Resistance to ground tests results shall be recorded and submitted to the consultant.

2.11 Photocells and Receptacles

2.11.1 Products

Specific requirements for photocells are as follows:

- Photo-sensor type - Filtered Silicone
- Load Rating - 1800VA
- Life at Rated Load - 5,000 hours of on-off operations
- Operating Levels - Turn-on 16 Lux +/- 6 Lux. Turn-off/Turn-on ratio: 1.5 to 1.

- Dielectric Strength - 5KV minimum between any current-carrying part and metal mounting surface.
- Lightning Protection - Minimum 320 Joule MOV.
- Time Delay - 2 to 4 seconds
- Ambient Temperature Range - -40°C to +70°C
- Moisture Resistance - 100% relative humidity
- Mechanical - Cover: UV stabilized polypropylene, Chassis: Molded polycarbonate, Plug blades: Solid brass/3 pole locking for luminaire, Gasket: Cross linked polyethylene.

For cobra head luminaires photocells shall be twist-lock type with a three-prong receptacle supplied mounted on the top of the luminaire. For decorative style post top luminaires the photocell may mount in the neck between the pole and luminaire or on top. For cabinets photocell shall be designed to attach to the top of the cabinet and shall be durable and vandal resistant.

2.11.2 Execution

All photocells shall be securely attached to the luminaires or cabinet. Photocells window shall be aimed north.

2.12 Poles, Anchor Bolts and Residential Lighting Controller Base

2.12.1 Products

Poles, anchor bolts and residential controller bases must be recognized to be eligible for use on projects within the City.

Designs for standard products are defined on the City Standard Lighting Drawings E3.1 to E3.19 therefore no shop drawings or review will be required provided products are constructed as per the drawings. Non-standard poles shall be designed in accordance American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

All materials shall be new. The supplier, shall supply mill certificates on all sheet steel and anchor bolts to the contractor. The mill certificates shall include all chemical and physical properties of the steel to be used in any fabrications.

All steel shall be free of surface defects and internal discontinuities and shall be weldable. All steel for poles and bases shall have a minimum grade of 300W (G45) or greater and shall conform to CSA-G40.21.

Silicon content of steel shall be as per ASTM A385 (Silicon up to 0.03% or between 0.15 % & 0.21% best accommodate galvanizing process).

All structural steel shall be certified to be impact tested per heat to category 3 and shall satisfy Charpy V-Notch test requirements of 20 Joules for grade 300W and 27 Joules for Grade 350W at minus 30°C.

Manufacturer, welding procedures, and welders shall be certified to Canadian Welding Bureau and CSA W59 and W178 Specifications.

Longitudinal welds shall be sound, continuous and have a minimum of 60 percent penetration, except those within 15 cm of circumferential groove welds and the longitudinal weld 15 cm up from the bottom of each female section of the slip joint. These shall be back welded on the inside. All circumferential welds must be guaranteed 100 percent penetration and internal back-up strip must be used at the joint. All welds shall be free of slag and splatter.

Welding shall be done by fabricators fully certified to CSA W47.1. Welder's certificate shall be available for inspection by the Engineer on demand and copies made available if requested. Electrodes for welding shall conform

to CSA W48.1 and W48.3 and shall have low hydrogen content. The suppliers welding practices shall be available for inspection by the City or consultant on demand and copies made available if requested.

All metal surfaces shall be thoroughly cleaned and free of any mill scale, rust, grease or weld splatter prior to applying any finish. Mill scale shall be removed as per the requirements of the caustic & acidic bath processes performed in the galvanizing process.

Holes required for handling purposes during fabrication shall be drilled and have a maximum of 20mm diameter and a minimum edge distance of 34mm. Flame-cut holes will not be allowed.

All steel poles shall be hot-dip galvanized after fabrication to the requirements of CSA G164M to a minimum thickness of 2.77 mils and shall be safeguarded against embrittlement by the CSA G164M Appendix A. All steel surfaces of poles shall be free of oil, paint, grease, varnish, rust, anti-splatter compounds and welding slag prior to galvanizing. Double dipping of poles is not permitted. The galvanizing finish shall be continuous and uniform with respect to colour, texture and appearance. Any loose galvanizing slag, splatter, sharp edges and/or drippings shall be removed and filed smooth and coated with a recognized cold galvanizing compound (with minimum 95% zinc content).

The galvanizer shall follow the most current version of CSA G164M as well as the following requirements:

- The galvanizer shall use an A.S.T.M. B6 Special High Grade type zinc or approved equivalent, having a minimum zinc content of 99.990%, with a maximum non-zinc composition of 0.010%; the non-zinc portion to include, but not limited to: iron, cadmium, aluminum, copper, and tin.
- The galvanizer shall submit a bath composition data sheet indicating the typical range of zinc and required non-zinc elements.
- The galvanizer shall submit two galvanized sample plates, 3 inches x 6 inches x ¼ inch thick (75mm x 150mm x 6mm) for approval.
- The galvanizer shall also include a field and shop repair procedure, including the surface preparation, cleaning, and coating material.
- A warranty must be provided and approved by the City of Edmonton, prior to acceptance.

The City of Edmonton shall approve all bath compositions and galvanizers prior to accepting the product. No quenching or chromating processes are to be done to any galvanized products supplied to the City of Edmonton to facilitate in future coating procedures. All products are to be finished to a visually acceptable state.

All fabrication shall meet the following tolerances:

- Straightness - The straightness of any item shall not exceed the overall length divided by 300 from the surface at any point. This shall be measured with a straight line joining the surface at both ends. The difference between the straight line and the surface shall then be measured to determine the straightness.
- Twisting - The twist in the overall length of any shaft, arm, or extension shall not exceed 7°.
- Length - The specified length of any item shall be within -0 to +60 mm or -0 to +5% (which ever is less).
- Across the flats Dimensions - The average of all across the flats dimensions from a given cross section shall be within 1% of the specified dimension. In addition, the ratio of the maximum to minimum across the flats dimensions shall be less than or equal to 1.05.
- Gap at Flange Connections - The gap at flange connections shall not exceed 2 mm.
- Arm Rise - The arm rise shall be within 1° of the specified rise. Arm rises shall apply to an unloaded structure in the standing position.

Fabrication shall comply with the most current edition of CAN/CSA 516.1-M unless otherwise instructed by the City.

All base plates of steel poles shall be hard stamped identifying manufacturer and year of fabrication prior to galvanizing. The stamp shall be on the top side of the base plate on the hand hole side, clearly visible after

galvanizing or other recognized finish is applied and located in such a place where washers or nut covers will not hide markings.

Two piece pole and davit assemblies with an overlapping slip joint shall have hard stamped on the pole, the minimum recommended overlap level identified on two opposite sides of pole. This overlap mark shall be clearly identified after galvanizing or pole finish is applied.

Anchor bolts shall be supplied with poles. Anchor bolts shall be a minimum 25mm (1") diameter x 1220mm long for poles 12.2m or less and 25.4mm (1”) diameter x 1220mm for 13.1m and 15m high poles. Minimum yield strength (Fy) of sSteel shall be 50 ksi (345MPa) for pole shaft and 36ksi (245MPa) for flange, base plate and other parts. Anchor rods shall be Grade A4140 with minimum yield strength (Fy) of 82 ksi (560 MPa) and a minimum tensile strength (Fu) of 105 ksi (725 MPa). The top 200mm of the anchor bolt shall be threaded to accommodate UNC hexagonal nut. After fabrication and galvanizing, the anchor bolts shall be capable to withstand an elongation of not less than 13% prior to failure.

Anchor bolts to be supplied complete with two hexagonal nuts, and one cut washer.

All anchor bolts and all nuts and washers shall be galvanized after fabrication to CAN/CSA G164M. Anchor bolt threads shall be sized to accept galvanized nuts without damaging galvanized coatings.

Poles, anchor bolts and related hardware shall be tested on an on-going basis by the supplier of testing agency certified to CAN/CSA-W178.1. The cost for testing of product shall be borne by the supplier including any re-testing costs. Should the supplier fail testing, the supplier shall repair or replace all defective product. Testing shall be as follows:

- Welding - The testing of welds shall be performed in accordance with CAN/CSA-W59. All welds shall be visually inspected. Full-penetration welds shall be ultrasonically tested. Fillet welds to base plates and flange plates shall be tested by the dry powder magnetic particle method. Seam welds shall be cut, etched and checked for penetration (random sample from seam welder).
- Galvanizing - Confirm thickness of galvanizing
- Steel - Verify mil test certificates.
- Anchor Bolts - Verify test certificates from the bolt manufacturer confirming that the galvanized anchor bolts and connecting hardware meet requirements. Bolts shall be tested for yield strength, ultimate strength and elongation in accordance with ASTM A325 and tested for embrittlement in accordance with CAN/CSA G164M, Clause 6.5.
- Tolerences - Confirm all tolerances meet requirements.

Testing shall be undertaken on 10% of product order or production run. Testing documentation shall include report summarizing tests undertaken referenced to product produced. Testing documentation shall be submitted to the consultant or City prior pole installation. Where poles have a powder coat finish it shall be tested and results submitted as defined in the Power Coat section of these specification.

2.12.2 Execution

The contractor shall take all necessary precautions to ensure adequate protection of existing works and personnel during installation of poles. Make all necessary arrangements with the utility company to de-energize high voltage overhead conductors in close proximity or within the limits of approach when installing light poles.

Care shall be taken to minimize damage to surfaces of poles and attachments. Only cloth straps shall be utilized when lifting poles. Any damage to finished surfaces shall be repaired to the satisfaction of the consultant and the City.

Poles shall be installed plumb with a one degree allowable lean tolerance and all poles on a given alignment must be true to each other

Exposed threads on anchor bolts shall be coated with suitable non-oxide grease prior to pole installation. All nuts shall be tightened to 1/3 past snug tight or as noted on the standard drawings.

Davit pole arms are to be installed at right angles to centerline of roadway or as otherwise noted.

Repairing damage to galvanized surfaces is defined under ASTM A780; Method A2 for small areas and Method A3 for large areas.

2.12.2.1 Method A2 - For Small Areas

Where damage to the galvanized surface is 6mm x150mm or smaller zinc rich paint repair as per method A2 as per ASTM A780 can be used. Under these conditions the surrounding zinc will still provide cathodic protection and the zinc rich paint applied to the damaged areas should prevent surface corrosion.

2.12.2.2 Method A3 - For Larger Areas

Where damage to the galvanized surface is larger than 6mm x150mm metalizing repair as per method A3 as per ASTM A780 shall be used. A minimum zinc coating thickness of 150 microns, shall be applied to ensure that the repaired area will be corrosion free for the life of the pole. In addition the top coating of the metalizing repair shall be coated with a zinc rich paint. This should aesthetically blend in the repair area with the surrounding galvanizing so it will not be as noticeable.

2.13 Banner Brackets

Banner Arm installation shall follow the City of Edmonton "Guideline for Residential Development Identification Banners" latest edition. All banners and banner brackets must be recognized by the City via a permit issued by the Transportation Department

Banner brackets shall be securely attached to the pole shaft to which they are mounted.

2.14 Breakaway Bases

Breakaway bases allow the pole to breakaway from its base when impacted by a motor vehicle. A typical breakaway base is shown on City Standard drawing E3.13.

Breakaway bases must be recognized to be eligible for use on projects within the City.

The U.S. Federal Highway Administration (FHWA) has adopted the testing parameters and criteria from the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals for determining acceptable performance of breakaway pole devices. The FHWA issues acceptance letters to manufacturers of pole breakaway systems acknowledging that the devices meet their requirements. Typically, the acceptance letters describe the device tested and include a drawing of the device, test results, and information on the use of the device, such as the weight of the system tested or the soil in which it is acceptable.

Whether a coupler, slip base or frangible base system is used, the system must be engineered, tested and proven by its manufacturer for the given application. As a minimum, the supplier's engineer should:

- confirm that the breakaway product will support the pole for the given wind pressure and wind speed for the area;
- provide FHWA acceptance letter.

2.14.1 Execution

The entire assembly shall be installed in accordance with manufactures instructions. Bolts tightness is critical to ensure the base performs as designed. All bolts shall be tightened as per manufacturer's instructions.

2.15 Powder Coat Finish

Powder coat finish suppliers and products must be listed on the City Recognized Product List to be used on City projects.

Where powder coat finishes are required they shall be durable and long lasting. A powder coat finish will typically be applied (where noted) to poles, cabinets and luminaires. These items shall be referred to herein as products.

Where powder finish product fails to meet the requirements of these specifications and ultimately fails testing it shall be replaced at no cost to the City and the new replacement product shall be supplied and installed in a timely fashion by the contractor. Lighting levels must be maintained in the event replacement is required.

This information has been developed in consultation with the powder product suppliers listed in the Recognized Product List. Neither the Consultant nor the City will take responsibility for a supplier's inability to produce product to meet the requirements of this standard. Where the applicator has an alternate process it must meet the approval of the City and the Consultant and must pass the tests noted in these specifications.

The supplier shall maintain a suitable quality control process, which shall apply from receipt of the product to final shipping. The quality control process shall be documented and available for review upon request. The quality control system shall identify all steps and quality control checks, which shall be applied throughout the process. Each product or group of products produced in a production run shall have a unique run number, which shall identify the specific batch and type of powder used; the date the powder was applied, testing documentation and corrections made.

Suppliers listed in the Recognized Product List shall supply the powder product. Alternate products must meet or exceed the recognized suppliers products specified and must meet the approval of the City. Submission requirements for alternate powder product shall generally consist of the following:

- Powder Properties;
- Curing Properties;
- Corrosion Protection Properties;
- Weather and UV Resistance Properties;
- Mechanical Properties;
- Independent Test Reports on Finished Product.

The base coat and topcoat shall be as noted in the Recognized Product List or recognized alternate. The topcoat shall meet the material requirements of a "Super-durable" powder material and the manufacturer must supply third party testing information stating that the material does meet these requirements.

Colors shall be defined on the reviewed engineering drawings (refer to recognized product list for recognized colors). The powder color shall be within 1 DE (Deltas) of the color specified.

Prior to producing a powder finish product the supplier shall produce a copy of their Quality Control program and written confirmation they intend to follow these specifications. The supplier shall name their independent testing agency and this information shall be submitted to the City for reference.

The application process shall be as follows:

- Powder shall only be applied after the product is completely fabricated and galvanized. No welding or bending shall take place after the powder is applied. Galvanized surfaces receiving the powder coating shall be cleaned and prepared for coating in accordance with the City of Edmonton Surface Preparation Specification for Galvanized or Metallized Surfaces.
- Assemblies conforming to the ASTM D 6386 definition for newly galvanized steel shall receive surface smoothing and surface cleaning in accordance with ASTM D 6386, Section 5, and surface preparation in accordance with ASTM D 6386, Section 5.4.1.
- Assemblies conforming to the ASTM D 6386 definition for partially weathered galvanized steel shall be checked and prepared in accordance with ASTM D 6386, Section 6, before then receiving surface smoothing and surface cleaning in accordance with ASTM D 6386, Section 5, and surface preparation in accordance with ASTM D 6386, Section 5.4.1.
- Assemblies conforming to the ASTM D 6386 definition for weathered galvanized steel shall be prepared in accordance with ASTM D 6386, Section 7 before then receiving surface smoothing and surface cleaning in accordance with ASTM D 6386, Section 5, and surface preparation in accordance with ASTM D 6386, Section 5.4.1.
- The Contractor shall notify the NACE Coating Inspector of all surface cleaning and preparation activities and shall provide the NACE Coating Inspector opportunity to perform quality assurance inspection at the completion of surface cleaning and preparation activities prior to beginning powder coating application.
- In the event the galvanizing is damaged during the blasting process and the extent of such damage is limited to a small area, the contractor shall patch the damaged area using a thermal spray process (metallizing) with a wire containing a minimum of 95% zinc.
- If brush blasting is done off site then the product shall be covered and shielded from any dirt or moisture during its return to the powder applicators facility. Where poles or products are not kept clean and dry or have any signs of flash rust they shall be returned for further brush blasting. For aluminum products a chemical wash treatment may be acceptable.
- Once at the applicators facility the pole or product shall be thoroughly cleaned and dried with an air gun. All hand marks or grease spots shall be cleaned with a mild solvent.
- After brush blasting and cleaning the entire pole or cabinet shall be pre-baked in an oven at 220 degrees C for at least 30 minutes to 1 hour, depending on steel thickness. The pre-baking must be done to prevent out-gassing during the curing cycle.
- The base powder coat (primer) shall then be applied electrostaticly while the pole or product is cooling from the 220 degrees C pre-bake period to allow the powder to melt and fuse to the surface. The base coat (primer) shall be applied to a thickness of 2 - 3 mils.
- After base powder coat (primer) is applied and set the topcoat shall be applied to a thickness of 3 to 4 mils. The pole or product shall be returned to the oven and heated to 190 to 220 degrees C (temperature shall not exceed pre-bake) for a minimum of 25 minutes, depending on steel thickness. Thicker product material may require longer bake cycles to fully cure. Upon removal of the pole or product from the oven it shall be left to rest until the pole or product is cool enough to the touch.
- For poles and cabinets once the topcoat has cured and the product cooled, they shall then be individually wrapped (min 4” overlapping method) with 1/8” foam wrap over the entire pole or product. Poles shall be bundled together and separated with suitable wood dunnage to avoid contact between the poles, product or other bundles. All bundles themselves shall be fully wrapped with foam and with stretch-wrap as noted above. Products shall be handled and shipped with great care to prevent damage; damaged product will be cause for rejection of the item(s).

Each run of product in an oven shall have at least one sample tested for:

- Adhesion - The finished powder surface shall have minimum pull-off strength exceeding 1000 PSI as tested in accordance with ASTM D4541.

- Quality - The finished powder surface shall be free from any imperfections as tested in accordance with ASTM D4541. The product shall also be free from wrinkles, orange peel, cracking, pinholes, fish eyes, blisters, etc by visual inspection.
- Color - The color shall be verified to be within 1 DE of recognized color.
- Coating thickness test demonstrating an average film thickness of no less than 5 mils after subtracting the predetermined thickness of the zinc galvanizing.
- Powder Coating Institute (PCI) test #8 recommended procedure for solvent cure test.

An independent testing agency that is qualified to test powder finish shall do the testing at the supplier's expense. The result of tests shall be included in the Construction Folder. A supplier who fails to test product as noted above will have their product rejected until the testing is completed and the product deemed acceptable by the testing agency.

Where the tested product fails on a given production run then a minimum of 30% of the entire production run shall be tested. If no other failures are found then the individual failed product shall be stripped, reapplied and re-tested until it passes. If any of the 30% of product tested fails then the entire order shall be stripped, reapplied and retested until it passes.

The supplier shall supply a transferable warranty. The warranty will cover the integrity of the surface for a minimum of 7 years from the date of installation. The warranty shall include all labor and materials required to provide replacement product if required including all costs related to removal, re-galvanizing, and reinstallation. The powder finish shall be the responsibility of the cabinet or pole supplier. The warranty shall apply to blistering, cracking, chipping, peeling and all other surface defects of the powder coat finish excluding mechanical damage and environmental damages occurring after installation as determined by a third party testing agency. The warranty shall include a letter signed by the supplier listing the date of delivery and that coatings meet all City requirements.

2.15.1 Procedure To Repair Damaged Powder Coat Finish

The following is step by step procedure to field repair powder coat finish:

- With a clean rag - wipe damaged areas to ensure there is no dust or dirt
- If the top coat is flaking use a small sharp knife (if needed) cut the excess topcoat paint off using a circular motion to form a smooth circle repair area. Make sure you press down to cut the excess - non -bonding topcoat from away from the galvanized surface.
- If the top coat is not flaking use a 80 grit sand paper and lightly sand the area showing and a small portion of the top coat to allow bonding for the new coats of paint.
- Using the Devoe 142 C 100% solids epoxy, using a small spatula, dab onto the area missing the coating. This coating will "build up" the coating to the same level as the original powder coating.
- Once the epoxy is dry, lightly sand with 80 grit sand paper so that this coating is flat with the existing powder coating, wipe off dust, mask the undamaged area beyond the spray zone (this helps keep the coating on the area that needs repairs and limits overspray) and spray the Endura EX2C topcoat (color to match pole) to the damaged area. Apply very thin coats no more than 3 mils thick when wet. The topcoat can also be applied using a foam paint brush, or using a small hand spray bottle. Note - when using the spray bomb, be careful to note wind direction and what cars and other personal property of owners are around so no overspray occurs. If needed, repeat this step so that the area is totally covered and looks good.

2.16 Luminaires

2.16.1 Products

Luminaires must be recognized to be eligible for use on projects within the City (refer to the City Recognized Product List).

HID luminaires shall be designed to provide the required lighting onto the roadway and sidewalk. Typical luminaires used in the City of Edmonton are 70W, 100W, 150W, 250W, 310W, and 400W as defined on the reviewed engineering drawings. Luminaires should provide ease of maintenance and superior photometric qualities, allow for greater spacing and provide considerable versatility in terms of application. All luminaires shall meet the requirements of CSA C653 Photometric Performance of Roadway Lighting Luminaires. The Consultant shall confirm the luminaire is CSA recognized. Luminaire suppliers shall provide proper photometric files in IES format.

All luminaires shall be designed to avoid reflecting energy towards the arc tube. When going from stabilized bare lamp operation to stabilized operation in the luminaire, the voltage of new lamps shall not increase more than that specified by the lamp manufacturer.

All luminaires (including internal components) shall be approved to the appropriate, nationally-recognized standards by organizations accredited by the Standards Council of Canada to do so, and bear the organizations' label inside the housing. As a minimum, luminaires shall meet the requirements of CAN/CSA Standard C22.2 No. 250 - Luminaires and ANSI C136 series of applicable standards.

Luminaires shall meet the requirements of ANSI-C136.31, American National Standard for Roadway Lighting Equipment - Luminaire Vibration.

Luminaire housings shall have a terminal block to accept up to a maximum No. 10 AWG power and neutral conductors and shall be accessible without having to remove internal components.

Ballast circuits for HPS lamps shall be capable of operating the lamp within the applicable ANSI trapezoid. Insulation shall be class H, 180 degrees C or better. Ballast circuits shall have a power factor of 90% or better. The ballast circuit design for the HPS luminaire shall be a constant wattage autotransformer (CWA) with the capacitor in series with the lamp or Mag-Reg type. The ballast circuit (i.e. starters, capacitors and transformers) shall be designed to operate without failure for up to three months while the lamp is in open or short circuit failure or the lamp has reached the end of life and starts to cycle.

Capacitors shall be rated for 90 degrees C and shall be positioned to prevent overheating of the capacitor. Starters shall be encapsulated. Lamp holders shall be glazed porcelain, with anti-vibration lamp grips and spring-loaded centre contact. Lamp holders shall be minimum 4 kV pulse rated and shall accommodate mogul screw type based lamps.

The ballast circuit shall be removable as a complete unit. This shall be achieved by mounting the components on a removable plate or mounted on the lower door housing for double door style roadway luminaires. The transformer, starter, capacitor and lamp socket shall be individually removable by using quick disconnect style connectors (i.e. molex style). Connectors shall be designed not to vibrate loose.

All wiring shall be colour coded No.18 AWG stranded and rated for 125 degrees C. Green shall only be used for bonding conductors and white for neutral conductors.

Luminaire housings shall have a smooth finish without any blemishes and rough or sharp edges. The housings shall be manufactured die cast aluminum alloy and designed to provide mechanical resistance to vibrations and wear under extreme weather conditions. The housing shall be designed to mount to the pole and shall have a built in leveling feature.

The luminaire optical system shall meet or exceed a rating of IP65 or better. The reflector shall be spun or segmented aluminum. The lens shall be glass.

Access to, removal of or replacement of all components in the luminaire, including the reflector assembly, lamp, ballast or any other interior component, shall be tool-less for all components.

A removable gasket of high density polyethylene or similar material 1mm thick shall be required to prevent birds or pests from entering the luminaire where it attaches to the pole.

Latch system shall be a captive spring-loaded latch designed to withstand extreme weather conditions and vibrations. The latch shall be easy to operate with gloved hand without the use of any tools. The top of the housing shall have a level surface to accommodate bubble level for adjustments.

Nuts, bolts, washers and miscellaneous hardware shall be stainless steel, zinc dichromate plated or brass. Stainless steel shall not be used for self-tapping screws or where screws are threaded into the aluminum casting. For this application, all hardware shall be zinc dichromate plated.

Installation instructions shall be supplied with each luminaire.

All labels shall be permanent and weatherproof. Luminaires shall have NEMA wattage labels located in such a way that they can be easily read from the ground

All non HPS luminaries shall bare a label showing the month and year of manufacture which shall be located adjacent to the NEMA wattage label. The label shall have black characters on a white background and shall be made from the same adhesive material as the NEMA wattage label. The character height shall be the same as the character height in the NEMA wattage label. The month/year label shall consist of 4 characters: two alpha characters for the month and two numbers for the year.

A wiring diagram shall be glued to the interior cavity of each luminaire. This diagram shall be completely visible without requiring the removal of any internal equipment.

Specific luminaire styles are as follows:

2.16.1.1 Cobrahead Luminaires

Cobrahead luminaire shall be designed to install on City standard davit poles. The lens shall be clear, tempered, shock-resistant glass, convex or flat in shape and shall contain no prisms. Recognized luminaires are listed on the City Recognized Product List.

2.16.1.2 Decorative Roadway and Walkway Luminaires

Decorative luminaire shall be designed to install on City standard or custom poles. The lens shall be clear, tempered and shock-resistant glass. Decorative luminaires will be reviewed on a project by project basis.

2.16.1.3 Underpass and Tunnel Luminaires

Underpass and tunnel luminaire shall be designed to install on walls or ceilings. The lens shall be clear, tempered, shock-resistant glass, convex or flat in shape and shall contain no prisms. Underpass and Tunnel Luminaires shall be reviewed on a project by project basis.

2.16.2 Execution

All luminaires shall be securely attached to their pole or mounting surface. Where installing luminaires on bridges or structures where vibration may be present the contractor shall attach to the pole or structure with safety cables. All wiring connections shall be securely attached.

All luminaires shall be installed level or plumb. Optic settings, aiming angles and alignments of luminaire shall be as instructed by the Consultant or the City. If proper aiming and alignment of luminaires is not achievable while the pole is on the ground, the Contractor shall supply all necessary man-lifts and equipment to allow for final adjustments to be performed after poles are erected, at no additional cost.

2.17 LED Luminaires

LED luminaires may be considered for specific applications within the City. The City has an LED specification however as LED's are under constant development and refinement the specification will be updated on an ongoing basis.

Products will be reviewed on a project by project basis.

2.18 LED Luminaire Specifications

LED roadway luminaire suppliers must meet these specifications and be listed on the City's Recognized Products List in order for their products to be used in the City. LED luminaire suppliers must apply and supply information required below to be listed on the City Recognized Product List. This specification is primarily meant for LED replacements for horizontally mounted cobra head or shoe box style roadway luminaries. The specifications can however be applied to vertically mounted decorative post top style luminaries.

The supplier shall state any exception in writing with their submission. The submission of approval information shall include:

1. A letter requesting pre-approval and responding to items 2 to 7 below.
2. Sample of the product as defined under 1.12 Testing and Certification.
3. Technical specifications including driver current draw and any options offered. Products must be production units and not prototype's.
4. Test results from a certified testing facility together with an approval rating for items listed under 1.12 Testing and Certification.
5. Proof of a suitable quality management system such as ISO 9001.
6. Provide a minimum of three references (name, title and phone#) where the LED based lighting product has been operating in North America for at least one year.
7. Provide proof the warranty meets the requirements listed within these specifications.

Where a product is non-compliant the City will provide a response defining deficiencies in product and submission.

When a supplier obtains product approval, the supplier will be added to the City's Recognized Products List. The City will retain all documentation for use in the product auditing process. This documentation will be used to ensure the product meets the minimum quality benchmark as stated by the supplier. Where this specification is revised, supplier's products shall conform to the revision to be listed. Suppliers shall demonstrate to the City that the modified product conforms to the specification.

The City may remove the product from the City Recognized Products List for any reason. Should the City remove the product from the Recognized Products List the supplier will not be eligible to re-apply for product approval until all deficiencies have been corrected to the satisfaction of the City.

2.18.1 General

LED luminaires shall include driver, housing, optical system, etc and must meet all requirements listed in these specifications.

2.18.2 Power Supply Driver

Power supply driver shall be a high reliability system with design features and component sets that provide for a minimum 50,000 hour life expectancy. Electrolytic capacitors used in the power supply driver shall have a life rating of 60,000 hours or better at 40° C. The LED power supply components shall be soldered to the printed circuit board in a nitrogen environment for high reliability lead free RoHS assembly. Power supply driver shall be rated for IP66 or greater ingress protection and be capable of operating in a -40°C degrees to +60°C degrees ambient temperature with a maximum case temperature of +90°C degrees.

Poke-in connectors, or secure terminal blocks with high spring tension push-in spring cage connection shall be used to connect the power supply to the light engines or to the main incoming AC power from the electrical grid.

The power supply shall be capable of operation at 50-60Hz with a power factor greater than 90%. The voltage shall be capable of self-adjustment between 120V to 277V. 347V shall also be available.

The entire luminaire including power supply and driver shall be designed to operate at ambient temperatures between -40°C degrees to +60°C degrees. Drivers must be mounted internally and shall be replaceable. Drivers must be rated for wet or damp locations, IP66 or greater. Luminaires shall be available in multiple driver currents as listed in 1.4 below.

2.18.3 Optical System

Light distributions available shall be available in a minimum of NEMA Type 2 and 3 distributions. The optical system must meet IDA fully-shielding requirements and IES full cut-off requirements. The following drive currents and corresponding efficacies shall meet or exceed the following:

Driver Operating Current	Minimum Efficacy	Minimum Lumen Output
Under 280mA	**80 Lm/W**	**6,850**
281 to 350mA	**74 Lm/W**	**7,338**
351 to 450mA	**67 Lm/W**	**9,400**
451 to 525mA	**62 Lm/W**	**10,880**
Over 526mA	**59 Lm/W**	**11,870**

No parts shall be constructed of polycarbonate unless it is UV stabilized (lens discoloration will be considered a failure under warranty).

The optical system shall have a rating of IP66 or better.

The luminaire must meet minimum performance standards. Luminaires shall meet a unit power density not exceeding 0.25 in accordance with ***CSA C653-08 Photometric Performance of Roadway Lighting Luminaires*** for both a Local Road and a Collector Road with a low pedestrian conflict. Use and define lumen output for the given LED luminaire and driver being submitted. For the lighting calculations the luminaire wattage for the local road shall be under 100W, under 150W for the collector roads and under 250W for arterial roads.

The optical system shall be designed to properly illuminate the roadway and sidewalks however shall provide maximum spill light cut-off beyond the sidewalk to reduce spill light and glare impacts on local residents.

2.18.4 Light Engine

Each luminaire shall have engine(s) populated with white LED's. Standard color temperature shall be no greater than 5,000K with a minimum colour rendering index of 70. LED modules/arrays shall meet IESNA LM-80 for measuring lumen maintenances of LED lighting sources at +25°C degrees.

LED's shall have multiple die chips. Single die chip LED's are not permitted.

2.18.5 Surge Suppression

For transient voltage and lightning protection; the power supply shall incorporate a surge protection capable of multiple strikes and be rated for 10Kv.

2.18.6 Heat Sink/Thermal Management:

The heat sinking system shall be passive. The heat sink shall contain individual heat sink fins, either internal or external, to dissipate heat. The heat sink system shall maintain a temperature for the LED's at 60,000 life (IESNA LM-80) at +25°C degrees that is well below their maximum rated Tj (LED junction temperature) for high performance light output and long life, even at high operating currents.

The performance of the thermal management system must be as follows:

Operating Current	LED Tj (Junction Temperature)
Under 280mA	**45°C or less**
279 to 350mA	**52°C or less**
351 to 450mA	**62°C or less**
451 to 525mA	**69°C or less**
Over 526mA	**76°C or less**

2.18.7 Manufacturing

All electronics (light engines and electronic power supplies) shall be manufactured in accordance to RoHS standards. The manufacturer shall have the ability to provide complete traceability of sub-assemblies and components.

All screws shall be stainless steel. Captive screws are needed on any components that require maintenance after installation.

2.18.8 Housing and Mounting

The housing shall be constructed using a single piece, die-cast, A380 aluminum alloy. The housing shall not contain extruded aluminum or multiple pieces bolted together.

Cobra head style replacement luminaries shall be mounted horizontally on a City standard davit style pole and shall be designed to attach to 60mm (OD) diameter x 180mm long tenon on the pole via bolted attachment. The attachment shall allow for a tilt adjustment of ±5°. The tenon adaptor shall be design to accommodate temporary overhead wiring directing into the luminaire which maybe required where the underground wiring has failed.

Cobra head luminaire replacements shall have an EPA of 0.1 square metres or less. The luminaire mass shall be not greater than 15kg.

Post top mount luminaries shall be designed to attach to a 100mm (OD) x 115mm long vertical pole tenon. As the style, shape and appearance of post top luminaires vary greatly from supplier to supplier decorative style post top mounted luminaries shall be reviewed with the City on a project by project basis.

The luminaire shall have a casting designed to accept a photocell receptacle. Where required, luminaires shall have a 3-prong locking ANSI C136.10 photocell receptacle. Where a photocell is not required the casting shall be solid with no hole for a photocell receptacle. Where no photocell is required a photocell receptacle and shorting cap will not be acceptable.

The LED housing shall contain a NEMA wattage label which shall be visible from the ground. The luminaire shall have a label which shall contain the manufacturer, serial number and date of manufacture in a location which can be viewed when accessing the luminaire for servicing.

2.18.9 Finish

Standard finish shall be bare aluminum with no powder or paint finish. Powder coat finished shall be available as an option. Colors shall be available and defined by RAL number. Powder coating shall meet the requirements of the City of Edmonton Road and Walkway Lighting Construction and Material Standards, Section 2.15 Powder Coat Finish.

2.18.10 Warranty

A warranty must be provided for the full replacement of the luminaire due to any failure. The warranty shall provide for replacement of defective luminaires for a minimum of 10 years from the date of purchase.

Replacement luminaires shall be supplied within 30 days of notification. The defective product shall be made available to the supplier at the City work yard. All packaging, shipping costs and arrangements shall be by the supplier. The City will remove the defective luminaire(s) and re-install the replacement luminaire(s) at their own expense. No pro-rated warranties will be accepted.

2.18.11 Testing and Certification

Testing and certification requirements are listed below. This information shall be supplied and accepted in order for a product to be listed in the recognized product list.

1. The LED light fixture shall meet a vibration standard, ANSI C136.31-2001, for Roadway Luminaire Vibration. ***Provide test results.***
2. Confirm junction temperatures meet or exceed LM-79 and LM-80. ***Provide test results.***
3. Confirm surge protection meets requirements listed. ***Provide test results.***
4. The manufacturer shall have RoHS (lead free) certification. ***Provide evidence.***
5. The optical system and driver shall be rated to IP66. ***Provide test results.***
6. IESNA LM-79-08 IESNA Recognized Method for the Electrical and Photometric Measurements of Solid-State Lighting Products. ***Provide absolute photometric files in accordance with LM79-08 for each luminaire type, wattage, operating current and photometric distribution.***
7. Confirm lumen output and efficacy at driver current listed in IESNA LM-80-08 IESNA Recognized Method for Measuring Lumen Maintenance of LED Light Sources. ***Provide test results.***
8. CSA or CUL listed and bare label. ***Provide evidence.***
9. Every single fixture shall be tested for total wattage and power factor prior to shipment. ***Provide evidence.***
10. For powder coat finishes. ***Provide salt spray and adhesion test results.***
11. Electrolytic capacitors. ***Provide evidence capacitors meet requirements listed.***
12. At 60,000 hours at +25°C the LEDs shall meet or exceed LM-80 recommended levels. ***Provide calculations and test results to validate.***
13. Lighting calculations as listed in 2.18.3 Optical System. ***Provide Calculations.***

Along with the data listed above the supplier shall submit a sample luminaire for City field testing. If the City finds the products complainant with the specifications they will install the luminaire and review its operation in the field over a period of time.

The City of Edmonton Transportation Department
Banner Guidelines

Purpose

Banners shall be used to provide directional information for residential show home parades, to create awareness for special events/festivals, and to add to the overall theme of streetscapes and business revitalization zones while sustaining vehicular and pedestrian safety and ensuring the structural integrity of all street light poles is maintained, as defined by the *"City of Edmonton Street Light and Trolley Pole Banner Attachment Limits"*.

1. The Word "banner(s)" may be interchanged with "hanging basket(s)" throughout this document.
2. Show home parades shall consist of no fewer than two (2) consecutive show homes.

Procedure

The following are the typical steps to get banners installed in the City of Edmonton:

1. Contact the Transportation Operations Branch: The Transportation Operations Branch will provide you with a copy of The City of Edmonton Banner Guidelines to become familiar with and to help you decide if you wish to pursue your banner installation. Please allow up to 12 weeks for banner installation upon receipt of banner request.

2. Send in Your Banner Request: Mail a letter to the City of Edmonton's Transportation Operations Branch indicating your intent to have banners installed. Your letter should include: your name, company name, all road segments to have banners installed, and a colored diagram of the proposed banner. You must also verify the banners meet the specifications mentioned in the Banner Specifications section. The total application fee for banner installation is $250.00 and is payable to the City of Edmonton. A deposit in the amount of $100.00, made payable to the City of Edmonton, must accompany the letter prior to a site meeting. Once the letter and cheque is received, you will be contacted by the Transportation Operations Branch to arrange a site meeting. If banners are not permitted on the roadways described in the letter, the Transportation Operations Branch will reject your request, in writing, and your $100.00 deposit will not be processed.

3. Site Meeting: During the site meeting, banner locations will be determined based on the banner guidelines and a street light pole condition assessment, which will be provided by the Transportation Operations Branch. Once a site meeting has been conducted, the $100.00 deposit will be processed.

4. Issuing of the Permit: If you wish to proceed with the banner installation after the site meeting, a cheque in the amount of $150.00, made payable to the City of Edmonton, must be sent to the Transportation Operations Branch to complete payment for the $250.00 banner application fee. Once the balance of the banner application fee is received, you will be mailed a permit letter allowing banners to be installed on the street light poles described in the permit. A copy of the permit letter will be sent to the Executive Director of the Urban Development Institute, Greater Edmonton Chapter and the Manager of Engineering of the Transportation Department's Electrical Services Contractor on your behalf. A contact for the Transportation Department's Electrical Services Contractor will also be provided in the permit.

At this point, you may contact the Transportation Department or the Department's Electrical Services Contractor to arrange the installation of the approved banners.

5. Permit Renewal

Regardless of the application, approval, and installation dates, all banner permits expire on December 1 of the approved year. If the applicant wishes to have the banner permit renewed for an additional year, a $100.00 cheque made payable to the City of Edmonton must be received by the Transportation Operations Branch prior to the December 1 expiry date. Once the permit renewal fee is received, you will be mailed a permit renewal letter extending for one (1) year. A copy of the renewal letter will be sent to the Executive Director of the Urban Development Institute, Greater Edmonton Chapter and the Manager of Engineering of the Transportation Department's Electrical Services Contractor. The renewal will extend the permit to December 1 of the following year. If the permit renewal fee is not received prior to the expiry date, the banners will be removed. The banner permit may be renewed each subsequent year that the banners are required on the condition that all requirements identified in the City of Edmonton Banner Guidelines are continued to be met. Permit renewal applications may not be re-approved based on poor banner maintenance, roadway reconfiguration, etc.

Banner Installation in New Developed Neighbourhood

- When the Construction Completion Certificate (CCC) for street light poles is approved the street light poles become City owned and the contractor must provide a two year warranty period until the Final Acceptance Certificate (FAC) date. During this two year period, the developer can submit an application to the City to have banners installed on the new poles. The installation must be done by the City's electrical services contractor, and any repair to damages occurred during this installation of banners will not be the responsibility of the original street light installation contractor. If no CCC has been issued, the party applying for banner installation must contact the developer for installation approval.
  These guidelines do not apply to street light poles in new subdivisions or developments that do not have the approved Construction Completion Certificate; however, it is recommended that these guidelines for the size and square footage of banner being installed on new street light poles, be adhered to. All banners at new subdivisions or developments must be removed prior to the Final Acceptance Certificate inspection in order for the FAC to be approved.

Where Banners Can and Cannot Be Installed

- Banners may be installed on street light poles along residential, collector, and some arterial roadways. The installation of banners on arterial roadways will be at the discretion of the Transportation Operations Branch. Banners are not permitted on highways or freeways.

- Banners are not allowed on street light poles that house existing signage exceeding 0.9m2.

■ Banners shall not be installed on street light poles with aerial feeds, drill stem poles, square poles, and 36' double davit poles.

■ Banners are allowed on street light poles in centre medians, on the condition they are not closer than the third street light pole from the intersection. A minimum clearance of 30m from the intersection must be maintained at all other intersection locations

■ Banners are not permitted on poles that house traffic signal fixtures and hardware. This includes traffic signals, pedestrian actuated only signals, crosswalk amber flashers, and all other such Transportation control devices. All banners must be hung in such a manner that sight lines of traffic control devices are not obstructed.

Bracket Installation and Maintenance

■ Brackets for all banners must be supplied and installed by the Transportation Department or their Electrical Services Contractor. The cost to purchase all brackets will be borne by the applicant.

■ Only the Transportation Department or its Electrical Services Contractor may perform maintenance on the banner brackets at the applicant's cost. No maintenance by private contractors is allowed.

Banner Installation and Maintenance

■ All banners must be supplied and installed by the Transportation Department or the Department's Electrical Services Contractor. All costs associated with the banner installation are the responsibility of the applicant.

■ The distance from the outside edge of the proposed banner to curb face should be a minimum of 0.4m. If the minimum distance of 0.4m is not possible because of the poleoffset from the curb, the banner may be oriented away from the roadway.

■ Banners shall be installed at a minimum of 3.5m from the top of the pole base to the bottom of the banner.

■ The applicant may hire the Transportation Department or the Transportation Department's Electrical Services Contractor for maintenance of the banners. If banner maintenance is required in areas where overhead trolley lines exist, the applicant must contact the Transportation Departments Electrical Services Contractor.

Banner Specifcations

■ Banners will be constructed of 10 oz. screentex or approved equal high strength, flameproof, 100% waterproof, rot and mildew resistant cloth material. For aluminum material, refer to the chart below:

Aluminum Sheet Alloy and Tempar	Nominal thickness	Max. Banner Height	Max. Banner Width
5052 - H38	2.1mm (0.081")	2000 mm	400 mm
5052 - H32	3.2mm(0.125")	2000 mm	550 mm
5052 - H32	4.8mm(0.188")	2000 mm	800 mm

Note: The aluminum grades and thicknesses listed above are commonly stocked by the City of Edmonton, and are available from local suppliers.

■ On street light poles, a maximum of one (1) banner is allowed. The maximum allowable banner size is 0.6m wide by 1.5m high (2' x 5') as outlined in the *"City of Edmonton Street Light and Trolley Pole Banners Attachment Limits".*

■ On heavy-duty trolley poles, a maximum of two (2) banners are allowed. The maximum allowable banner size is 0.6m wide by 1.5m high (2' x 5') as outlined in the *"City of Edmonton Street Light and Trolley Pole Banners Attachment Limits ".*

- Subdivision banners may include:

a) Directional arrows
b) Subdivision / neighbourhood name
c) Subdivision / neighbourhood logo
d) The words "Show Homes"

■ Business revitalization banners may include:

a) Business revitalization zone name
b) Business revitalization zone location
c) Business revitalization theme/symbol

■ Banners shall not include telephone numbers or general advertising

■ Banners must be in good taste. Any logo or text that may be deemed offensive may be rejected by the Transportation Department.

Cost Breakdown:

Description	Cost	Payment Recipient
Banner Permit Fee	$250 ($100 paid prior to site meeting, $150 paid after site meeting)	The City of Edmonton Transportation Operations Branch
Banner Permit Renewal	$100	The City of Edmonton Transportation Operations Branch
Banner Brackets	$200/set	The Transportation Department's Electrical Services Contractor
Banner Installation	$300/banner (estimate) ***Subject to conditions in the field	The Transportation Department's Electrical Services Contractor
Banner Removal	Free	N/A

Additional Information

■ The applicant is responsible for obtaining approval for all banner locations from the Transportation Department. Proof of a permit must be provided within 30 days of any inquiry made by the Transportation Department. Failing to do so may result in the removal of the banners in question. Once banners have been removed, the developer must reapply for the banner permit if they wish to have them reinstalled, even if they are to be reinstalled in the same location.

■ Separate applications must be made for different development projects.

■ The Transportation Department requires a minimum of 30 days to review and process the application all banner request applications.

■ If, at any point in time, the structural integrity of a street light pole is in question, it shall be subject to a current condition assessment to determine if it can support the loads borne by a banner.

The City of Edmonton will not review or approve banners in areas that do not have an approved Street Lighting Final Acceptance Certificate.

Contact Information

Phone Contact: Gary Ursulak
Supervisor of Street Lighting
(780) 496-1908

Mailing Address: The City of Edmonton
Transportation Operations Branch
16th Floor, Century Place
9803 102A Avenue NW
Edmonton, AB, T5J 3A3

Transportation Department
Transportation Operations

Banner Application Form

1. Applicant Information

Company Name: Contact Person:

Address line 1:
Address line 2:
Postal Code: Phone Number:

2. Banner Characteristics:

a) Aluminum

Height = mm Width = mm
Nominal Thickness = Aluminum Sheet Alloy and Temper =

(Please check appropriate box) (Please check appropriate box)
2.1mm ☐ 3.2mm ☐ 4.8mm ☐ 5052 - H32 ☐ 5052 - H38 ☐

b) 10 oz. Screentex

Height = mm Width = mm

3. Banner Classifcation:

Subdivision ☐ Business Revitalization Zone ☐

4. Banner Map Request or Banner Renewal for:

Along - Avenue/Street/Drive/Road/Way
From - Avenue/Street/Drive/Road/Way
To - Avenue/Street/Drive/Road/Way

5: Please Enclose or Electronically Forward Your Banner Illustration.

6. Payment Enclosed
(Please make cheque payable to City of Edmonton, Transportation Operations Branch)

New Banner Location Application = $250.00 ☐
Banner Location Renewal = $100.00 ☐

7. Return Completed Application To:

Mail: Gary Ursulak
Transportation Operations Branch
16th Floor, Century Place
9803 - 102 A Avenue
Edmonton, Alberta T5J 3A3
Fax: (780) 496-1757 Email: gary.ursulak@edmonton.ca

THE CITY OF Edmonton

TRANSPORTATION OPERATIONS BRANCH
- Signals and Streetlighting Section

INSPECTION FIELD SHEET

SUBDIVISION: _____ NBHD: _____ STAGE: _____

CONTRACTOR: _____ DEVELOPER: _____
CONSULTANT: _____ P & D CONTACT: _____

INPECTION DATE: _____ INSPECTOR: _____

INSPECTION TYPE: ☐ IPC ☐ Pre-CCC ☐ CCC ☐ FAC

POLE ID	Anchor Rod Damaged	Attachments	Base Damaged	Base Grade	Bae Shimmed	Fillcrete Missing	Leaning	Loose or Missing Nuts	Luminaire Damaged or Crooked	Luminaire Unsquare to Centreline	Luminaire Damaged - New Luminaire Required	Pole or Base Unsquare	Lamp Out	Powder Coating Chips - In Field Repair Required	Powder Coating Damaged - Recoating Required	Galvanizing Repair Required	Pole Dented - New Pole Required	Landscaping	Comments
1																			
2																			
3																			
4																			
5																			
6																			
7																			
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29																			
30																			

CoE Comments:
(No Action Required)

TESP RECEIVED: ☐
TESP REQUIRED FOR APPROVAL: ☐

THE CITY OF Edmonton PLANNING AND DEVELOPMENT

DEVELOPMENT COORDINATION
8th FLOOR, 10250 - 101 STREET NW
EDMONTON, ALBERTA
T5J 3P4
FAX: (780) 496-6054

CONSTRUCTION COMPLETION CERTIFICATE

DEVELOPMENT AREA: _____

DEVELOPER: _____

RESIDENTIAL SERVICING AGREEMENT DATED: _____ AGREEMENT NO.: _____

CONTRACTOR: _____

MUNICIPAL IMPROVEMENT: _____

BOUNDARIES OF DEVELOPMENT AREA: AS PER ATTACHED PLAN

DATE OF APPLICATION: _____

PURSUANT TO THE CITY OF EDMONTON RESIDENTIAL SERVICING AGREEMENT NO. _____ DATED _____
I, _____ OF THE FIRM _____
("CONSULTING ENGINEERS") HEREBY CERTIFY THAT THE MUNICIPAL IMPROVEMENT WORK NOTED HEREIN MEETS ALL REQUIREMENTS FOR A CONSTRUCTION COMPLETION CERTIFICATE AS SPECIFIED IN THE SAID RESIDENTIAL SERVICING AGREEMENT MENTIONED ABOVE, AND CONSTRUCTED AS FAR AS CAN BE PRACTICALLY ASCERTAINED ACCORDING TO THE CITY OF EDMONTON SERVICING STANDARDS MANUAL IN COMPLIANCE WITH THE REQUIREMENTS OF THE SAID RESIDENTIAL SERVICING AGREEMENT, I, HEREBY, RECOMMEND THIS MUNICIPAL IMPROVEMENT FOR APPROVAL THE CONSTRUCTION COMPLETION CERTIFICATE BY THE CITY OF EDMONTON.

_____ Date _____
Project Engineer (Consulting Engineering Firm)

_____ Date _____
Signing Officer (Consulting Engineering Firm)

Seal

Approved on _____ 20 _____ _____
Civic Department Engineer

Rejected on _____ 20 _____ _____
Civic Department Engineer

Cause(s) for Rejection: (See attached report) _____

_____

PERMIT TO PRACTICE

Signature _____

Date _____

PERMIT NUMBER: P
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

I hereby certify that the items listed as reasons for rejection have been corrected.

_____ Date _____
Project Engineer (Consulting Engineering Firm)

Approved: _____ Date _____
Development Engineer – Planning and Development

Date Maintenance Period to Start: _____

Date Maintenance Period to End: _____

FORM 171-3629E

THE CITY OF Edmonton PLANNING AND DEVELOPMENT

DEVELOPMENT COORDINATION
8th FLOOR, 10250 - 101 STREET NW
EDMONTON, ALBERTA
T5J 3P4
FAX: (780) 496-6054

FINAL ACCEPTANCE CERTIFICATE

DEVELOPMENT AREA: _____

DEVELOPER: _____

RESIDENTIAL SERVICING AGREEMENT DATED: _____ AGREEMENT NO.: _____

CONTRACTOR: _____

MUNICIPAL IMPROVEMENT: _____

BOUNDARIES OF DEVELOPMENT AREA: AS PER ATTACHED PLAN

DATE OF APPLICATION: _____

PURSUANT TO THE CITY OF EDMONTON RESIDENTIAL SERVICING AGREEMENT NO. _____ DATED _____
I, _____ OF THE FIRM _____
("CONSULTING ENGINEERS") HEREBY CERTIFY THAT AS OF THE ABOVE DATE, THE SAID MUNICIPAL IMPROVEMENT MEETS ALL THE REQUIREMENTS FOR FINAL ACCEPTANCE AS SPECIFIED BY THE SAID RESIDENTIAL SERVICING AGREEMENT, AND I HEREBY RECOMMEND THIS MUNICIPAL IMPROVEMENT FOR FINAL ACCEPTANCE BY THE CITY OF EDMONTON.

_____ Date _____
Project Engineer (Consulting Engineering Firm)

_____ Date _____
Signing Officer (Consulting Engineering Firm)

_____ Date _____
Authorized City Inspector

Seal

Approved on _____ 20 _____ _____
Civic Department Engineer

Rejected on _____ 20 _____ _____
Civic Department Engineer

Cause(s) for Rejection: (See attached report) _____

_____

PERMIT TO PRACTICE

Signature _____

Date _____

PERMIT NUMBER: P
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

I hereby certify that the items listed as reasons for rejection have been corrected.

_____ Date _____
Project Engineer (Consulting Engineering Firm)

Approved: _____ Date _____
Development Engineer – Planning and Development

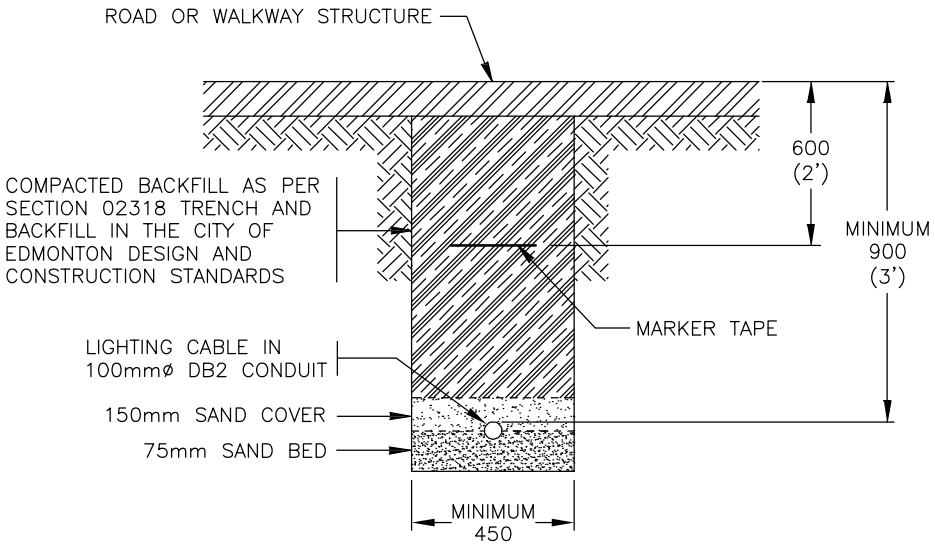
Date Maintenance Period to End: _____

FORM 171-3699D

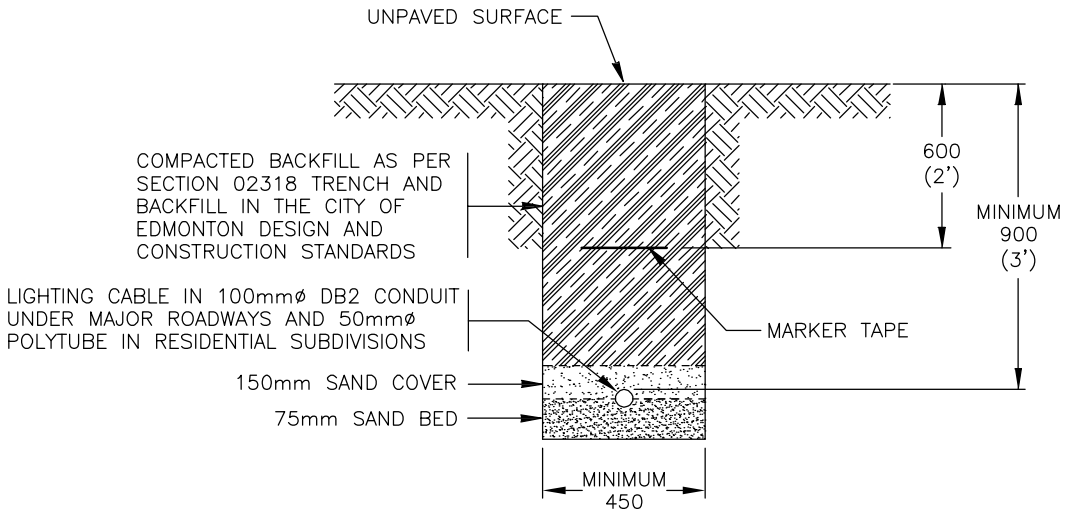
Recognized Lighting Product List

SPEC REF	PRODUCT NAME/ MANUFACTURER	MODEL NAME AND NUMBER	COMMENTS
	POLES and ANCHOR BOLTS		
	West Coast Engineering Ltd	Not applicable	Poles must meet all requirements listed in the reference specs.
	Nova Pole International	Not applicable	Poles must meet all requirements listed in the reference specs.
	RESIDENTAL LIGHTING CONTROLLER BASES		
	AC Dandy		
	LIGHTING CONTROL CABINETS and PANELS		
	Valid Manufacturing Ltd	Not applicable	Lighting control cabinets must meet all requirements listed in the reference specs.
	BREAKAWAY BASES		
	Manitoba Bafety Base	To suit application	
	LUMINIARES		
	Lumec Helios Cobrahead	HBS for 200W and below and HBM for 250W and above	Luminaire may require photocell receptable and must meet all requirements listed in the reference specs.
	Philips Lumec	Roadstar, Roadview,Streetview Metroscape, Urbanscape	Contact City of Edmonton for distributions, LLF and wattages
	Cree lighting	XAL, XSP	Contact City of Edmonton for distributions, LLF and wattages
	LED Roadway	Satelite Series, NXT	Contact City of Edmonton for distributions, LLF and wattages
	COLOURS		
	Black	Federal Standard 595C #17038	
	Blue	Federal Standard 595C #15055	
	Green	Federal Standard 595C #14036	
	Grey	Federal Standard 595C #16473	
	POWDER COAT PRODUCTS		
	Fuller Western		
	White Powder Coating		
	Amnor		
	Boontek		
	West Coast (Valmont)		
	GALVANIZERS		
	Canadian Galvanizing		
	Falcon Machinery		
	DAAM Galvanizing		

List of Standard Drawings



TRENCH DETAIL FOR PAVED SURFACES



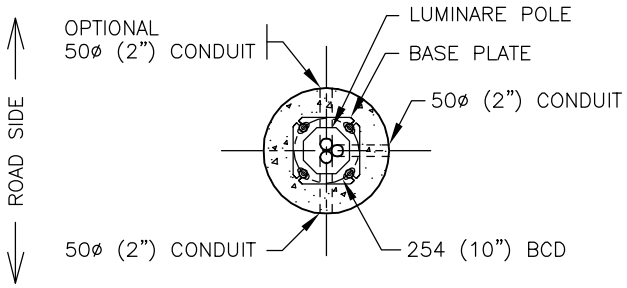
TRENCH DETAIL FOR UNPAVED SURFACES

NOTE:

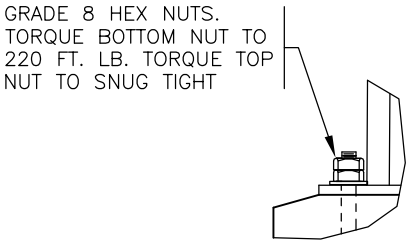
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.

Dimensions in Metric

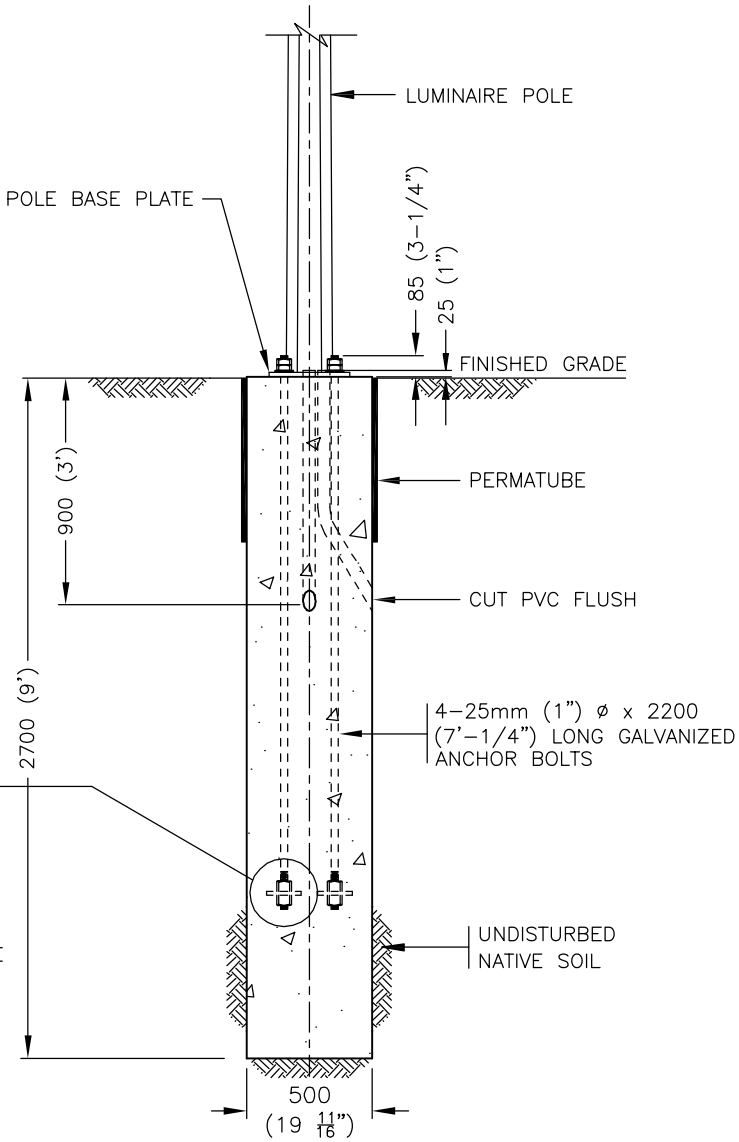
THE CITY OF Edmonton Transportation and Streets		Title: CONDUIT & CABLE TRENCH DETAIL		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E1.1
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8770

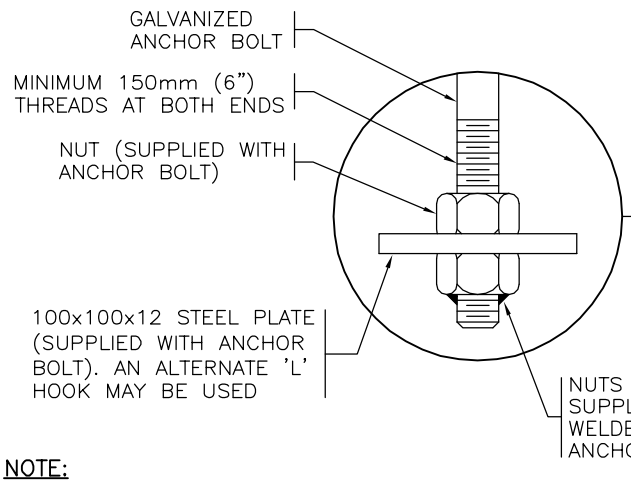


PLAN



ANCHOR BOLT DETAIL





ELEVATION

NOTE:

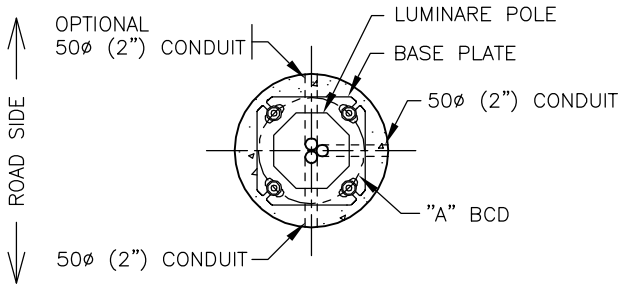
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. SOIL IS ASSUMED TO BE HOMOGENEOUS FIRM CLAY. IF UNSUITABLE SOIL IS FOUND TO BE MORE THAN 1.5m DEEP, THE PILE LENGTH MUST BE INCREASED TO ACCOMMODATE SUCH ADDITIONAL DEPTH OF UNSUITED SOIL. IF SITE CONDITION DOES NOT CONCUR WITH THE FIRM CLAY ASSUMPTION, IT MUST BE NOTIFIED TO THE PROJECT ENGINEER IMMEDIATELY.

Dimensions in Metric

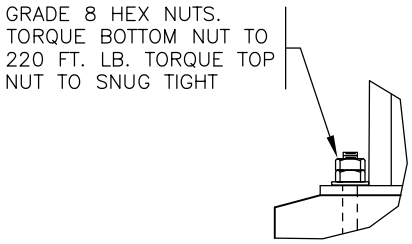
THE CITY OF Edmonton Transportation and Streets		Title: POURED IN PLACE CONCRETE BASE FOR 4.9m (16') & 6.1m (20') POST TOP POLES		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E2.1
Scale: N.T.S.	Checked By: DSM			Old Drawing # –

HEIGHT OF STANDARD	"A" BCD
UP TO 8.5m (28')	254 (10")
9.1m (30')	279 (11")
9.8m (32')	279 (11")

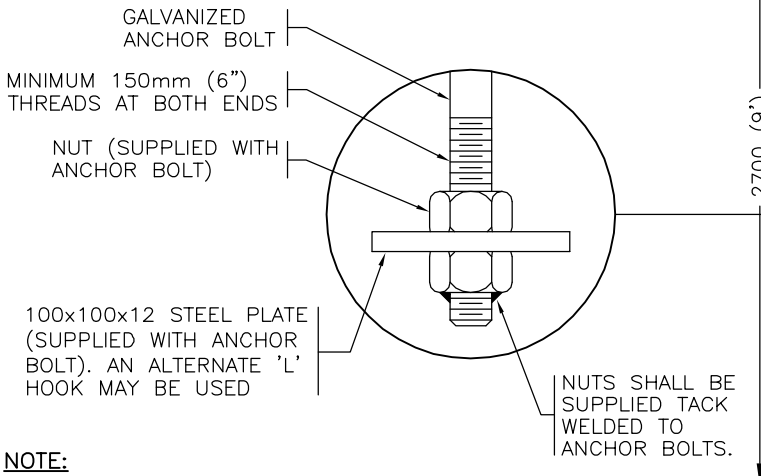
HEIGHT OF STANDARD	NUMBER OF CONDUITS	"B"
UP TO 8.5m (28')	2	508 (20")
	3	610 (24")
9.1m (30')	2	508 (20")
	3	610 (24")
9.8m (32')	2	508 (20")
	3	610 (24")

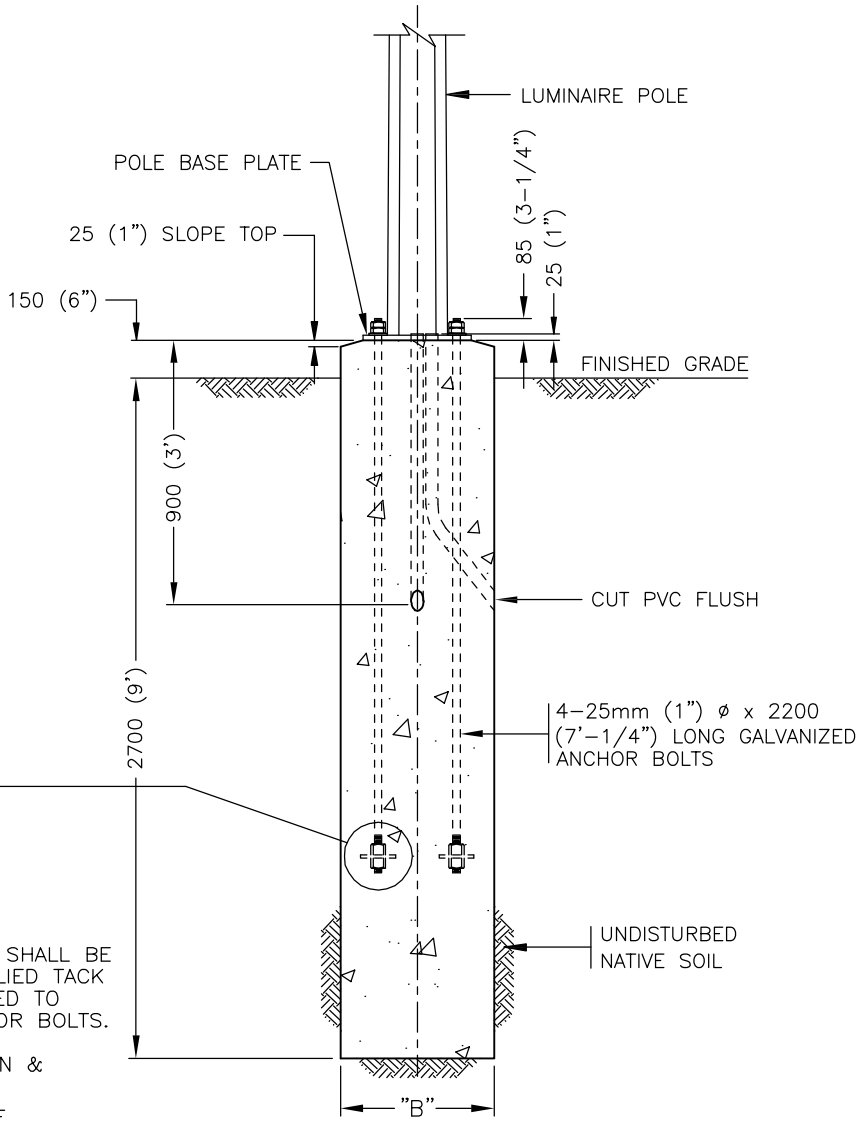


PLAN



ANCHOR BOLT DETAIL





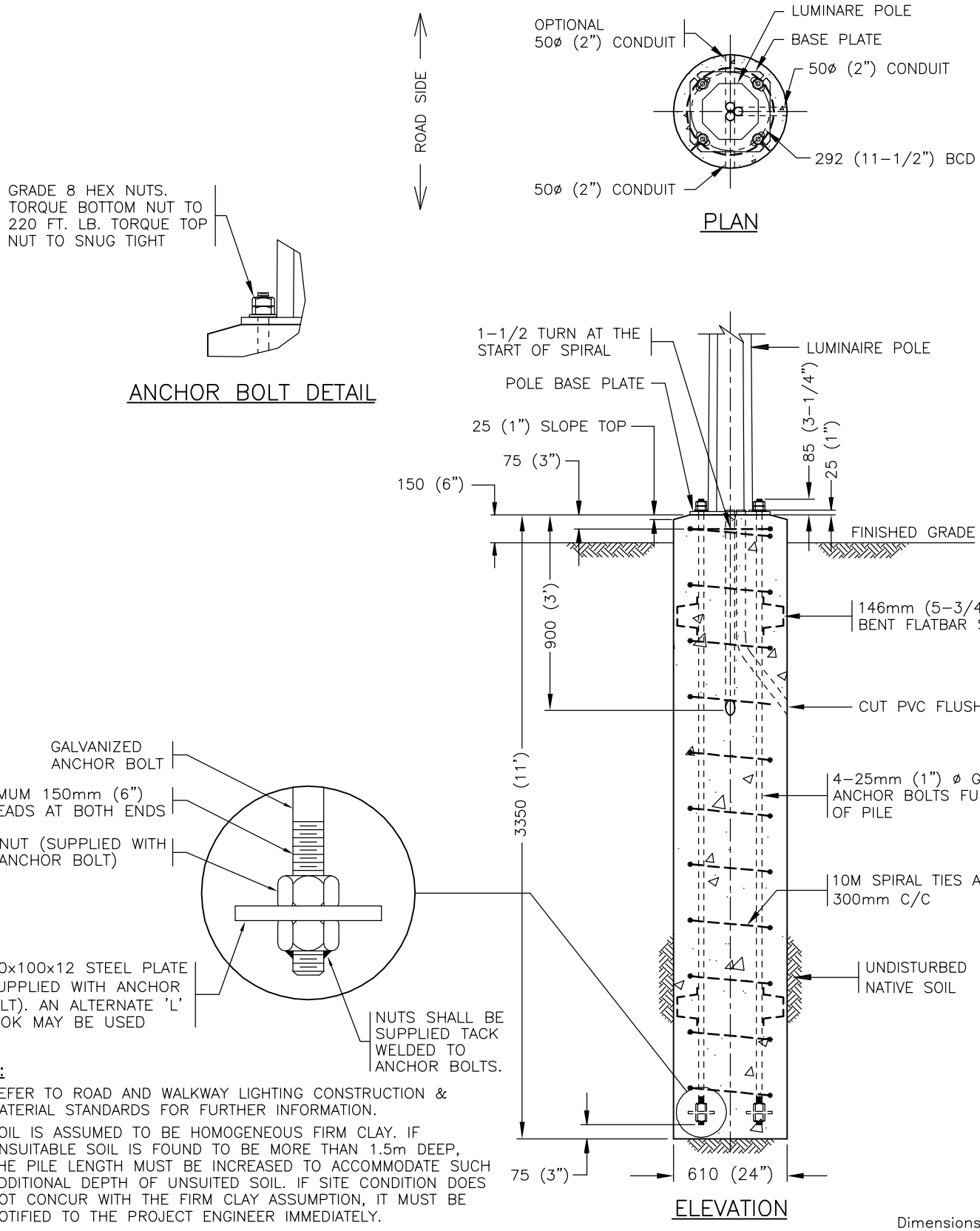
ELEVATION

NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. SOIL IS ASSUMED TO BE HOMOGENEOUS FIRM CLAY. IF UNSUITABLE SOIL IS FOUND TO BE MORE THAN 1.5m DEEP, THE PILE LENGTH MUST BE INCREASED TO ACCOMMODATE SUCH ADDITIONAL DEPTH OF UNSUITED SOIL. IF SITE CONDITION DOES NOT CONCUR WITH THE FIRM CLAY ASSUMPTION, IT MUST BE NOTIFIED TO THE PROJECT ENGINEER IMMEDIATELY.

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: POURED IN PLACE CONCRETE BASE FOR UP TO 8.5m (28'), 9.1m (30") & 9.8m (32') SINGLE DAVIT POLES WITH MAX. 2.44m (8') ARM		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E2.2
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8780



NOTE:

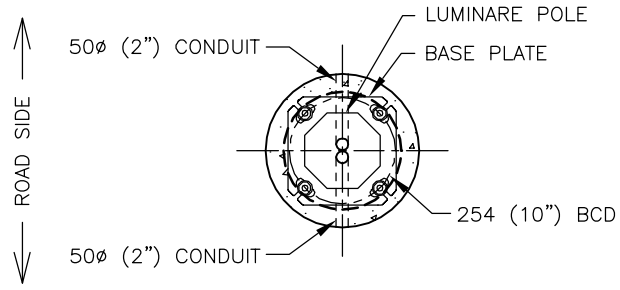
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. SOIL IS ASSUMED TO BE HOMOGENEOUS FIRM CLAY. IF UNSUITABLE SOIL IS FOUND TO BE MORE THAN 1.5m DEEP, THE PILE LENGTH MUST BE INCREASED TO ACCOMMODATE SUCH ADDITIONAL DEPTH OF UNSUITED SOIL. IF SITE CONDITION DOES NOT CONCUR WITH THE FIRM CLAY ASSUMPTION, IT MUST BE NOTIFIED TO THE PROJECT ENGINEER IMMEDIATELY.

Dimensions in Metric

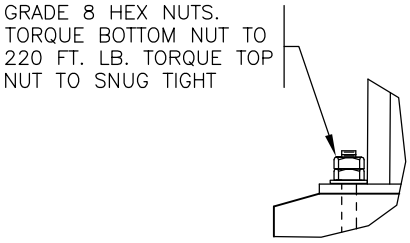
THE CITY OF Edmonton
Transportation and Streets

Title: POURED IN PLACE CONCRETE BASE FOR 11m (36') SINGLE DAVIT POLE

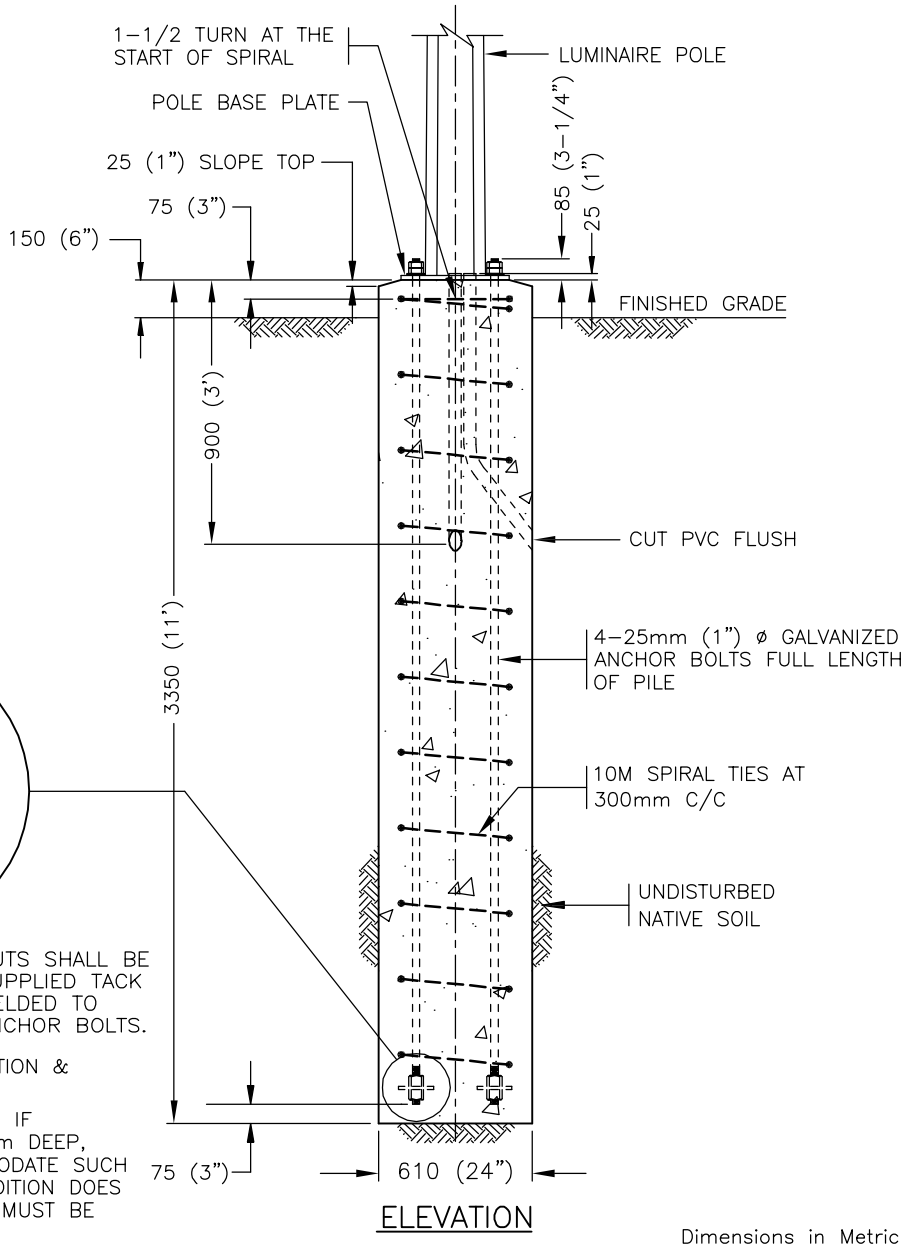
Date Approved:	Drawn By:	Approved	Rev.	Drawing #
–	ALM	Originals signed by:	08/28/09	E2.3
Scale: N.T.S.	Checked By: DSM			Old Drawing # –



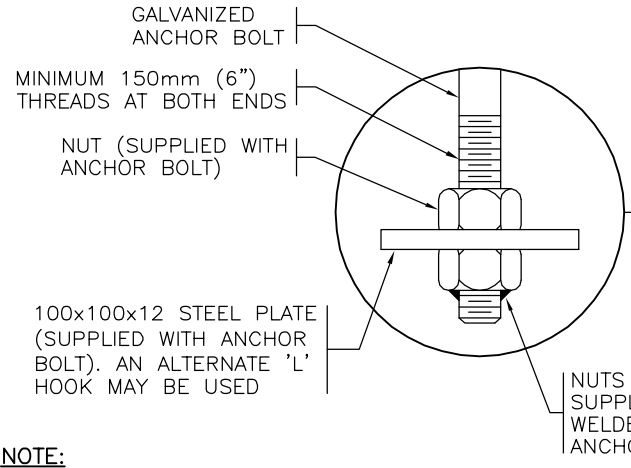
PLAN



ANCHOR BOLT DETAIL



ELEVATION

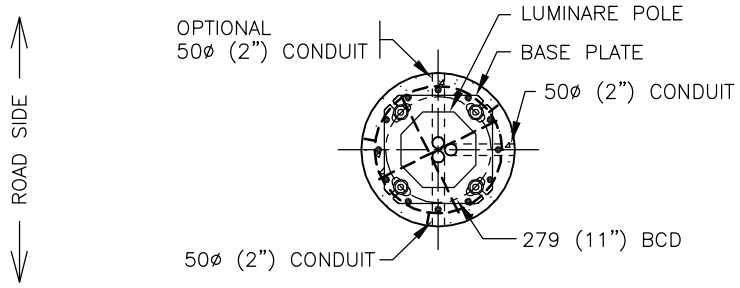


NOTE:

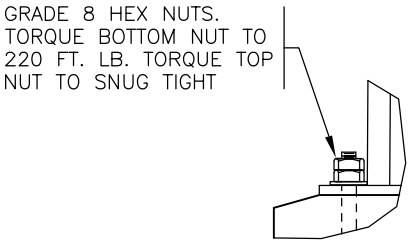
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. SOIL IS ASSUMED TO BE HOMOGENEOUS FIRM CLAY. IF UNSUITABLE SOIL IS FOUND TO BE MORE THAN 1.5m DEEP, THE PILE LENGTH MUST BE INCREASED TO ACCOMMODATE SUCH ADDITIONAL DEPTH OF UNSUITED SOIL. IF SITE CONDITION DOES NOT CONCUR WITH THE FIRM CLAY ASSUMPTION, IT MUST BE NOTIFIED TO THE PROJECT ENGINEER IMMEDIATELY.

Dimensions in Metric

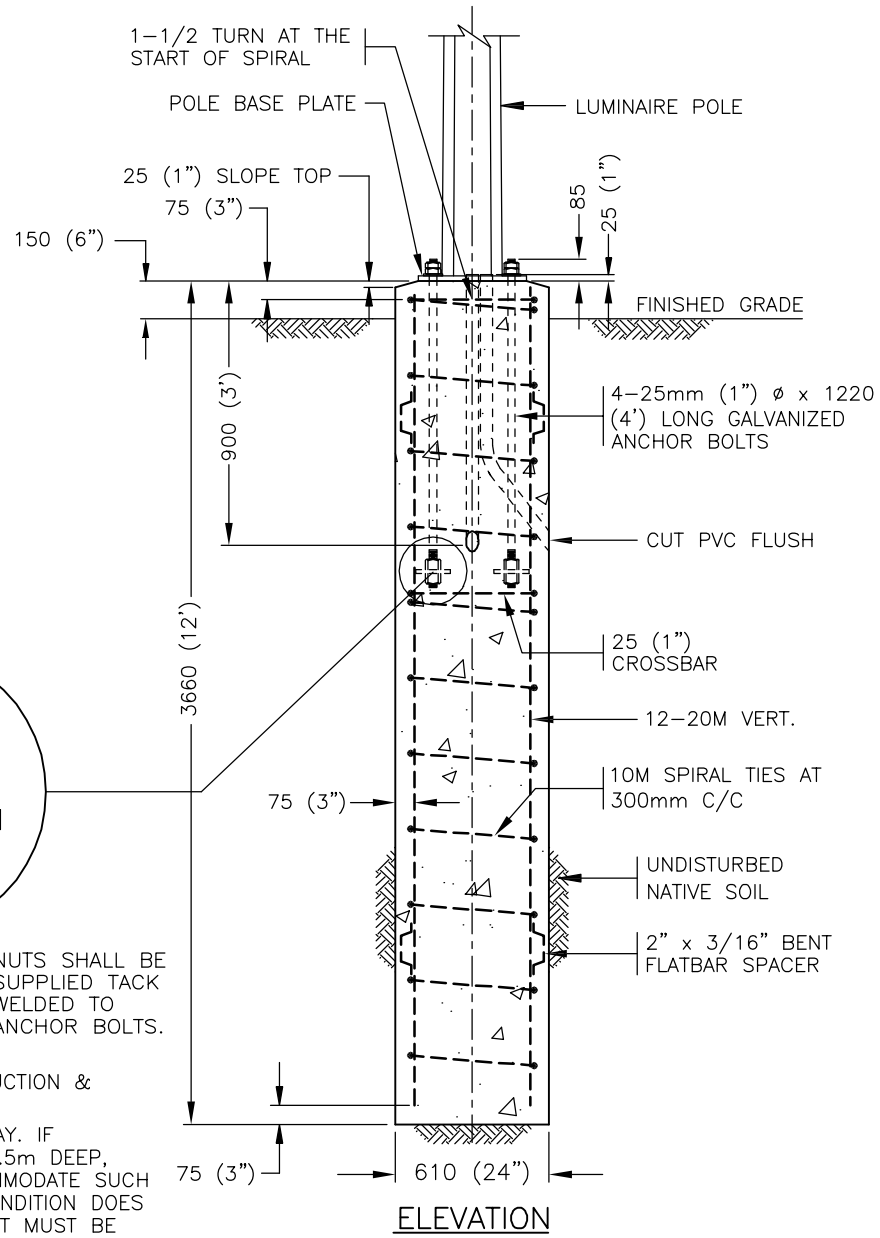
THE CITY OF Edmonton Transportation and Streets		Title: POURED IN PLACE CONCRETE BASE FOR 8.5m (28') DOUBLE DAVIT POLE		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E2.4
Scale: N.T.S.	Checked By: DSM			Old Drawing # –

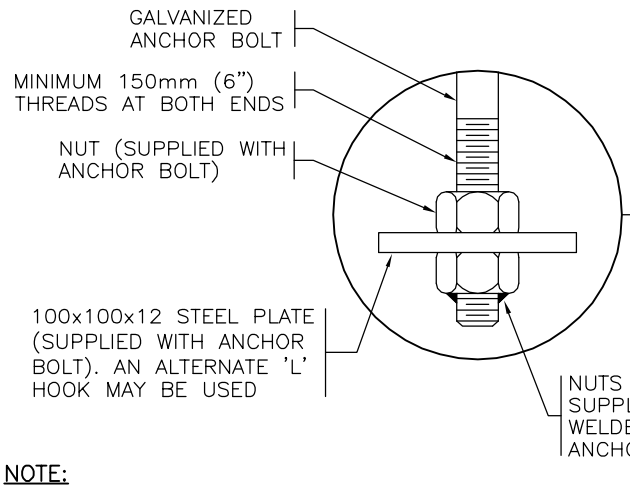


PLAN



ANCHOR BOLT DETAIL





ELEVATION

NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. SOIL IS ASSUMED TO BE HOMOGENEOUS FIRM CLAY. IF UNSUITABLE SOIL IS FOUND TO BE MORE THAN 1.5m DEEP, THE PILE LENGTH MUST BE INCREASED TO ACCOMMODATE SUCH ADDITIONAL DEPTH OF UNSUITED SOIL. IF SITE CONDITION DOES NOT CONCUR WITH THE FIRM CLAY ASSUMPTION, IT MUST BE NOTIFIED TO THE PROJECT ENGINEER IMMEDIATELY.

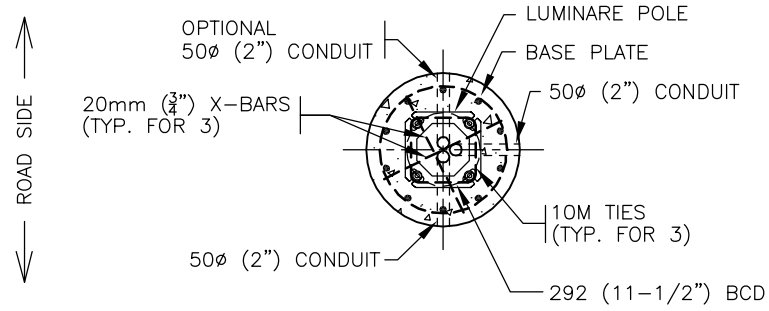
Dimensions in Metric

THE CITY OF Edmonton
Transportation and Streets

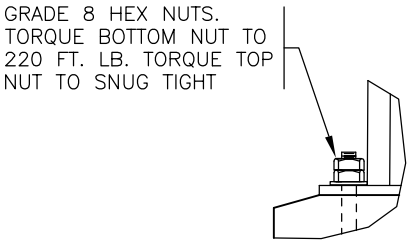
Title: POURED IN PLACE CONCRETE BASE FOR 9.8m (32') DOUBLE DAVIT POLES AND SINGLE DAVIT DECORATIVE POLES WITH 3.6m (12') ARM

Date Approved:	Drawn By:	Approved	Rev.	Drawing #
–	ALM	Originals signed by:	08/28/09	E2.5
Scale:	Checked By:			Old Drawing #
N.T.S.	DSM			8786

1/31/2011 9:54:29 AM, Plotted By: R.F.



PLAN



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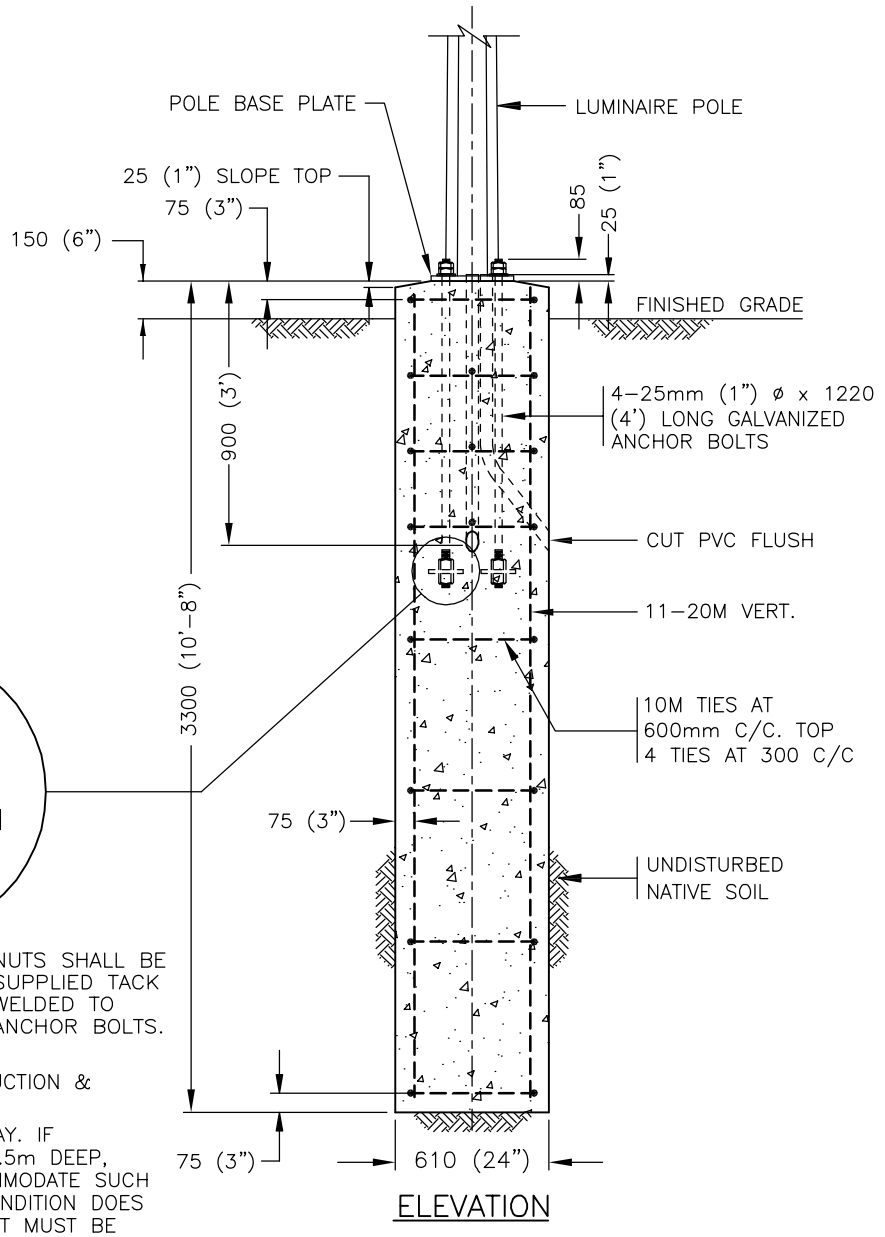
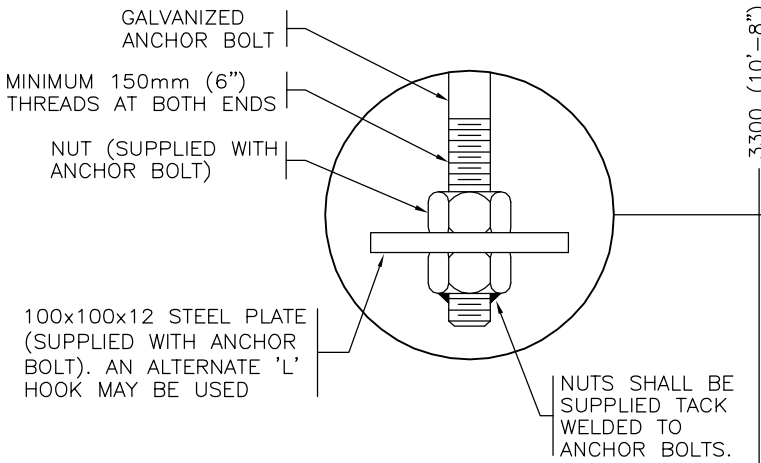




ELEVATION

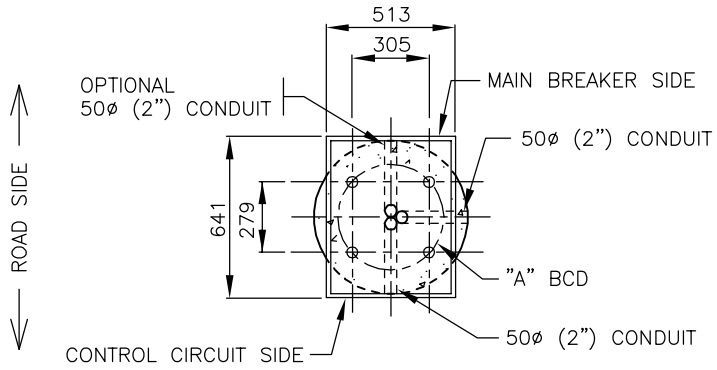
NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. SOIL IS ASSUMED TO BE HOMOGENEOUS FIRM CLAY. IF UNSUITABLE SOIL IS FOUND TO BE MORE THAN 1.5m DEEP, THE PILE LENGTH MUST BE INCREASED TO ACCOMMODATE SUCH ADDITIONAL DEPTH OF UNSUITED SOIL. IF SITE CONDITION DOES NOT CONCUR WITH THE FIRM CLAY ASSUMPTION, IT MUST BE NOTIFIED TO THE PROJECT ENGINEER IMMEDIATELY.

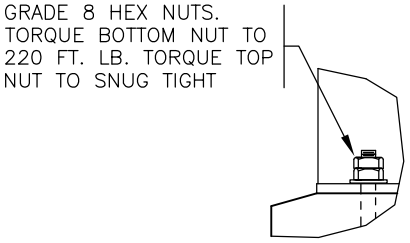
Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: POURED IN PLACE CONCRETE BASE FOR 11.0m (36') DOUBLE DAVIT POLES		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E2.6
Scale: N.T.S.	Checked By: DSM			Old Drawing # –

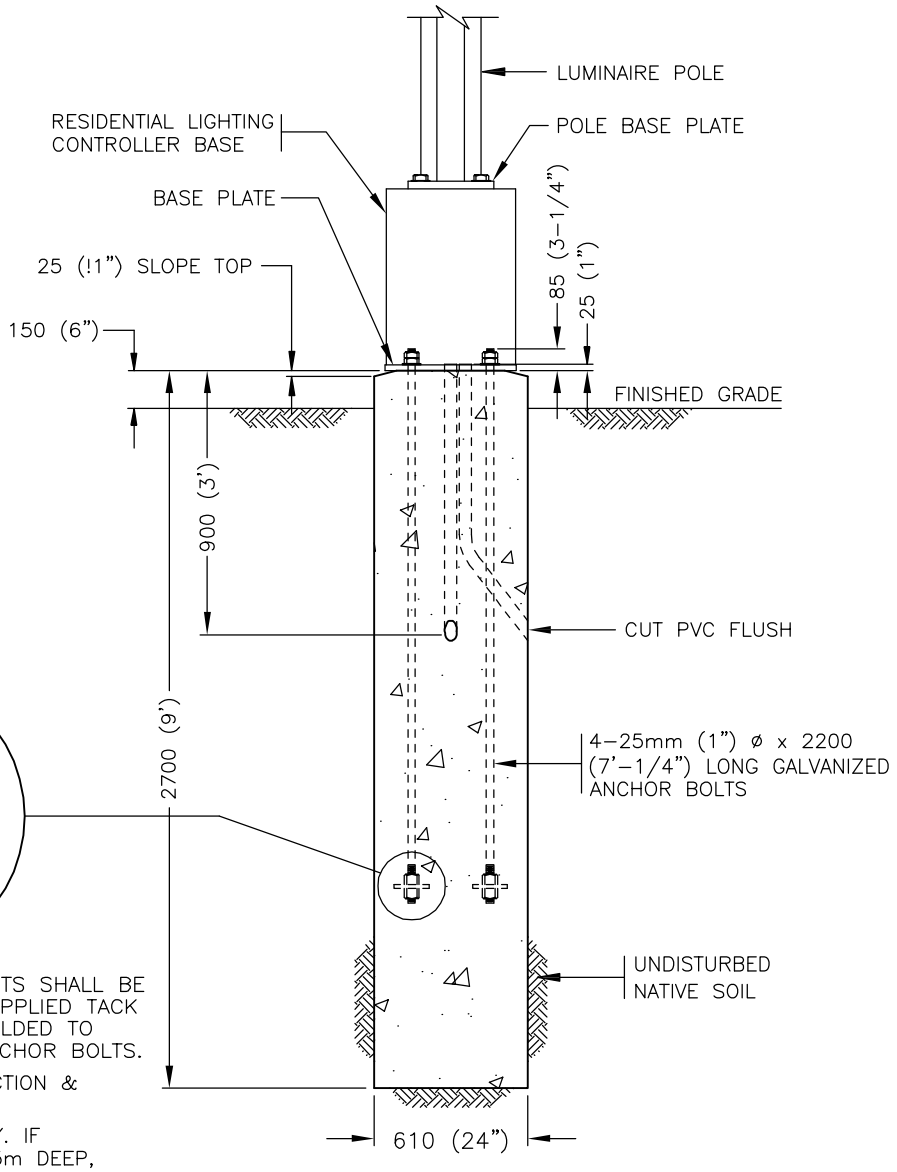
HEIGHT OF STANDARD	"A" BCD
7.9m (26')	254 (10")
9.1m (30')	279 (11")

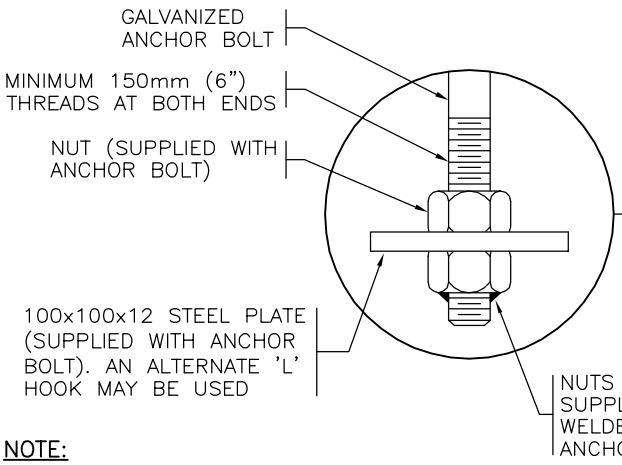


PLAN



ANCHOR BOLT DETAIL





ELEVATION

NOTE:

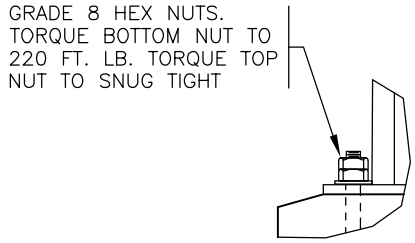
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. SOIL IS ASSUMED TO BE HOMOGENEOUS FIRM CLAY. IF UNSUITABLE SOIL IS FOUND TO BE MORE THAN 1.5m DEEP, THE PILE LENGTH MUST BE INCREASED TO ACCOMMODATE SUCH ADDITIONAL DEPTH OF UNSUITED SOIL. IF SITE CONDITION DOES NOT CONCUR WITH THE FIRM CLAY ASSUMPTION, IT MUST BE NOTIFIED TO THE PROJECT ENGINEER IMMEDIATELY.

Dimensions in Metric

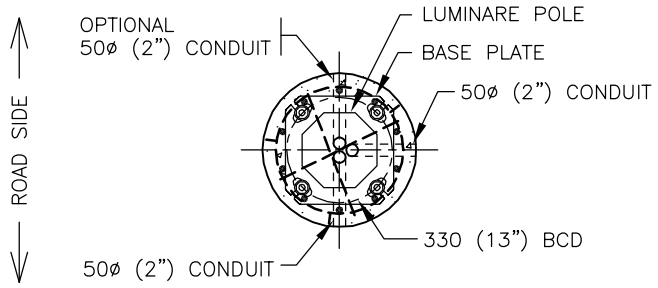
THE CITY OF Edmonton
Transportation and Streets

Title: POURED IN PLACE CONCRETE BASE FOR 7.9m (26') & 9.1m (30') DAVIT POLE & RESIDENTIAL LIGHTING CONTROLLER BASE

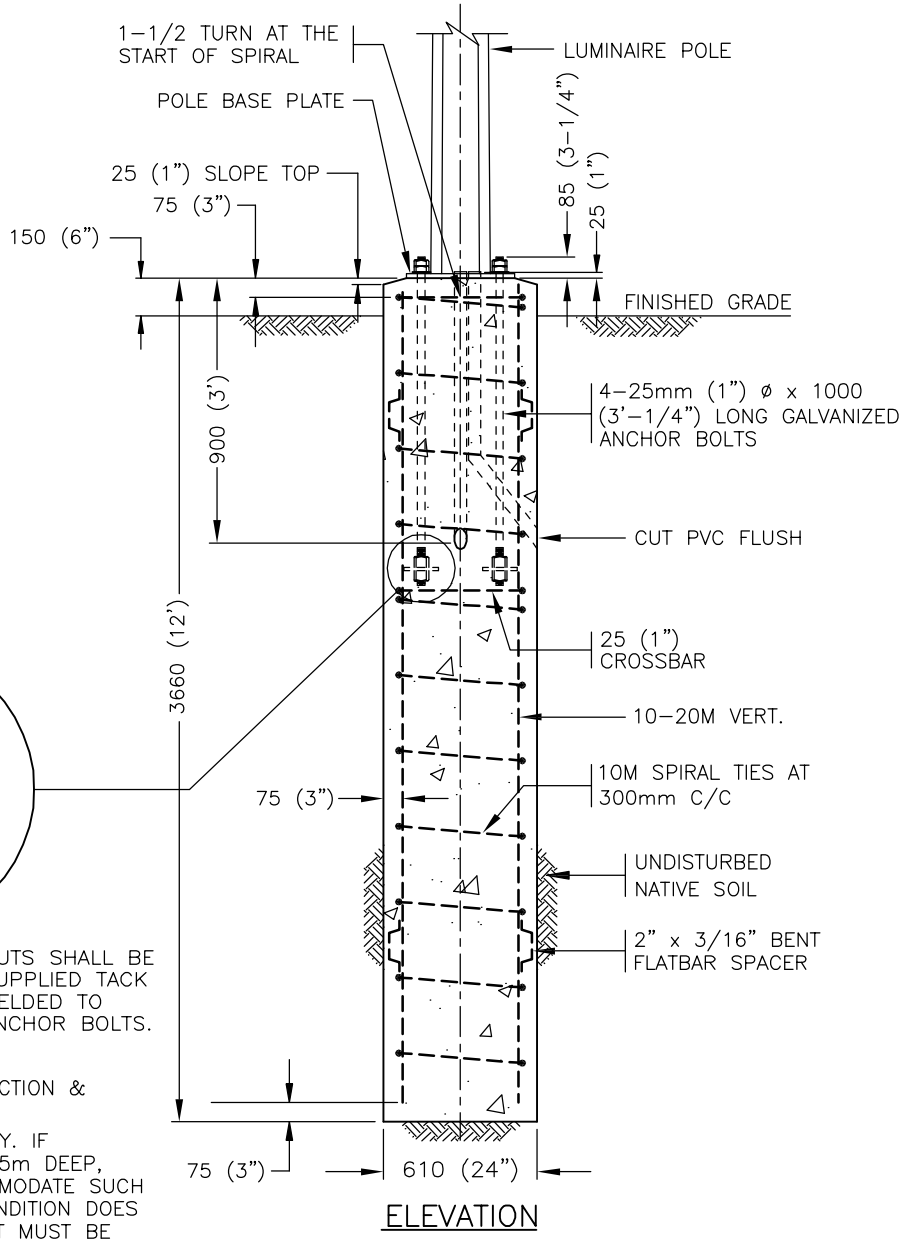
Date Approved:	Drawn By:	Approved	Rev.	Drawing #
–	ALM	Originals signed by:	08/28/09	E2.7
Scale:	Checked By:			Old Drawing #
N.T.S.	DSM			8787

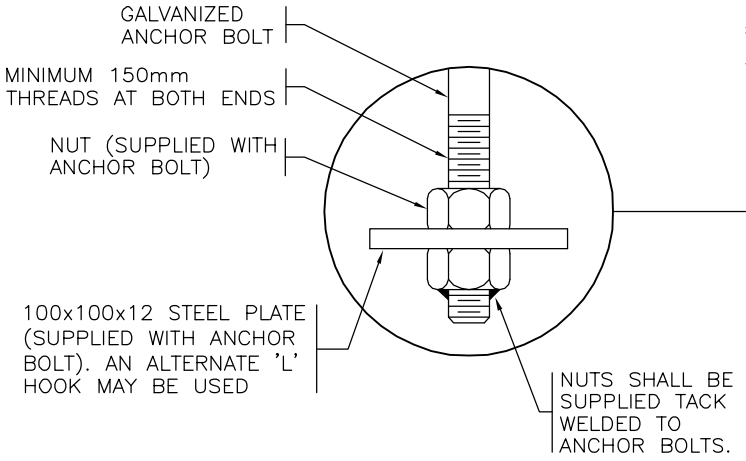


ANCHOR BOLT DETAIL



PLAN





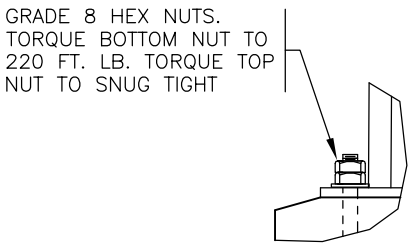
ELEVATION

NOTE:

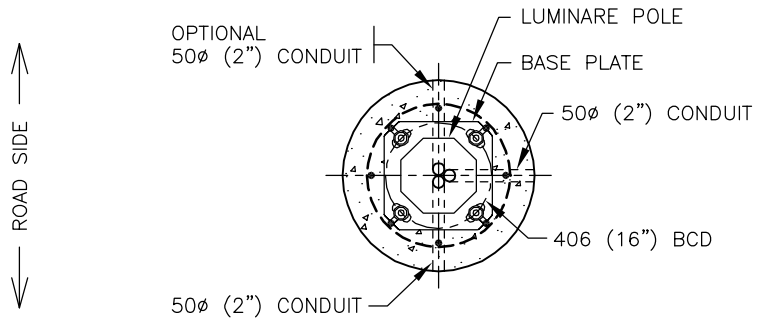
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. SOIL IS ASSUMED TO BE HOMOGENEOUS FIRM CLAY. IF UNSUITABLE SOIL IS FOUND TO BE MORE THAN 1.5m DEEP, THE PILE LENGTH MUST BE INCREASED TO ACCOMMODATE SUCH ADDITIONAL DEPTH OF UNSUITED SOIL. IF SITE CONDITION DOES NOT CONCUR WITH THE FIRM CLAY ASSUMPTION, IT MUST BE NOTIFIED TO THE PROJECT ENGINEER IMMEDIATELY.

Dimensions in Metric

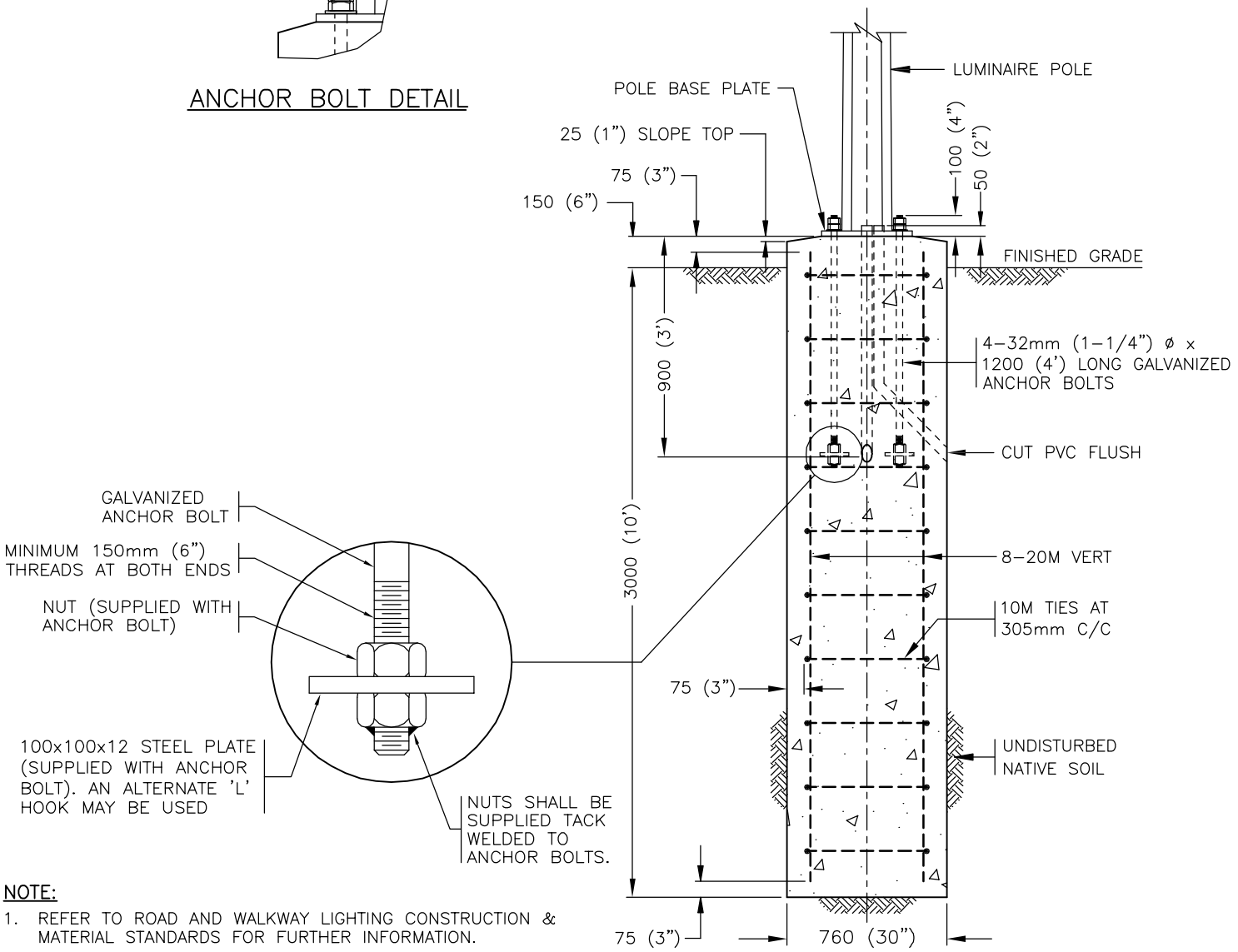
THE CITY OF Edmonton Transportation and Streets		Title: POURED IN PLACE CONCRETE BASE FOR 13.1m (43') SINGLE & DOUBLE DAVIT POLES		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E2.8
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8788



ANCHOR BOLT DETAIL



PLAN



ELEVATION

NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. FOUNDATION HAS BEEN DESIGNED ON AN ASSUMED UNCONFIRMED COMPRESSIVE STRENGTH OF 2000 PSF. MINIMUM EMBEDMENT DEPTH OF FOUNDATION TO BE OF 2.1m (82 $\frac{5}{8}$") INTO UNDISTURBED CLAY SOIL AND MINIMUM OVERALL LENGTH OF 3.0m (118 $\frac{1}{8}$"). THE TOP 1.8m (70 $\frac{7}{8}$") OF SOIL HAS BEEN NEGLECTED IN THE DESIGN.

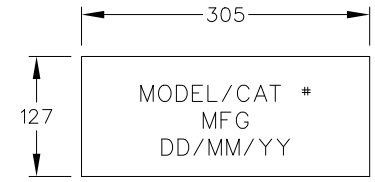
Dimensions in Metric

THE CITY OF Edmonton
Transportation and Streets

Title

POURED IN PLACE CONCRETE BASE FOR 15.2m (50') SINGLE & DOUBLE DAVIT POLES

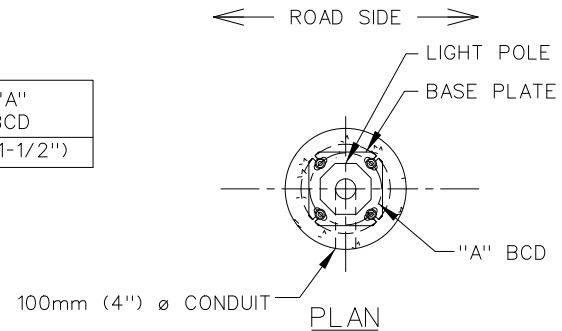
Date Approved:	Drawn By:	Approved	Rev.	Drawing #
–	ALM	Originals signed by:	08/28/09	E2.9
Scale:	Checked By:			Old Drawing #
N.T.S.	DSM			8784



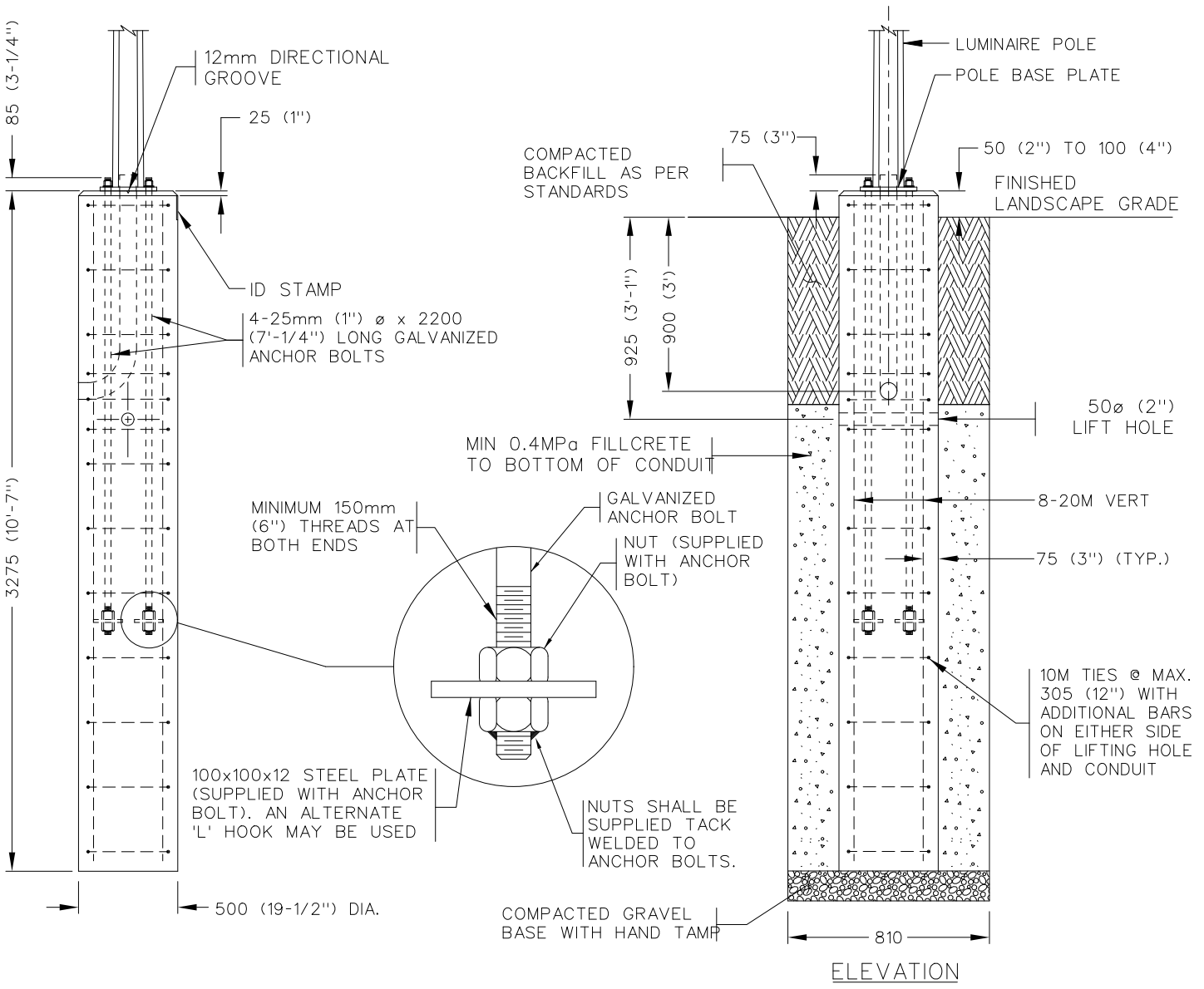
HEIGHT OF STANDARD	"A" BCD
11.0m (36')	292 (11-1/2")

NOTES:
1. TEXT TO BE 25mm (1") HIGH
2. SPACES BETWEEN ROW IS 13mm (0.5")
3. MFG - MANUFACTURER NAME

ID STAMP



PLAN



ELEVATION

NOTE:
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. ALL LOOSE MATERIAL SHALL BE REMOVED FROM EXCAVATION AND BACKFILLED WITH 20mm FRACTUREL ROCK IN LAYERS NOT EXCEEDING 150mm THICKNESS AND EACH LAYER SHALL BE MECHANICALLY TAMPED MINIMUM 95% PROCTOR DENSITY.

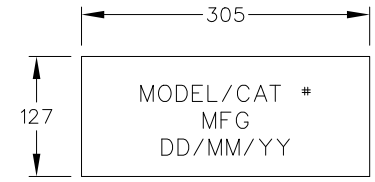
WHEN USING POLES WITH LUMINAIRE ARMS LONGER THAN 2440 (8') THE CONCRETE BASE SUITABILITY SHALL BE CONFIRMED BY THE DESIGNER.

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets

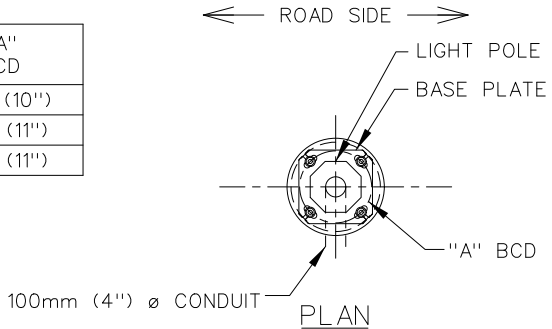
Title: PRECAST CONCRETE BASE FOR 11.0m (36') SINGLE DAVIT POLES

Date Approved	Drawn By:	Approved	Rev.	Drawing #
-	ALM	Originals signed by:	01/31/12	E2.10
Scale:	Checked By:			Old Drawing #
N.T.S.	DSM			-



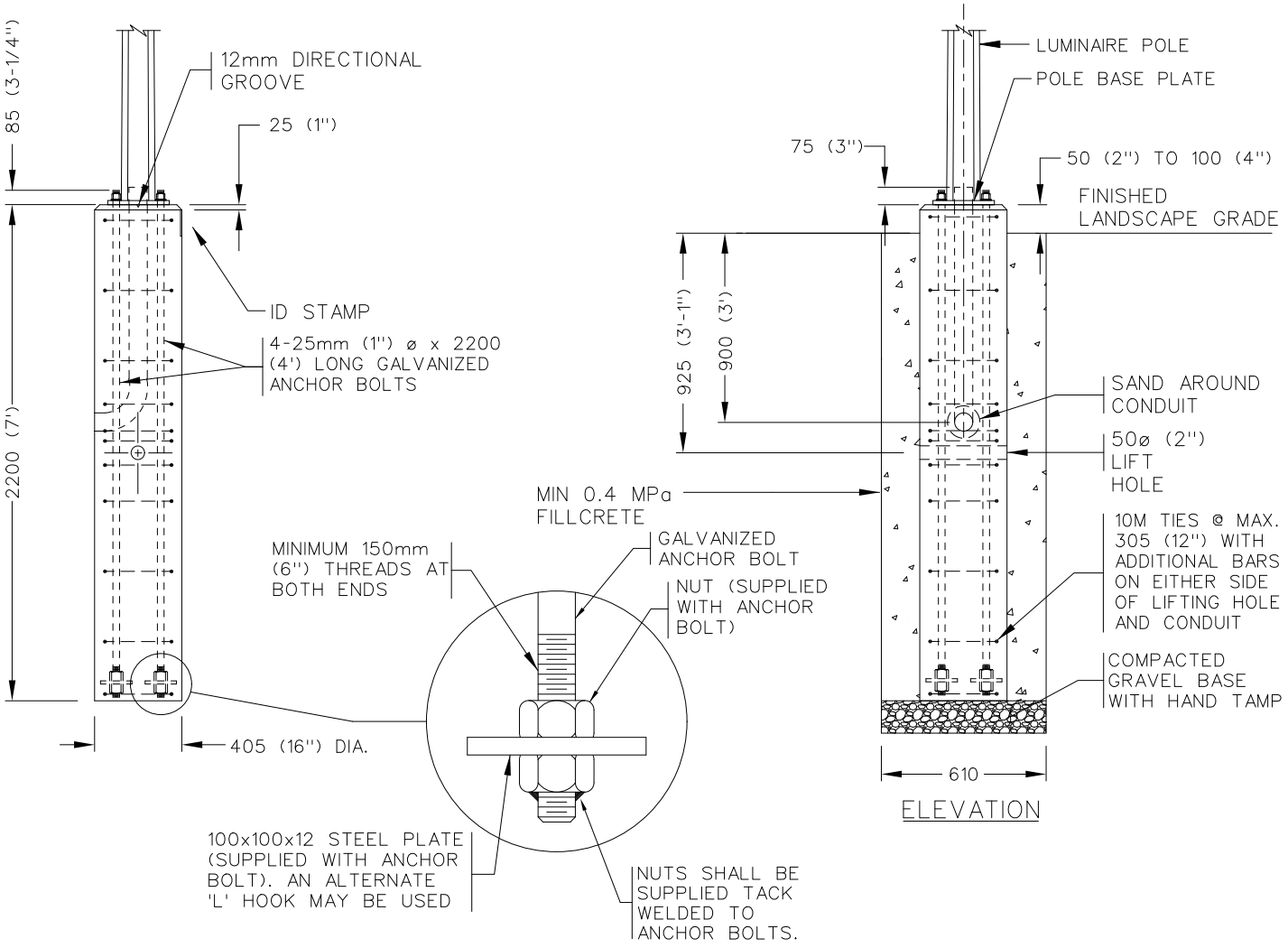
HEIGHT OF STANDARD	"A" BCD
8.5m (28')	254 (10")
9.1m (30')	279 (11")
9.8m (32')	279 (11")

NOTES:
1. TEXT TO BE 25mm (1") HIGH
2. SPACES BETWEEN ROW IS 13mm (0.5")
3. MFG - MANUFACTURER NAME



PLAN

ID STAMP



ELEVATION

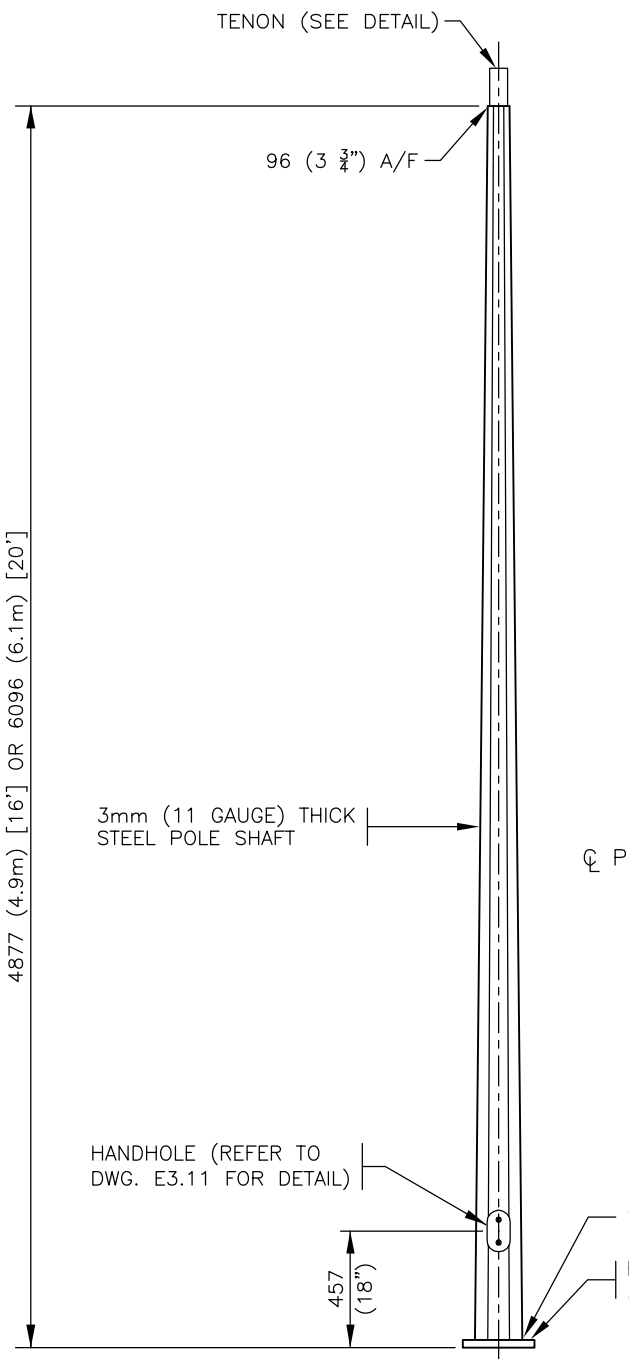
NOTE:
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.

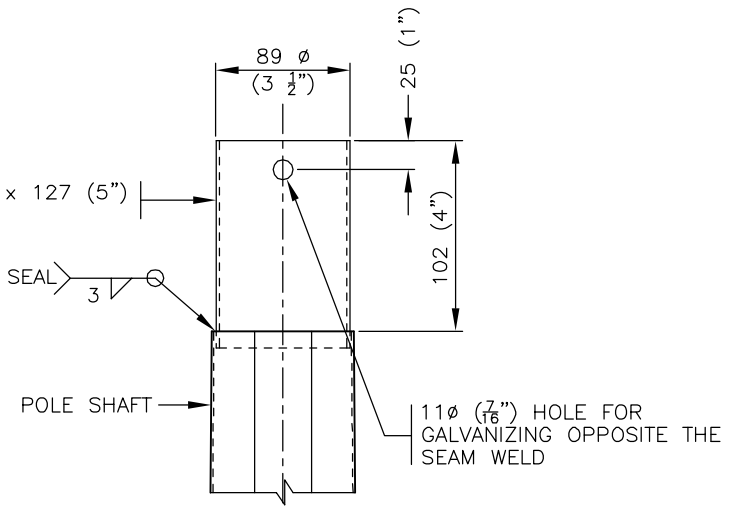
WHEN USING POLES WITH LUMINAIRE ARMS LONGER THAN 2440 (8') THE CONCRETE BASE SUITABILITY SHALL BE CONFIRMED BY THE DESIGNER.

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets	Title: PRECAST CONCRETE BASE FOR 8.5m (28'), 9.1m (30'), 9.8m (32') SINGLE DAVIT POLES			
Date Approved: -	Drawn By: ALM	Approved Originals signed by:	Rev. 01/31/12	Drawing # E2.11
Scale: N.T.S.	Checked By: DSM			Old Drawing # -

DESIGN LOADS FROM LIGHT POLE	4.9m (16') POLE	6.1m (20') POLE
MAX. MOMENT @ BASE	10.5 kNm	13.3 kNm
MAX. HOR. SHEAR	8.8 kN	3.3 kN
MAX. VERT. LOAD	0.9 kN	1.1 kN

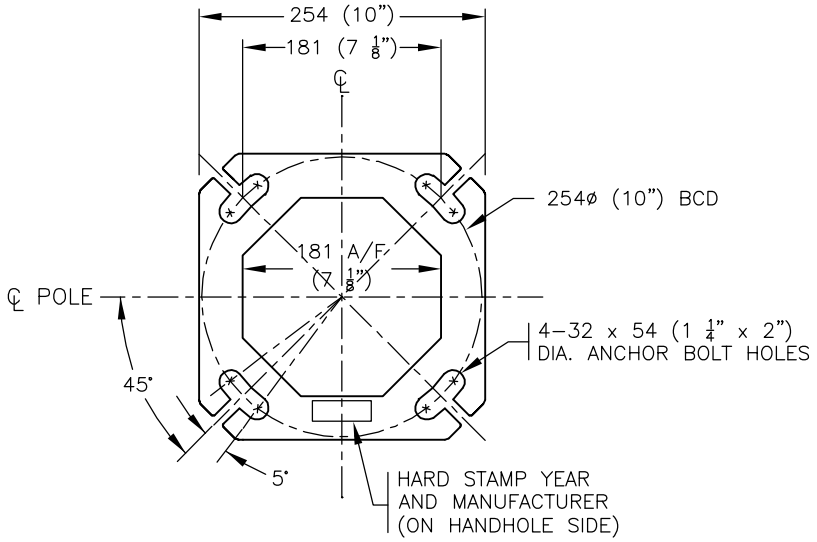




TENON DETAIL

NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. POLE DESIGNED FOR LUMINAIRE WITH EPA OF 0.28m² @ 160 km/h WIND SPEED (+1.3 GUST FACTOR)

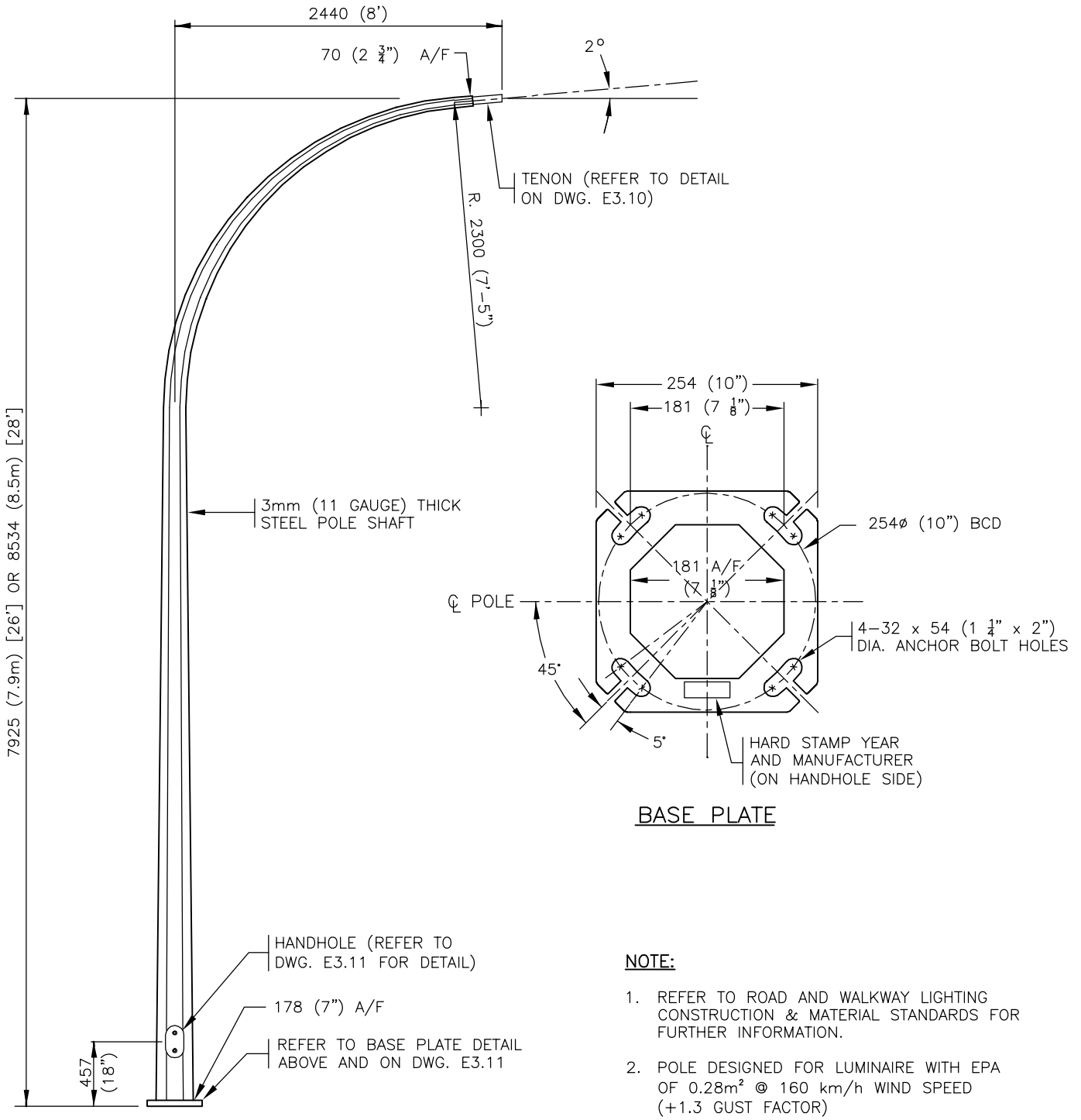


BASE PLATE

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: 4.9m (16') & 6.1m (20') POST TOP POLES		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E3.1
Scale: N.T.S.	Checked By: DSM		Old Drawing # 8570M	

DESIGN LOADS FROM LIGHT POLE	7.9m (26') POLE	8.5m (28') POLE
MAX. MOMENT @ BASE	12.7 kNm	13.9 kNm
MAX. HOR. SHEAR	3.0 kN	3.1 kN
MAX. VERT. LOAD	1.3 kN	1.4 kN



BASE PLATE

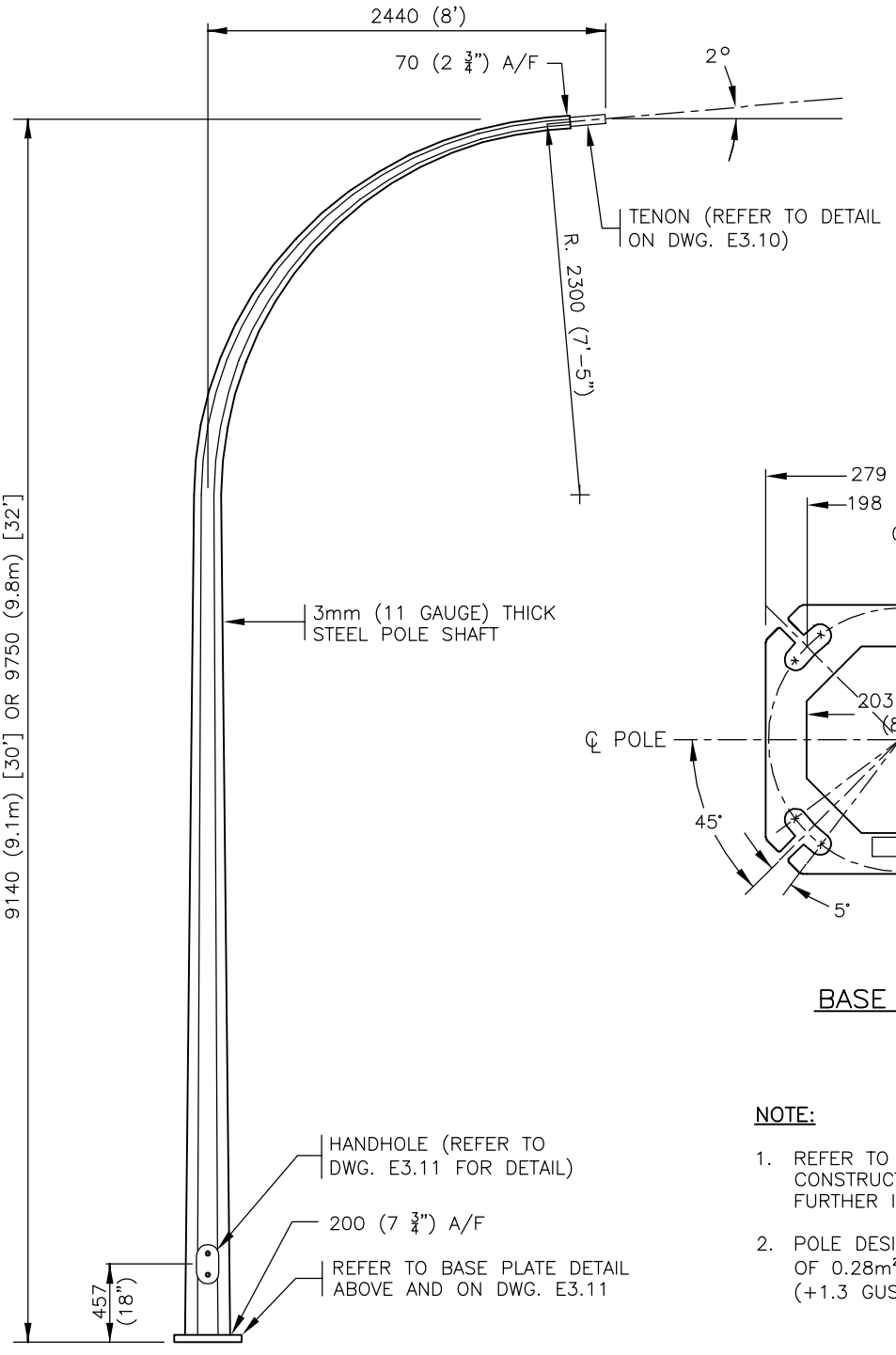
NOTE:

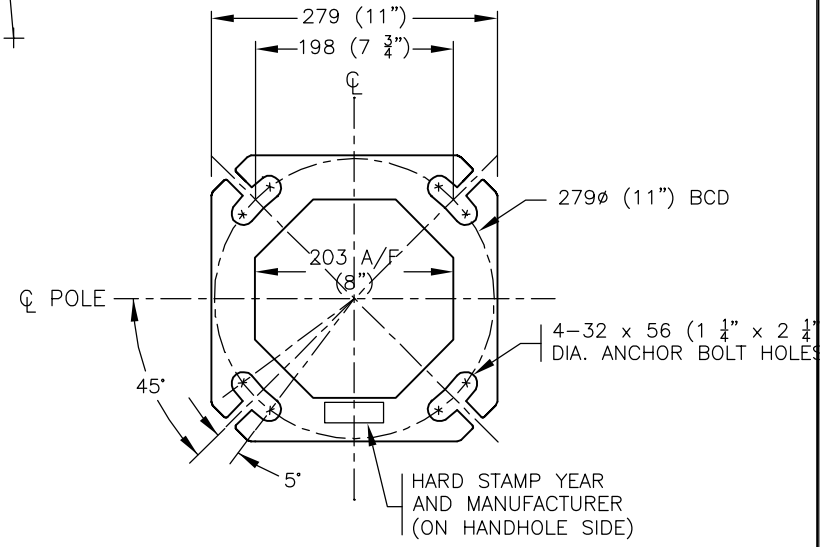
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. POLE DESIGNED FOR LUMINAIRE WITH EPA OF 0.28m² @ 160 km/h WIND SPEED (+1.3 GUST FACTOR)

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: 7.9m (26') & 8.5m (28') SINGLE DAVIT POLES		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E3.2
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8610M

DESIGN LOADS FROM LIGHT POLE	9.1m (30') POLE	9.8m (32') POLE
MAX. MOMENT @ BASE	16.7 kNm	17.8 kNm
MAX. HOR. SHEAR	3.5 kN	3.6 kN
MAX. VERT. LOAD	1.5 kN	1.6 kN





BASE PLATE

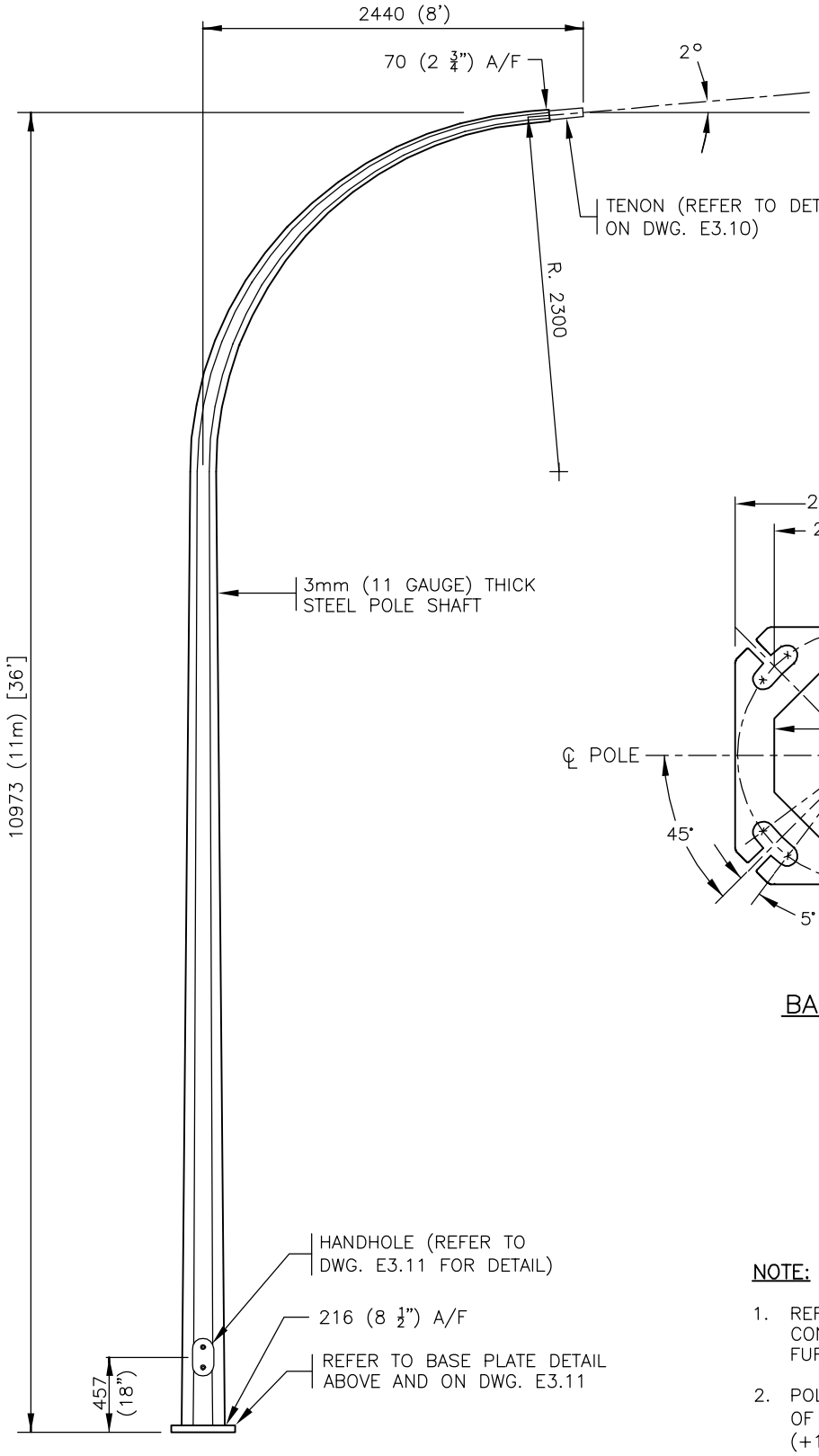
NOTE:

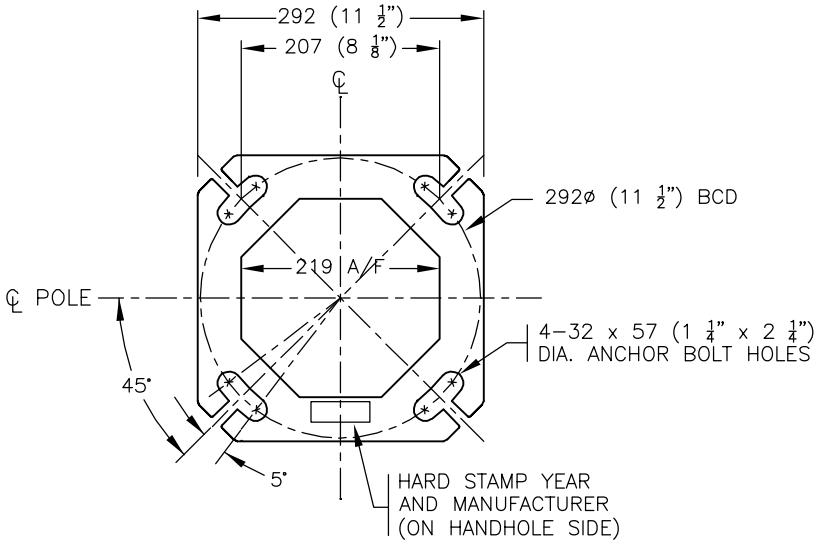
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. POLE DESIGNED FOR LUMINAIRE WITH EPA OF 0.28m² @ 160 km/h WIND SPEED (+1.3 GUST FACTOR)

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: 9.1m (30') & 9.8m (32') SINGLE DAVIT POLES		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E3.3
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8611M

DESIGN LOADS FROM LIGHT POLE	11.0m (36') POLE
MAX. MOMENT @ BASE	21.6 kNm
MAX. HOR. SHEAR	4.0 kN
MAX. VERT. LOAD	1.7 kN





BASE PLATE

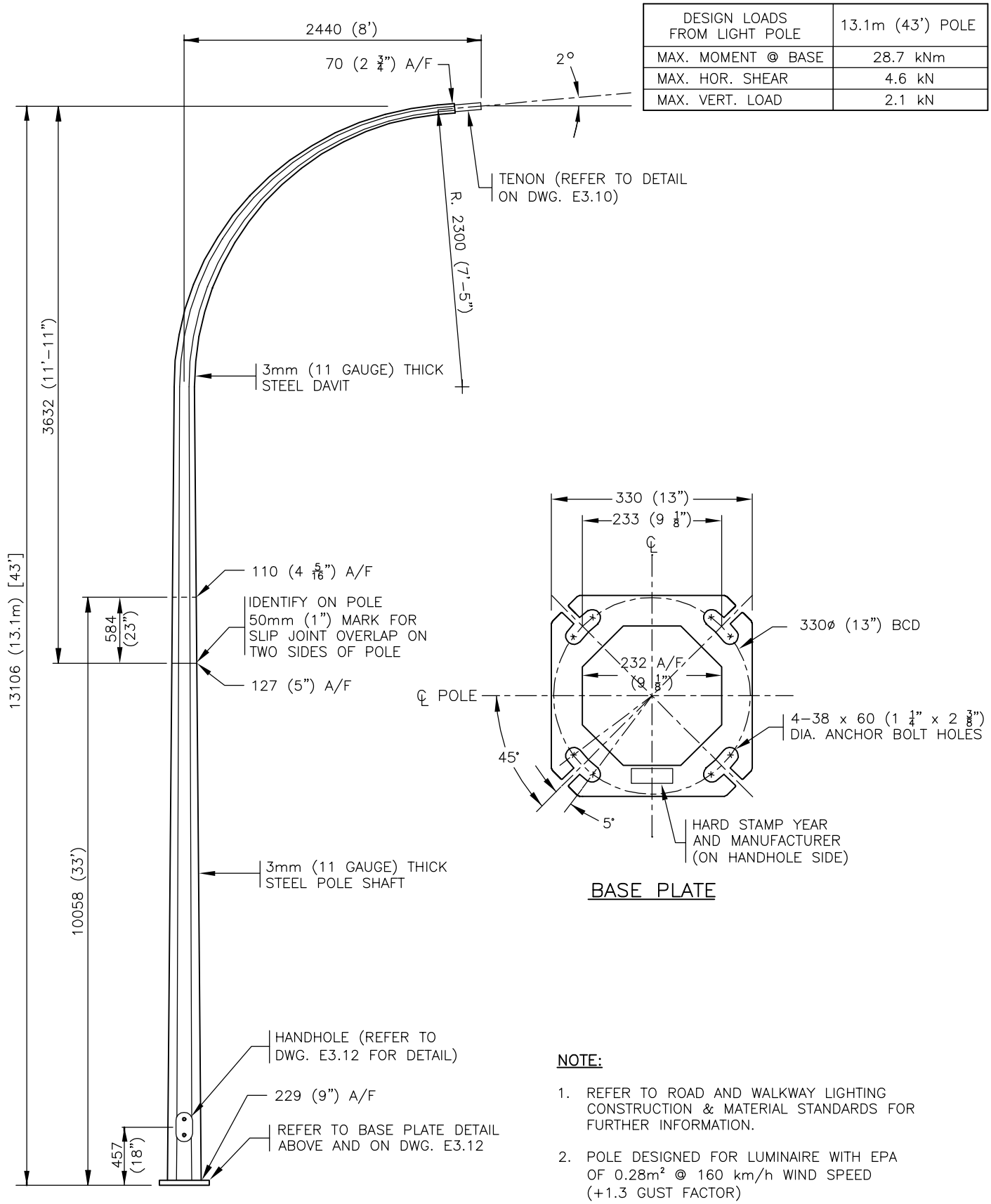
NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. POLE DESIGNED FOR LUMINAIRE WITH EPA OF 0.28m² @ 160 km/h WIND SPEED (+1.3 GUST FACTOR)

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: 11.0m (36') SINGLE DAVIT POLE		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E3.4
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8611M

DESIGN LOADS FROM LIGHT POLE	13.1m (43') POLE
MAX. MOMENT @ BASE	28.7 kNm
MAX. HOR. SHEAR	4.6 kN
MAX. VERT. LOAD	2.1 kN



BASE PLATE

NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. POLE DESIGNED FOR LUMINAIRE WITH EPA OF 0.28m² @ 160 km/h WIND SPEED (+1.3 GUST FACTOR)

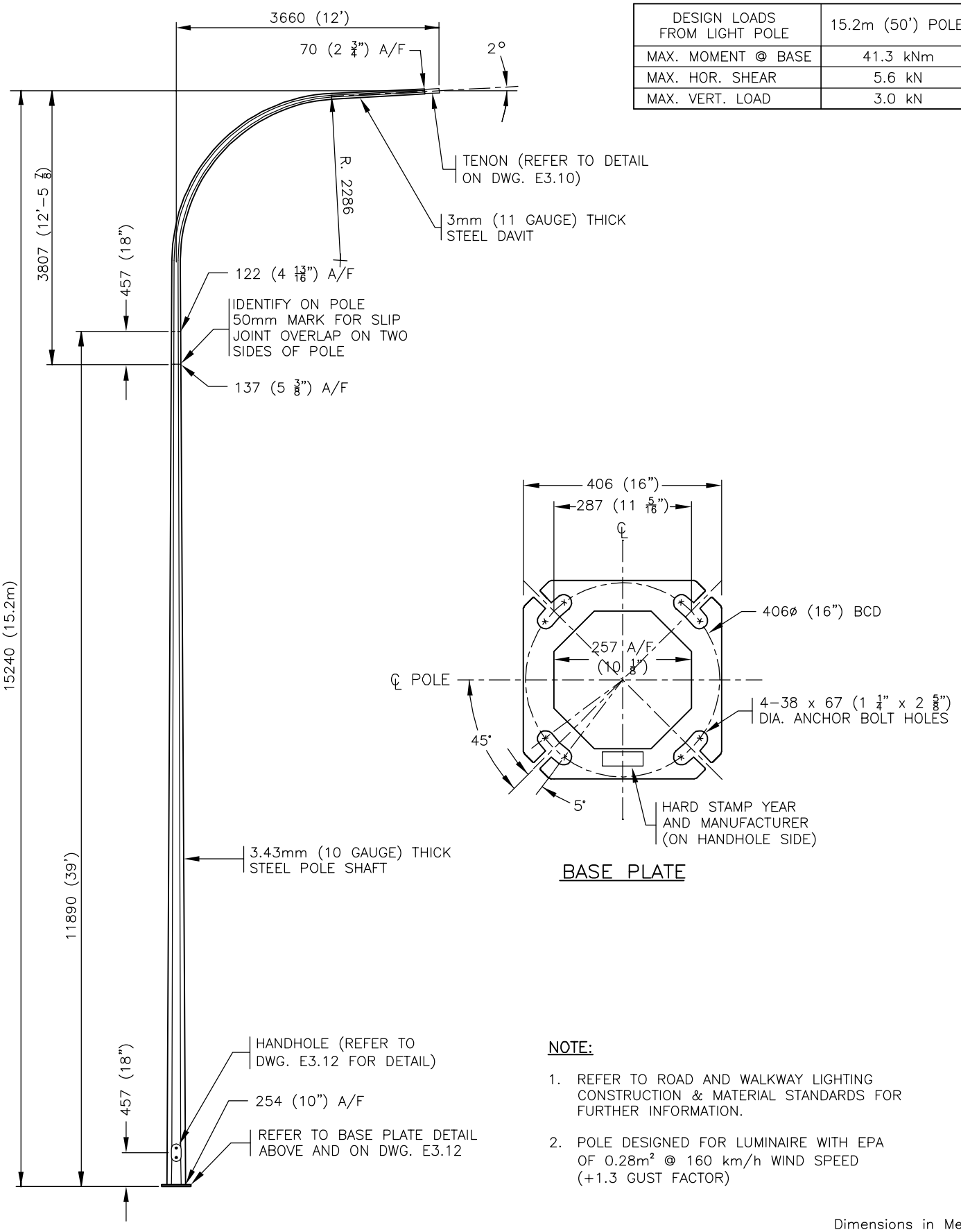
Dimensions in Metric

THE CITY OF Edmonton
Transportation and Streets

Title: 13.1m (43') SINGLE DAVIT POLE

Date Approved:	Drawn By:	Approved	Rev.	Drawing #
–	ALM	Originals signed by:	08/28/09	E3.5
Scale: N.T.S.	Checked By: DSM		Old Drawing #	8613M

DESIGN LOADS FROM LIGHT POLE	15.2m (50') POLE
MAX. MOMENT @ BASE	41.3 kNm
MAX. HOR. SHEAR	5.6 kN
MAX. VERT. LOAD	3.0 kN



BASE PLATE

NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. POLE DESIGNED FOR LUMINAIRE WITH EPA OF 0.28m² @ 160 km/h WIND SPEED (+1.3 GUST FACTOR)

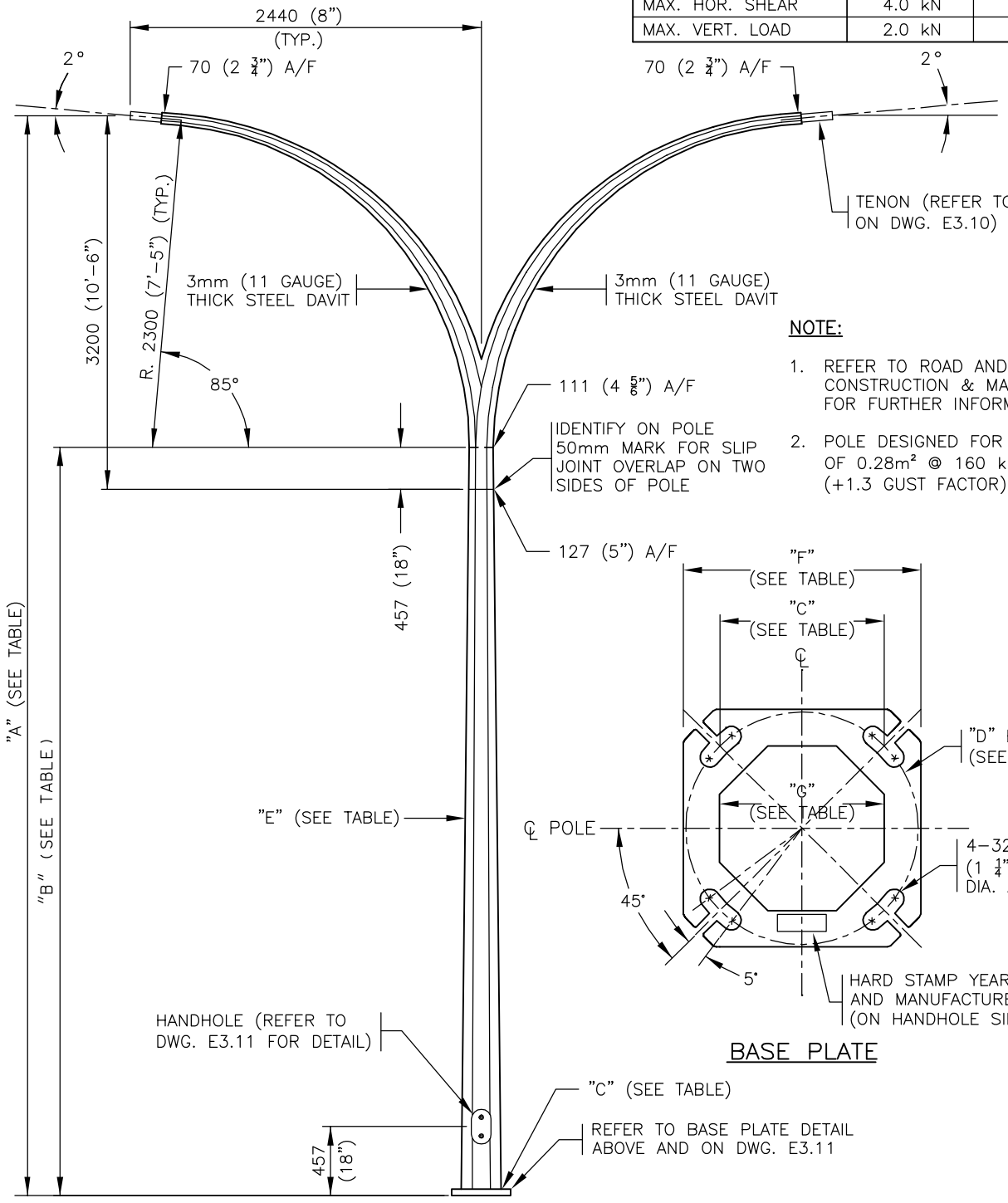
Dimensions in Metric

THE CITY OF Edmonton
Transportation and Streets

Title: 15.2m (50') SINGLE DAVIT POLE

Date Approved:	Drawn By:	Approved	Rev.	Drawing #
–	ALM	Originals signed by:	08/28/09	E3.6
Scale: N.T.S.	Checked By: DSM		Old Drawing #	8614M

DESIGN LOADS FROM LIGHT POLE	8.5m POLE	9.8m POLE	11.0m POLE
MAX. MOMENT @ BASE	21.5 kNm	25.5 kNm	30.2 kNm
MAX. HOR. SHEAR	4.0 kN	4.4 kN	4.8 kN
MAX. VERT. LOAD	2.0 kN	2.2 kN	3.1 kN



NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. POLE DESIGNED FOR LUMINAIRE WITH EPA OF 0.28m² @ 160 km/h WIND SPEED (+1.3 GUST FACTOR)

BASE PLATE

POLE	"A" HEIGHT OF STANDARD	"B" LOWER POLE SHAFT	"C" BOLT SQ.	"D" BCD	"E" STEEL THICKNESS	"F" BASE PLATE	"G" A/F OF BASE PLATE
8.5m	8534 (28')	5791 (19')	186 (7 5/16")	254 (10")	3 (11)	254 (10")	189 (7 1/2")
9.8m	9754 (32')	7010 (23')	186 (7 5/16")	279 (11")	3 (11)	279 (11")	204 (8")
11.0m	10972 (27')	8230 (27')	217 (8 1/2")	292 (11 1/2")	3.43 (10)	292 (11 1/2")	220 (8 3/4")

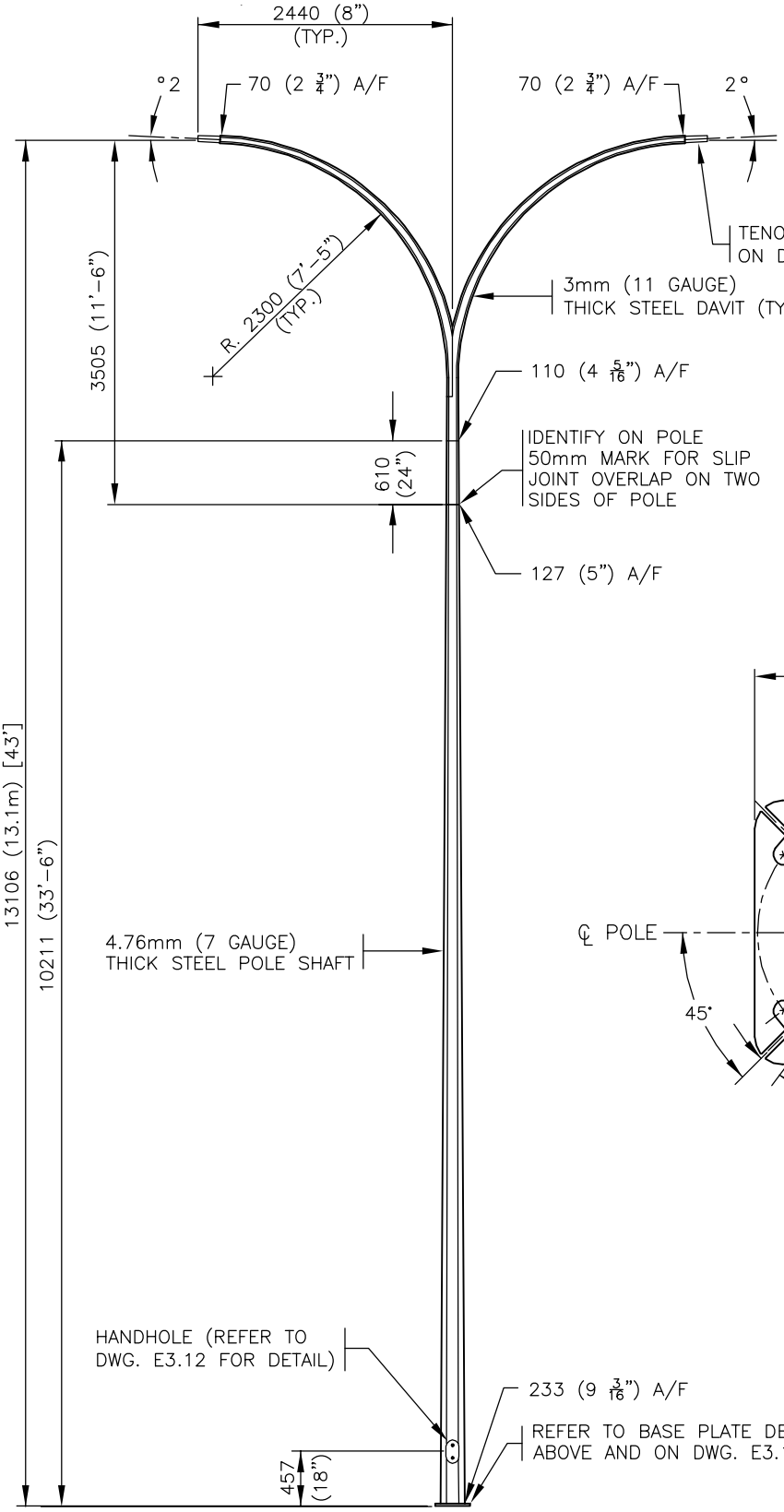
Dimensions in Metric

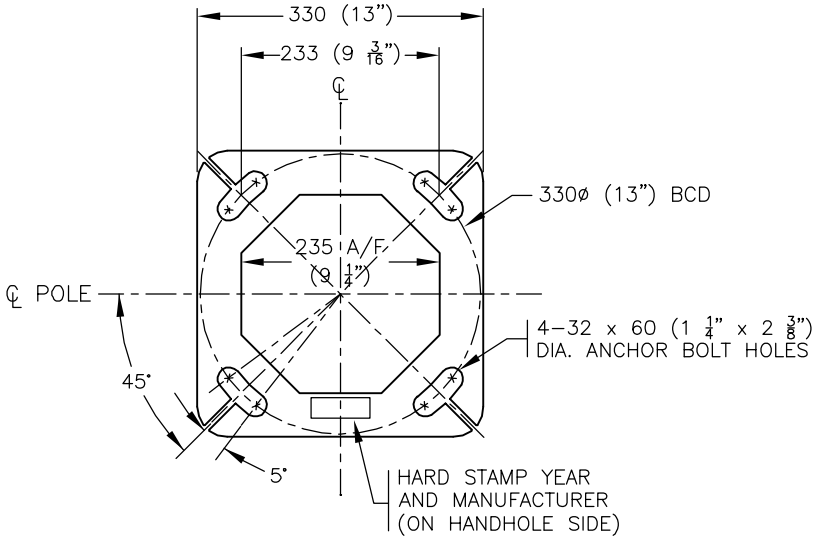
THE CITY OF Edmonton
Transportation and Streets

Title: 8.5m, 9.8m & 11.0m DOUBLE DAVIT POLES

Date Approved:	Drawn By:	Approved	Rev.	Drawing #
–	ALM	Originals signed by:	08/28/09	E3.7
Scale: N.T.S.	Checked By: DSM		Old Drawing # 8620M	

DESIGN LOADS FROM LIGHT POLE	13.1m (43') POLE
MAX. MOMENT @ BASE	39.6 kNm
MAX. HOR. SHEAR	5.4 kN
MAX. VERT. LOAD	3.5 kN





BASE PLATE

NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. POLE DESIGNED FOR LUMINAIRE WITH EPA OF 0.28m² @ 160 km/h WIND SPEED (+1.3 GUST FACTOR)

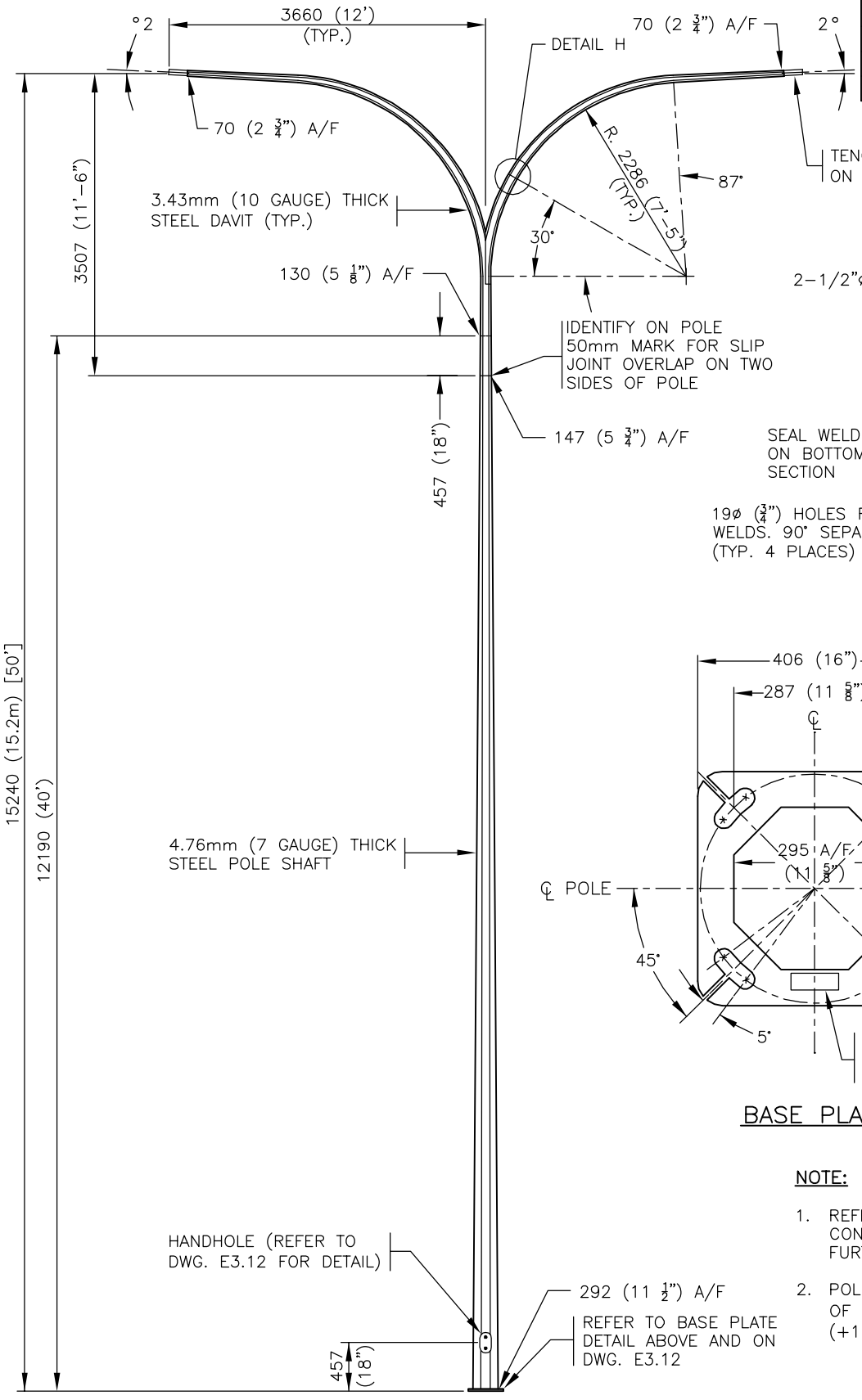
Dimensions in Metric

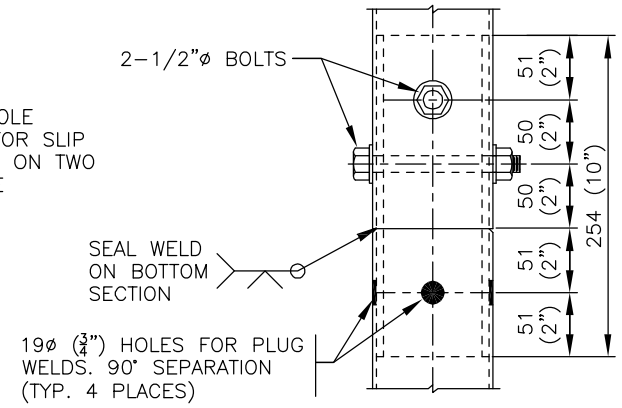
THE CITY OF Edmonton
Transportation and Streets

Title: 13.1m (43') DOUBLE DAVIT POLE

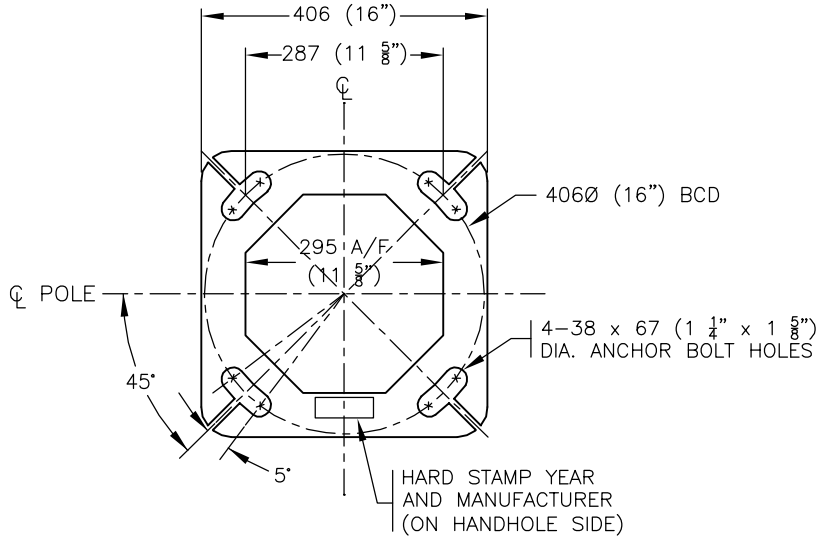
Date Approved:	Drawn By:	Approved	Rev.	Drawing #
–	ALM	Originals signed by:	08/28/09	E3.8
Scale: N.T.S.	Checked By: DSM			Old Drawing # –

DESIGN LOADS FROM LIGHT POLE	15.2m (50') POLE
MAX. MOMENT @ BASE	70.0 kNm
MAX. HOR. SHEAR	8.0 kN
MAX. VERT. LOAD	4.9 kN





DETAIL H



BASE PLATE

NOTE:

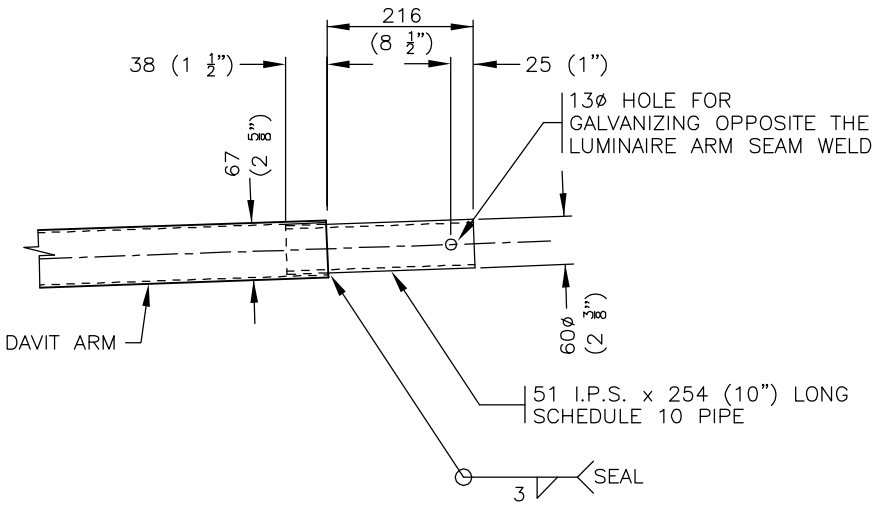
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. POLE DESIGNED FOR LUMINAIRE WITH EPA OF 0.28m² @ 160 km/h WIND SPEED (+1.3 GUST FACTOR)

Dimensions in Metric

THE CITY OF Edmonton
Transportation and Streets

Title: 15.2m (50') DOUBLE DAVIT POLE

Date Approved:	Drawn By:	Approved	Rev.	Drawing #
–	ALM	Originals signed by:	08/28/09	E3.9
Scale: N.T.S.	Checked By: DSM			Old Drawing # –



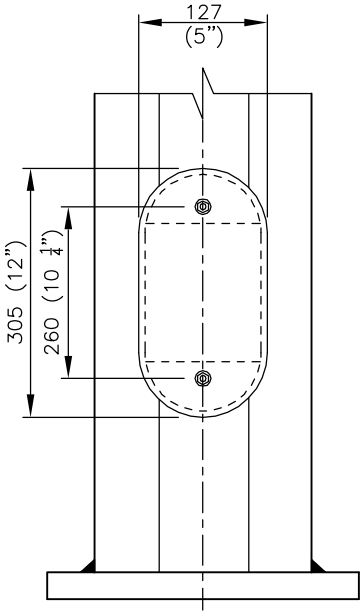
DAVIT TENON DETAIL

NOTE:

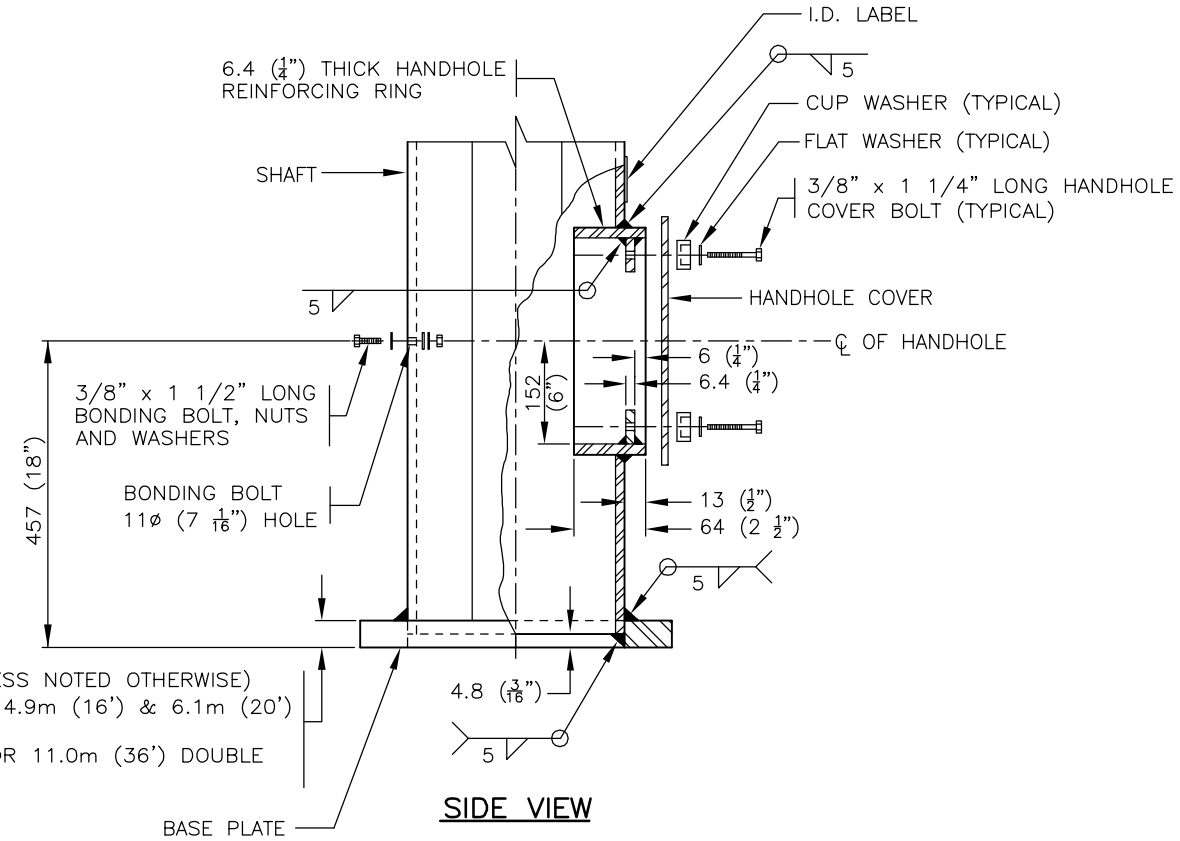
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: DAVIT TENON DETAIL		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E3.10
Scale: N.T.S.	Checked By: DSM		Old Drawing # –	



FRONT VIEW



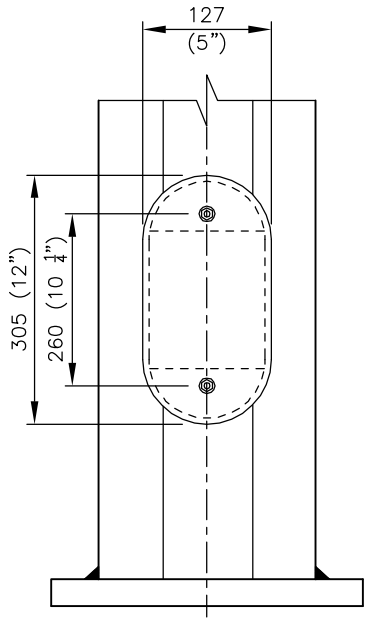
SIDE VIEW

NOTE:

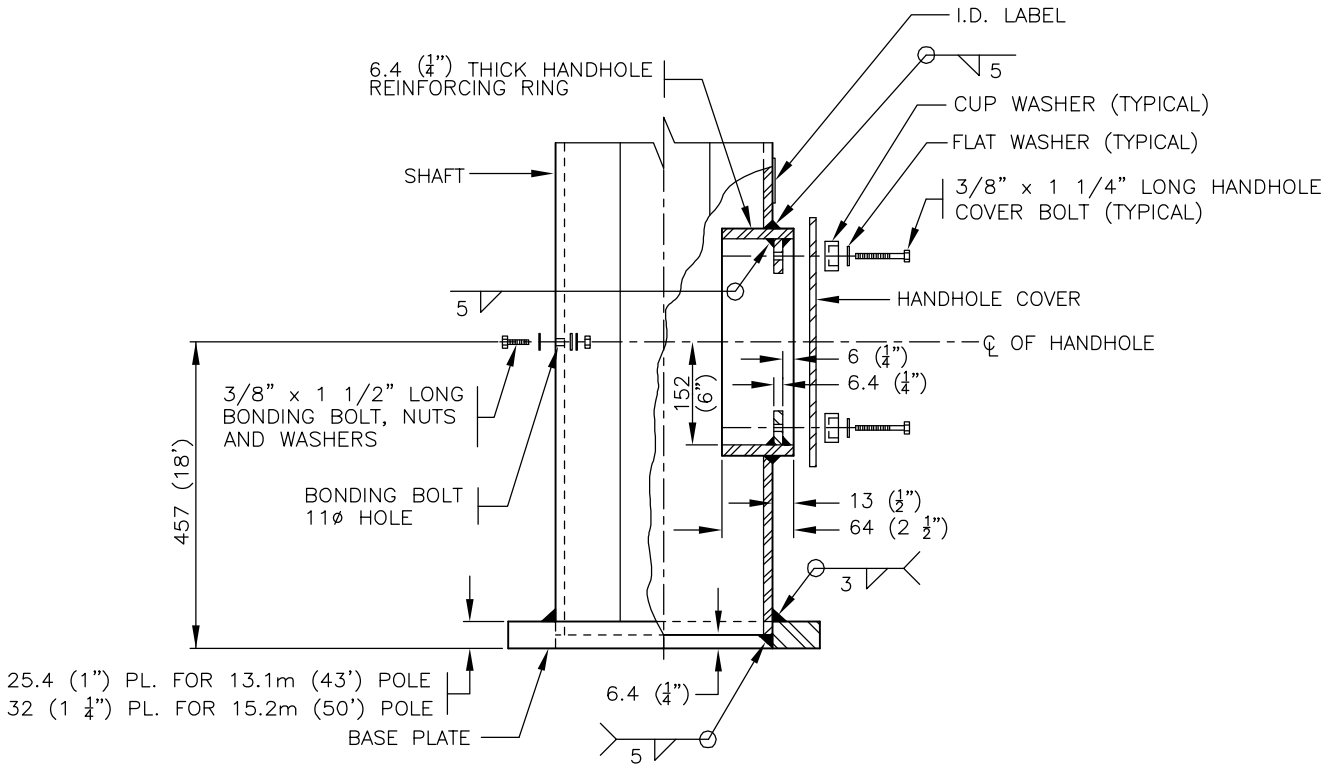
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: HANDHOLE AND BASE PLATE FOR ALL POLES 11.0m (36') TALL & BELOW		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E3.11
Scale: N.T.S.	Checked By: DSM			Old Drawing # –



FRONT VIEW



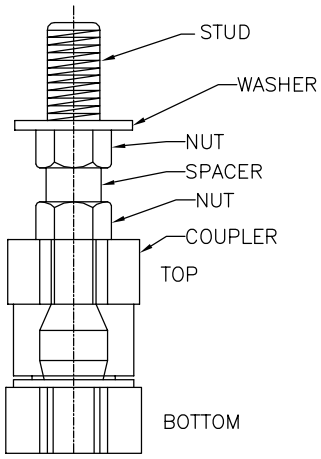
SIDE VIEW

NOTE:

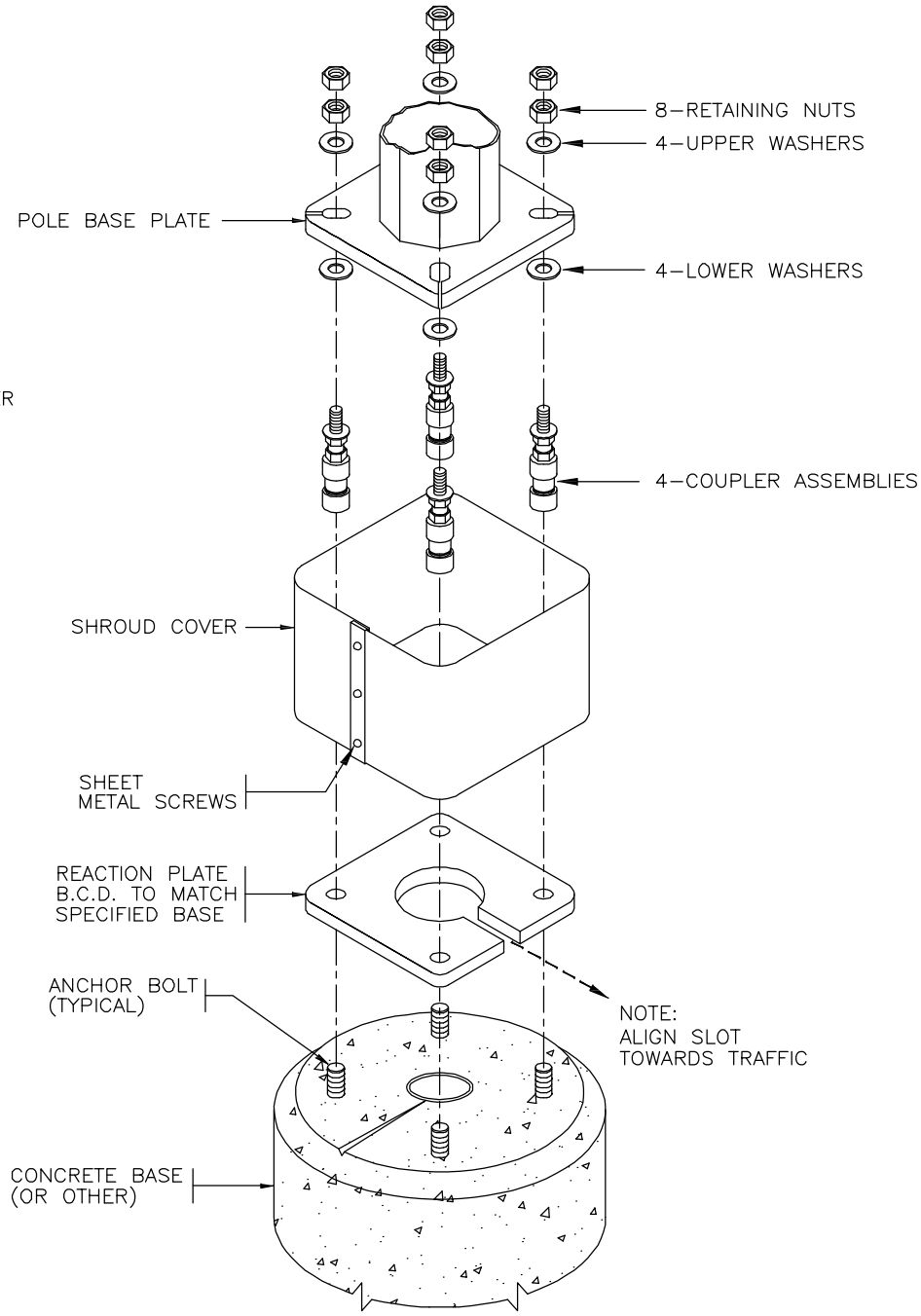
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: HANDHOLE AND BASE PLATE FOR ALL POLES 13.1m (43') TALL & ABOVE		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E3.12
Scale: N.T.S.	Checked By: DSM			Old Drawing # –



COUPLER ASSEMBLY



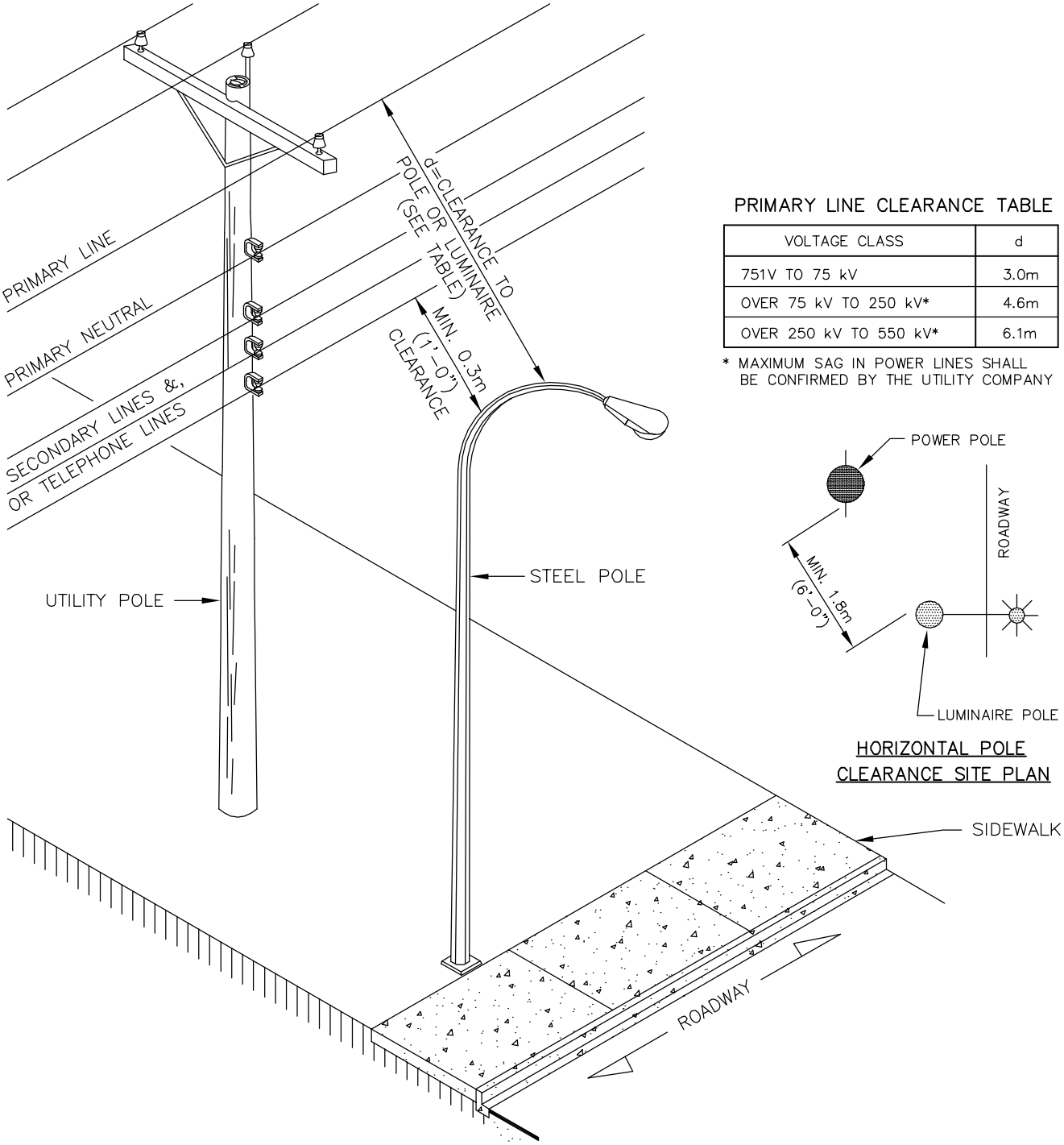
BREAKAWAY BASE ASSEMBLY

NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. TIGHTEN & ASSEMBLE AS PER MANUFACTURER INSTRUCTIONS.

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: LUMINAIRE POLE BREAKAWAY BASE ASSEMBLY		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E3.13
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8790



PRIMARY LINE CLEARANCE TABLE

VOLTAGE CLASS	d
751V TO 75 kV	3.0m
OVER 75 kV TO 250 kV*	4.6m
OVER 250 kV TO 550 kV*	6.1m

* MAXIMUM SAG IN POWER LINES SHALL BE CONFIRMED BY THE UTILITY COMPANY

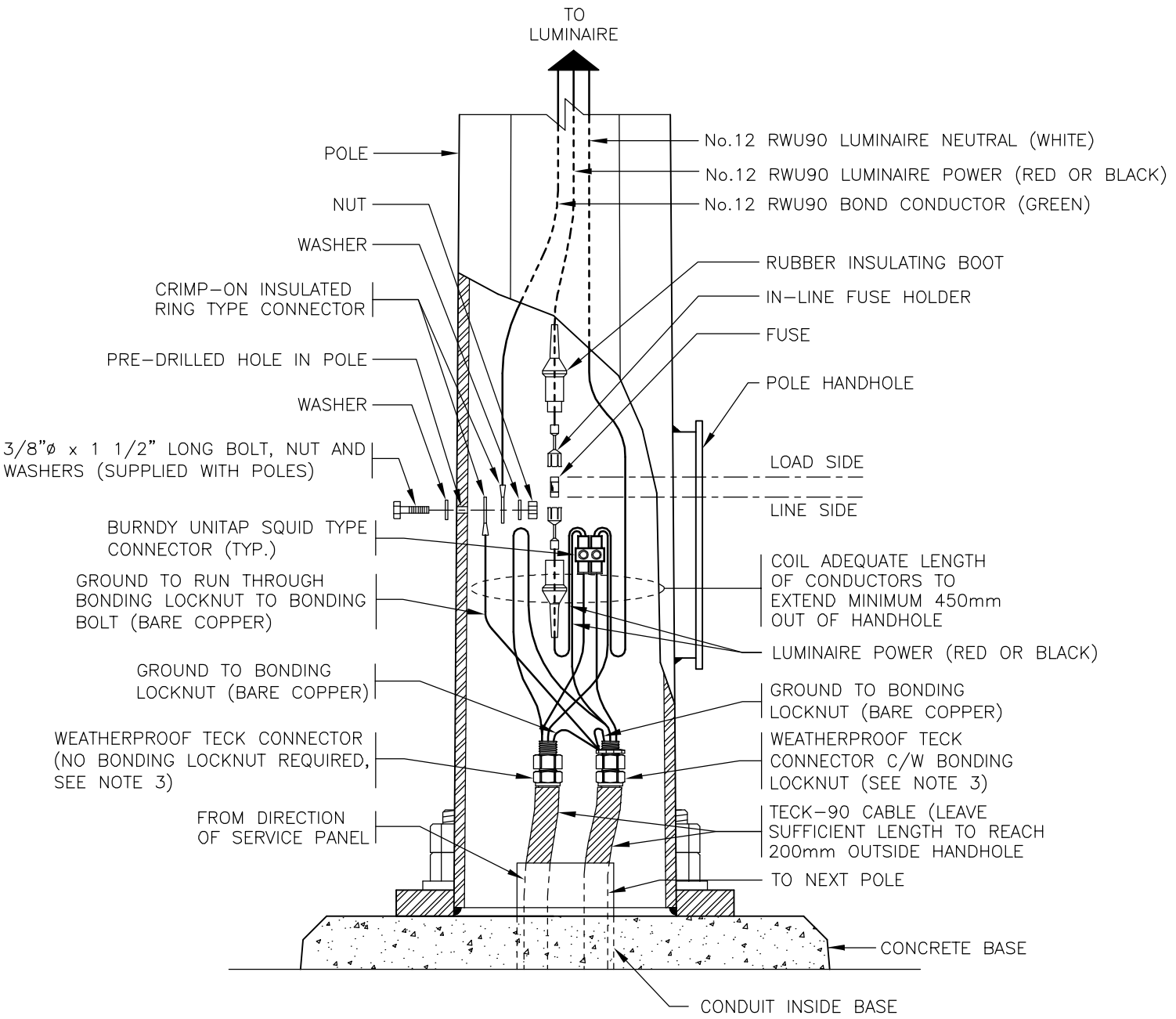
HORIZONTAL POLE CLEARANCE SITE PLAN

NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. CLEARANCES FOR ALL UTILITIES LISTED ABOVE ARE TO BE USED AS A GUIDELINE ONLY. EXACT REQUIRED CLEARANCES MAY VARY AND MUST BE CONFIRMED BY CONTRACTOR PRIOR TO CONSTRUCTION.
3. FOR CLEARANCES LESS THAN 3.0m (10') CONTRACTOR TO OBTAIN APPROVAL FROM UTILITY COMPANY AND WORKERS COMPENSATION BOARD (WCB) PRIOR TO INSTALLATION.

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: MINIMUM CLEARANCES TO OVERHEAD POWERLINES		
Date Approved: —	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E3.14
Scale: N.T.S.	Checked By: DSM			Old Drawing # F8.14



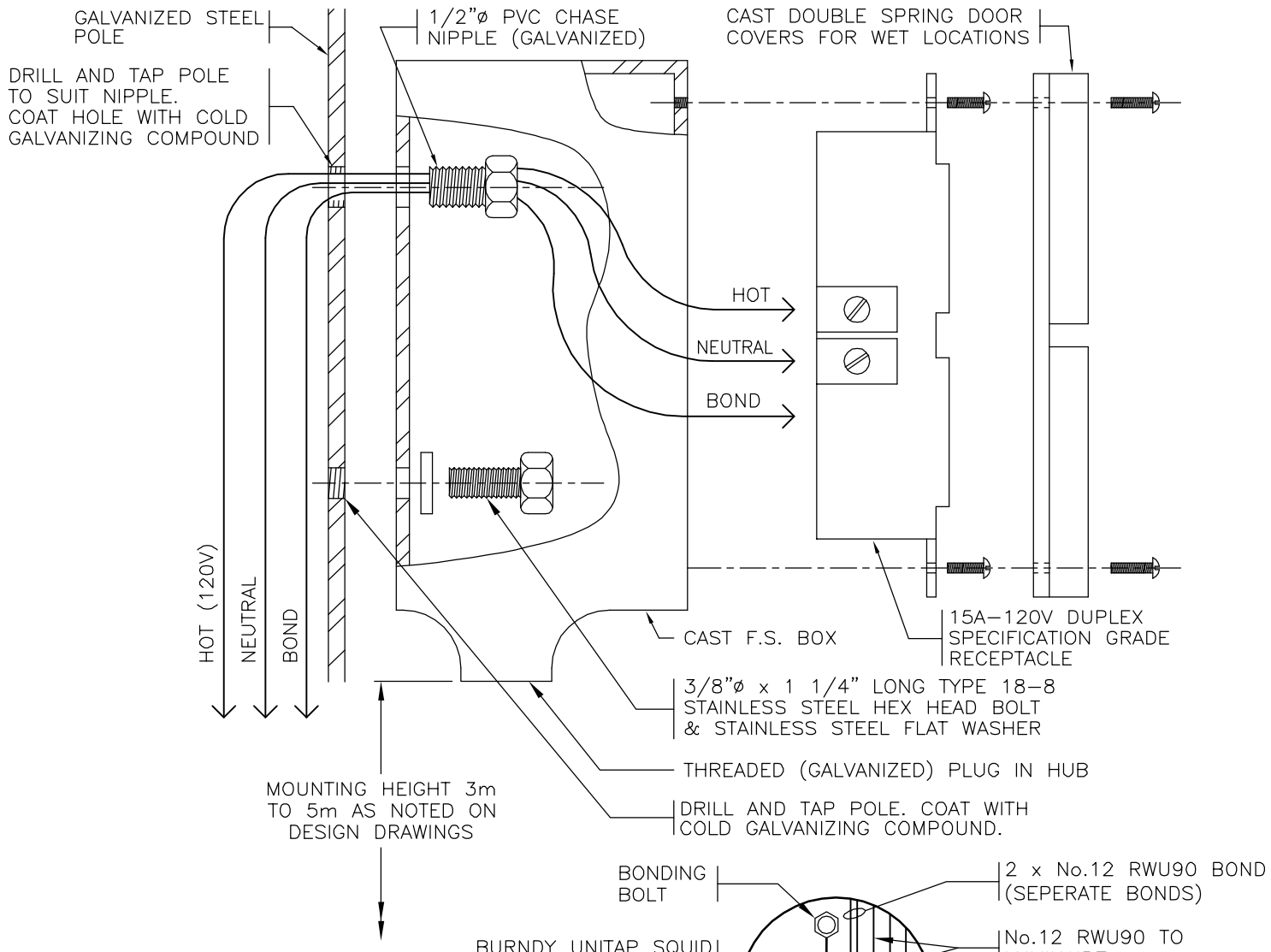
ELEVATION

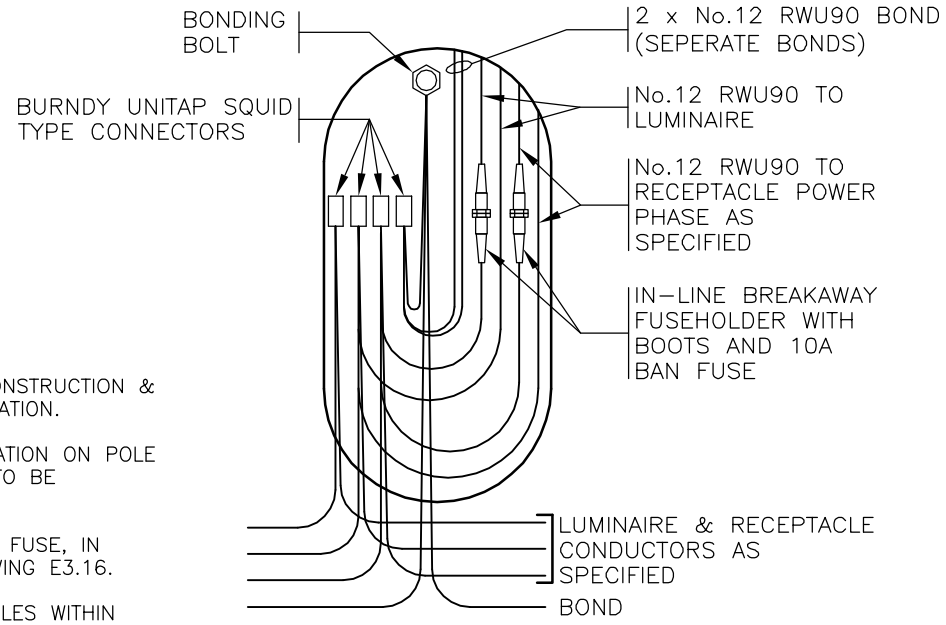
NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. TECK–90 ARMORED CABLE WILL REQUIRE MECHANICAL TERMINATION AS PER CEC OR LOCAL INSPECTION REQUIREMENTS.
3. BOND TECK CABLE SHEATH AT 'LINE' END OF CABLE ONLY.

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: LUMINAIRE WIRING IN POLE HANDHOLE		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E3.15
Scale: N.T.S.	Checked By: DSM			Old Drawing # TCS–E–615





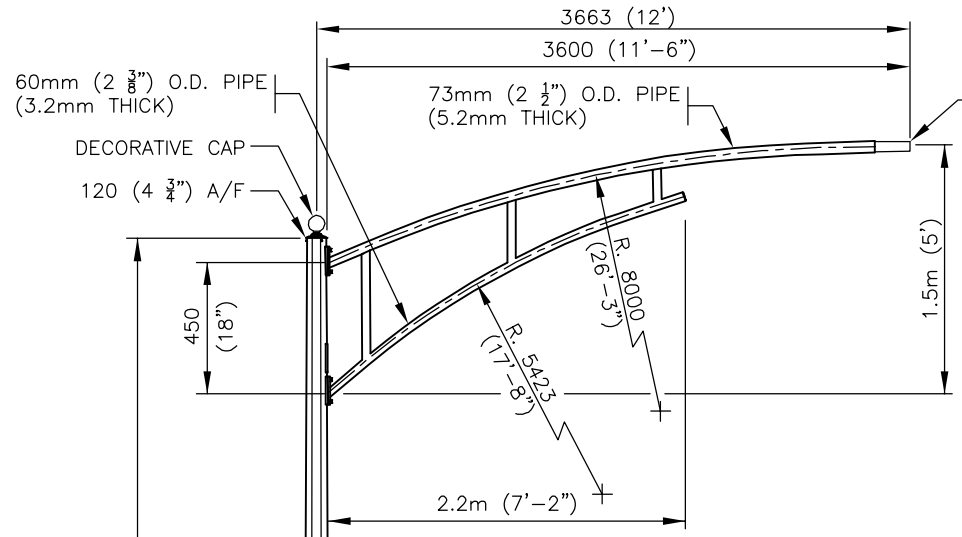
STREETLIGHT WITH RECEPTACLE
HAND HOLE WIRING

NOTE:

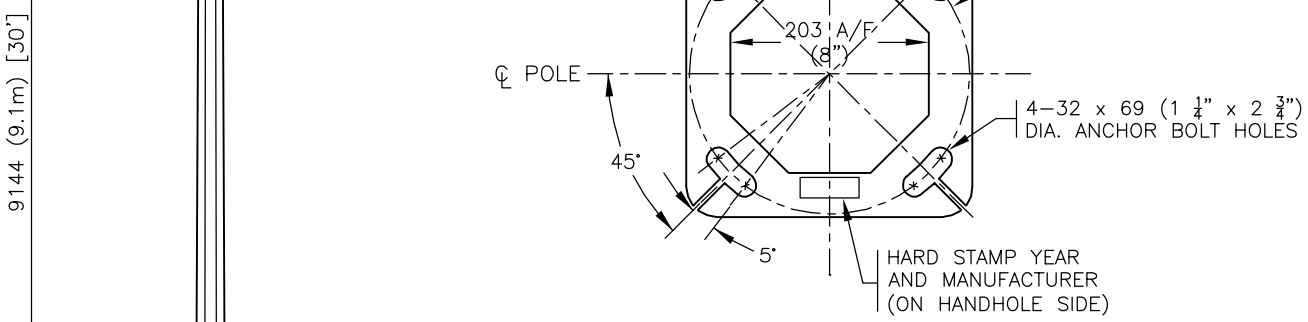
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. RECEPTACLE MOUNTING HEIGHT AND ORIENTATION ON POLE TO BE NOTED ON CONTRACT DRAWING OR TO BE CONFIRMED WITH THE CONSULTANT OR CITY.
3. FUSE RECEPTACLE CIRCUITS, WITH A 10AMP FUSE, IN HANDHOLE AT BASE OF POLE AS PER DRAWING E3.16.
4. RECEPTACLES TO NOT BE INSTALLED ON POLES WITHIN 15m OF A SIGNALIZED INTERSECTION AND NOT UNDER ANY CIRCUMSTANCES TO BE INSTALLED ON TRAFFIC SIGNAL OR SIGN POLES.

Dimensions in Metric

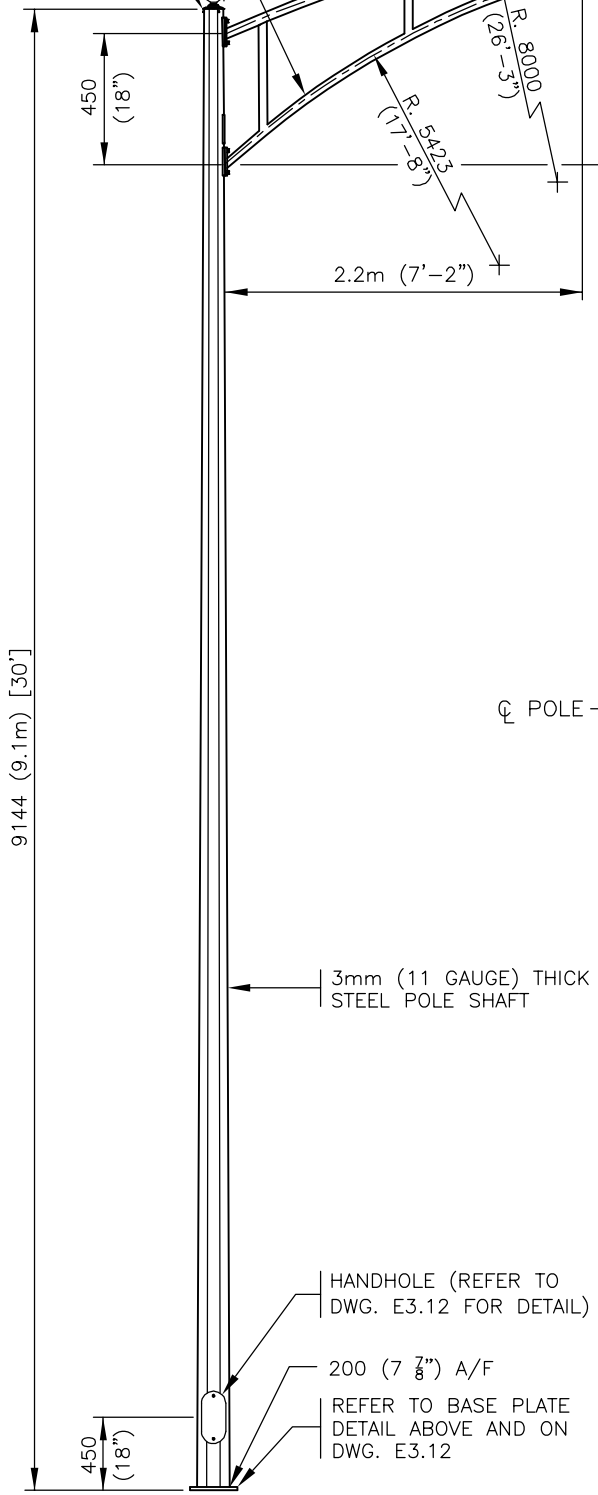
THE CITY OF Edmonton Transportation and Streets		Title: POLE MOUNTED RECEPTACLE		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E3.16
Scale: N.T.S.	Checked By: DSM			Old Drawing # E8.15 REV 1



DESIGN LOADS FROM LIGHT POLE	9.1m (30') POLE
MAX. MOMENT @ BASE	25.7 kNm
MAX. HOR. SHEAR	4.2 kN
MAX. VERT. LOAD	2.53 kN



BASE PLATE



NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. POLE DESIGNED FOR LUMINAIRE WITH EPA OF 0.28m² @ 160 km/h WIND SPEED (+1.3 GUST FACTOR)

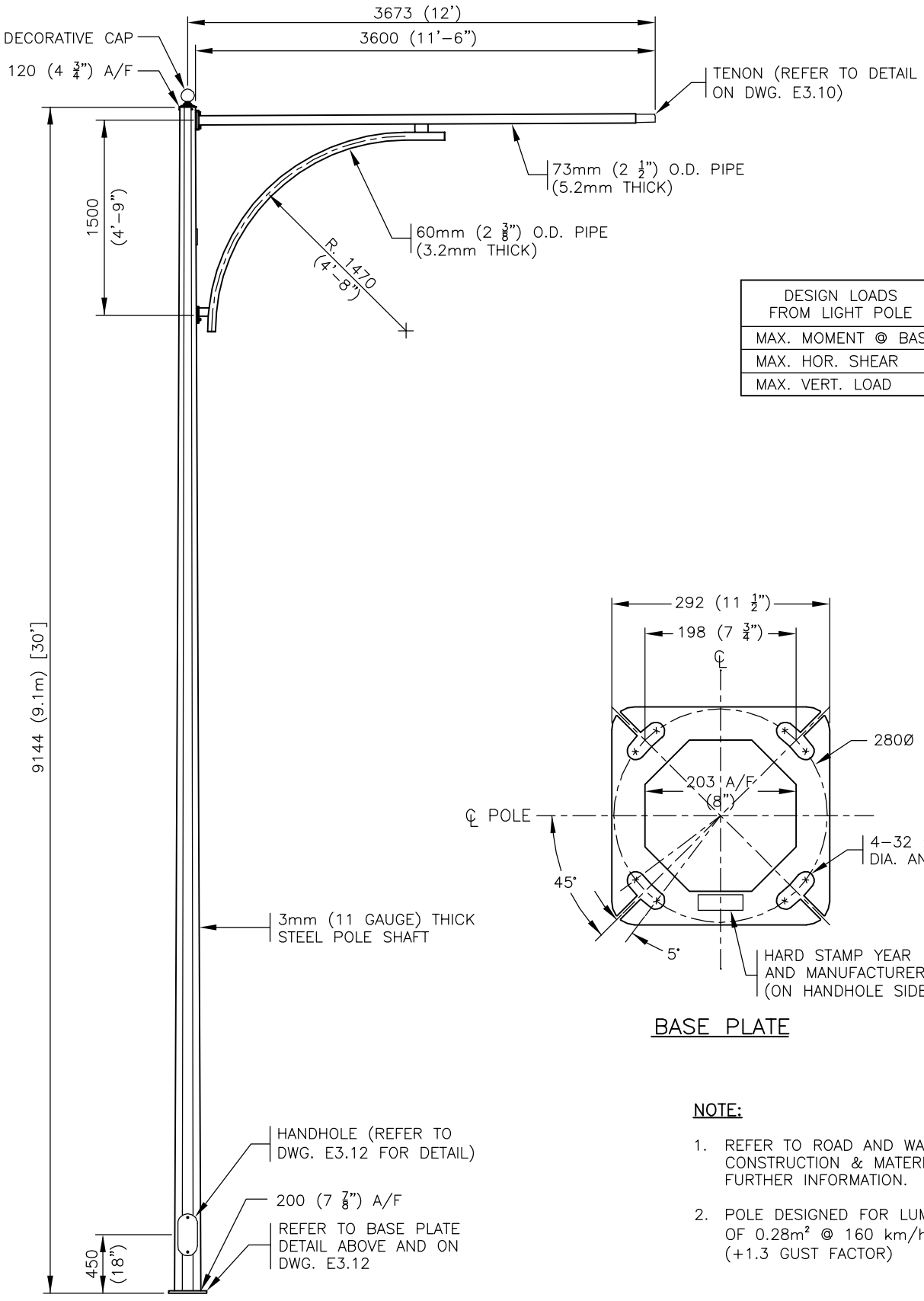
Dimensions in Metric

THE CITY OF Edmonton
Transportation and Streets

Title

9.1m (30') DECORATIVE POLE C/W 12' NEWPORT ARM

Date Approved:	Drawn By:	Approved	Rev.	Drawing #
–	RF	Originals signed by:	01/04/11	E3.17
Scale: N.T.S.	Checked By: DSM			Old Drawing # –



DESIGN LOADS FROM LIGHT POLE	9.1m (30') POLE
MAX. MOMENT @ BASE	24.2 kNm
MAX. HOR. SHEAR	4 kN
MAX. VERT. LOAD	2.5 kN

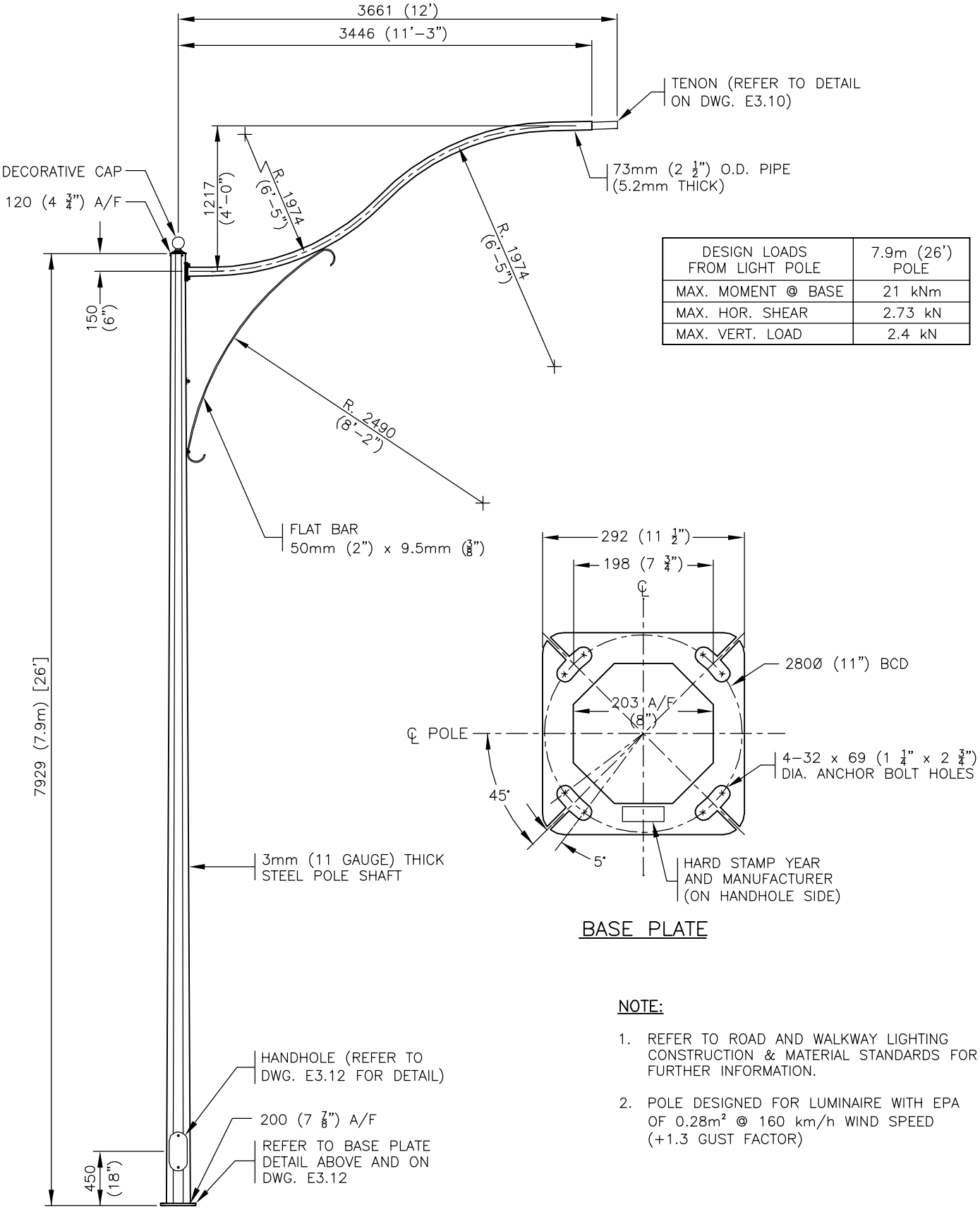
BASE PLATE

NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. POLE DESIGNED FOR LUMINAIRE WITH EPA OF 0.28m² @ 160 km/h WIND SPEED (+1.3 GUST FACTOR)

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: 9.1m (30') DECORATIVE POLE C/W 12' HERITAGE ARM		
Date Approved: –	Drawn By: RF	Approved Originals signed by:	Rev. 01/04/11	Drawing # E3.18
Scale: N.T.S.	Checked By: DSM			Old Drawing # –



BASE PLATE

DESIGN LOADS FROM LIGHT POLE	7.9m (26') POLE
MAX. MOMENT @ BASE	21 kNm
MAX. HOR. SHEAR	2.73 kN
MAX. VERT. LOAD	2.4 kN

NOTE:

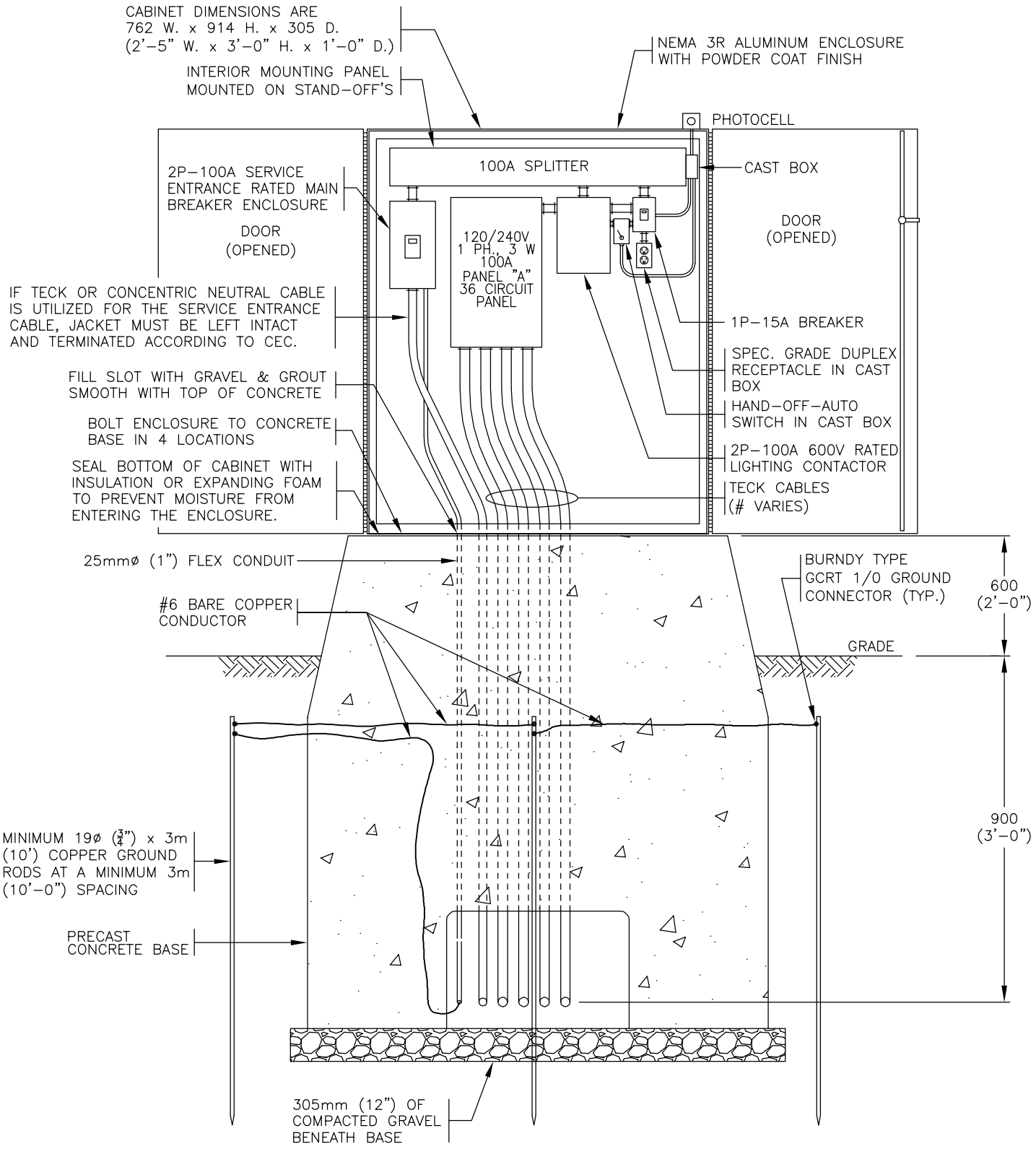
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. POLE DESIGNED FOR LUMINAIRE WITH EPA OF 0.28m² @ 160 km/h WIND SPEED (+1.3 GUST FACTOR)

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets

Title: 7.9m (26') DECORATIVE POLE C/W 12' HODGSON ARM

Date Approved:	Drawn By:	Approved	Rev.	Drawing #
–	RF	Originals signed by:	01/04/11	E3.19
Scale: N.T.S.	Checked By: DSM			Old Drawing # –

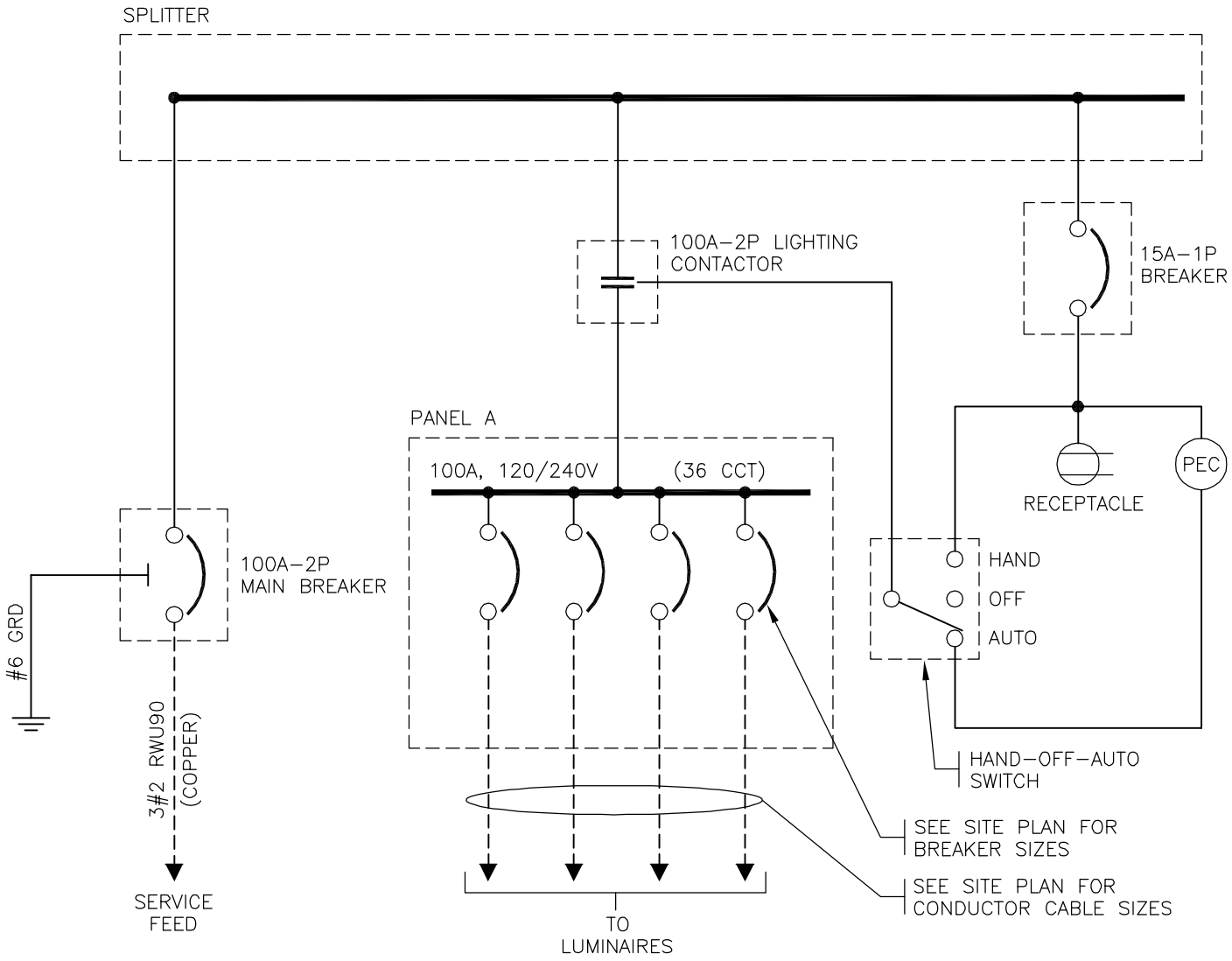


NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: 120/240V, 100A, SINGLE PHASE LIGHTING DISTRIBUTION/CONTROL CABINET		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E4.1
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8800



ONE LINE DIAGRAM

NOTE:

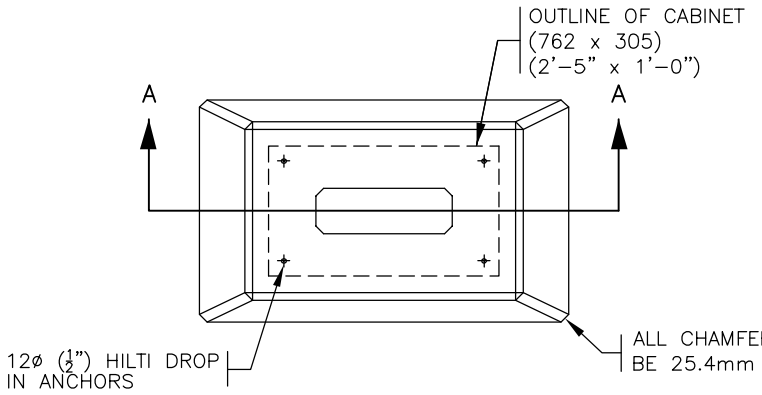
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. – – – – – – – – – FIELD WIRING

Dimensions in Metric

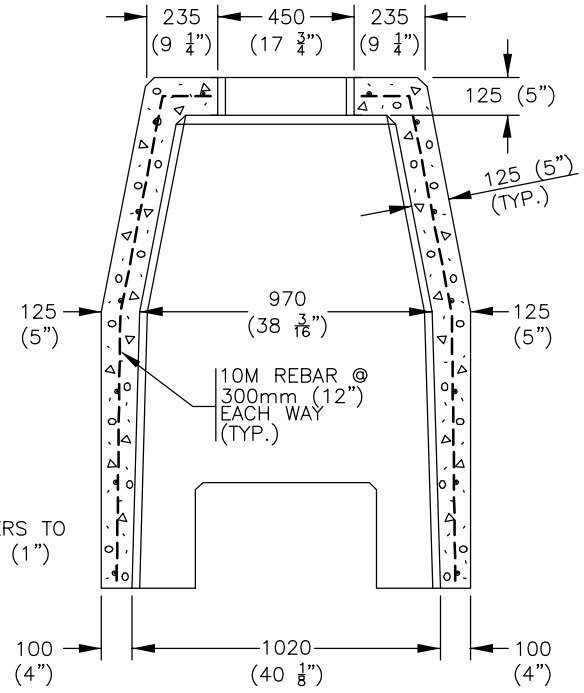
THE CITY OF Edmonton Transportation and Streets		Title: WIRING DIAGRAM FOR 120/240V, 100A, SINGLE PHASE LIGHTING DISTRIBUTION/CONTROL CABINET		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E4.2
Scale: N.T.S.	Checked By: DSM			Old Drawing # –

NOTE:

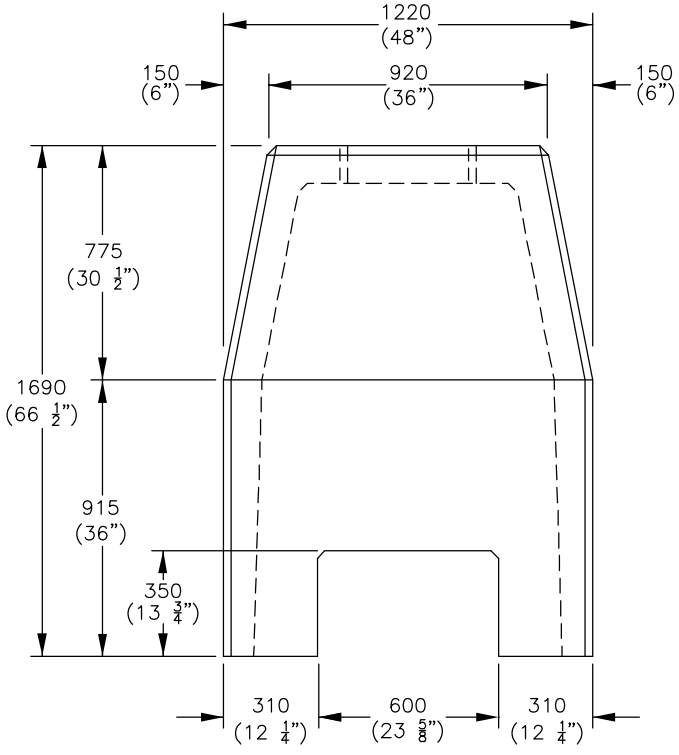
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.



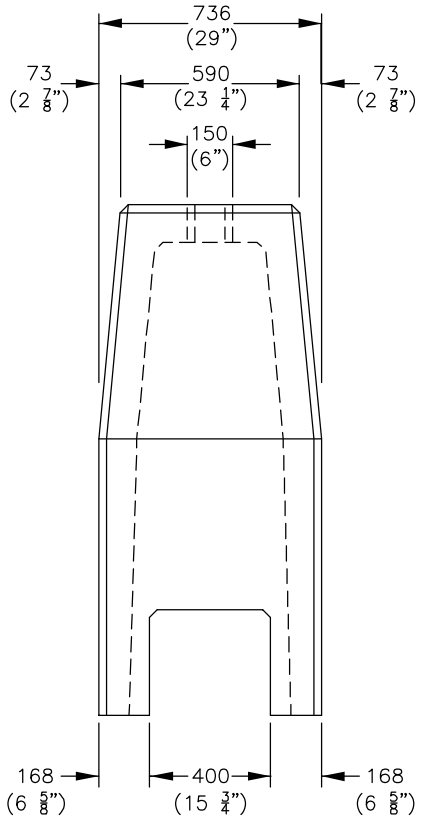
TOP VIEW



SECTION A–A



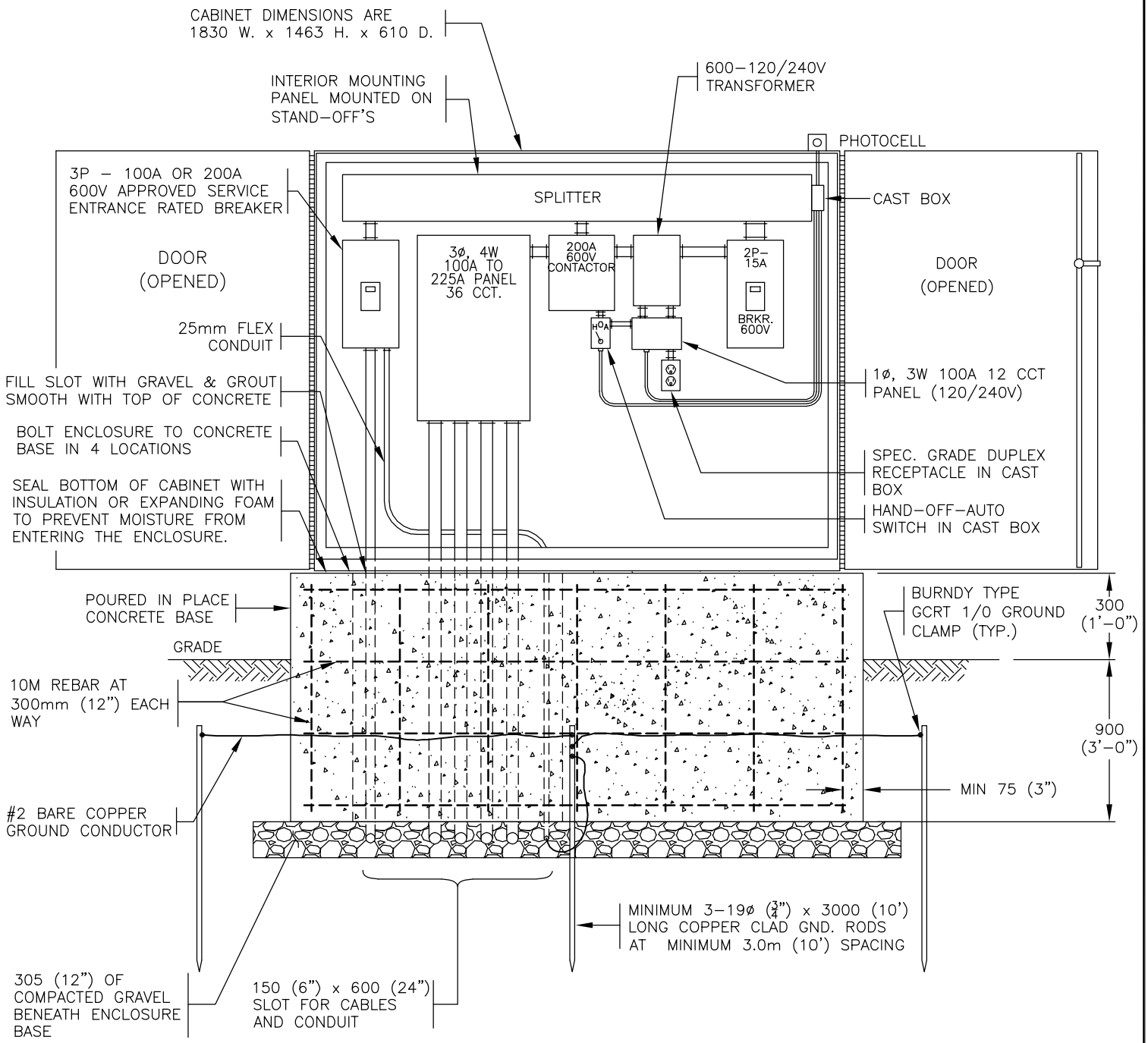
FRONT VIEW



SIDE VIEW

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: PRECAST CONCRETE BASE FOR 120/240V, 100A SINGLE PHASE LIGHTING DISTRIBUTION/CONTROL CABINET		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E4.3
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8802

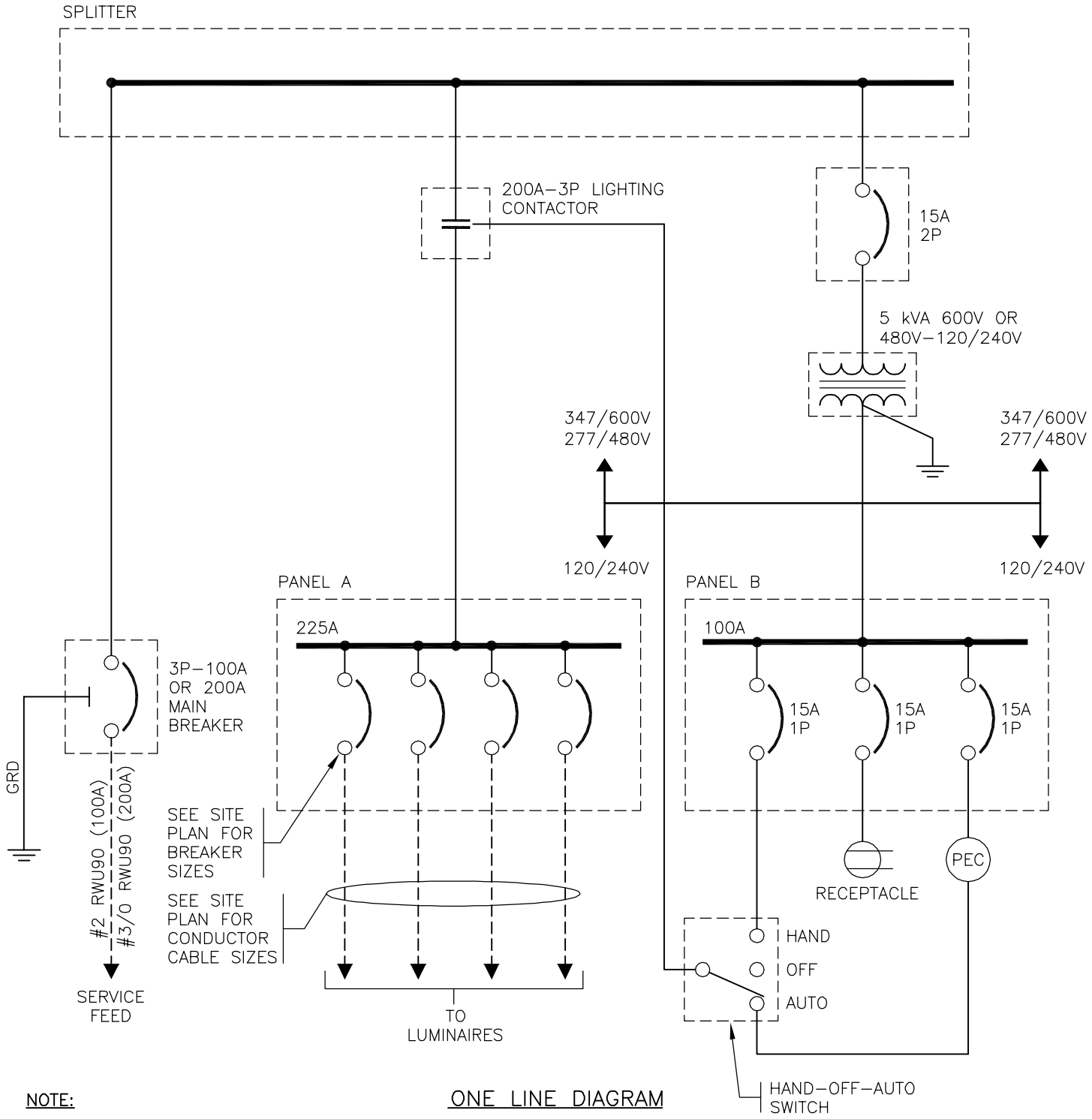


NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: THREE PHASE LIGHTING DISTRIBUTION/CONTROL CABINET		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E4.4
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8811



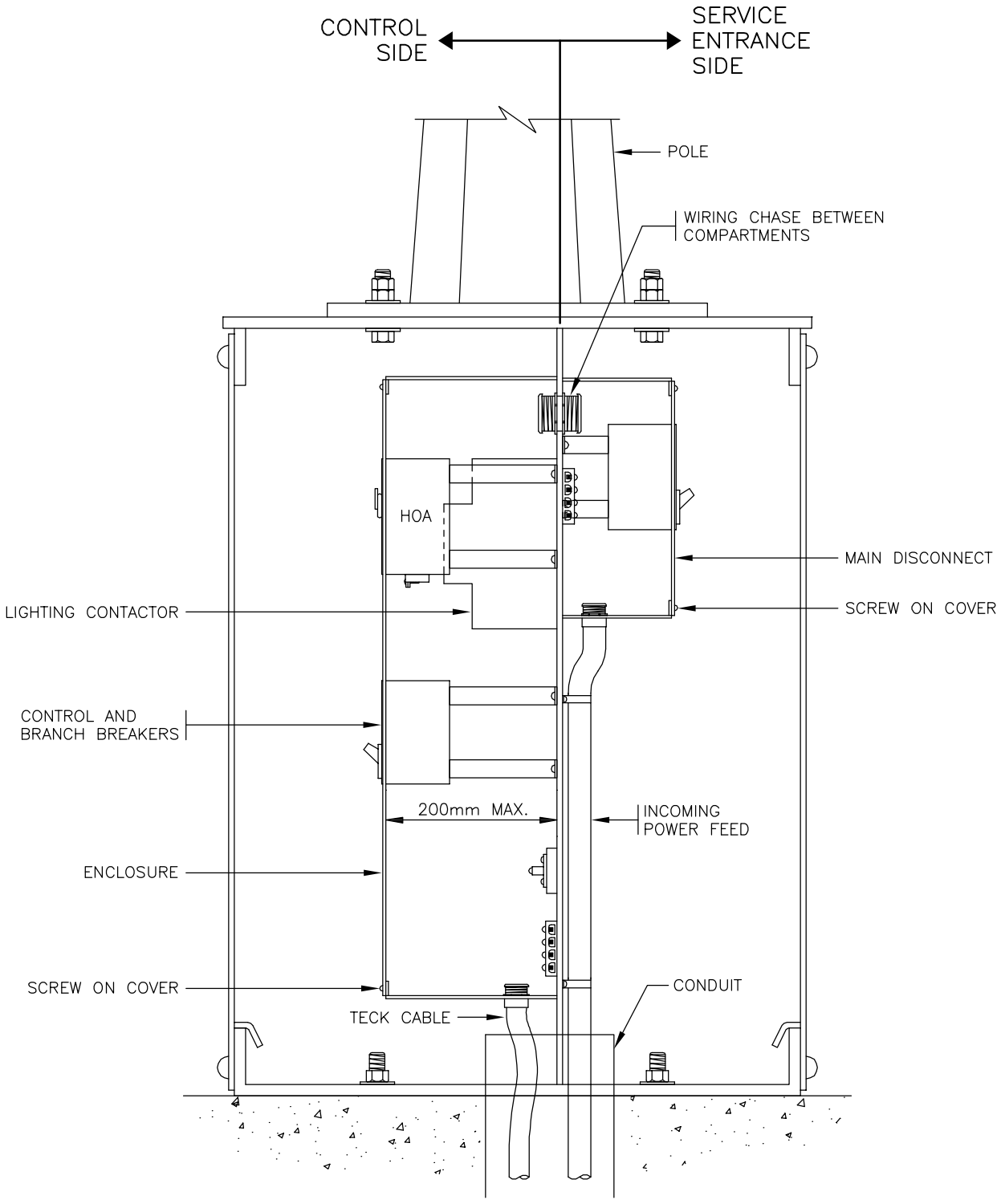
ONE LINE DIAGRAM

NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. 347/600V & 277/480V SUPPLY VOLTAGE SHOWN. FOR 120/208V SUPPLY VOLTAGE, TRANSFORMER & PANEL B WILL NOT BE REQUIRED.
3. – – – – – – – – – FIELD WIRING

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: WIRING DIAGRAM FOR THREE PHASE LIGHTING DISTRIBUTION/CONTROL CABINET		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E4.5
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8812

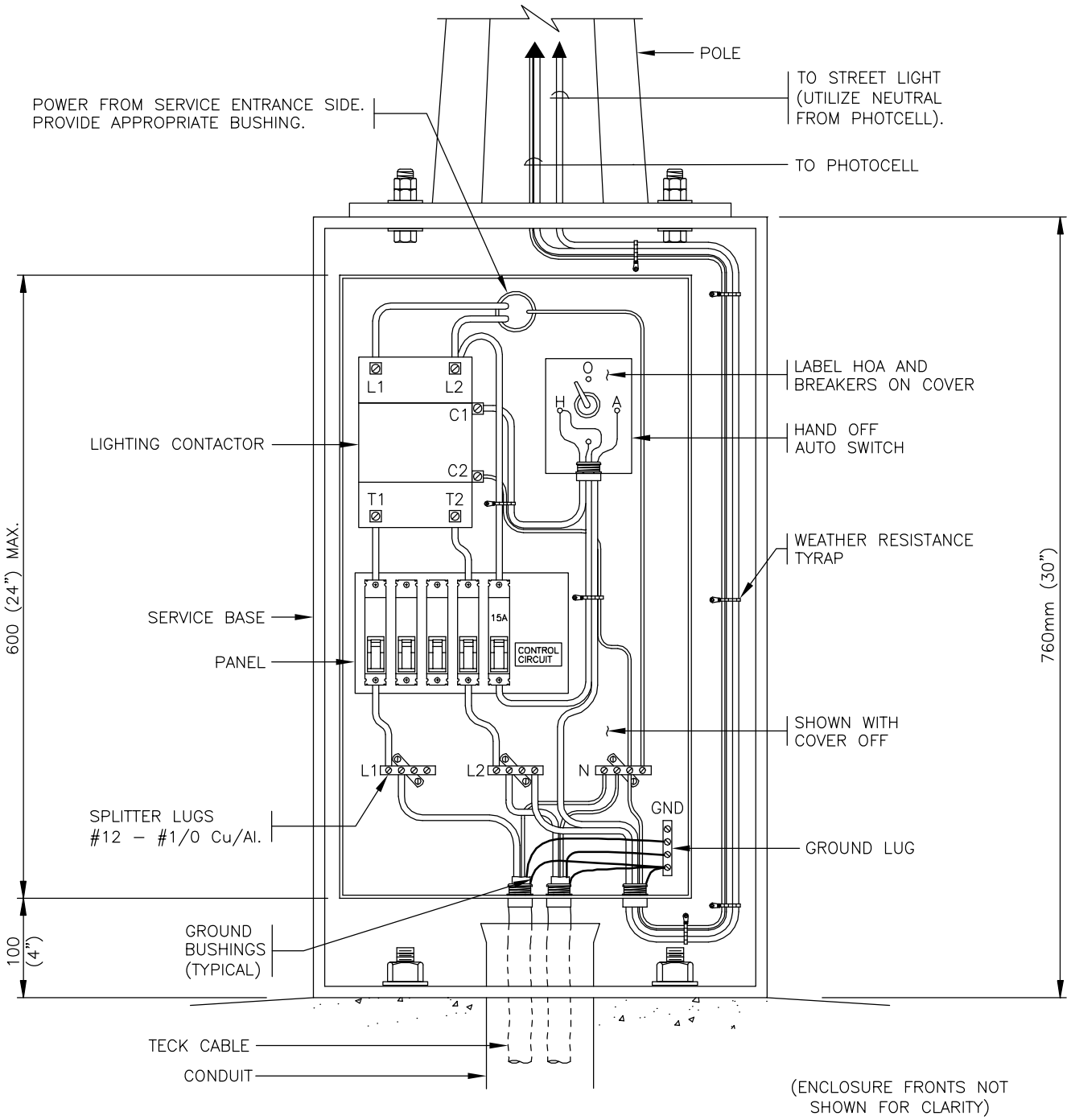


NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: RESIDENTIAL LIGHTING CONTROLLER BASE (120/240V)		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E4.6
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8821

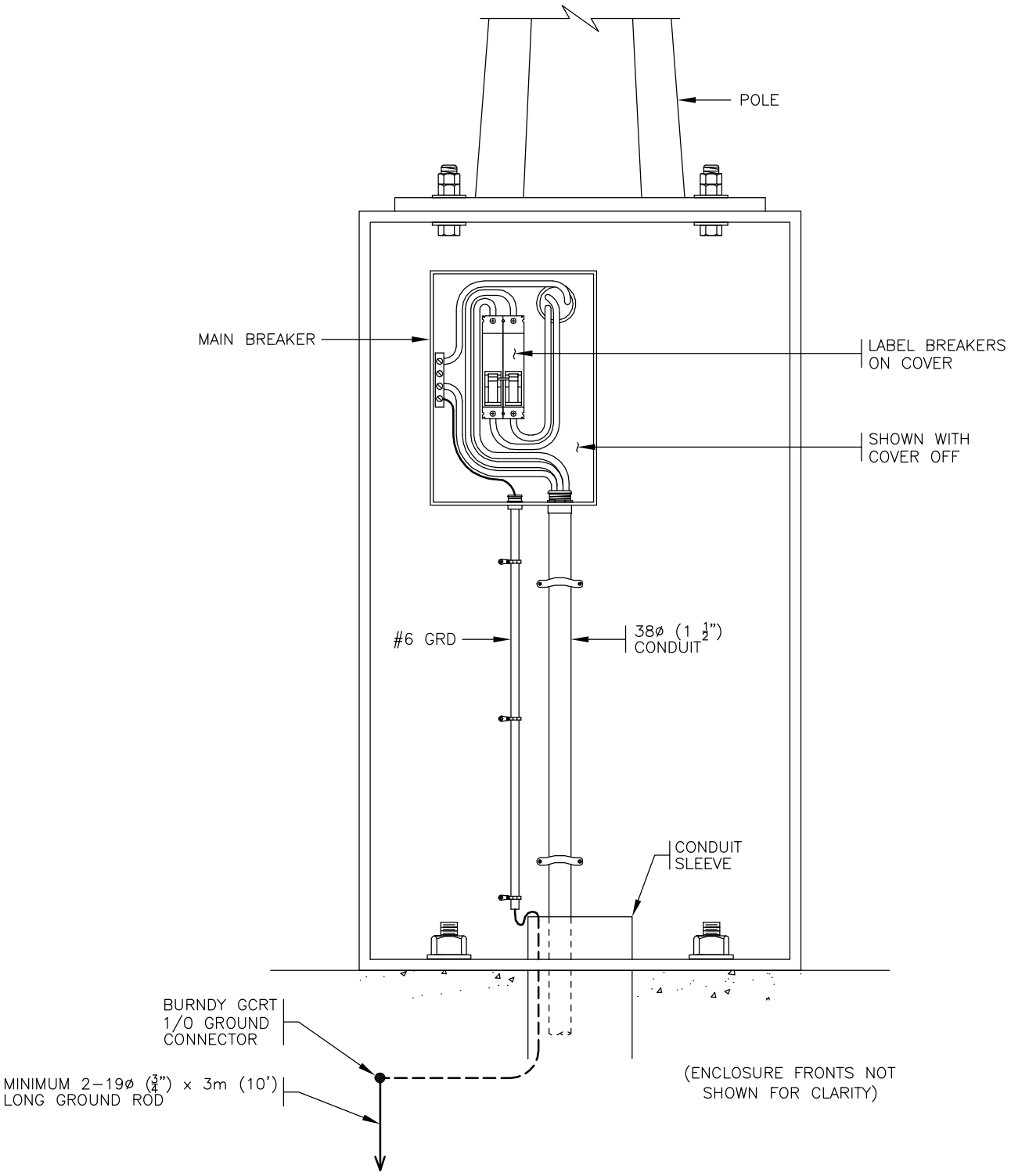


NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: RESIDENTIAL LIGHTING CONTROLLER BASE (120/240V) (CONTROL SIDE)		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E4.7
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8820

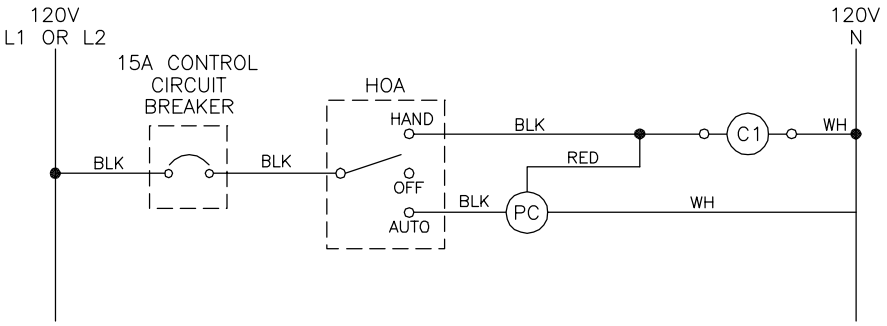


NOTE:

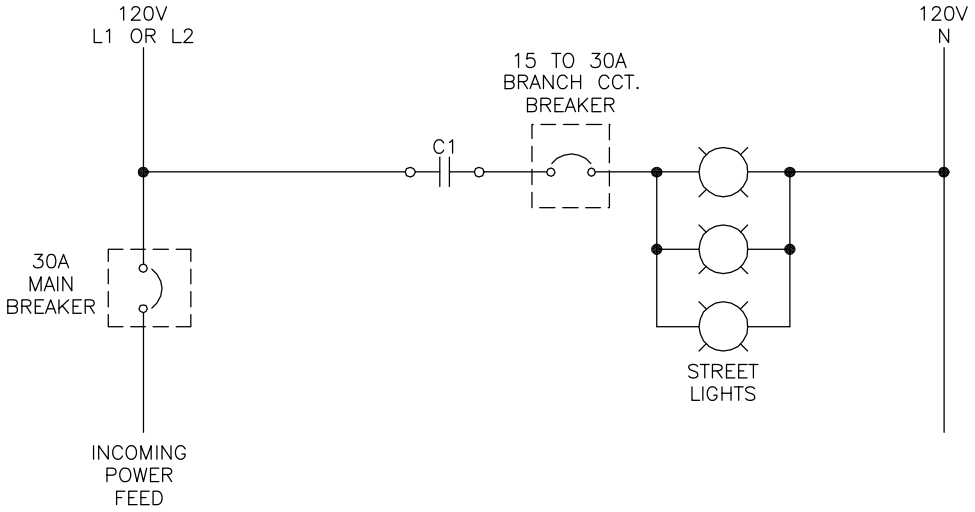
1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: RESIDENTIAL LIGHTING CONTROLLER BASE (120/240V) (SERVICE ENTRANCE SIDE)		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E4.8
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8822



RESIDENTIAL CONTROL
CIRCUIT SCHEMATIC

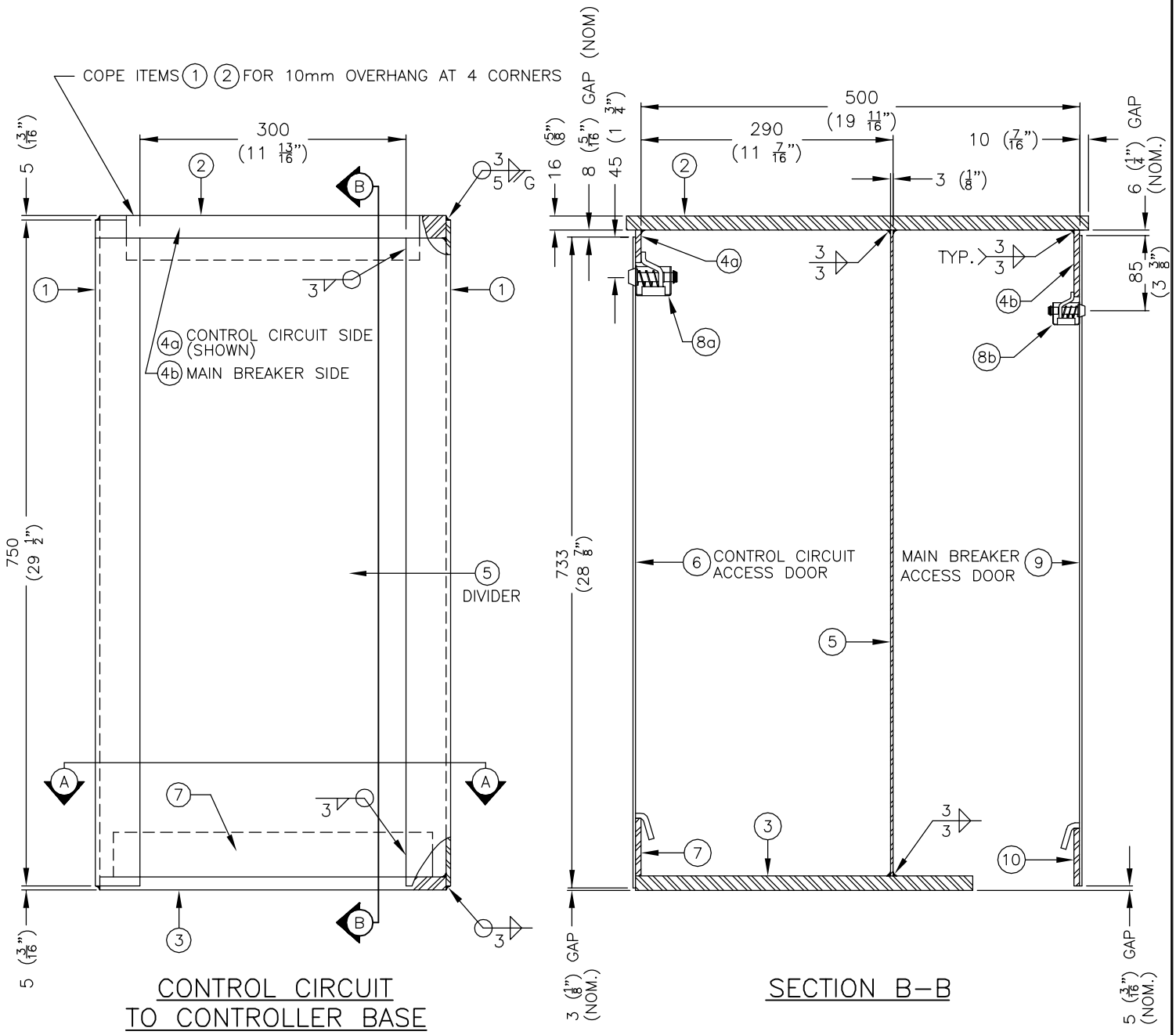


TYPICAL LIGHTING CIRCUIT

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: RESIDENTIAL CONTROL AND LIGHTING CIRCUITS		
Date Approved: —	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E4.9
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8823

ITEM NO.	NO. REQUIRED	DESCRIPTION	MATERIAL	REMARKS
1	2	BENT SIDE PLATES 750mm (29 1/2") LG.	11 GA. A570 GR.40	
2	1	TOP PLATE 400mm x 520mm x 16mm (15 3/4" x 20 1/2" x 5/8") PL.	G40.21 300 WT	COPE CORNERS
3	1	BOTTOM PLATE 380mm x 400mm x 16mm (15" x 15 3/4" x 5/8") PL.	G40.21 300 WT	
4a	1	STRAP CONTROL CIRCUIT SIDE 25mm x 330mm x 6mm (1" x 13" x 5/8") PL.	G40.21 260 W MIN.	
4b	1	STRAP MAIN BREAKER SIDE 75mm x330mm x 6mm (3" x 13" x 1/4") PL.	G40.21 260 W MIN.	
5	1	INTERIOR DIVIDER 728mm x 400mm (28 5/8" x 13")	11 GA. A570 GR.40	
6	1	CONTROL CIRCUIT DOOR 733mm x 380mm (28 7/8" x 15") DEV.WIDTH	11 GA. A570 GR.40	
7	1	STRAP CONTROL CIRCUIT SIDE 51mm x 6mm x 365mm LG. (2"x1/4"x14 3/8") PL.	G40.21 260 W MIN.	
8a	2	LATCH ASSEMBLY CONTROL CIRCUIT SIDE		
8b	2	LATCH ASSEMBLY MAIN BREAKER SIDE		
9	1	MAIN BREAKER DOOR 733mm x 380mm (28 7/8" x 15") DEV. WIDTH	11 GA. A570 GR.40	
10	2	STRAPS MAIN BREAKER SIDE 64mm x 6mm x 95mm LG. (2 1/2" x 1/4" 3 3/4") PL.	G40.21 260 W MIN.	



CONTROL CIRCUIT TO CONTROLLER BASE

(ACCESS DOORS NOT SHOWN)

SECTION B–B

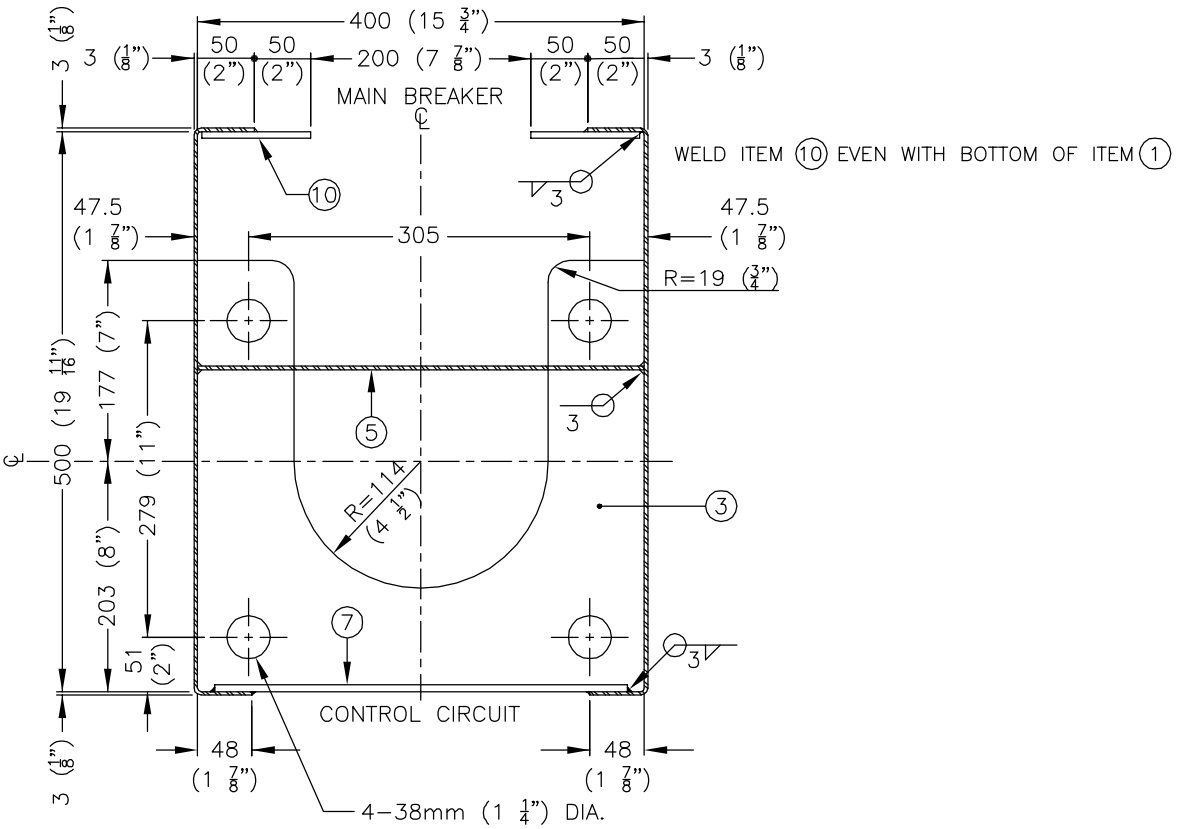
Dimensions in Metric

THE CITY OF Edmonton
Transportation and Streets

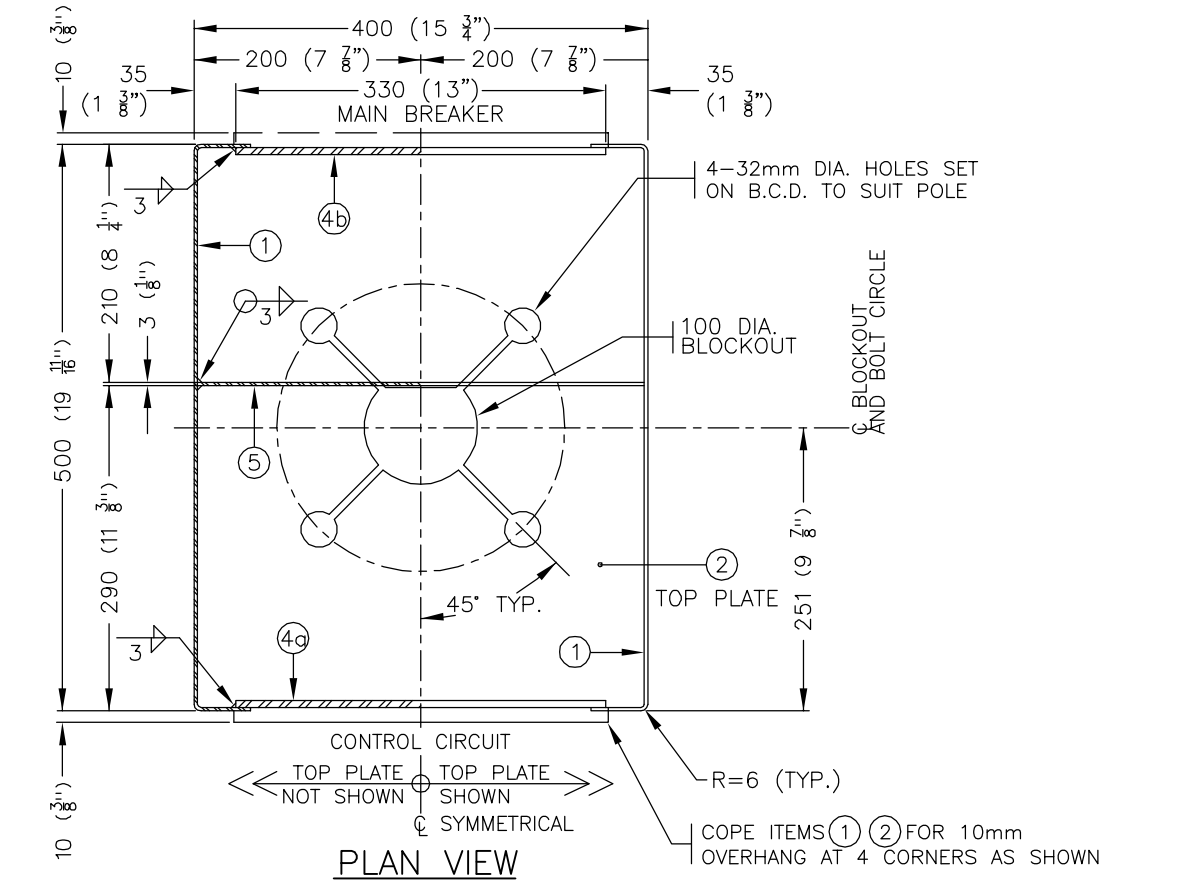
Title

RESIDENTIAL STREET LIGHTING CONTROLLER CABINET

Date Approved:	Drawn By:	Approved	Rev.	Drawing #
–	ALM	Originals signed by:	08/28/09	E4.10
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8830/8832



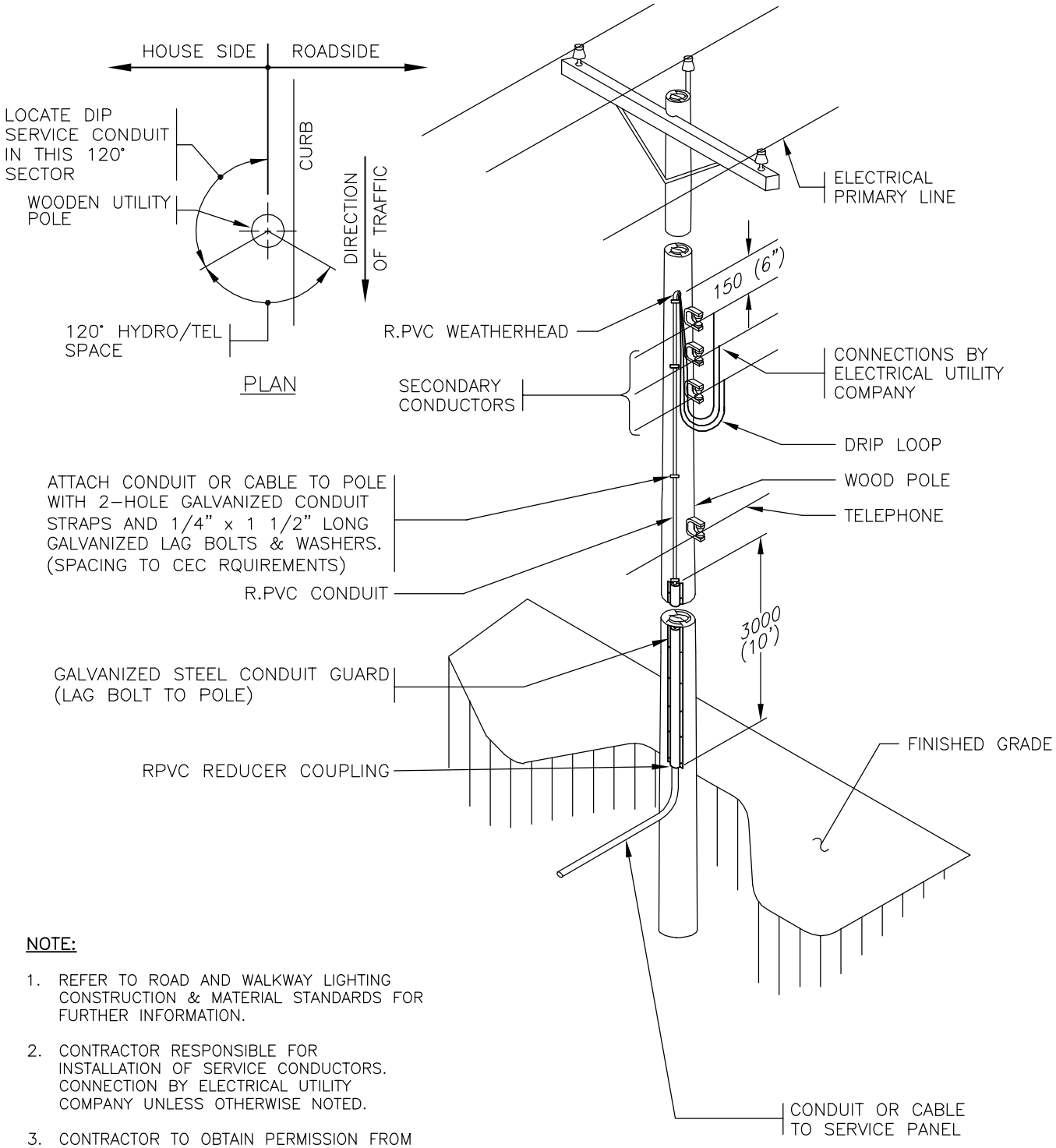
SECTION A-A



PLAN VIEW

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: RESIDENTIAL STREET LIGHTING CONTROLLER CABINET		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E4.11
Scale: N.T.S.	Checked By: DSM			Old Drawing # 8831



NOTE:

1. REFER TO ROAD AND WALKWAY LIGHTING CONSTRUCTION & MATERIAL STANDARDS FOR FURTHER INFORMATION.
2. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF SERVICE CONDUCTORS. CONNECTION BY ELECTRICAL UTILITY COMPANY UNLESS OTHERWISE NOTED.
3. CONTRACTOR TO OBTAIN PERMISSION FROM UTILITY COMPANY PRIOR TO INSTALLING CONDUIT ON THEIR POLE.
4. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
5. SERVICE CONDUCTORS AS DETAILED ON CONTRACT DRAWINGS.

Dimensions in Metric

THE CITY OF Edmonton Transportation and Streets		Title: UNDERGROUND DIP SERVICE		
Date Approved: –	Drawn By: ALM	Approved Originals signed by:	Rev. 08/28/09	Drawing # E4.12
Scale: N.T.S.	Checked By: DSM			Old Drawing # –