Electrical Standard Drawings List

1. Handwells

Drawing Number	Drawing Title	Revision Date
E-1.01	300mm Dia. Concrete Handwell “Type B” (2 Sleeves)	January 2023
E-1.02	300mm Dia. Concrete Handwell “Type A” (4 Sleeves)	January 2023
E-1.03	450mm Dia. Concrete Handwell (4 Sleeves)	January 2023
E-1.04	675mm Dia. Precast Concrete Handwell (4 Sleeves)	January 2023
E-1.05	340mm Dia. Structural Plastic Handwell (4 Sleeves)	January 2023
E-1.06	500mm Dia. Structural Plastic Handwell (4 Sleeves)	January 2023

2. Pole Bases

Drawing Number	Drawing Title	Revision Date
E.2.13	Anchorage Assembly for 300mm Dia. Concrete Pole Base	January 2023
E-2.14	Temporary Foundation	January 2023
E-2.15	Base Mounted Poles Placed in Slopes	January 2023
E-2.16	Frangible Base Detail (Grooved Coupler)	January 2023
E-2.17	Anchorage Assembly for 600mm Dia. and 762mm Dia. Concrete Pole Bases	January 2023
E-2.18	Concrete Pole Bases with Anchorage Assemblies for Octagonal Steel Poles and Sectional Steel Poles	January 2023
E-2.19	Anchorage Assembly in Concrete Slab Raised Median Island	January 2023
E-2.20	Isolation in Concrete Sidewalk	January 2023

3. Traffic Signals

Drawing Number	Drawing Title	Revision Date
E-3.01	Typical Wood Pole Installation for Temporary Traffic Signals	January 2023
E-3.02	Aerial Cable Attachment Detail	January 2023
E-3.03	PVC Junction Box Mounting Detail	January 2023
E-3.04	Traffic Signal Equipment on Wood Poles (Aerial Installation)	January 2023
E-3.04A	Traffic Signal Equipment on Concrete Poles (Aerial Installation)	January 2023
E-3.05	Traffic Signal Equipment on Wood Poles (Buried Installation)	January 2023
E-3.05A	Traffic Signal Equipment on Concrete Poles (Buried Installation)	January 2023
E-3.06	Traffic Signal Equipment on Steel Poles (Buried Installation)	January 2023
E-3.07	Earth Pad Platform Detail for Concrete Controller Pad	January 2023
E-3.08	Temporary Wood Traffic Signal Controller Pad	January 2023
E-3.09	Typical Concrete Pad for Traffic Signal Controller	January 2023
E-3.09A	Concrete Controller Pad Clearance	January 2023
E-3.10	Mounting Details for Cabinet on Direct Buried Pole	January 2023
E-3.12	Aluminum Single Member Traffic Signal Mast Arm Attachment Details	January 2023
E-3.13	Traffic Signal Head Vertical Bracket Mounting Detail	January 2023
E-3.14	Typical Traffic Signal Head Mounting Details	January 2023
E-3.15	Elevator Plumbizer (Adjustable) Attachment Detail	January 2023
E-3.16	Temporary Mast Extension Detail	January 2023
E-3.17	Installation Detail for Optical Pre-Emption Detector	January 2023
E-3.22	Typical Strut Guy Installation	January 2023
E-3.23	Typical Pole Guying Detail	January 2023
E-3.24	Treatment for Wire Inductive Loop Crossing Butt or Irregularity	January 2023
E-3.25	Loop Detector Lead-In Details	January 2023
E-3.26	Integrated Dome Close Circuit Television Camera Mounting Detail	January 2023
E-3.27	Typical Wire Inductive Loop Layout and Details	January 2023
E-3.28	Typical Wire Inductive Loop Layout for Actuation or Counting	January 2023
E-3.29	Typical Video Detection Camera Installation and Layout	January 2023

E-3.30	Accessible Pedestrian Signal Station Mounting Details for One Way or Two Way Pedestrian Movement	January 2023
E-3.32	Temporary Traffic Signal Stand (For Emergency or Short Duration Construction Use Only)	January 2023
E-3.33	Traffic Signal Head Universal Bracket Mounting Detail	January 2023
E-3.34	Side Mount Luminaire Bracket	January 2023
E-3.35	Installation Detail for Pre-Emption Detector on Span Wire	January 2023
E-3.36	1.5m Pedestrian Pushbutton/APS Pole on 300m Dia. Concrete Pole Base with Anchorage Assembly	January 2023
E-3.38	Mast Extension Detail for Temporary CCTV Camera Installation	January 2023
E-3.39	2-Way Plumbizer Mast Arm Bracket Attachment Detail	January 2023
E-3.40	Typical Non-Intrusive Detection Zone Layout and Placement	January 2023

4. Wiring

Drawing Number	Drawing Title	Revision Date
E-4.01	Typical Traffic Signal Wiring, 2 to 8 Vehicle Phases, Using 12/C Cable	January 2023
E-4.02	Typical Traffic Signal Wiring for Pedestrian Equipment	January 2023
E-4.03	Typical Traffic Signal Equipment Wiring (Pole Wiring)	January 2023

5. Power Supplies

Drawing Number	Drawing Title	Revision Date
E-5.01	Typical Buried Power Supply Mounting Detail (Alectra Utilities)	January 2023
E-5.02	Typical Metered Power Supply on Wood or Concrete Poles (Newmarket Hydro)	January 2023
E-5.03	Typical Aerial Power Supplies	January 2023
E-5.05	Typical Metered Service on Steel Pole with Buried Hydro Supply (Newmarket Hydro)	January 2023
E-5.08	Typical Service on Steel Pole with Buried Hydro Supply (Alectra Utilities)	January 2023
E-5.09	Typical Hydro Supply Detail	January 2023
E-5.10	Service Pole 1 - Metered with Buried Hydro Supply	January 2023
E-5.11	Service Pole 2 - Metered with Aerial Hydro Supply	January 2023
E-5.12	Service Pole 3 - Buried Hydro Supply	January 2023
E-5.13	Service Pole 4 - Aerial Hydro Supply	January 2023

6. Median Islands and Sidewalk

Drawing Number	Drawing Title	Revision Date
E-6.01	Typical Detail for Construction of Asphalt Raised Median Islands at Intersections	January 2023
E-6.02	Cut-Out Detail for Future Traffic Signal Pole in Asphalt Raised Median Island	January 2023
E-6.03	Typical Detail for Construction of Concrete Slab Raised Median Islands at Intersections	January 2023
E-6.04	Typical Detail for Construction of Concrete Slab Raised Median Islands at Intersections	January 2023
E-6.05	Typical Detail for Construction of 1.5m or Wider Concrete Slab Raised Median Islands at Intersections	January 2023
E-6.06	Cut-Out Detail for Future Traffic Signal Pole in 1.5m or Wider Concrete Slab Raised Median Island	January 2023
E-6.07	Tactical Warning Plate	January 2023

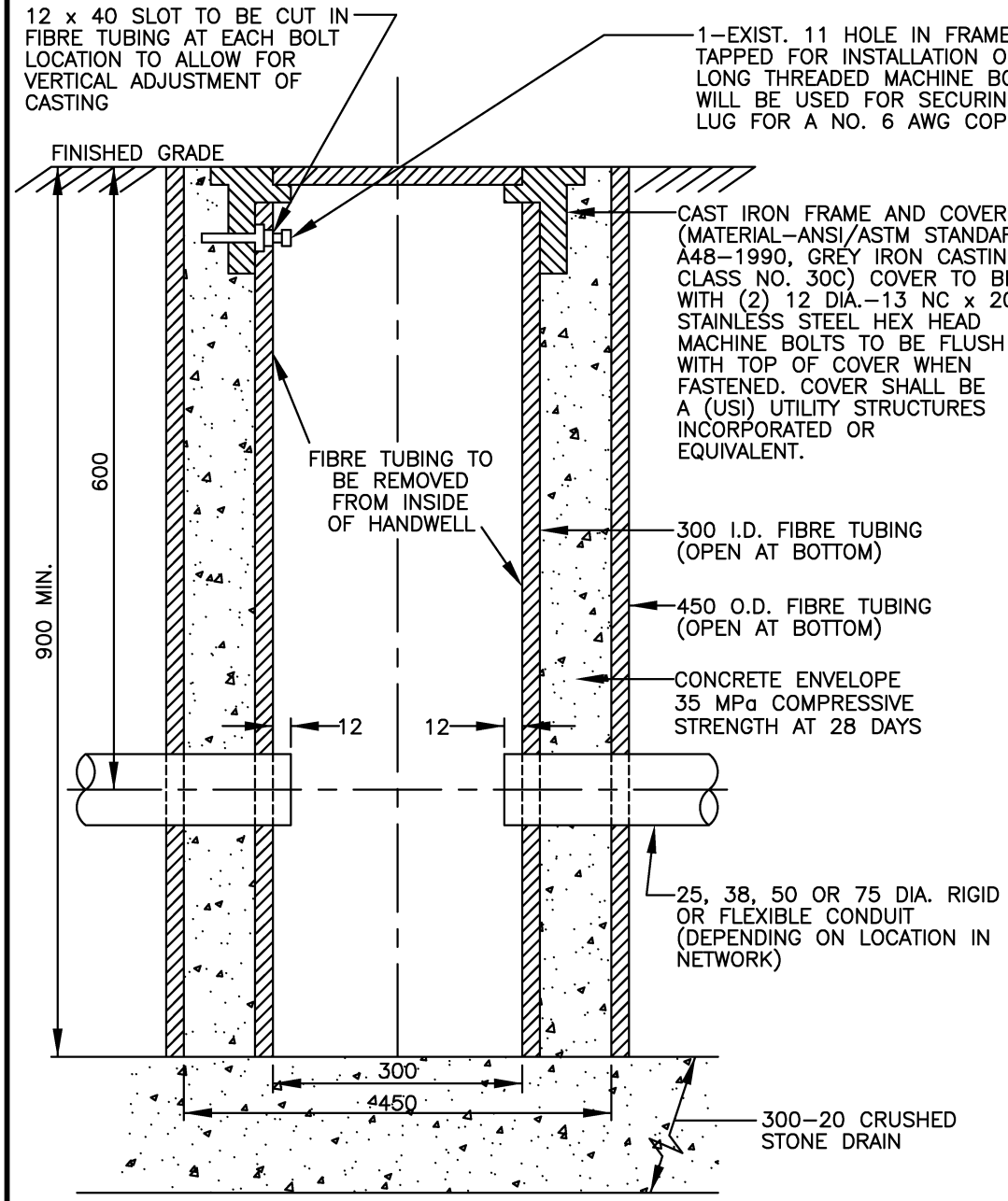
7. Signs and Sign Assemblies

Drawing Number	Drawing Title	Revision Date
E-7.01	Typical "Keep Right" Sign and Object Marker Installation in Median Islands	January 2023
E-7.04	Typical Mounting Detail for "Traffic Signals Ahead" Sign and "New" Tab (Urban and Rural)	January 2023
E-7.06	"Left Turn Signal" Sign Mounting Detail	January 2023
E-7.07	Overhead Lane Designation Signs for Dual Left Turn Lanes (Type 1)	January 2023
E-7.08	Overhead Lane Designation Signs for Dual Left Turn Lanes (Type 2)	January 2023
E-7.11	Typical "Stop" Sign with Flashing Red LED Beacon	January 2023
E-7.12	Warning Sign with Flashing Amber LED Beacon	January 2023
E-7.13	Sign with Horizontal Alternating Flashing Amber LED Beacons (Aerial Installation)	January 2023
E-7.14	Sign with Vertical Alternating Flashing Amber LED Beacons (Aerial Installation)	January 2023
E-7.15	Sign with Horizontal Alternating Flashing Amber LED Beacons (Buried Installation)	January 2023
E-7.16	Sign with Vertical Alternating Flashing Amber LED Beacons (Buried Installation)	January 2023
E-7.18	Road/Street Name Sign Mounting Detail	January 2023
E-7.19	Road/Street Name Sign Mounting Assembly (For Mounting on Front of Traffic Signal Mast Arm)	January 2023
E-7.20	Road/Street Name Sign Mounting Assembly (For Mounting on Back of Traffic Signal Mast Arm)	January 2023
E-7.24	"Signals Ahead" Sign with Horizontal Alternating Flashing Amber LED Beacons and "Prepare To Stop When Flashing" Tab (Aerial and Burried Installation)	January 2023
E-7.27	"Signals Ahead" Sign with Solar Powered Flashing Amber LED Beacon and "Be Prepared To Stop" Tab	January 2023
E-7.28	Typical "Stop" Sign with Solar Powered Flashing Red LED Beacon	January 2023
E-7.29	Warning Sign with Solar Powered Flashing Amber LED Beacon on a Wood Post	January 2023

E-7.31	"Signals Ahead" Sign with Flashing Amber LED Beacon and "Be Prepared To Stop" Tab (Aerial and Buried Installation)	January 2023
E-7.32	Road/Street Name Sign Mounting Assembly on Span Wire	January 2023
E-7.32A	Signal Mast-Arm Mounted Arterial Street Name Sign	January 2023
E-7.35	Warning Sign with Solar Powered Flashing Amber LED Beacon on Concrete Base Mounted Steel Pole	January 2023
E-7.36	Overhead Lane Designation Sign Assembly for HOV Lanes and Bike Lanes	January 2023
E-7.37	Typical Mounting Assembly for Overhead Lane Designation Signs Above HOV Lanes and Bike Lanes	January 2023
E-7.38	Typical Installation of "Share The Road" Sign and "Share The Road" Tab on a Pole or Wood Post	January 2023

8. Miscellaneous

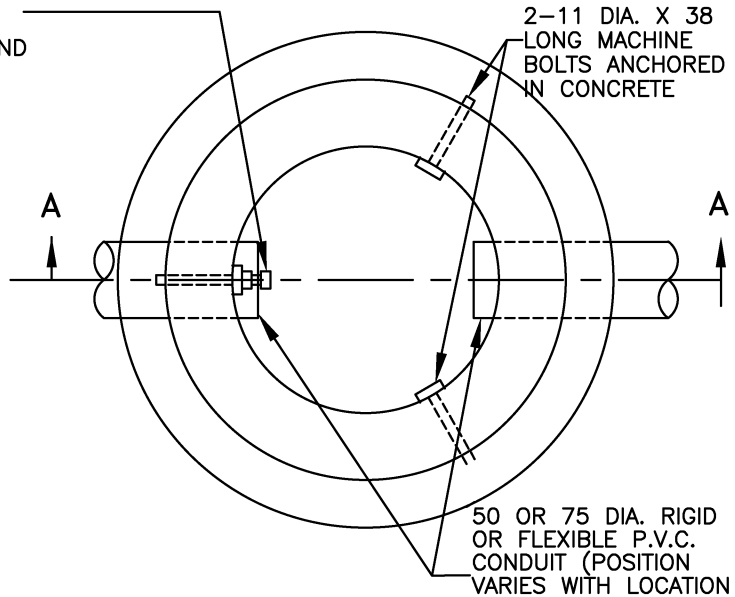
Drawing Number	Drawing Title	Revision Date
E-8.01	Typical Delineator Installation for Protection of Concrete Handwells	January 2023
E-8.02	Typical Pipe Bumper	January 2023
E-8.04	Typical Permanent Traffic Counting Station Mounting Detail	January 2023
E-8.05	Typical Counting/Classification Station Detail	January 2023
E-8.07	Typical Flexible Delineator Installation in 1.5m or Wider Concrete Slab Raised Median Island at Intersections	January 2023



SECTION A–A

N.T.S.

TOP VIEW



NOTES

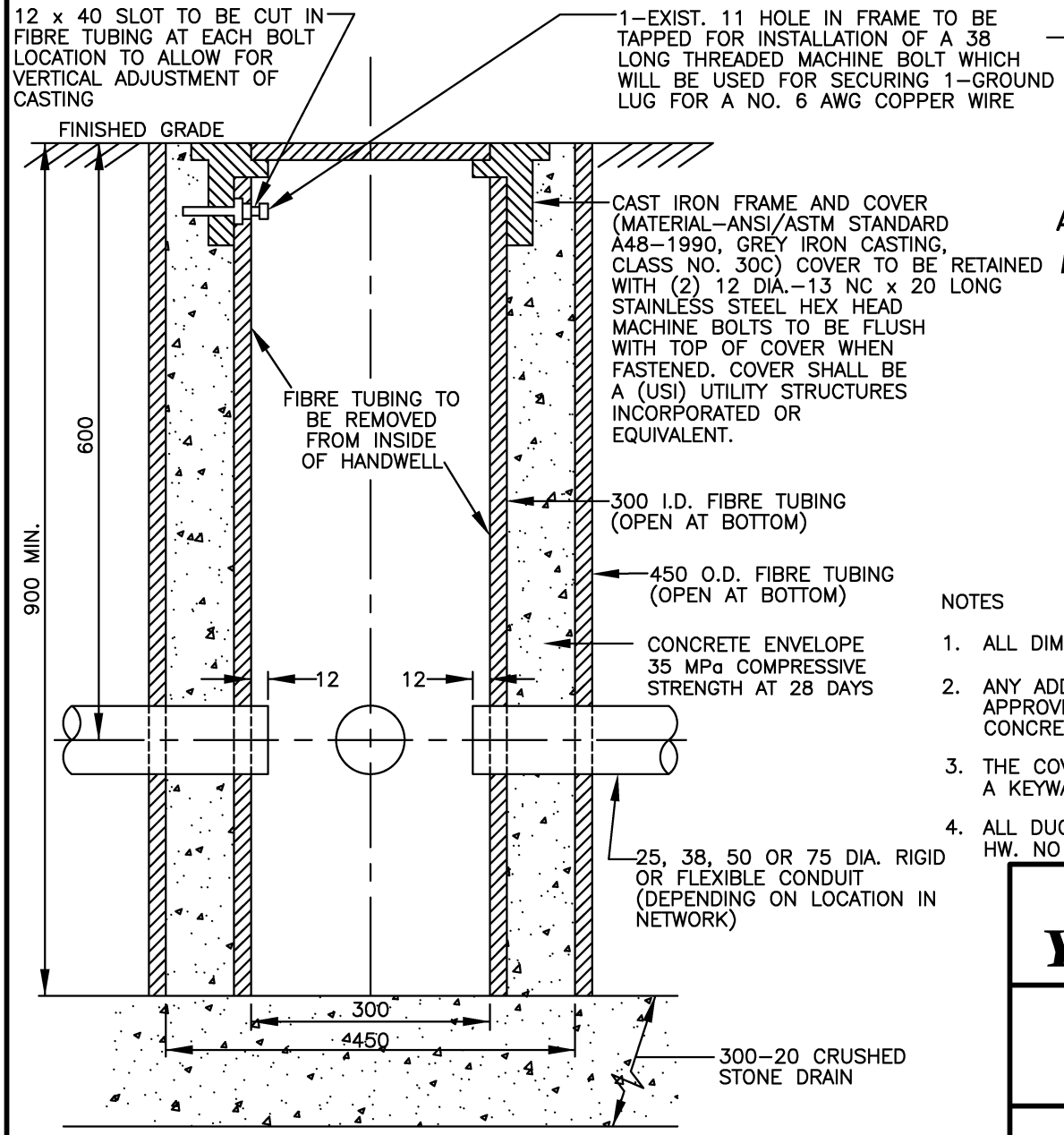
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ANY ADDITIONAL DUCTS ENTERING THE CONCRETE HANDWELLS MUST BE APPROVED FIRST BY THE REGION'S ENGINEER. ALL CONDUIT ENTERING CONCRETE HANDWELLS MUST BE PROPERLY GROUTED.
3. THE COVER MUST HAVE A DATE OF INSTALLATION AND A KEYWAY FOR REMOVAL.
4. ALL DUCTS SHALL BE INSTALLED IN THE WALLS OF THE HW. NO DUCTS SHALL BE INSTALLED IN THE BOTTOM

York Region **Public Works Transportation**

300mm DIA. CONCRETE HANDWELL "TYPE B" (2 SLEEVES)

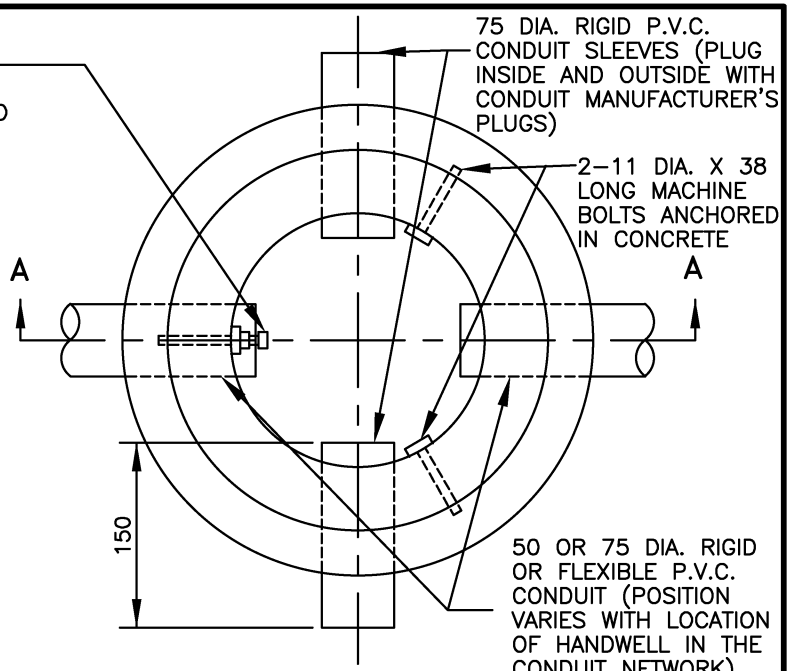
JANUARY 2023
DATE

E–1.01



SECTION A – A

N.T.S.



TOP VIEW

NOTES

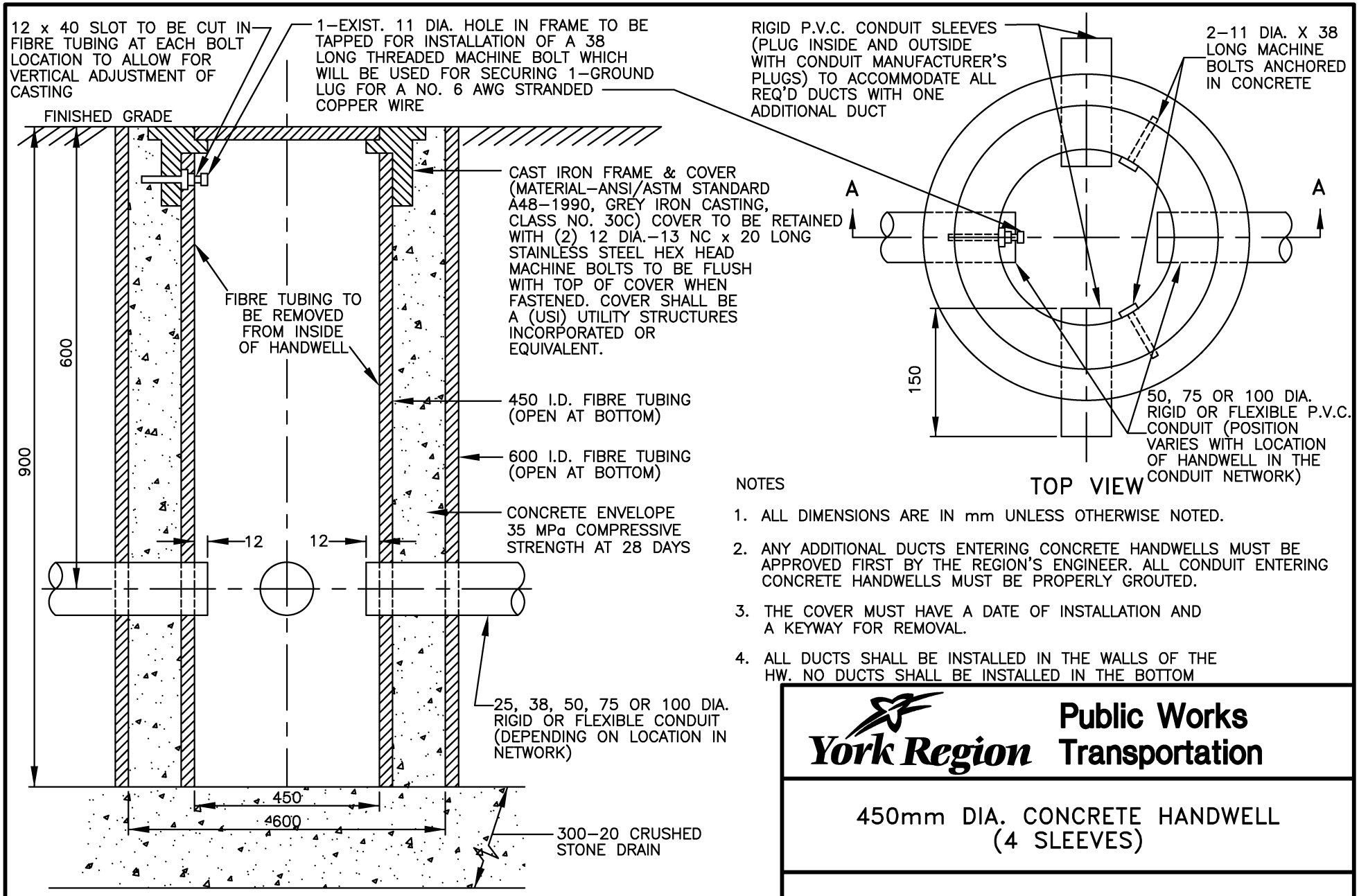
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ANY ADDITIONAL DUCTS ENTERING CONCRETE HANDWELLS MUST BE APPROVED FIRST BY THE REGION'S ENGINEER. ALL CONDUIT ENTERING CONCRETE HANDWELLS MUST BE PROPERLY GROUTED.
3. THE COVER MUST HAVE A DATE OF INSTALLATION AND A KEYWAY FOR REMOVAL.
4. ALL DUCTS SHALL BE INSTALLED IN THE WALLS OF THE HW. NO DUCTS SHALL BE INSTALLED IN THE BOTTOM

York Region **Public Works Transportation**

300mm DIA. CONCRETE HANDWELL "TYPE A" (4 SLEEVES)

JANUARY 2023
DATE

E–1.02



N.T.S.

NOTES

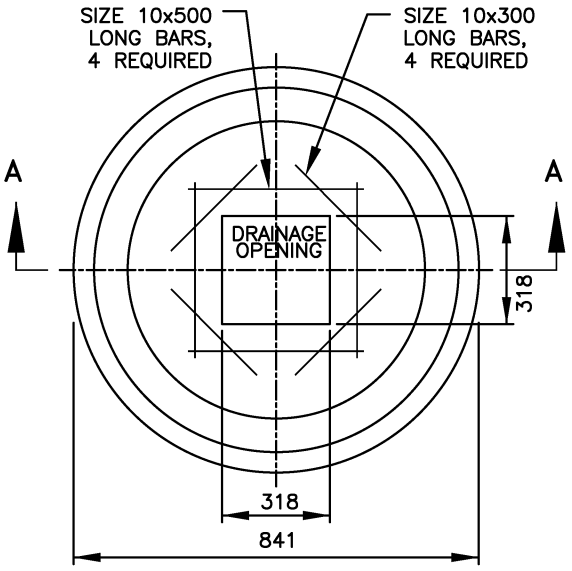
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ANY ADDITIONAL DUCTS ENTERING CONCRETE HANDWELLS MUST BE APPROVED FIRST BY THE REGION'S ENGINEER. ALL CONDUIT ENTERING CONCRETE HANDWELLS MUST BE PROPERLY GROUTED.
3. THE COVER MUST HAVE A DATE OF INSTALLATION AND A KEYWAY FOR REMOVAL.
4. ALL DUCTS SHALL BE INSTALLED IN THE WALLS OF THE HW. NO DUCTS SHALL BE INSTALLED IN THE BOTTOM

York Region **Public Works Transportation**

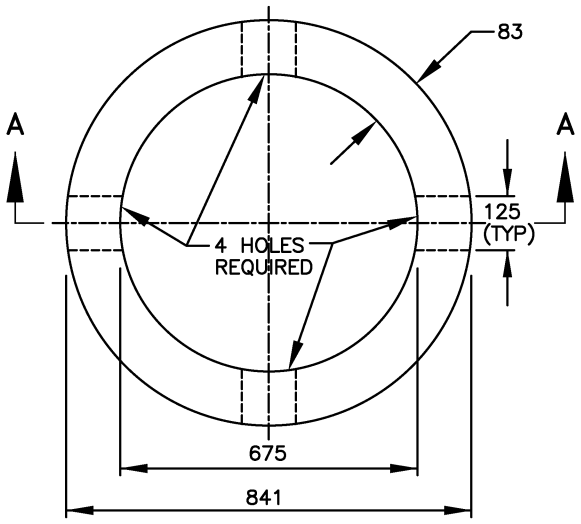
450mm DIA. CONCRETE HANDWELL (4 SLEEVES)

JANUARY 2023
DATE

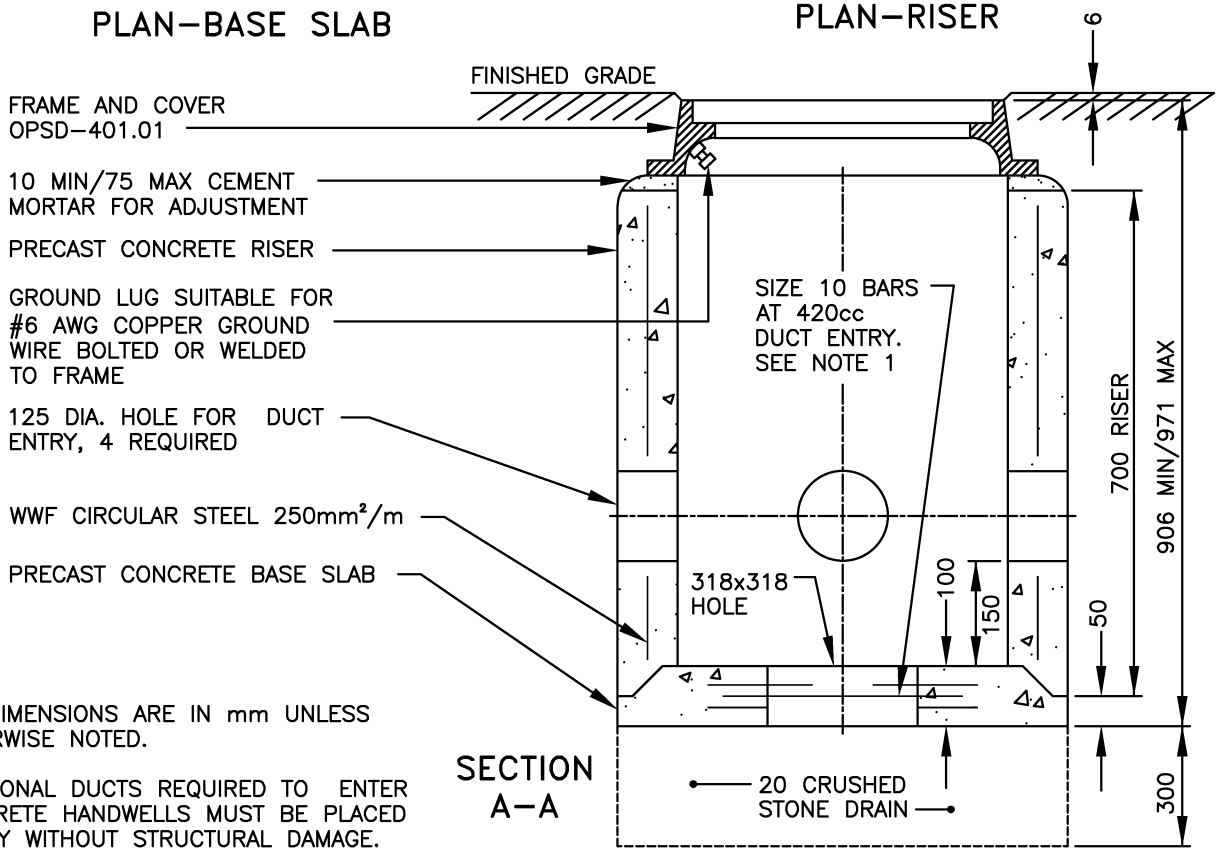
E–1.03



PLAN–BASE SLAB



PLAN–RISER



SECTION
A–A

N.T.S.

NOTES

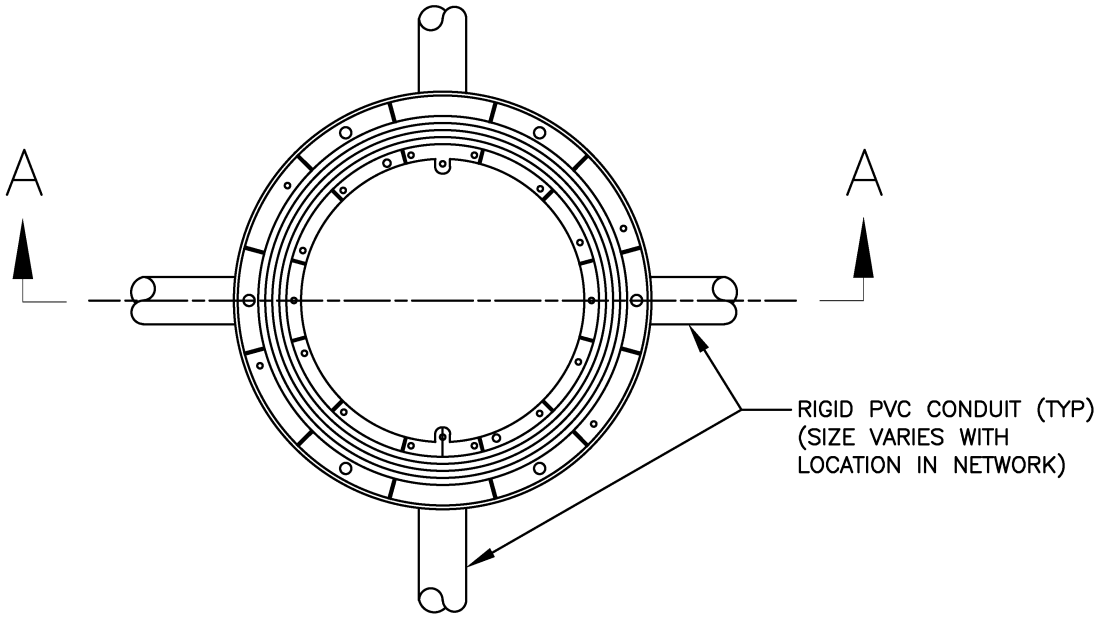
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ADDITIONAL DUCTS REQUIRED TO ENTER CONCRETE HANDWELLS MUST BE PLACED NEATLY WITHOUT STRUCTURAL DAMAGE.
3. ALL CONDUIT ENTERING CONCRETE HANDWELLS MUST BE PROPERLY GROUTED.
4. UNUSED PRECAST HOLES IN THE HANDWELLS ARE TO BE PLUGGED WITH CONDUIT PLUGS.
5. THE COVER MUST HAVE A DATE OF INSTALLATION AND A KEYWAY FOR REMOVAL.
6. ALL DUCTS SHALL BE INSTALLED IN THE WALLS OF THE HANDWELL. NO DUCTS SHALL BE INSTALLED IN THE BOTTOM.
7. CONCRETE CLASS TO BE 35 MPa COMPRESSIVE STRENGTH AT 28 DAYS.

York Region **Public Works Transportation**

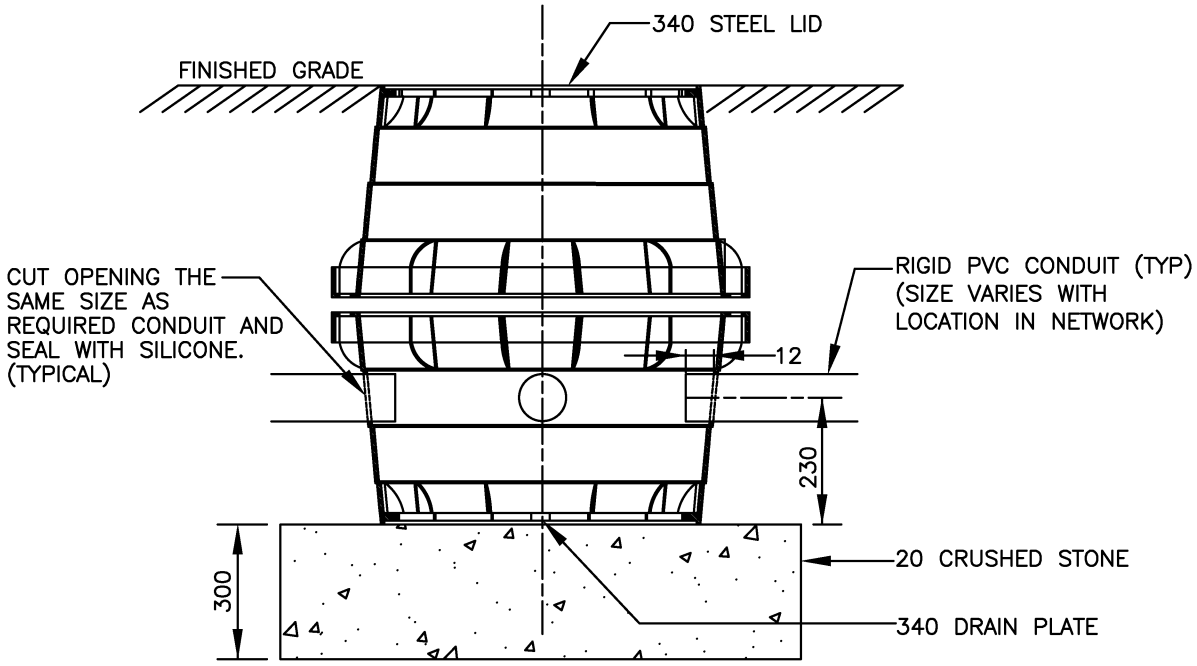
675mm DIA. PRECAST CONCRETE HANDWELL (4 SLEEVES)

JANUARY 2023
DATE

E–1.04



TOP VIEW



SECTION A–A

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ALL DUCTS ARE TO BE PROPERLY SEALED TO PREVENT THE ENTRY OF MOISTURE.
3. EARTH BACKFILL SHALL BE COMPACTED TO 95% MAX. DRY DENSITY.

N.T.S.

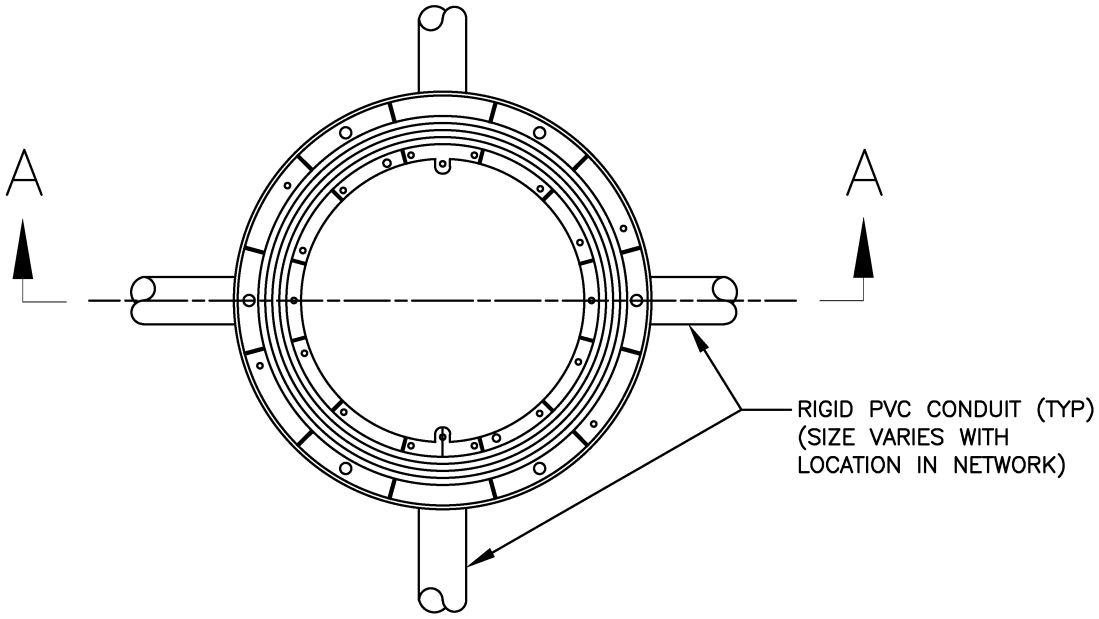
York Region

Public Works
Transportation

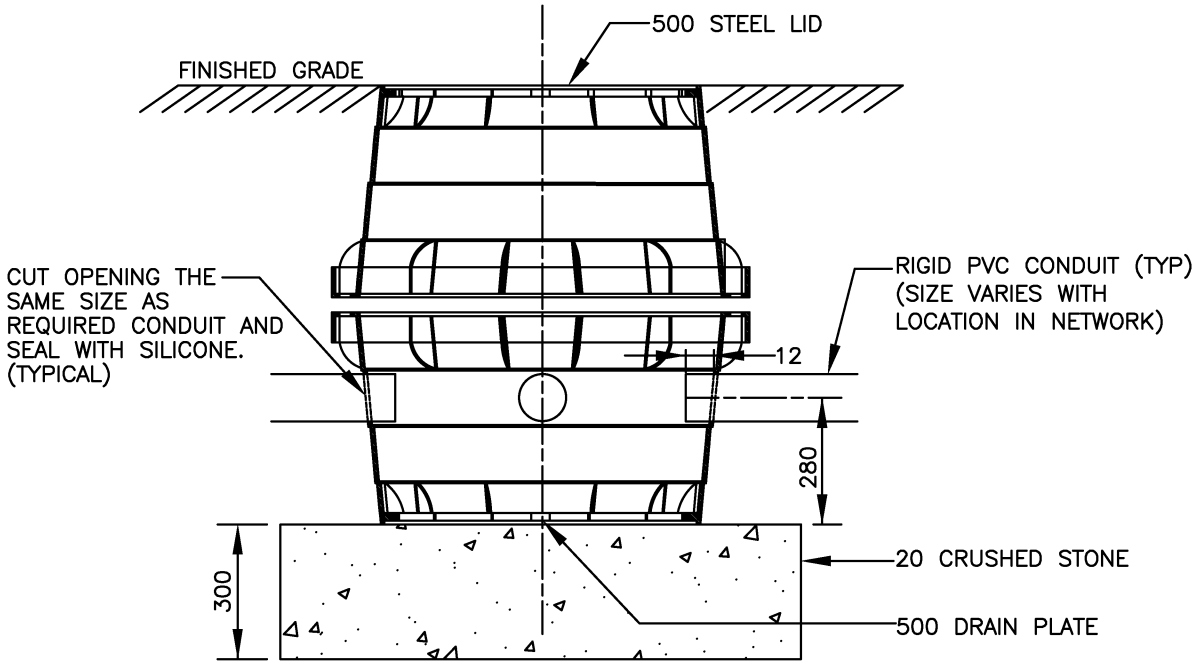
340mm DIA. STRUCTURAL PLASTIC HANDWELL (4 SLEEVES)

JANUARY 2023
DATE

E–1.05



TOP VIEW



SECTION A–A

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ALL DUCTS ARE TO BE PROPERLY SEALED TO PREVENT THE ENTRY OF MOISTURE.
3. EARTH BACKFILL SHALL BE COMPACTED TO 95% MAX. DRY DENSITY.

N.T.S.

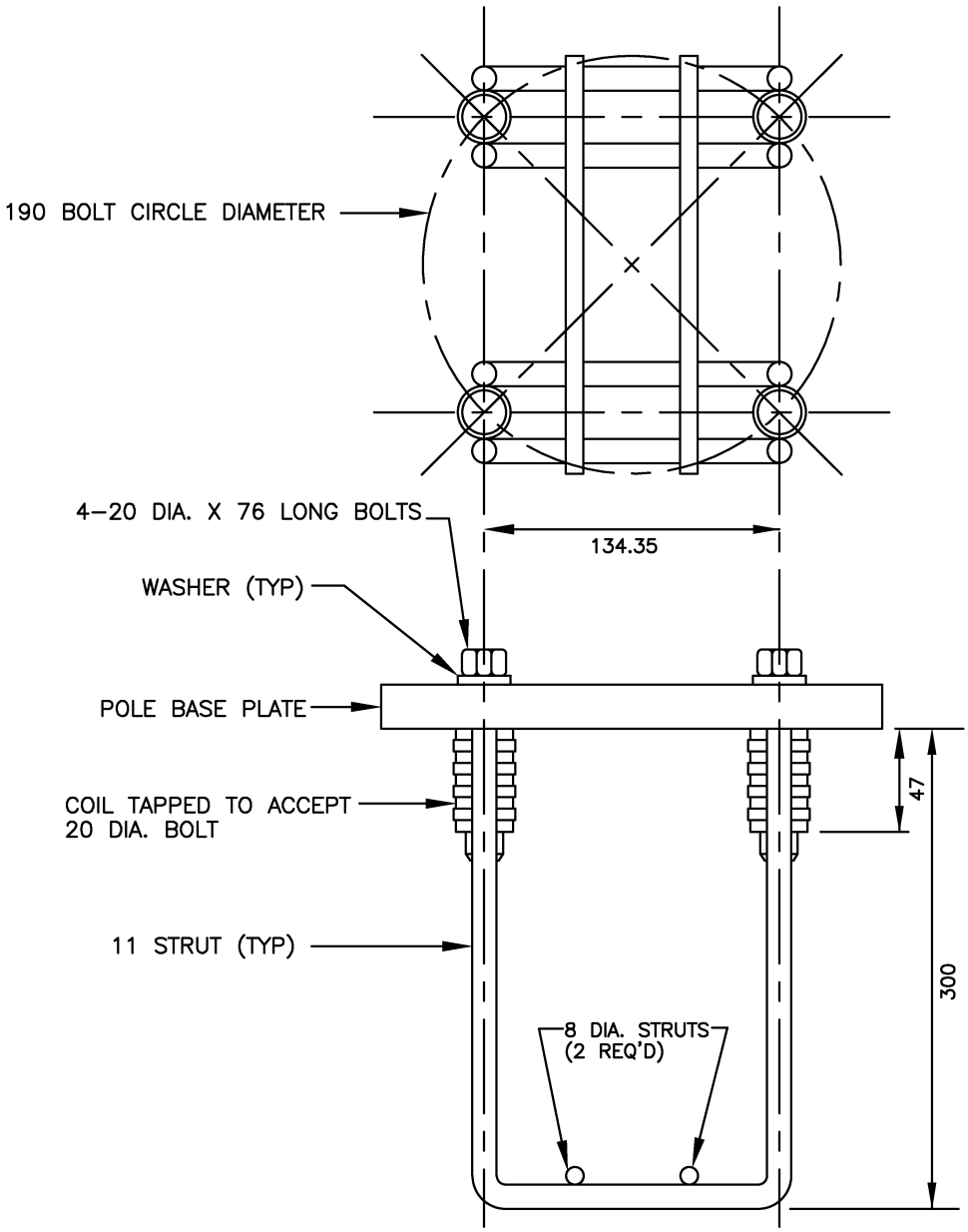
York Region

Public Works
Transportation

500mm DIA. STRUCTURAL PLASTIC HANDWELL (4 SLEEVES)

JANUARY 2023
DATE

E–1.06



N.T.S.

York Region

Public Works
Transportation

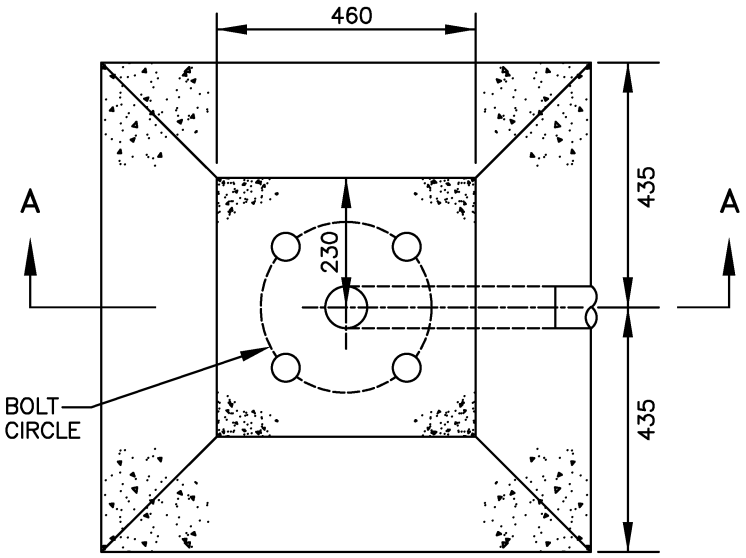
ANCHORAGE ASSEMBLY FOR 300mm DIA. CONCRETE POLE BASE

NOTES

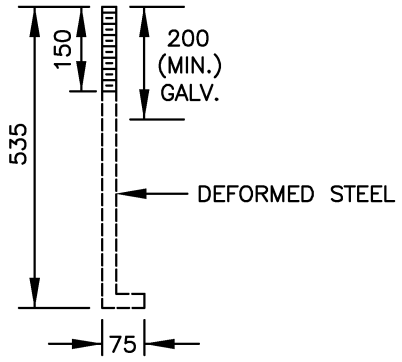
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. BOLTS SHALL BE FACTORY SET IN FERRULE, HAND TIGHTENED WITH ANTI SIEZE COMPOUND.

JANUARY 2023
DATE

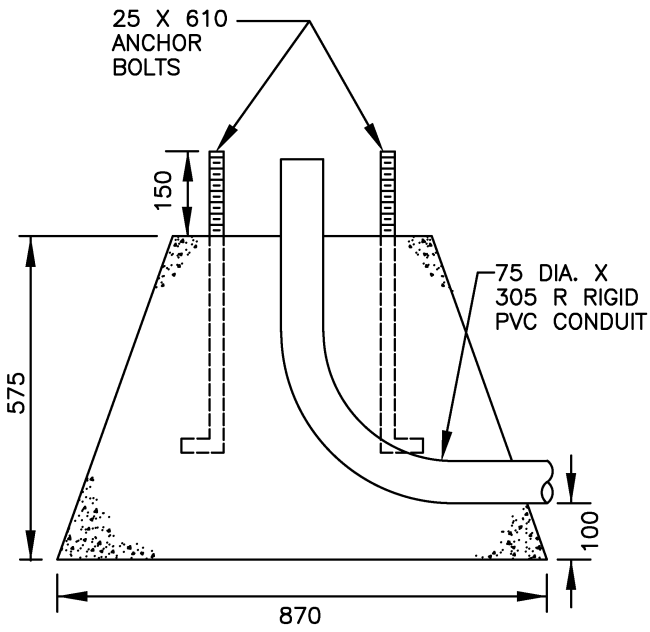
E–2.13



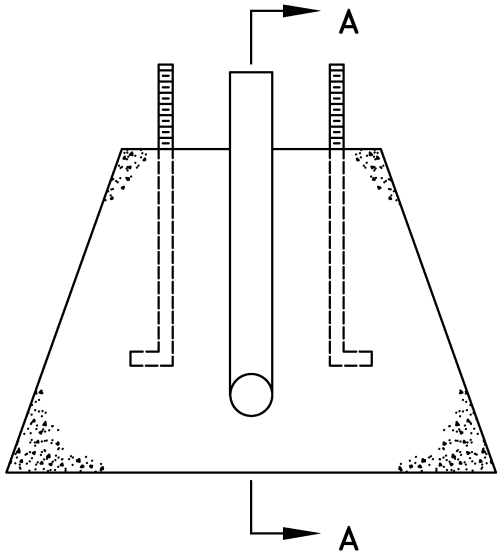
PLAN VIEW



STANDARD ANCHOR BOLT



SECTION A–A



RIGHT VIEW

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. TOP TO BE ROUGH FINISHED.
3. CONCRETE TO BE MIN. 32 MPa 28 DAYS.
4. ELBOW TO BE 100 ABOVE FINISHED GRADE
5. ANCHOR BOLTS ARE INTERMEDIATE GRADE STEEL, MINIMUM LOAD 14 520kg CSA G 30.1

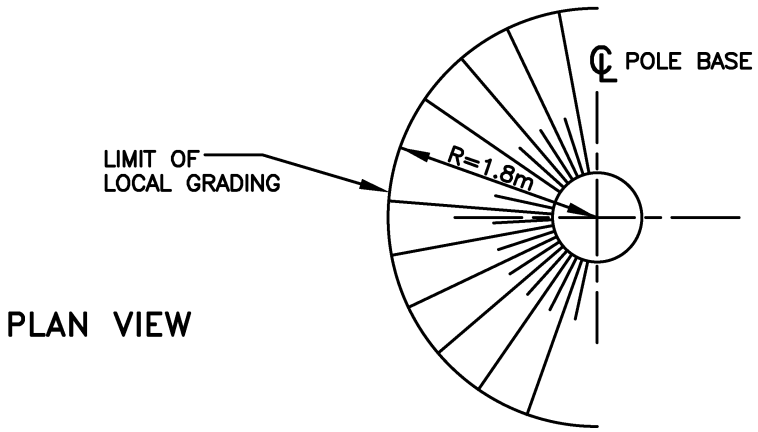
York Region

Public Works
Transportation

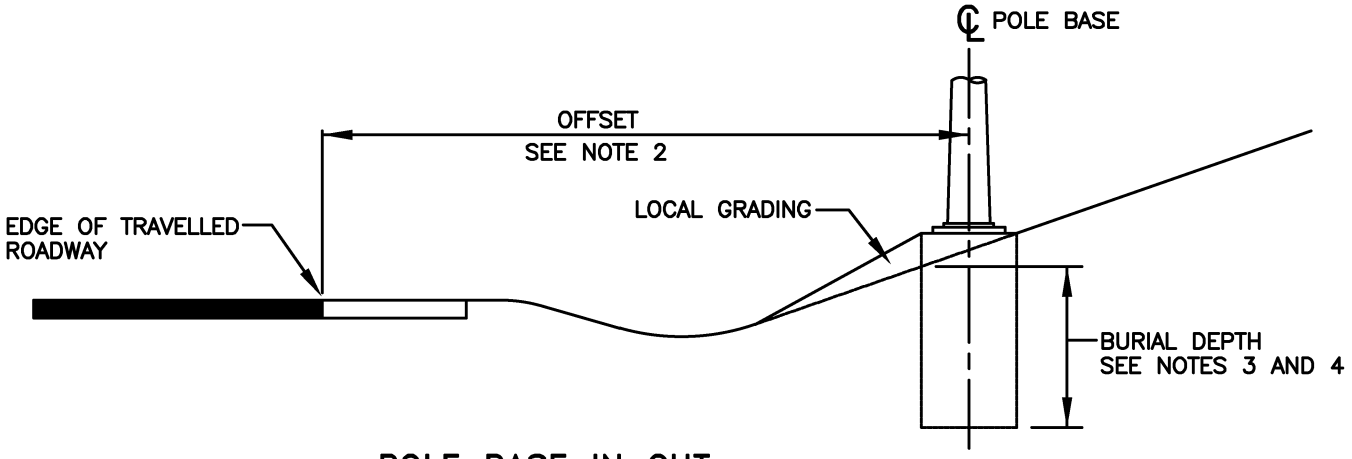
TEMPORARY FOUNDATION

JANUARY 2023
DATE

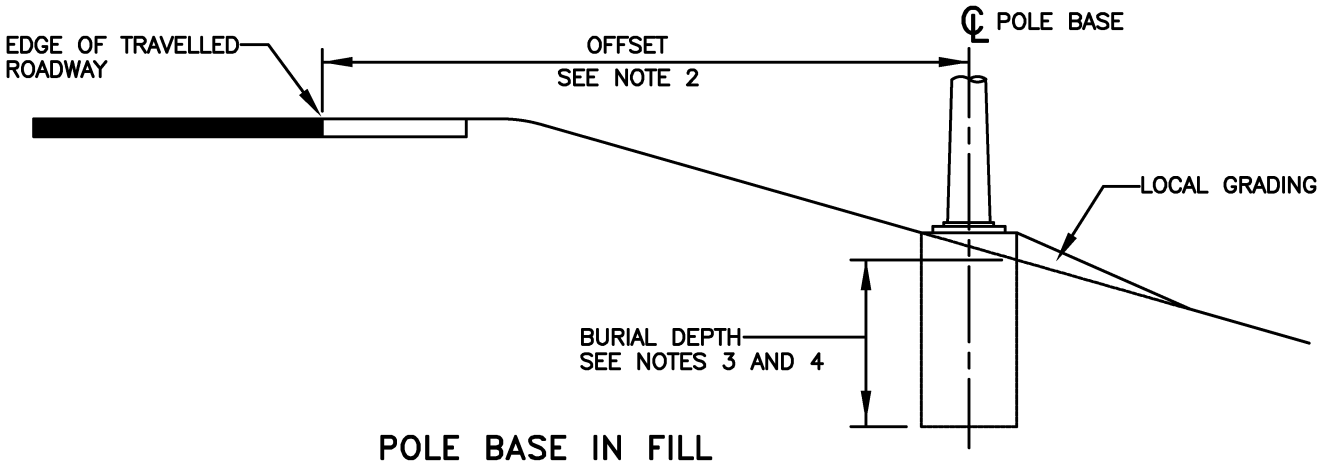
E–2.14



PLAN VIEW



POLE BASE IN CUT



POLE BASE IN FILL

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. FOR OFFSET SEE POLES AND ELECTRICAL STRUCTURES CHART.
3. BURIAL DEPTH SHALL BE MEASURED FROM THE LOWEST GRADE ELEVATION AT CONCRETE POLE BASE.
4. FOR BURIAL DEPTH SEE APPROPRIATE STANDARD.

N.T.S.

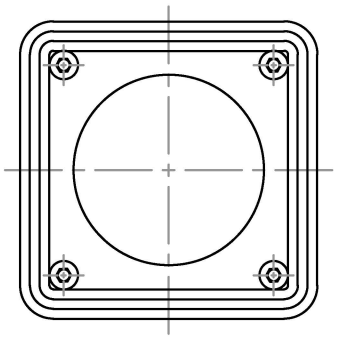
York Region

Public Works
Transportation

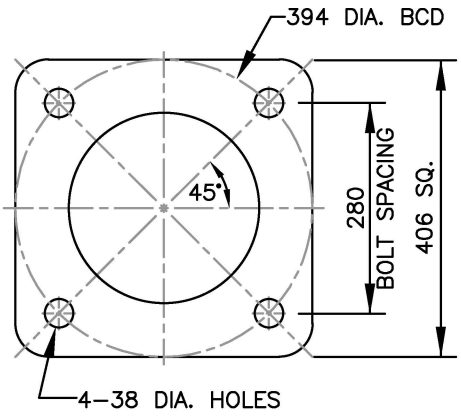
BASE MOUNTED POLES PLACED IN SLOPES

JANUARY 2023
DATE

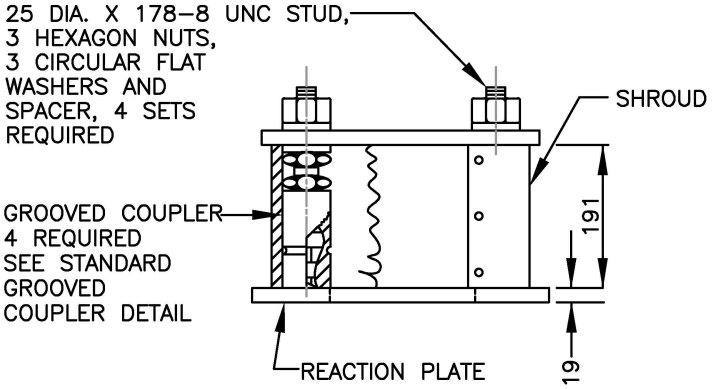
E–2.15



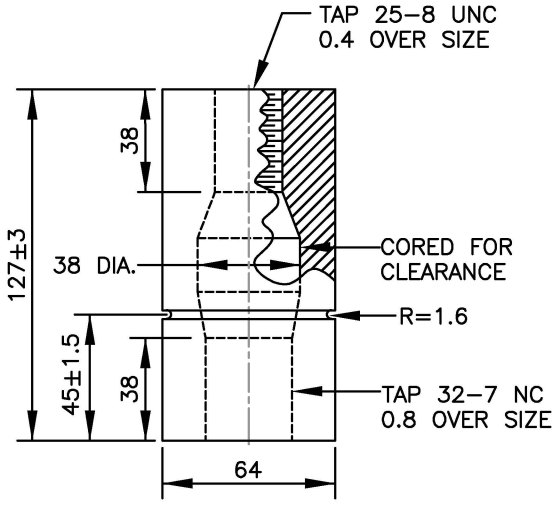
TOP VIEW



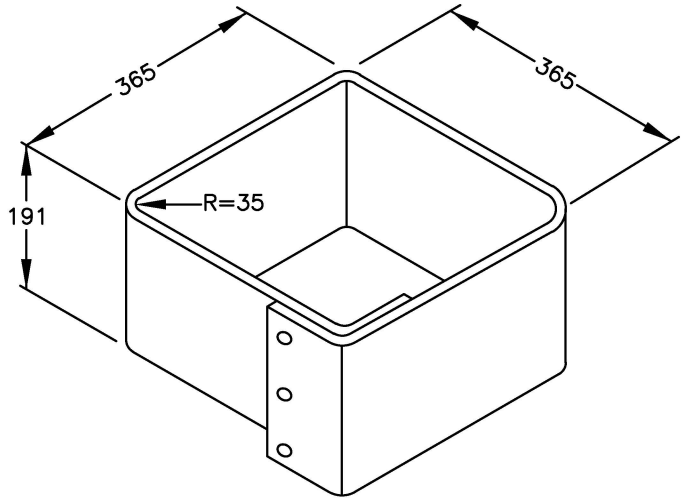
REACTION PLATE DETAIL



FRONT VIEW



STANDARD GROOVED
COUPLER DETAIL



SHROUD COVER

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. BCD = BOLT CIRCLE DIAMETER
   UNC = UNIFIED NATIONAL COARSE

N.T.S.

York Region

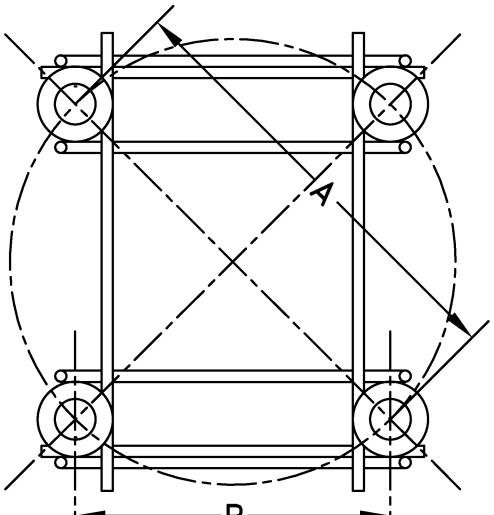
Public Works
Transportation

FRANGIBLE BASE DETAIL (GROOVED COUPLER)

JANUARY 2023
DATE

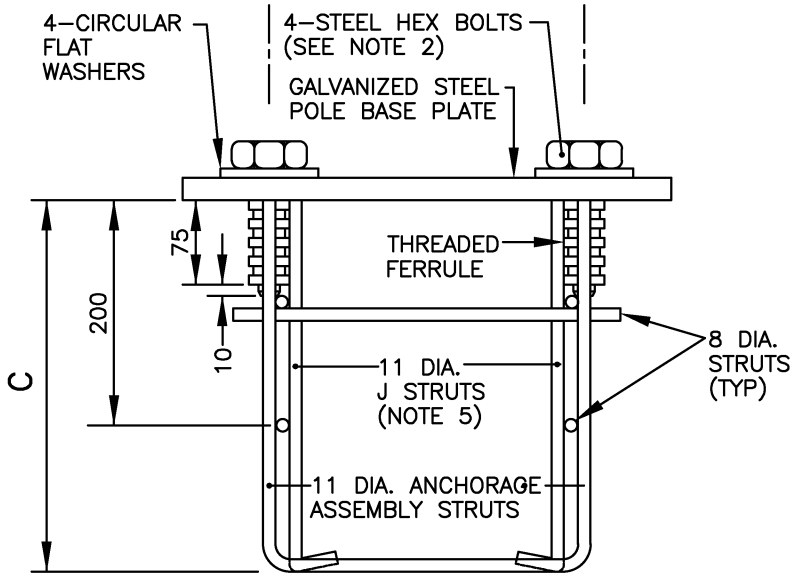
E–2.16

ASSEMBLY DIMENSIONS				
POLE LENGTH (m)	A BOLT CIRCLE DIA. (mm)	B BOLT DISTANCE (mm)	C ANCHORAGE DEPTH (mm)	BOLT DIA. (mm)
OCT. STEEL 3.7, 6.1 7.3, 9.1 10.7	406	287.1	457	32 (1–1/4")
SECT. STEEL 3.8	323	228.4	457	25.4 (1")
7.0, 8.71 10.5	449	317.5		32 (1–1/4")



PLAN

AN ANTI–SEIZE COMPOUND SHALL BE APPLIED TO ALL BOLTS



ELEVATION

N.T.S.

INSTRUCTIONS:

1. DO NOT REMOVE BOLTS FROM THREADED FERRULES.
2. PLACE WOOD TEMPLATE OVER FORM TUBING.
3. TIE ANCHORAGE TO STEEL IN FOOTING.
4. TIE ANCHORAGE TO DUCTS.
5. ADJUST FOR LEVEL USING A CARPENTER'S LEVEL SEVERAL WAYS ON THE TEMPLATE.
6. SECURE IN THE LEVEL POSITION PRIOR TO POURING CONCRETE TO THE TOP OF THE FORMWORK.
7. REMOVE WOOD TEMPLATE AND FINISH CONCRETE ON TOP OF FOOTING AS SOON AS CONCRETE HAS AN INITIAL SET. REPLACE TEMPLATE AND PLACE BOLTS FULLY TO THREADED FERRULES (HAND TIGHT).

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. WHEN FRANGIBLE BASE IS REQUIRED, STUD LENGTHS SHALL BE FACTORY SET TO SUIT THE FRANGIBLE BASE.
3. J STRUTS ARE NOT REQUIRED IN ASSEMBLY WITH BOLT CIRCLE DIAMETER LESS THAN 406mm.
4. BOLTS SHALL BE FACTORY SET IN FERRULE, HAND TIGHTENED WITH ANTI SEIZE COMPOUND.

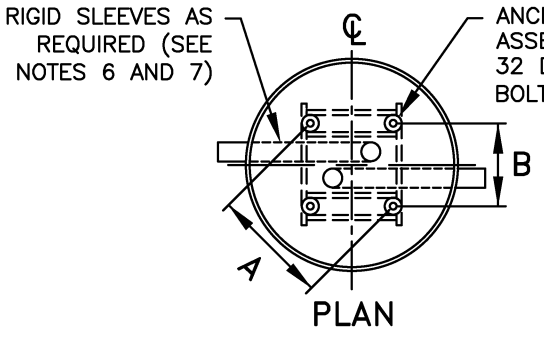
York Region

Public Works
Transportation

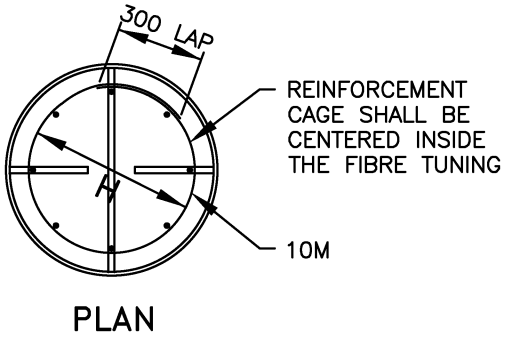
ANCHORAGE ASSEMBLY FOR 600mm DIA. AND 762mm DIA. CONCRETE POLE BASES

JANUARY 2023
DATE

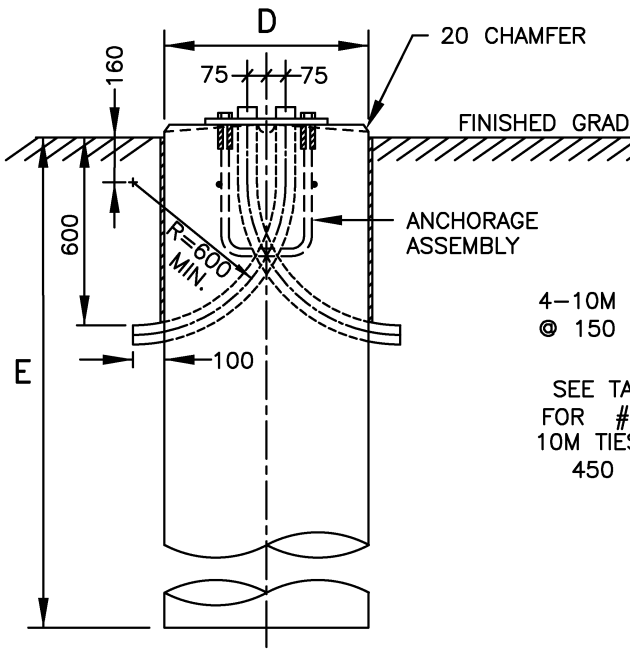
E–2.17



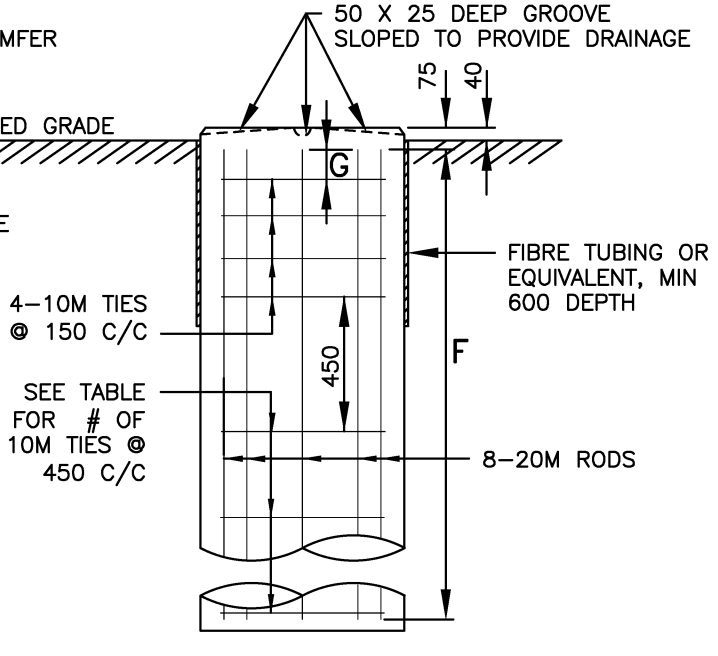
PLAN



PLAN



ELEVATION
LAYOUT



ELEVATION
REINFORCEMENT

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. FOR ANCHORAGE ASSEMBLY DETAILS, SEE STD. DWG. E–2.17.
3. CONCRETE IN FOUNDATION SHALL BE PLACED AGAINST UNDISTURBED GROUND.
4. TOP OF FOUNDATION SHALL BE TRULY LEVEL.
5. CLASS OF CONCRETE TO BE MIN. 32 MPa AT 28 DAYS.
6. SLEEVES SHALL BE 50 OR 75 I.D., 90° BEND, RIGID PVC CONDUIT.
7. EITHER ONE OR TWO SLEEVES REQUIRED FOR EACH CONCRETE FOOTING.
8. BOLTS SHALL BE FACTORY SET IN FERRULE, HAND TIGHTENED WITH ANTI SEIZE COMPOUND.
9. ALL FOOTINGS WILL BE VIBRATED DURING CONCRETE POUR.

N.T.S.

POLE LENGTH (m)	D BASE DIA. (mm)	E BURIAL DEPTH (m)	F ROD LENGTH (m)	G (mm)	H CAGE DIA. (mm)	No. OF 10M TIES @ 450 C TO C	BOLT CIRCLE DIA. (mm)
OCT. STEEL							
3.7, 6.1 7.3, 9.1 10.7	600	2.5	2.2	100	508	3	406
SECT. STEEL							
3.8	600	2.5	2.2	100	508	3	323
7.0, 8.71 10.5	762	2.5	2.2	100	559	3	449

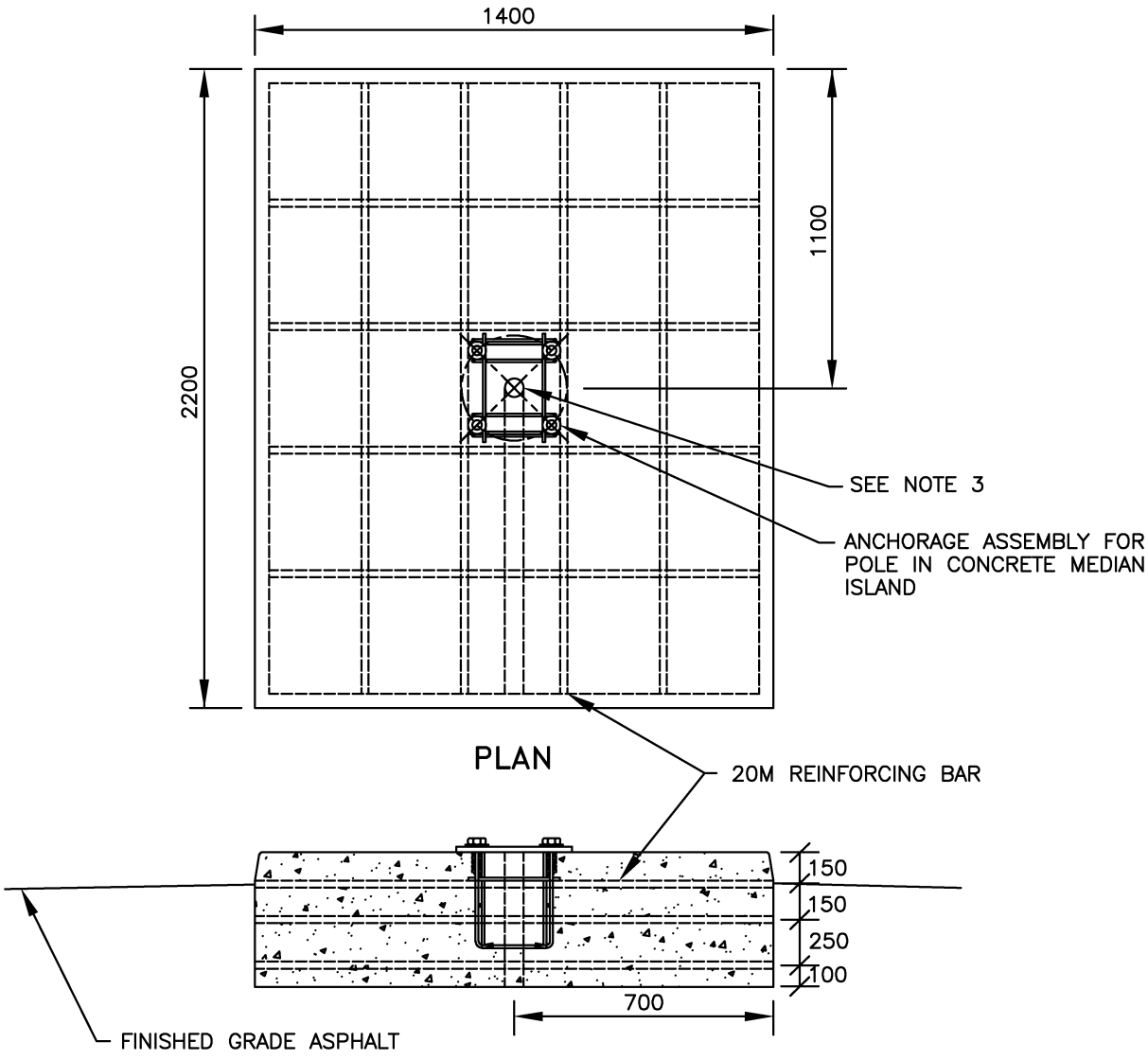
York Region

Public Works
Transportation

CONCRETE POLE BASES WITH ANCHORAGE ASSEMBLIES FOR OCTAGONAL STEEL POLES AND SECTIONAL STEEL POLES

JANUARY 2023
DATE

E–2.18



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. FOR ANCHORAGE ASSEMBLY, SEE STD. E–2.17.
3. SEE LAYOUT DRAWINGS FOR NUMBER OF DUCTS AND DIAMETER INSTALLED IN BASE.
4. ANCHORAGE ASSEMBLY TO BE SET WITH THE AID OF TEMPLATE SUPPLIED WITH ANCHOR.
5. ALL FOOTINGS WILL BE VIBRATED DURING CONCRETE POUR.

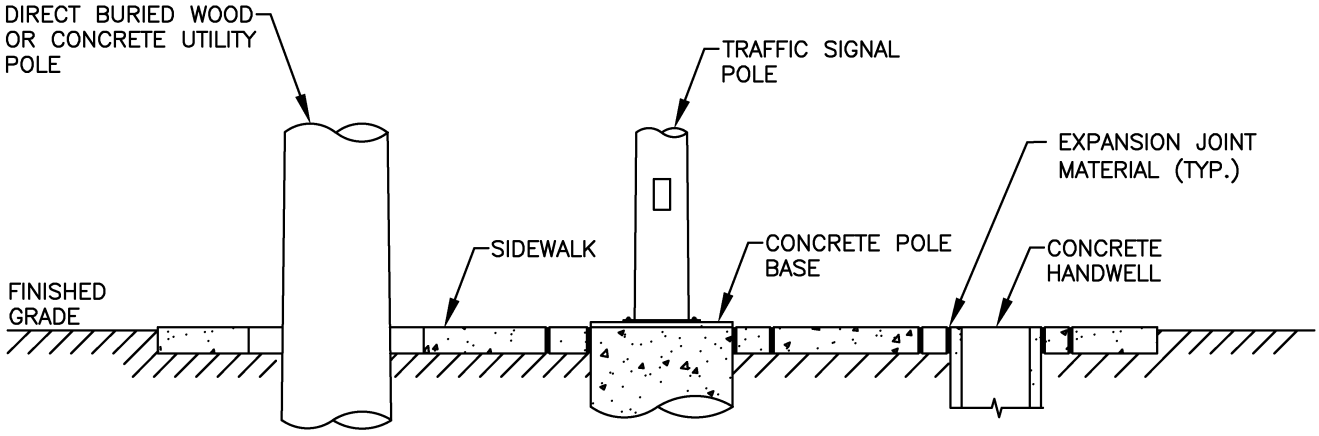
York Region

Public Works
Transportation

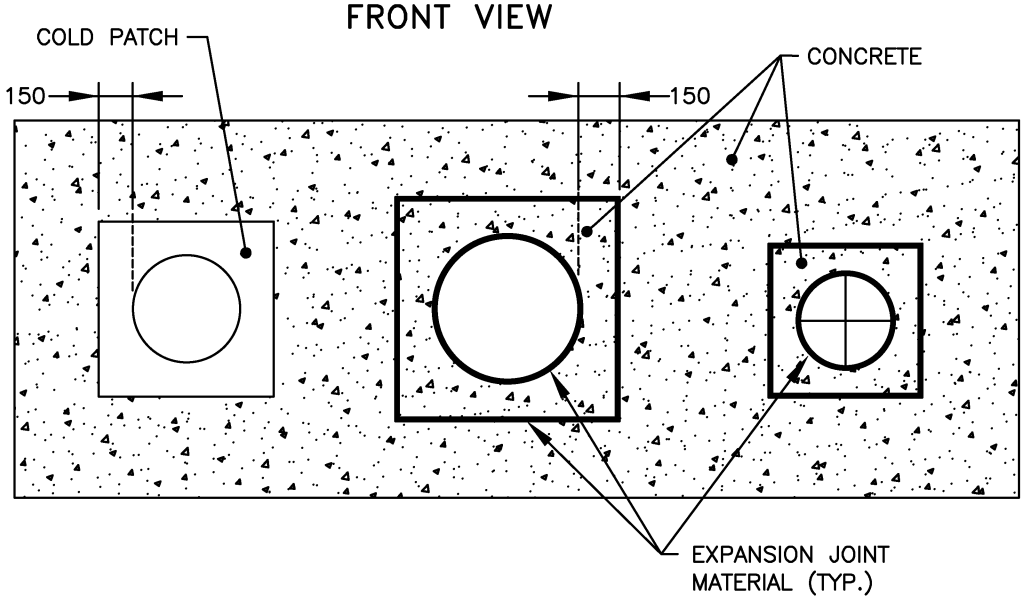
ANCHORAGE ASSEMBLY IN CONCRETE SLAB RAISED MEDIAN ISLAND

JANUARY 2023
DATE

E–2.19



FRONT VIEW



PLAN VIEW

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. EXPANSION JOINT MATERIAL MUST BE FULL DEPTH OF SIDEWALK.
3. HANDWELLS SHALL EITHER BE ISOLATED AS SHOWN ABOVE OR FRAME AND COVER FLOATED TO SAME ELEVATION OF SURROUNDING SIDEWALK.

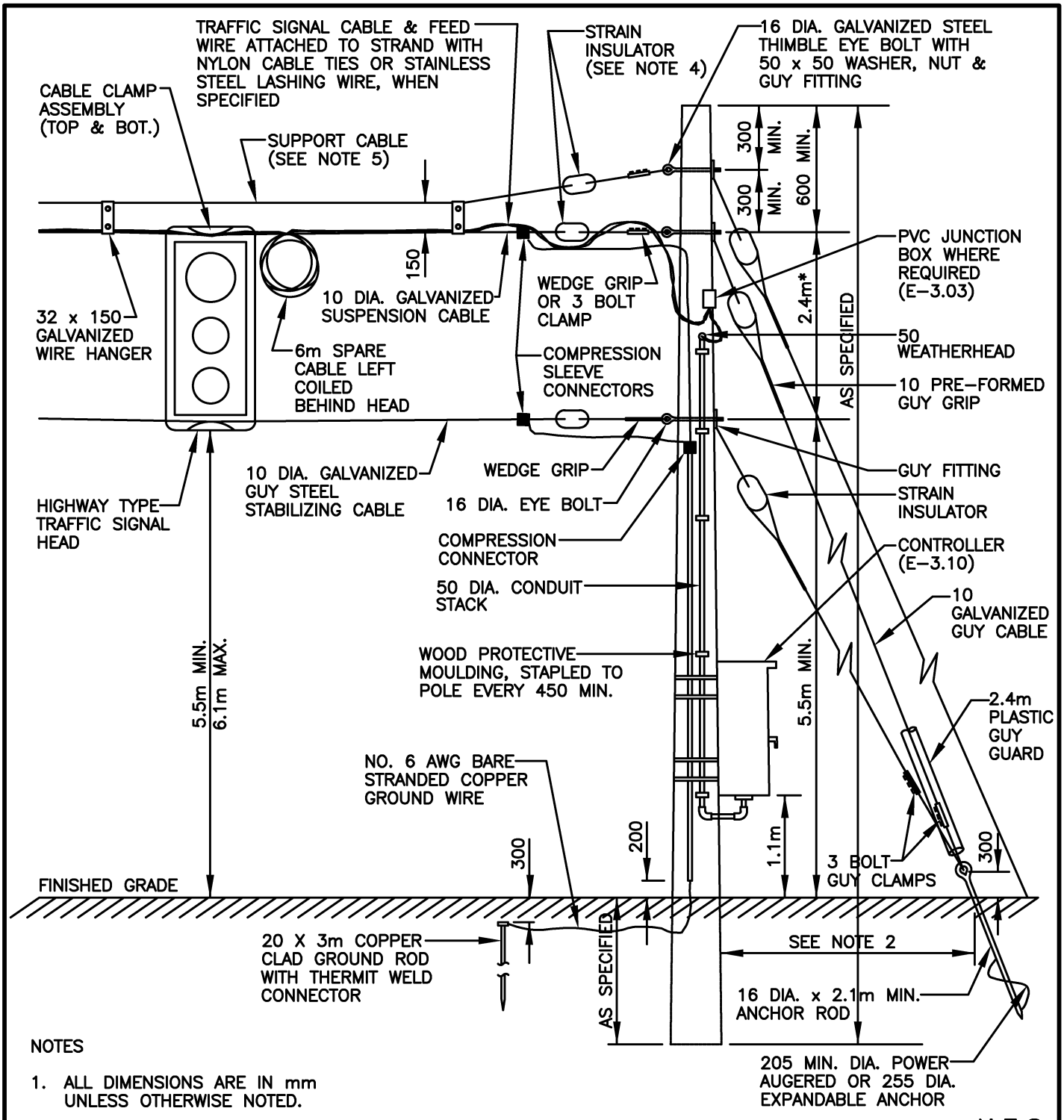
York Region

Public Works Transportation

ISOLATION IN CONCRETE SIDEWALK

JANUARY 2023
DATE

E–2.20



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. DISTANCE FROM POLE TO ANCHOR IS TO BE PROPERLY DETERMINED BY THE CONTRACTOR OR AS DIRECTED BY THE COMMISSIONER.
3. IF A SIDEWALK STRUT IS REQUIRED, SEE STD. DWG. No. E-3.22
4. STRAIN INSULATORS TO BE USED FOR ATTACHMENT TO UTILITY POLES OR POLES WITH ADJACENT LIVE CABLES.
5. SUPPORT SPAN & BACK GUY TO BE USED WHEN DIRECTED BY THE REGION.
6. USE CABLE SPACER BARS WHEN THREE & FOUR SECTION HEADS ARE INSTALLED ON THE SAME SPAN.

* ADJUST AS REQUIRED FOR HYDRO LINE CLEARANCE

N.T.S.

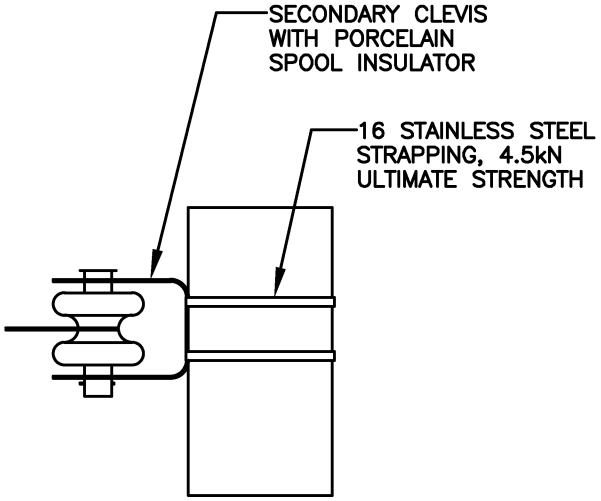
York Region

Public Works Transportation

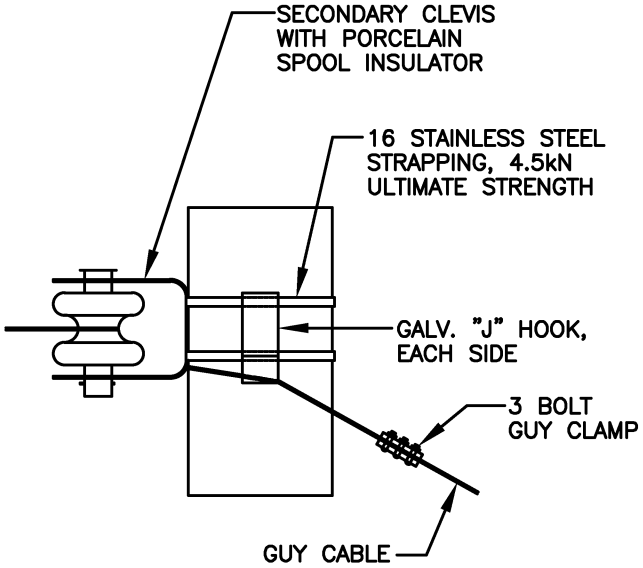
TYPICAL WOOD POLE INSTALLATION FOR TEMPORARY TRAFFIC SIGNALS

JANUARY 2023
DATE

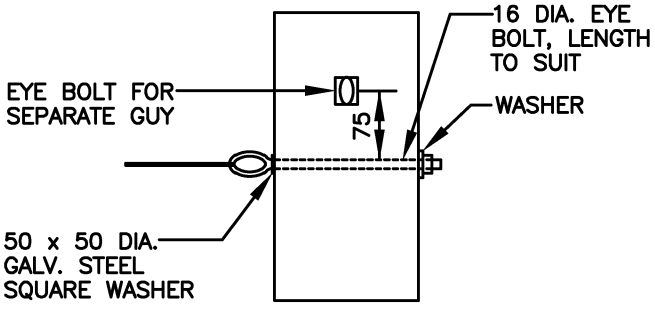
E-3.01



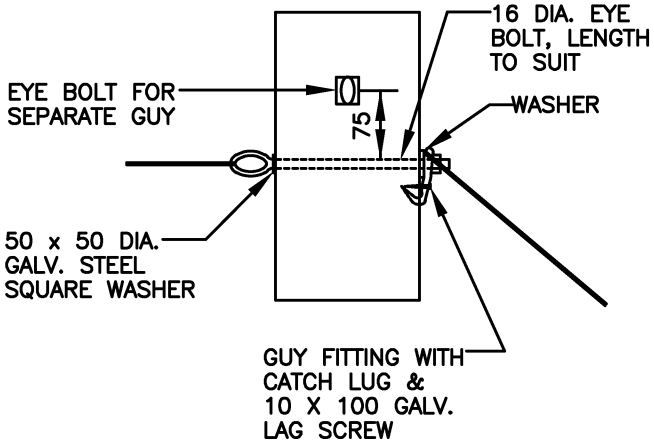
AERIAL CABLE ATTACHMENT DETAIL
STEEL OR CONCRETE POLE



AERIAL CABLE ATTACHMENT DETAIL
STEEL OR CONCRETE POLE
WITH BACK GUY



AERIAL CABLE ATTACHMENT DETAIL
WOOD POLE



AERIAL CABLE ATTACHMENT DETAIL
WOOD POLE WITH BACK GUY

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. NO HOLES ARE TO BE DRILLED IN THE STEEL OR CONCRETE POLES FOR THE ATTACHMENT OF AERIAL CABLES
3. FOR FURTHER GUYING INFORMATION, REFER TO STD. DWG. E–3.22 OR E–3.23

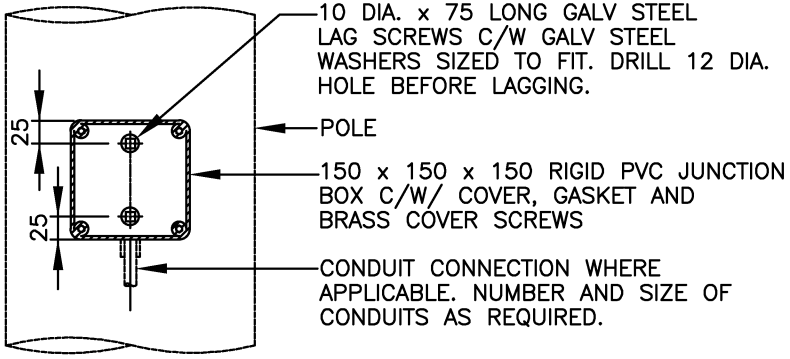
York Region

Public Works
Transportation

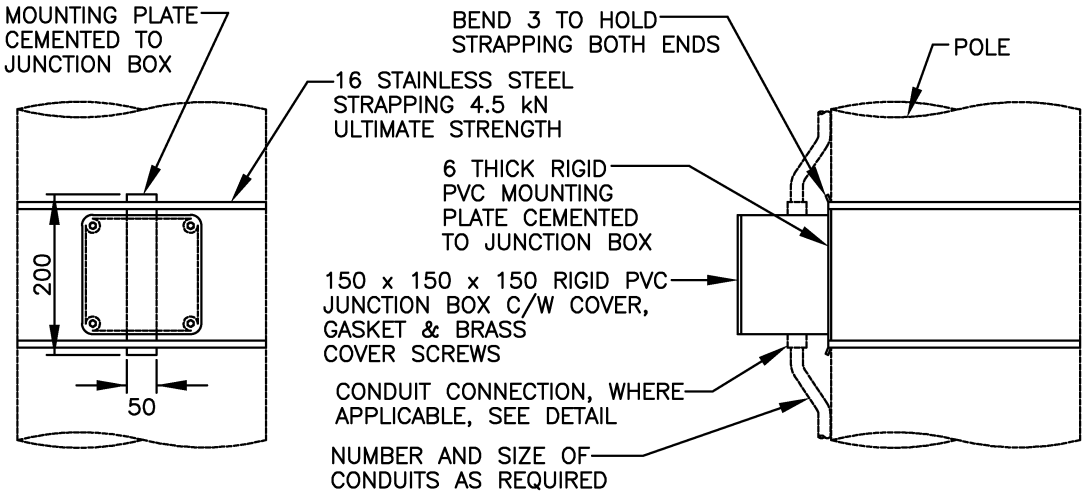
AERIAL CABLE ATTACHMENT DETAIL

JANUARY 2023
DATE

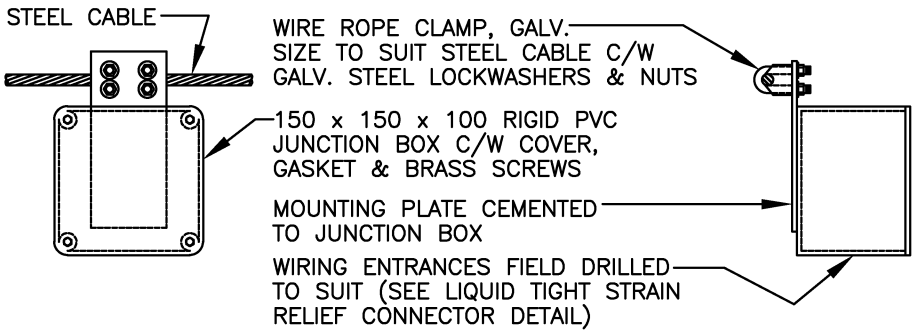
E–3.02



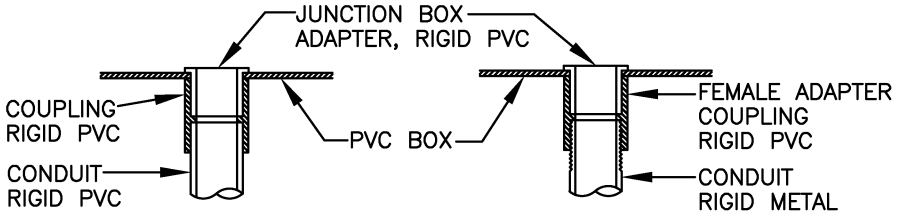
MOUNTING ON WOOD POLE



MOUNTING ON CONCRETE OR METAL POLE



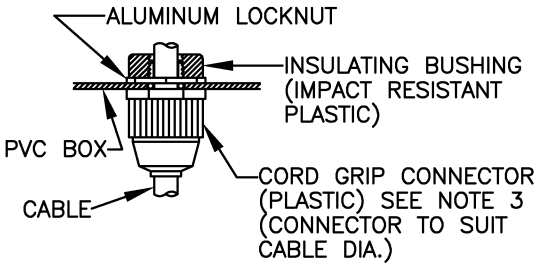
CABLE MOUNTING



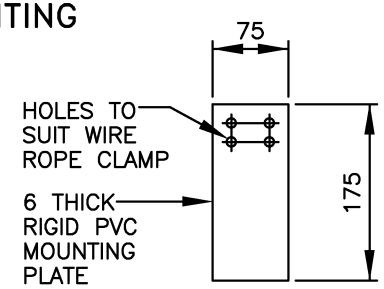
TYPICAL CONNECTION RIGID PVC CONDUIT

TYPICAL CONNECTION RIGID METAL CONDUIT

CONDUIT CONNECTION DETAIL



TYPICAL LIQUID TIGHT STRAIN RELIEF CONNECTOR



MOUNTING PLATE FOR CABLE MOUNTING

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ALL RIGID PVC CONNECTIONS SHALL BE MADE WITH AN APPROVED SOLVENT CEMENT.
3. FOR CABLE MOUNTING, DRILL WIRING ENTRANCES ON BOTTOM OF JUNCTION BOX ONLY.

N.T.S.

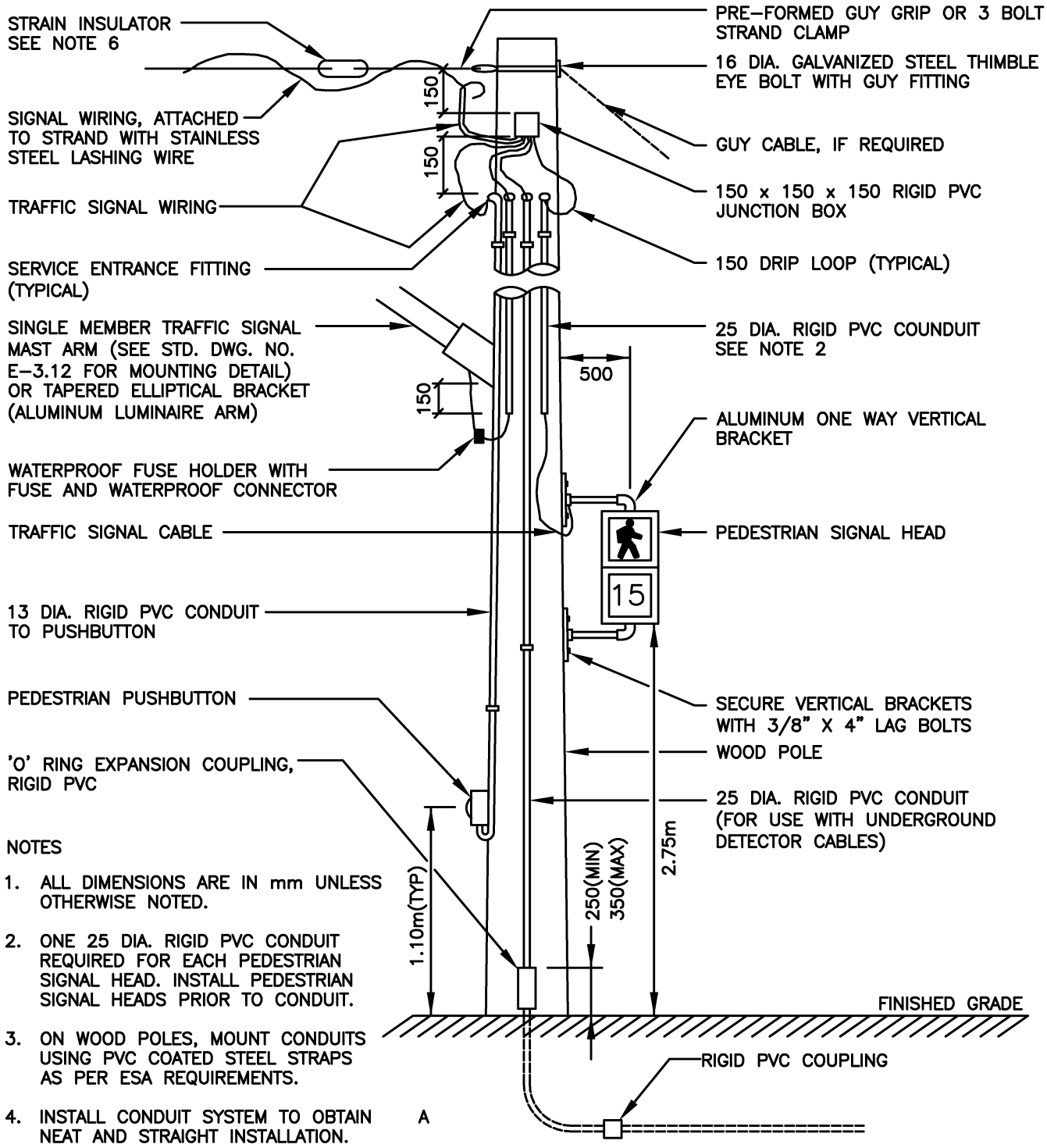
York Region

Public Works Transportation

PVC JUNCTION BOX MOUNTING DETAIL

JANUARY 2023
DATE

E–3.03



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ONE 25 DIA. RIGID PVC CONDUIT REQUIRED FOR EACH PEDESTRIAN SIGNAL HEAD. INSTALL PEDESTRIAN SIGNAL HEADS PRIOR TO CONDUIT.
3. ON WOOD POLES, MOUNT CONDUITS USING PVC COATED STEEL STRAPS AS PER ESA REQUIREMENTS.
4. INSTALL CONDUIT SYSTEM TO OBTAIN NEAT AND STRAIGHT INSTALLATION.
5. STRAIN INSULATORS ARE TO BE USED ONLY FOR ATTACHMENT TO UTILITY POLES OR POLES WITH LIVE CABLES LOCATED ABOVE THE SUSPENSION CABLE.
6. FOR ORIENTATION AND LOCATION OF POLES AND EQUIPMENT SEE LAYOUT DRAWINGS.
7. ALL STEEL TRAFFIC SIGNAL EQUIPMENT IS TO BE ADEQUATELY GROUNDED.
8. ALL VERTICAL PVC CONDUITS SHALL BE SECURED WITH PVC COATED 2-HOLE STRAPS AT INTERVALS NO GREATER THAN SPECIFIED BY ESA RULE 12-1114, BASED ON CONDUIT SIZE.

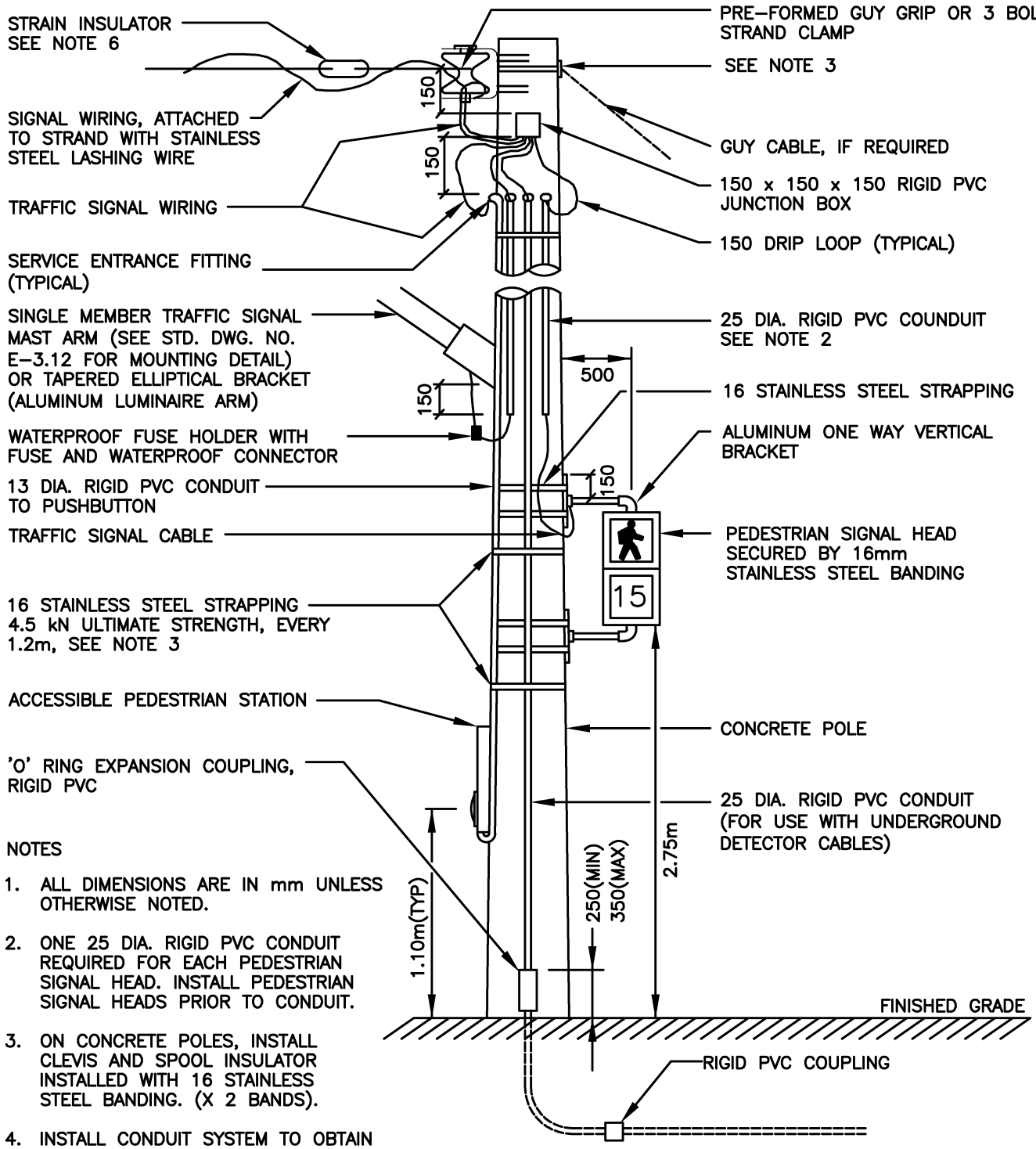
York Region

Public Works Transportation

TRAFFIC SIGNAL EQUIPMENT ON WOOD POLES (AERIAL INSTALLATION)

JANUARY 2023
DATE

E-3.04



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ONE 25 DIA. RIGID PVC CONDUIT REQUIRED FOR EACH PEDESTRIAN SIGNAL HEAD. INSTALL PEDESTRIAN SIGNAL HEADS PRIOR TO CONDUIT.
3. ON CONCRETE POLES, INSTALL CLEVIS AND SPOOL INSULATOR INSTALLED WITH 16 STAINLESS STEEL BANDING. (X 2 BANDS).
4. INSTALL CONDUIT SYSTEM TO OBTAIN A NEAT AND STRAIGHT INSTALLATION.
5. STRAIN INSULATORS ARE TO BE USED ONLY FOR ATTACHMENT TO UTILITY POLES OR POLES WITH LIVE CABLES LOCATED ABOVE THE SUSPENSION CABLE.
6. FOR ORIENTATION AND LOCATION OF POLES AND EQUIPMENT SEE LAYOUT DRAWINGS.
7. ALL STEEL TRAFFIC SIGNAL EQUIPMENT IS TO BE ADEQUATELY GROUNDED.
8. ALL VERTICAL PVC CONDUITS ARE TO BE SECURED BY BANDING AT INTERVALS NO GREATER THAN SPECIFIED BY ESA RULE 12-1114, BASED ON CONDUIT SIZE.

N.T.S.

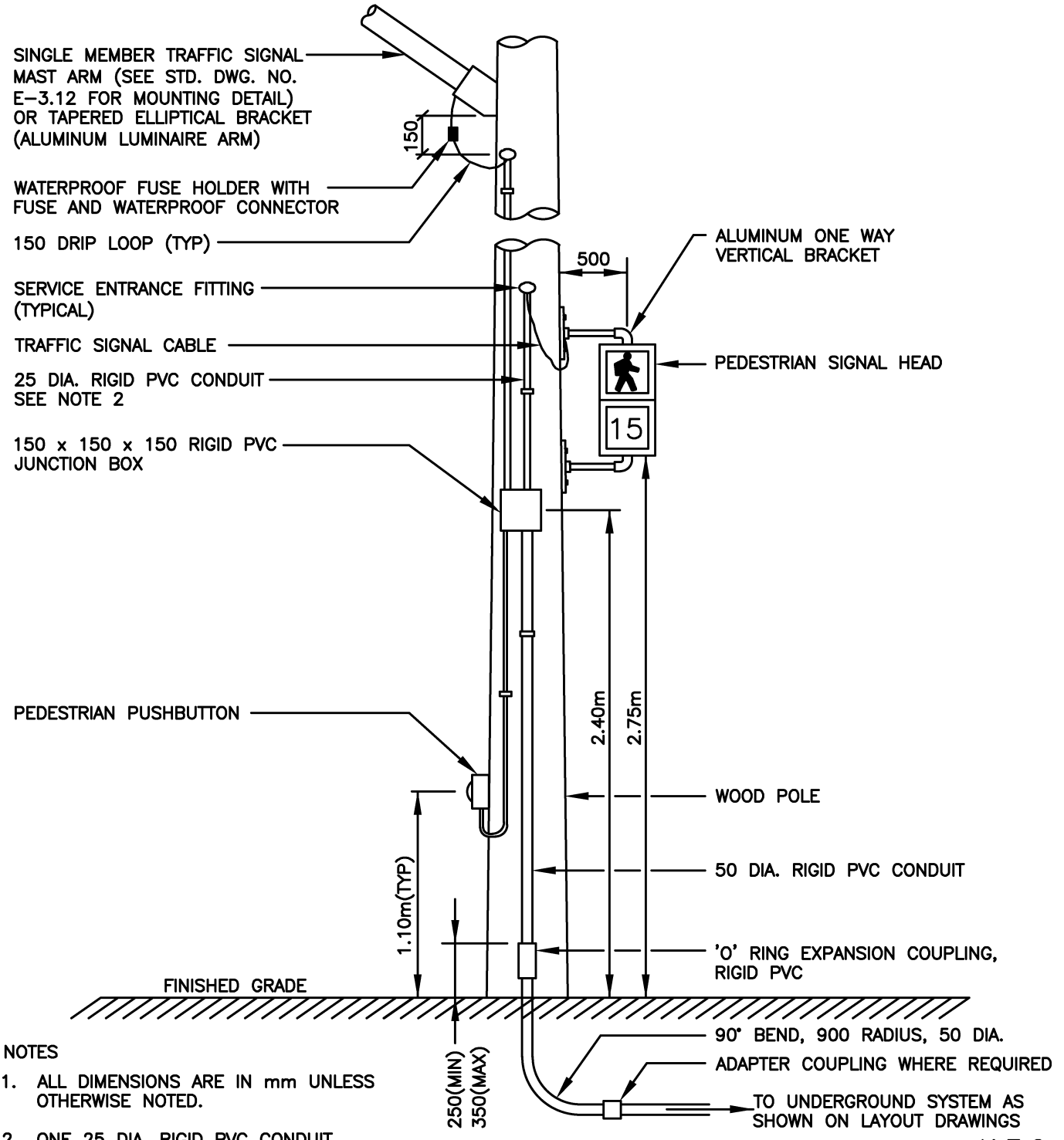
York Region

Public Works Transportation

TRAFFIC SIGNAL EQUIPMENT ON CONCRETE POLES (AERIAL INSTALLATION)

JANUARY 2023
DATE

E-3.04A



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ONE 25 DIA. RIGID PVC CONDUIT REQUIRED FOR EACH PEDESTRIAN SIGNAL HEAD. INSTALL PEDESTRIAN SIGNAL HEADS PRIOR TO CONDUIT.
3. ON WOOD POLES, MOUNT CONDUITS USING PVC COATED STEEL STRAPS AS PER ESA REQ'S.
4. INSTALL CONDUIT SYSTEM TO OBTAIN A NEAT AND STRAIGHT INSTALLATION.
5. FOR ORIENTATION AND LOCATION OF POLES AND EQUIPMENT SEE LAYOUT DRAWINGS.
6. ALL STEEL TRAFFIC SIGNAL EQUIPMENT IS TO BE ADEQUATELY GROUNDED.

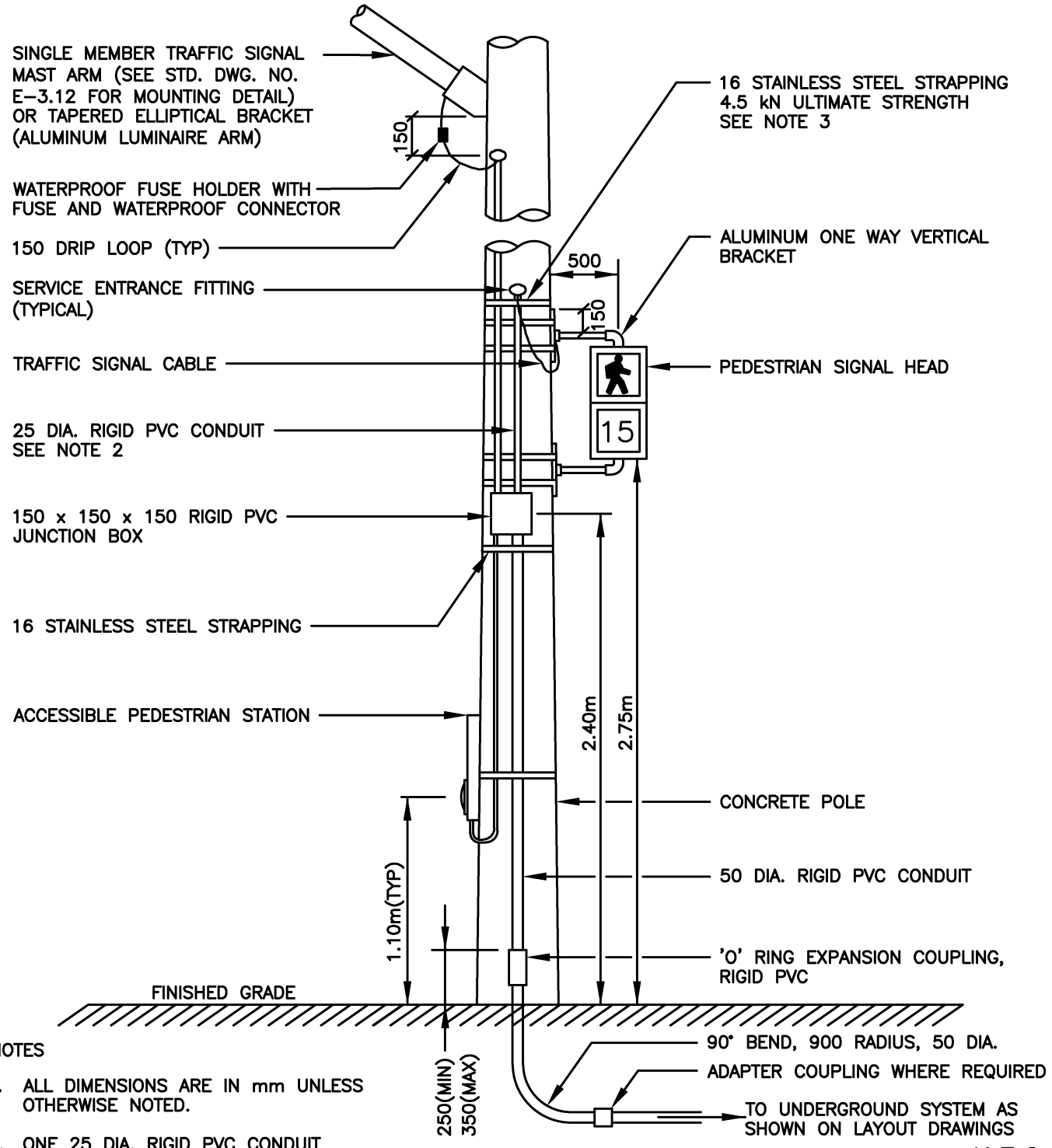
York Region

Public Works Transportation

TRAFFIC SIGNAL EQUIPMENT ON WOOD POLES (BURIED INSTALLATION)

JANUARY 2023
DATE

E–3.05



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ONE 25 DIA. RIGID PVC CONDUIT REQUIRED FOR EACH PEDESTRIAN SIGNAL HEAD. INSTALL PEDESTRIAN SIGNAL HEADS PRIOR TO CONDUIT.
3. INSTALL CONDUIT SYSTEM TO OBTAIN A NEAT AND STRAIGHT INSTALLATION.
4. FOR ORIENTATION AND LOCATION OF POLES AND EQUIPMENT SEE LAYOUT DRAWINGS.
5. ALL STEEL TRAFFIC SIGNAL EQUIPMENT IS TO BE ADEQUATELY GROUNDED.
6. ALL VERTICAL PVC CONDUITS ARE TO BE SECURED BY BANDING AT INTERVALS NO GREATER THAN SPECIFIED BY ESA RULE 12-1114, BASED ON CONDUIT SIZE.

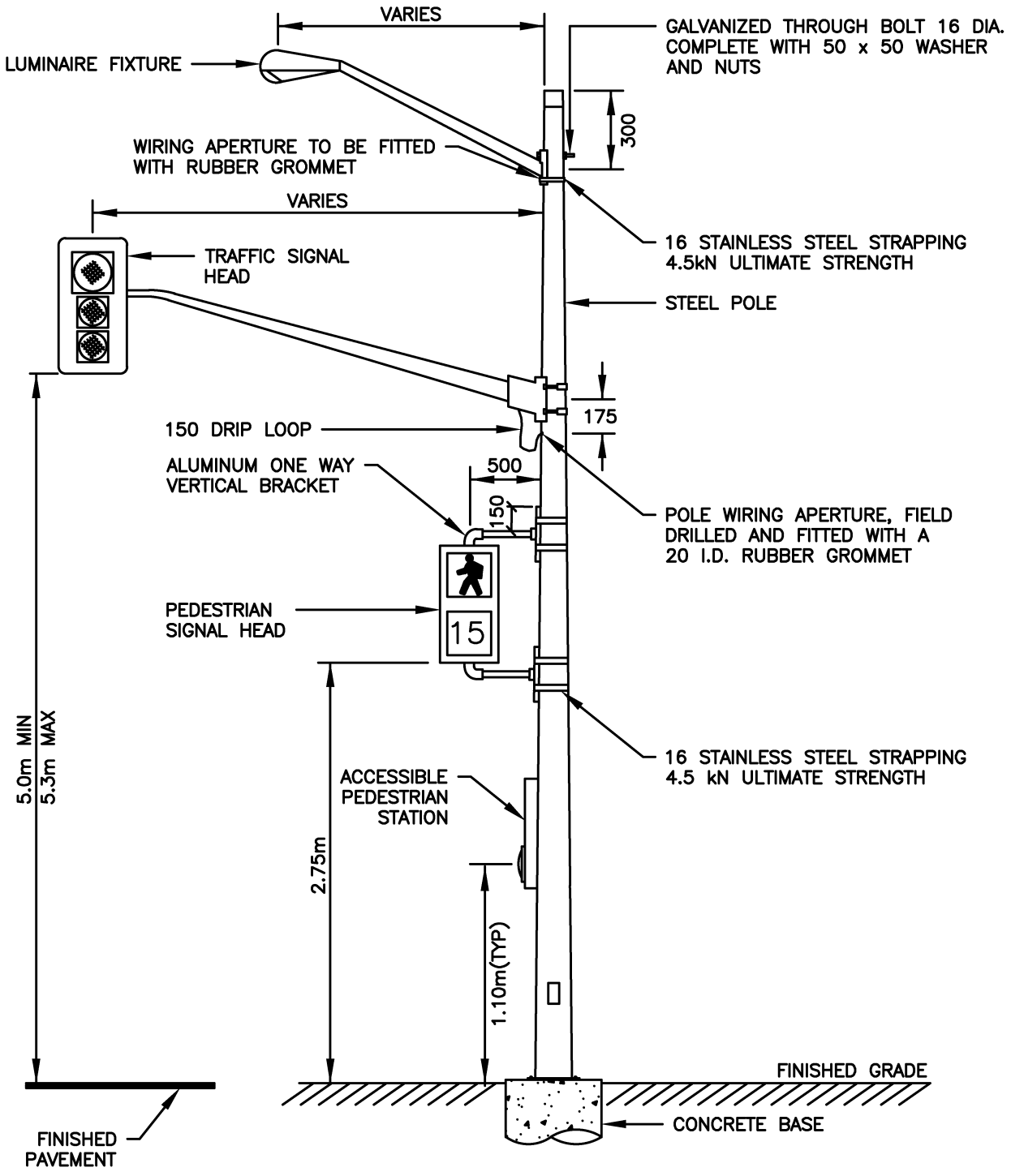
York Region

Public Works Transportation

TRAFFIC SIGNAL EQUIPMENT ON CONCRETE POLES (BURIED INSTALLATION)

JANUARY 2023
DATE

E-3.05A



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. WIRING APERTURE IS TO BE 25 BELOW OVERLAPPING SECTIONAL STEEL JOINTS WHEN SECTION STEEL POLES ARE SPECIFIED.
3. ALL WIRING APERTURES ARE TO BE DE-BURRED & PROTECTED WITH GREY ZINC RICH PAINT.
4. FOR ORIENTATION AND LOCATION OF POLES AND EQUIPMENT SEE LAYOUT DRAWINGS.

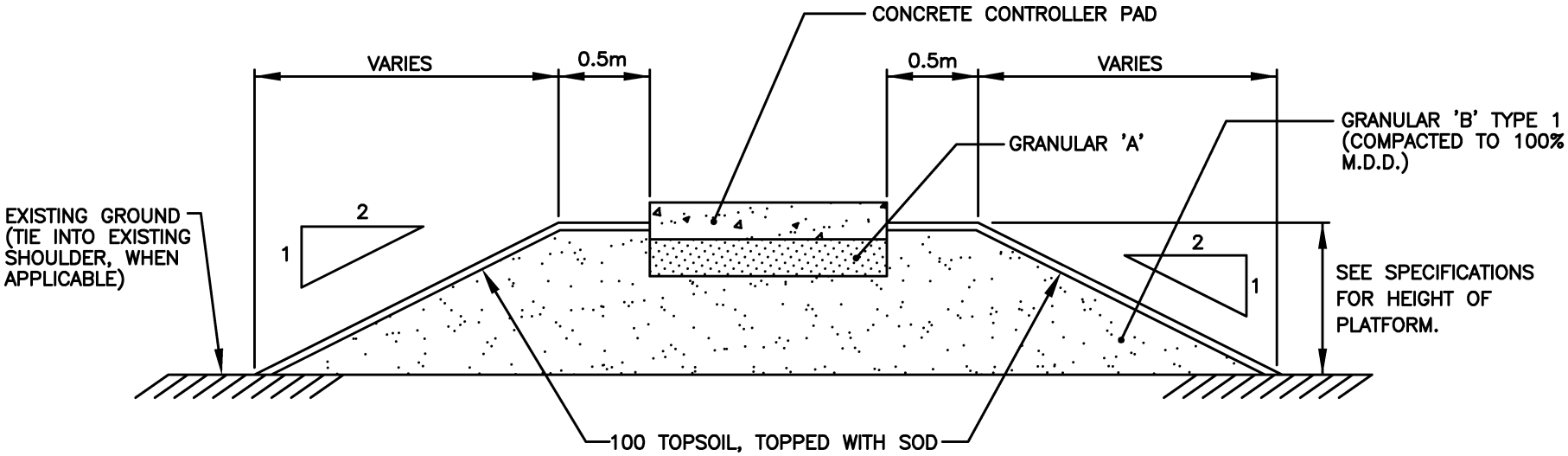
York Region

Public Works
Transportation

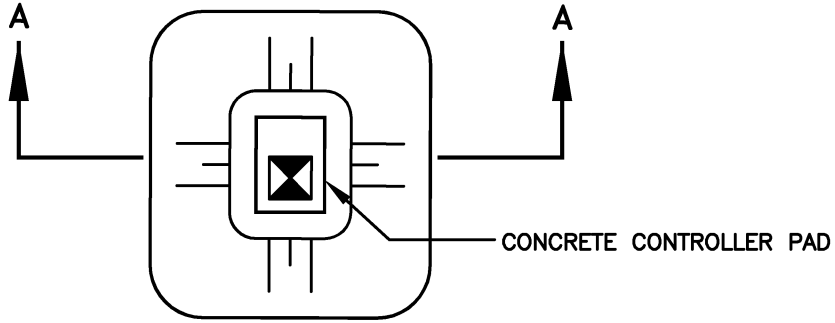
TRAFFIC SIGNAL EQUIPMENT ON STEEL POLES (BURIED INSTALLATION)

JANUARY 2023
DATE

E-3.06



SECTION A–A



PLAN VIEW

N.T.S.

NOTES:

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. SEE CONTRACT DRAWING FOR CONTROLLER PAD LOCATION. CONTROLLER PAD TO BE CONSTRUCTED IN ACCORDANCE WITH STANDARD DRAWING NO. E–3.09

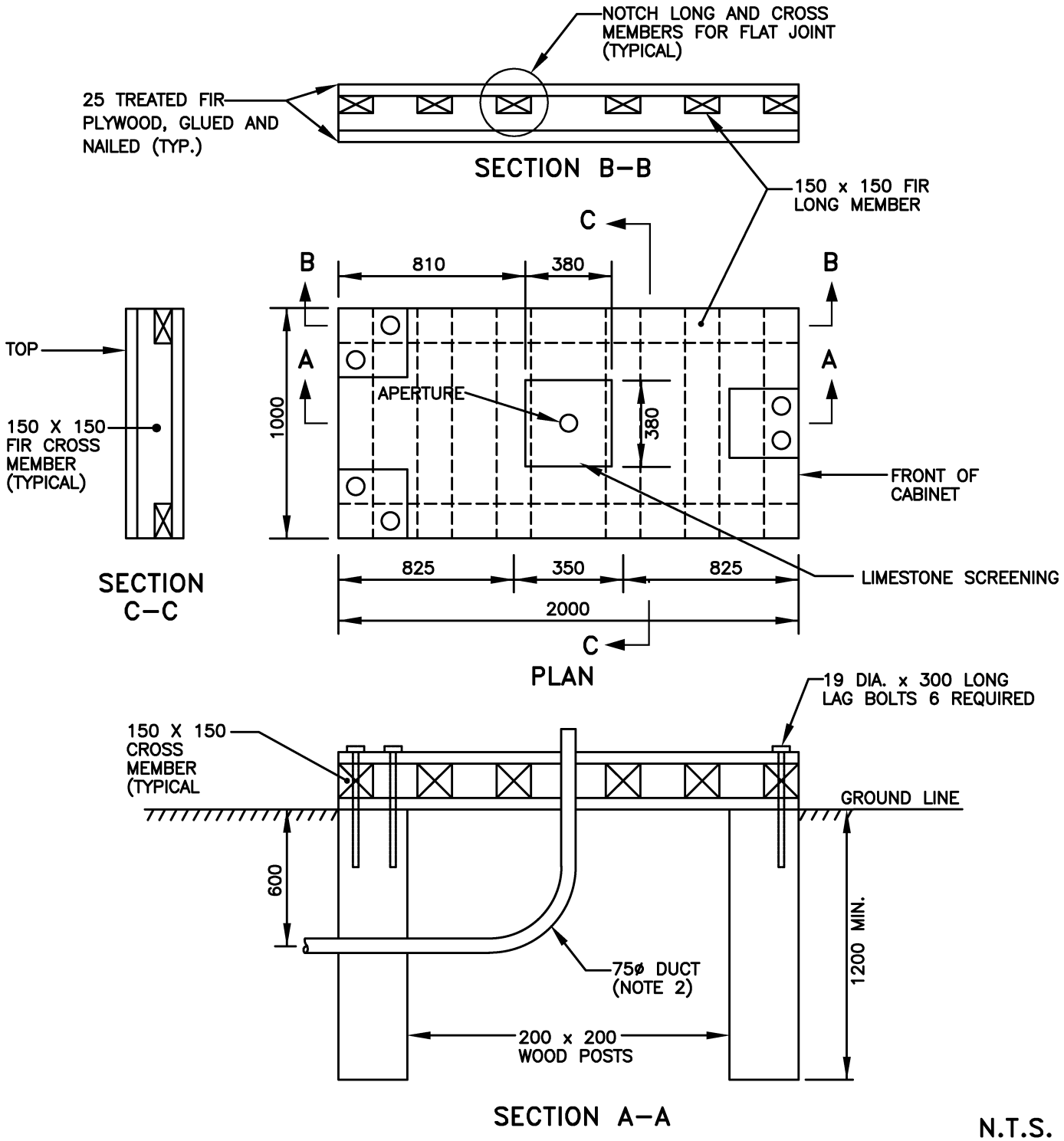
York Region

Public Works
Transportation

EARTH PAD PLATFORM DETAIL FOR CONCRETE CONTROLLER PAD

JANUARY 2023
DATE

E–3.07



N.T.S.

NOTES

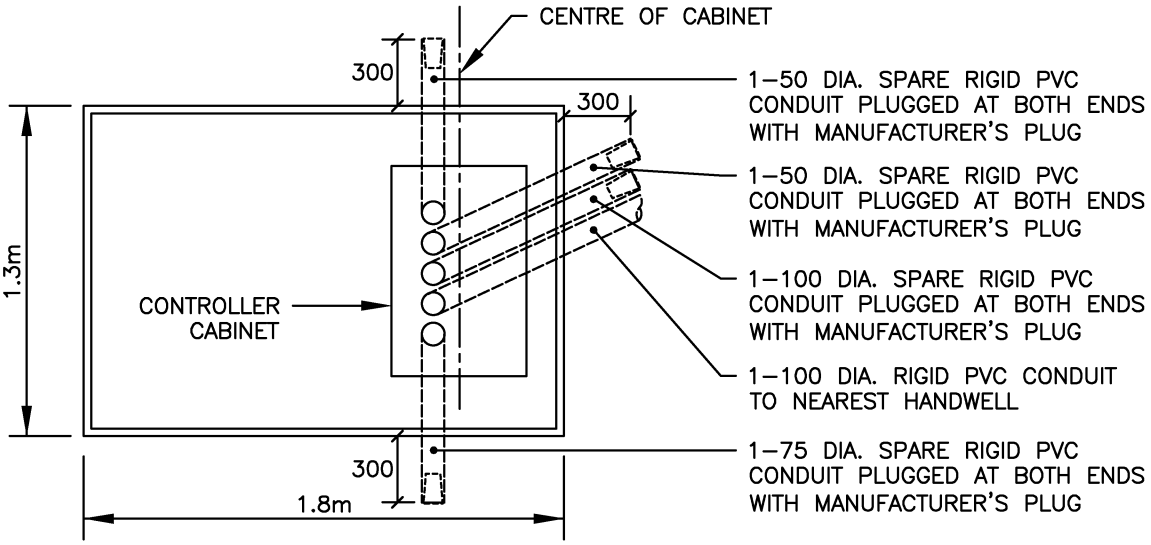
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. FOR NUMBER AND ORIENTATION OF DUCTS SEE LAYOUT DRAWINGS.

York Region **Public Works Transportation**

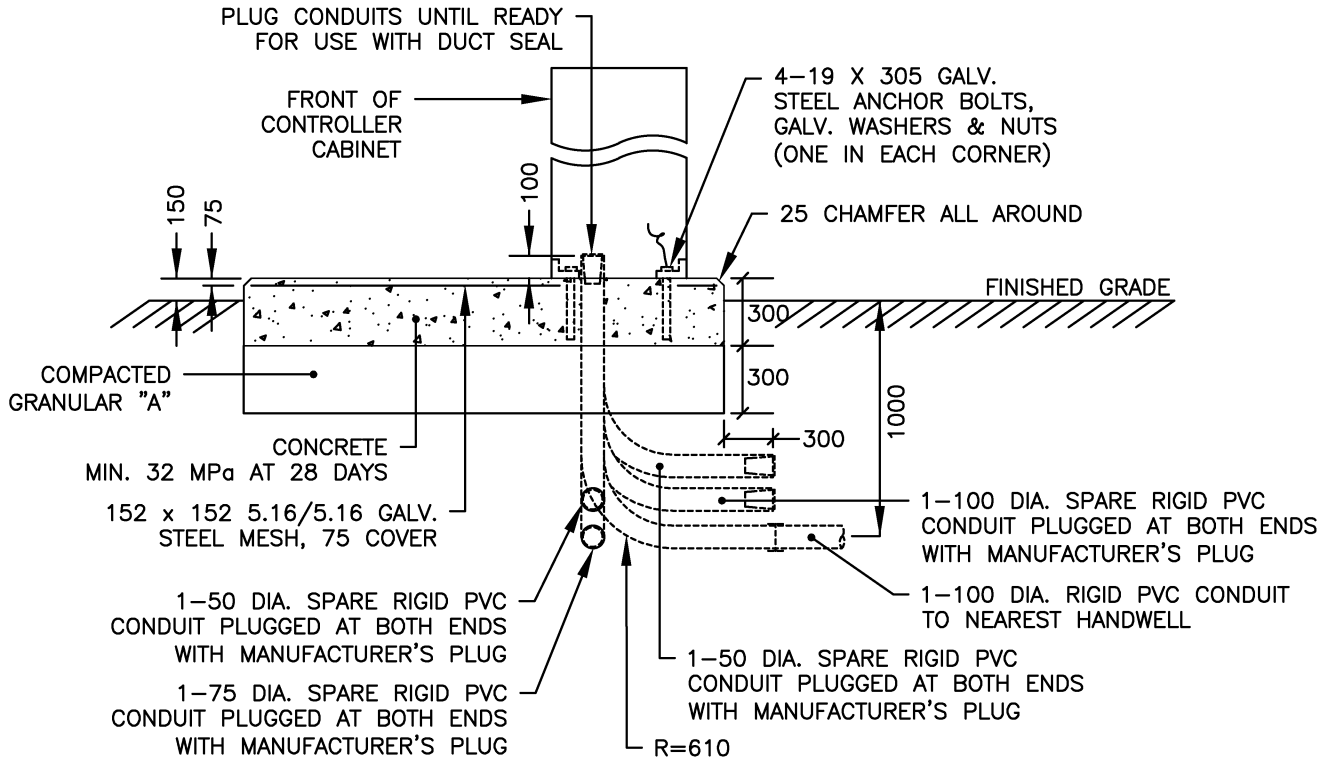
TEMPORARY WOOD TRAFFIC SIGNAL CONTROLLER PAD

JANUARY 2023
DATE

E–3.08



PLAN VIEW



ELEVATION

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR IS TO OBTAIN THE ANCHOR BOLT PATTERNS FROM THE CONTROLLER CABINET SUPPLIER.
3. CONCRETE AND REINFORCING STEEL TO BE PLACED IN ACCORDANCE WITH M.T.O. FORM 904 AND 905.
4. SEE CONTRACT DRAWINGS FOR CONCRETE PAD LOCATION.
5. REFER TO STD. DWG. E–3.09A FOR CONCRETE CONTROLLER PAD CLEARANCE.

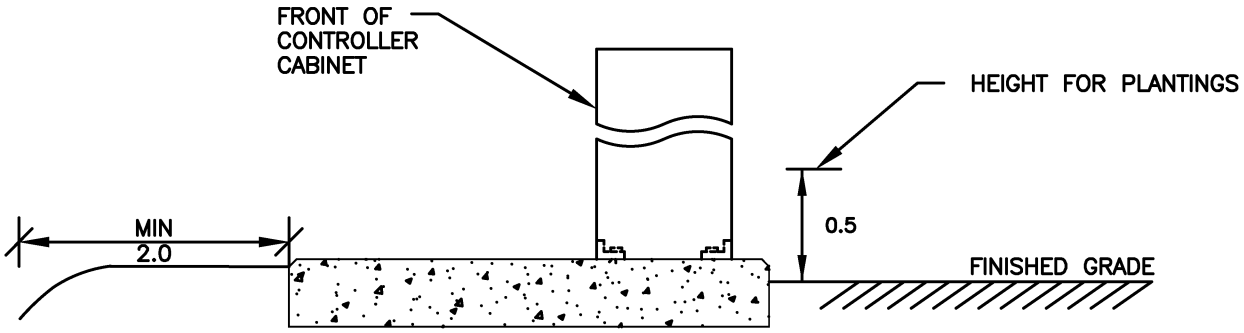
York Region

Public Works
Transportation

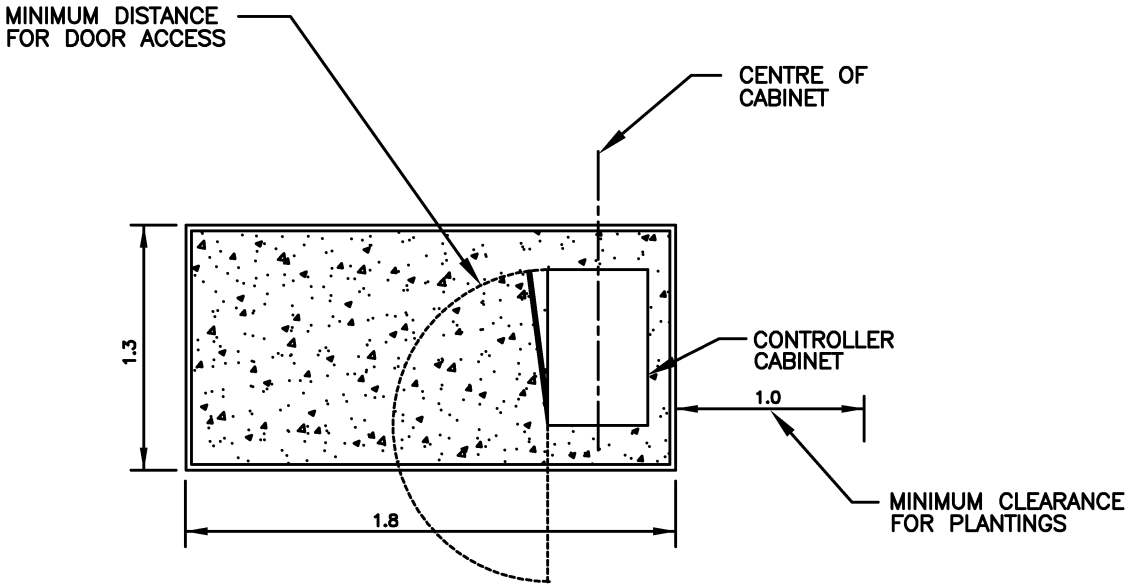
TYPICAL CONCRETE PAD FOR TRAFFIC SIGNAL CONTROLLER

JANUARY 2023
DATE

E–3.09



ELEVATION



PLAN VIEW

NOTES

1. ALL DIMENSIONS ARE IN m UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR IS TO OBTAIN THE ANCHOR BOLT PATTERNS FROM THE CONTROLLER CABINET SUPPLIER.
3. THE CONTROLLER PAD SHALL HAVE A 1.0m CLEARANCE FROM ALL PLANTINGS AND PLANTINGS SHALL BE NO MORE THAN 0.5m IN HEIGHT
4. A HARD SURFACE IS REQUIRED TO ACCESS THE CONTROLLER PAD; NO DIRT OR SHAVINGS
5. HEIGHT OF CONTROLLER PAD MUST MATCH OR EXCEED THE HEIGHT OF THE PLANTER CURB, IF APPLICABLE
6. THE CONTROLLER DOOR SHALL NOT ENCROACH ANY WALKWAYS WHEN OPEN
7. MINIMUM OF 2.0m LEVEL GROUND IN FRONT OF CONTROLLER PAD.
8. CONTROLLER ORIENTATION TO BE DETERMINED ON SITE WITH ELECTRICAL CONSTRUCTION COORDINATOR

N.T.S.

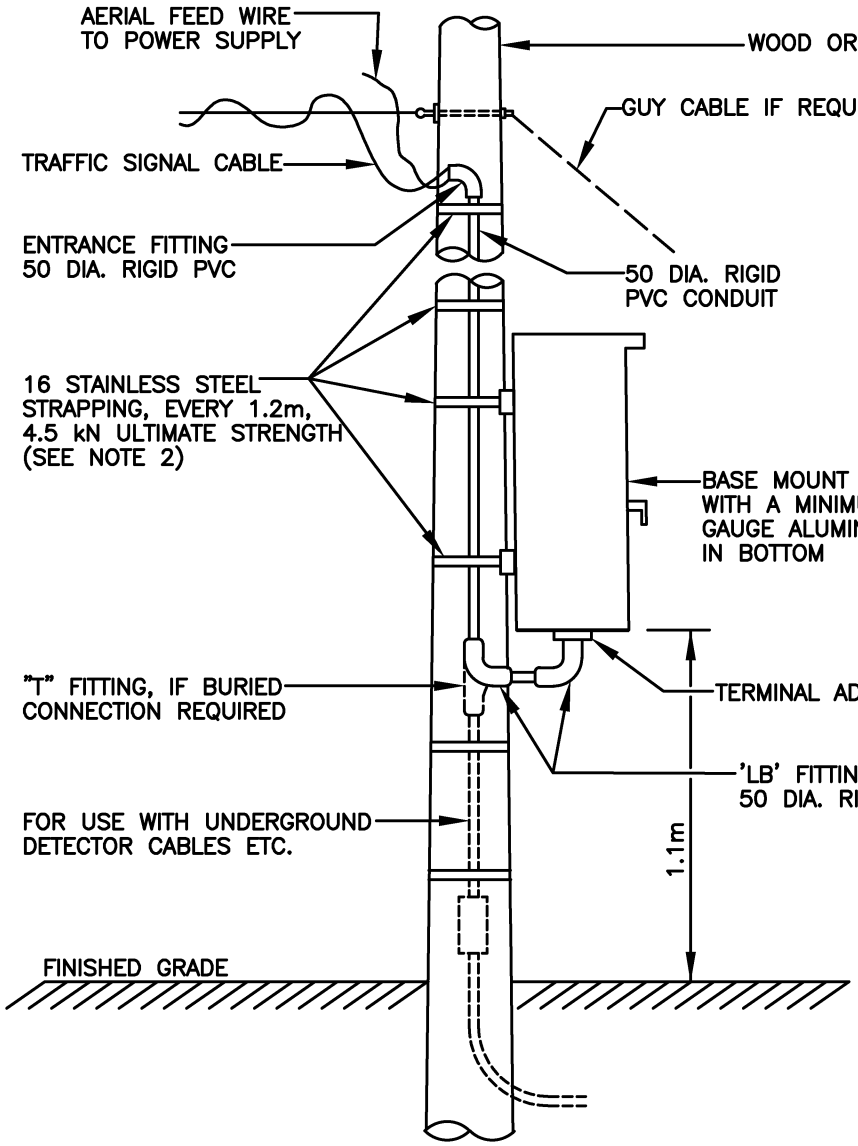
York Region

Public Works
Transportation

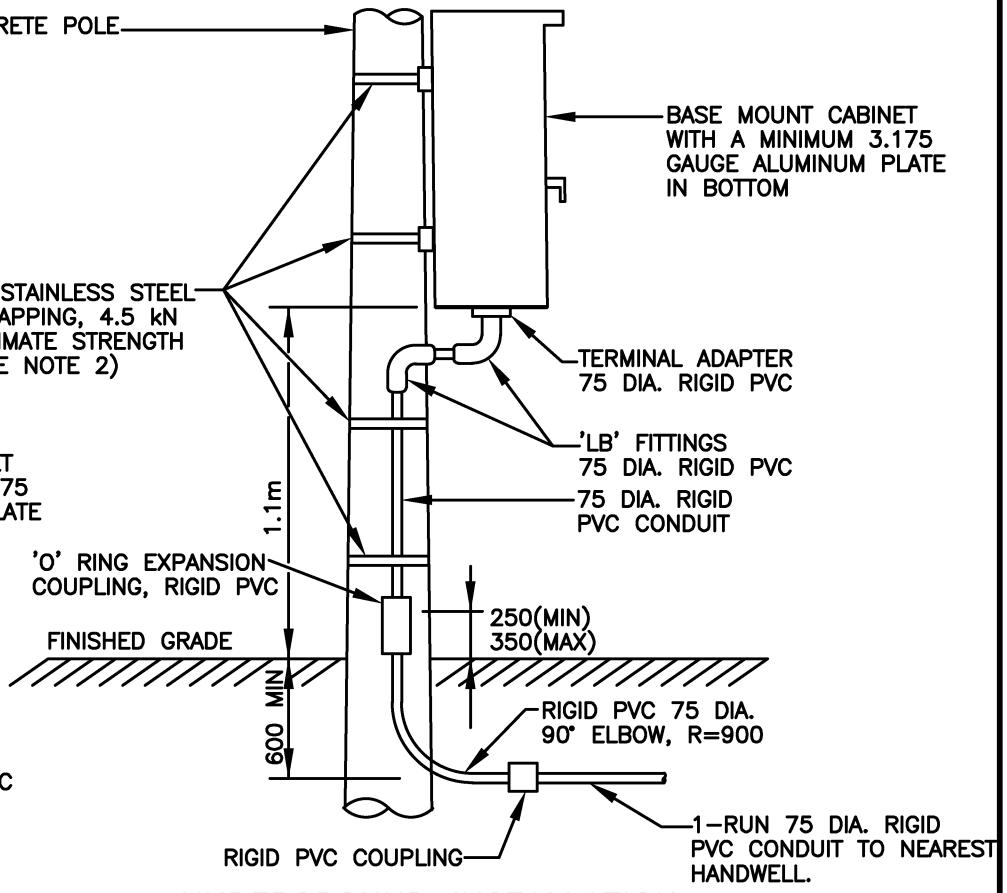
CONCRETE CONTROLLER PAD CLEARANCE

JANUARY 2023
DATE

E–3.09A



AERIAL INSTALLATION



UNDERGROUND INSTALLATION

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. PVC COATED STEEL PIPE STRAPS EVERY 1.2m IN LIEU OF STRAPPING ON WOOD POLES.

N.T.S.

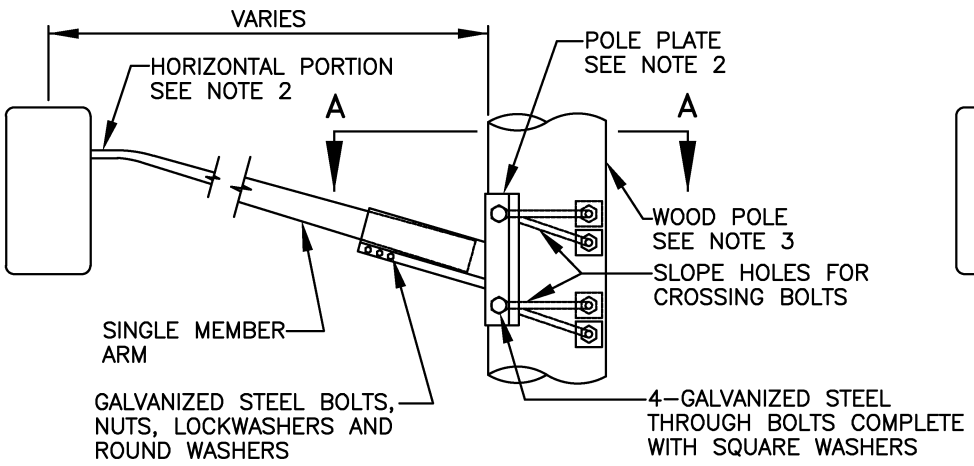
York Region

Public Works Transportation

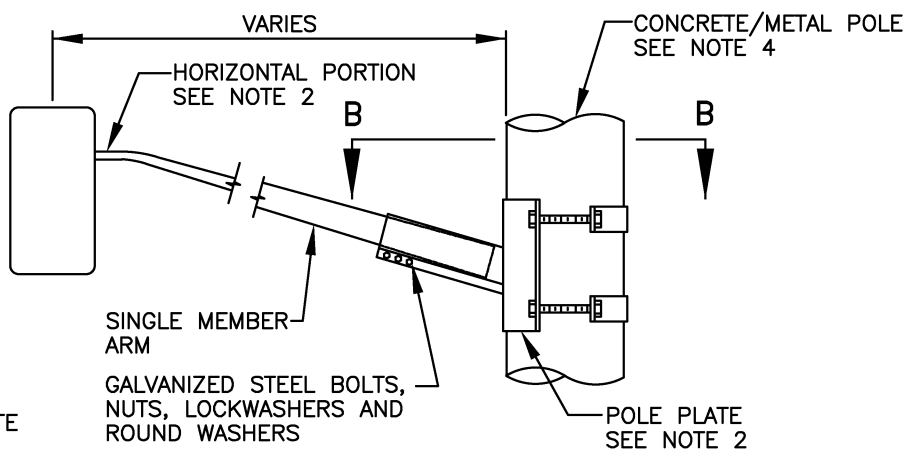
MOUNTING DETAILS FOR CABINET ON DIRECT BURIED POLE

JANUARY 2023
DATE

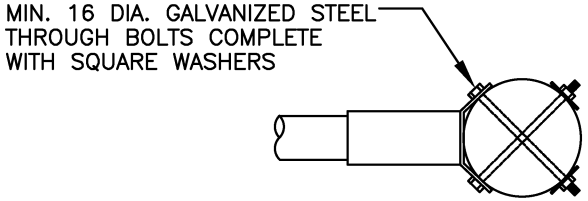
E-3.10



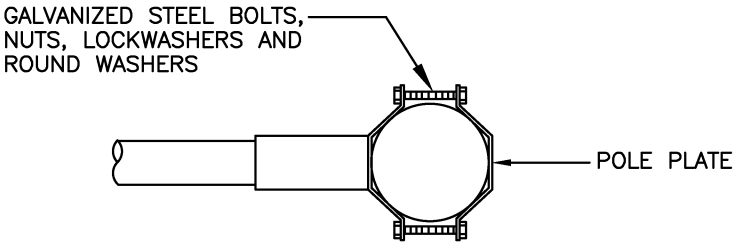
GENERAL ARRANGEMENT



GENERAL ARRANGEMENT



SECTION A–A
WOODEN POLE ATTACHMENT
(SEE NOTE 3)



SECTION B–B
CONCRETE/METAL POLE ATTACHMENT
(SEE NOTE 4)

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. POLE PLATE BOLTS TO BE ADJUSTED SO THAT HORIZONTAL PORTION OF ARM IS LEVEL.
3. WOOD POLE ATTACHMENT – MIN. 16 (5/8") LINE HARDWARE.
4. CONCRETE/METAL POLE ATTACHMENT – AS PER MANUFACTURER SUPPLY.
5. METAL REINFORCEMENT AT THE BOTTOM OF THE POLE PLATE REQUIRED IF SPECIFIED BY THE COMMISSIONER.

N.T.S.

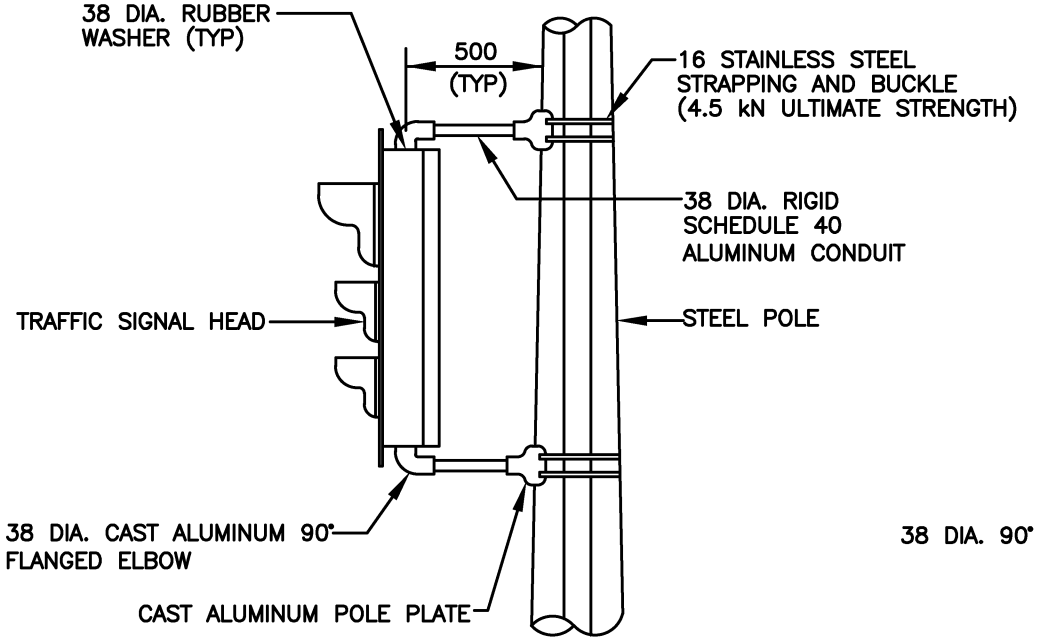
York Region

Public Works
Transportation

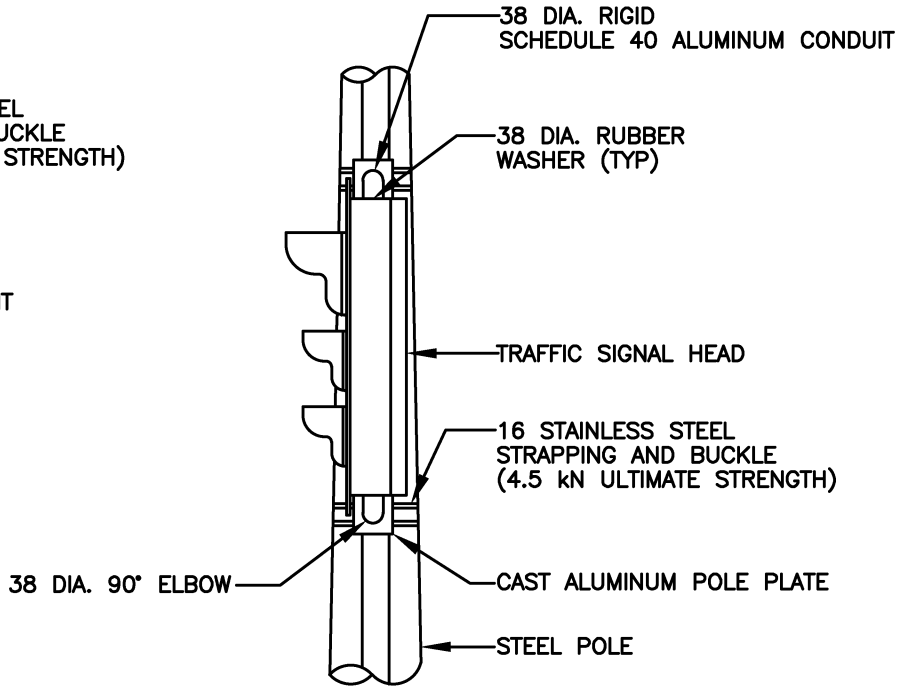
ALUMINUM SINGLE MEMBER TRAFFIC SIGNAL MAST ARM ATTACHMENT DETAILS

JANUARY 2023
DATE

E–3.12



TYPICAL TRAFFIC SIGNAL HEAD
(FRONT MOUNTING)
DETAIL "A"



TYPICAL TRAFFIC SIGNAL HEAD
(SIDE MOUNTING)
DETAIL "B"

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. TRAFFIC SIGNAL HEADS ARE TO BE MOUNTED A MINIMUM OF 4.9m ABOVE THE PAVEMENT. WHEN SPECIAL HEADS ARE SPECIFIED AND THE MINIMUM HEIGHT CANNOT BE ACHIEVED, THE HEADS ARE TO BE MOUNTED AT THE MAXIMUM HEIGHT POSSIBLE.

N.T.S.

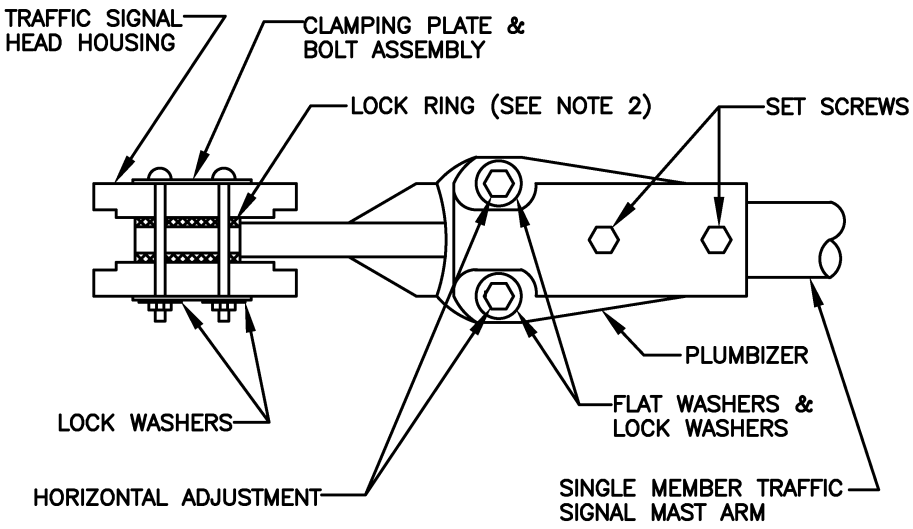
York Region

Public Works
Transportation

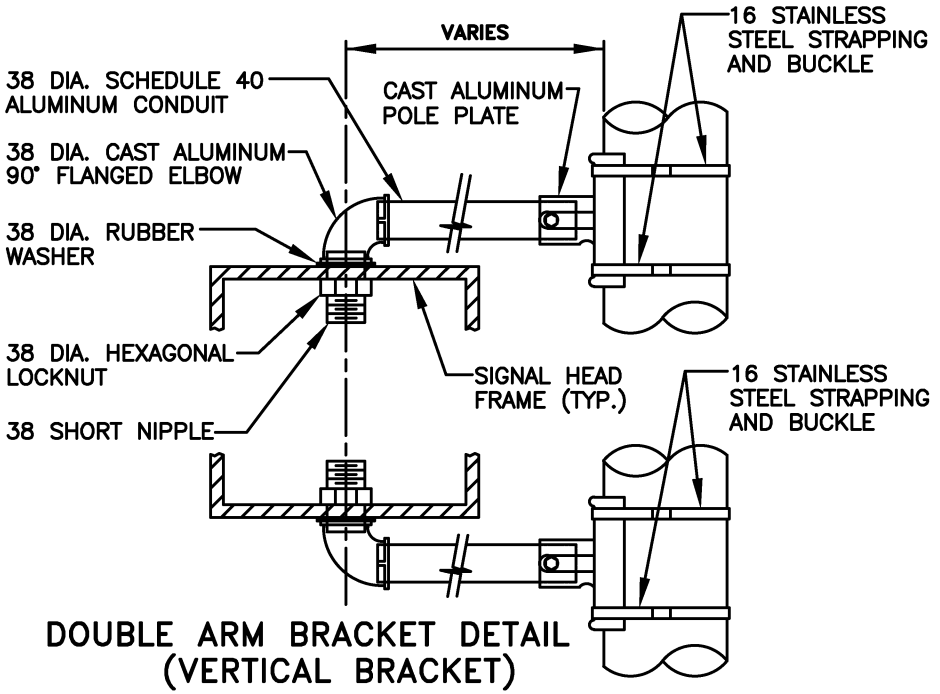
TRAFFIC SIGNAL HEAD
VERTICAL BRACKET MOUNTING DETAIL

JANUARY 2023
DATE

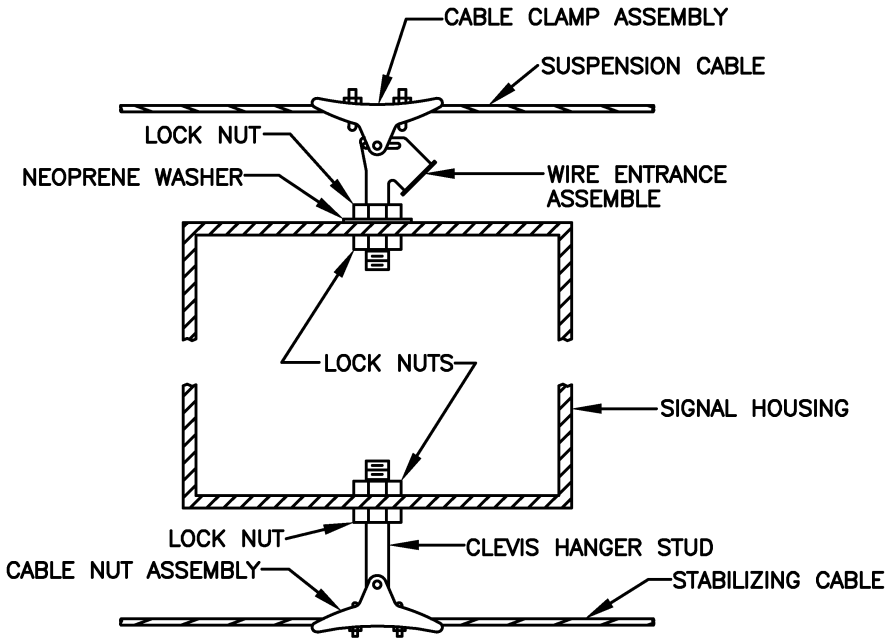
E–3.13



PLUMBIZER ATTACHMENT



DOUBLE ARM BRACKET DETAIL
(VERTICAL BRACKET)



CABLE MOUNTING DETAIL

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. CABLE MOUNTING DETAIL TO BE USED IN CONJUNCTION WITH STD. DWG. NO. E–3.01
3. PLUMBIZER MOUNTING DETAIL TO BE USED IN CONJUNCTION WITH STD. DWG. NO. E–3.15.

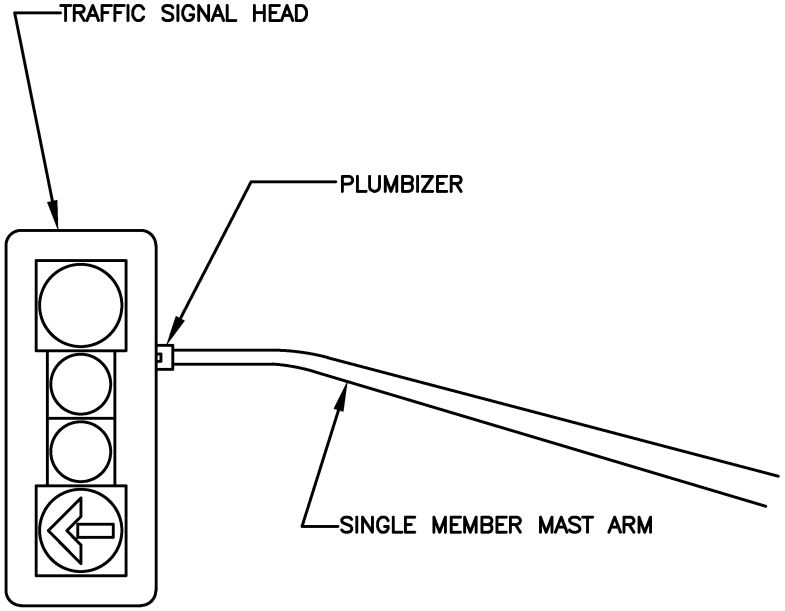
York Region

Public Works
Transportation

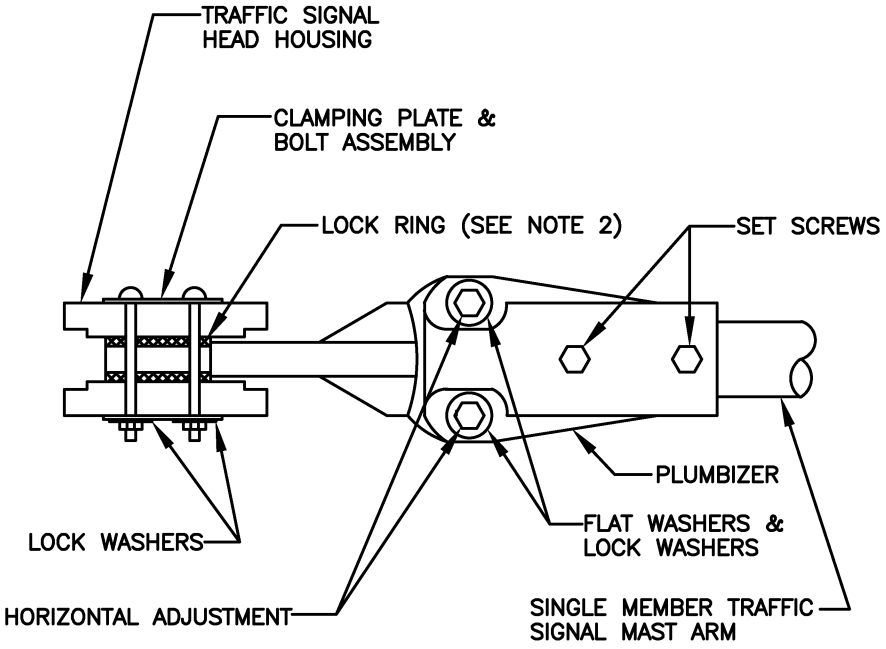
TYPICAL TRAFFIC SIGNAL HEAD MOUNTING DETAILS

JANUARY 2023
DATE

E–3.14



FRONT VIEW



ATTACHMENT

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. LOCK RING OR ADAPTER RING SHALL BE USED WITH HEADS WITHOUT INTEGRALLY CAST MATCHING SERRATIONS. RINGS ARE TO BE OF BRASS OR BRONZE, WITH SUFFICIENT CONTACT AREA TO COVER FLANGE ON SIGNAL HOUSING.
3. THE PLUMBIZER IS TO BE INSTALLED BETWEEN THE RED AND AMBER SECTIONS OF THE TRAFFIC SIGNAL HEAD, UNLESS OTHERWISE SPECIFIED.

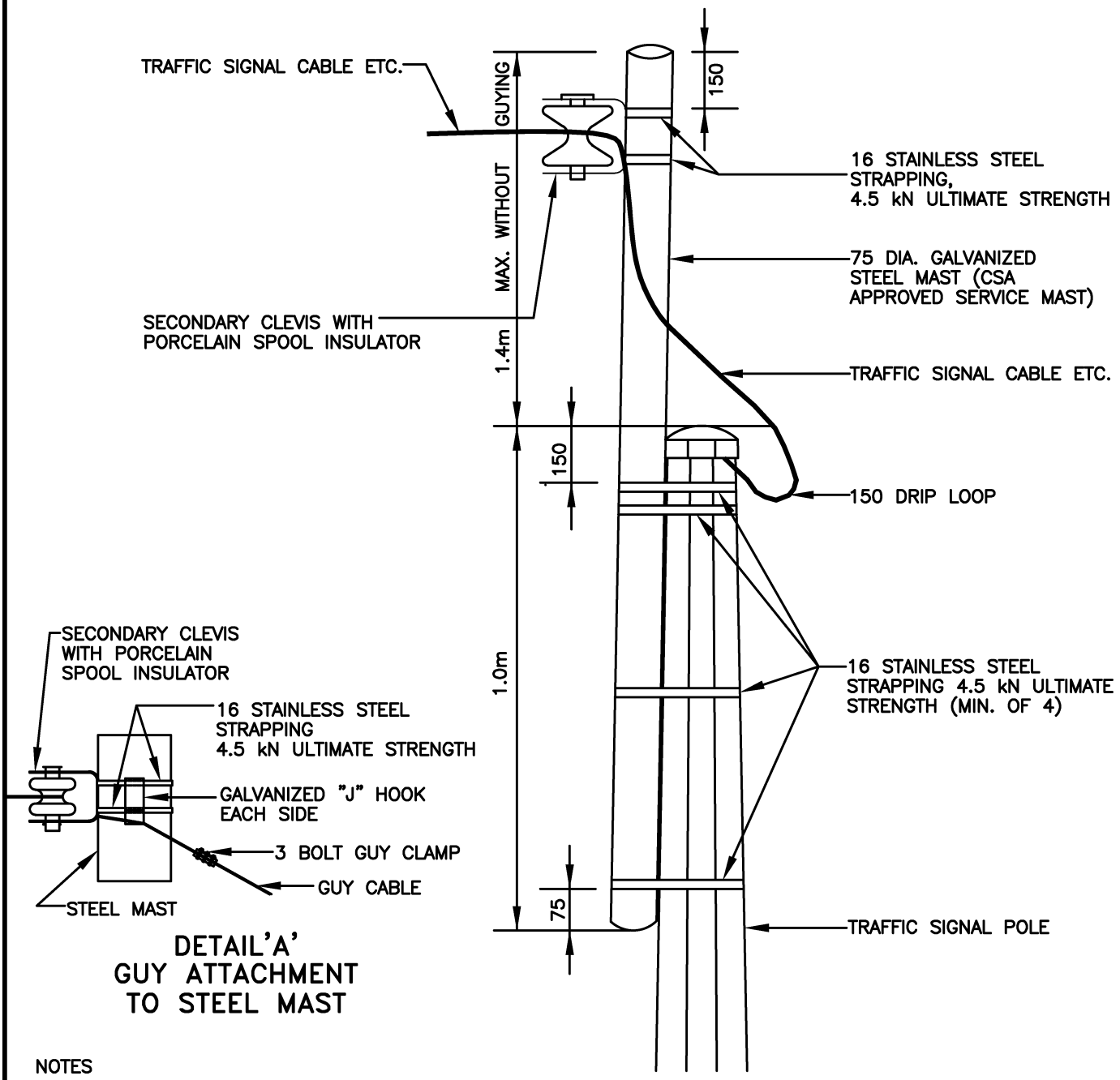
York Region

Public Works
Transportation

ELEVATOR PLUMBIZER (ADJUSTABLE) ATTACHMENT DETAIL

JANUARY 2023
DATE

E–3.15



DETAIL'A'
GUY ATTACHMENT TO STEEL MAST

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. LENGTH OF STEEL MAST TO BE DETERMINED BY A MINIMUM ROAD CROSSING CLEARANCE OF 5.8m AT MAXIMUM SAG.
3. NO HOLES ARE TO BE DRILLED IN THE EXISTING STEEL POLES. ALL TEMPORARY WIRING IS TO BE DONE THROUGH THE TOP OF THE STEEL POLES. THE CONTRACTOR MUST ENSURE THE APERTURE IS WEATHERPROOF.
4. GUYING IS REQUIRED IF STEEL MAST EXTENSION EXCEEDS 1.4m OR IF SPECIFIED. IF GUYING IS REQUIRED, IT IS TO BE IN ACCORDANCE WITH DETAIL 'A' & STD. DWG. E–3.22 OR E–3.23

N.T.S.

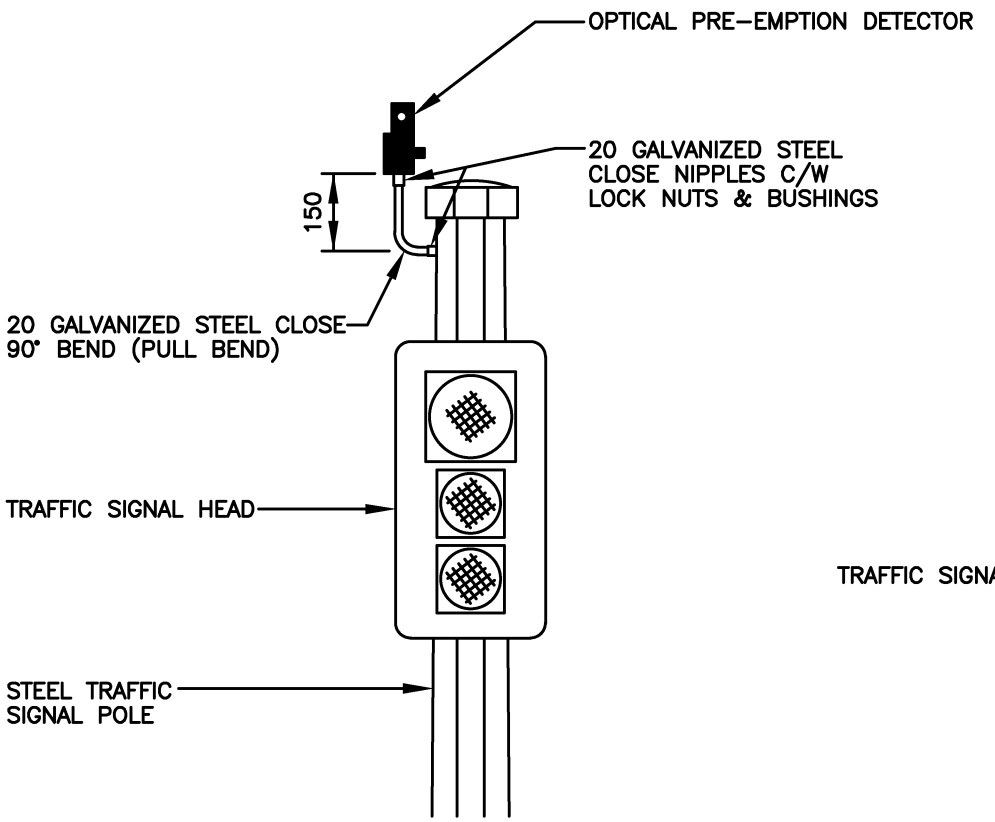
York Region

Public Works Transportation

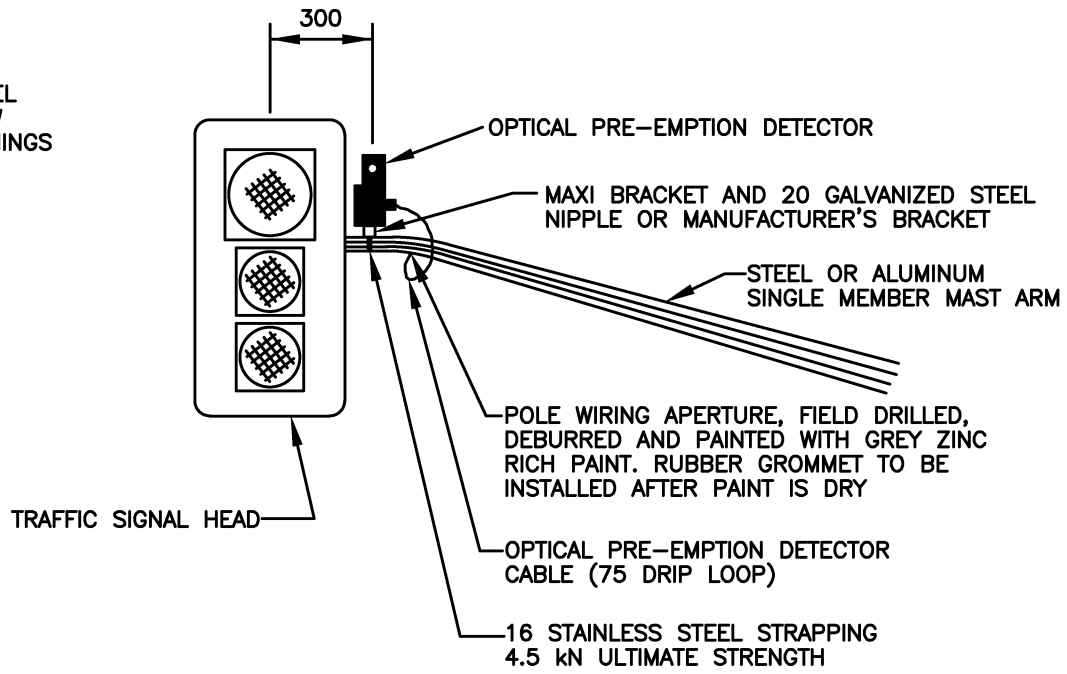
TEMPORARY MAST EXTENSION DETAIL

JANUARY 2023
DATE

E–3.16



POLE MOUNTING



MAST ARM MOUNTING

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.

N.T.S.

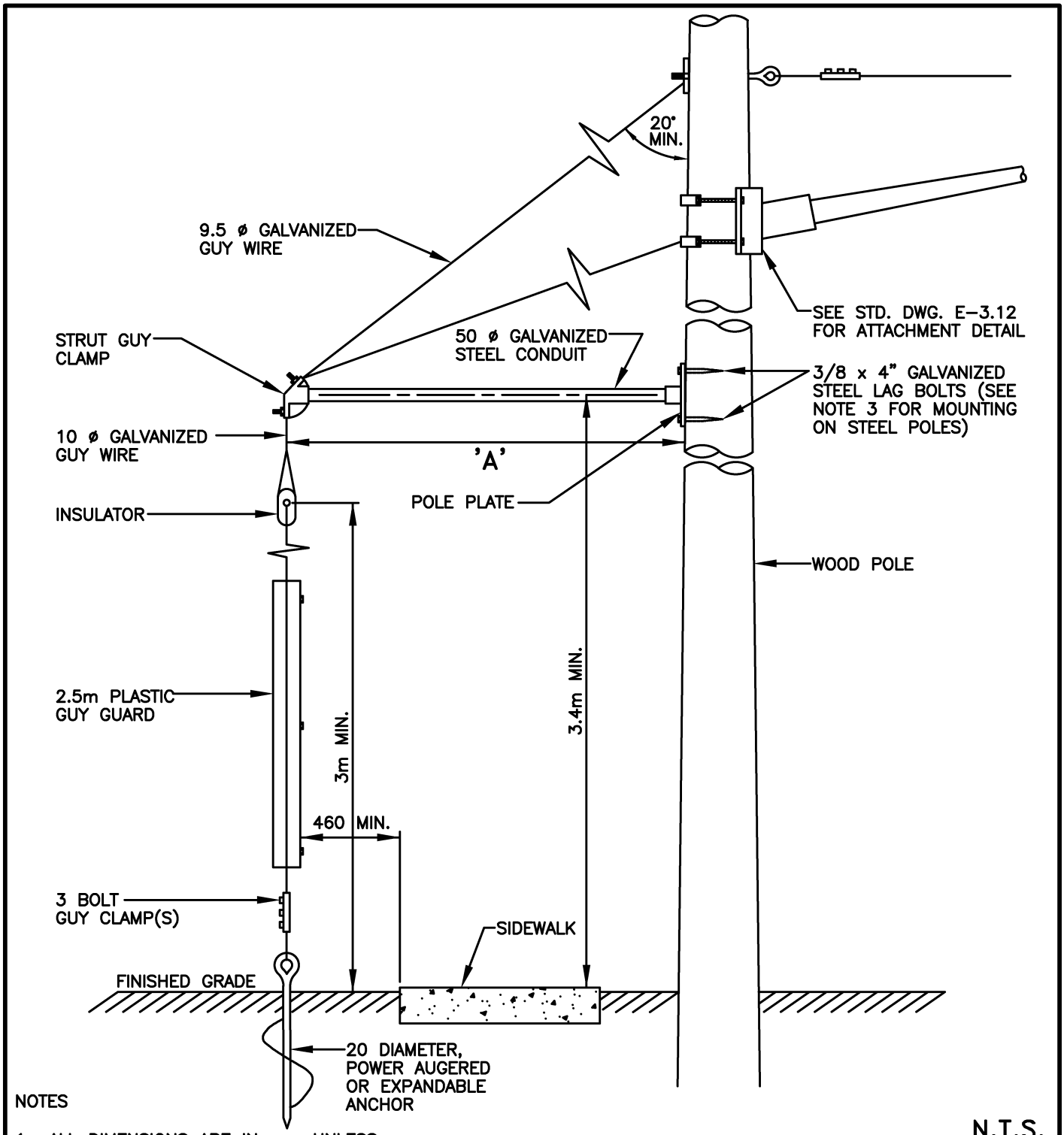
York Region

Public Works
Transportation

INSTALLATION DETAIL FOR OPTICAL PRE-EMPTION DETECTOR

JANUARY 2023
DATE

E-3.17



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. LENGTH 'A' TO BE SPECIFIED FOR EACH INSTALLATION. MAX. LENGTH TO BE 3m.
3. FOR ATTACHMENT TO STEEL POLES, USE ONE 10 ø GALVANIZED STEEL THROUGH BOLT AND 16 STAINLESS STEEL STRAPPING AND BUCKLE.
4. REFER TO OPSD 2235.01 FOR MIN./MAX. LEAD SETTINGS.
5. WHERE IT IS IMPRACTICAL TO INSTALL POWER DRIVEN ANCHORS, 254 ø EXPANDABLE TYPE ANCHORS SHALL BE INSTALLED AND U–FILL SHALL BE USED

N.T.S.

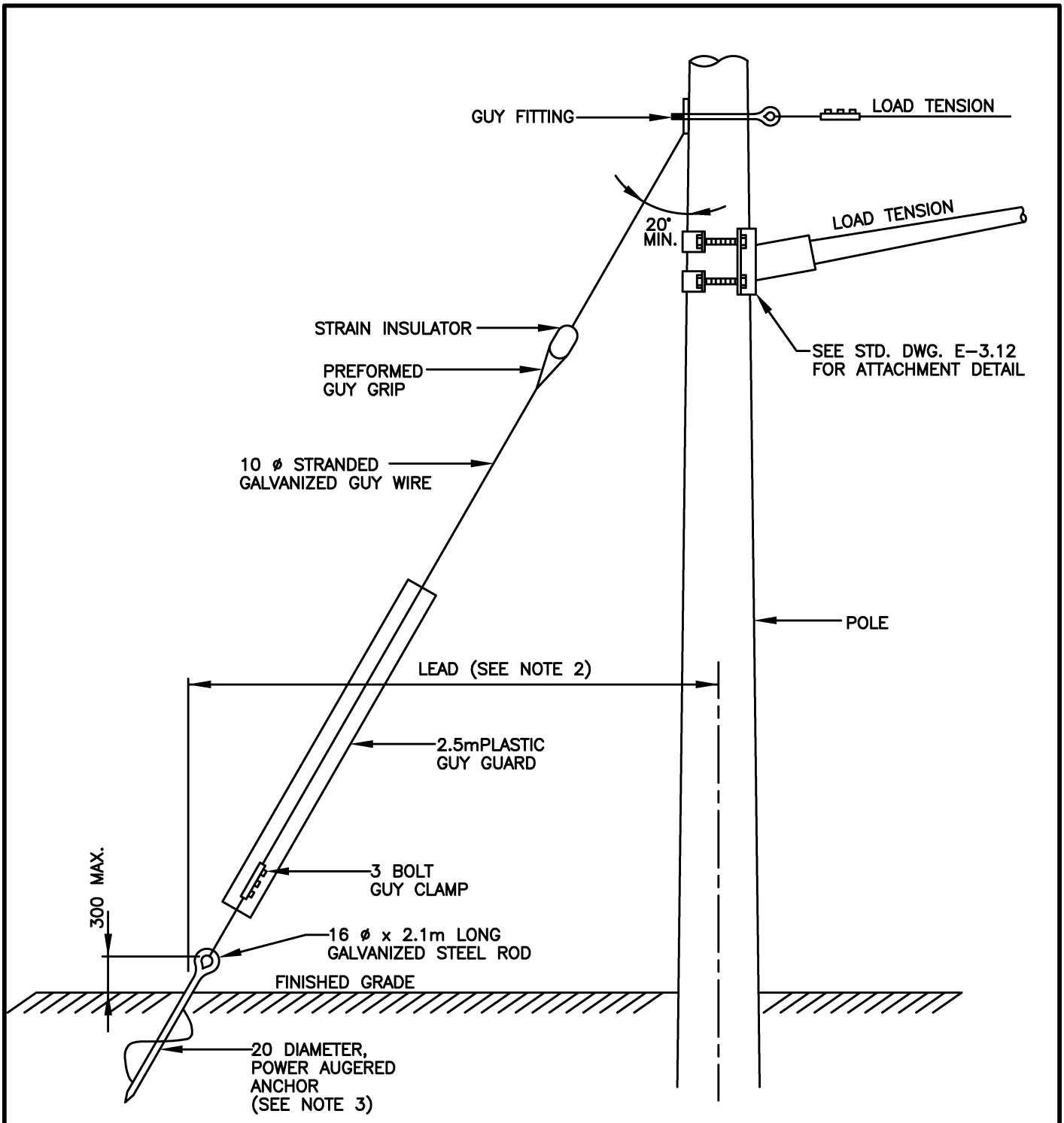
York Region

Public Works
Transportation

TYPICAL STRUT GUY INSTALLATION

JANUARY 2023
DATE

E–3.22



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. REFER TO OPSD 2235.01 FOR MIN./MAX. LEAD SETTINGS.
3. WHERE IT IS IMPRACTICAL TO INSTALL POWER DRIVEN ANCHORS, 254 ø EXPANDABLE TYPE ANCHORS SHALL BE INSTALLED AND U-FILL SHALL BE USED

N.T.S.

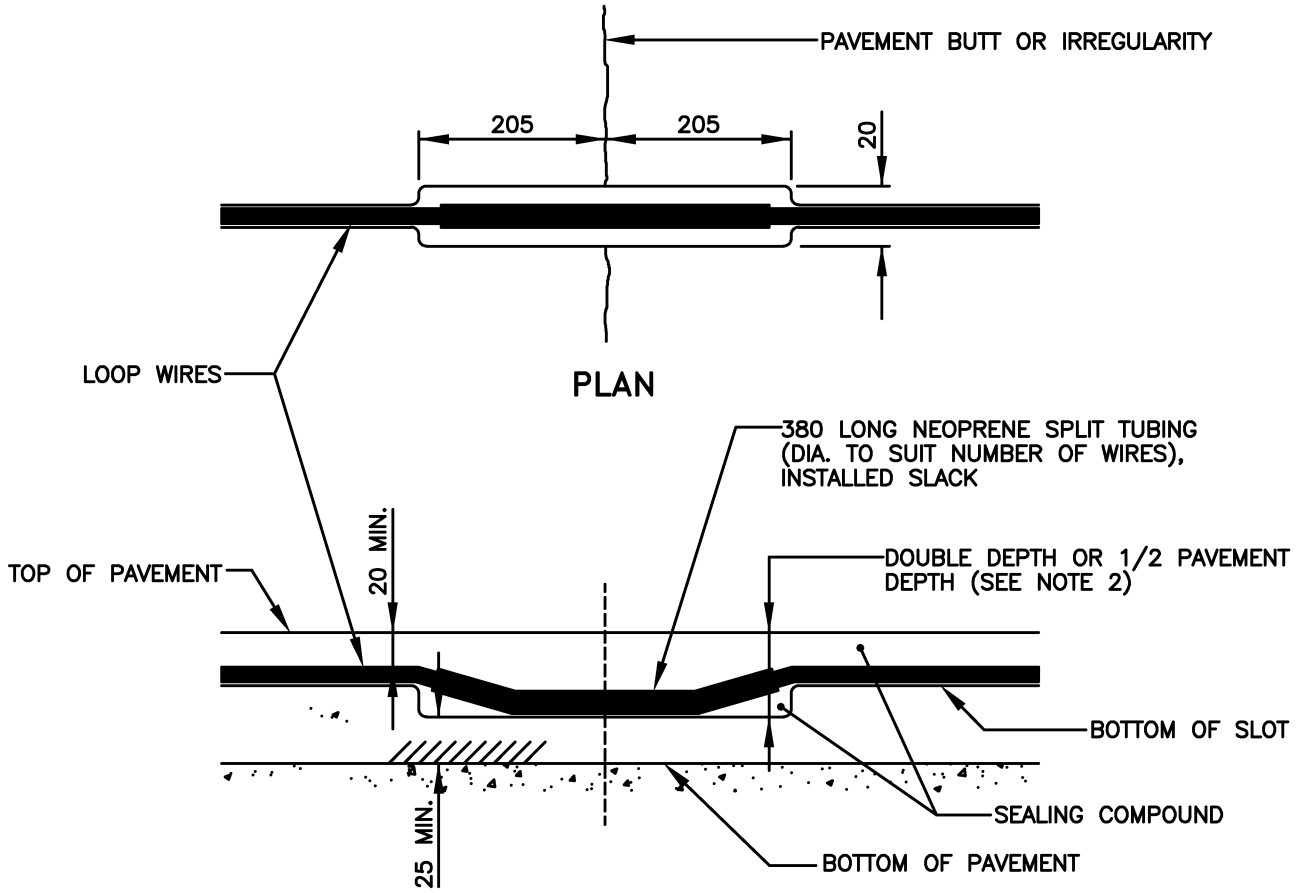
York Region

Public Works
Transportation

TYPICAL POLE GUYING DETAIL

JANUARY 2023
DATE

E-3.23



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. WIRING TO BE INSTALLED SLACK TO ALLOW FOR EXPANSION AND CONTRACTION. KINKING OR RUBBING OF CABLES ON EXPOSED SHARP AGGREGATES SHALL BE AVOIDED.
3. DEPTH OF SLOT IS DETERMINED BY THE NUMBER OF TURNS REQUIRED.
4. SLOT TO BE CLEANED BY AIR BLAST PRIOR TO INSTALLING WIRING.

N.T.S.

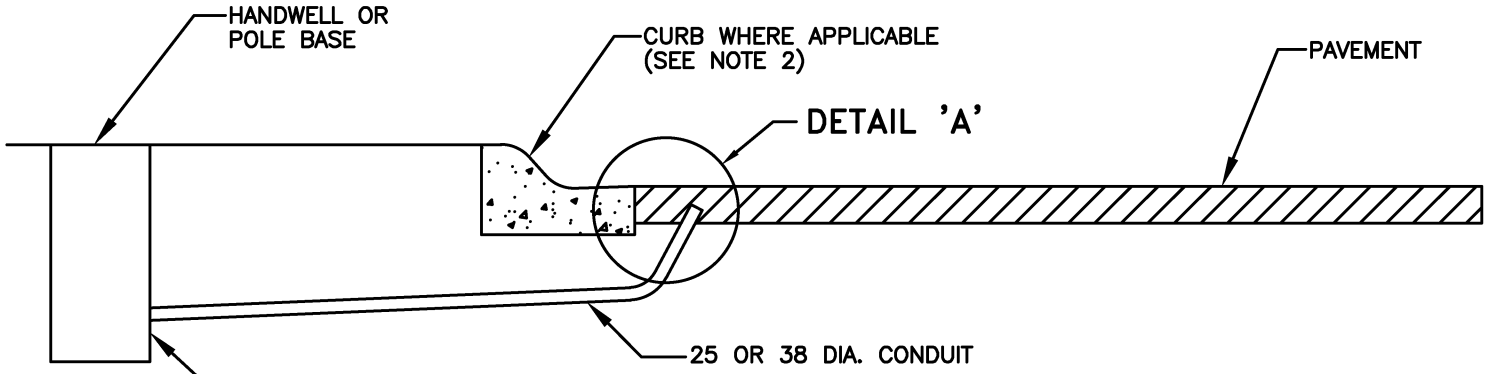
York Region

Public Works
Transportation

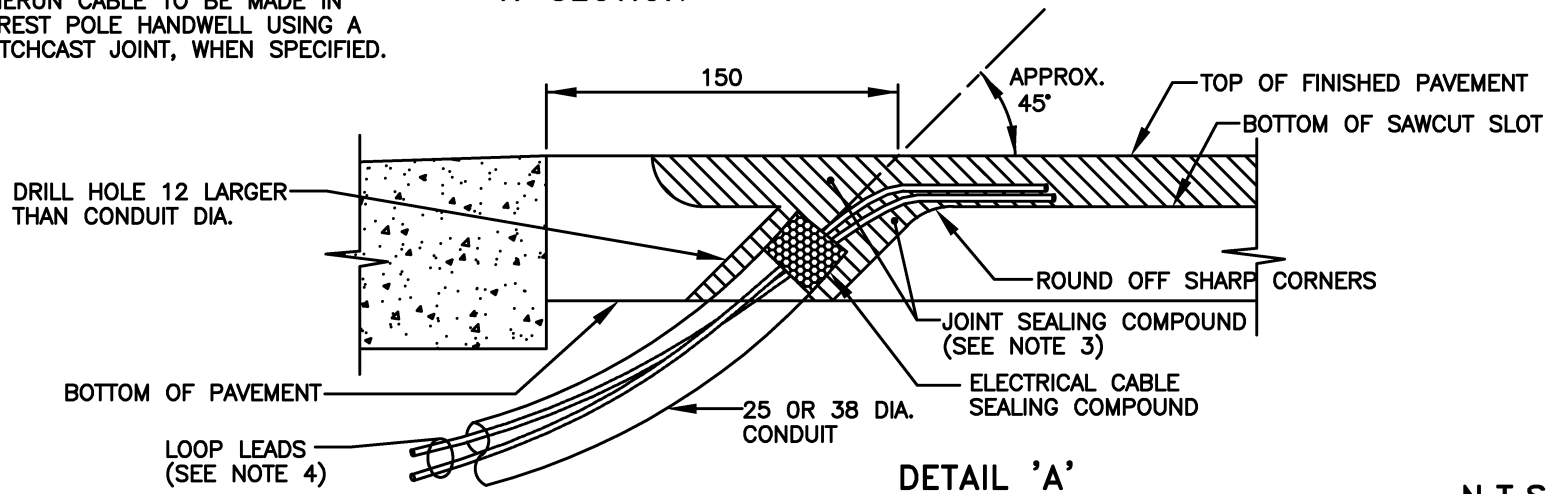
TREATMENT FOR WIRE INDUCTIVE LOOP CROSSING BUTT OR IRREGULARITY

JANUARY 2023
DATE

E–3.24



X–SECTION



DETAIL 'A'

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. GRANULAR MATERIAL UNDER CURB TO BE DISTRIBUTED AS LITTLE AS POSSIBLE AND RECOMPACTED TO 100% DENSITY UPON COMPLETION.
3. THE JOINT SEALING COMPOUND SHALL BE AN APPROVED HOT POURED RUBBERIZED ASPHALT JOINT SEALING COMPOUND. COMPOUND SHALL BE NEATLY PLACED TO PREVENT SPILLAGE ON PAVEMENT.
4. LEADS BETWEEN THE LOOP AND SPLICE POINT SHALL BE TWISTED TEN TURNS PER METRE WITH AN EQUAL LAY ON EACH WIRE.
5. ONLY ONE SPLICE ALLOWED BETWEEN LOOP DETECTOR AND CONTROLLER.
6. FOR LOCATION OF HANDWELLS, POLES ETC., REFER TO LAYOUT DRAWINGS.

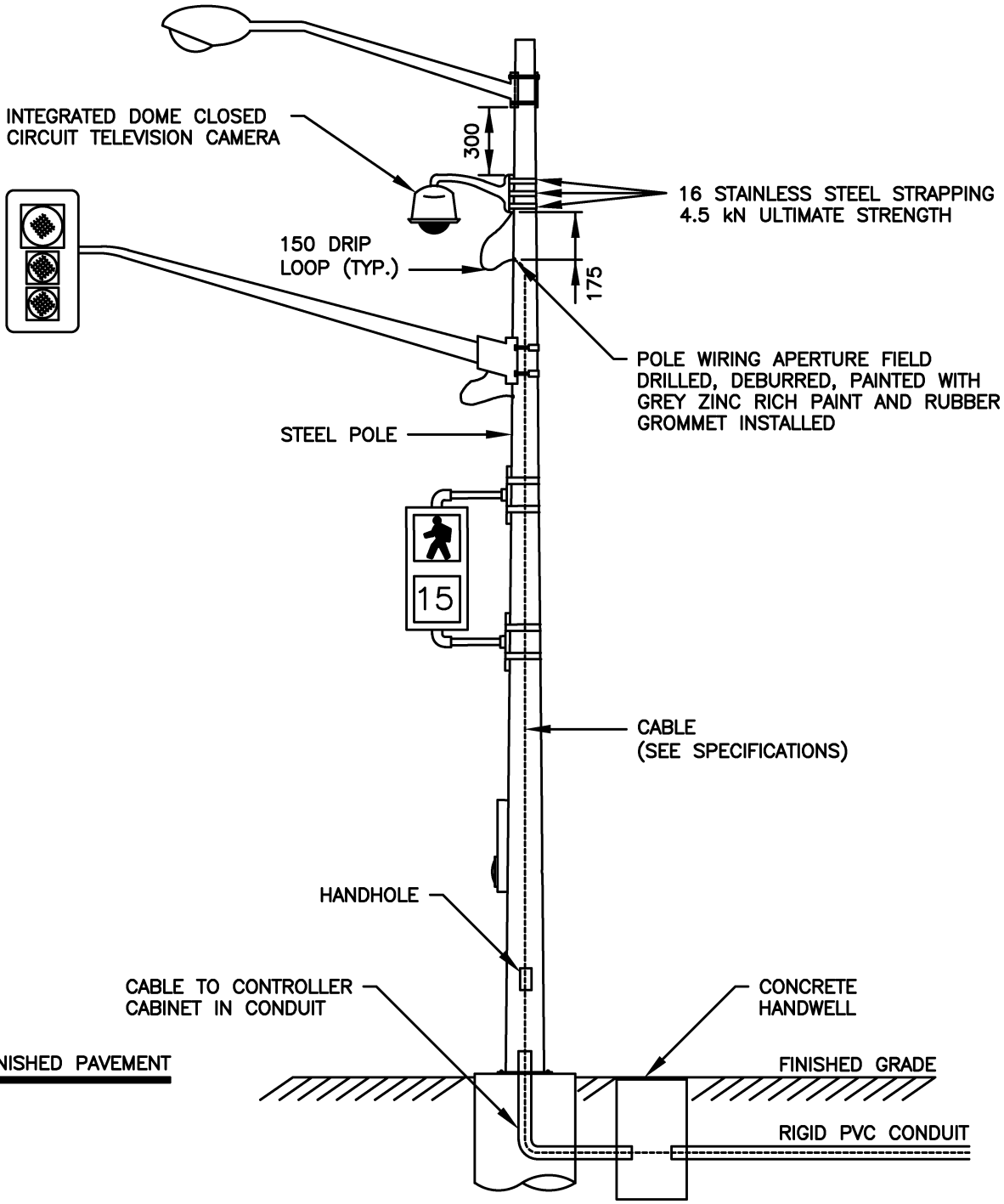
York Region

Public Works
Transportation

LOOP DETECTOR LEAD–IN DETAILS

JANUARY 2023
DATE

E–3.25



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ALL WIRING APERTURES ARE TO BE DEBURRED & PROTECTED WITH GREY ZINC RICH PAINT.
3. FOR ORIENTATION AND LOCATION OF POLES AND EQUIPMENT SEE LAYOUT DRAWINGS OR REFER TO SPECIFICATIONS.
4. NO SPLICING OF CABLE WILL BE ALLOWED.
5. CAMERA TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION SPECIFICATIONS.

N.T.S.

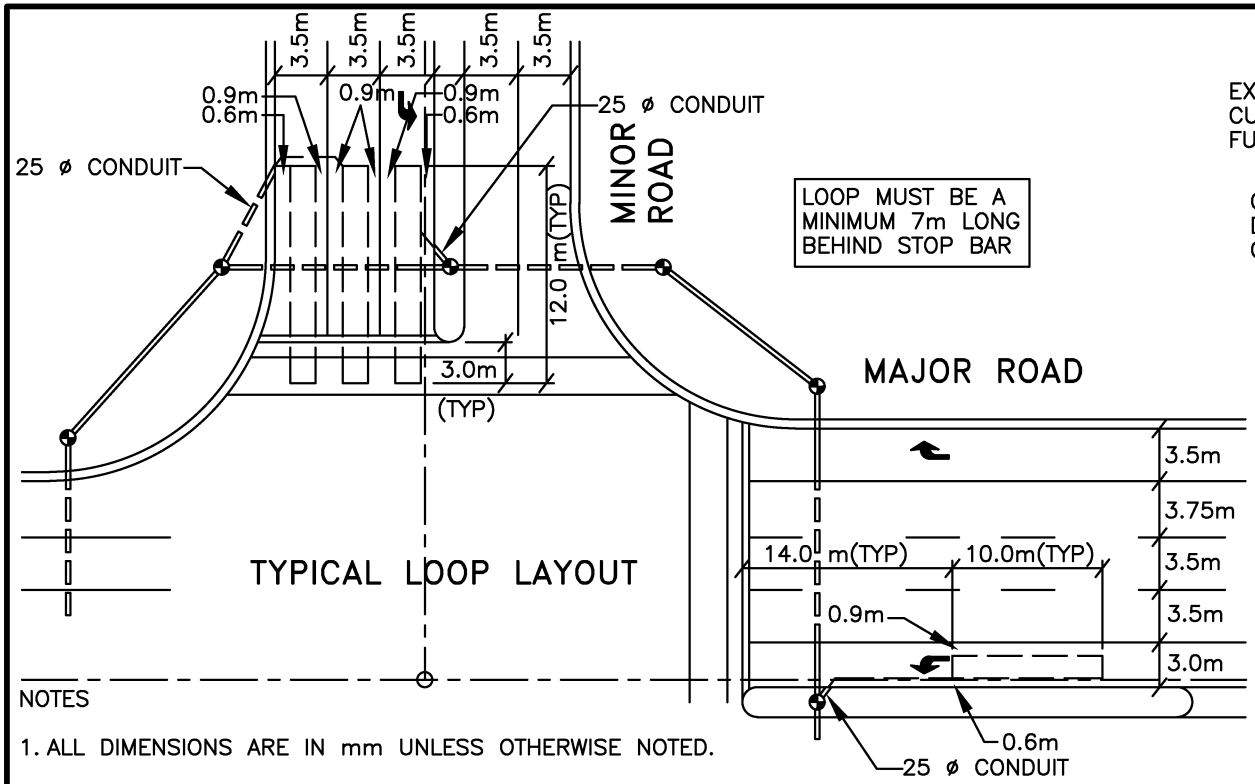
York Region

Public Works Transportation

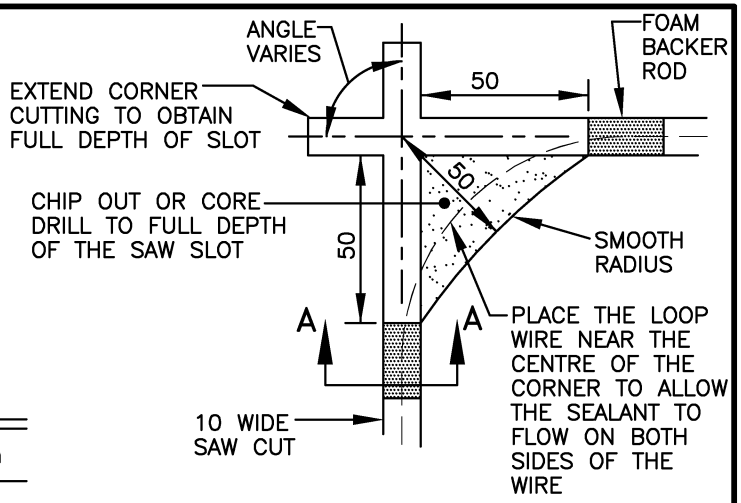
INTEGRATED DOME CLOSE CIRCUIT TELEVISION CAMERA MOUNTING DETAIL

JANUARY 2023
DATE

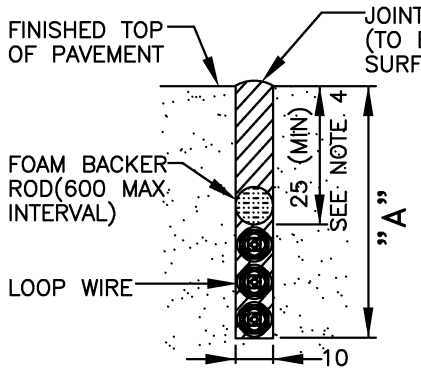
E–3.26



TYPICAL LOOP LAYOUT



DETAIL AT 90° BEND



SECTION A–A

No. OF LOOP WIRES	"A" IN mm (MIN)
1	55
2	55
3	55
4	60
5	65
6	70

N.T.S.

NOTES

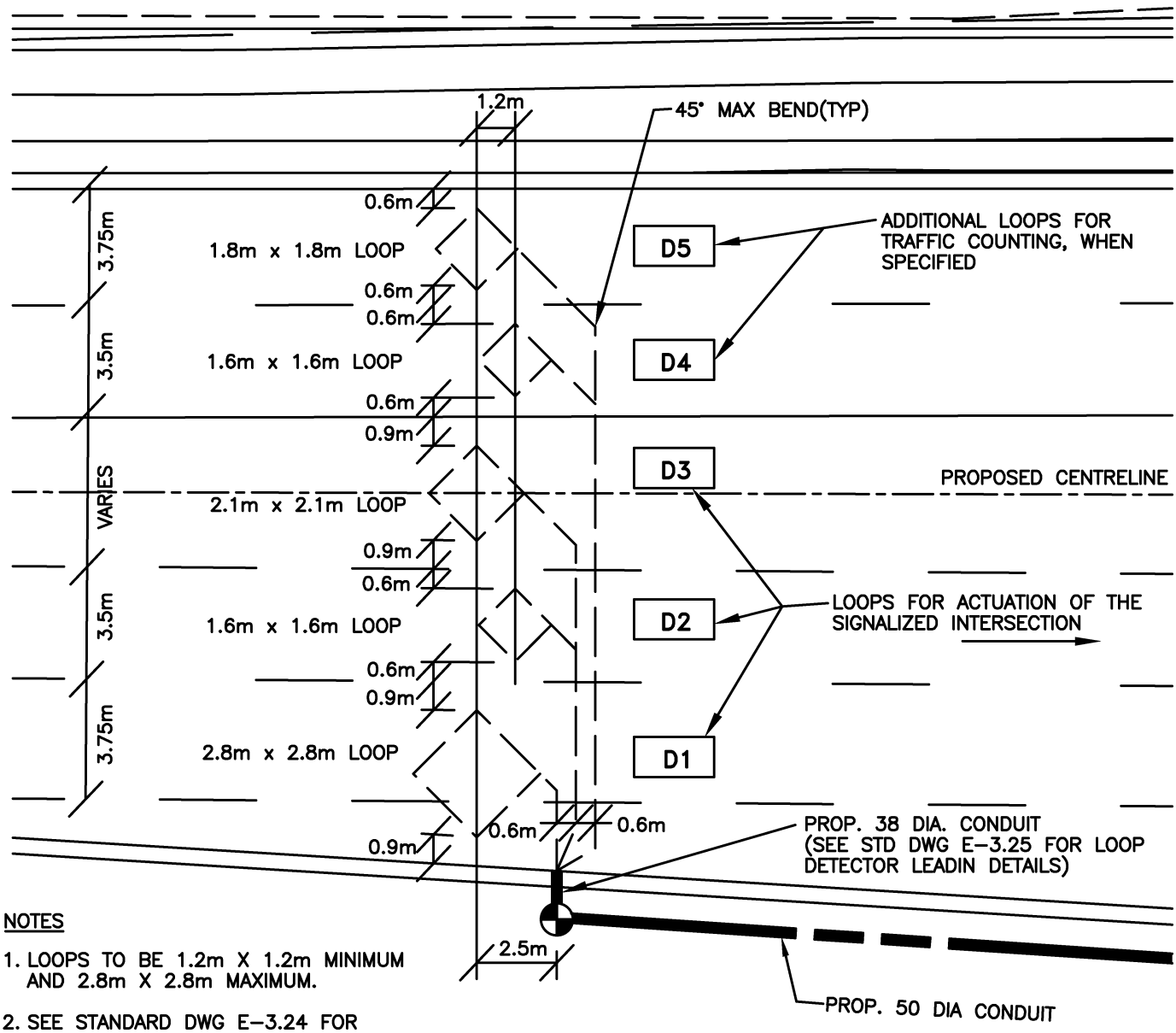
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. SEE STD. DWG. E–3.24 FOR TREATMENT FOR WIRE INDUCTIVE LOOP CROSSING BUTT OR IRREGULARITY.
3. LOOP WIRES ARE TO BE INSTALLED IN THE BASE COURSE OF ASPHALT WHENEVER PRACTICAL.
4. WHERE CABLE IS INSTALLED PRIOR TO THE FINISHED COURSE OF ASPHALT, THE MAXIMUM DEPTH OF COVER SHALL BE 100mm.
5. THE LOOP WIRE IS TO BE #14 AWG TYPE RWU 90 (X–LINK) STRANDED COPPER CONDUCTOR.
6. PRESENCE LOOPS SHALL CONSIST OF 2 TURNS OF CABLE AND LONG DISTANCE LOOPS SHALL CONSIST OF 3 OR 4 TURNS OF CABLE.
7. FOAM BACKER RODS ARE TO BE USED FOR THE INSTALLATION OF THE LOOP DETECTORS. THEY ARE TO BE INSTALLED ON TOP OF THE LOOP WIRE, SPACED EVERY 600. HOT POURED RUBBERIZED ASPHALT JOINT SEALING COMPOUND IS TO BE INSTALLED ON TOP OF THE BACKER RODS, COMPLETELY SEALING THE OPENING AND LEAVING A COVEX SURFACE ON THE TOP OF THE SEALANT.
8. SIZE OF CONDUIT FOR LOOP LEAD–INS USE:– 25 FOR UP TO 3 LOOPS; 38 FOR 4 TO 6 LOOPS; 2–38 FOR MORE THAN 6 LOOPS.
9. SIMPLE LOOP SHALL BE 1.5m MIN. TO 2.4m MAX. WIDTH. ANY LOOP WIDER THAN 2.4m SHALL BE A QUADROPOLE LOOP.

York Region **Public Works Transportation**

TYPICAL WIRE INDUCTIVE LOOP LAYOUT AND DETAILS

JANUARY 2023
DATE

E–3.27



NOTES

1. LOOPS TO BE 1.2m X 1.2m MINIMUM AND 2.8m X 2.8m MAXIMUM.
2. SEE STANDARD DWG E-3.24 FOR TREATMENT FOR WIRE INDUCTIVE LOOP CROSSING BUTT OR IRREGULARITY.
3. LOOP WIRES ARE TO BE INSTALLED IN THE BASE COURSE OF ASPHALT WHENEVER PRACTICAL.
4. THE LOOP WIRE IS TO BE #14 AWG TYPE RWU 90 (X-LINK) STRANDED COPPER CONDUCTOR.
5. FOAM BACKER RODS ARE TO BE USED FOR THE INSTALLATION OF THE LOOP DETECTORS. THEY ARE TO BE INSTALLED ON TOP OF THE LOOP WIRE, SPACED EVERY 600.
6. FOR LOOP LEAD-INS USE:
   25 FOR UP TO 3 LOOPS
   38 FOR 4 TO 6 LOOPS
   2-38 FOR MORE THAN 6 LOOPS

ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE INDICATED

York Region

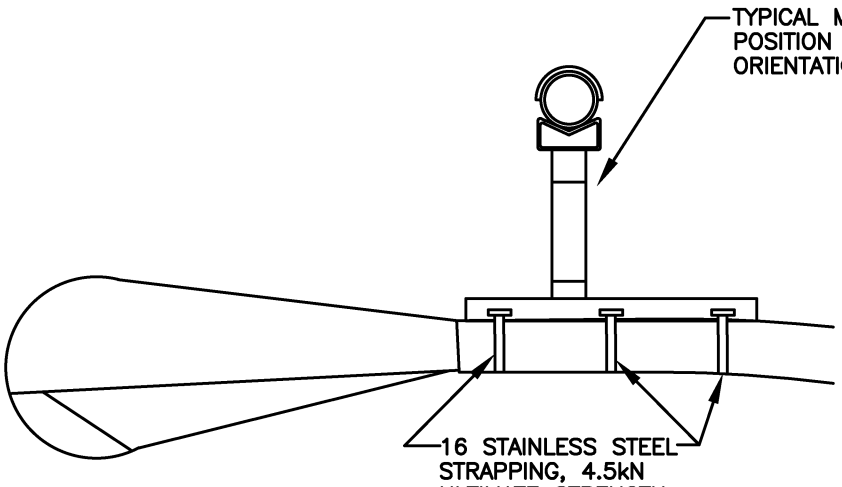
Public Works
Transportation

TYPICAL WIRE INDUCTIVE LOOP LAYOUT FOR ACTUATION OR COUNTING

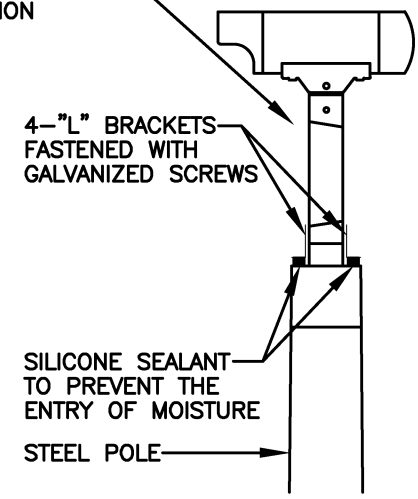
JANUARY 2023
DATE

N.T.S.

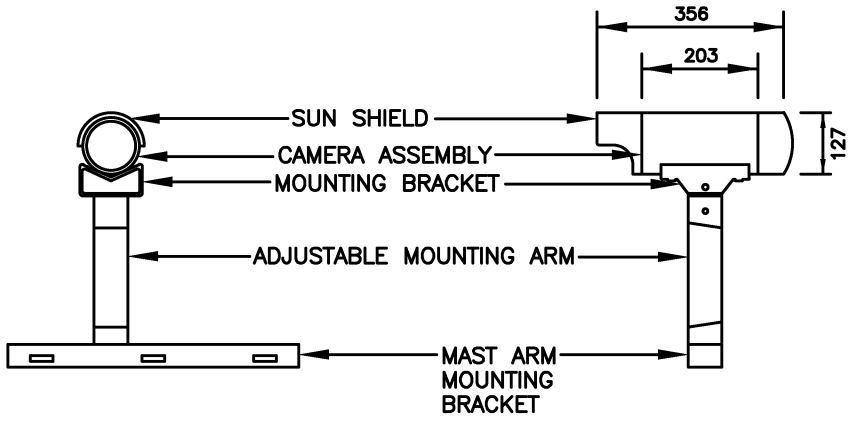
E-3.28



MAST ARM MOUNTING DETAIL



POLE MOUNTING DETAIL



CAMERA DETAIL

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. CONNECTIONS INCLUDE BNC CONNECTOR FOR VIDEO AT REAR OF HOUSING, DC INPUT, NEUTRAL AND SAFETY GROUND AT REAR OF HOUSING.
3. POWER: 115/230 VAC (15W MAX.) 50/60 Hz OR 12V DC (10W MAX.)
4. CAMERA IS MOUNTED, TILTED DOWN AT 20° OR MORE BELOW HORIZONTAL, TO AVOID DIRECT VIEW OF SUN.

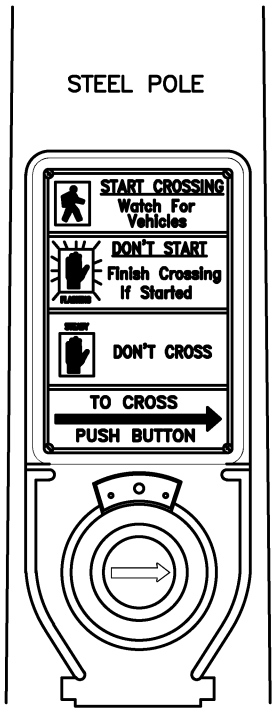
York Region

Public Works Transportation

TYPICAL VIDEO DETECTION CAMERA INSTALLATION AND LAYOUT

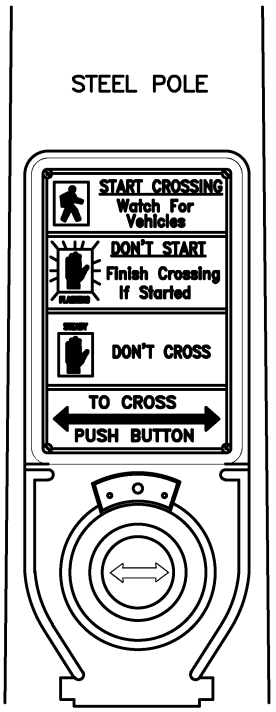
JANUARY 2023
DATE

E–3.29



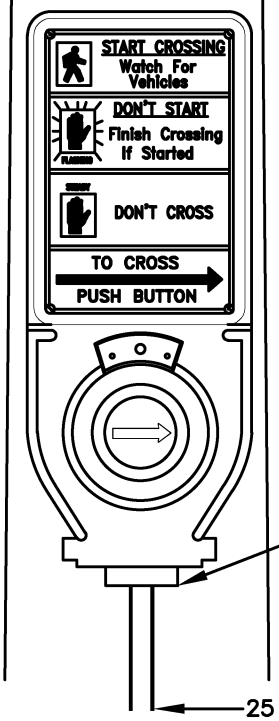
DETAIL 1

ONE WAY PEDESTRIAN MOVEMENT



DETAIL 2

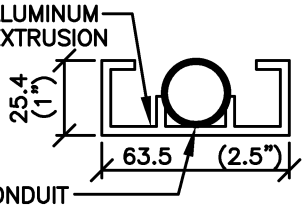
TWO WAY PEDESTRIAN MOVEMENT

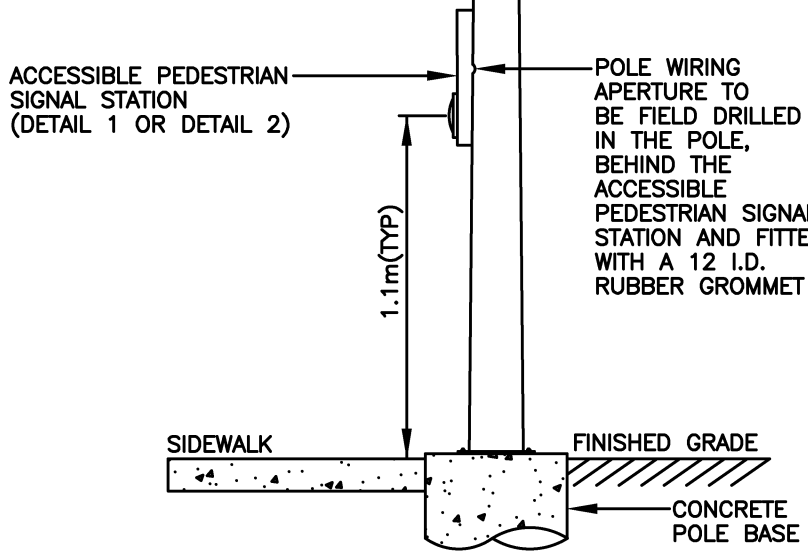


MOUNTING DETAIL FOR WOOD/CONC. POLE

MOUNT ACCESSIBLE PEDESTRIAN SIGNAL STATION ON WOOD OR CONC. POLE, USING ALUMINUM EXTRUSION, TO MATCH MANUFACTURER'S SPECIFIED MOUNTING HOLE REQUIREMENTS

ALUMINUM EXTRUSION DETAIL





ON STEEL POLE

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ALL WIRING APERTURES ARE TO BE DE-BURRED & PROTECTED WITH GREY ZINC RICH PAINT.
3. THE CONTRACTOR SHALL REVIEW THE LAYOUT DRAWINGS FOR THE ORIENTATION AND LOCATION OF THE ACCESSIBLE PEDESTRIAN SIGNAL STATION TO THE APPROPRIATE DIRECTION OF THE PEDESTRIAN CROSSWALK.

York Region

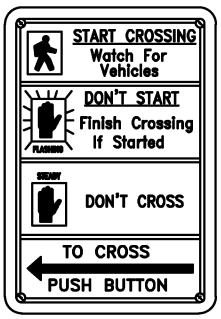
Public Works Transportation

ACCESSIBLE PEDESTRIAN SIGNAL STATION MOUNTING DETAILS FOR ONE WAY OR TWO WAY PEDESTRIAN MOVEMENT

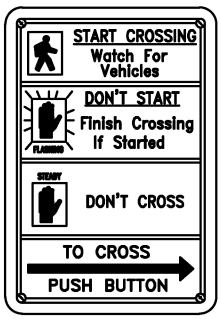
JANUARY 2023
DATE

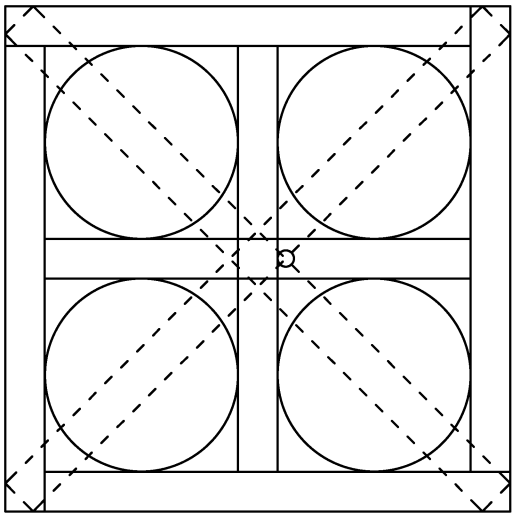
E-3.30

G–19L



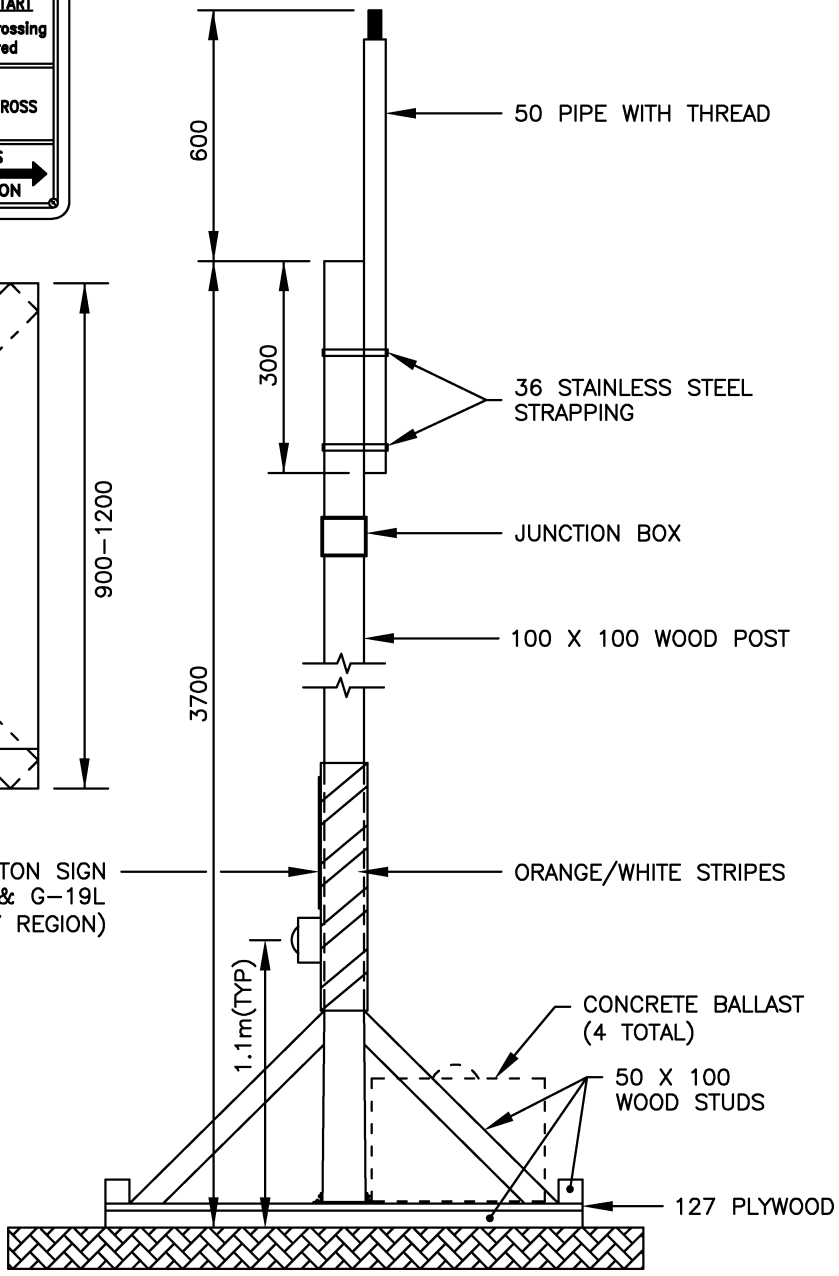
G–19R





900–1200

PEDESTRIAN PUSHBUTTON SIGN
DOUBLE SIDED G–19R & G–19L
(PROVIDED BY REGION)



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. A TEMPORARY TRAFFIC STAND IS TO BE USED FOR EMERGENCIES OR SHORT DURATION CONSTRUCTION ONLY.
3. THE CONTRACTOR SHALL REVIEW THE LAYOUT DRAWINGS FOR THE ORIENTATION AND LOCATION OF THE TEMPORARY TRAFFIC SIGNAL STAND TO THE APPROPRIATE DIRECTION OF THE PEDESTRIAN CROSSWALK.

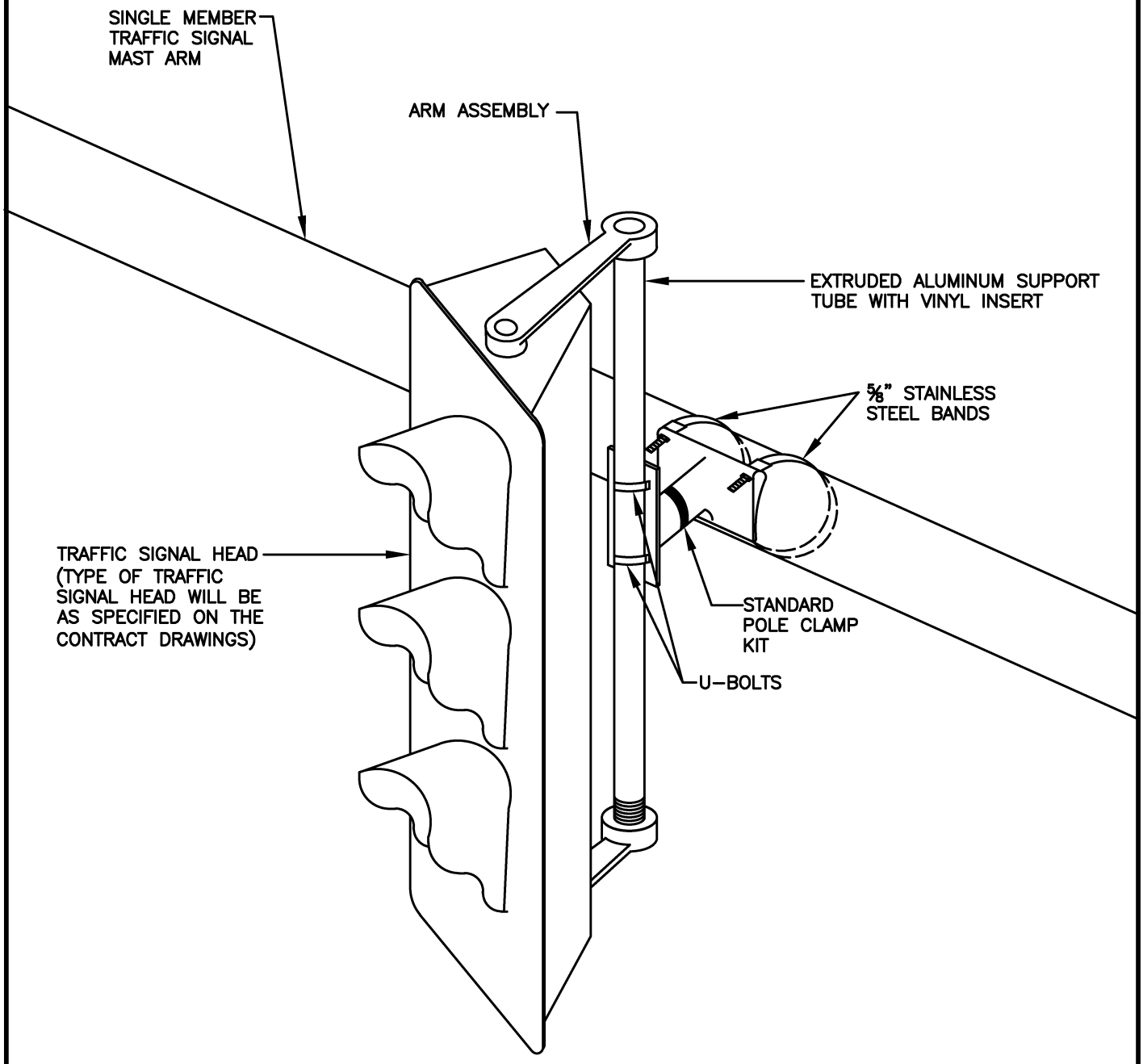
York Region

Public Works
Transportation

TEMPORARY TRAFFIC SIGNAL STAND

JANUARY 2023
DATE

E–3.32



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. MINIMUM CLEARANCE BETWEEN THE TRAFFIC SIGNAL HEADS AND THE PAVEMENT IS 5.0m AND THE MAXIMUM CLEARANCE IS 5.3m.
3. TRAFFIC SIGNAL HEADS ARE TO BE AIMED AS DIRECTED BY THE REGION'S REPRESENTATIVE.

N.T.S.

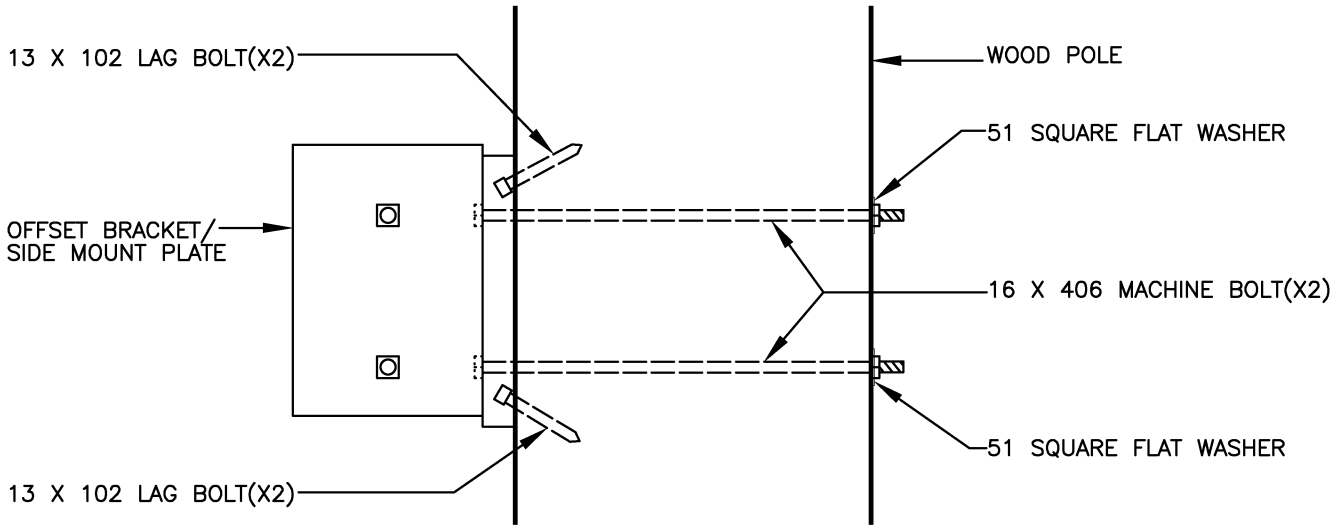
York Region

Public Work
Transportation

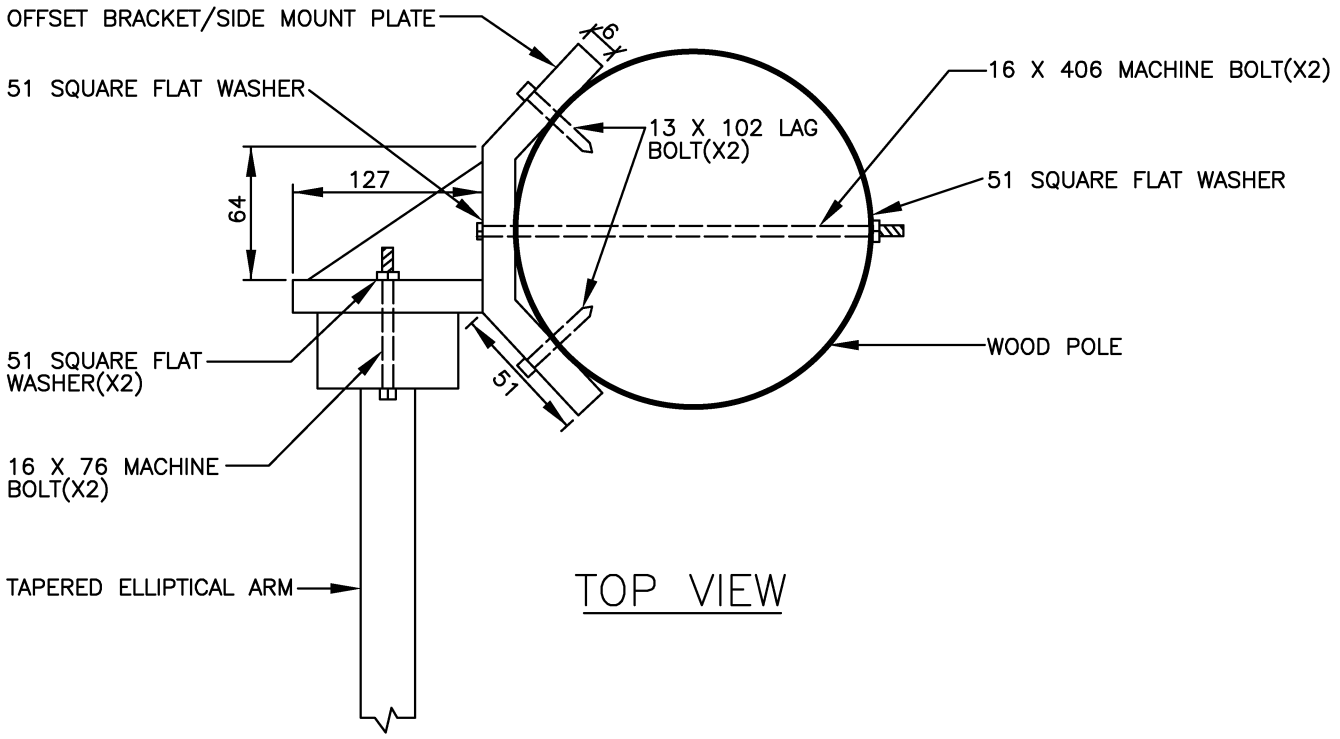
TRAFFIC SIGNAL HEAD UNIVERSAL BRACKET MOUNTING DETAIL

JANUARY 2023
DATE

E-3.33



SIDE VIEW



TOP VIEW

ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED N.T.S.

BILL OF MATERIALS	
QTY	DESCRIPTION
6	51 X 51 X 3.2 HOT DIP GALVANIZED SQUARE FLAT WASHER
2	16 X 406 HOT DIP GALVANIZED HEX HEAD MACHINE BOLT
4	13 X 102 HOT DIP GALVANIZED LAG BOLT
2	16 X 76 HOT DIP GALVANIZED HEX HEAD MACHINE BOLT
1	HOT DIP GALVANIZED SIDE MOUNT PLATE FOR TAPERED ELLIPTICAL ARM/BRACKET

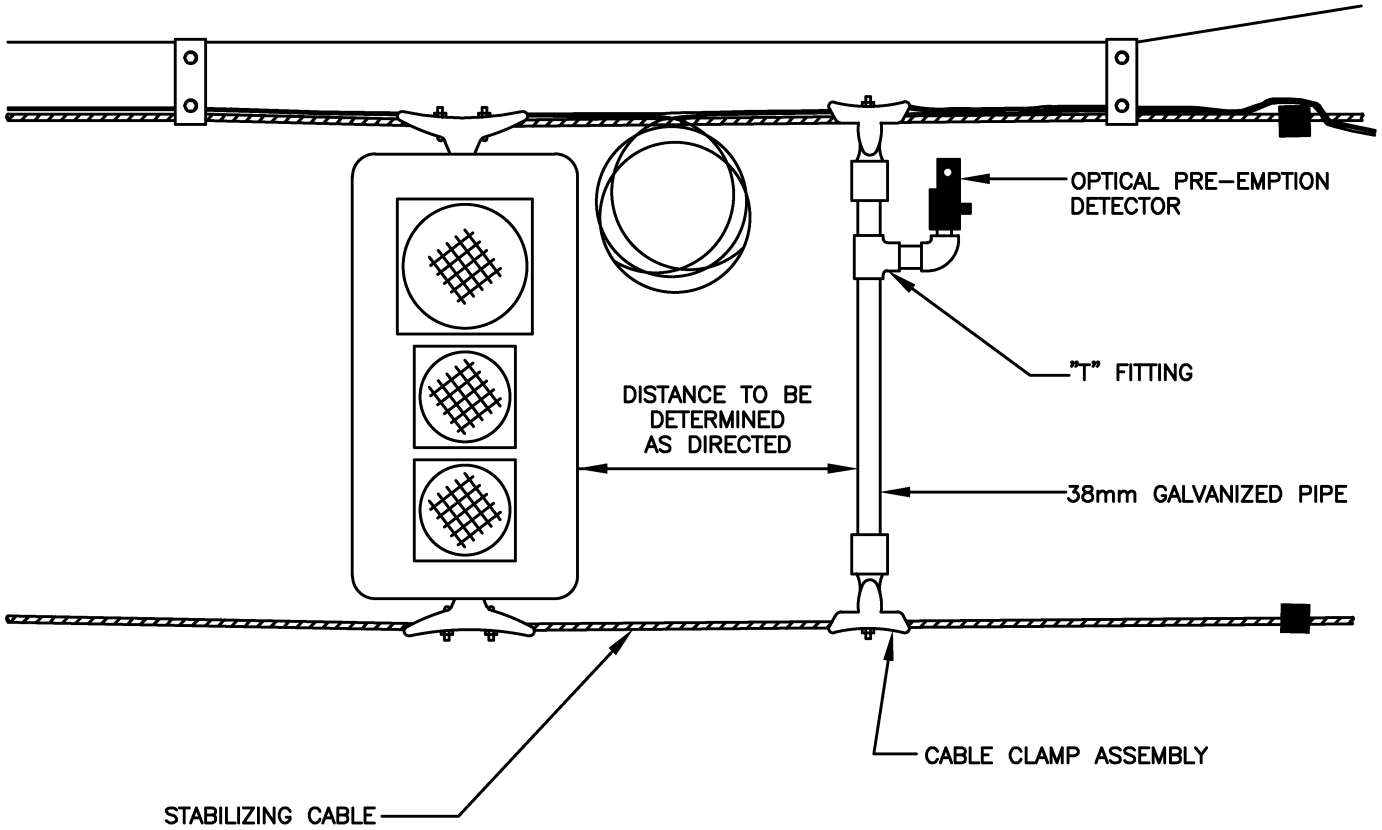
York Region

Public Works Transportation

SIDE MOUNT LUMINAIRE BRACKET

JANUARY 2023
DATE

E–3.34



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.

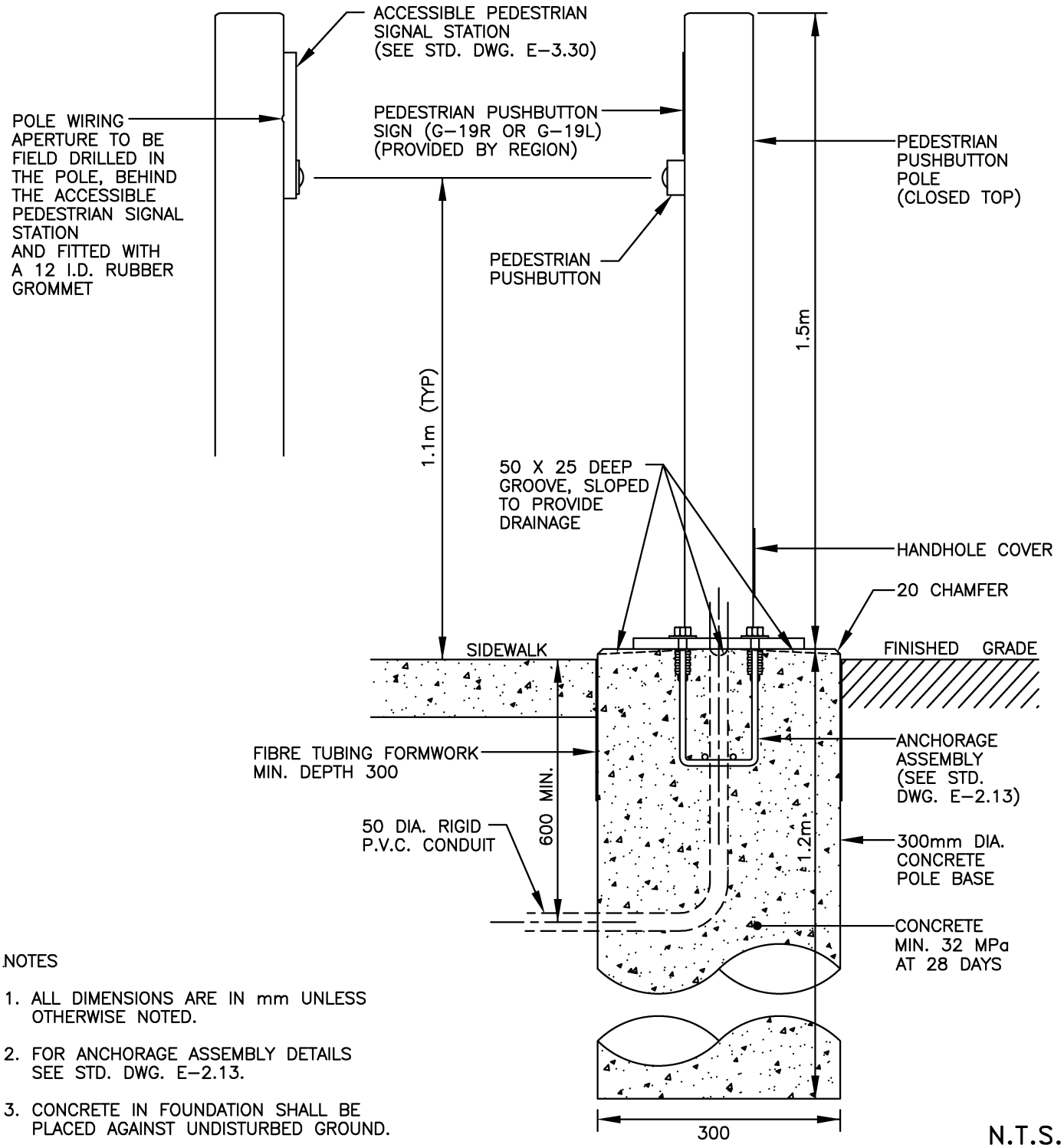
York Region

Public Works
Transportation

INSTALLATION DETAIL FOR PRE-EMPTION DETECTOR ON SPAN WIRE

JANUARY 2023
DATE

E-3.35



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. FOR ANCHORAGE ASSEMBLY DETAILS SEE STD. DWG. E–2.13.
3. CONCRETE IN FOUNDATION SHALL BE PLACED AGAINST UNDISTURBED GROUND.
4. TOP OF FOUNDATION SHALL BE TRULY LEVEL.
5. SLEEVES SHALL BE 50 I.D., 90° BEND, RIGID P.V.C. CONDUIT.
6. ANCHOR BOLTS ARE INTERMEDIATE GRADE STEEL, MIN. LOAD 30.840 kg, C.S.A. G.30.1 FACTORY STEEL, SET IN FERRULE WITH PRE–APPLIED THREAD LOCKING COMPOUND.
7. THE CONTRACTOR SHALL REVIEW THE LAYOUT DRAWINGS FOR THE ORIENTATION & LOCATION OF THE ACCESSIBLE PEDESTRIAN SIGNAL STATION TO THE APPROPRIATE DIRECTION OF THE PEDESTRIAN CROSSWALK.

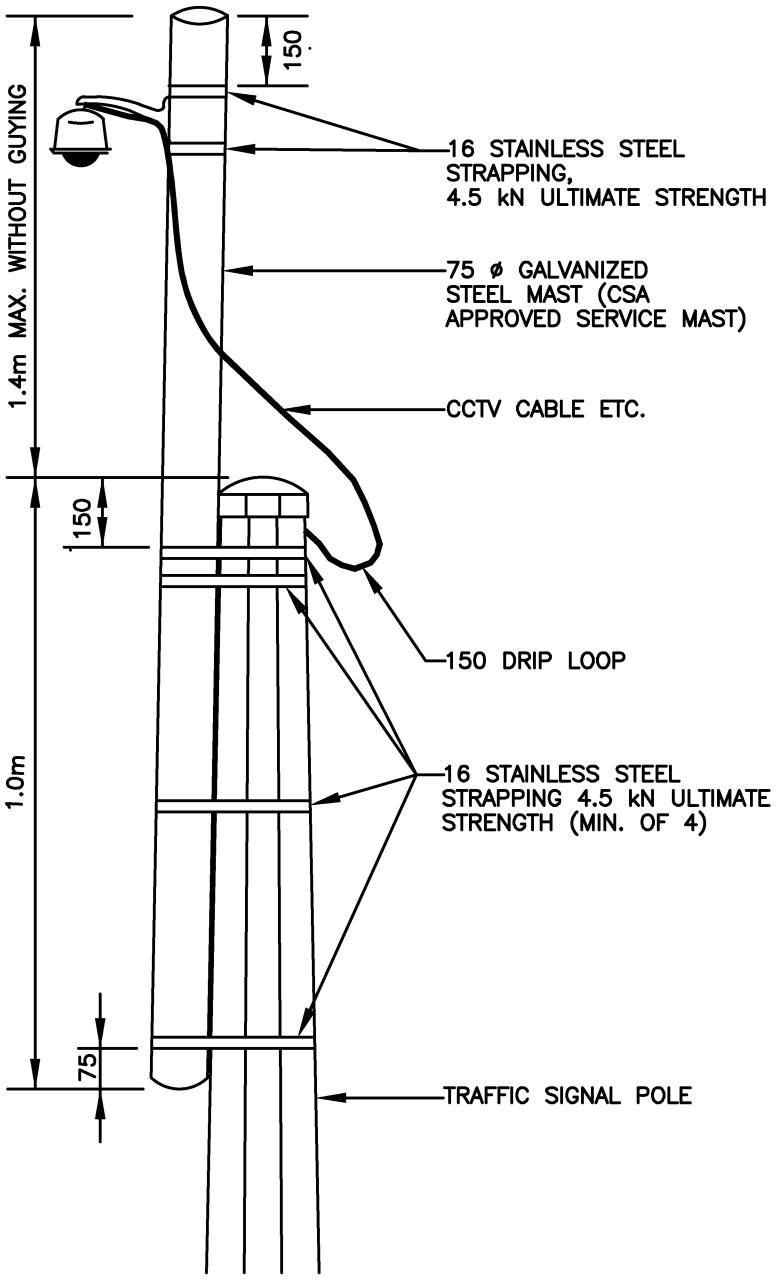
York Region

Public Works
Transportation

1.5m PEDESTRIAN PUSHBUTTON/APS POLE ON 300mm DIA. CONCRETE POLE BASE WITH ANCHORAGE ASSEMBLY

JANUARY 2023
DATE

E–3.36



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. NO HOLES ARE TO BE DRILLED IN THE EXISTING STEEL POLES. ALL WIRING IS TO BE DONE THROUGH THE TOP OF THE STEEL POLES. THE CONTRACTOR MUST ENSURE THE APERTURE IS WEATHERPROOF.
3. GUYING IS REQUIRED IF STEEL MAST EXTENSION EXCEEDS 1.4m OR IF SPECIFIED. IF GUYING IS REQUIRED, IT IS TO BE IN ACCORDANCE WITH STD. DWG. E–3.22 OR E–3.23

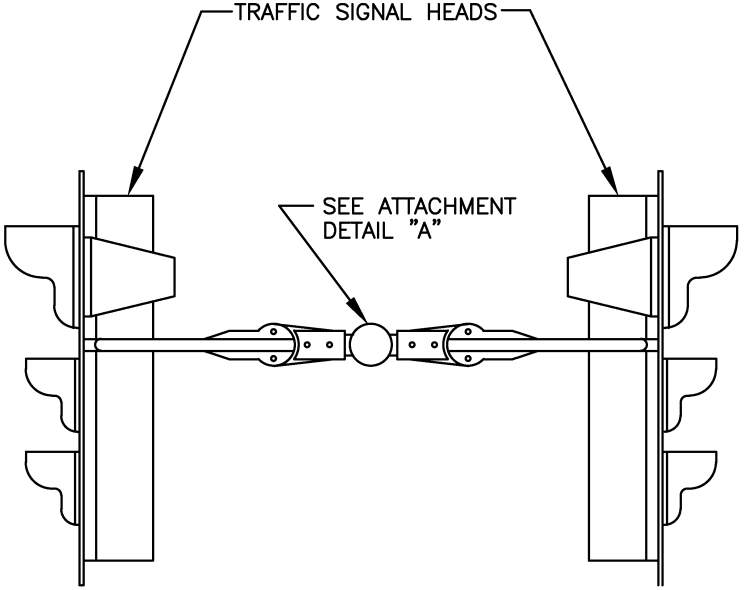
York Region

Public Works
Transportation

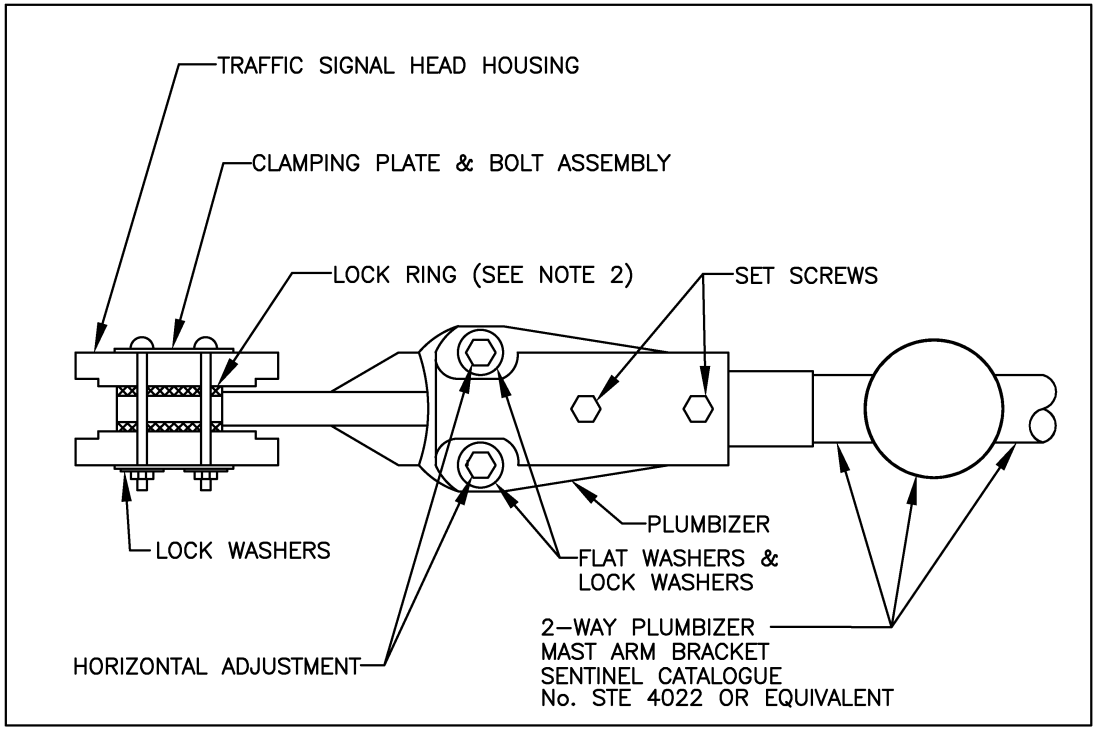
MAST EXTENSION DETAIL FOR TEMPORARY CCTV CAMERA INSTALLATION

JANUARY 2023
DATE

E–3.38



SIDE VIEW



ATTACHMENT DETAIL "A"

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. LOCK RING OR ADAPTER RING SHALL BE USED WITH HEADS WITHOUT INTEGRALLY CAST MATCHING SERRATIONS. RINGS ARE TO BE BRASS OR BRONZE, WITH SUFFICIENT CONTACT AREA TO COVER FLANGE ON SIGNAL HOUSING.
3. THE PLUMBIZER IS TO BE INSTALLED BETWEEN THE RED AND AMBER SECTIONS OF THE TRAFFIC SIGNAL HEAD, UNLESS OTHERWISE SPECIFIED.

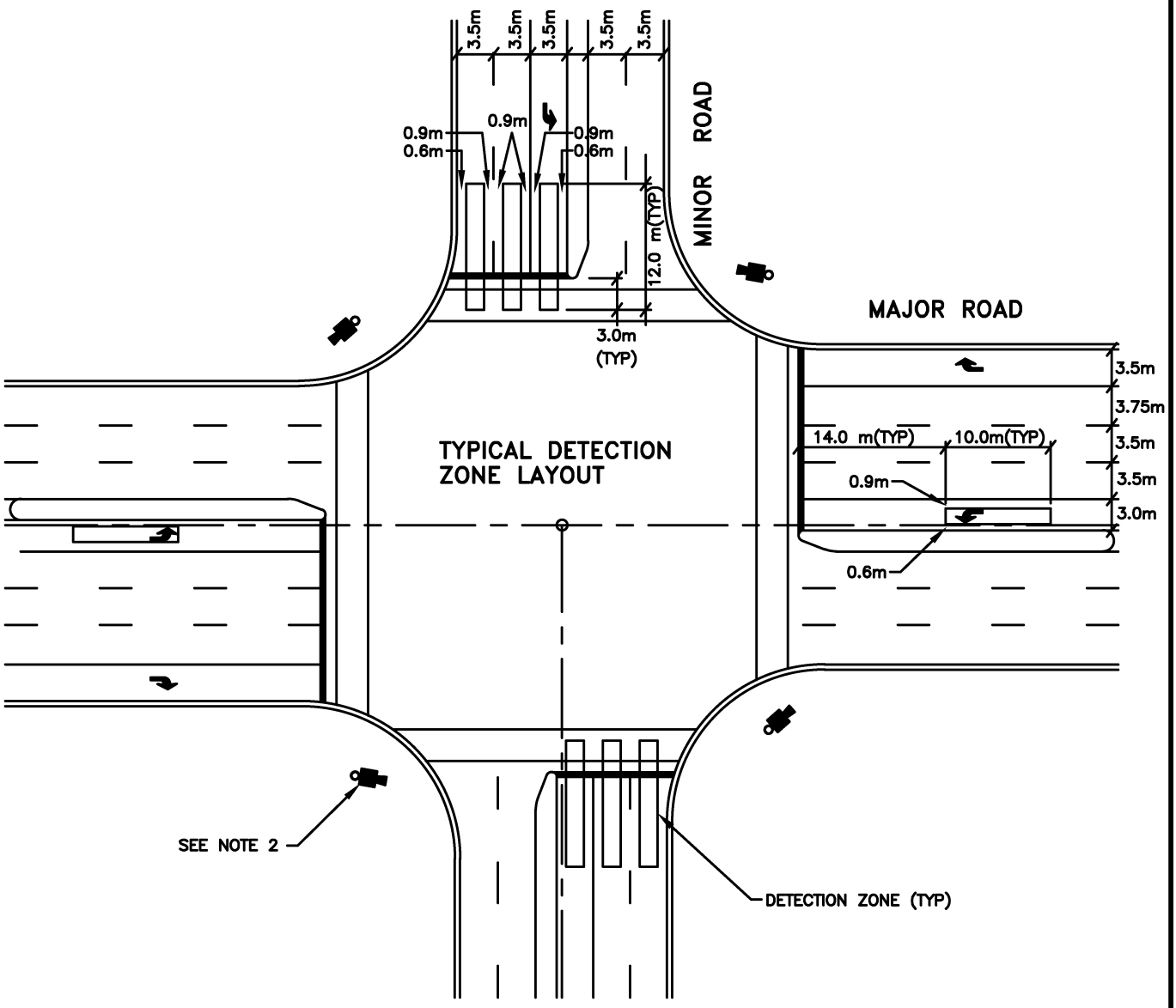
York Region

Public Works
Transportation

2-WAY PLUMBIZER MAST ARM BRACKET ATTACHMENT DETAIL

JANUARY 2023
DATE

E-3.39



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. SMART SENSORS ARE TO BE PLACED AS PER MANUFACTURER'S RECOMMENDATIONS.
3. DETECTION IS TO BE CONSTANTLY MAINTAINED THROUGHOUT ALL CONSTRUCTION PHASES.

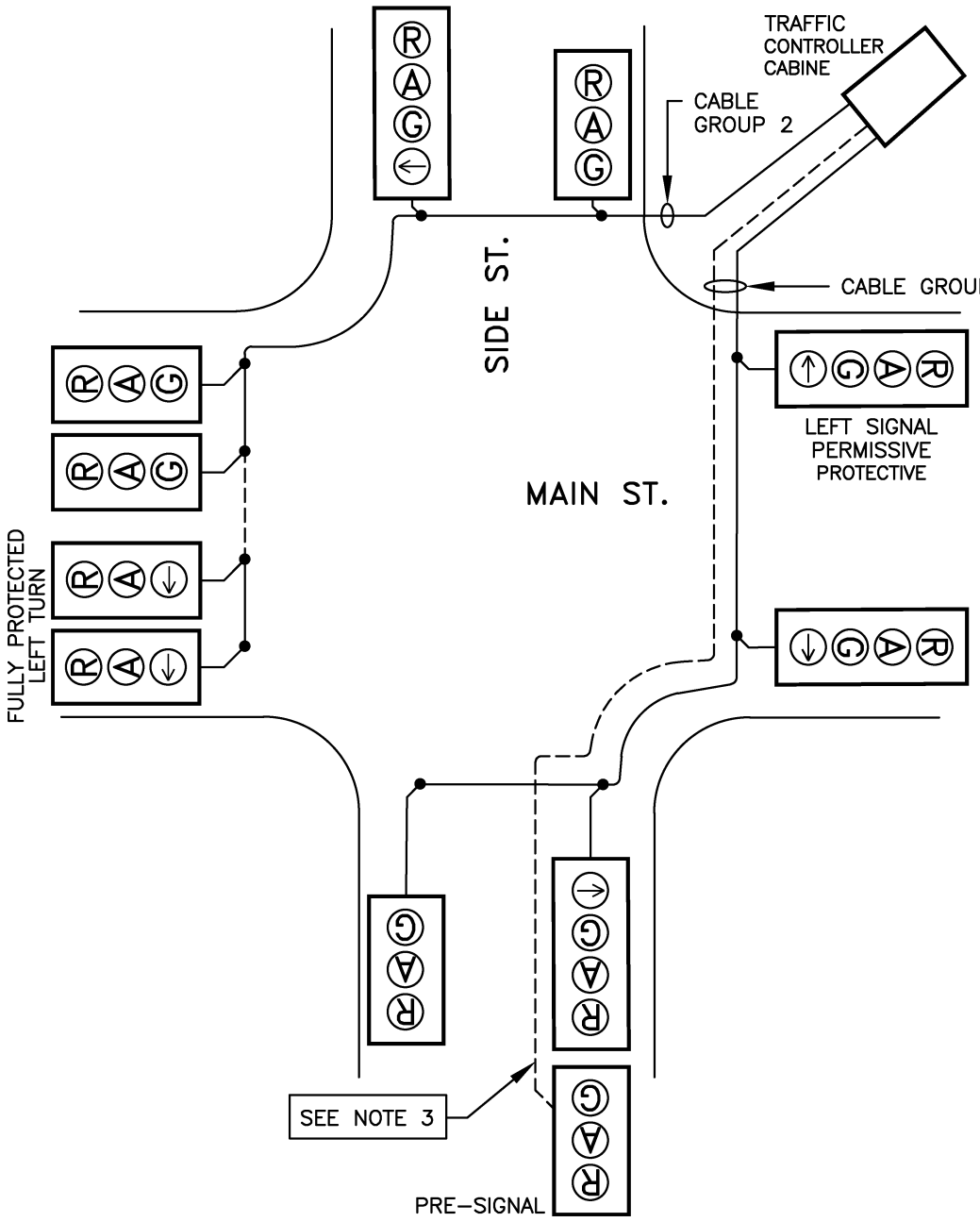
York Region

Public Works
Transportation

TYPICAL NON-INTRUSIVE DETECTION ZONE LAYOUT AND PLACEMENT

JANUARY 2023
DATE

E-3.40



N.T.S.

12/C #14 TRAFFIC CABLE	COLOUR	CABLE GROUP 1	CABLE GROUP 2
	WHITE	NEUTRAL	NEUTRAL
	BLUE 1	MAIN ST. GREEN (1)	MAIN ST. GREEN (2)
	AMBER 1	MAIN ST. AMBER (1)	MAIN ST. AMBER (2)
	RED 1	MAIN ST. RED (1)	MAIN ST. RED (2)
	BLUE 2	SIDE ST. GREEN (1)	SIDE ST. GREEN (2)
	AMBER 2	SIDE ST. AMBER (1)	SIDE ST. AMBER (2)
	RED 2	SIDE ST. RED (1)	SIDE ST. RED (2)
	BLUE 3	NOTE 4	NOTE 4
	AMBER 3	NOTE 4	NOTE 4
	BLACK	NOTE 4	NOTE 4
	ORANGE	NOTE 4	NOTE 4
	RED 3	NOTE 4	NOTE 4

NOTES

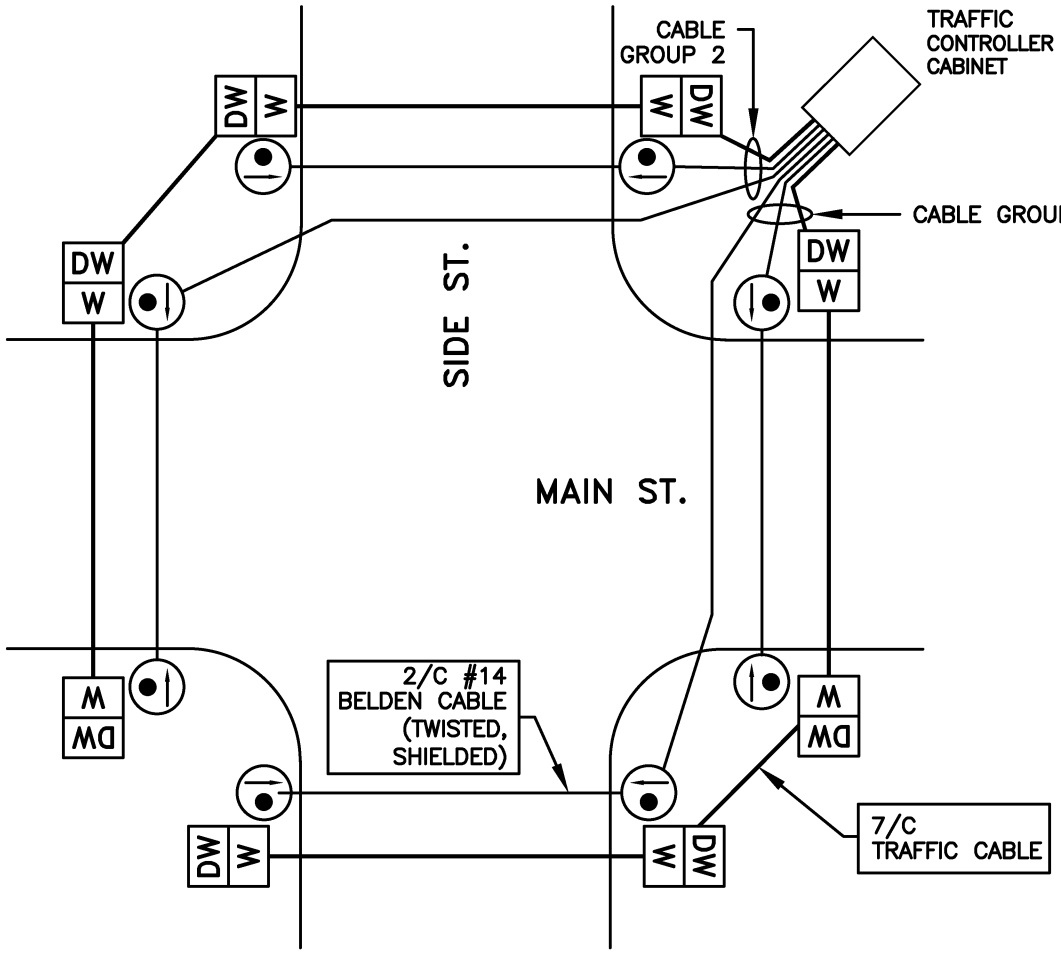
1. THIS IS A TYPICAL WIRING LAYOUT DIAGRAM. HANDWELLS ARE NOT SHOWN. IT IS APPLICABLE PRINCIPAL TO ALL YORK REGION SIGNALIZED INTERSECTION CONFIGURATIONS.
2. ALL TRAFFIC SIGNAL HOME RUN CABLES SHALL BE 14 GAUGE MTO SEPC RUNNER CABLES.
3. TRAFFIC SIGNAL CABLE FEEDING VEHICLE SIGNALS SHALL HAVE 12 CONDUCTORS. PRE-SIGNALS SHALL HAVE A DEDICATED 7-CONDUCTOR HOME RUN CABLE.
4. CONNECTIONS SHOWN ARE GENERAL AND SHALL BE ADJUSTED TO SUIT THE INTERSECTION LAYOUT. WHERE ADVANCE TURN PHASES ARE INSTALLED, USE BLUE 3 & AMBER 3 FOR MAIN STREET AND BLACK AND AMBER FOR SIDE STREET HEADS. TO BE DETERMINED ON A SPECIFIC PER LOCATION BASIS.
5. ANY UNUSED CONDUCTORS IN THE RUNNER CABLES SHALL BE CONNECTED THROUGH TO THE LAST POLE IN THE RUN, CAPPED AND DESIGNATED AS SPARES.

York Region **Public Works Transportation**

TYPICAL TRAFFIC SIGNAL WIRING VEHICLE PHASES

JANUARY 2023
DATE

E-4.01



NOTES

1. THIS IS A TYPICAL WIRING LAYOUT DIAGRAM, HANDWELLS ARE NOT SHOWN. IT IS APPLICABLE IN PRINCIPLE TO ALL YORK REGION SIGNALIZED INTERSECTION CONFIGURATIONS.
2. ALL PEDESTRIAN SIGNAL HOME RUN CABLES SHALL BE 14 GAUGE MTO SPEC RUNNER CABLES WITH 7 CONDUCTORS.
3. ANY UNUSED CONDUCTORS IN THE RUNNER CABLES SHALL BE CONNECTED THROUGH TO THE LAST POLE IN THE RUN, CAPPED AND DESIGNATED AS SPARES.
4. EACH SIGNALIZED PEDESTRIAN CROSSING EQUIPPED WITH EITHER STANDARD PUSHBUTTONS OR A.P.S. REQUIRES A DEDICATED 2–CONDUCTOR #14 BELDEN HOME RUN CABLE.
5. 2–CONDUCTOR #14 BELDEN CABLES ARE LIMITED TO A MAXIMUM OF THREE A.P.S. PUSHBUTTONS. LOCATIONS THAT HAVE FOUR PUSHBUTTONS ASSIGNED TO THE SAME PHASE REQUIRE TWO HOME RUN CABLES.
6. CONNECTIONS SHOWN ARE GENERAL AND TYPICAL AND SHALL BE ADJUSTED TO SUIT THE INTERSECTION LAYOUT.

N.T.S.

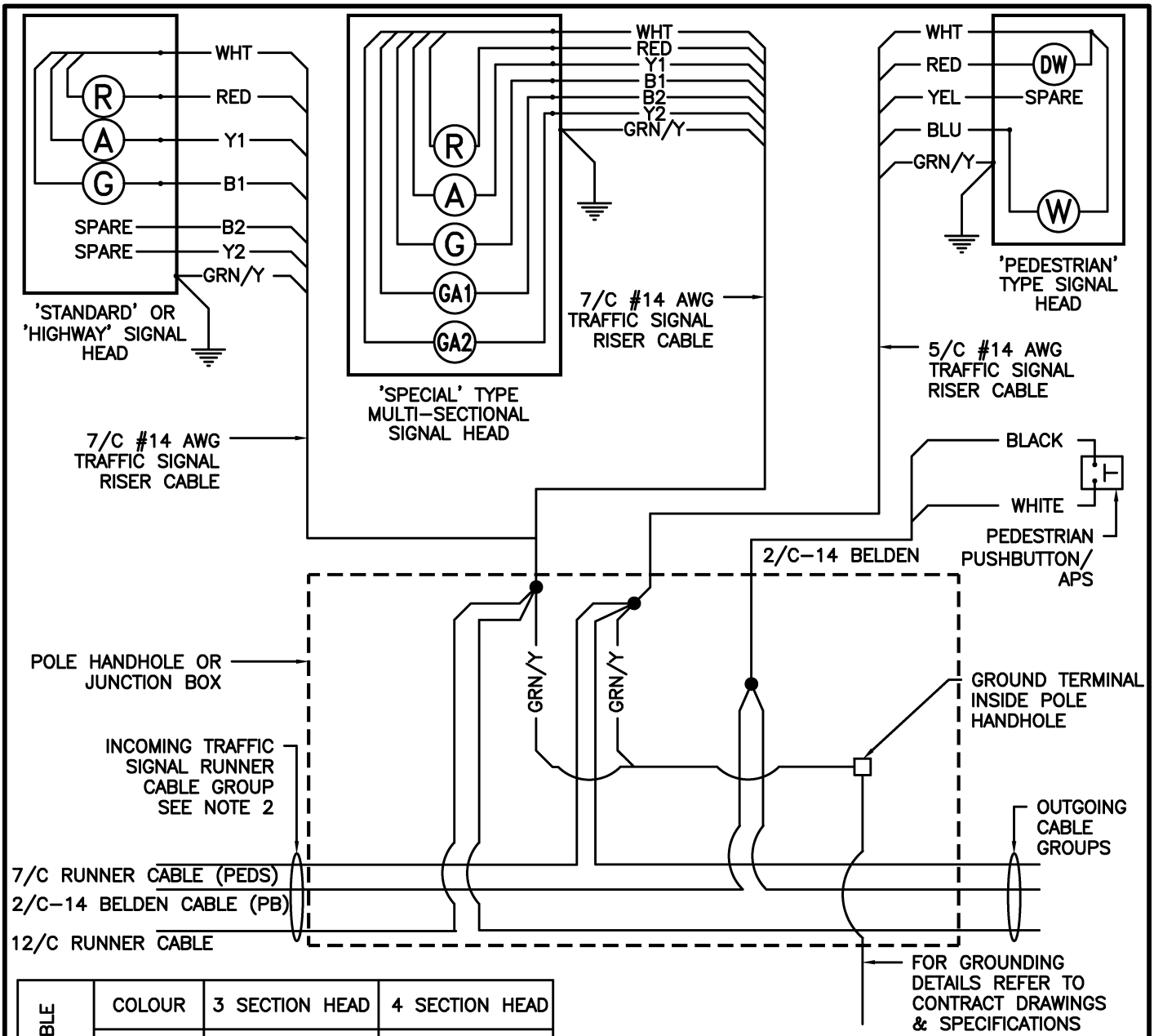
7/C #14 PEDESTRIAN SIGNAL TRAFFIC CABLE	COLOUR	CABLE GROUP 1	CABLE GROUP 2
	WHITE	NEUTRAL	NEUTRAL
	BLUE 1	WALK (MS1)	WALK (MS2)
	RED 1	DON'T WALK (MS1)	DON'T WALK (MS2)
	BLUE 2	WALK (SS1)	WALK (SS2)
	RED 2	DON'T WALK (SS1)	DON'T WALK (SS2)
	AMBER 1	SPARE	SPARE
	AMBER 2	SPARE	SPARE

York Region **Public Works Transportation**

TYPICAL TRAFFIC SIGNAL WIRING FOR PEDESTRIAN EQUIPMENT

JANUARY 2023
DATE

E–4.02



7/C #14 RISER CABLE VEHICLE HEADS	COLOUR	3 SECTION HEAD	4 SECTION HEAD
	WHITE	NEUTRAL	NEUTRAL
	RED	RED	RED
	AMBER 1	AMBER	AMBER
	BLUE 1	GREEN	GREEN
	AMBER 2	SPARE	AMBER ARROW
	BLUE 2	SPARE	GREEN ARROW
	GREEN	GROUND	GROUND

5/C #14 RISER CABLE PEDESTRIAN HEADS	COLOUR	PED HEAD
	WHITE	NEUTRAL
	RED	DON'T WALK
	BLUE	WALK
	AMBER	SPARE
	GREEN	GROUND

N.T.S.

NOTES

1. DETAILS SHOWN ARE TYPICAL ONLY. FOR MULTIPLE EQUIPMENT INSTALLATIONS ON THE SAME POLE, MAINTAIN RISER CABLE TYPE AND COLOUR CODING.
2. GREEN CONDUCTORS 'WITH YELLOW TRACER' USED AS GROUND SHALL BE TAGGED 'GROUND' IN THE POLE HANDHOLE OR JUNCTION BOX.

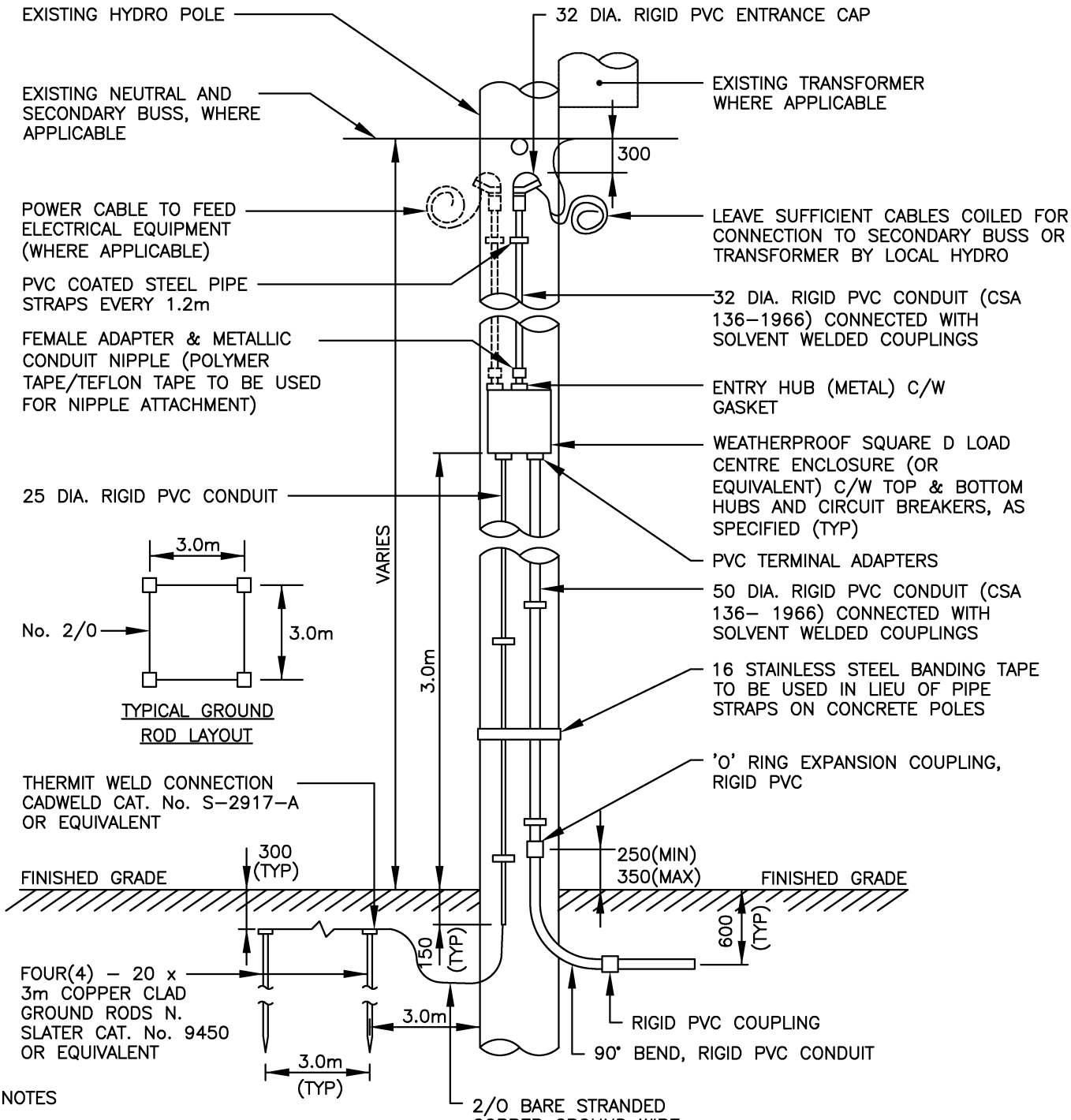
York Region

Public Works Transportation

TYPICAL TRAFFIC SIGNAL EQUIPMENT WIRING (POLE WIRING)

JANUARY 2023
DATE

E-4.03



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. WORK ON HYDRO POLE SHALL BE DONE ONLY IN THE PRESENCE OF OR WITH THE PERMISSION OF THE LOCAL HYDRO AUTHORITY.
3. CO–ORDINATE THIS WORK WITH THE LOCAL HYDRO AUTHORITY, GIVING TWO WEEKS ADVANCED NOTICE AND INCORPORATING ANY MINOR CHANGES REQUIRED.
4. MOUNTING DETAILS SHOWN ARE TYPICAL ONLY AND SHALL BE ADAPTED TO SUIT SITE CONDITIONS AND THE LOCAL HYDRO AUTHORITY.

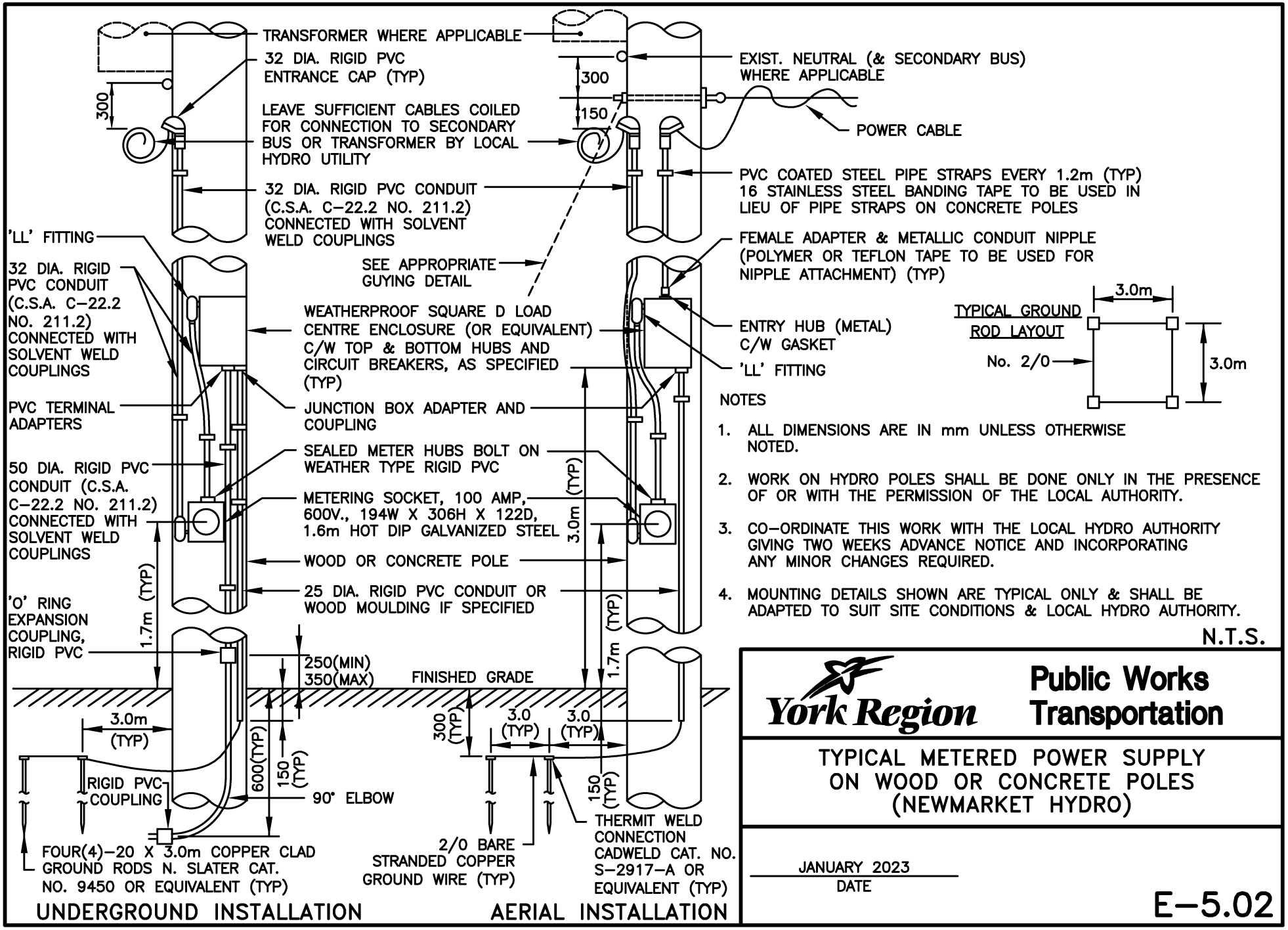
York Region

Public Works Transportation

TYPICAL BURIED POWER SUPPLY MOUNTING DETAIL

JANUARY 2023
DATE

E–5.01



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. WORK ON HYDRO POLES SHALL BE DONE ONLY IN THE PRESENCE OF OR WITH THE PERMISSION OF THE LOCAL AUTHORITY.
3. CO-ORDINATE THIS WORK WITH THE LOCAL HYDRO AUTHORITY GIVING TWO WEEKS ADVANCE NOTICE AND INCORPORATING ANY MINOR CHANGES REQUIRED.
4. MOUNTING DETAILS SHOWN ARE TYPICAL ONLY & SHALL BE ADAPTED TO SUIT SITE CONDITIONS & LOCAL HYDRO AUTHORITY.

N.T.S.

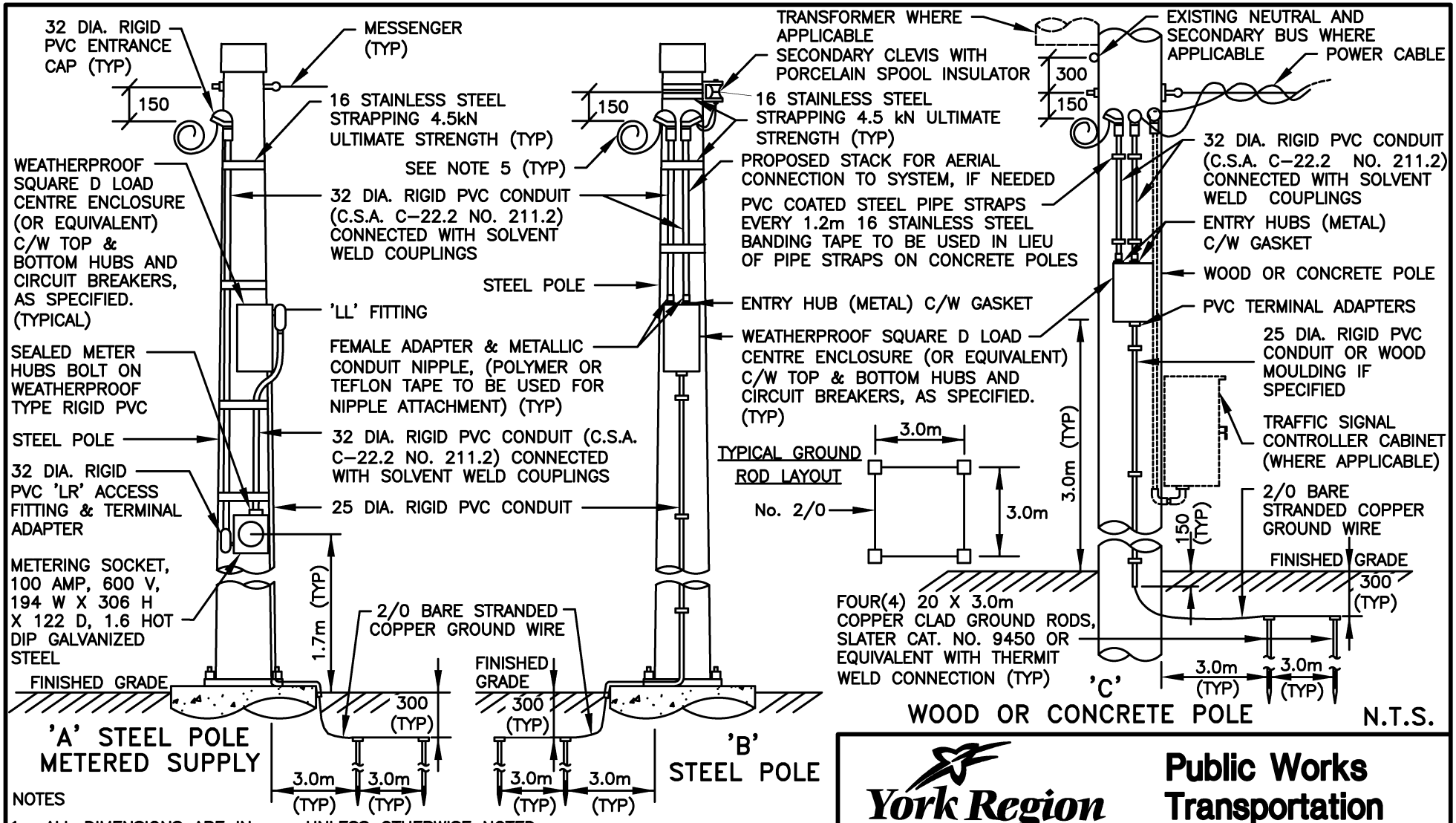
York Region

Public Works Transportation

TYPICAL METERED POWER SUPPLY ON WOOD OR CONCRETE POLES (NEWMARKET HYDRO)

JANUARY 2023
DATE

E-5.02



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. WORK ON HYDRO POLES SHALL BE DONE ONLY IN THE PRESENCE OF OR WITH THE PERMISSION OF THE LOCAL HYDRO AUTHORITY.
3. CO-ORDINATE THIS WORK WITH THE LOCAL HYDRO AUTHORITY, GIVING TWO WEEKS ADVANCE NOTICE AND INCORPORATING ANY MINOR CHANGES REQUIRED.
4. MOUNTING DETAILS SHOWN ARE TYPICAL ONLY AND SHALL BE ADAPTED TO SUIT SITE CONDITIONS AND THE LOCAL HYDRO AUTHORITY.
5. LEAVE SUFFICIENT CABLES COILED FOR CONNECTION TO SECONDARY, SECONDARY BUS OR TRANSFORMER BY LOCAL AUTHORITY.

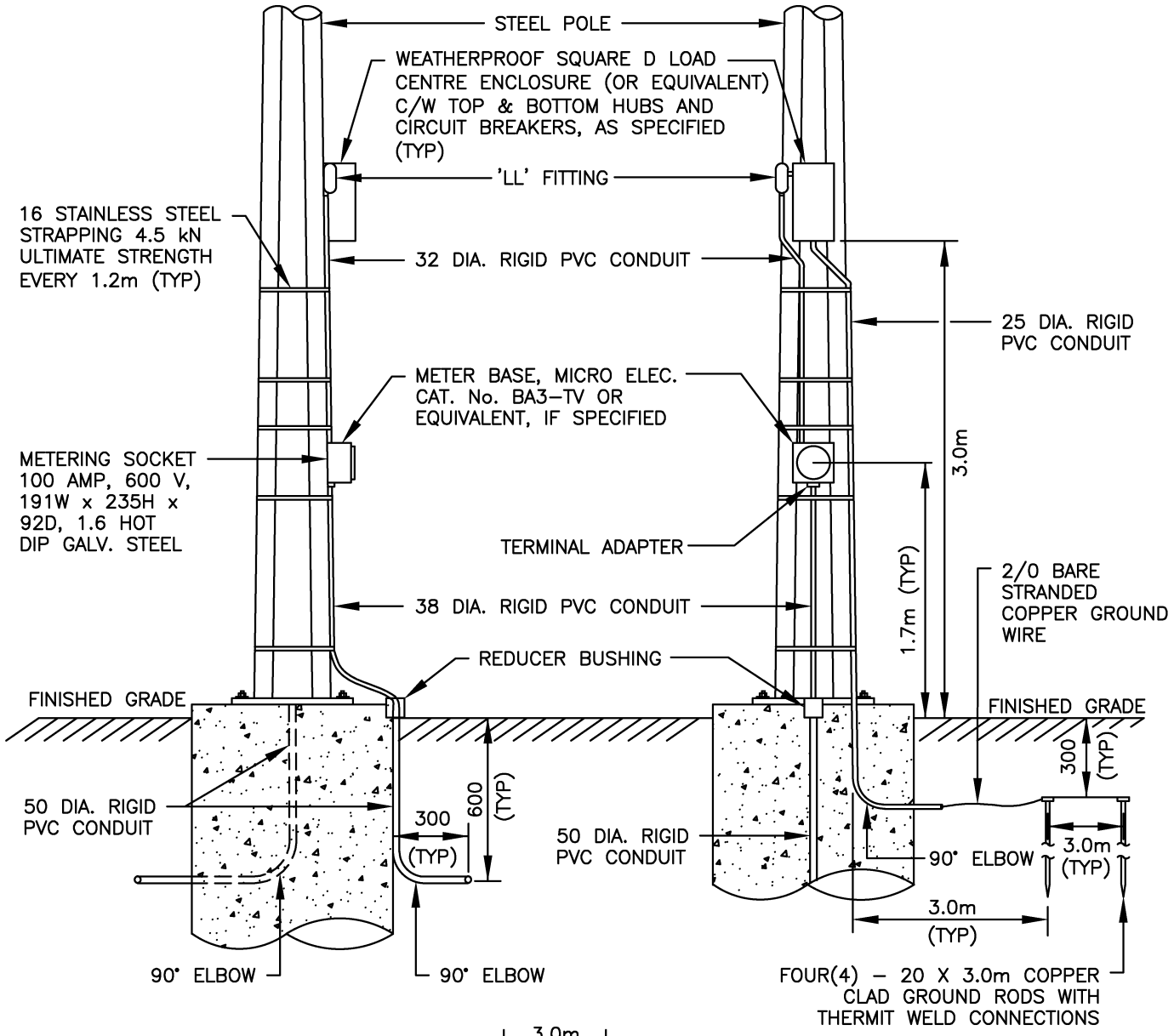
York Region

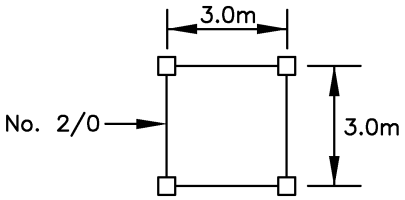
Public Works
Transportation

TYPICAL AERIAL POWER SUPPLIES

JANUARY 2023
DATE

E-5.03





TYPICAL GROUND ROD LAYOUT

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL CONTACT THE HYDRO AUTHORITY 3 WEEKS PRIOR TO POWER BEING REQUIRED AND REQUEST A 'SERVICE LAYOUT'.
3. THE CONTRACTOR SHALL OBTAIN AN 'INSPECTION CLEARANCE' FROM THE ELECTRICAL SAFETY AUTHORITY. THIS MUST BE OBTAINED WELL IN ADVANCE OF POWER TURN ON.

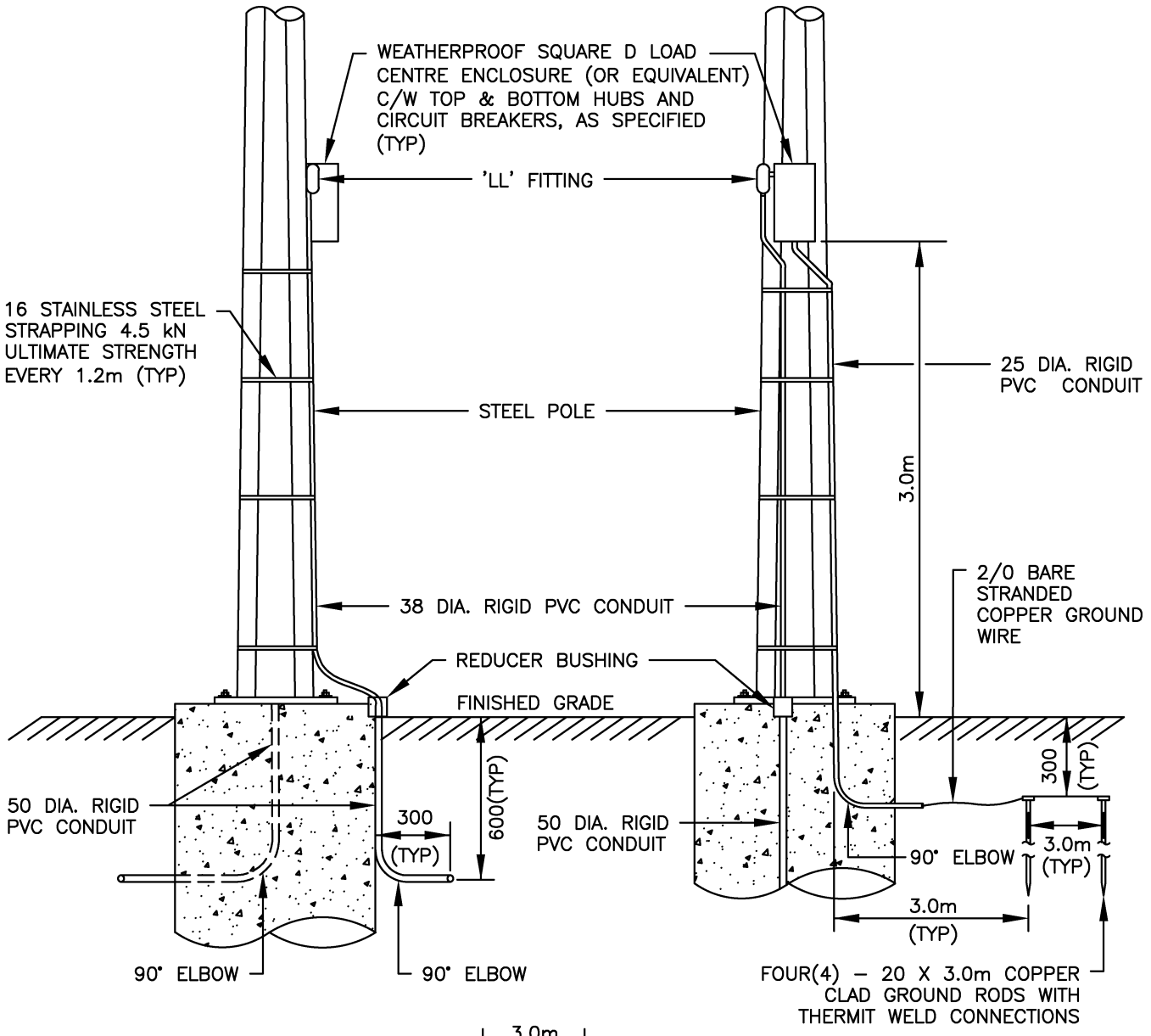
York Region

Public Works Transportation

TYPICAL METERED SERVICE ON STEEL POLE WITH BURIED HYDRO SUPPLY (NEWMARKET HYDRO)

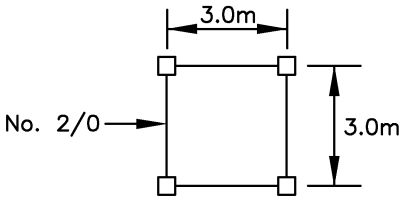
JANUARY 2023
DATE

E–5.05



SIDE VIEW

FRONT VIEW



TYPICAL GROUND ROD LAYOUT

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL CONTACT THE HYDRO AUTHORITY 3 WEEKS PRIOR TO POWER BEING REQUIRED AND REQUEST A 'SERVICE LAYOUT'.
3. THE CONTRACTOR SHALL OBTAIN AN 'INSPECTION CLEARANCE' FROM THE ELECTRICAL SAFETY AUTHORITY. THIS MUST BE OBTAINED WELL IN ADVANCE OF POWER TURN ON.

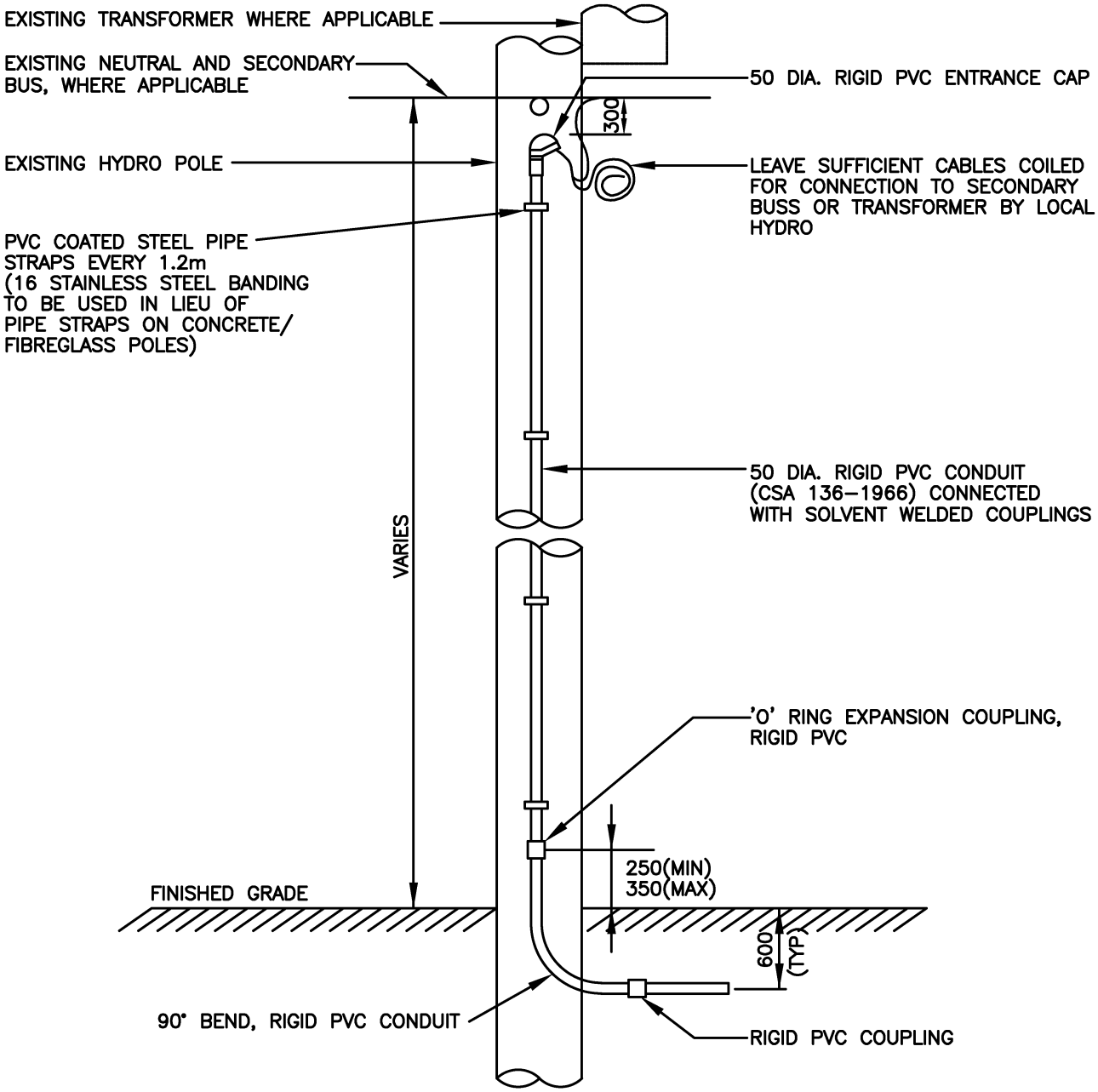
York Region

Public Works Transportation

TYPICAL SERVICE ON STEEL POLE WITH BURIED HYDRO SUPPLY (ALECTRA UTILITIES)

JANUARY 2023
DATE

E–5.08



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. WORK ON HYDRO POLE SHALL BE DONE ONLY IN THE PRESENCE OF OR WITH THE PERMISSION OF THE LOCAL HYDRO AUTHORITY.
3. CO–ORDINATE THIS WORK WITH THE LOCAL HYDRO AUTHORITY, GIVING TWO WEEKS ADVANCED NOTICE AND INCORPORATING ANY MINOR CHANGES REQUIRED.
4. MOUNTING DETAILS SHOWN ARE TYPICAL ONLY AND SHALL BE ADAPTED TO SUIT SITE CONDITIONS AND THE LOCAL HYDRO AUTHORITY.

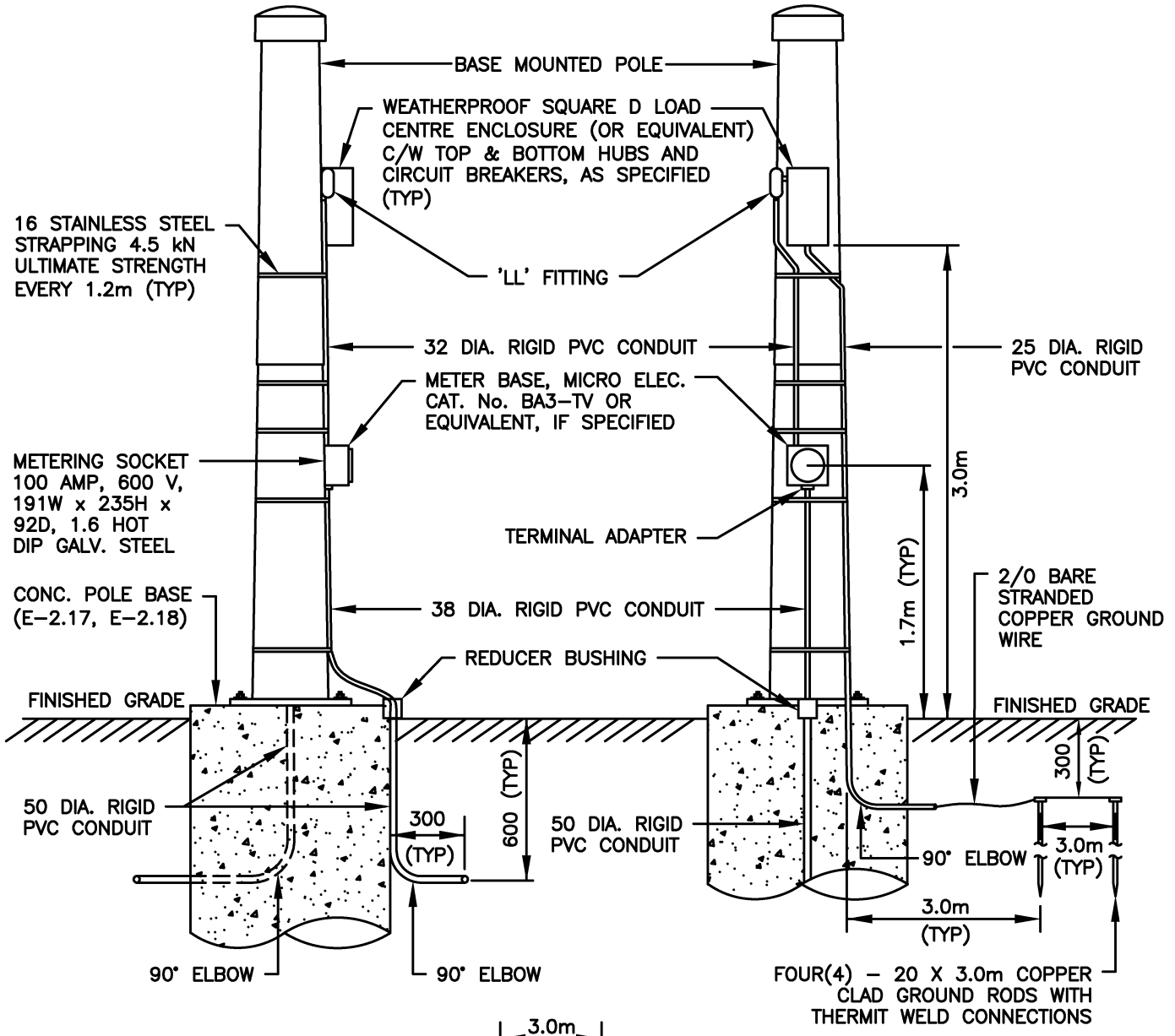
York Region

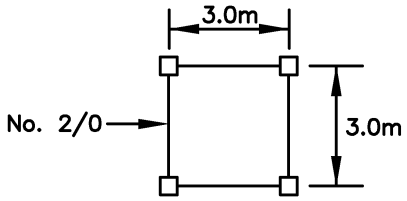
Public Works Transportation

TYPICAL HYDRO SUPPLY DETAIL

JANUARY 2023
DATE

E–5.09





TYPICAL GROUND ROD LAYOUT

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL CONTACT THE HYDRO AUTHORITY 3 WEEKS PRIOR TO POWER BEING REQUIRED AND REQUEST A 'SERVICE LAYOUT'.
3. THE CONTRACTOR SHALL OBTAIN AN 'INSPECTION CLEARANCE' FROM THE ELECTRICAL SAFETY AUTHORITY. THIS MUST BE OBTAINED WELL IN ADVANCE OF POWER TURN ON.

York Region

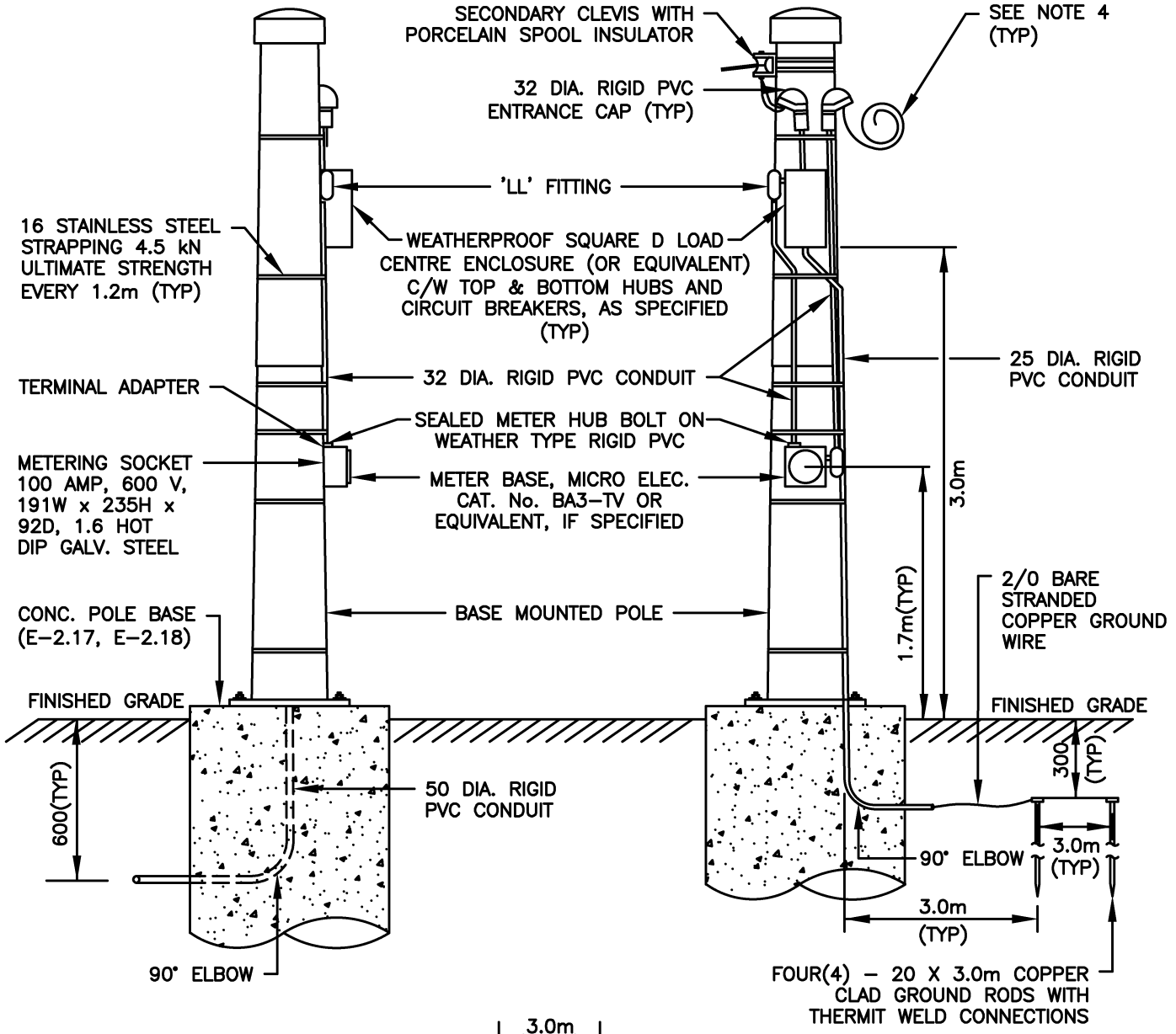
Public Works Transportation

SERVICE POLE 1

METERED WITH BURIED HYDRO SUPPLY

JANUARY 2023
DATE

E–5.10



TYPICAL GROUND ROD LAYOUT

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL CONTACT THE HYDRO AUTHORITY 3 WEEKS PRIOR TO POWER BEING REQUIRED AND REQUEST A 'SERVICE LAYOUT'.
3. THE CONTRACTOR SHALL OBTAIN AN 'INSPECTION CLEARANCE' FROM THE ELECTRICAL SAFETY AUTHORITY. THIS MUST BE OBTAINED WELL IN ADVANCE OF POWER TURN ON.
4. LEAVE SUFFICIENT CABLES COILED FOR CONNECTION TO SECONDARY, SECONDARY BUS OF TRANSFORMER BY LOCAL AUTHORITY.

York Region

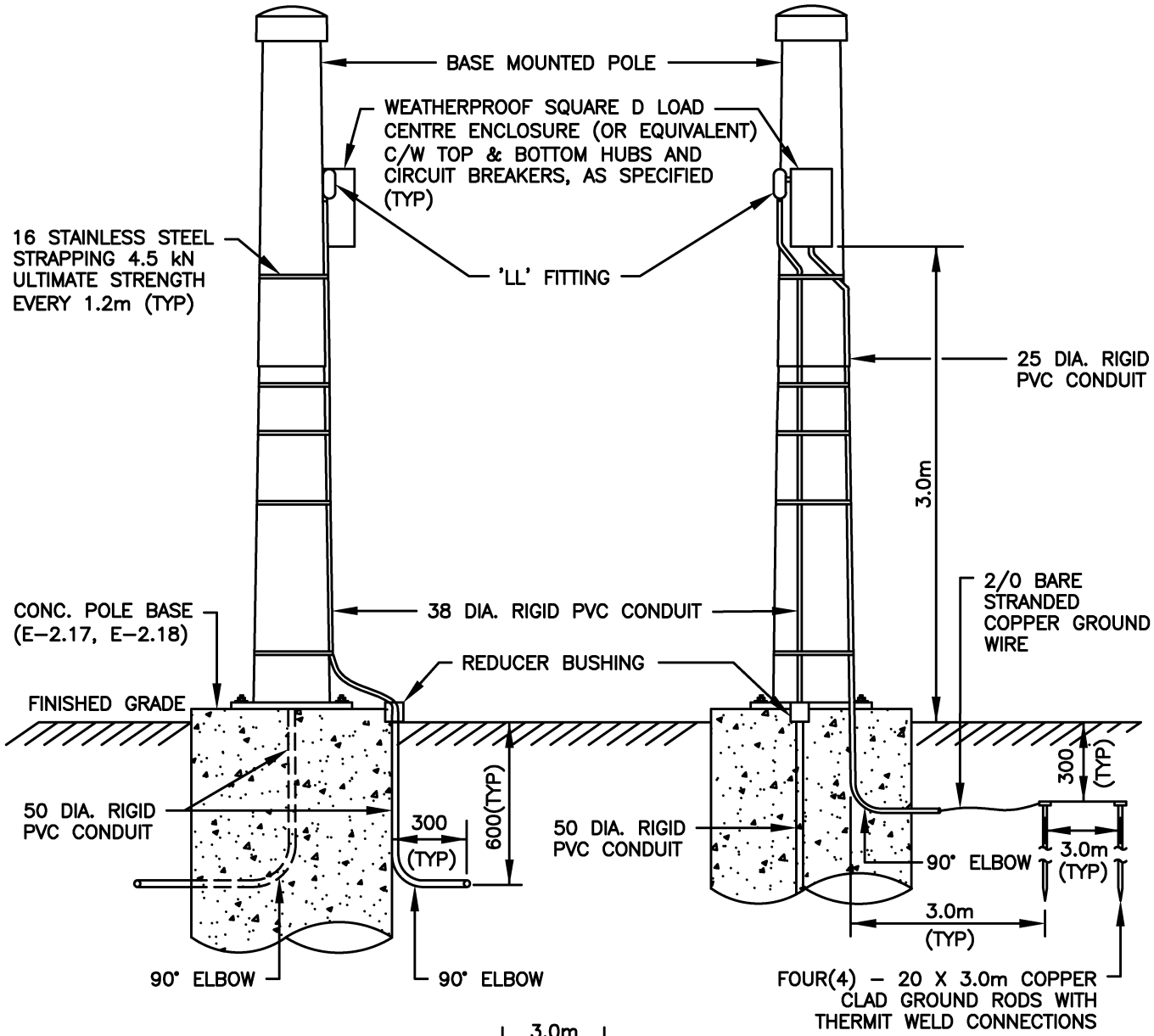
Public Works Transportation

SERVICE POLE 2

METERED WITH AERIAL HYDRO SUPPLY

JANUARY 2023
DATE

E-5.11



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL CONTACT THE HYDRO AUTHORITY 3 WEEKS PRIOR TO POWER BEING REQUIRED AND REQUEST A 'SERVICE LAYOUT'.
3. THE CONTRACTOR SHALL OBTAIN AN 'INSPECTION CLEARANCE' FROM THE ELECTRICAL SAFETY AUTHORITY. THIS MUST BE OBTAINED WELL IN ADVANCE OF POWER TURN ON.

York Region

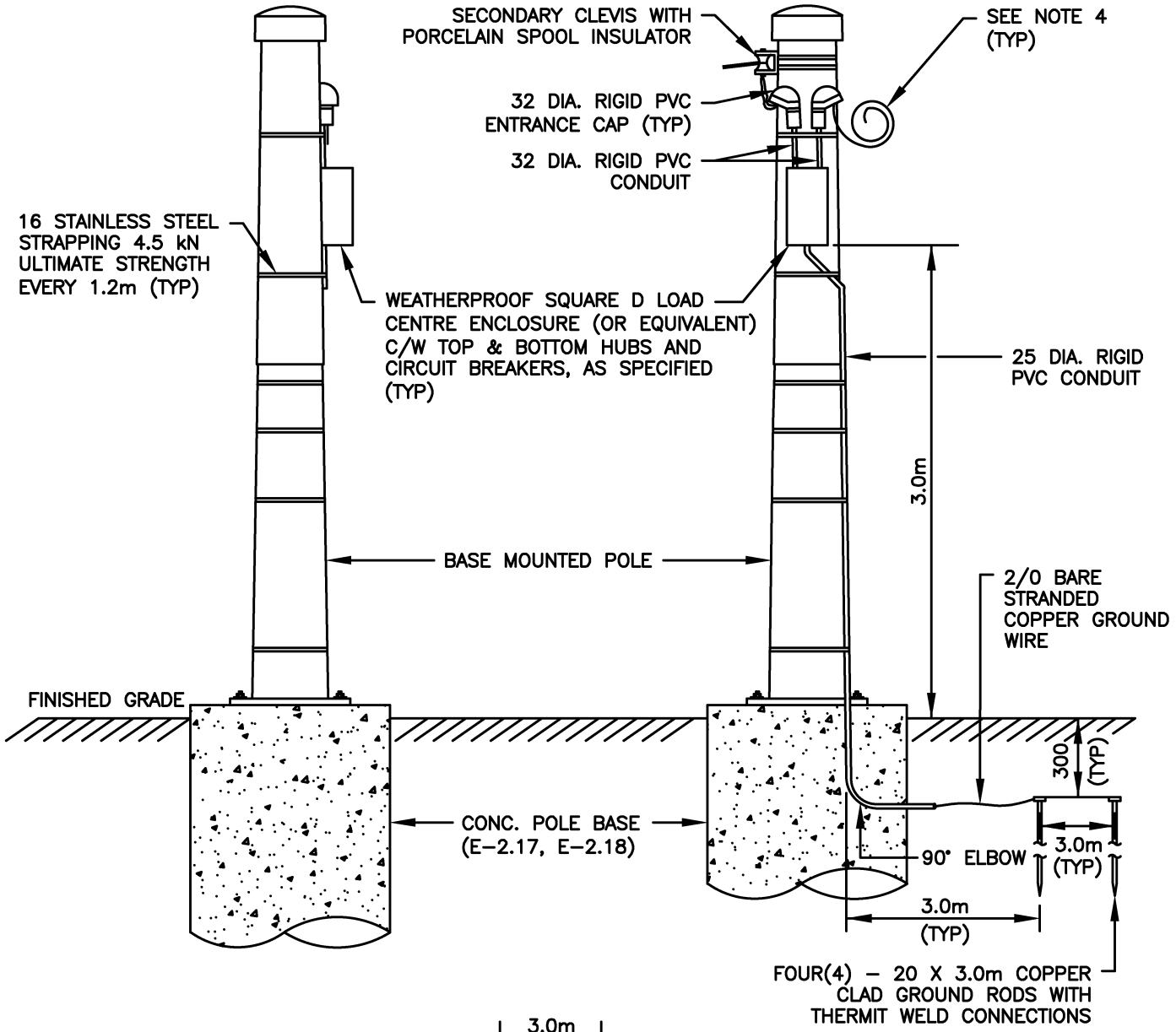
Public Works Transportation

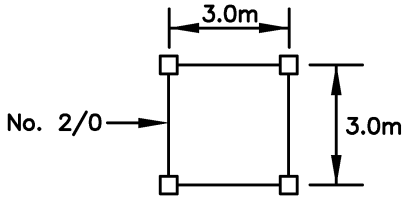
SERVICE POLE 3

BURIED HYDRO SUPPLY

JANUARY 2023
DATE

E-5.12





TYPICAL GROUND ROD LAYOUT

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL CONTACT THE HYDRO AUTHORITY 3 WEEKS PRIOR TO POWER BEING REQUIRED AND REQUEST A 'SERVICE LAYOUT'.
3. THE CONTRACTOR SHALL OBTAIN AN 'INSPECTION CLEARANCE' FROM THE ELECTRICAL SAFETY AUTHORITY. THIS MUST BE OBTAINED WELL IN ADVANCE OF POWER TURN ON.
4. LEAVE SUFFICIENT CABLES COILED FOR CONNECTION TO SECONDARY, SECONDARY BUS OF TRANSFORMER BY LOCAL AUTHORITY.

York Region

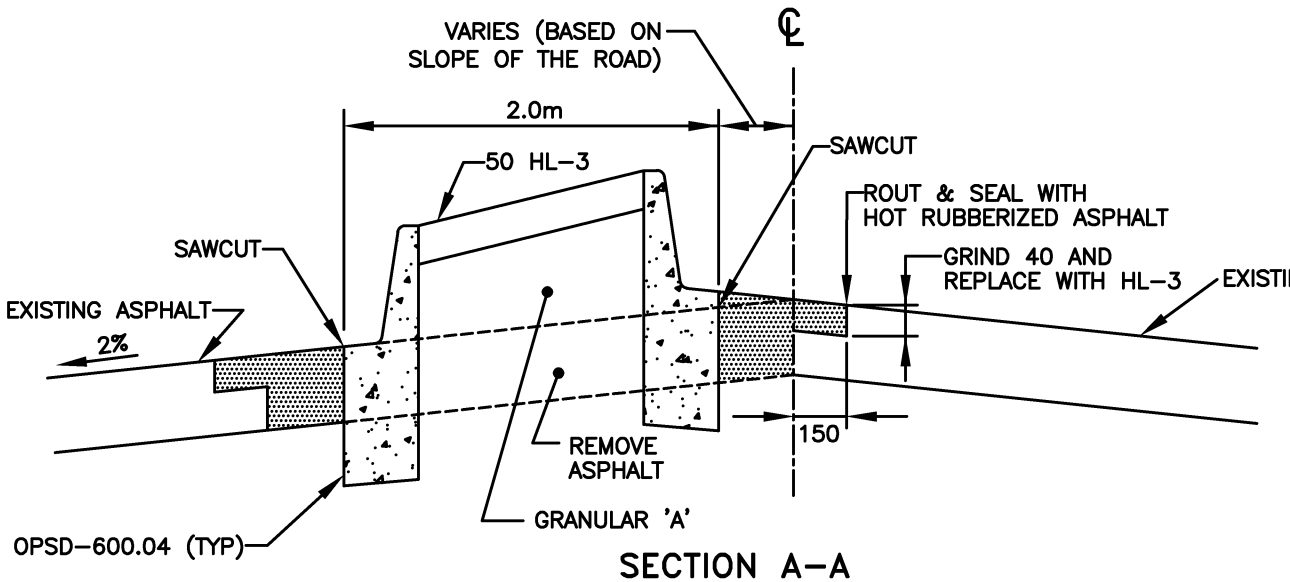
Public Works Transportation

SERVICE POLE 4

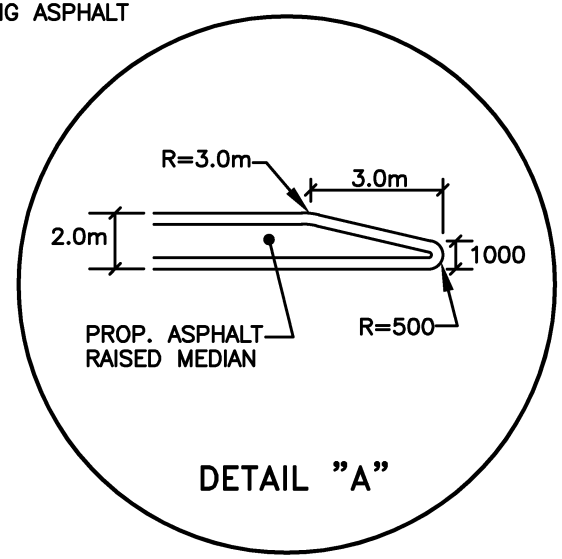
AERIAL HYDRO SUPPLY

JANUARY 2023
DATE

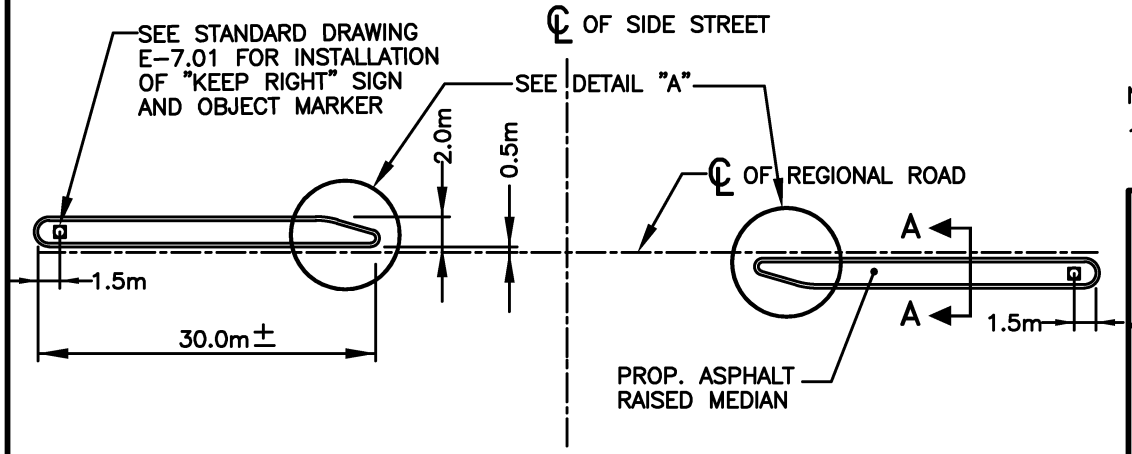
E-5.13



SECTION A-A
TYPICAL ISLAND SECTION
MATCHING EXISTING PAVEMENT



DETAIL "A"



PLAN VIEW

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.

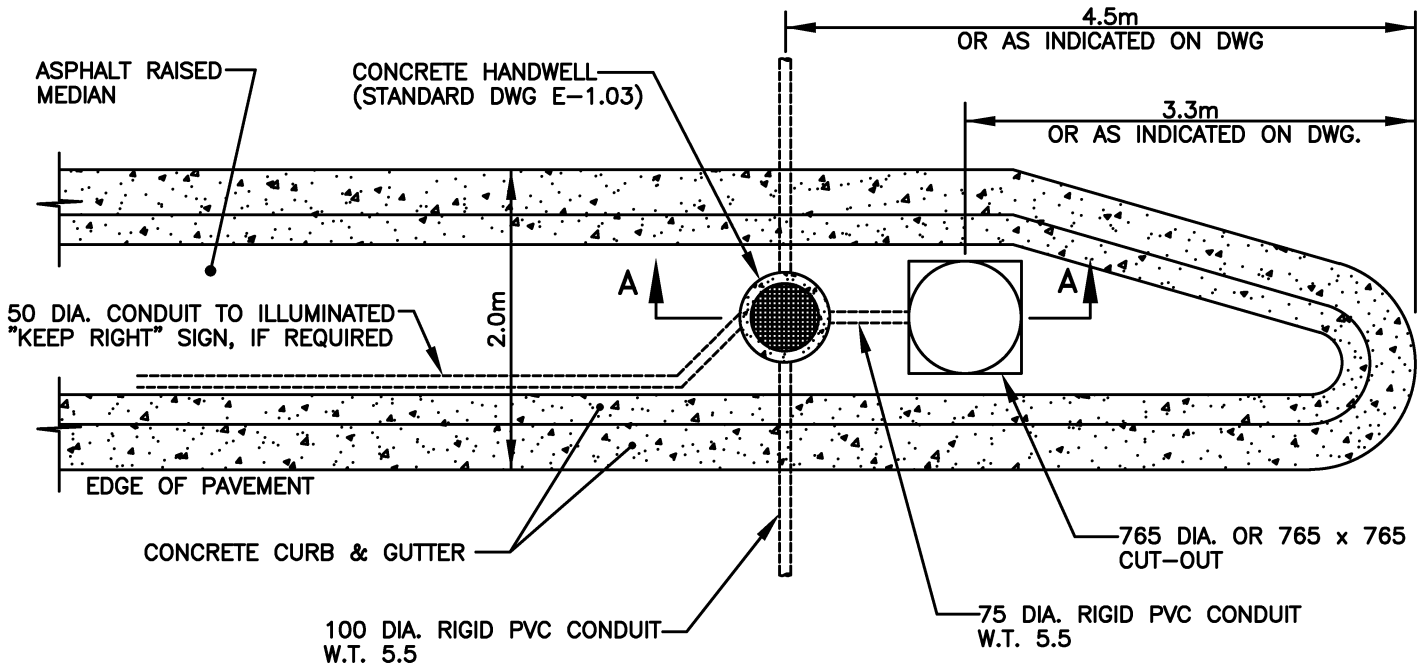
York Region

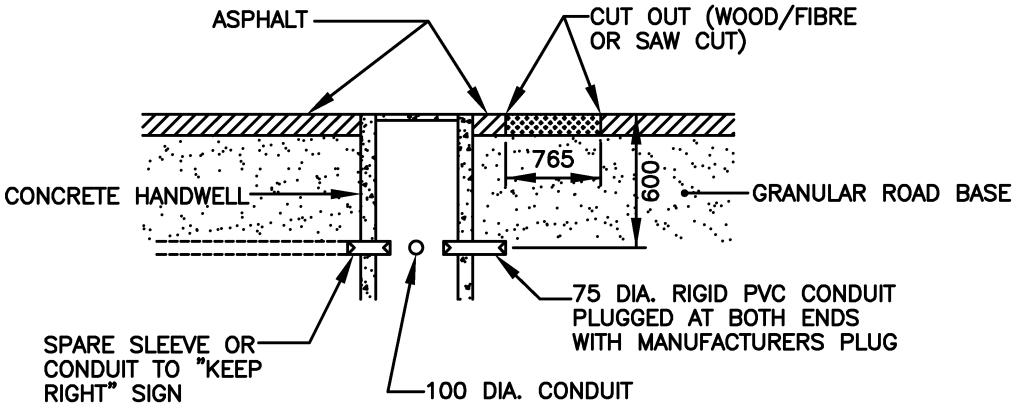
Public Works
Transportation

TYPICAL DETAIL FOR CONSTRUCTION
OF ASPHALT RAISED MEDIAN
ISLANDS AT INTERSECTIONS

JANUARY 2023
DATE

E-6.01





SECTION A-A

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. CUT-OUT TO BE FILLED WITH ASPHALT

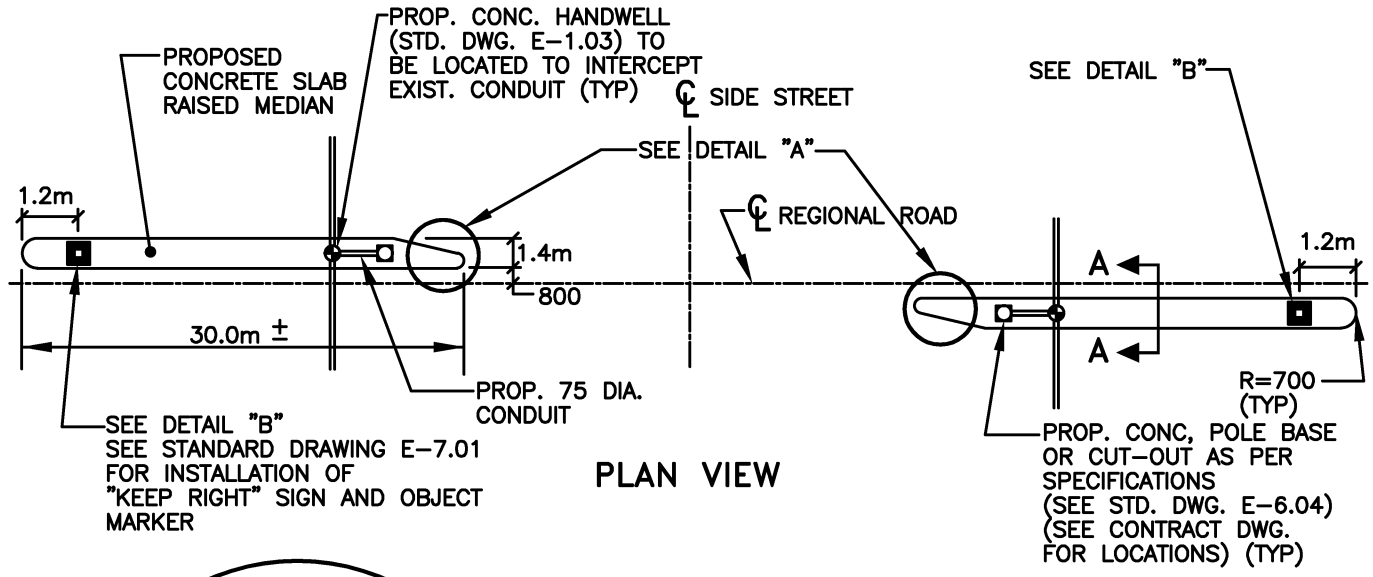
York Region

Public Works
Transportation

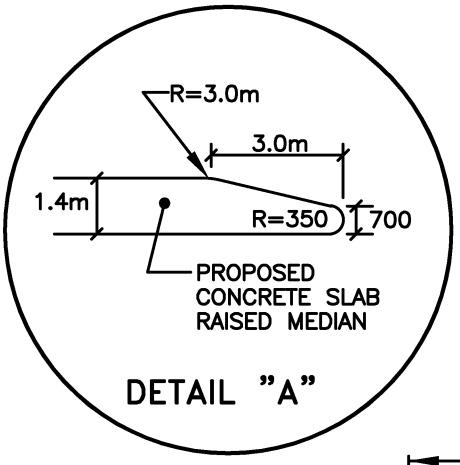
CUT-OUT DETAIL FOR FUTURE TRAFFIC SIGNAL POLE IN ASPHALT RAISED MEDIAN ISLAND

JANUARY 2023
DATE

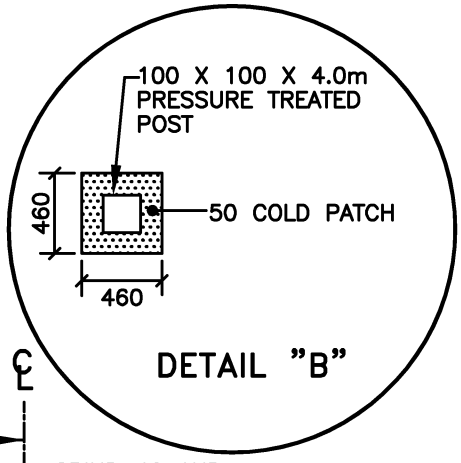
E-6.02



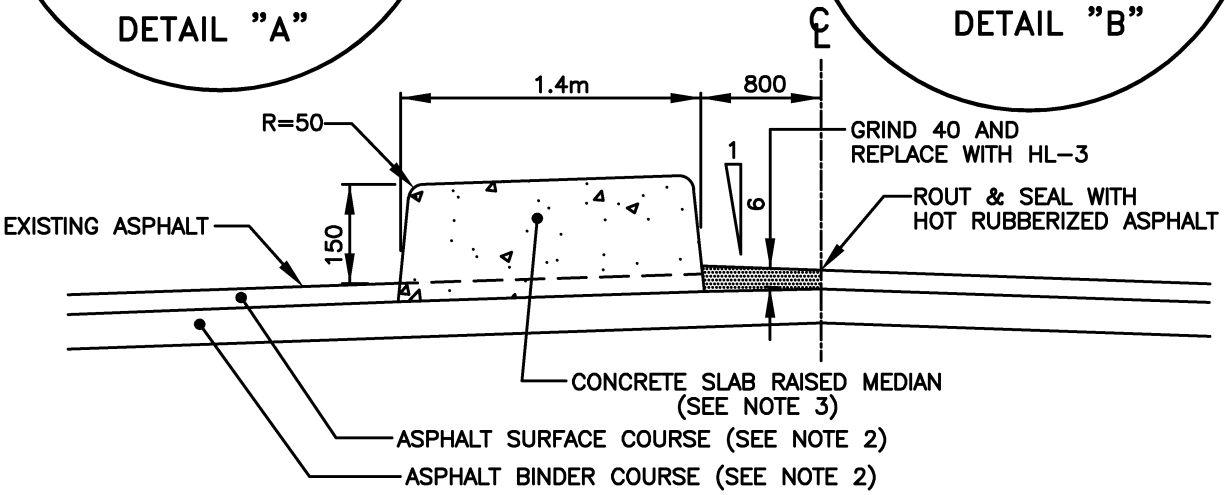
PLAN VIEW



DETAIL "A"



DETAIL "B"



SECTION A-A

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. WHEN SLAB TYPR RAISED MEDIAN IS INSTALLED ON EXISTING ROAD SURFACE, THE EXISTING ASPHALT SHALL BE GROUND DOWN 40 OVER ENTIRE AREA OF SLAB.
3. CONCRETE SHALL BE 32 MPa COMPRESSIVE STRENGTH AT 28 DAYS, WITH 5% TO 8% AIR ENTRAINMENT.
4. CONTRACTION JOINTS (5 X 60 DEEP) SHALL BE CUT IN THE CONCRETE SLAB EVERY 2.5 METRES.
5. SEE STANDARD DRAWING DS-109 FOR MEDIAN LAYOUT IN RELATION TO EXISTING LANE WIDTHS.

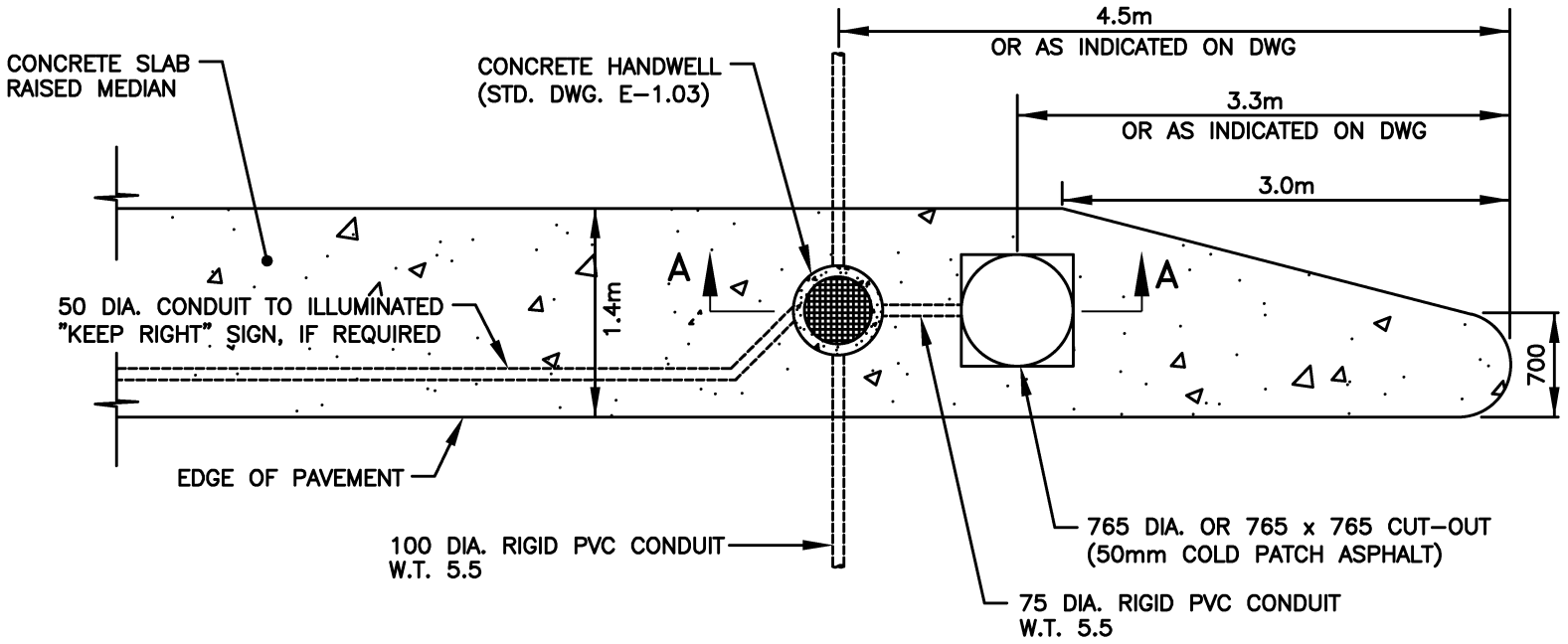
York Region

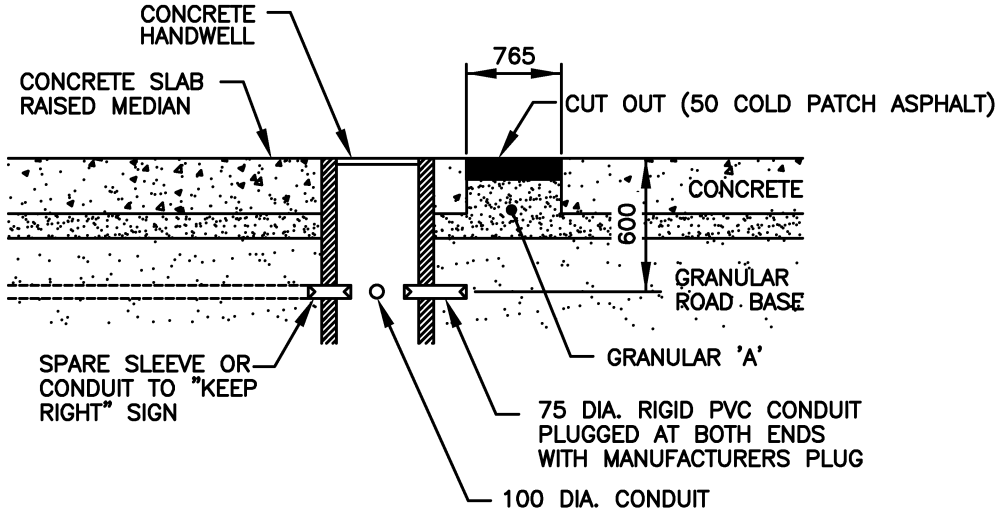
Public Works
Transportation

TYPICAL DETAIL FOR CONSTRUCTION OF CONCRETE SLAB RAISED MEDIAN ISLANDS AT INTERSECTIONS

JANUARY 2023
DATE

E-6.03





SECTION A-A

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. SEE STANDARD DRAWING DS-109 FOR MEDIAN LAYOUT IN RELATION TO EXISTING LANE WIDTHS.

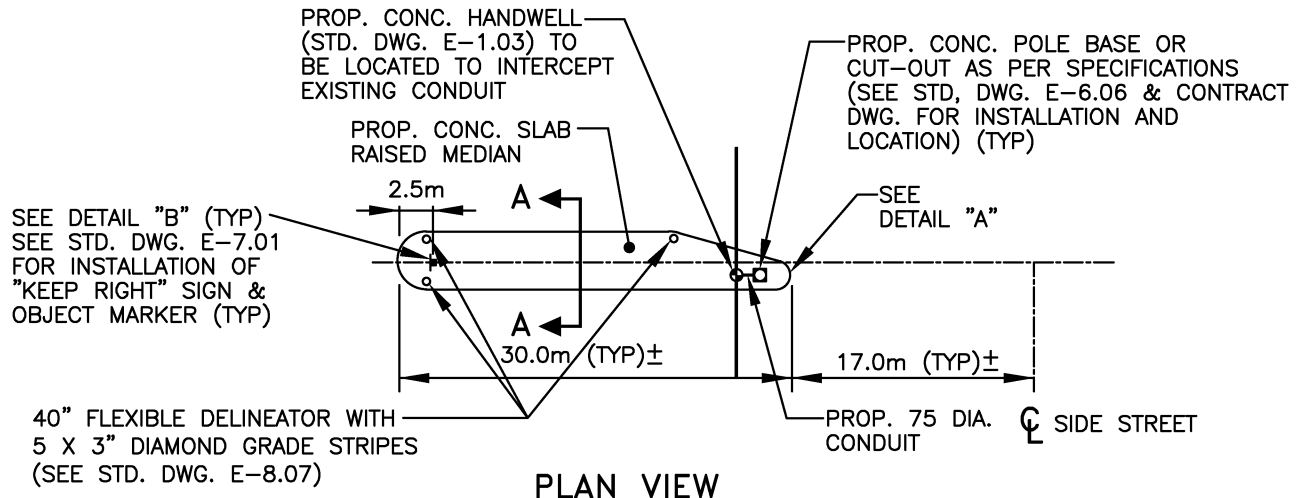
York Region

Public Works
Transportation

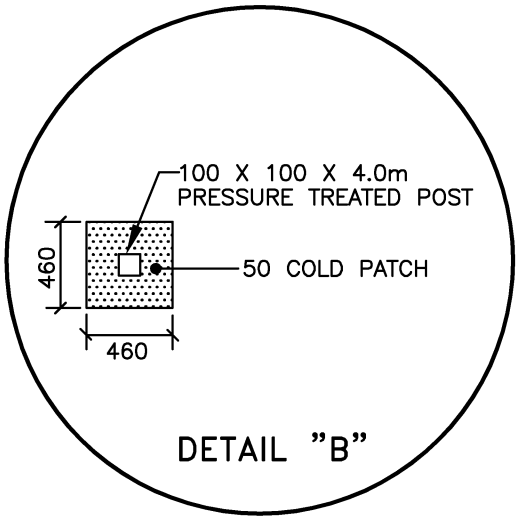
CUT-OUT DETAIL FOR FUTURE TRAFFIC SIGNAL POLE IN CONCRETE SLAB RAISED MEDIAN ISLAND

JANUARY 2023
DATE

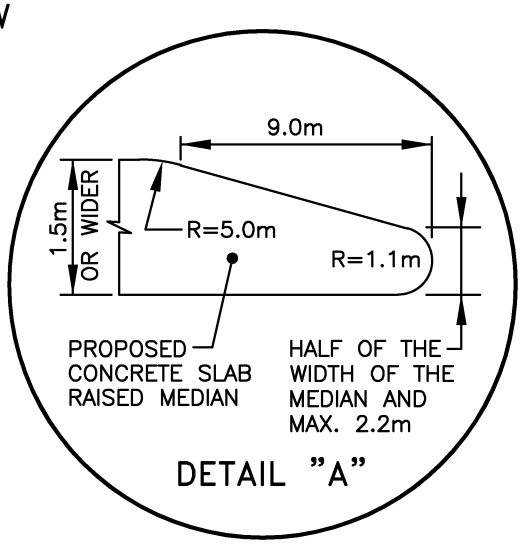
E-6.04



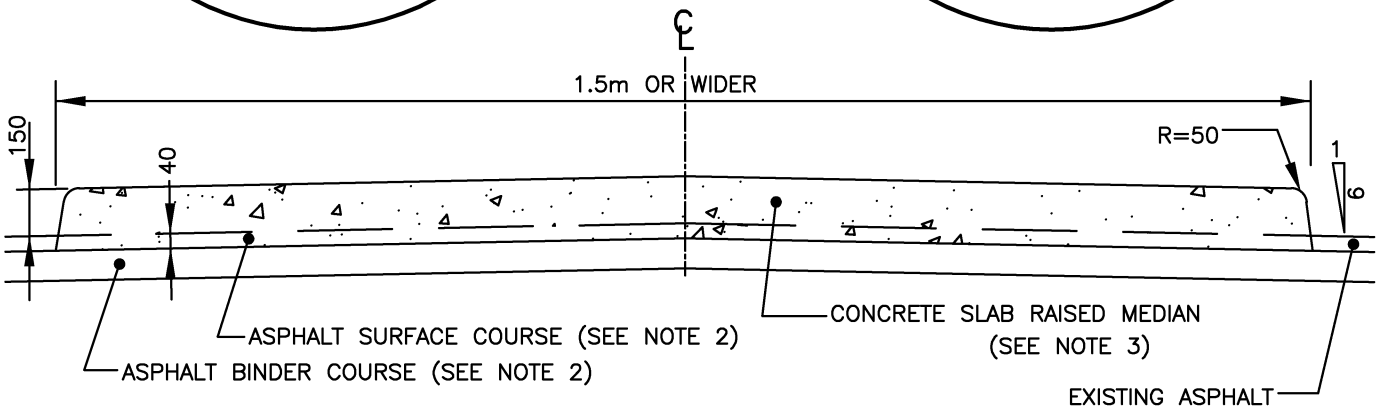
PLAN VIEW



DETAIL "B"



DETAIL "A"



SECTION A-A

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE INDICATED.
2. WHEN SLAB TYPE RAISED MEDIAN IS INSTALLED ON EXISTING ROAD SURFACE, THE EXISTING ASPHALT IS TO BE GROUND DOWN 40 OVER THE ENTIRE AREA OF SLAB.
3. CONCRETE TO BE 32 MPa COMPRESSIVE STRENGTH AT 28 DAYS, WITH 5% TO 8% AIR ENTRAINMENT.
4. CONTRACTION JOINTS (5 X 50 DEEP) ARE TO BE CUT IN THE CONCRETE SLAB EVERY 2.5m.
5. DELINEATORS ARE REQUIRED ON ANY CONC. SLAB RAISED MEDIAN WIDER THAN 1.5m.

N.T.S.

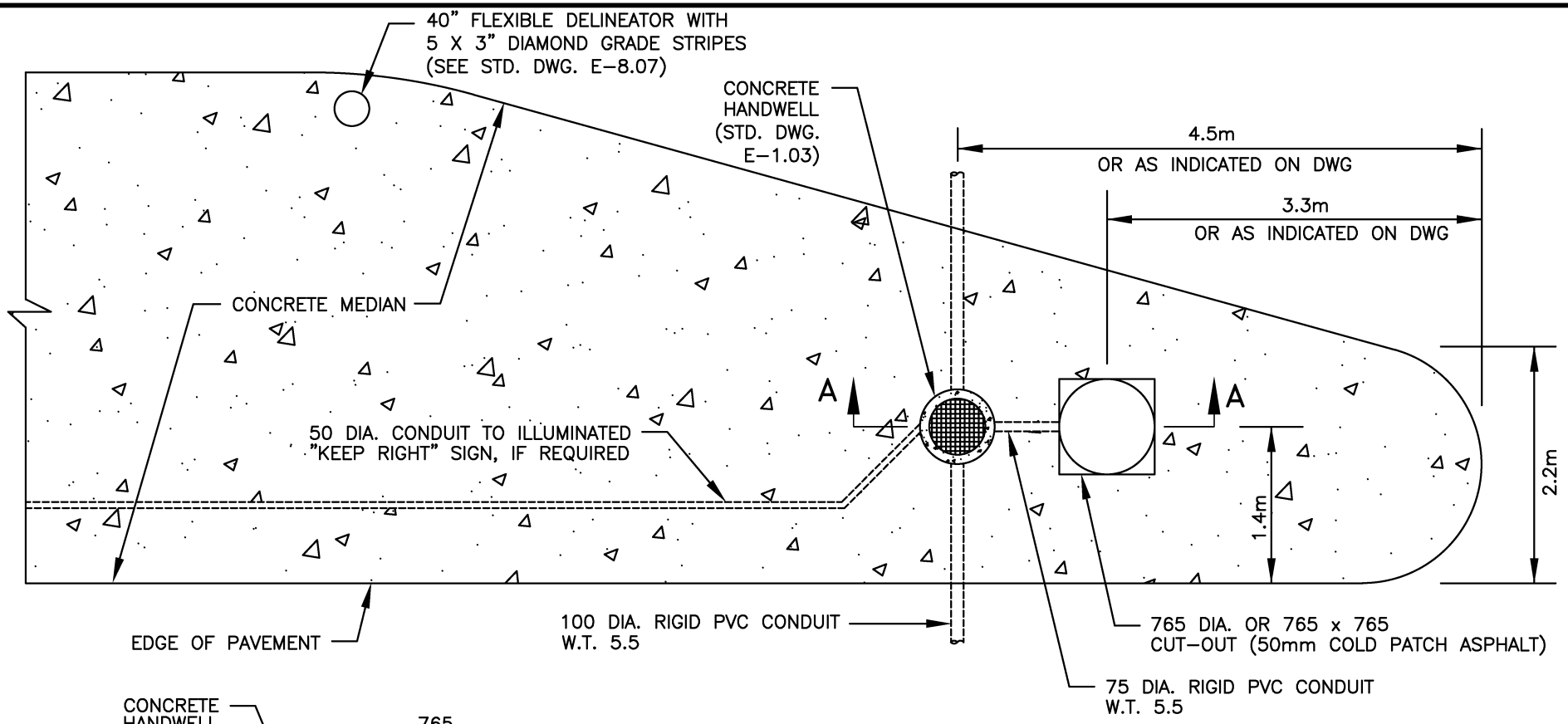
York Region

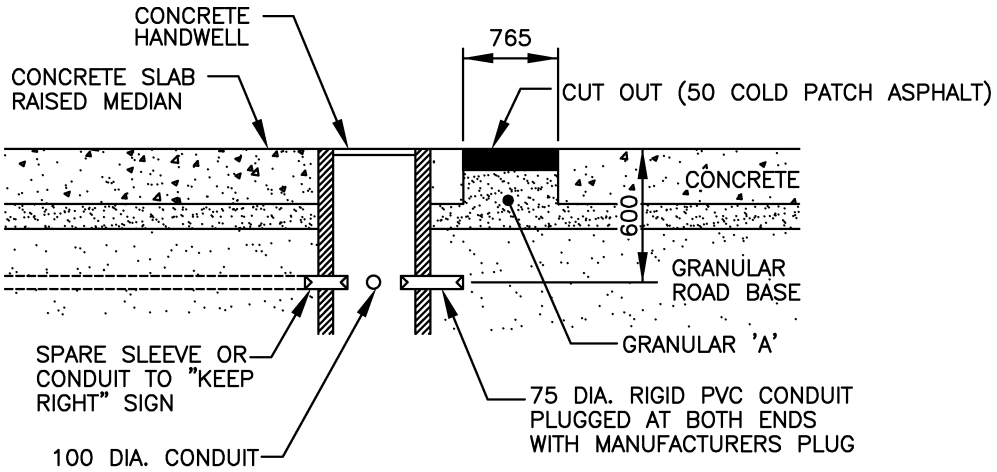
Public Works Transportation

TYPICAL DETAIL FOR CONSTRUCTION OF 1.5m OR WIDER CONCRETE SLAB RAISED MEDIAN ISLANDS AT INTERSECTIONS

JANUARY 2023
DATE

E-6.05





SECTION A-A

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.

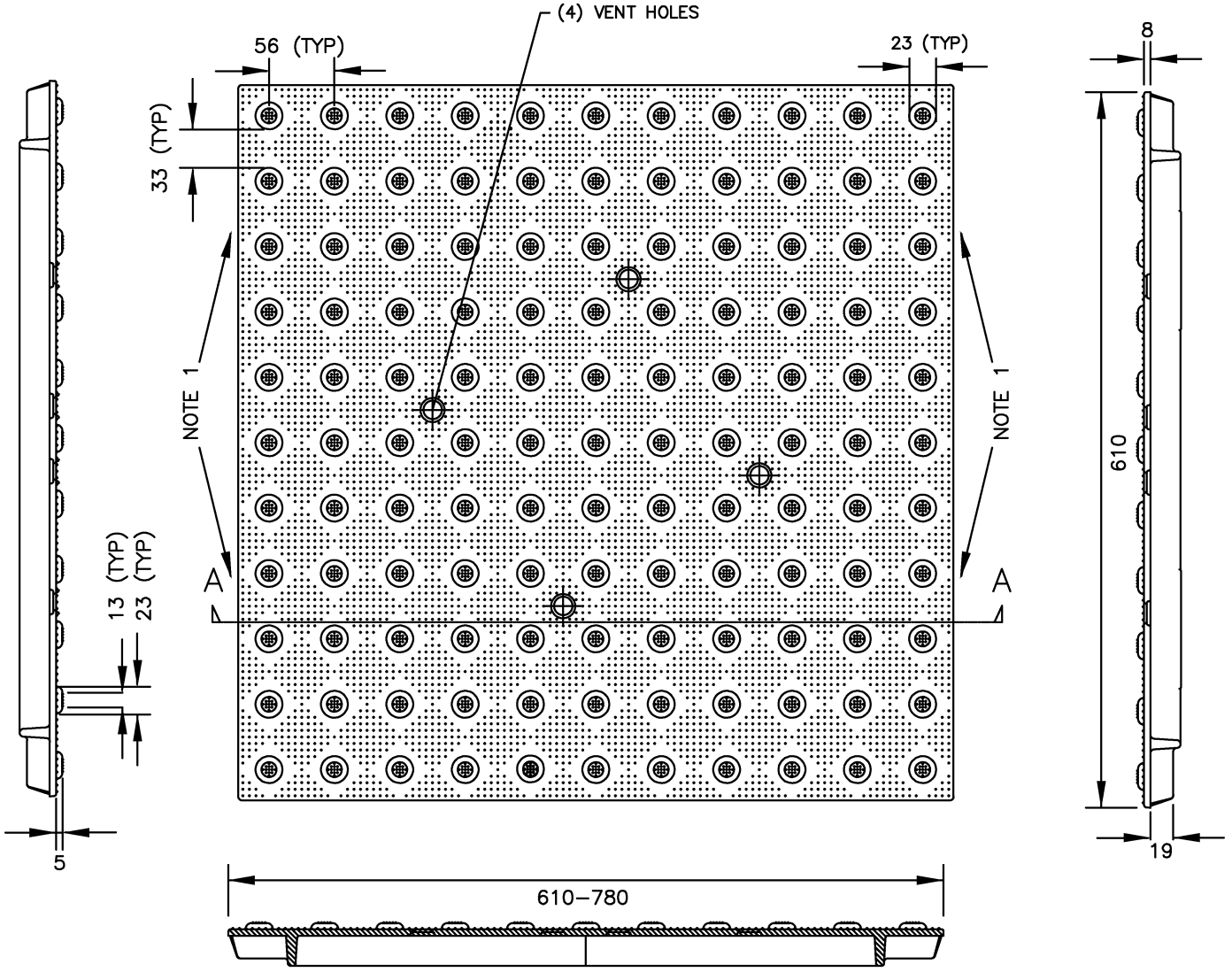
York Region

Public Works
Transportation

CUT-OUT DETAIL FOR FUTURE TRAFFIC SIGNAL POLE IN 1.5m OR WIDER CONCRETE SLAB RAISED MEDIAN ISLAND

JANUARY 2023
DATE

E-6.06



SECTION A–A

NOTES

1. LOCK LUG AND SLOTS TO INTERCONNECT ADJACENT CAST IRON PLATES. ALTERNATIVELY THE PLATES CAN BE BOLTED TOGETHER.
2. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE INDICATED.
3. INSTALL PLATES INTO WET CONCRETE TO FINAL POSITION.
4. PRESS ASSEMBLY INTO WET CONCRETE TO FINAL ELEVATION.
5. SEE STANDARD DRAWING DS–119 FOR DETAILS ABOUT LOCATION OF TACTILE PLATES.

N.T.S.

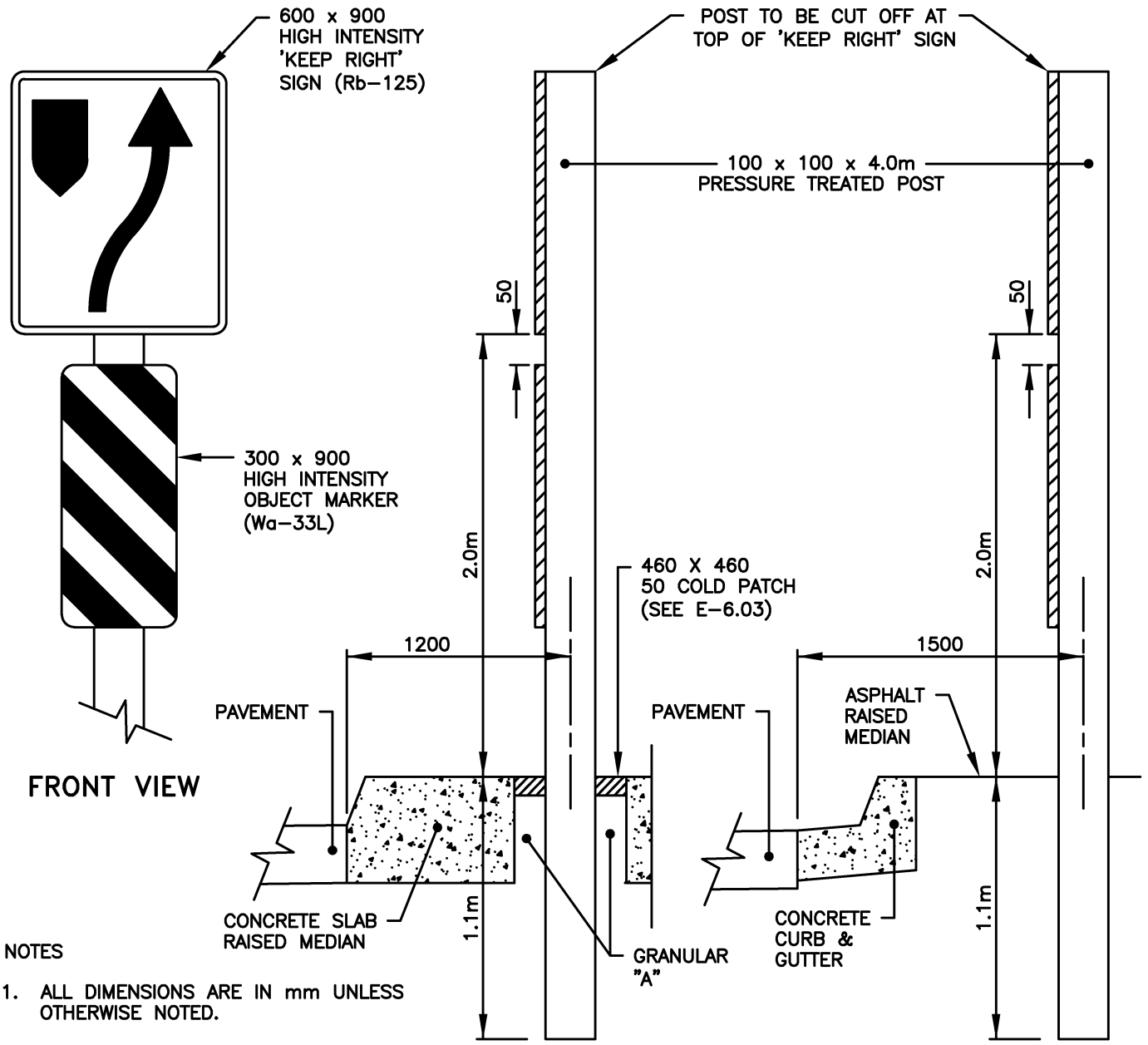
York Region

Public Works
Transportation

TACTILE WARNING PLATE

JANUARY 2023
DATE

E–6.07



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. THE SIGN AND MARKER ARE TO BE ATTACHED TO THE WOOD POST USING 9.5 x 64 GALVANIZED STEEL LAG SCREWS & WASHERS. WHEN THE SIGN AND MARKER ARE TO BE INSTALLED ON STEEL MEDIAN ISLAND POLES, 16 STAINLESS STEEL STRAPPING, 4.5kN ULTIMATE STRENGTH, IS TO BE USED TOP & BOTTOM, IN LIEU OF LAG SCREWS. WASHERS ARE TO BE USED FOR BOTH METHODS OF SIGN MOUNTING. TWO WASHERS ARE TO BE USED FOR EACH LAG SCREW OR BOLT; ONE FLAT 9.5 x 31.8 DIA. NYLON WASHER PLACED AGAINST THE SIGN SURFACE AND ONE FLAT 9.5 x 31.8 DIA. GALVANIZED STEEL (WITH LAG SCREWS) OR STAINLESS STEEL (WITH LAG SCREWS OR STRAPPING) ON TOP OF THE NYLON WASHER.
3. FOR THE INSTALLATION OF "KEEP RIGHT" SIGN AND OBJECT MARKER IN A CONCRETE SLAB RAISED MEDIAN ISLAND, SEE STANDARD DWG. NO. E-6.03, DETAIL "B".
4. WIDTH OF BANDING SHALL BE AT MIN. 16.

N.T.S.

York Region

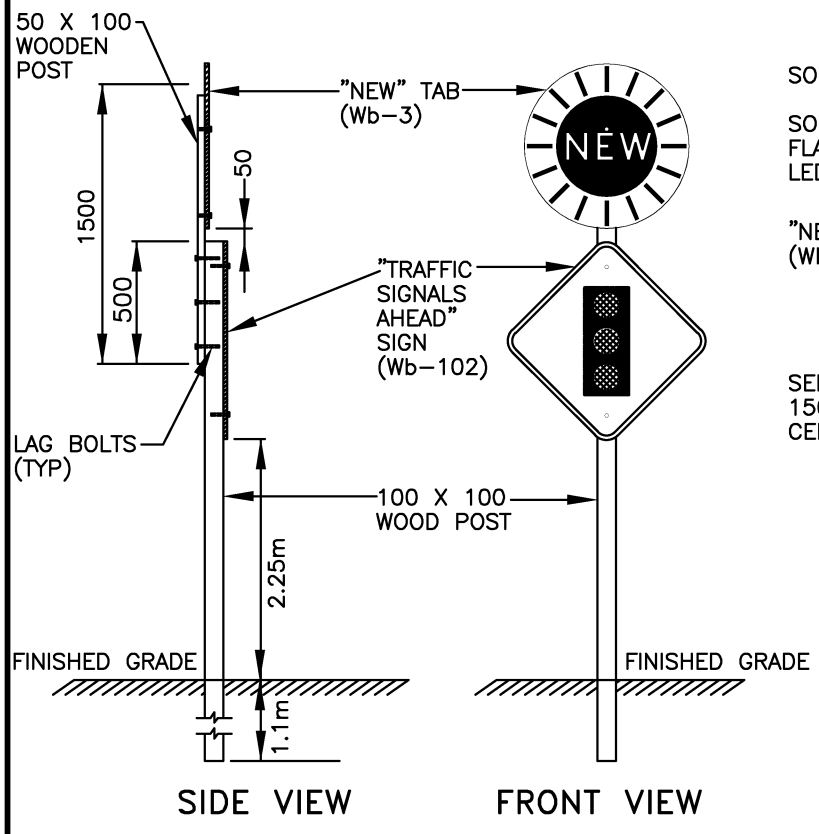
Public Works
Transportation

TYPICAL "KEEP RIGHT" SIGN AND OBJECT MARKER INSTALLATION IN MEDIAN ISLANDS

JANUARY 2023
DATE

E-7.01

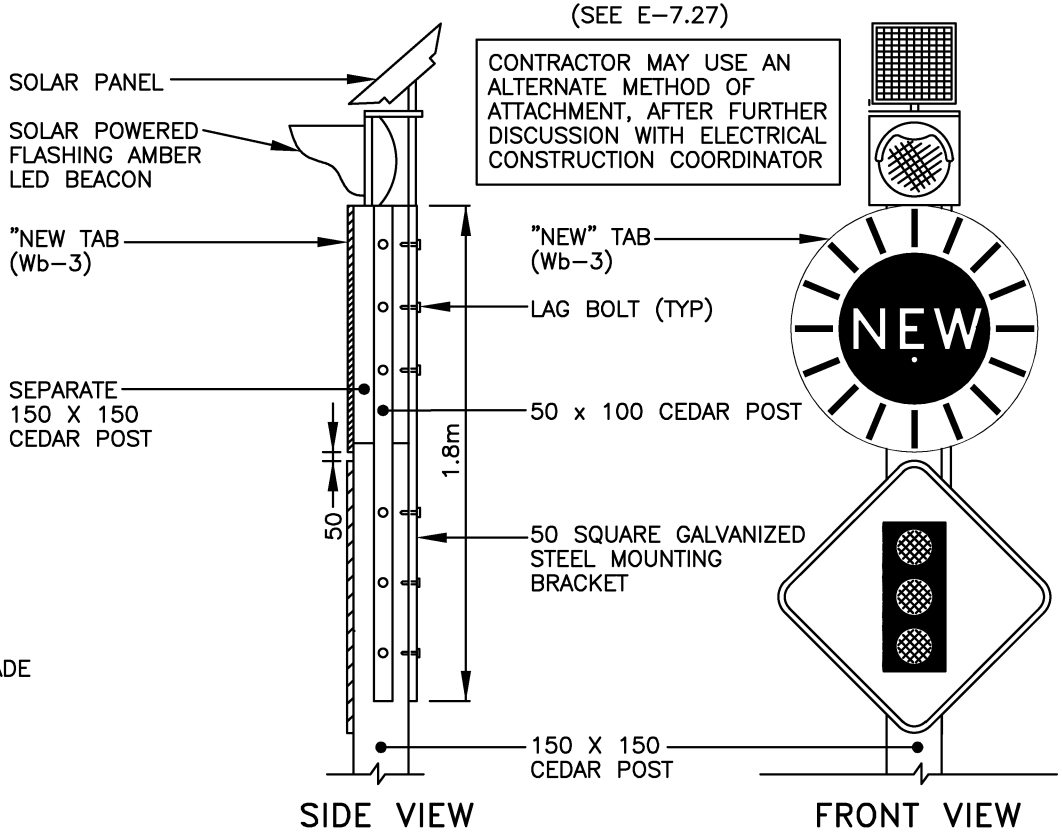
SCENARIO 1



SCENARIO 2

(SEE E-7.27)

CONTRACTOR MAY USE AN ALTERNATE METHOD OF ATTACHMENT, AFTER FURTHER DISCUSSION WITH ELECTRICAL CONSTRUCTION COORDINATOR



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. IN URBAN INTERSECTIONS, THE CONTRACTOR WILL REMOVE AND SALVAGE "TRAFFIC SIGNALS AHEAD" SIGN, "NEW" TAB AND WOOD POST, 50 DAYS AFTER THE TRAFFIC SIGNAL TURN ON.
3. IN RURAL INTERSECTIONS, THE CONTRACTOR WILL REMOVE AND SALVAGE "NEW" TAB AND 50 x 100 WOODEN EXTENSION 50 DAYS AFTER THE TRAFFIC SIGNAL TURN ON. THE POST AND "TRAFFIC SIGNALS AHEAD" SIGN TO REMAIN.
4. SOLAR PANEL TO BE ORIENTATED AS INSTRUCTED BY MANUFACTURER.
5. POST TO BE SUPPLIED & INSTALLED BY THE CONTRACTOR. SIGNS TO BE SUPPLIED BY THE REGION AND INSTALLED BY THE CONTRACTOR.
6. IN SCENARIO 2, CONTRACTOR MUST LOWER SOLAR PANEL ONCE THE "NEW" TAB IS REMOVED.
7. SEE E-7.27 FOR COMPLETE DETAILS OF SCENARIO 2.

York Region

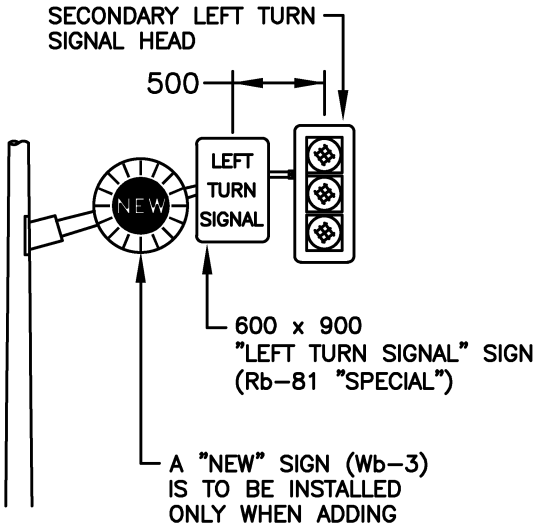
Public Works
Transportation

TYPICAL MOUNTING DETAIL FOR "TRAFFIC SIGNALS AHEAD" SIGN AND "NEW" TAB (URBAN & RURAL)

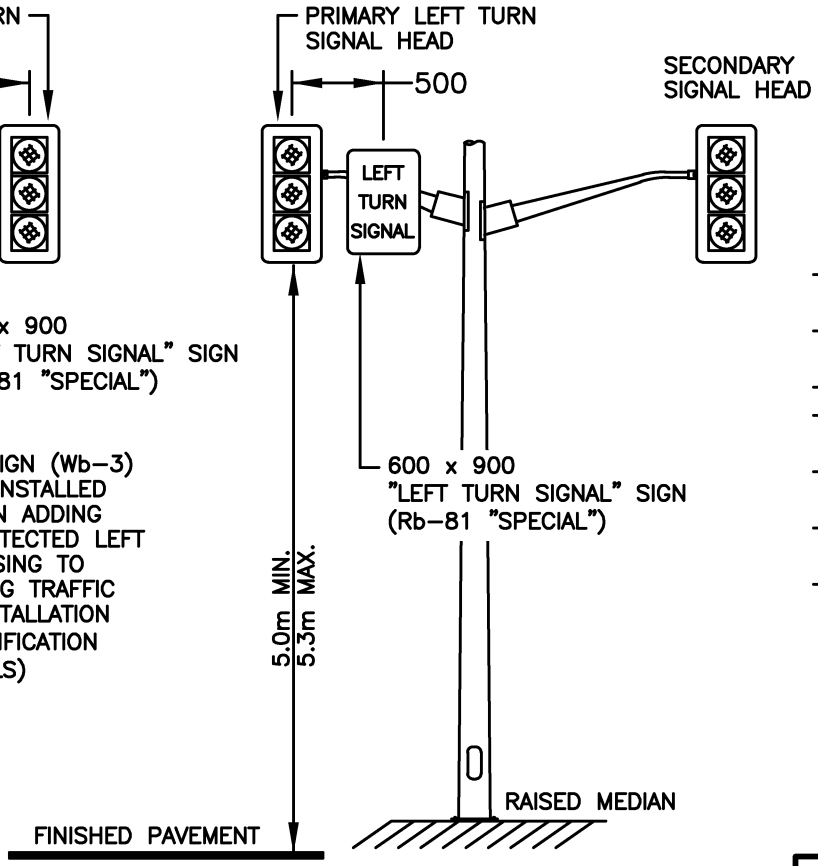
JANUARY 2023
DATE

E-7.04

SECONDARY POLE

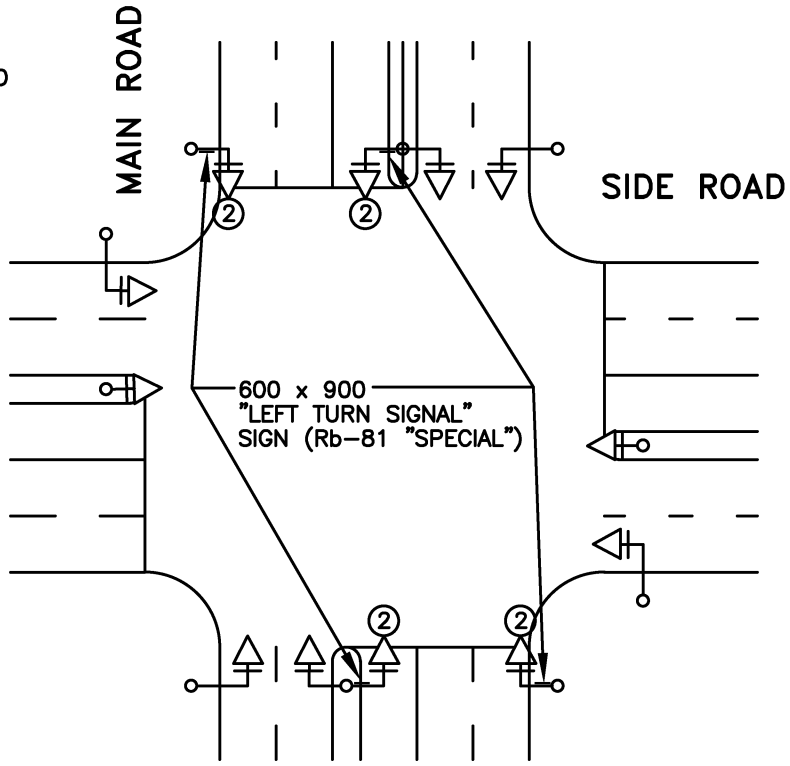


MEDIAN POLE



FRONT VIEW

TYPICAL SEPARATE LEFT TURN PHASE INTERSECTION



PLAN VIEW

NOTE

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE INDICATED.
2. FOR SIGN MOUNTING, TWO WASHERS ARE TO BE USED FOR EACH BOLT; ONE FLAT 9.4 X 19 DIA. NYLON WASHER PLACED AGAINST THE SIGN SURFACE AND ONE FLAT 9.4 X 19 DIA. STAINLESS STEEL WASHER ON TOP OF THE NYLON WASHER.
3. THE CONTRACTOR WILL REMOVE AND SALVAGE THE "NEW" TAB 50 DAYS AFTER THE TRAFFIC SIGNAL MODIFICATION.

N.T.S.

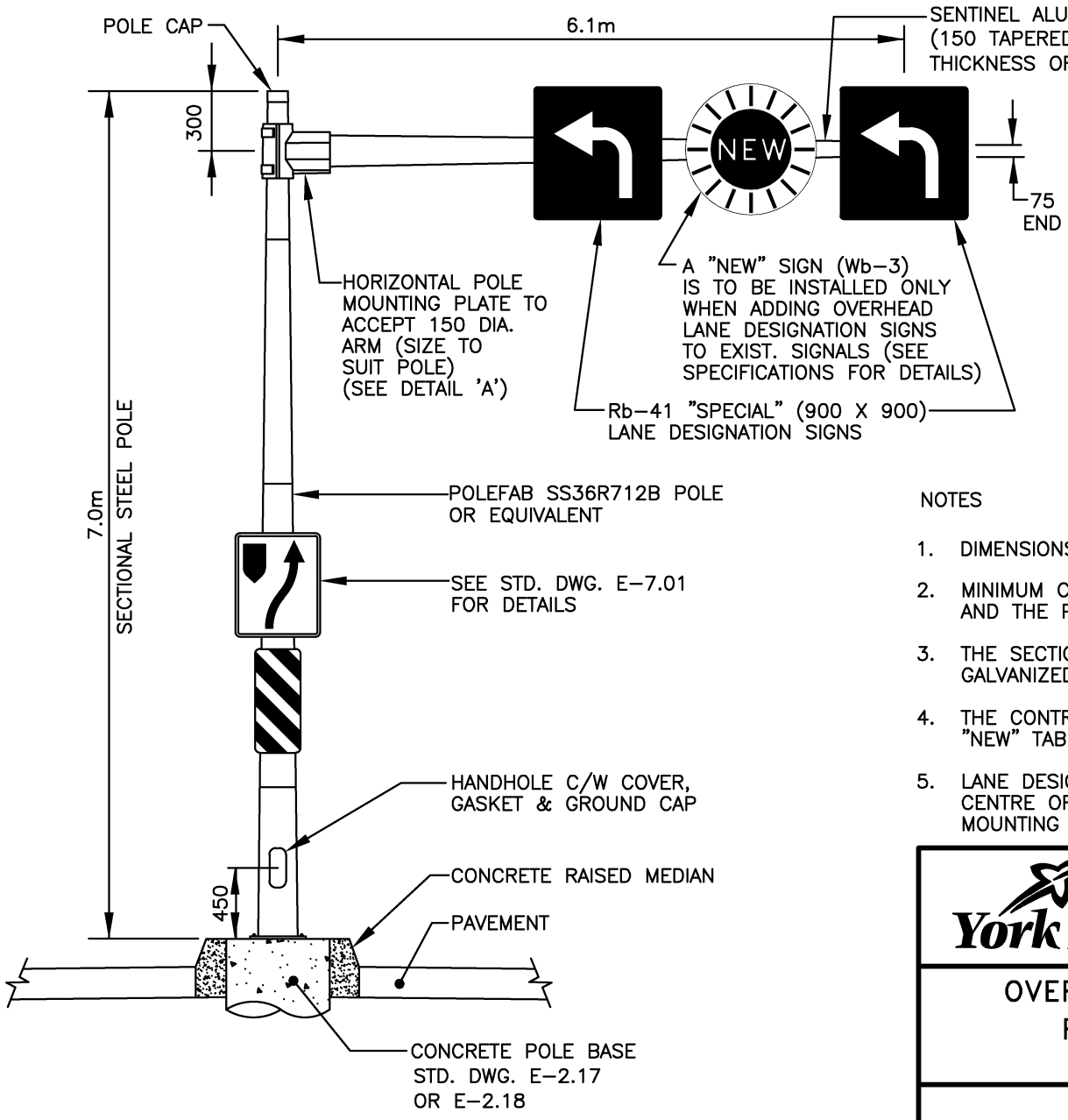
York Region

Public Works
Transportation

"LEFT TURN SIGNAL" SIGN MOUNTING DETAIL

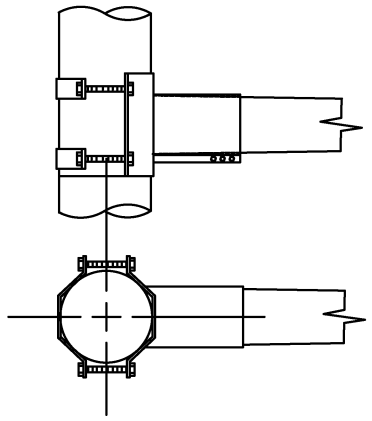
JANUARY 2023
DATE

E–7.06



CANTILEVER SIGN & POLE ASSEMBLY

N.T.S.



DETAIL 'A'

NOTES

1. DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. MINIMUM CLEARANCE BETWEEN THE LANE DESIGNATION SIGNS AND THE PAVEMENT IS 5.5m.
3. THE SECTIONAL STEEL POLE IS TO BE POLEFAB GALVANIZED STEEL OR APPROVED EQUAL.
4. THE CONTRACTOR WILL REMOVE AND SALVAGE THE "NEW" TAB, 50 DAYS AFTER THE TRAFFIC SIGNAL MODIFICATION.
5. LANE DESIGNATION SIGNS ARE TO BE MOUNTED OVER THE CENTRE OF THE LEFT TURN LANES, USING THE APPROPRIATE MOUNTING BRACKETS.

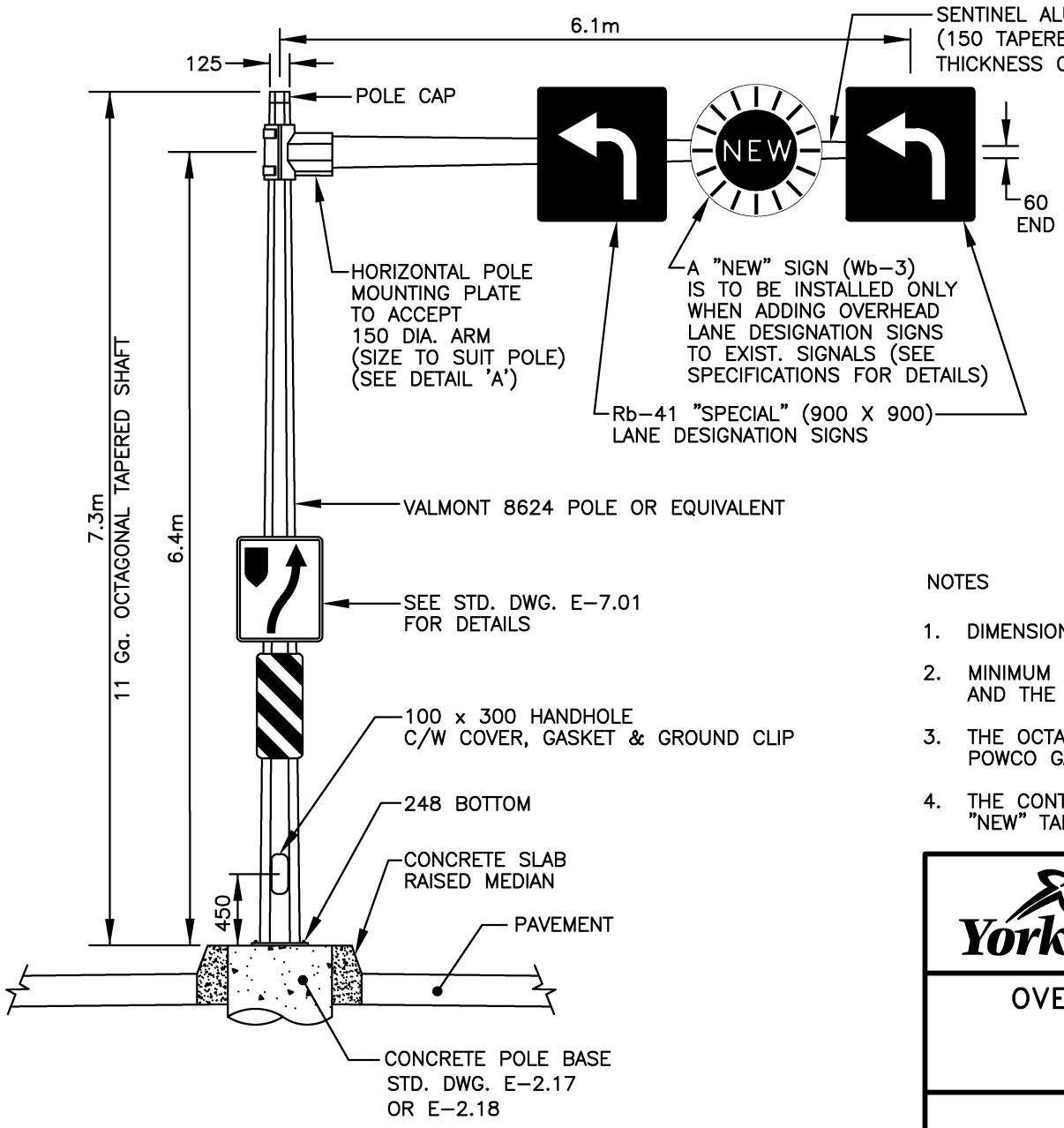
York Region

Public Works
Transportation

OVERHEAD LANE DESIGNATION SIGNS FOR DUAL LEFT TURN LANES (TYPE 1)

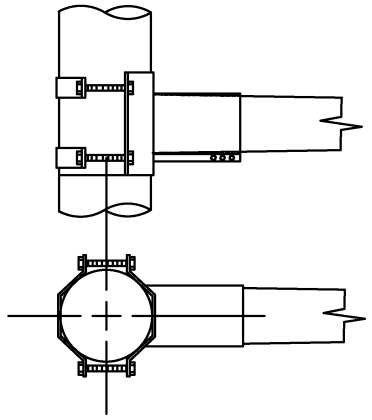
JANUARY 2023
DATE

E-7.07



CANTILEVER SIGN & POLE ASSEMBLY

N.T.S.



DETAIL 'A'

* LANE DESIGNATION SIGNS ARE TO BE MOUNTED OVER THE CENTRE OF THE LEFT TURN LANES USING THE APPROPRIATE MOUNTING BRACKETS

NOTES

1. DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. MINIMUM CLEARANCE BETWEEN THE LANE DESIGNATION SIGNS AND THE PAVEMENT IS 5.5m.
3. THE OCTAGONAL POLE IS TO BE POWCO GALVANIZED STEEL OR APPROVED EQUAL.
4. THE CONTRACTOR WILL REMOVE AND SALVAGE THE "NEW" TAB, 50 DAYS AFTER THE TRAFFIC SIGNAL MODIFICATION.

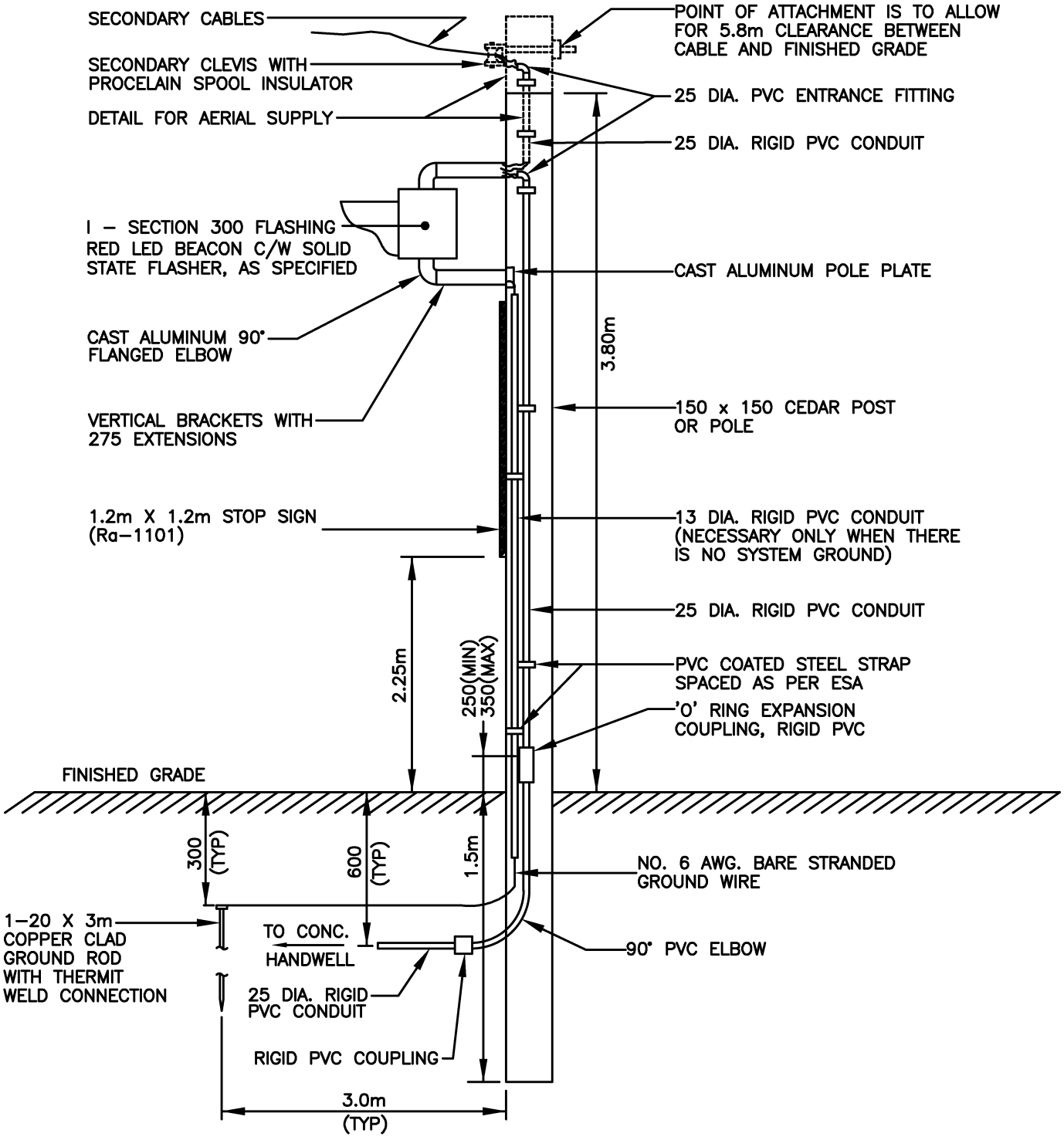
York Region

Public Works Transportation

OVERHEAD LANE DESIGNATION SIGNS FOR DUAL LEFT TURN LANES (TYPE 2)

JANUARY 2023
DATE

E-7.08



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. POST/POLE TO BE SUPPLIED AND INSTALLED BY THE CONTRACTOR

York Region

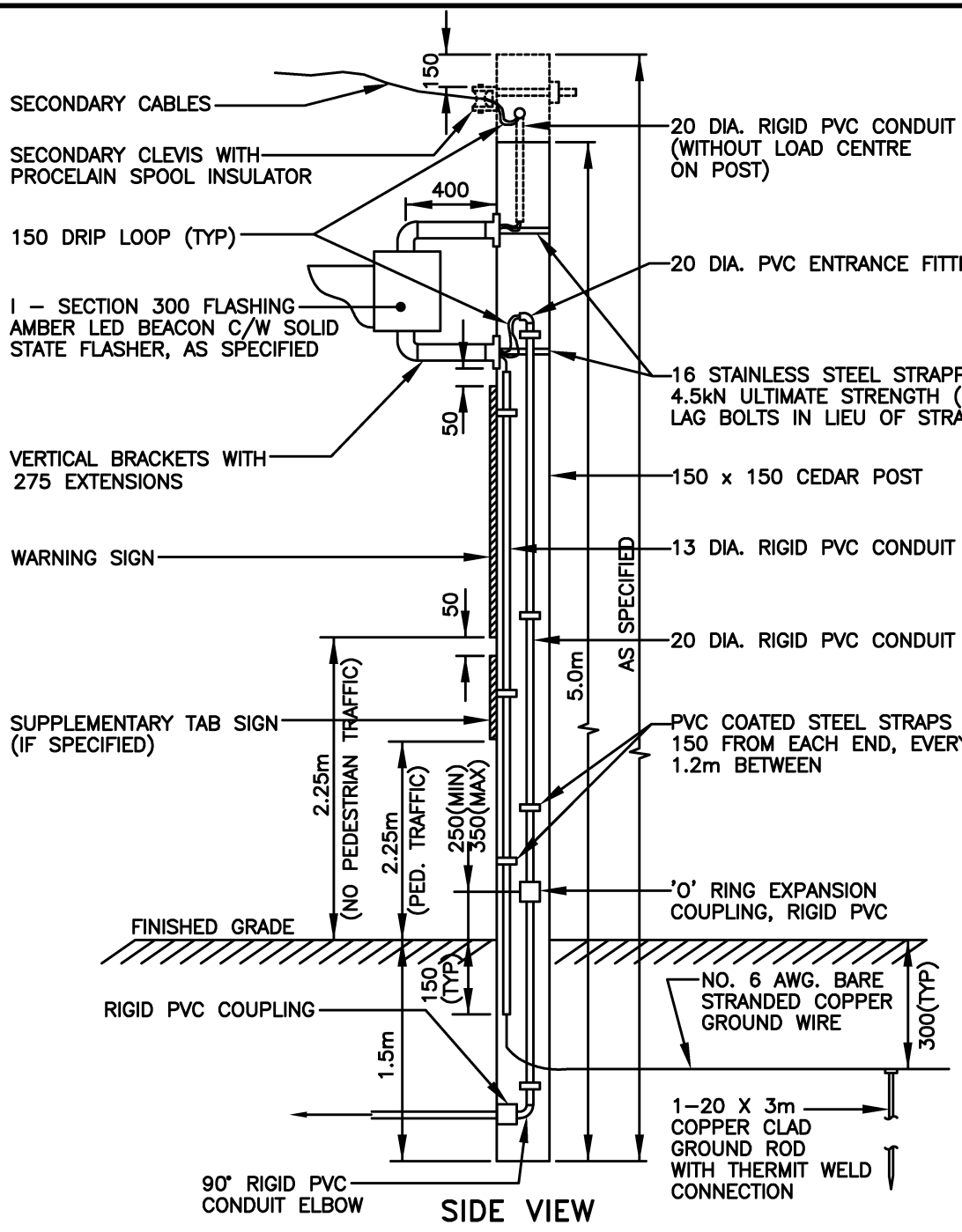
Public Works Transportation

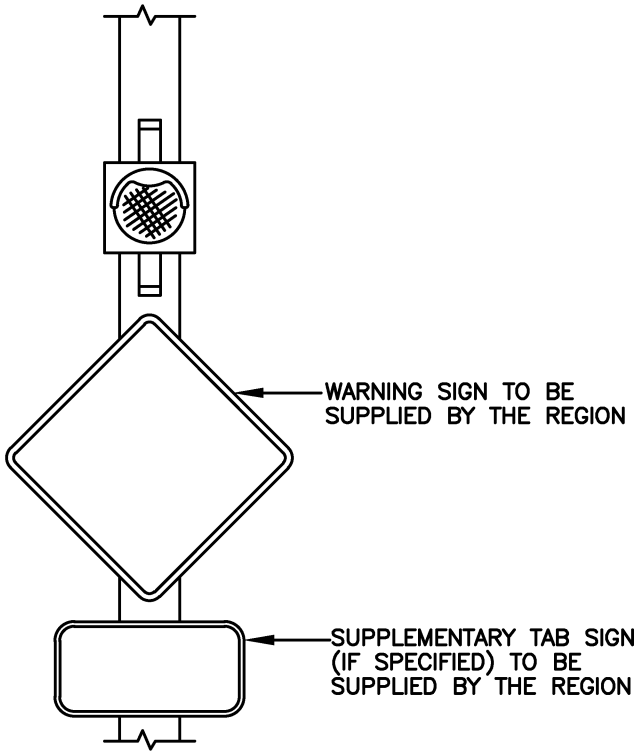
TYPICAL "STOP" SIGN WITH FLASHING RED LED BEACON

JANUARY 2023
DATE

N.T.S.

E–7.11





NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.

N.T.S.

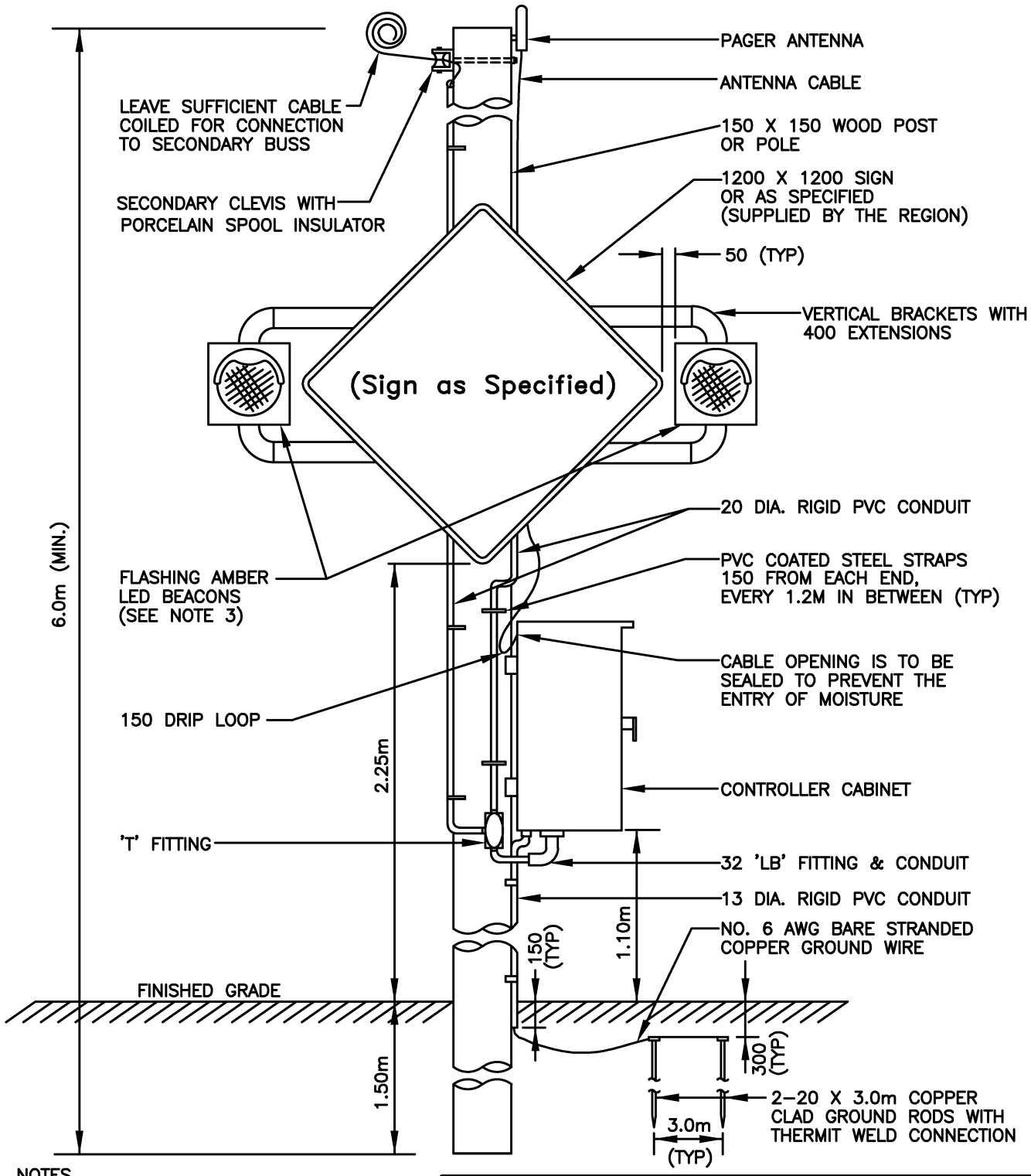
York Region

Public Works
Transportation

WARNING SIGN WITH FLASHING AMBER LED BEACON

JANUARY 2023
DATE

E–7.12



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. FLASHING BEACONS TO BE ONE SECTION FLASHING BEACONS WITH 200 AMBER LED LAMPS.
3. THE PROPOSED AMBER BEACONS ARE TO BE INSTALLED SO THAT THE BEACON DOORS OPEN AWAY FROM THE SIGN.

York Region

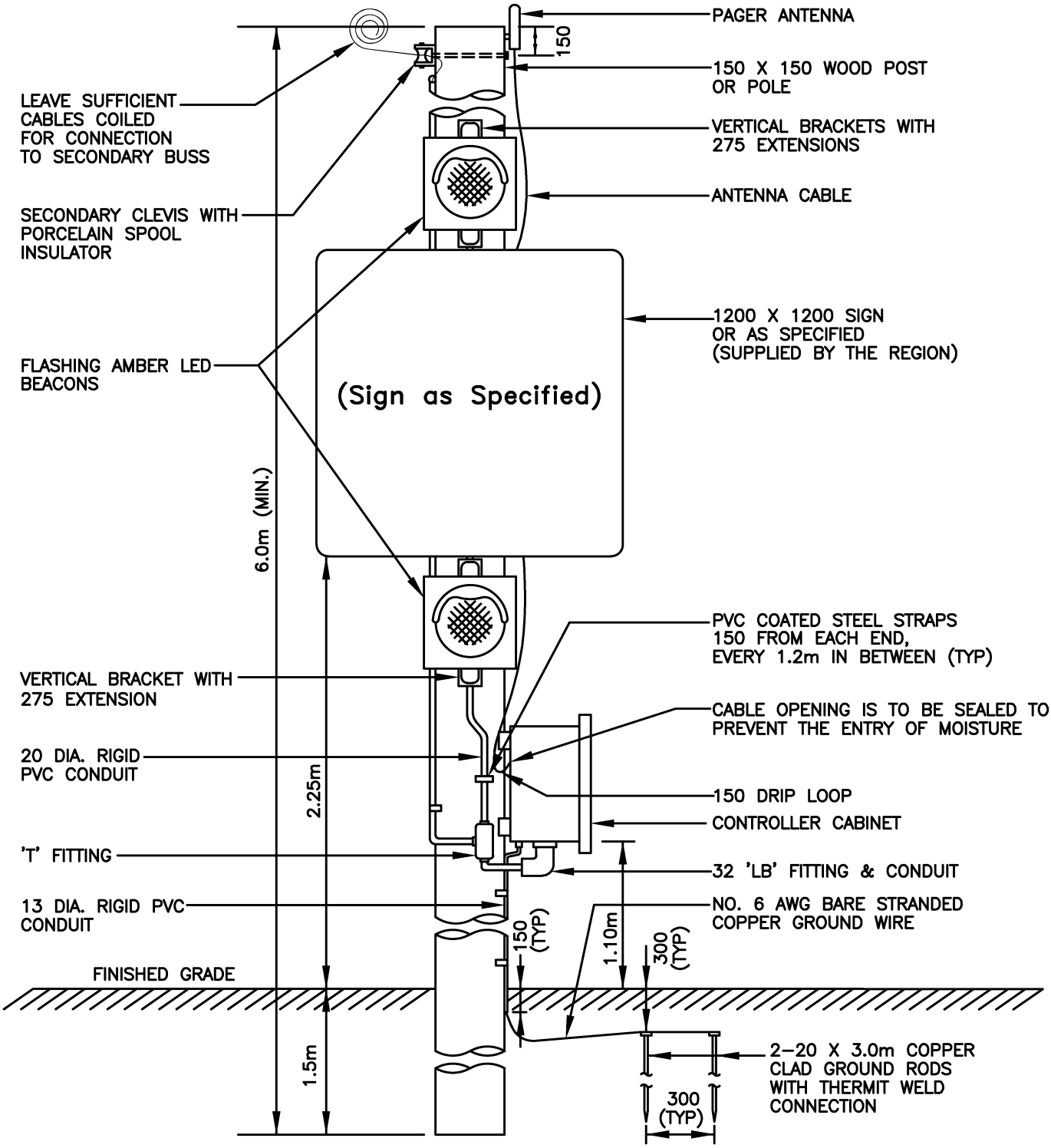
Public Works
Transportation

SIGN WITH HORIZONTAL ALTERNATING FLASHING AMBER LED BEACONS (AERIAL INSTALLATION)

JANUARY 2023
DATE

N.T.S.

E-7.13



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. FLASHING BEACONS TO BE ONE SECTION FLASHING BEACONS WITH 200 AMBER LED LAMPS.

N.T.S.

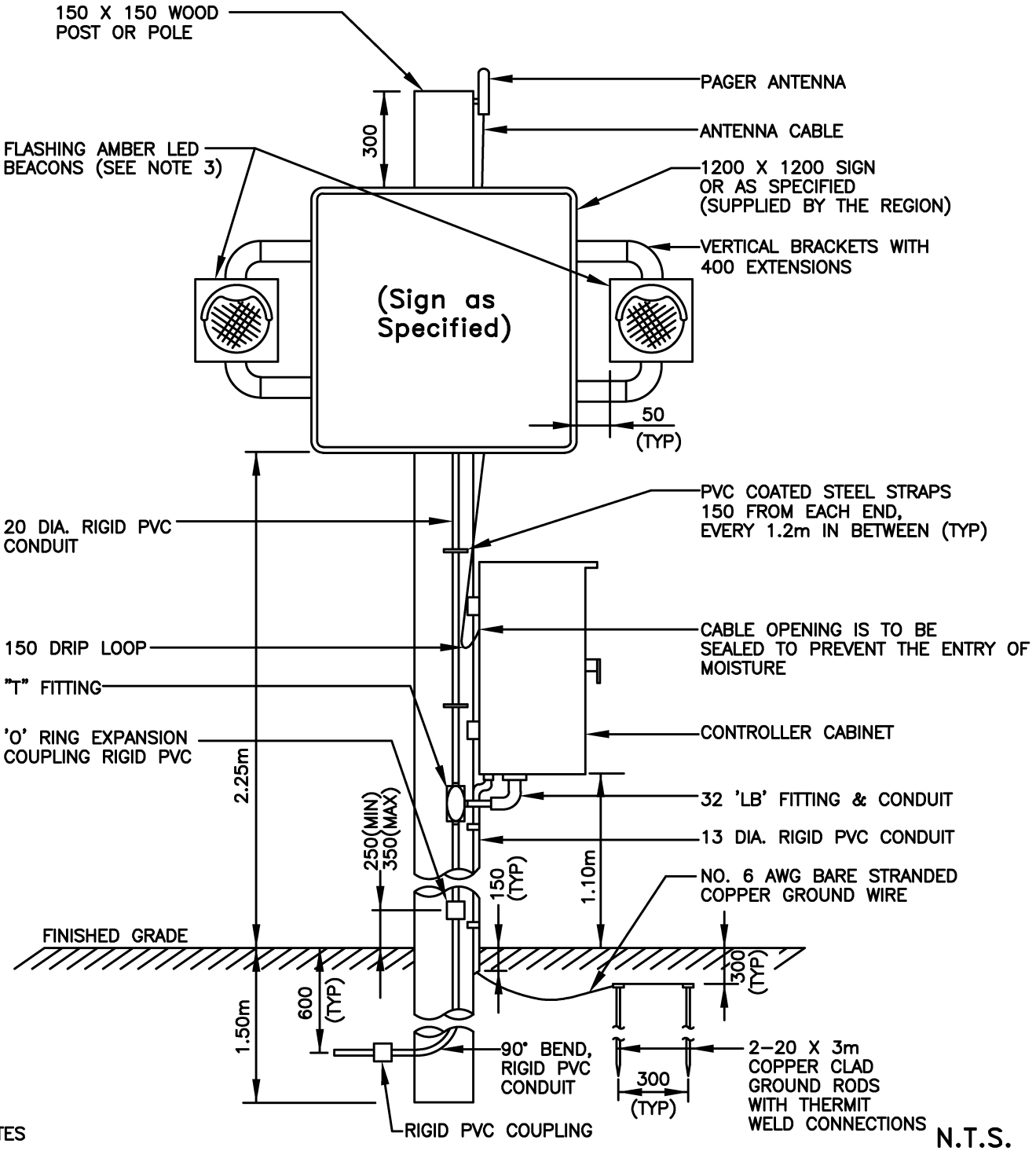
York Region

Public Works
Transportation

SIGN WITH VERTICAL ALTERNATING FLASHING AMBER LED BEACONS (AERIAL INSTALLATION)

JANUARY 2023
DATE

E-7.14



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. FLASHING BEACONS TO BE ONE SECTION FLASHING BEACONS WITH 200 AMBER LED LAMPS.
3. THE PROPOSED AMBER BEACONS ARE TO BE INSTALLED SO THAT THE BEACON DOORS OPEN AWAY FROM THE SIGN.

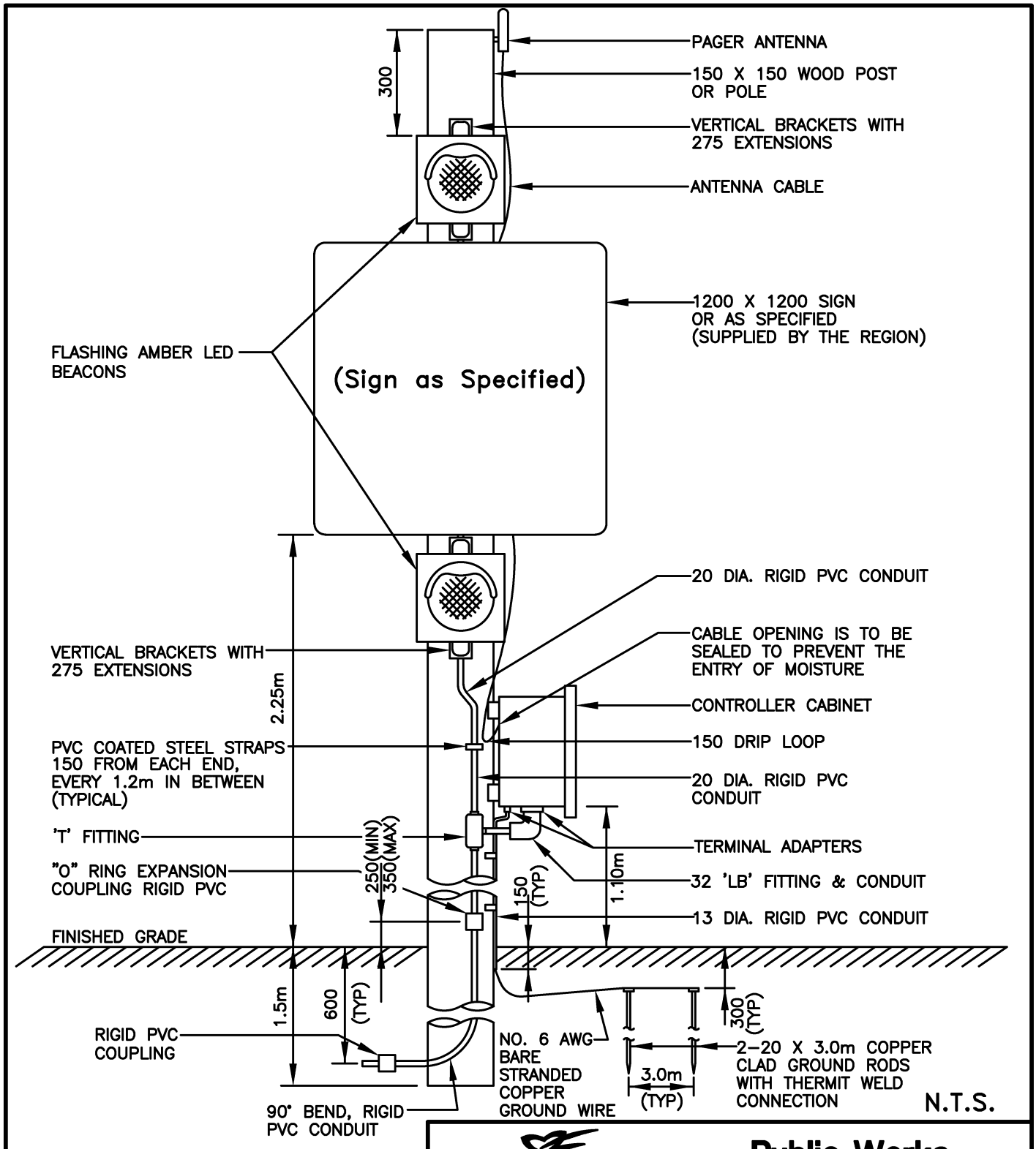
York Region

Public Works Transportation

SIGN WITH HORIZONTAL ALTERNATING FLASHING AMBER LED BEACONS (BURIED INSTALLATION)

JANUARY 2023
DATE

E-7.15



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. FLASHING BEACONS TO BE ONE SECTION FLASHING BEACONS WITH 200 AMBER LED LAMPS.

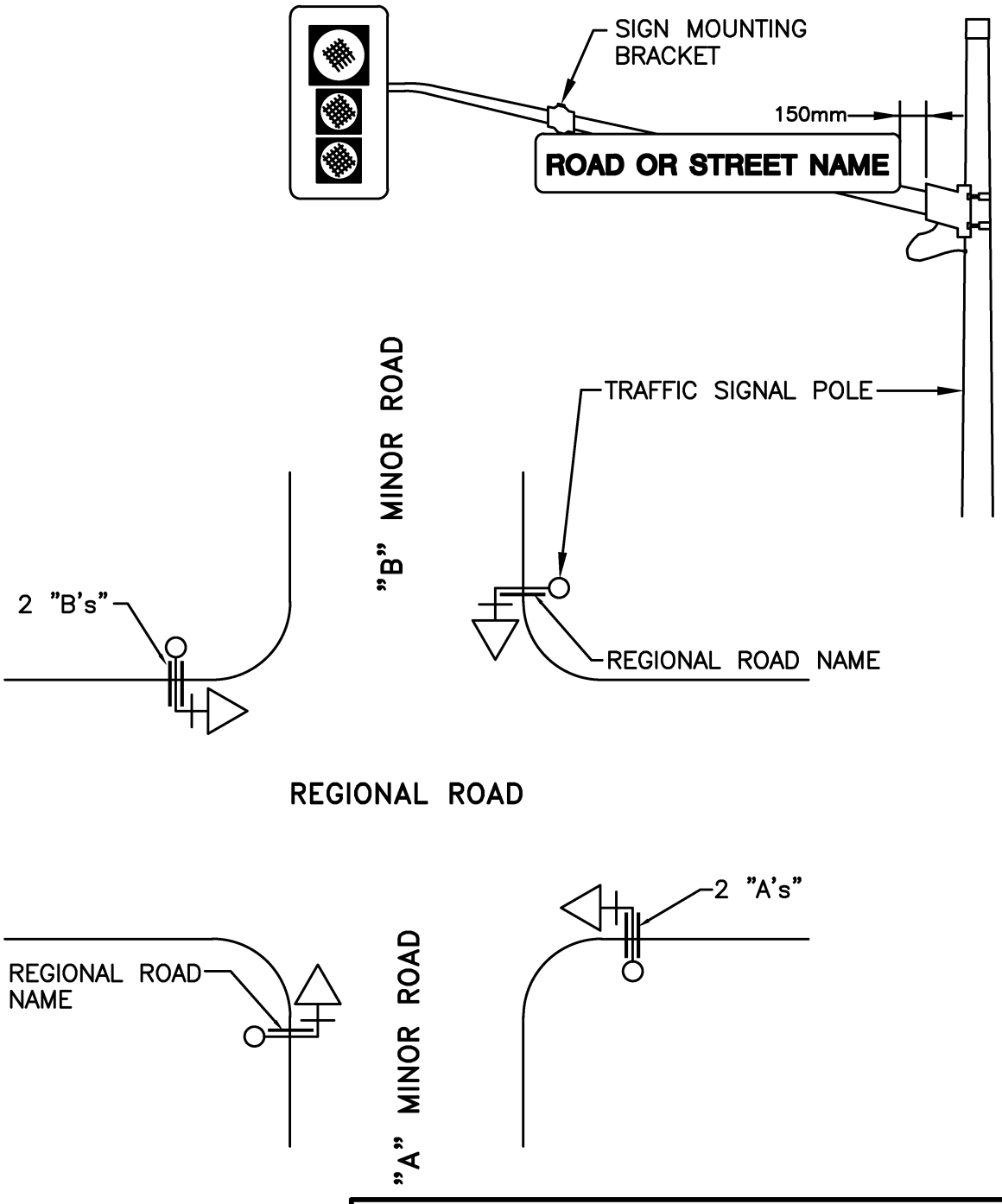
York Region

Public Works
Transportation

SIGN WITH VERTICAL ALTERNATING FLASHING AMBER LED BEACONS (BURIED INSTALLATION)

JANUARY 2023
DATE

E-7.16



NOTE

1. IF STREET NAME IS THE SAME ON BOTH MINOR ROADS, ONLY ONE SIGN ON THE PRIMARY POLE IS REQUIRED.

York Region

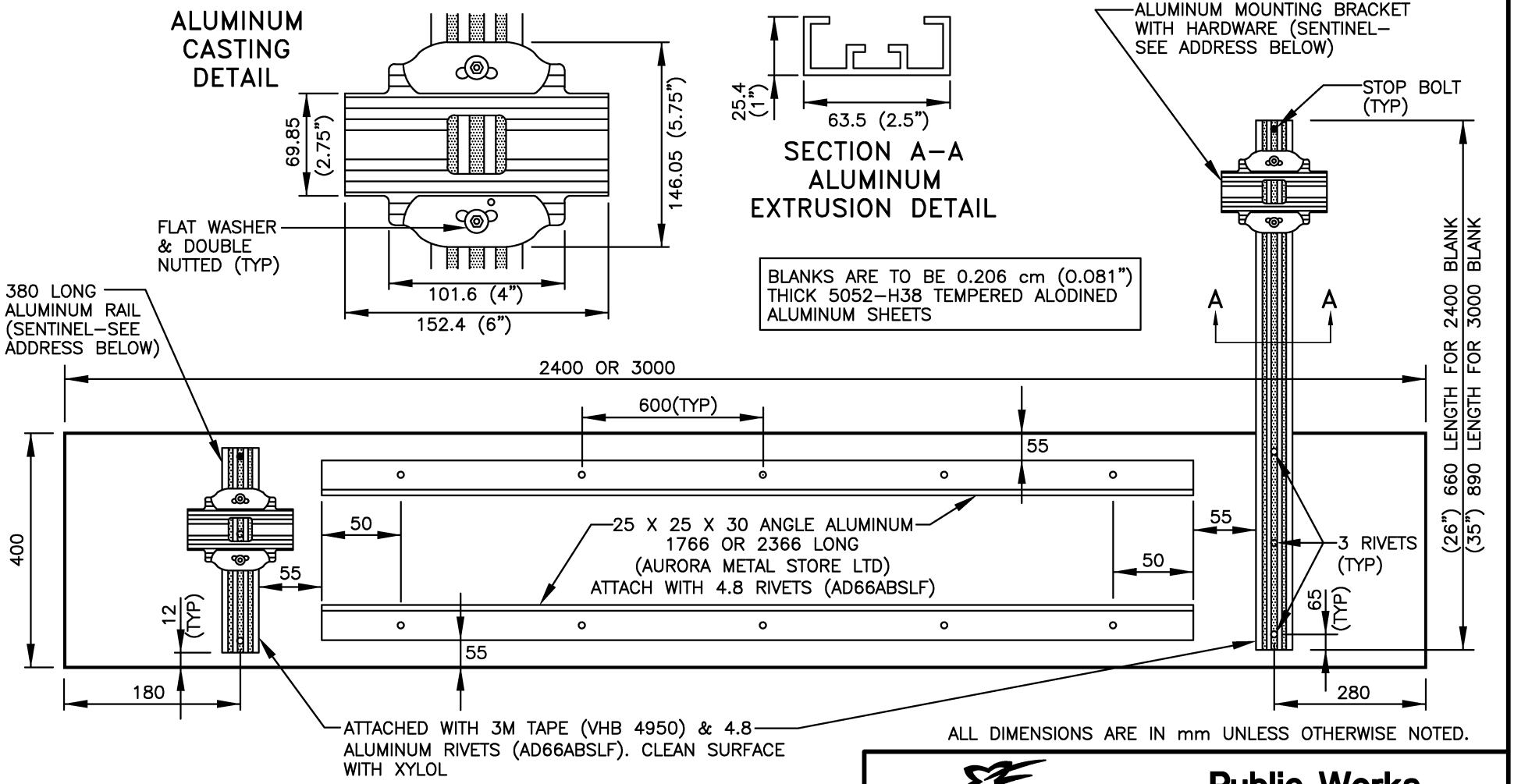
Public Works
Transportation

ROAD/STREET NAME SIGN MOUNTING DETAIL

JANUARY 2023
DATE

N.T.S.

E–7.18



ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.

BACK OF ROAD/STREET NAME SIGN

ALUMINUM RAIL, HARDWARE & MOUNTING BRACKET:

SENTINEL
POLE & TRAFFIC EQUIPMENT LIMITED
375 ADMIRAL BLVD., UNIT 3
MISSISSAUGA, ONT.
905–564–2929

N.T.S.

York Region

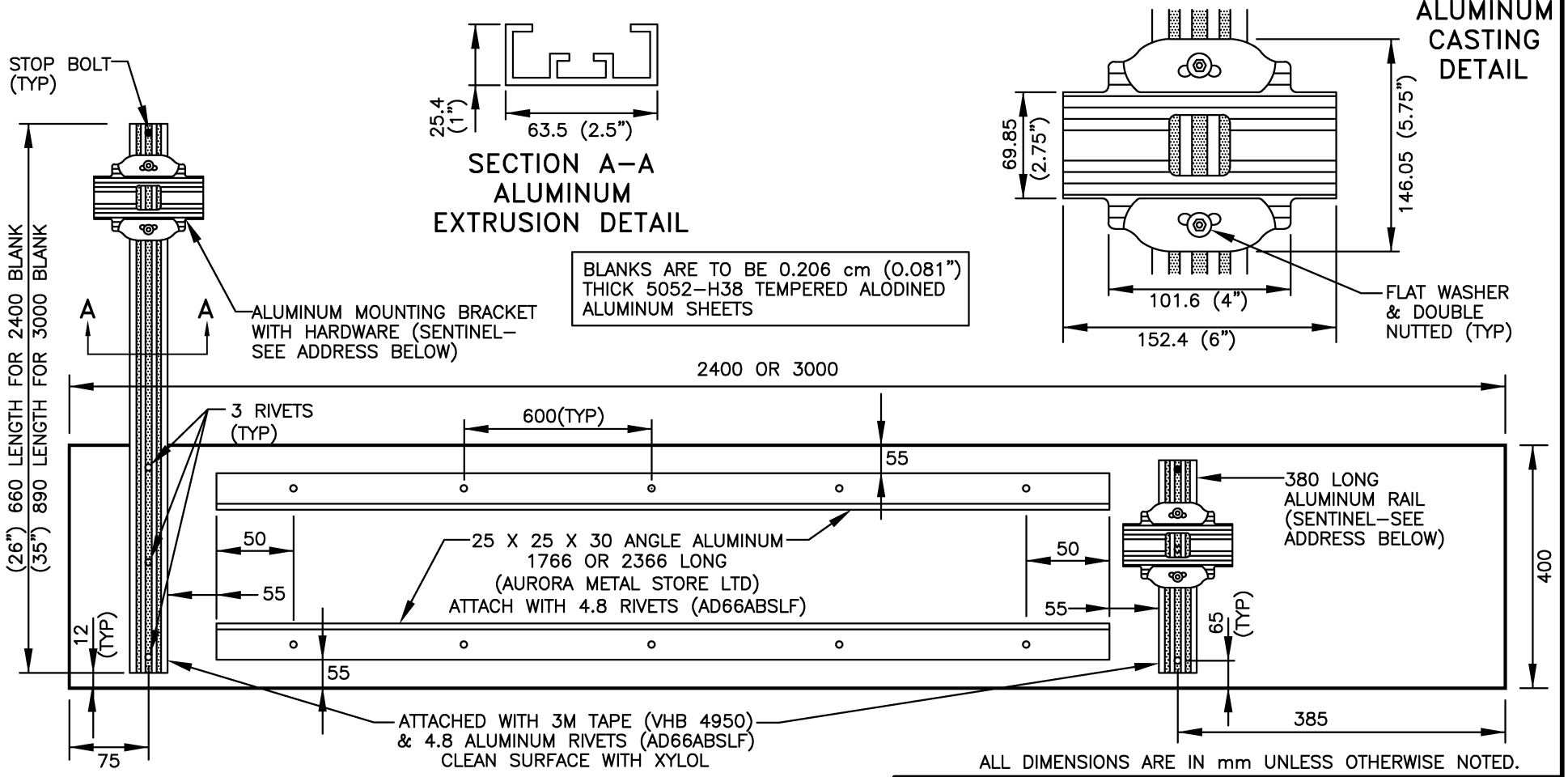
Public Works Transportation

ROAD/STREET NAME SIGN MOUNTING ASSEMBLY

(FOR MOUNTING ON FRONT OF TRAFFIC SIGNAL MAST ARM)

JANUARY 2023
DATE

E–7.19



ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.

BACK OF ROAD/STREET NAME SIGN

ALUMINUM RAIL, HARDWARE & MOUNTING BRACKET:

SENTINEL
POLE & TRAFFIC EQUIPMENT LIMITED
375 ADMIRAL BLVD., UNIT 3
MISSISSAUGA, ONT.
905–564–2929

N.T.S.

York Region

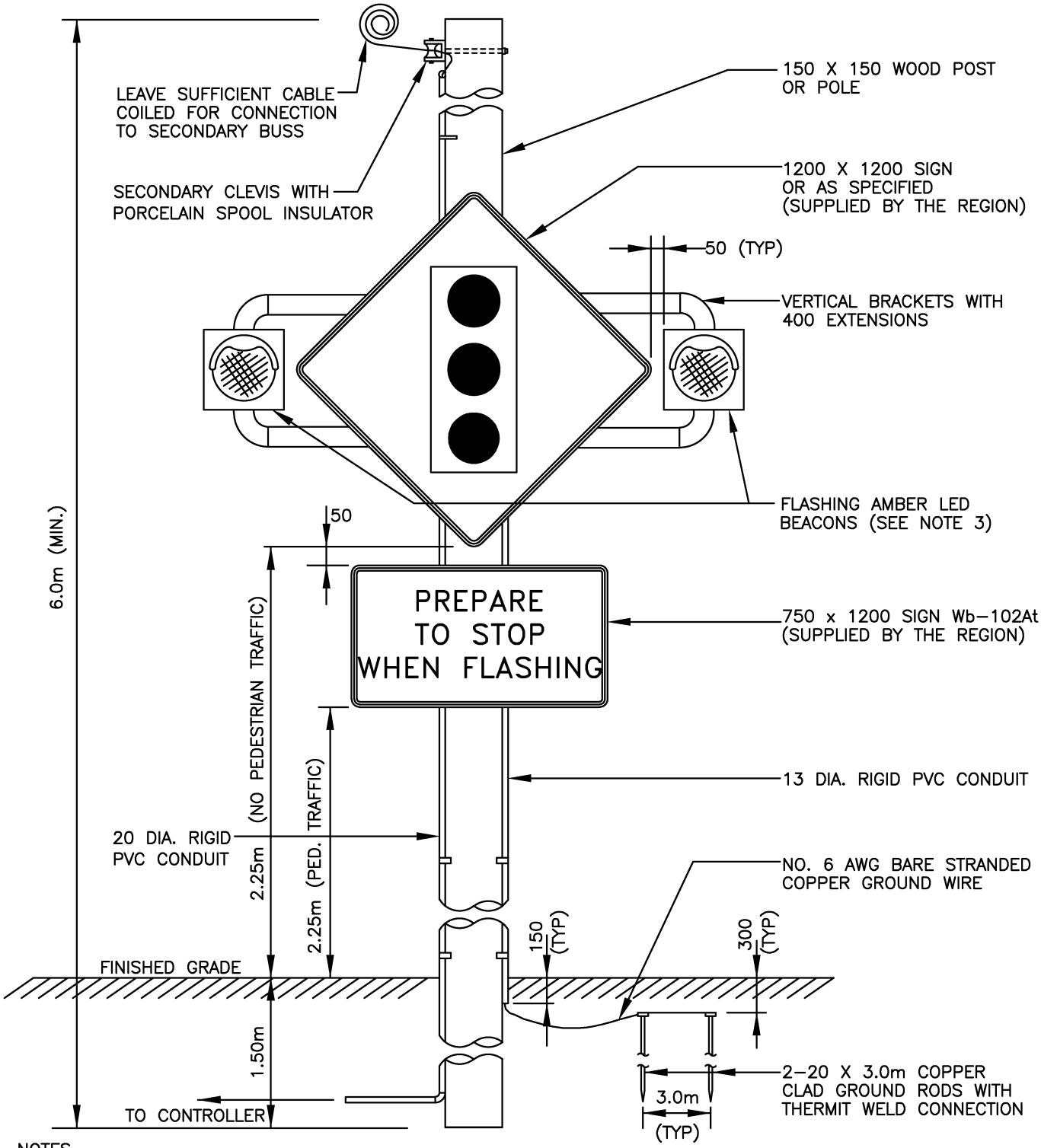
Public Works
Transportation

ROAD/STREET NAME SIGN MOUNTING ASSEMBLY

(FOR MOUNTING ON BACK OF TRAFFIC SIGNAL MAST ARM)

JANUARY 2023
DATE

E–7.20



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. FLASHING BEACONS TO BE ONE SECTION FLASHING BEACONS WITH 200 mm AMBER LED LAMPS.
3. THE PROPOSED AMBER BEACONS ARE TO BE INSTALLED SO THAT THE BEACON DOORS OPEN AWAY FROM THE SIGN.

York Region

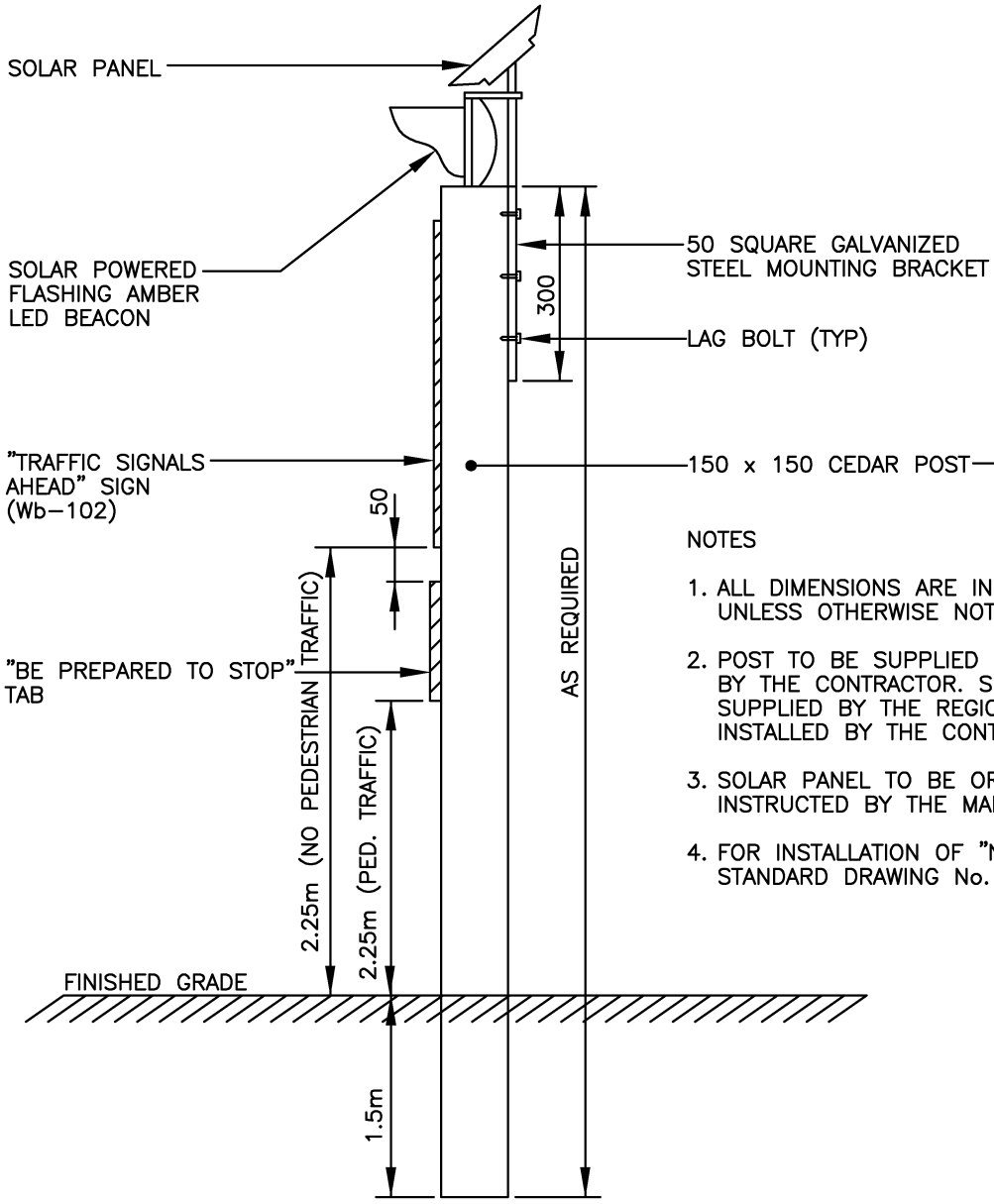
Public Works Transportation

"SIGNALS AHEAD" SIGN WITH HORIZONTAL ALTERNATING FLASHING AMBER LED BEACONS (AERIAL AND BURIED INSTALLATION)

JANUARY 2023
DATE

N.T.S.

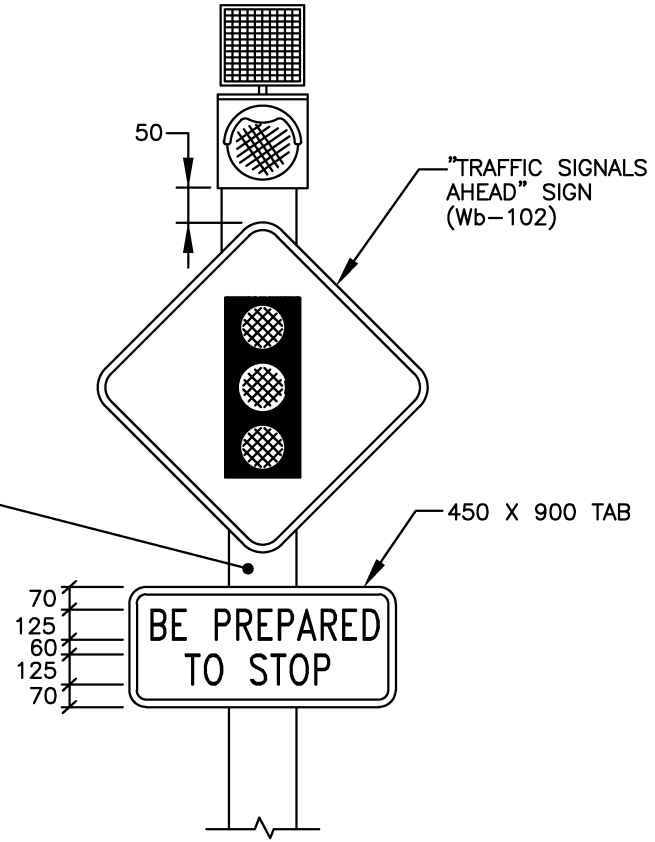
E-7.24



SIDE VIEW

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. POST TO BE SUPPLIED & INSTALLED BY THE CONTRACTOR. SIGNS TO BE SUPPLIED BY THE REGION AND INSTALLED BY THE CONTRACTOR.
3. SOLAR PANEL TO BE ORIENTATED AS INSTRUCTED BY THE MANUFACTURER.
4. FOR INSTALLATION OF "NEW" TAB SEE STANDARD DRAWING No. E–7.04.



FRONT VIEW

N.T.S.

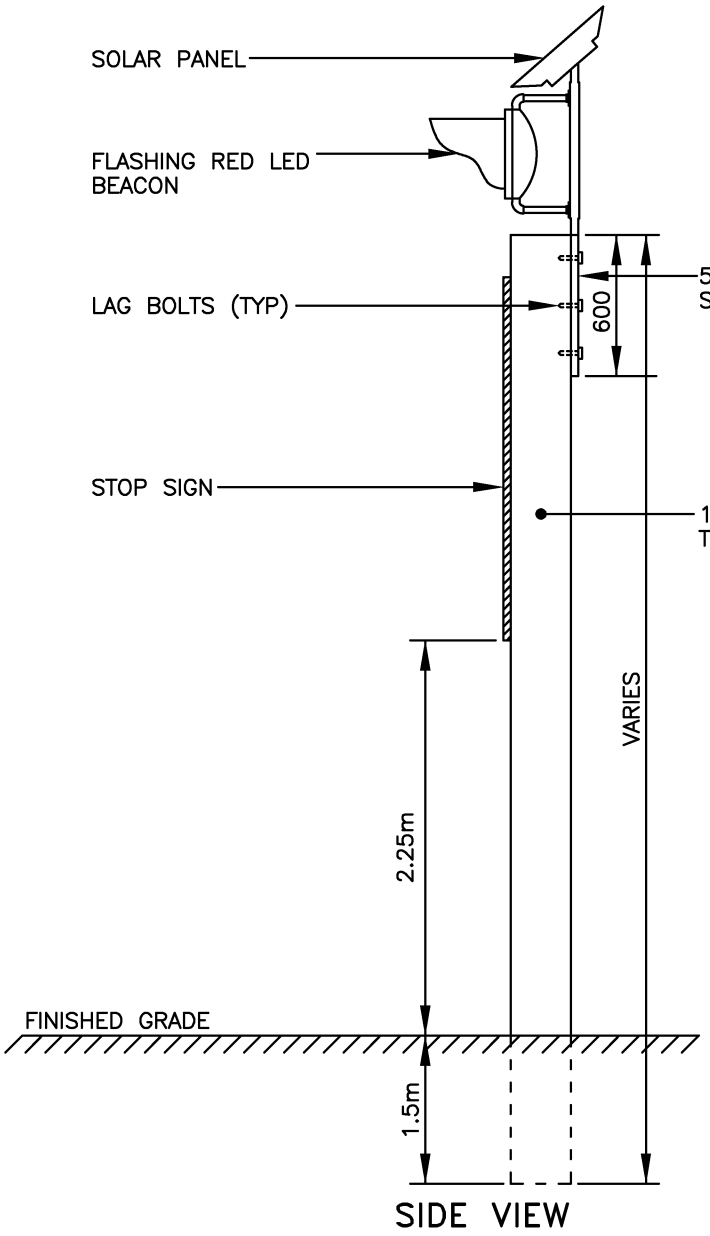
York Region

Public Works Transportation

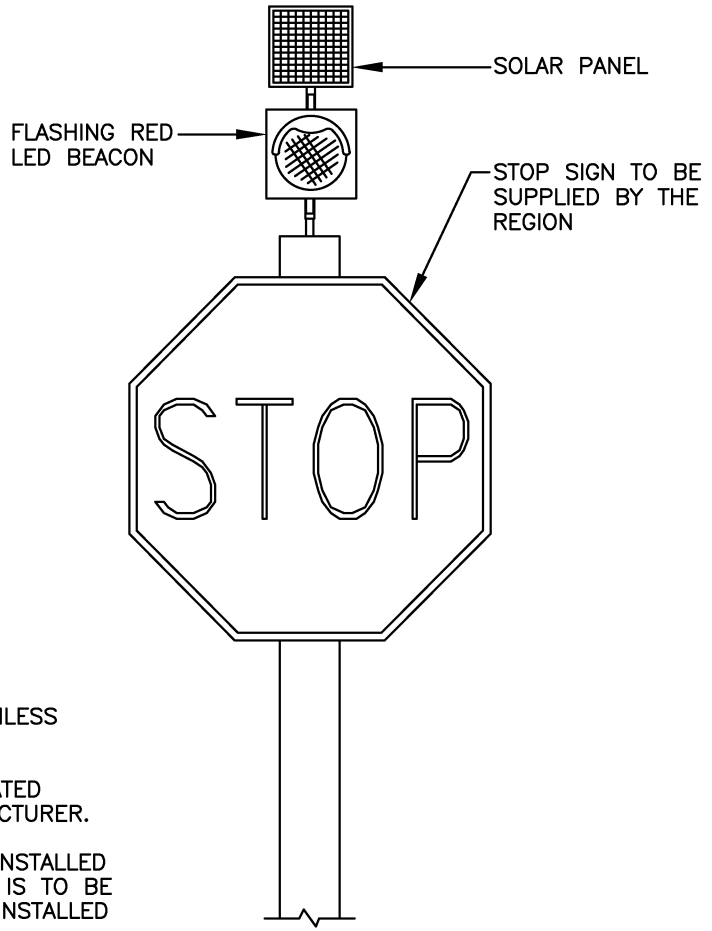
"SIGNALS AHEAD" SIGN WITH SOLAR POWERED FLASHING AMBER LED BEACON

JANUARY 2023
DATE

E–7.27



SIDE VIEW



FRONT VIEW

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. SOLAR PANEL IS TO BE ORIENTATED AS INSTRUCTED BY THE MANUFACTURER.
3. POST IS TO BE SUPPLIED AND INSTALLED BY THE CONTRACTOR. THE SIGN IS TO BE SUPPLIED BY THE REGION AND INSTALLED BY THE CONTRACTOR.

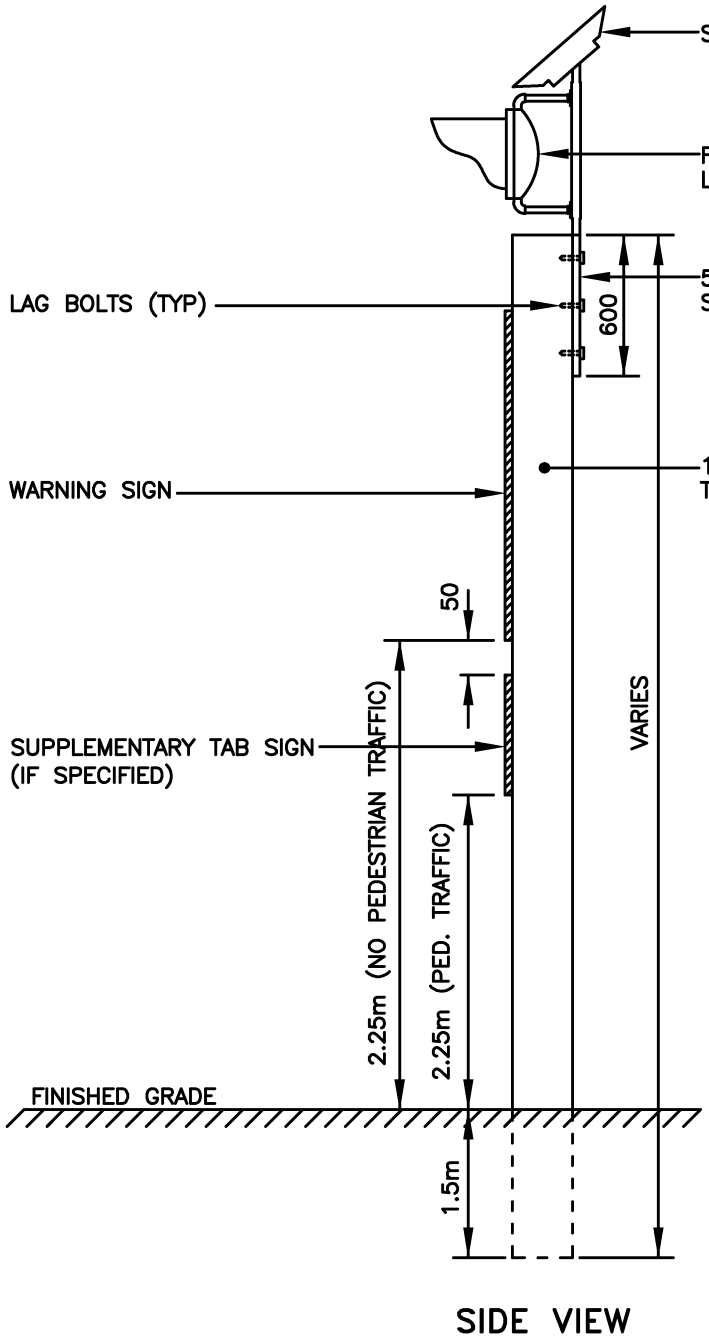
York Region

Public Works
Transportation

TYPICAL "STOP" SIGN WITH SOLAR POWERED FLASHING RED LED BEACON

JANUARY 2023
DATE

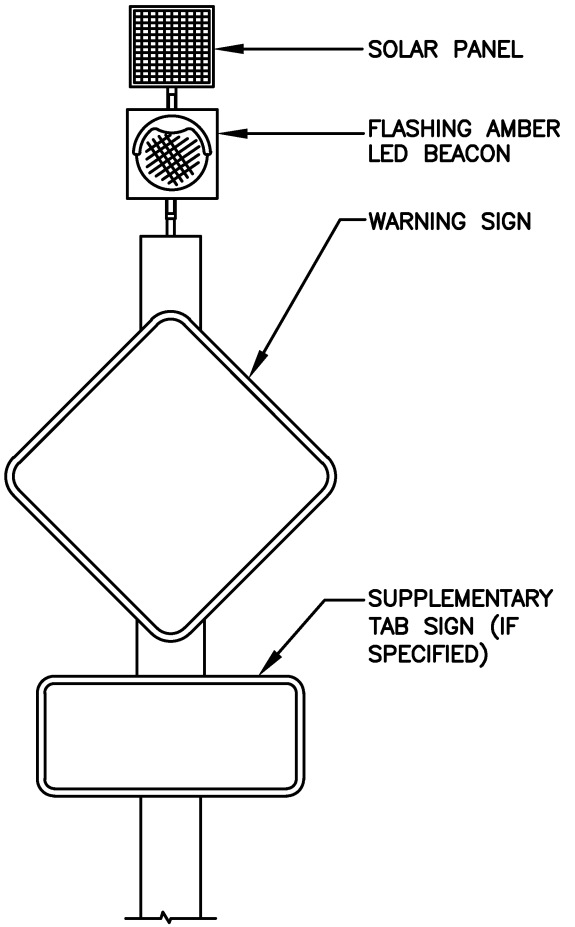
E–7.28



SIDE VIEW

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. SOLAR PANEL IS TO BE ORIENTATED AS INSTRUCTED BY THE MANUFACTURER.
3. POST IS TO BE SUPPLIED AND INSTALLED BY THE CONTRACTOR. THE SIGN IS TO BE SUPPLIED BY THE REGION AND INSTALLED BY THE CONTRACTOR.



FRONT VIEW

N.T.S.

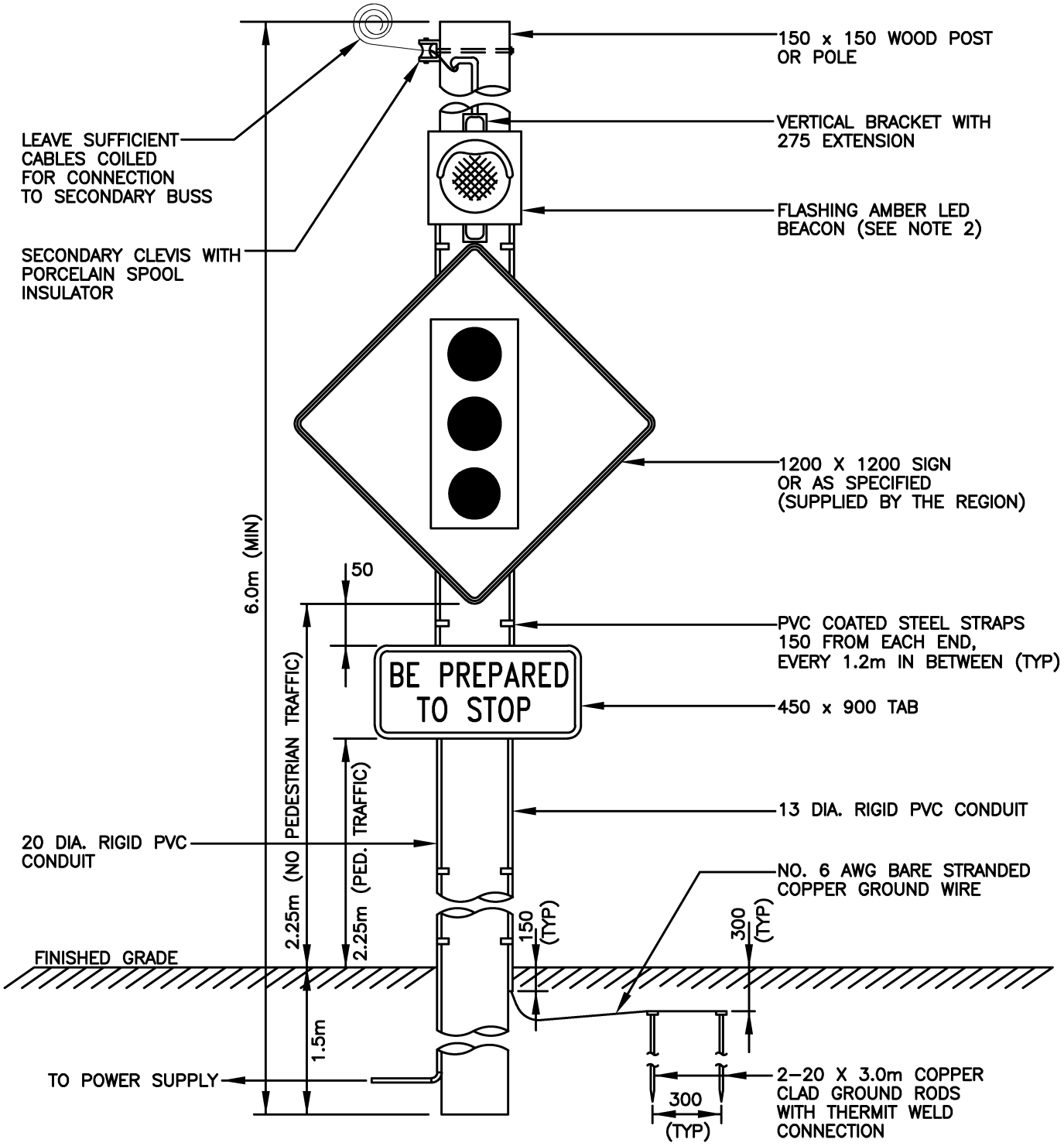
York Region

Public Works Transportation

WARNING SIGN WITH SOLAR POWERED FLASHING AMBER LED BEACON ON A WOOD POST

JANUARY 2023
DATE

E–7.29



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. FLASHING BEACON TO BE ONE SECTION FLASHING BEACON WITH 200 AMBER LED LAMP.

York Region

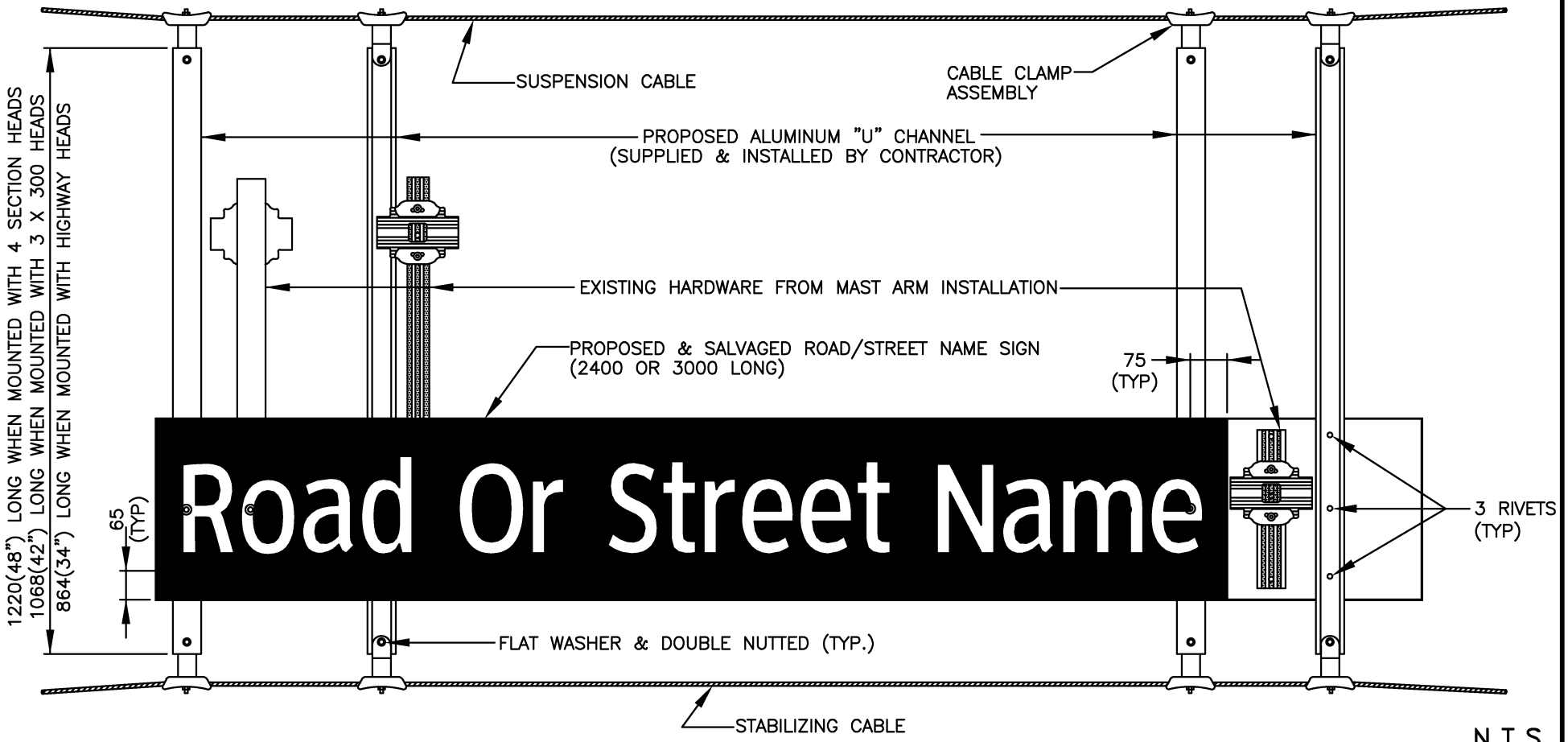
Public Works
Transportation

"SIGNALS AHEAD" SIGN WITH FLASHING AMBER LED BEACON (AERIAL AND BURIED INSTALLATION)

JANUARY 2023
DATE

N.T.S.

E-7.31



N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. STANDARD DRAWING IS TO BE USED FOR ALL ROAD/STREET NAME SIGNS BEING INSTALLED OR REINSTALLED ON SPAN WIRE.
3. FOR ORIENTATION OF ROAD/STREET NAME SIGNS, REFER TO LAYOUT DRAWINGS.
4. DETAIL SHOWN IS FOR RELOCATION OF BACK–TO–BACK ROAD/STREET NAME SIGNS.

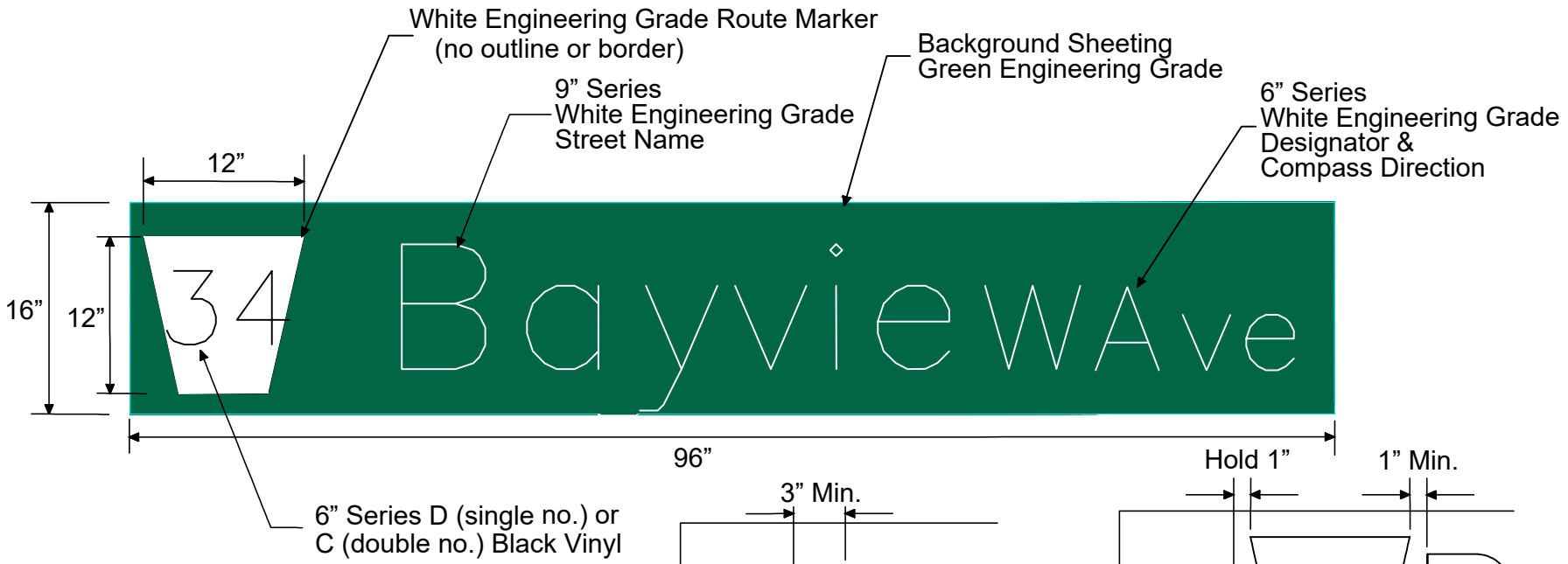
York Region

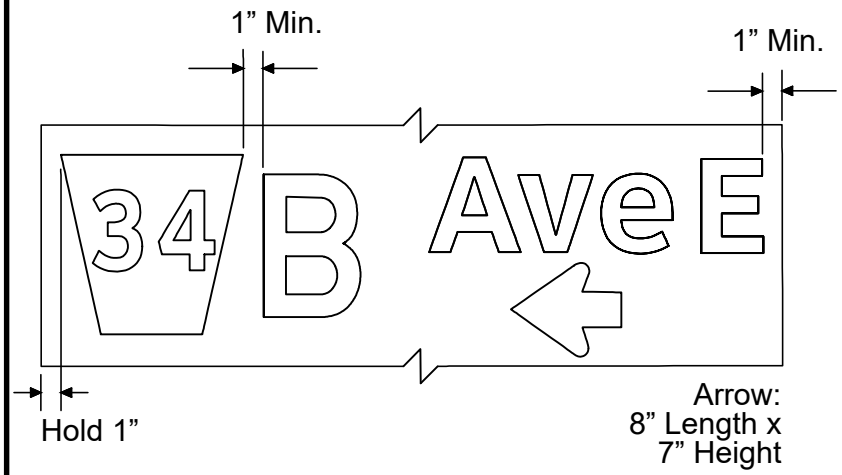
Public Works Transportation

ROAD/STREET NAME SIGN MOUNTING ASSEMBLY ON SPAN WIRE

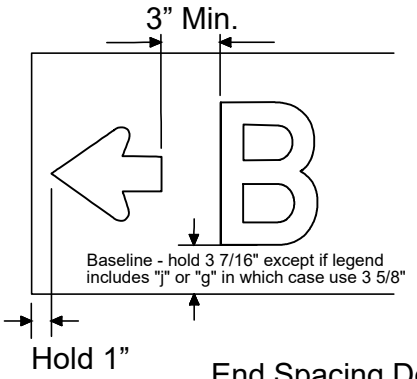
JANUARY 2023
DATE

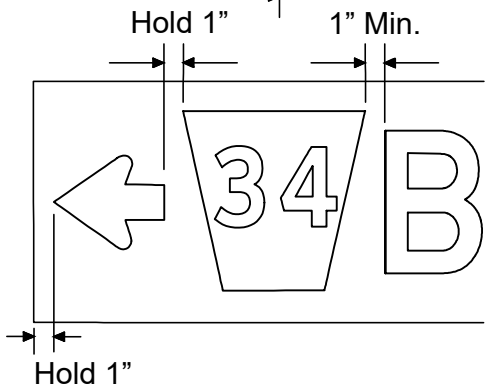
E–7.32





End Spacing Detail Constrained





End Spacing Detail Unconstrained

NOTES

-Font to be Clearview
-Legend to be optically kerned for best appearance
-Legend to be vertically centered about the first letter

Note: Imperial Dimensions

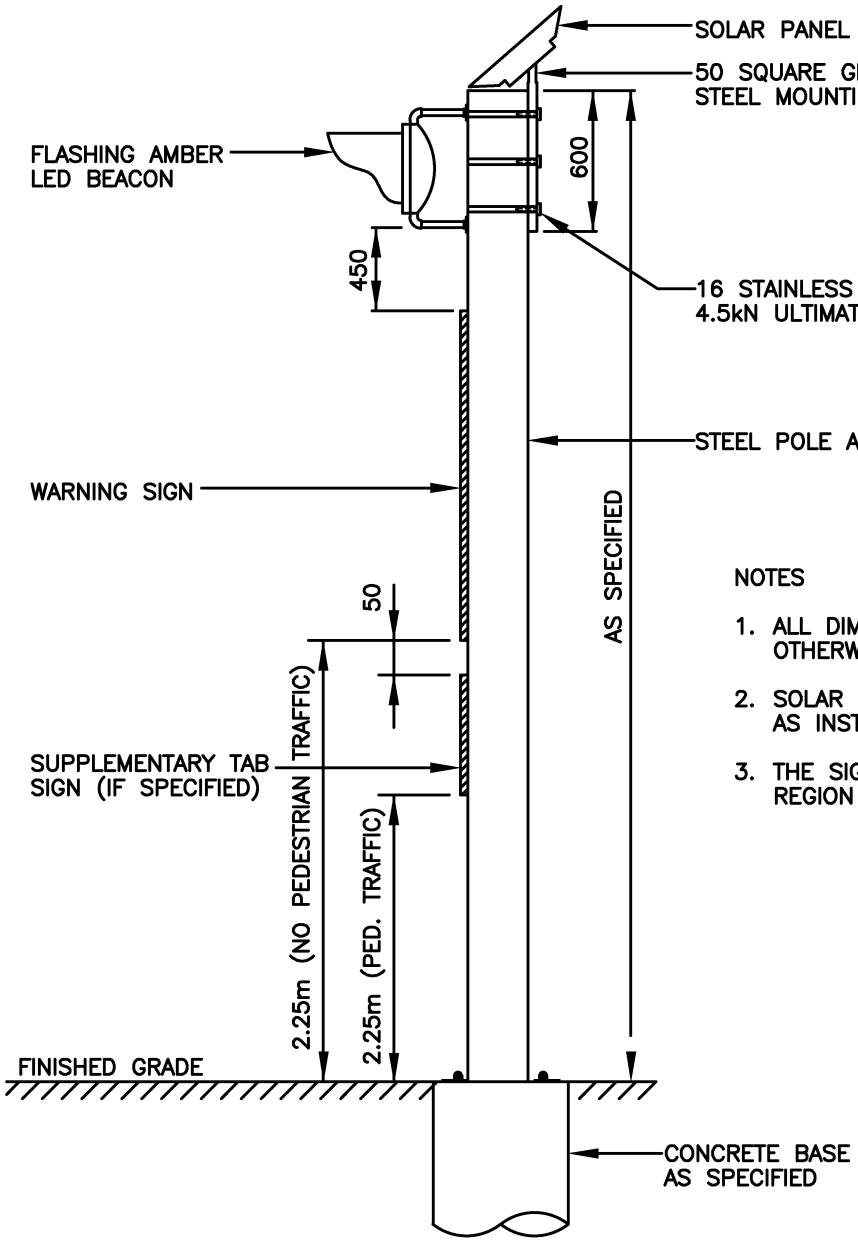
York Region

Public Works
Transportation

SIGNAL MAST–ARM MOUNTED ARTERIAL STREET NAME SIGN

JANUARY 2023
DATE

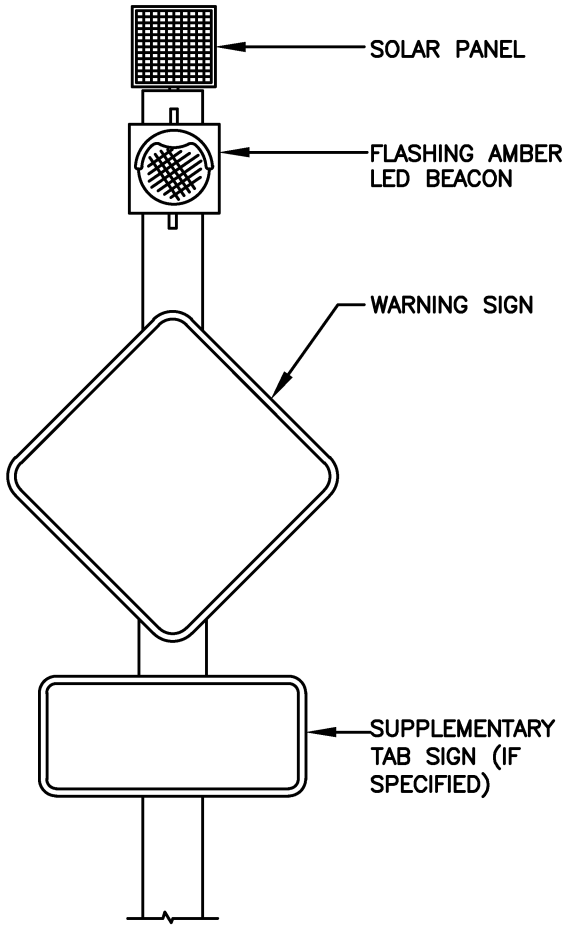
E–7.32A



SIDE VIEW

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. SOLAR PANEL IS TO BE ORIENTATED AS INSTRUCTED BY THE MANUFACTURERE.
3. THE SIGNS ARE TO BE SUPPLIED BY THE REGION AND INSTALLED BY THE CONTRACTOR.



FRONT VIEW

N.T.S.

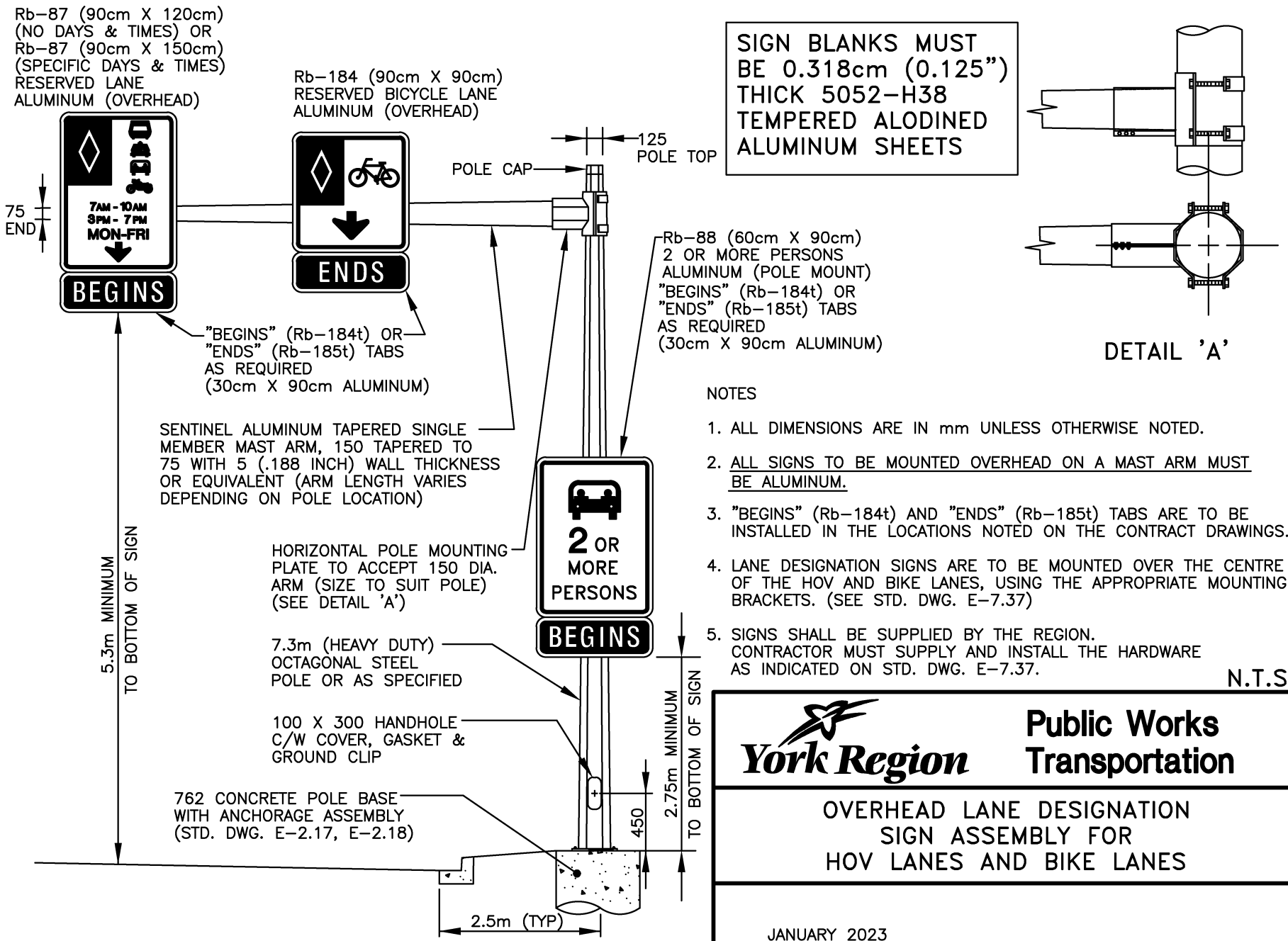
York Region

Public Works Transportation

WARNING SIGN WITH SOLAR POWERED FLASHING AMBER LED BEACON ON A CONCRETE BASE MOUNTED STEEL POLE

JANUARY 2023
DATE

E–7.35



CANTILEVER SIGNS & POLE ASSEMBLY

SIGN BLANKS MUST BE 0.318cm (0.125") THICK 5052–H38 TEMPERED ALODINED ALUMINUM SHEETS

DETAIL 'A'

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ALL SIGNS TO BE MOUNTED OVERHEAD ON A MAST ARM MUST BE ALUMINUM.
3. "BEGINS" (Rb–184t) AND "ENDS" (Rb–185t) TABS ARE TO BE INSTALLED IN THE LOCATIONS NOTED ON THE CONTRACT DRAWINGS.
4. LANE DESIGNATION SIGNS ARE TO BE MOUNTED OVER THE CENTRE OF THE HOV AND BIKE LANES, USING THE APPROPRIATE MOUNTING BRACKETS. (SEE STD. DWG. E–7.37)
5. SIGNS SHALL BE SUPPLIED BY THE REGION. CONTRACTOR MUST SUPPLY AND INSTALL THE HARDWARE AS INDICATED ON STD. DWG. E–7.37.

N.T.S.

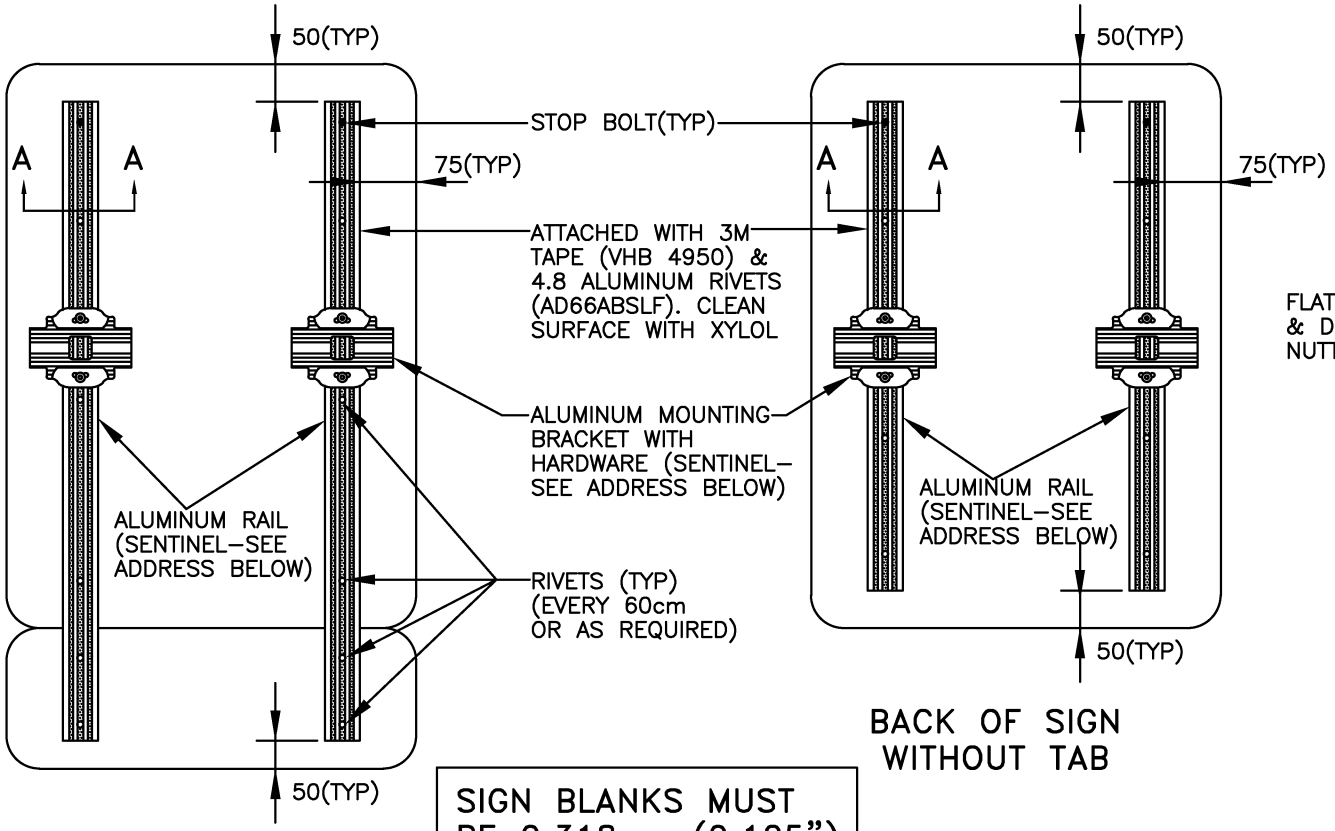
York Region

Public Works
Transportation

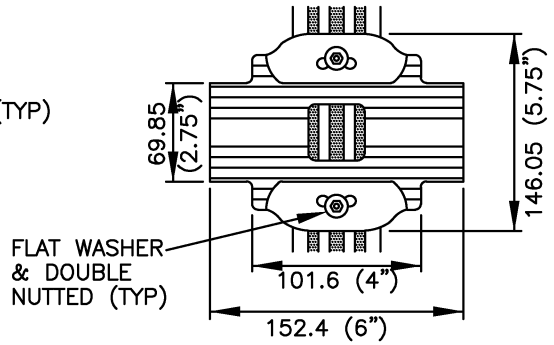
OVERHEAD LANE DESIGNATION SIGN ASSEMBLY FOR HOV LANES AND BIKE LANES

JANUARY 2023
DATE

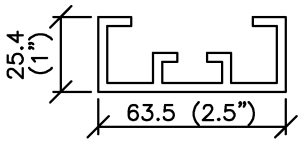
E–7.36



SIGN BLANKS MUST BE 0.318cm (0.125") THICK 5052–H38 TEMPERED ALODINED ALUMINUM SHEETS



ALUMINUM CASTING DETAIL



SECTION A–A ALUMINUM EXTRUSION DETAIL

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. ALL SIGNS TO BE MOUNTED OVERHEAD ON A MAST ARM MUST BE ALUMINUM.
3. SIGNS SHALL BE SUPPLIED BY THE REGION. CONTRACTOR MUST SUPPLY AND INSTALL THE HARDWARE AS SHOWN ABOVE.
4. ALUMINUM RAIL, HARDWARE & MOUNTING BRACKETS AVAILABLE FROM:–
   SENTINEL POLE & TRAFFIC LIMITED
   375 ADMIRAL BLVD., UNIT 3
   MISSISSAUGA, ONTARIO, L5T 2N1
   905–564–2929

N.T.S.

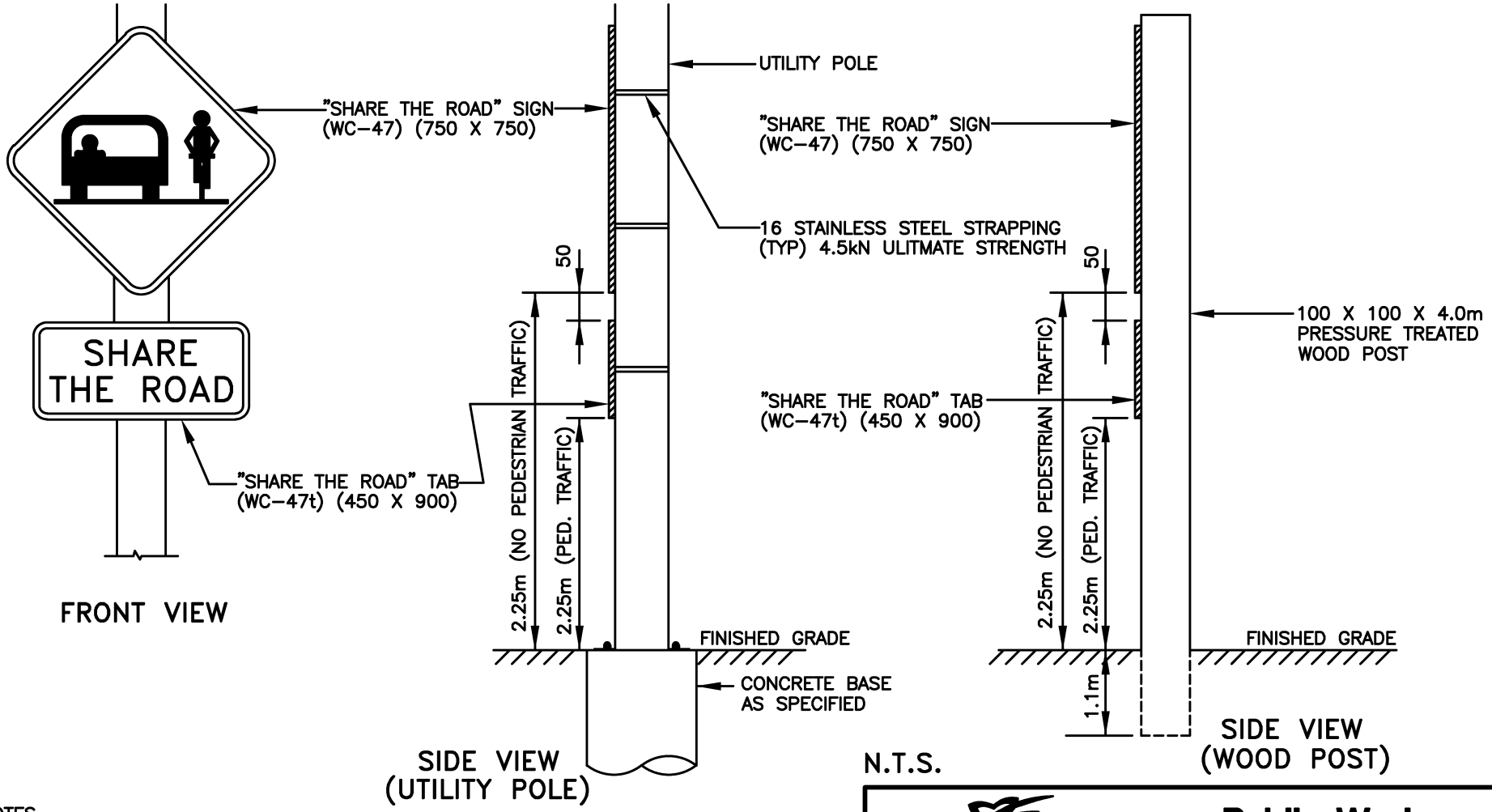
York Region

Public Works Transportation

TYPICAL MOUNTING ASSEMBLY FOR OVERHEAD LANE DESIGNATION SIGNS ABOVE HOV LANES AND BIKE LANES

JANUARY 2023
DATE

E–7.37



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. POST IS TO BE SUPPLIED AND INSTALLED BY THE CONTRACTOR. THE SIGNS ARE TO BE SUPPLIED BY THE REGION AND INSTALLED BY THE CONTRACTOR.
3. THE SIGNS ARE TO BE ATTACHED TO THE WOOD POST USING 9.4 X 64 GALVANIZED STEEL LAG SCREWS & WASHERS. WHEN THE SIGNS ARE TO BE INSTALLED ON UTILITY POLES, 16 STAINLESS STEEL STRAPPING, 4.5kN ULTIMATE STRENGTH, IS TO BE USED TOP & BOTTOM. IN LIEU OF LAG SCREWS. WASHERS ARE TO BE USED FOR BOTH METHODS OF SIGN MOUNTING. TWO WASHERS ARE TO BE USED FOR EACH LAG SCREW OR BOLT, ONE FLAT 9.4 X 19 DIA. NYLON WASHER, PLACED AGAINST THE SIGN SURFACE AND ONE FLAT 9.4 X 19 DIA. GALVANIZED STEEL (WITH LAG SCREWS) OR STAINLESS STEEL (WITH LAG SCREWS OR STRAPPING) ON TOP OF THE NYLON WASHER.

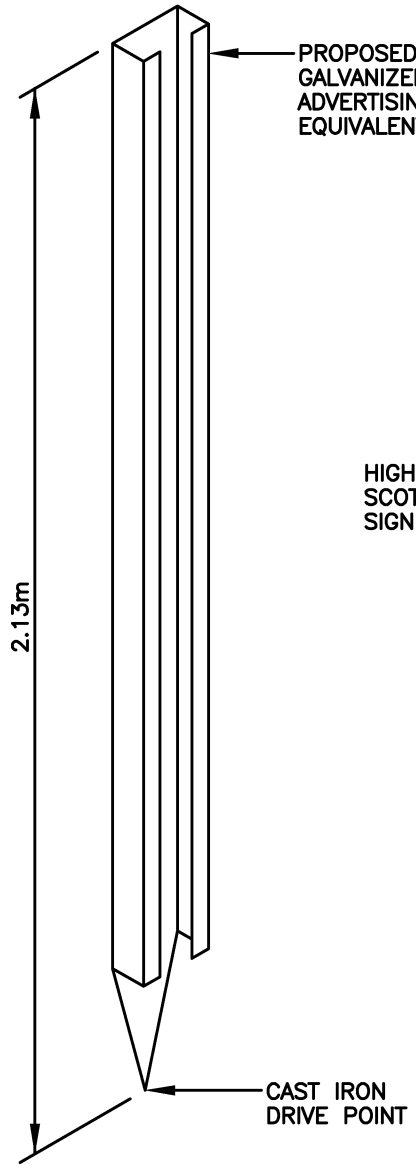
York Region

Public Works
Transportation

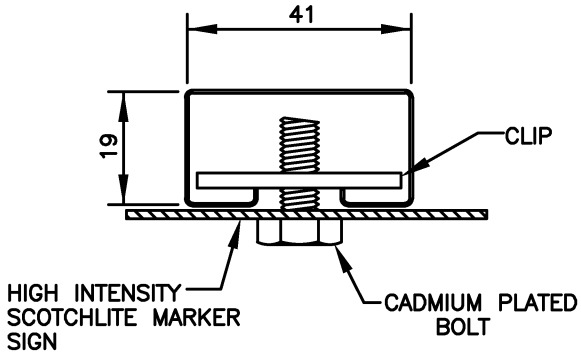
TYPICAL INSTALLATION OF "SHARE THE ROAD" SIGN AND "SHARE THE ROAD" TAB ON A POLE OR WOOD POST

JANUARY 2023
DATE

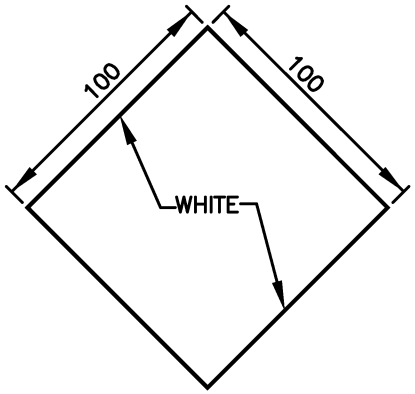
E-7.38

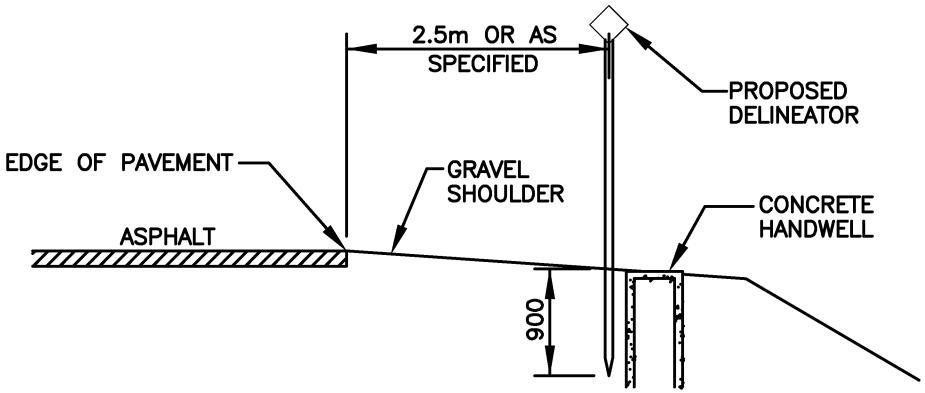


DELINEATOR ATTACHMENT DETAIL

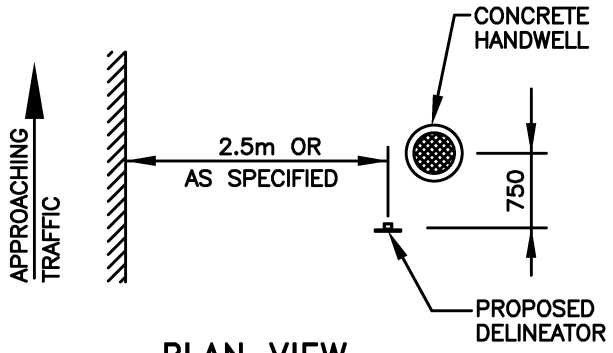


DIAMOND DELINEATOR (HI-INTENSITY GRADE)





X-SECTION



PLAN VIEW

N.T.S.

NOTE

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.

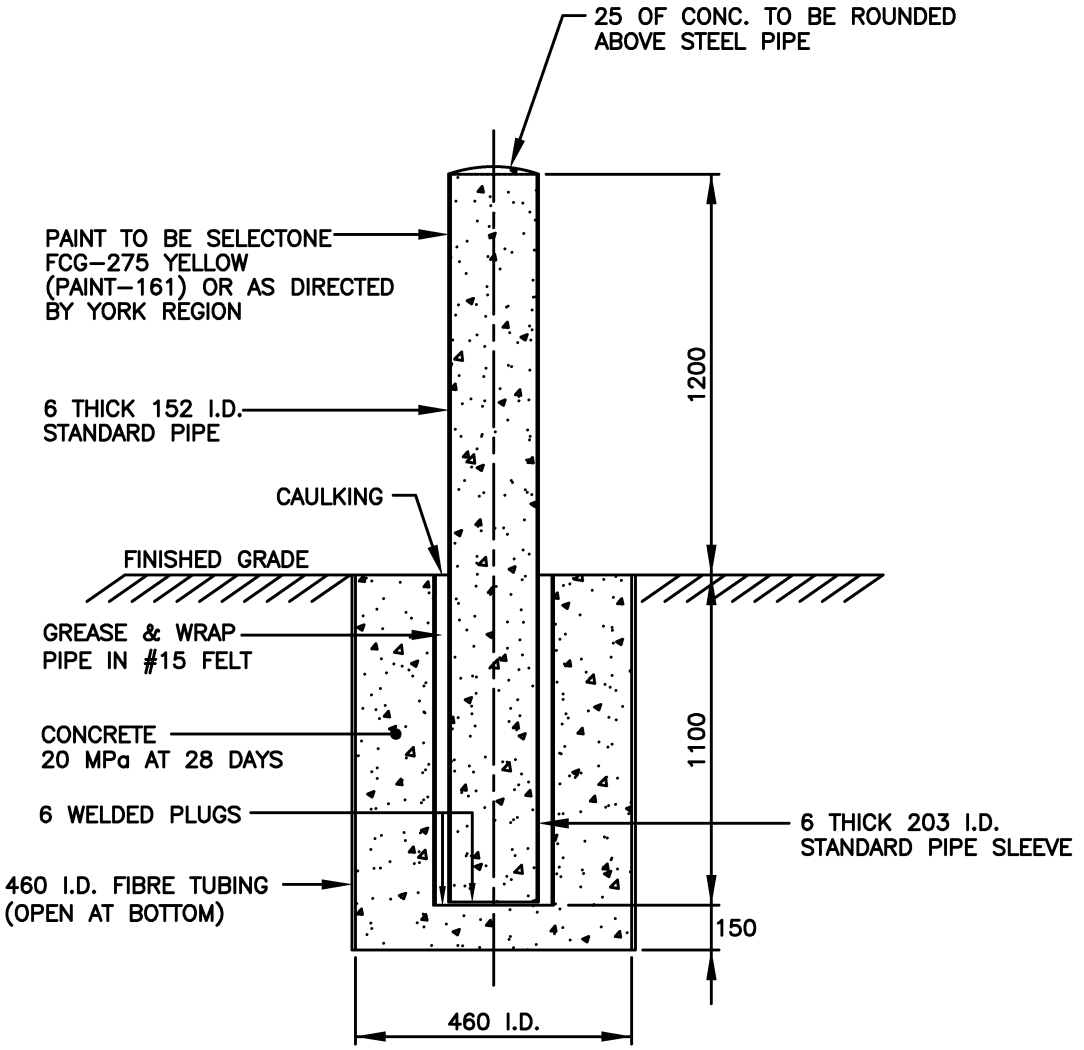
York Region

Public Works Transportation

TYPICAL DELINEATOR INSTALLATION FOR PROTECTION OF CONCRETE HANDWELLS

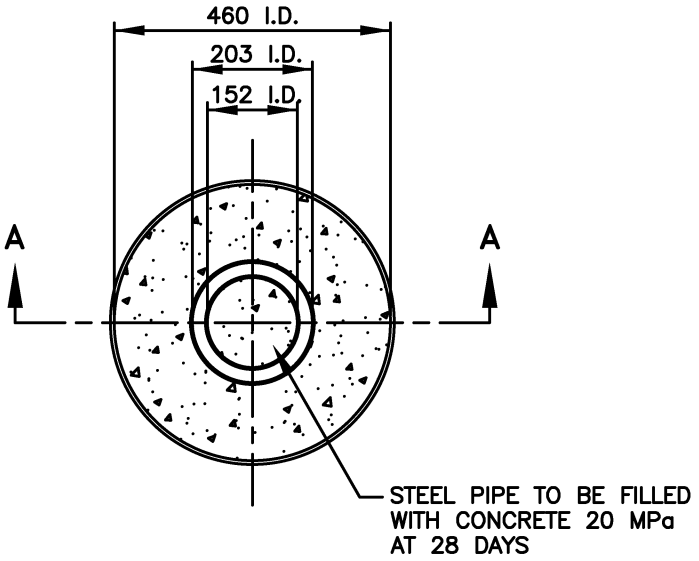
JANUARY 2023
DATE

E-8.01



SECTION A – A

N.T.S.



NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.

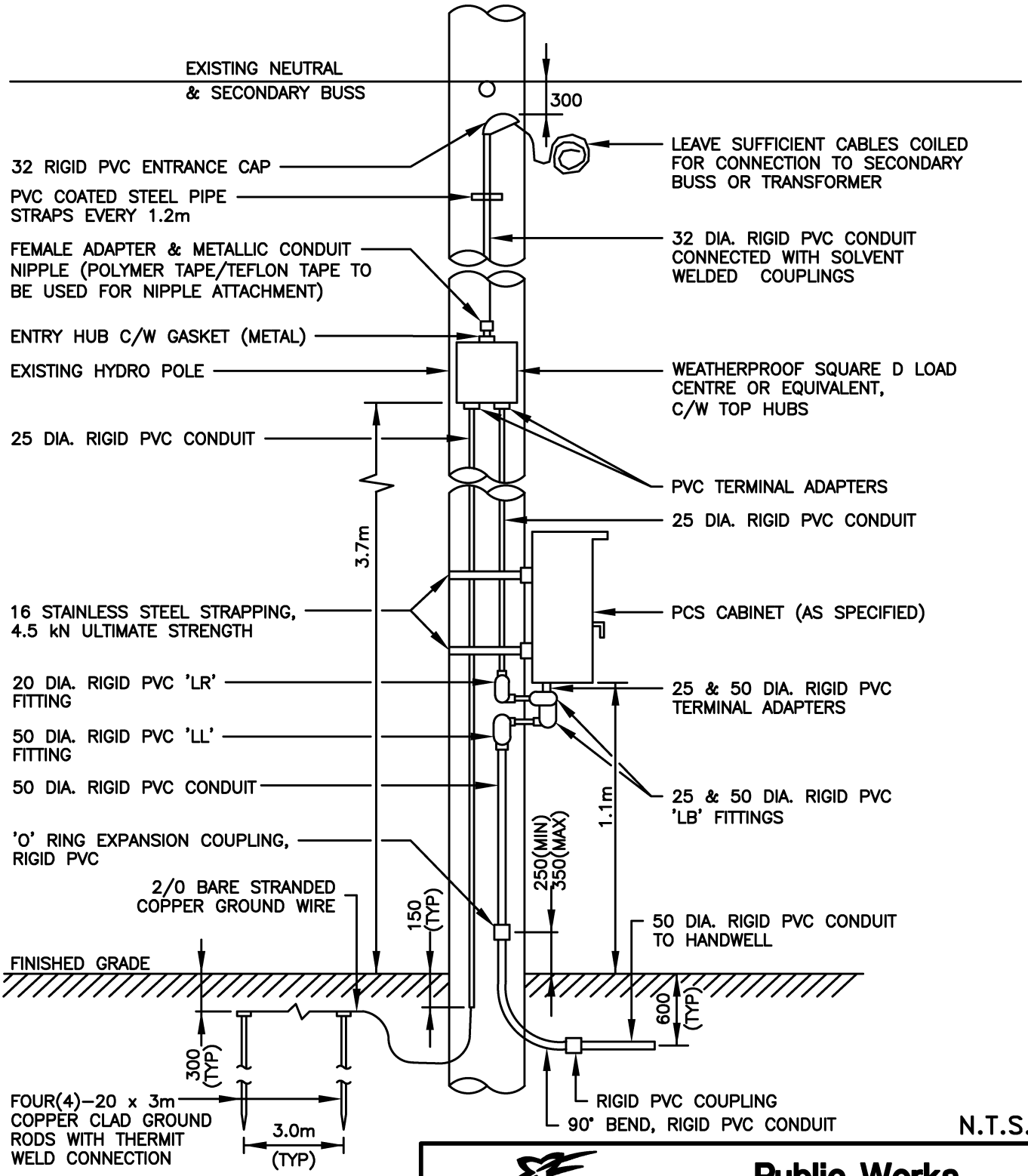
York Region

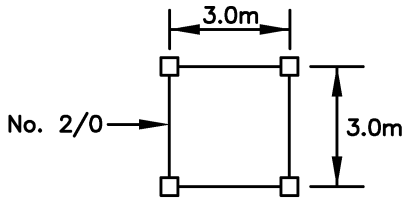
Public Works
Transportation

TYPICAL PIPE BUMPER

JANUARY 2023
DATE

E–8.02





TYPICAL GROUND ROD LAYOUT

NOTE

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.

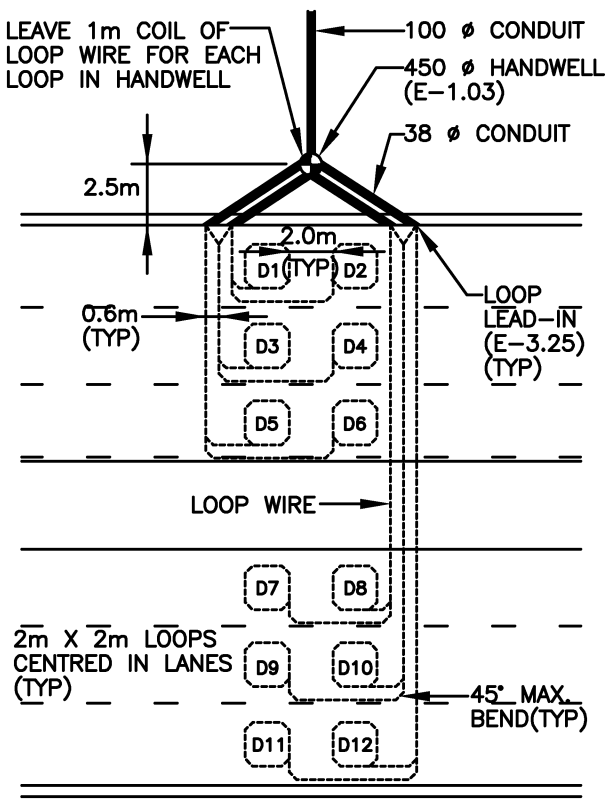
York Region

Public Works Transportation

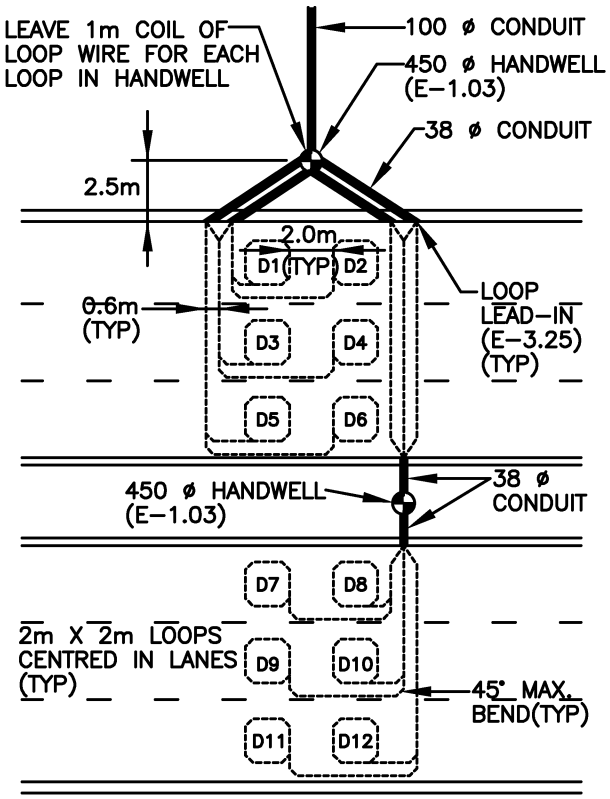
TYPICAL PERMANENT TRAFFIC COUNTING STATION MOUNTING DETAIL

JANUARY 2023
DATE

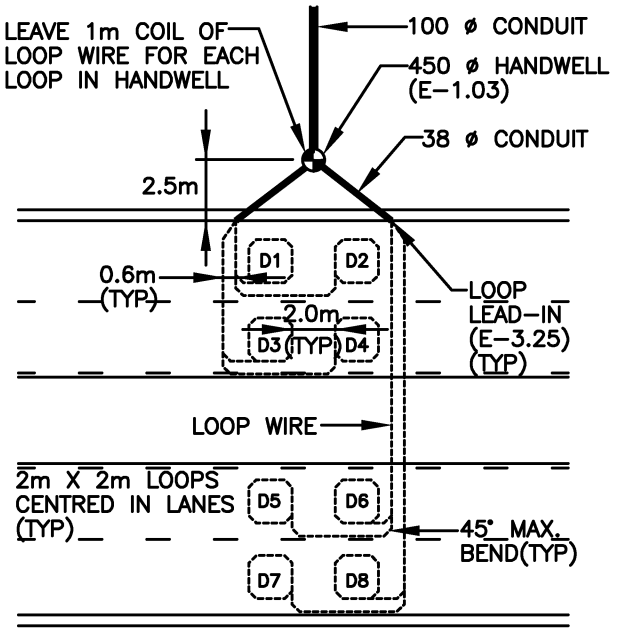
E–8.04



7 LANE CONFIGURATION



6 LANE CONFIGURATION WITH MEDIAN



5 LANE CONFIGURATION

N.T.S.

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE INDICATED.
2. SEE STANDARD DRAWING E-8.04 FOR LOCATION AND DETAILS FOR CABINET AND SERVICE.
3. WHEN ROAD IS TO BE RESURFACED, LOOPS ARE TO BE INSTALLED PRIOR TO TOP COURSE OF ASPHALT BEING PLACED.
4. EACH SET OF LOOP DETECTOR WIRES ARE TO BE TAGGED WITH THE APPROPRIATE NUMBER FOR THAT LOOP DETECTOR.

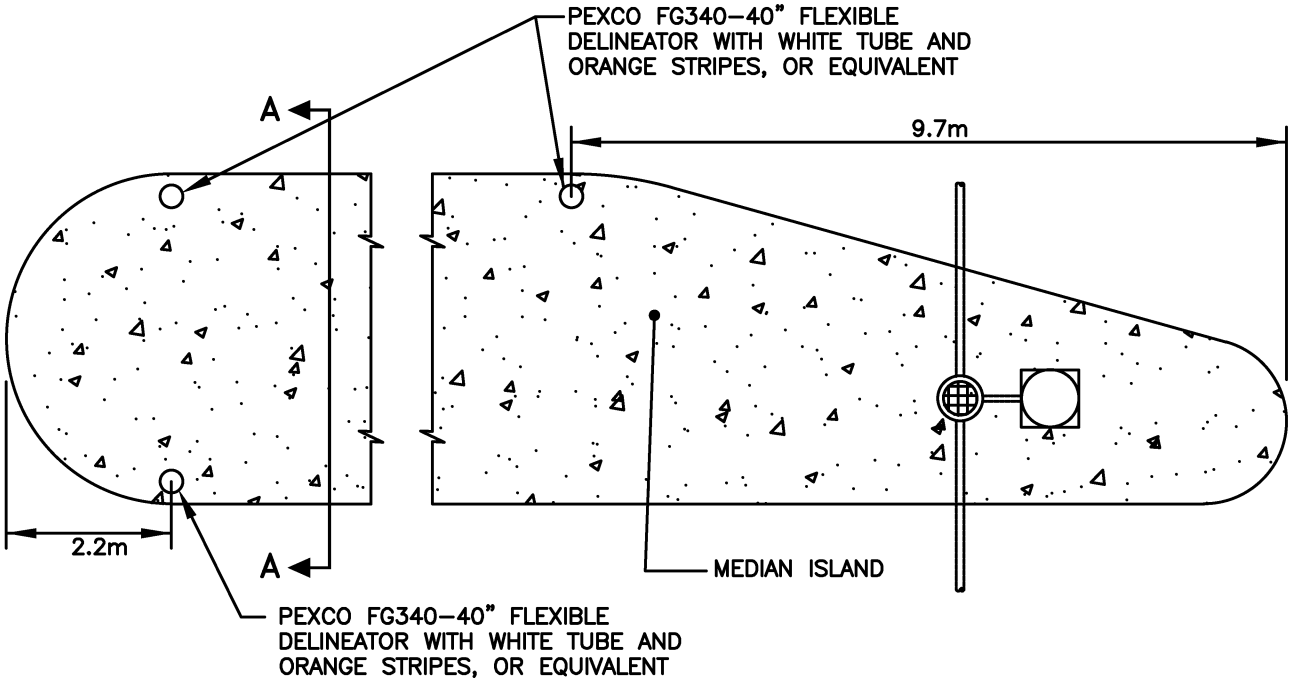
York Region

Public Works Transportation

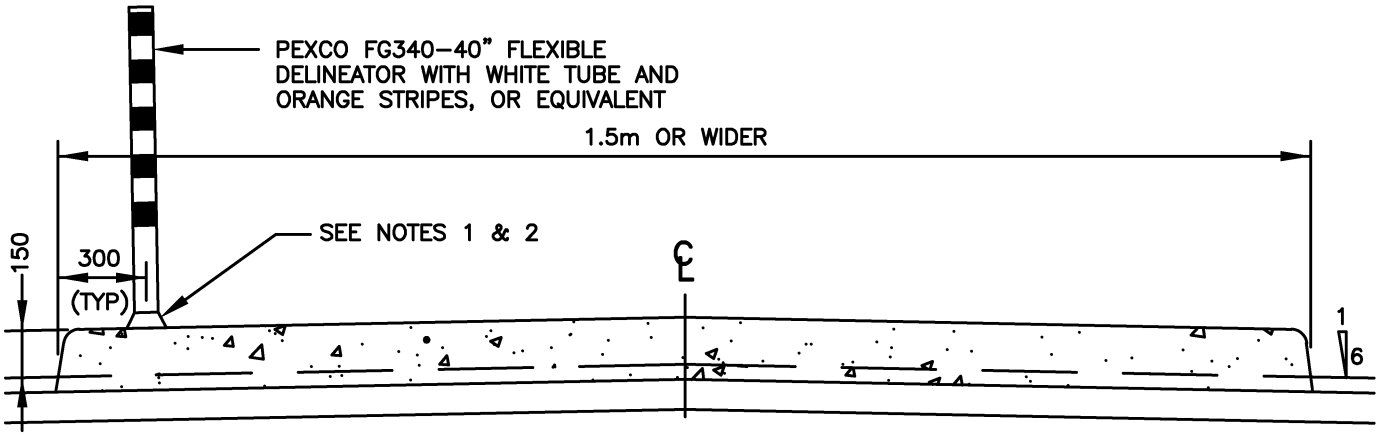
TYPICAL COUNTING/CLASSIFICATION STATION DETAIL

JANUARY 2023
DATE

E-8.05



PLAN VIEW



SECTION A–A

NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.
2. SEE STD. DWG. E–6.05 & E–6.06 FOR MEDIAN CONSTRUCTION DETAILS.
3. HOLES ARE TO BE DRILLED 64 INTO MEDIAN THROUGH THE HOLES IN EACH DELINEATOR BASE, USING A 9.5ø SDS BIT.
4. ANCHOR BOLTS WITH PROPER LENGTH ARE TO BE DRILLED THROUGH THE HOLES IN EACH DELINEATOR BASE. TIGHTENING OF BOLTS IS NOT TO BEGIN UNTIL SEVERAL THREADS HAVE BEEN INSERTED AND SHOULD END WHEN THE BOLT HEAD IS FIRMLY SEATED.

N.T.S.

York Region

Public Works
Transportation

TYPICAL FLEXIBLE DELINEATOR INSTALLATION IN 1.5m OR WIDER CONCRETE SLAB RAISED MEDIAN ISLAND AT INTERSECTIONS

JANUARY 2023
DATE

E–8.07