

Amendment Notice: Underground Raceway Infrastructure Layout

This bulletin introduces the following new GO Standard Specifications and Drawings:

- Sample Side Platform - Typical Conduit Routing (165-SER-E-4001)
- Sample Island Platform - Typical Conduit Routing (165-SER-E-4002)
- Sample Electrical Trench Details - 1 of 2 (165-SER-E-5001)
- Sample Electrical Trench Details - 2 of 2 (165-SER-E-5002)
- Sample Pull Box/Manhole - Sizing (165-SER-E-5003)

This bulletin applies to and amends the following document:

- GO Design Requirements Manual (DRM), GO-DRM-STD-2017 Revision 3, dated February 2020

This Bulletin updates existing DRM (Feb. 2020) requirements for underground raceways and conduits and introduces new GO Standard Drawings illustrating electrical handholes, pull boxes and trench details as well as typical conduit routing on platforms. This revision better supports Metrolinx underground wire management for station electrical and communications systems.

The revision addresses operation and maintenance issues caused by insufficient location requirements for underground raceways and underground raceway structures. Existing requirements allow underground raceways to be located in walking paths and rail platforms which cause difficulties for maintenance access. Additionally, conflicts arise between raceways and platform snow melt systems.

The new GO Standard Drawings require underground raceways to be located off of platforms and away from walking paths. The revision will decrease disruption needed for system maintenance and allow easier access to service systems. This reduces delays in maintenance repairs caused by limited access and lead time for flagging, as well as mitigates risk of conflict between conduit systems and snowmelt systems.

Amendments to the DRM and the new GO Standard Drawings are provided in the following attachments:

- Attachment 1: GO Standard Drawings, Underground Raceway Requirements
- Attachment 2: Revisions to GO DRM Feb. 2020 - Wiring Methods, Conduits

On MyLinX the new Drawings are available for staff download on [GO Standard Drawings and Specifications](#) and the Bulletin is located on the [GO Manual](#) page.

The Bulletin and Drawings are also available for external users to download via the Metrolinx public download site (http://www.gosite.ca/engineering_public/).

For support and Engineering inquiries contact Nevine Eskander: Nevine.Eskander@metrolinx.com

Michael J. Mortimer

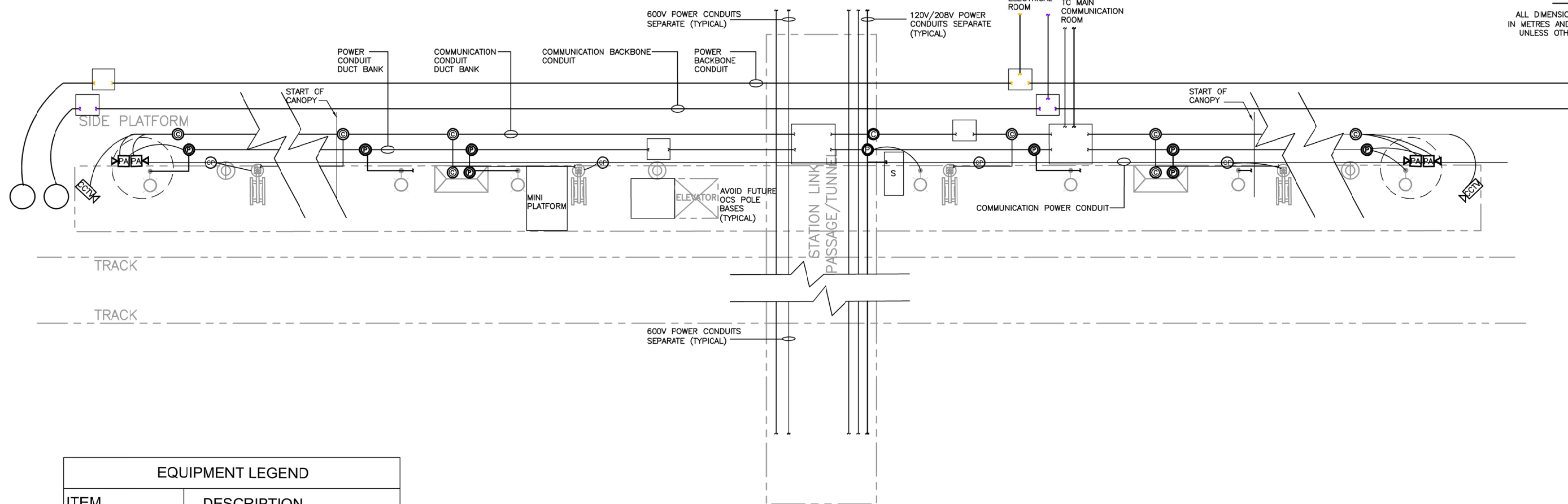
Director, Facilities Engineering and Standards Development
Engineering and Asset Management Division

Attachment 1 - GO Standard Drawings, Underground Raceway Requirements

- SAMPLE SIDE PLATFORM - TYPICAL CONDUIT ROUTING (165-SER-E-4001)
- SAMPLE ISLAND PLATFORM - TYPICAL CONDUIT ROUTING (165-SER-E-4002)
- SAMPLE ELECTRICAL TRENCH DETAILS - 1 OF 2 (165-SER-E-5001)
- SAMPLE ELECTRICAL TRENCH DETAILS - 2 OF 2 (165-SER-E-5002)
- SAMPLE PULL BOX/MANHOLE - SIZING (165-SER-E-5003)

METRIC

ALL DIMENSIONS SHOWN ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE NOTED.



EQUIPMENT LEGEND	
ITEM	DESCRIPTION
⊙	COMMUNICATION HANDWELL (TYPICAL)
⊕	POWER HANDWELL (TYPICAL)
▭	SHELTER (TYPICAL)
□	MINI-HUB ROOM (TYPICAL)
⊕	OCS POLE
⊙	LIGHT POLE
S	SNOW MELT CHAMBER
⊕	DIGITAL INFORMATION SIGN
▶PA	SPEAKER MOUNTED ON LIGHT POLE (TYPICAL)
▶CCTV	CCTV MOUNTED ON DEDICATED POLE
□	MANHOLE (TYPICAL)
○	MANHOLE (TYPICAL)
⊕	COMMUNICATION POWER HANDWELL (TYP.)

NOTES:

- WHERE LAND SPACE ALLOWS, ALL SIDE PLATFORM CONDUITS SHALL BE LOCATED OFF OF THE PLATFORM IN A PARALLEL CONDUIT RUN ON THE SIDE OF THE PLATFORM AWAY FROM THE TRACKS. FOR PLATFORMS WITH MINI-HUB ROOMS, THE MINI-HUB ROOMS SHALL BE FED DIRECTLY FROM THIS CONDUIT RUN AND THE MINI-HUB ROOM SHALL FEED ALL DEVICES.
- THIS DRAWING SHOWS TYPICAL ARRANGEMENT ONLY, NUMBER TYPE AND SIZE OF CONDUITS/MANHOLES/HANDWELLS/PULLBOXES TO BE INSTALLED ARE SPECIFIED IN DRW.
- ALL CONDUITS SHOWN SHALL BE HIDDEN WHERE POSSIBLE.
- WHERE LAND SPACE ALLOWS, ALL MINI-HUB ROOMS SHALL BE LOCATED OFF OF THE PLATFORM. MINI-HUB ROOMS MUST BE LOCATED TO MAINTAIN A MAXIMUM 90m TO COMMUNICATION DEVICES ON THE PLATFORM.
- SIZE ALL ELECTRICAL EQUIPMENT USING THE MOST CURRENT VERSION OF METROLINX DRW.
- USE A MINIMUM OF 0.6M TO SEPARATE ELECTRICAL AND COMMUNICATION CONDUITS. REFER TO METROLINX RAIL CORRIDOR RACEWAY GUIDELINES FOR MORE INFORMATION.
- ALL STUB UPS AND ELECTRICAL EQUIPMENT SHALL ACCOMMODATE FOR FUTURE LEVEL BOARDING.
- POWER AND COMMUNICATION DEVICES IN CANOPY SHALL BE FED THROUGH MINI-HUB ROOMS OR SHELTERS. POWER AND COMMUNICATION HANDHOLES SHALL BE IN EVERY SHELTER OUT OF THE WALKING PATH AND NOT OBSTRUCTING THE DOORS.
- CCTV TO BE MOUNTED ON A SEPARATE DEDICATED POLE. EXCEPT FOR STRUCTURAL MOUNTED CAMERAS.
- POWER AND COMMUNICATIONS PULL BOXES SHALL NOT BE LOCATED DIRECTLY IN FRONT OF ELEVATORS.
- LIGHTING DISTRIBUTION SHALL BE ARRANGED SO ALL ADJACENT LIGHTS ARE ON ALTERNATE CIRCUITS TO MAINTAIN 50% COVERAGE AT ALL TIMES.
- FOR ALL POLE BASES, THERE MUST BE CONDUITS ENTERING AND LEAVING THE POLE FOR POWER AND COMMUNICATIONS.

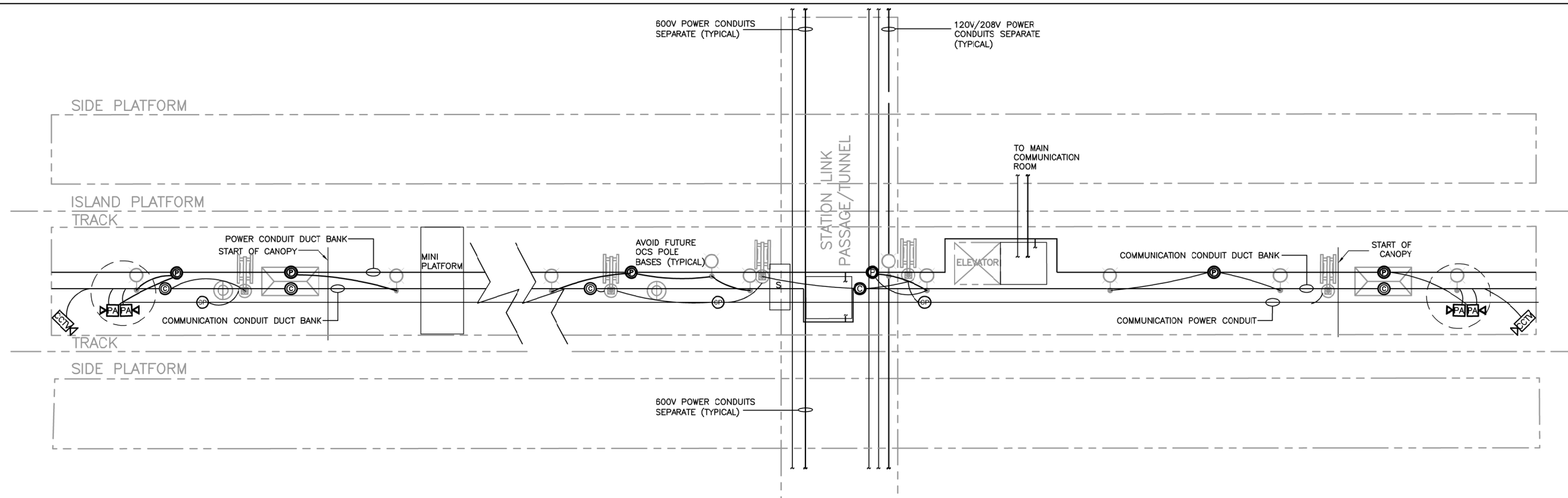
NOTE:
THIS DRAWING IS PROVIDED FOR INSTRUCTIONAL DESIGN PURPOSES ONLY BASED ON METROLINX GO TRANSIT DESIGN GUIDELINES AND REQUIREMENTS. THE CONTRACTED PARTY SHALL VERIFY FOR LOCAL CODE COMPLIANCE, EXISTING SITE CONDITIONS AND INTER DISCIPLINARY DRAWING COORDINATION. ALL DIMENSIONS AND SPECIFICATIONS SHOULD BE VERIFIED BY CONTRACTED PARTY AND/OR CONTRACTOR BEFORE CONSTRUCTION BEGINS.

METROLINX PROJECT NO.

REFERENCE DRAWINGS	ISSUE	REVISIONS	DRAWN BY: X.X.X. YY/MM/DD	DESIGNED BY: X.X.X. YY/MM/DD		XXXXXXXX STATION ----- SAMPLE SIDE PLATFORM - TYPICAL CONDUIT ROUTING
			CHECKED BY: X.X.X. YY/MM/DD	APPROVED BY: X.X.X. YY/MM/DD		
			SCALE: 1:XXX	FULL SIZE ONLY		
DWG NO.	TITLE	NO. DATE	ISSUED FOR	REV. DATE		

METRIC

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EQUIPMENT LEGEND	
ITEM	DESCRIPTION
	COMMUNICATION HANDWELL (TYPICAL)
	POWER HANDWELL (TYPICAL)
	SHELTER (TYPICAL)
	MINI-HUB ROOM (TYPICAL)
	OCS POLE
	LIGHT POLE
	SNOW MELT CHAMBER
	DIGITAL INFORMATION SIGN
	SPEAKER MOUNTED ON LIGHT POLE (TYPICAL)
	CCTV MOUNTED ON DEDICATED POLE
	MANHOLE (TYPICAL)
	MANHOLE (TYPICAL)
	COMMUNICATION POWER HANDWELL (TYP.)

NOTES:

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- THIS DRAWING SHOWS TYPICAL ARRANGEMENT ONLY, NUMBER TYPE AND SIZE OF CONDUITS/MANHOLES/HANDWELLS/PULLBOXES TO BE INSTALLED ARE SPECIFIED IN DRM.
- ALL CONDUITS SHOWN SHALL BE HIDDEN WHERE POSSIBLE.
- WHERE LAND SPACE ALLOWS, ALL MINI-HUB ROOMS SHALL BE LOCATED OFF OF THE PLATFORM. MINI-HUB ROOMS MUST BE LOCATED TO MAINTAIN A MAXIMUM 90m TO COMMUNICATION DEVICES ON THE PLATFORM.
- SIZE ALL ELECTRICAL EQUIPMENT USING THE MOST CURRENT VERSION OF METROLINX DRM.
- USE A MINIMUM OF 0.6M TO SEPARATE ELECTRICAL AND COMMUNICATION CONDUITS. REFER TO METROLINX RAIL CORRIDOR RACEWAY GUIDELINES FOR MORE INFORMATION.
- ALL STUB UPS AND ELECTRICAL EQUIPMENT SHALL ACCOMMODATE FOR FUTURE LEVEL BOARDING.
- POWER AND COMMUNICATION DEVICES IN CANOPY SHALL BE FED THROUGH MINI-HUB ROOMS OR SHELTERS. POWER AND COMMUNICATION HANDHOLES SHALL BE IN EVERY SHELTER OUT OF THE WALKING PATH AND NOT OBSTRUCTING THE DOORS.
- CCTV TO BE MOUNTED ON A SEPARATE DEDICATED POLE. EXCEPT FOR STRUCTURAL MOUNTED CAMERAS.
- POWER AND COMMUNICATIONS PULL BOXES SHALL NOT BE LOCATED DIRECTLY IN FRONT OF ELEVATORS.
- LIGHTING DISTRIBUTION SHALL BE ARRANGED SO ALL ADJACENT LIGHTS ARE ON ALTERNATE CIRCUITS TO MAINTAIN 50% COVERAGE AT ALL TIMES.
- FOR ALL POLE BASES, THERE MUST BE CONDUITS ENTERING AND LEAVING THE POLE FOR POWER AND COMMUNICATIONS.
- DESIGN MUST ACCOMMODATE (IF REQUIRED) A SEPARATE CORRIDOR BACKBONE FOR POWER AND COMMUNICATIONS.

NOTE:
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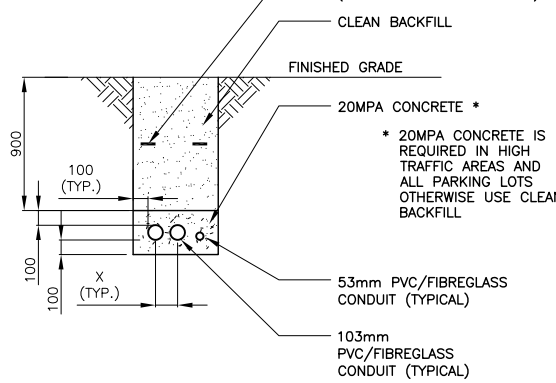
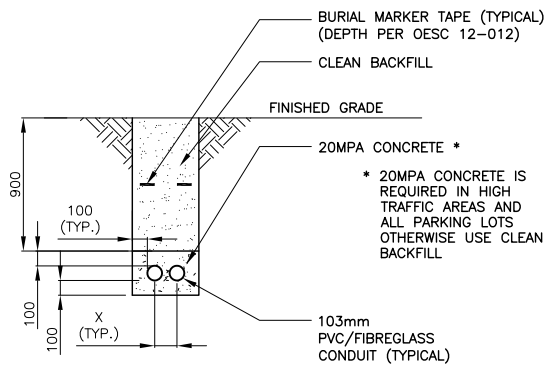
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			CHECKED BY: X.X.X. YY/MM/DD	APPROVED BY: X.X.X. YY/MM/DD		
			SCALE: 1:XXX	FULL SIZE ONLY		
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NOTES - UNDERGROUND TRENCH DETAILS

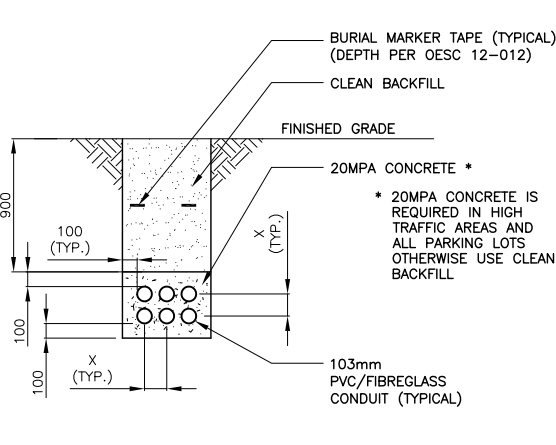
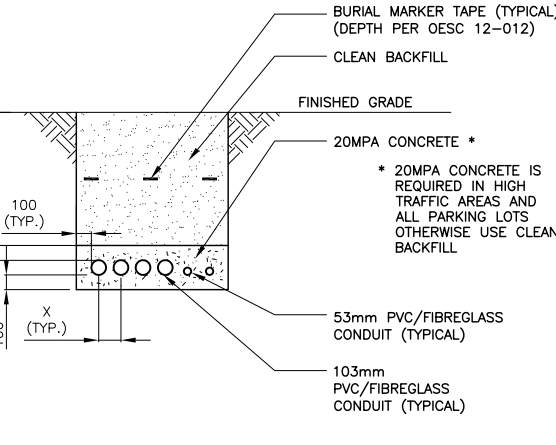
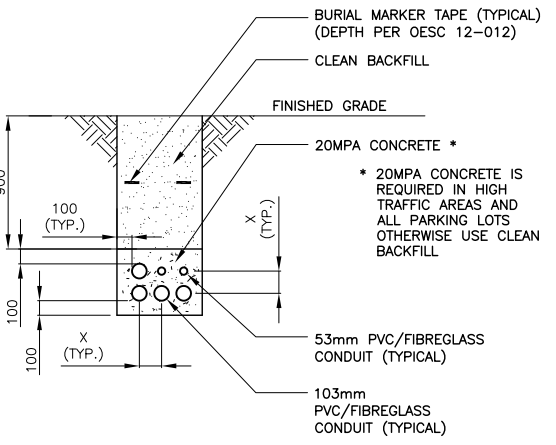
- POWER AND COMMUNICATION CONDUITS MUST BE IN SEPARATE DUCT BANKS.
- REFER TO METROLINX DRM FOR CONDUIT INSTALLATION, SPACING, CONDUIT FILL AND MAXIMUM NUMBER OF CONDUCTORS IN CONDUIT.
- DIMENSION "X" TO MEET OESC (ONTARIO ELECTRICAL SAFETY CODE) REQUIREMENTS BASED ON SYSTEM VOLTAGE.
- ALL ELECTRICAL SYSTEM GROUNDING FOR POWER AND COMMUNICATIONS SHALL BE INSTALLED INSIDE OF THE CONDUIT WITHIN THE OCLZ.
- CONDUITS CAN BE INSTALLED INSIDE SCHEDULE 40 OR GREATER STEEL PIPING (SLEEVES) TO CROSS TRACKS OR HIGH TRAFFIC AREA, PROVIDED THAT THE MINIMUM CONDUIT SPACING IS PER THE OESC, BASED ON THE SYSTEM'S VOLTAGE BEING MAINTAINED, AND THE METALLIC SLEEVE WITHIN THE OCLZ AREA IS BONDED TO THE TRACTION POWER RETURN.
- HANDWELLS AND MANHOLES MUST CONTAIN DRAINAGE TO PREVENT THE ACCUMULATION OF WATER. SLOPE DUCTS AWAY FROM BUILDING ENTRANCES.
- FOR HANDWELLS LOCATED IN ELECTRIFICATION ZONE, GROUNDING WIRE NEEDS TO BE VERIFIED TO WITHSTAND STEP AND TOUCH VOLTAGE LEVELS. COORDINATE WITH ELECTRIFICATION KA FALUT LEVELS AND TIMING. REFER TO DRM REQUIREMENTS OR GROUNDING - WHICHEVER IS MORE STRINGENT.
- RACEWAYS AND BRANCH CIRCUITRY SHALL BE IMPLEMENTED TO MINIMIZE FAILURE OF A COMPLETE SYSTEM DUE TO FAILURE OR MALFUNCTIONING OF ANY SINGLE ELECTRICAL COMPONENT.
- MINIMIZE THE DISTRIBUTION OF CONDUCTORS OF DIFFERENT CIRCUITS SHARING COMMON RACEWAYS, PULL BOXES, ETC.
- RACEWAYS SELECTED SHALL RESIST MECHANICAL DAMAGE AND ENVIRONMENTAL DETERIORATION EFFECTS.
- SPECIAL ATTENTION SHALL BE APPLIED TO CORROSION INHIBITORS AND PROTECTIVE COATINGS OR TREATMENTS ON SURFACE MOUNTED CONDUIT IN AREAS CAPABLE OF CORROSION OR CONDENSATION DUE TO TEMPERATURE CHANGE AND PROTECTION AGAINST EMI/EMC SUCH AS GROUNDING AND SHIELDING.
- REFER TO COMMUNICATION DRAWINGS FOR COMPLETE LAYOUT.
- PROVIDE STRUCTURAL SUPPORTS AND GROUNDING AS REQUIRED.
- ACCOUNT FOR FUTURE LEVEL BOARDING WHEN ESTABLISHING THE DUCT BANK DEPTH.
- THE TYPE OF CONTAINMENT (DUCT BANK WITH/WITHOUT CONCRETE, DIRECT BURIED, ETC.) SHALL BE COORDINATED AS PER SITE CONDITIONS. DETAILS SHALL BE SUBMITTED FOR APPROVAL IN ACCORDANCE WITH OESC CODE AND PROJECT SPECIFICATIONS.
- FOR CONCRETE DUCT BANKS, REINFORCEMENT DETAILS SHALL BE SUBMITTED FOR APPROVAL IN ACCORDANCE WITH CONTRACT AND PROJECT SPECIFICATIONS.
- DESIGNATE TOP LEVEL OF CONDUITS AS SPARE FOR FUTURE USE AND EASE OF ACCESSIBILITY.

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 2. THE CONNECTION OF HANDWELLS/PULL BOXES TO DRAINAGE SYSTEM TO BE COORDINATED IN FIELD. PROVIDE 300mm OF CLEAR STONE BEDDING BELOW HANDWELLS/PULLBOXES.
 3. REFER TO OPSD 2112.040 REGARDING ELECTRICAL HANDHOLE PRECAST CONCRETE.
 4. REFER TO OPSD 2117.020 REGARDING ELECTRICAL HANDHOLES GENERAL INSTALLATION REQUIREMENTS.
 5. REFER TO OPSD 2123.030 REGARDING ENTRY OF DIRECT BURIED AND ENCASED DUCTS.
 6. REFER TO OPSD 401.010 REGARDING MAINTENANCE HOLES.



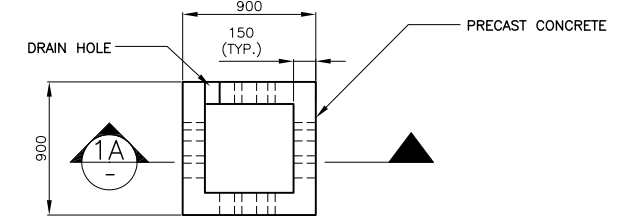
2 DUCTS INSTALLATION DETAILS
 2x103mm (1) E-5001

3 DUCTS INSTALLATION DETAILS
 2x103mm, 1x53mm (2) E-5001



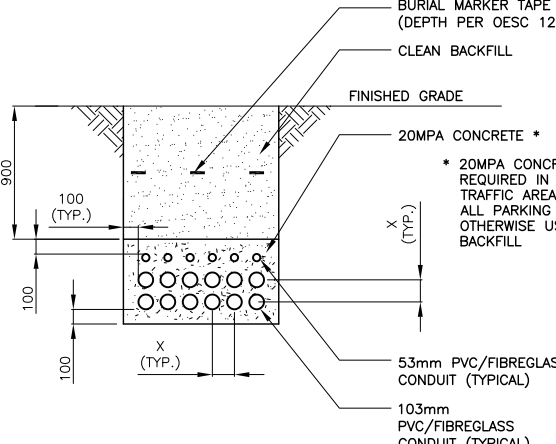
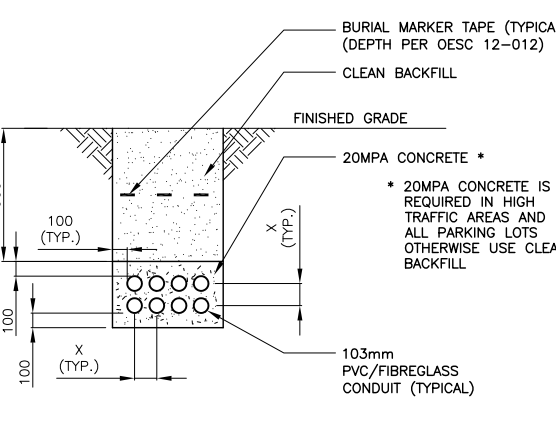
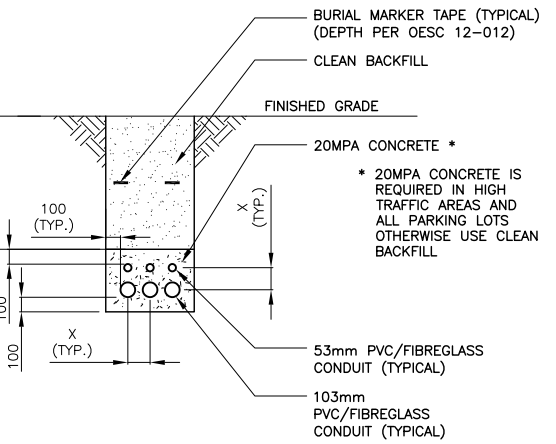
6 DUCTS INSTALLATION DETAILS
 4x103mm, 2x53mm (3) E-5001

6 DUCTS INSTALLATION DETAILS
 6x103mm (4) E-5001



ELECTRICAL HANDHOLE - 600 x 600mm - PLAN (8) E-5001
 N.T.S.

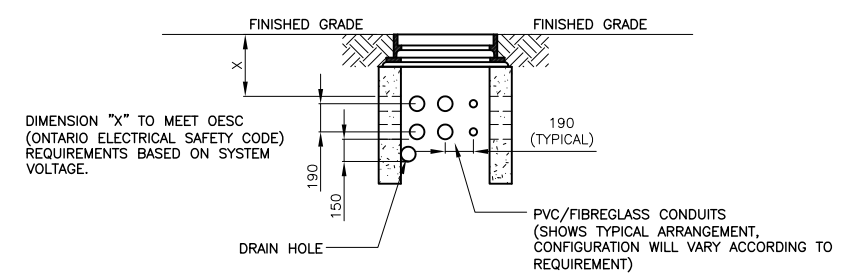
ELECTRICAL HANDHOLE PRECAST CONCRETE
 600mm x 600mm
 REFER TO OPSD 2112.040



6 DUCTS INSTALLATION DETAILS
 3x103mm, 3x53mm (5) E-5001

8 DUCTS INSTALLATION DETAILS
 8x103mm (6) E-5001

18 DUCTS INSTALLATION DETAILS
 12x103mm, 6x53mm (7) E-5001



ELECTRICAL HANDHOLE - 600 x 600mm - SECTION (8A) E-5001
 N.T.S.

ELECTRICAL HANDHOLE PRECAST CONCRETE
 600mm x 600mm
 REFER TO OPSD 2112.040

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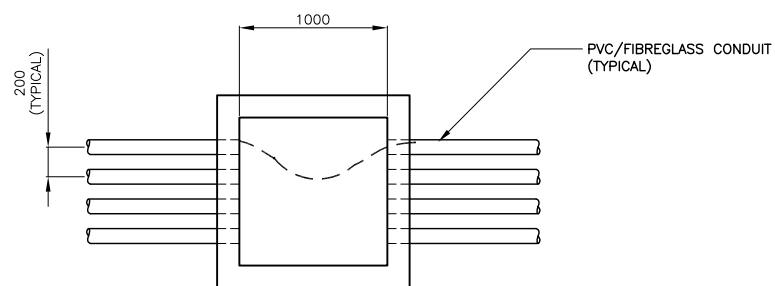
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XXXXXXX STATION

SAMPLE ELECTRICAL TRENCH DETAILS - 1 OF 2

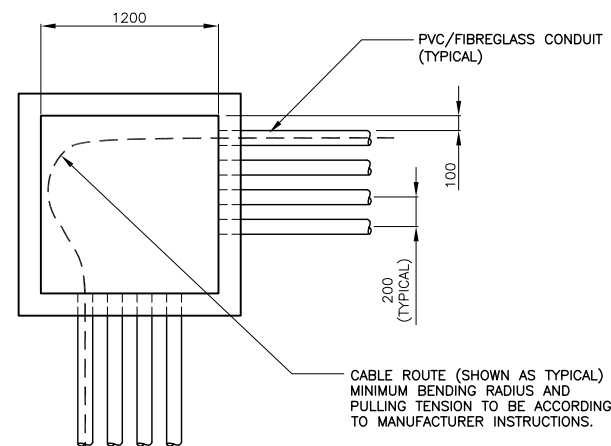
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PULL BOX/MANHOLE – STRAIGHT THROUGH PULL – PLAN

DRAIN HOLE NOT SHOWN FOR CLARITY

1
E-5003



PULL BOX/MANHOLE – 90° BEND PULL – PLAN

DRAIN HOLE NOT SHOWN FOR CLARITY

2
E-5003

NOTES – SQUARE PULL BOX/MANHOLE

1. THE CALCULATIONS FOR THE SQUARE RECTANGULAR PULL BOX/MANHOLE ARE INTERNAL DIMENSIONS, WALL THICKNESS MUST BE ADDED.
2. WIDTH IS (2) – 90 DEGREE BEND PULL – 6X THE SIZE OF THE LARGEST CONDUIT PLUS 2X THE SIZE OF EACH ADDITIONAL CONDUIT IN THAT ROW, IF THERE ARE 4-100mm CONDUITS THEN THE SIZE IS 600+3X2X100 = 1200mm. ALSO THE CONDUITS ARE PLACED CLOSER TO THE OPPOSITE END OF THE PULL, TO ALLOW A LONGER RADIUS BEND OF THE CABLE IN THE PULL BOX/HANDWELL. AGAIN, IF THE MANUFACTURER ALLOWS 50mm SPACING BETWEEN THE CONDUITS THEN THE SIZE WILL BE 1200 – 150 = 1150mm.
3. CYLINDRICAL HANDWELLS UP TO 800mm DIAMETER SHALL BE USED FOR ONLY 2-53mm CONDUIT RUNS.
4. PULL BOX/MANHOLE COVER TO BE SECURED WITH BOLTS, GROUNDED IF METALLIC, AND IDENTIFIED AS PER METROLINX NAMING STANDARDS.
5. AS PER DRM AND SPECIFICATIONS, MANHOLE COLLAR IDENTIFICATION SHALL BE FOLLOWED.
6. PROVIDE SLACK PROVISION FOR ALL CABLES ENTERING A MANHOLE.
7. MANHOLES ARE TO BE DESIGNED WITH PROPER DRAINAGE.

NOTES:

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2. THE CONNECTION OF HANDWELLS/PULL BOXES TO DRAINAGE SYSTEM TO BE COORDINATED IN FIELD. PROVIDE 300mm OF CLEAR STONE BEDDING BELOW HANDWELLS/PULLBOXES.
3. REFER TO OPSD 2112.040 REGARDING ELECTRICAL HANDHOLE PRECAST CONCRETE.
4. REFER TO OPSD 2117.020 REGARDING ELECTRICAL HANDHOLES GENERAL INSTALLATION REQUIREMENTS.
5. REFER TO OPSD 2123.030 REGARDING ENTRY OF DIRECT BURIED AND ENCASED DUCTS.
6. REFER TO OPSD 401.010 REGARDING MAINTENANCE HOLES.

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						SCALE: 1:XXX	FULL SIZE ONLY		SAMPLE PULL BOX/MANHOLE – SIZING	
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DWG. NO.	TITLE	NO.	DATE	ISSUED FOR	REV.	DATE			REV. 0	SHEET

Attachment 2 - Revisions to GO DRM Feb. 2020 - Wiring Methods, Conduits

7.2.9 Wiring Methods

7.2.9.1 Raceways and conductors

Raceways and branch circuitry shall be implemented to minimize failure of a complete system due to failure or malfunctioning of any single electrical component. Distribution minimizing conductors of different circuits sharing common raceways and pull-boxes, etc., shall be implemented. Raceways selected shall suitably resist mechanical damage and environmental deterioration effects. In particular, special attention shall be applied to corrosion inhibitors and protective coatings or treatments on surface mounted conduit in underground areas (e.g., tunnels, below grade electrical rooms, Bridges and parking structures etc.).

A minimum 12 AWG stranded copper wire green insulated RWU90 below grade and RW90 above grade shall be placed inside each raceway. This wire is to be used as a tracer wire inside a buried raceway for the purpose of locates after installation.

In addition, slack wire shall be provided. In all runs, the amount of slack shall be no less than 1.0m each termination point and 600mm in each pull point. Access wire is to be neatly coiled and be available for future use.

Drip loops shall be provided on all outside hanging raceways or conductors.

Refer to Metrolinx Standard Specifications: Rail Corridor Raceway Requirements 27 05 41, Raceway for Electrical Systems 26 05 34 and Electrical Conductors and Cables 26 05 21.

7.2.9.2 Conduits

Rigid galvanized steel conduit, or other Metrolinx approved cabling protection methods shall be used for all exposed work in normally dry areas not likely to present corrosion problems. Rigid steel or rigid PVC conduit may be used embedded in slabs where high impact protection is required. Rigid non-metallic conduit shall be used below ground, either direct buried or concrete encased.

PVC or epoxy coated rigid galvanized steel conduit shall be used in areas that can have condensation on metal or corrosion problem areas. Conduit, having a minimum of 53mm shall be used in parking lots when deemed necessary. Concrete encasements shall be provided for bus loops, road crossings, and railway Right-of-Ways. In finished areas, all conduits shall be concealed.

~~Metallic conduits shall not be used within the Overhead Contact Line Zone (OCLZ) as detailed in the Enabling Works Standards, MX-ELECT TRAC EW-DW-2016.~~

Refer to [GO](#) Standard specifications for detailed requirements

7.2.9.3 Cable Trays

Where required, ~~hot dip galvanized~~ cable trays shall be ladder type; hot dip galvanized steel or aluminum or non-metallic as required for the application, complete with vertical barriers to separate systems or cables as required. Class shall be selected based on conductor weight plus 50% spare capacity as a minimum. Cable trays to be cantilever-supported for ease in installation of cables. Fire barriers of multi-transit type shall be provided at firewalls and fire separations, and shall be in accordance with the O.B.C. and CAN4-S115-M.

Types of Cable trays to be used:

- Wire Cable Trays: Used under raised floors
- Ladder Cable Trays: Used in Electrical/Communication Rooms
- Enclosed Cable Trays-Cable bus from transformers to main substation switch gear, outdoors

7.2.9.4 Wire and Cable

All conductors shall be stranded copper. Conductors smaller than No. 12 AWG shall not be permitted for lighting or motor branch circuit wiring, except that No. 14 AWG multi-strand type conductors may be used for control circuits only. Provide appropriate connection for terminating and standard wire.

Conductors shall have a minimum insulation temperature rating of 90°C, but design shall be for 75°C. All conductor insulation shall be colour coded.

An approved transition method shall be established when different gauges of wire are to be terminated together.

7.2.9.5 Responsibility

The Consultant shall specify responsibility for wiring and equipment connections. Examples: For voice-activated intercoms, the type of wiring is to be as recommended by the equipment supplier, and is to be installed by the electrical contractor, but connected by the equipment supplier. For the P/A, CCTV, and security systems, the electrical contractor shall provide conduit with pull-strings, and the equipment supplier shall install wiring and the equipment, making all connections, testing and commissioning. Any equipment customization shall have appropriate seals from approved standards authority.

7.2.9.6 Enclosures

Enclosures shall be selected for the environment in which they are intended to be installed. In general, enclosures for indoor, dry application shall be EEMAC sprinkler proof type 1 or type 12 where applicable. Enclosure for damp and wet areas (e.g., exterior boxes exposed to the weather, tunnels and escalators or elevator pits) shall be EEMAC type 4x.

- Where installed in public areas, all enclosures, cover-plates, outlets plates, access panels, and handwells shall be provided with method of securing doors and covers. All enclosures and panels shall have a common key and in an enclosed, protected area where possible
- Manholes and handholes shall be located remotely from doors, shelters and main road and pedestrian traffic areas
- Electrical and communication pull points such as manholes or boxes shall have a maximum 45m distance between manholes
- No splices are permitted below grade
- Underground conduits entering Mechanical, Electrical and Communications Rooms from the exterior shall be sloped to ensure positive drainage away from room
- Underground raceways entering any Mechanical, Electrical or Communications Room shall be interrupted by a drained manhole or handhole within 3000 mm of the room
- The minimum opening in the top of the handhole shall be no smaller than 460 mm
- The lip of the handhole and manholes shall be identified as to the type of service within by means of grooves cut into the collar of the handhole or manhole.
- These markings are on the collar shall be 2 grooves; 3 mm deep for communications in the direction of conduit in and out and 1 groove; 3 mm deep in the direction of conduit in and out for electrical
- All electrical or communications handholes placed in the path of vehicular traffic or snow removal equipment shall be OPSD-2112.040 with OPSD-401.030 covers. If OPSD-2112.02 handholes are used, the covers shall be reinforced