Illinois Tollway Base Sheet Revisions

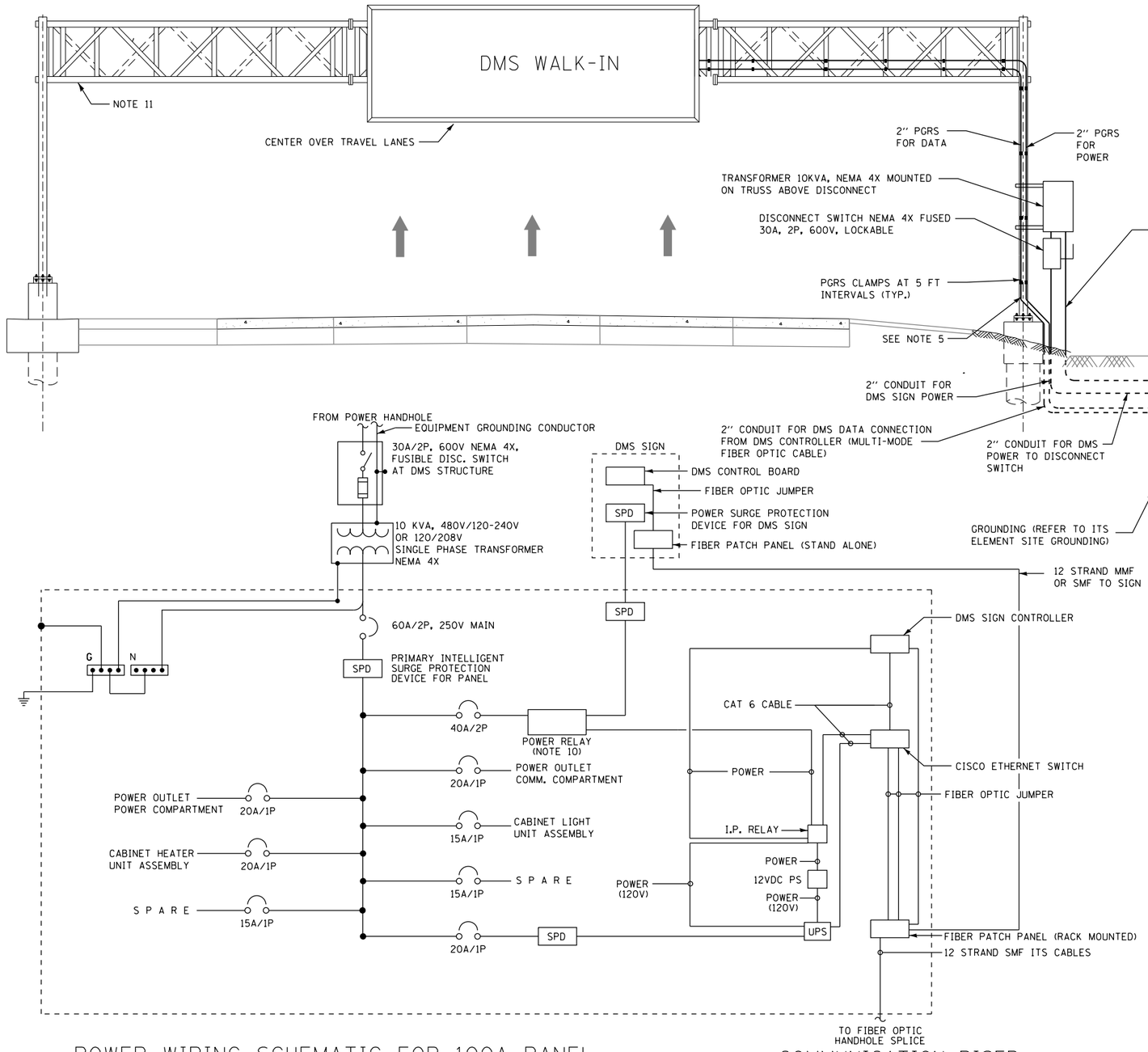
Section M	Base Sheet Drawings	
	Drawing	**Modification Summary** **Effective: 2020-03-01**
	Pole Assembly (ITS)-Series 1000	
	M-ITS-1000	**Elevation Views Pole Mounted ITS Element Assembly**
		Use 1 1/2" stainless conduits for power and fiber to ITS Enclosure instead of 2". Corrected the MVDS mounting height on elevation details Use 1 1/2" stainless conduit for ITS Disconnect switch
	M-ITS-1001	**General Notes Pole Mounted ITS Assembly**
		Note added on placement of battery enclosure
	M-ITS-1002	**ITS Standard Foundation**
		Note added to use 12 ft helix foundation for slopes over 1:6
	M-ITS-1003	**ITS Concrete Service Pad**
		Shows option for back-to-back mounted ITS enclosures.
	M-ITS-1004	**Cabinet Wiring Diagram - ITS Pole Mounted Enclosure (Solar Powered MVDS) (2 sheets)**
		Sheet 1: Revised layout to better accommodate future expansion.
	Dynamic Message Sign (ITS)-Series 1100	
	M-ITS-1100 to M- ITS-1108	**DMS**
		(Typical) Revised Type 1 nomenclature to Walk-in (Typical) Revised Type 2 nomenclature to Front Access
	M-ITS-1101	**DMS Type 1 Site Grounding Plan**
		Revised to show paved median structure
	M-ITS-1108	**DMS Cabinet Wiring Diagram**
		Clarified wiring diagram Updated switch model
	Cabinet Wiring (ITS)-Series 1200	
	M-ITS-1200 to M-ITS-1217	**Cabinet Wiring Diagrams**
		New Cat6 surge suppressor Axis T8061 for Axis PoE camera and Ditek for Cohu PoE camera Revised layout for Cisco 4000 switch, power supply, Cohu PoE injectors Revised 1214-1216 plan to remove Cisco switch Added Level 3 Cisco license (L-IE4000-RTU=) Modified gator patch model number
	Roadway Weather Information System (ITS)-Series 1300	
	M-ITS-1300	**RWIS Pole, Sensor Mounting Detail**
		General note to have manufacturer to supervise installation and commissioning Revised to show option for co-located CCTV camera and ITS enclosure Clarified the mounting height measured from pavement surface Installed new ITS Enclosure back to back to the RPU enclosure Add ITS Disconnect switch within 50 feet from primary pole Show RWIS cabinet configuration for the 3 electrical services
	M-ITS-1301	**RWIS Cabinet Wiring Diagram**
		Removed Cisco switch and gator patch from RPU enclosure
	M-ITS-1302	**Typical RWIS Site Installation Plan**
		Proposed location of temperature sensors are site specific, final position to be determined by the Engineer in consultation with manufacturer. Correct sensor beam position to be in the wheel track for primary and secondary pole. Power cable from primary pole to secondary pole not to be spliced
	M-ITS-1303	**RWIS Grounding Schematic**
		Corrections and additional detail to grounding diagram

New Sheet Retired Standard

Illinois Tollway Base Sheet Revisions

Section M	Base Sheet Drawings	
	Drawing	**Modification Summary** **Effective: 2020-03-01**
	Solar Powered Generator (ITS)-Series 1400	
	M-ITS-1400	**Solar Power Generator Details**
		Enclosure changed to Nema 4X
	Tower Mounted CCTV (ITS)-Series 1500	
	M-ITS-1500	**ITS Details Tower Mount Camera Details**
		Vertical distance between the two cameras is 24 in min. Both cameras to be installed on same side of the tower structure
	~~**M-ITS-1501**~~	**ITS Details Tower Mount Camera Details, 300' Cat6 or More**
		Retired
	M-ITS-1502	**ITS Details Tower Mount Camera Details, 300' Cat6 or Less**
		Vertical distance between the two cameras is 24 in min. Both cameras to be installed on same side of the tower structure
	M-ITS-1503	**Cabinet Wiring Diagram Tower Mounted CCTV ITS Assembly**
		New Cat6 surge suppressor model Revised layout of Cisco switch, power supply and Cohu PoE injector
	Weigh-in-Motion (ITS)-Series 1600	
	M-ITS-1600	**Weigh-In-Motion Cabinet and Foundation Details**
		Show two permanent antennas installed on top of WIM cabinet
	M-ITS-1603	**Weigh-In-Motion Detector Loop and Quartz Sensor Detail**
		Show parking area for one vehicle for annual calibration
	M-ITS-1607	**Weigh-In-Motion Height Detector**
		Added detail for overheight detector
	Flashing Sign Beacon (ITS)-Series 1700	
	M-ITS-1701	**Cabinet Layout and Wiring ITS Pole Mounted Enclosure (1-CCTV and Flashing Sign Beacon)**
		Update enclosure layout
	IPDC Facility (ITS)-Series 1800	
	M-ITS-1800	**IPDC Facility**
		No change
	Conduit Details at Integral Abutment Bridge (ITS)-Series 1900	
	M-ITS-1900	**Conduit Details at Integral Abutment Bridge with MSE Wall (Sheet 3)**
		No change
	100 FT. Monopole (ITS)-Series 2000	
	M-ITS-2000	**100 FT. Monopole Closed Circuit Television (CCTV) Camera Tower**
		Pole cap to use hex head screws Show revised grounding around service pad

New Sheet ~~Retired Standard~~



POWER WIRING SCHEMATIC FOR 100A PANEL, 120 / 240V LOAD CENTER OF DMS CABINET

(NOT TO SCALE)

COMMUNICATION RISER

(NOT TO SCALE)

DMS CABINET - IP RELAY WIRING TABLE					
DESCRIPTION		CONNECTION FROM		CONNECTION TO	
IP TERMINAL	IP TERMINAL ASSIGNMENT	DEVICE	CONNECTION	DEVICE	CONNECTION
1	RESERVED FOR CCTV1				
2	RESERVED FOR CCTV2				
3	DMS LOAD SHEDDING RELAY	IP_RELAY	12VDC (+)	CB	CB1A
		CB	CB1B	IP_RELAY	3 COMM
		IP_RELAY	3 NC	LOAD SHED RELAY	COIL (+)
		SPLICE BLOCK	120 V	IP_RELAY	NC
4	DMS CONTROLLER				
		IP_RELAY	4 NC	POWER OUTLET #1 (COMMUNICATION)	HOT
5	RESERVED FOR FLASHING BEACONS				
6	RESERVED FOR WIM				
7	RESERVED FOR MVDS 1				
8	RESERVED FOR MVDS 2				

NOTE TO DESIGNER

THIS BASE SHEET SHOWS TYPICAL NEW CONSTRUCTION BUT IT IS NOT A STANDARD DRAWING. IT REQUIRES COMPLETION BY THE DESIGNER PRIOR TO INSERTION INTO A CONTRACT. MICROSTATION FILES AND THE "CADD STANDARDS MANUAL" AVAILABLE ON THE ILLINOIS TOLLWAY WEBSITE. THE DESIGNER SHALL ACCEPT THE RESPONSIBILITY OF THE DESIGN OF THIS SHEET UPON ITS COMPLETION AND INSERTION INTO A CONTRACT. ALL "NOTE TO DESIGNER" BOXES SHALL BE REMOVED PRIOR TO INSERTION OF THE DRAWING INTO THE PLAN SET.

GENERAL NOTES:

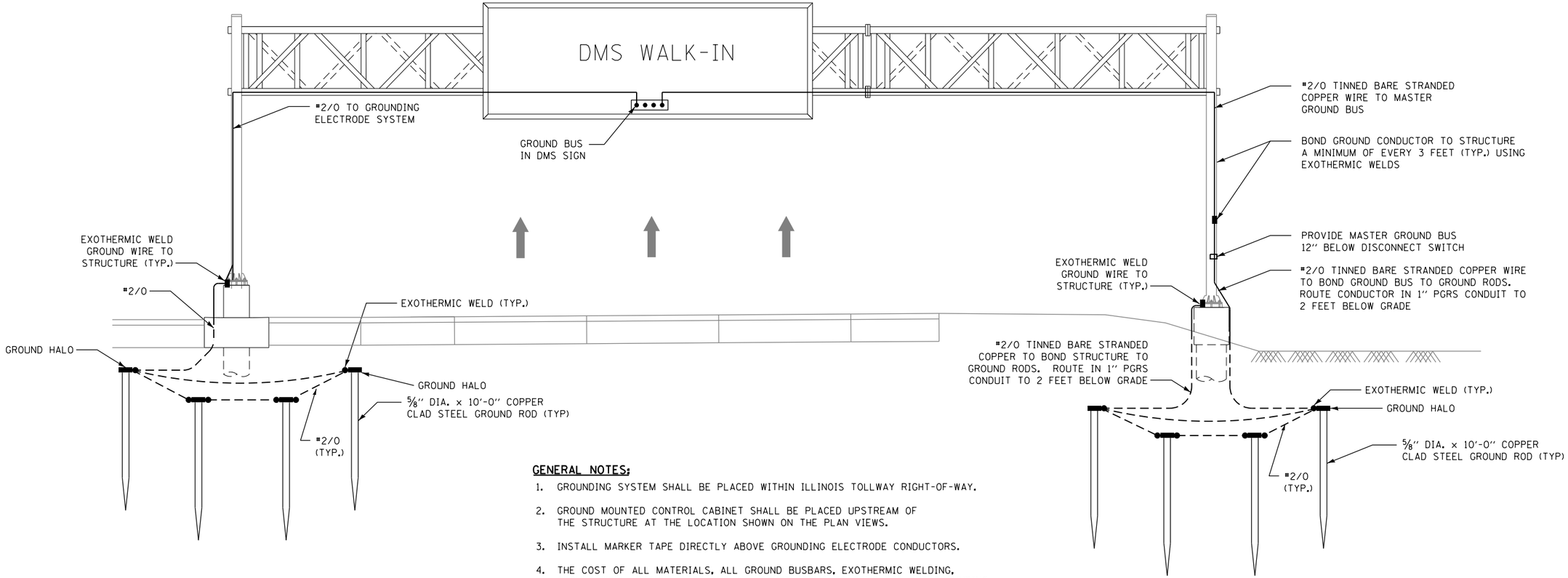
1. FURNISH AND INSTALL LOCKABLE SERVICE DISCONNECT AT PROPOSED STRUCTURE.
2. 10KVA, 480V/120/240V SINGLE PHASE TRANSFORMER SHALL BE MOUNTED ABOVE DISCONNECT.
3. THIS IS A DIAGRAMMATIC SCHEMATIC, ALL BREAKERS, TRANSFORMER LOAD CENTER SHALL BE SIZED AND WIRED AS PER MANUFACTURER RECOMMENDATIONS.
4. NEUTRAL AND GROUNDING SHALL BE BONDED AT SERVICE ENTRANCE DISCONNECT.
5. ALL UNDERGROUND CONDUITS SHALL BE NON-METALLIC CNC AND ABOVE GRADE CONDUITS SHALL BE RGS PVC COATED. COUPLERS SHALL BE UTILIZED WHEN TRANSITIONING FROM CNC TO PRGS.
6. MOUNT CLAMPS ON 5'-0" ON CENTER MOUNTING. HARDWARE SHALL BE USED AS PER CONDUIT MANUFACTURER RECOMMENDATION.
7. CONTRACTOR SHALL SUPPLY AND INSTALL CABLE REDUCER LUGS WHERE SIZE OF CABLE ENTERING THE DISCONNECT IS MORE THAN RECOMMENDED SIZE DUE TO VOLTAGE DROP.
8. ALL ELECTRICAL WORK FOR DMS WALK-IN SHALL BE PAID UNDER PAY ITEM "JT132621 - DMS ELECTRICAL WORK - WALK-IN".
9. THIS SCHEMATIC IS FOR GUIDANCE ONLY. CONTRACTOR SHALL WIRE THE DMS CABINET AS PER MANUFACTURER RECOMMENDATIONS AND INDUSTRY STANDARDS.
10. THE COM (COMMON) CONTACT AND NC (NORMALLY CLOSED) CONTACT ON RELAY CONTACTS OF DIN RELAY SHALL FOLLOW THE TABLE ABOVE.
11. REFER TO ILLINOIS TOLLWAY STANDARD DRAWING F17 FOR OVERHEAD SIGN STRUCTURE SPAN TYPE (STEEL) STRUCTURE DETAILS.
12. FIBER PATCH PANEL IN DMS SIGN HOUSING SHALL BE A FACTORY TERMINATED UNIT WITH A 12-STRAND PIGTAIL CONNECTING TO RACK MOUNTED FIBER PATCH PANEL IN DMS CONTROLLER CABINET.

M-ITS-1100

Illinois Tollway

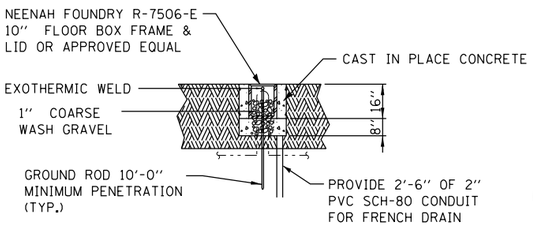
DMS WALK-IN ELECTRICAL PLAN

DATE
3-01-2020

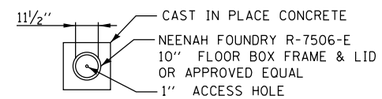


GENERAL NOTES:

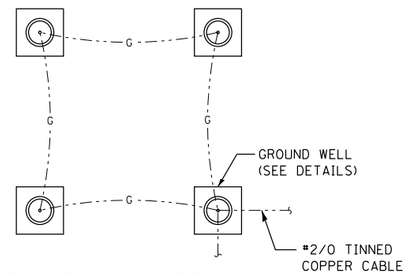
1. GROUNDING SYSTEM SHALL BE PLACED WITHIN ILLINOIS TOLLWAY RIGHT-OF-WAY.
2. GROUND MOUNTED CONTROL CABINET SHALL BE PLACED UPSTREAM OF THE STRUCTURE AT THE LOCATION SHOWN ON THE PLAN VIEWS.
3. INSTALL MARKER TAPE DIRECTLY ABOVE GROUNDING ELECTRODE CONDUCTORS.
4. THE COST OF ALL MATERIALS, ALL GROUND BUSBARS, EXOTHERMIC WELDING, GROUND WELL, GROUND RODS AND ALL OTHER ITEMS TO COMPLETE THE GROUNDING ELECTRODE SYSTEM SHALL BE INCLUDED IN PAY ITEM JT132621 - DMS ELECTRICAL WORK - WALK-IN.
5. REFER TO SHEET M-ITS-1102 FOR DMS TYPICAL SITE WIRING DETAIL.
6. GROUND RODS SHALL BE INSTALLED IN GROUND WELLS IN FINISHED GRADE UNLESS INSTALLED UNDER SHOULDERS OR PAVEMENT.



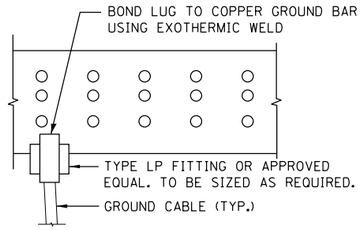
GROUND WELL ELEVATION DETAIL
(NOT TO SCALE, NOTE 3)



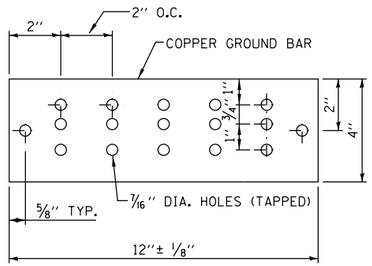
GROUND WELL PLAN DETAIL
(NOT TO SCALE, NOTE 3)



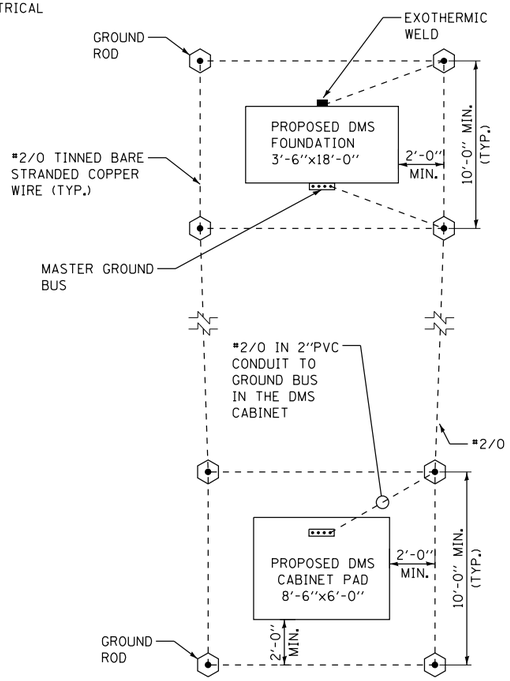
GROUND HALO DETAIL
(NOT TO SCALE)



MASTER GROUND BUSBAR CONNECTION DETAIL
(NOT TO SCALE)



MASTER GROUND BUSBAR SUPPORT SPACING DETAIL
(NOT TO SCALE)



GROUNDING SCHEMATIC
(NOT TO SCALE)

NOTE TO DESIGNER

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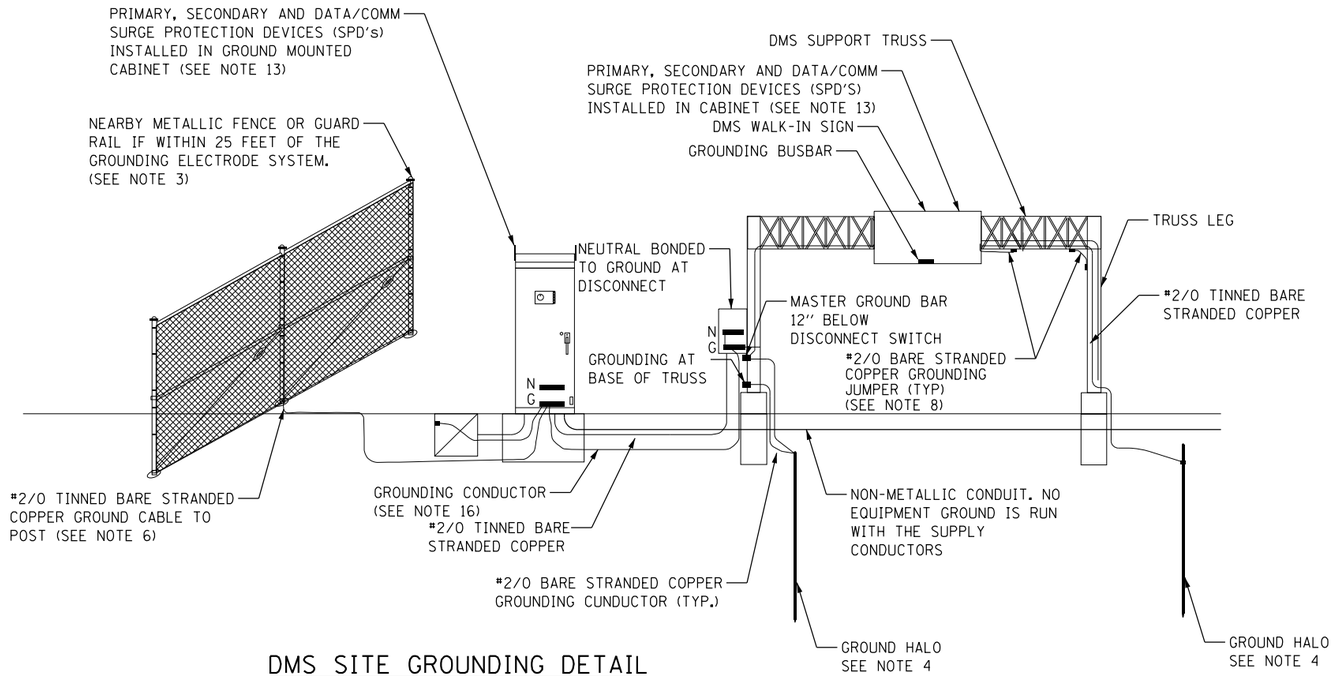
M-ITS-1101

Illinois Tollway

DMS WALK-IN
SITE GROUNDING PLAN

DATE
3-01-2020



DMS SITE GROUNDING DETAIL

(NOT TO SCALE)

NOTES:

1. ADDITIONAL GROUND RODS SHALL BE ADDED TO GROUNDING ELECTRODE CONDUCTOR AS REQUIRED UNTIL RESISTANCE TO GROUND IS 5 OHMS OR LESS. FOR DEVICE AND POWER SERVICE LOCATIONS. IF ADDITIONAL GROUND ROD ELECTRODES ARE REQUIRED IN ORDER TO ACHIEVE REQUIRED RESISTANCE THEY SHALL RADIATE OUT FROM EXISTING GROUND ROD ELECTRODES. THESE SHALL BE CONNECTED WITH #2/0 TINNED BARE STRANDED CONDUCTOR, AND SHALL BE 20' FROM CONNECTED GROUND ROD. ALL COMMUNICATION EQUIPMENT GROUNDING SITES SHALL BE TESTED FOR RESISTANCE TO GROUND USING THE THREE-POINT FALL-OF-POTENTIAL TEST PER ANSI/IEEE STD 81. SEE ITS ELEMENT SITE GROUNDING SPECIAL PROVISION FOR PROCEDURES.
2. GROUND RODS SHALL NOT BE ROUTED THROUGH FOUNDATIONS.
3. FENCES AND OTHER METALLIC STRUCTURES WITH PATHS TO GROUND SHALL BE CONNECTED TO EQUIPMENT GROUND IF THEY ARE LOCATED WITHIN 25' OF THE GROUNDING ELECTRODE SYSTEM OR ANY OBJECT GROUNDED TO THE GROUNDING ELECTRODE SYSTEM.
4. GROUND RODS SHALL BE INSTALLED IN GROUND WELLS IN FINISHED GRADE UNLESS INSTALLED UNDER SHOULDERS OR PAVEMENT.
5. ALL EQUIPMENT GROUNDS SHALL BE PROPERLY CONNECTED TO A CHASSIS: ALL PAINT AND OTHER COATINGS, INCLUDING GALVANIZATION, SHALL BE REMOVED PRIOR TO TERMINATION OF A GROUND, AFTER THE GROUND IS TERMINATED A NON-OXIDIZING COATING SHALL BE PAINTED OVER THE EXPOSED METAL SURFACES.
6. GROUNDING ELECTRODE SYSTEM CONNECTIONS TO FENCING SHALL BE MADE USING HEAVY DUTY TINNED LISTED PIPE CLAMPS DESIGNED FOR GROUNDING AND STAINLESS STEEL HARDWARE.
7. ALL GROUNDING DIAGRAMS ARE SCHEMATIC ONLY.
8. ALL METALLIC MEMBERS OF THE DMS TRUSS AND THE DMS SIGN WITHIN 6 FEET OF EACH OTHER SHALL BE BONDED TOGETHER. WELDS SHALL BE CONSIDERED AN ACCEPTABLE BONDING METHOD. U-BOLT CONNECTIONS SHALL NOT BE CONSIDERED AN ACCEPTABLE BONDING METHOD.
9. AT LEAST AN 8 INCH MINIMUM BENDING RADIUS SHALL BE MAINTAINED ON ALL GROUNDING ELECTRODE CONDUCTORS. THE ANGLE OF ANY BENDING SHALL NOT BE LESS THAN 90 DEGREE.
10. GROUNDING CONDUCTORS SHALL ALWAYS ROUTE AS STRAIGHT AS POSSIBLE. "U" FORM JUMPERS SHALL BE ACCEPTABLE ONLY FOR GATES AND DOORS.
11. THE QUANTITY OF GROUNDING ELECTRODE CONDUCTORS CONNECTED TO A GROUND ROD ELECTRODE SHALL BE LIMITED TO THREE.
12. WHENEVER POSSIBLE, GROUND ROD ELECTRODES SHALL BE INSTALLED NO CLOSER THAN 11' FROM A FOUNDATION.
13. EVERY COPPER CONDUCTOR OR CABLE ENTERING OR LEAVING A DMS ENCLOSURE, THE DMS CONTROLLER, OR THE CCTV ELECTRONICS ENCLOSURE SHALL BE PROTECTED, WITH A SURGE PROTECTION DEVICE.
14. DIAGRAM OMITS EQUIPMENT GROUNDING INSIDE ENCLOSURES.
15. GROUNDING CONDUCTOR SHALL BE #2/0 TINNED BARE STRANDED COPPER. CONTRACTOR SHALL INSTALL GROUND RODS AS NECESSARY TO ENSURE GROUND RESISTANCE AT DMS CABINET IS 5 OHMS OR LESS.
16. IF THERE IS A METAL HANDRAIL WITHIN 20 FEET OF CONTROL CABINET CONNECT HANDRAIL TO GROUNDING SYSTEM WITH #2/0 TINNED BARE STRANDED COPPER CONDUCTOR.

NOTE TO DESIGNER

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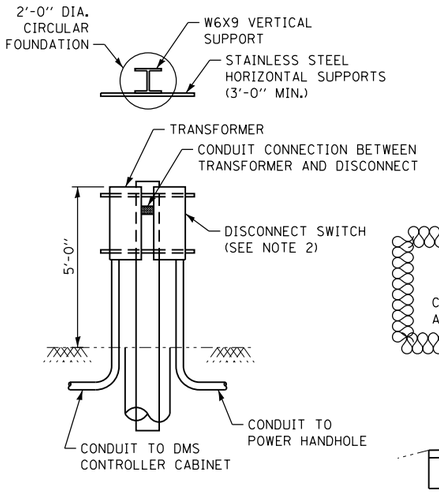
M-ITS-1102

Illinois Tollway

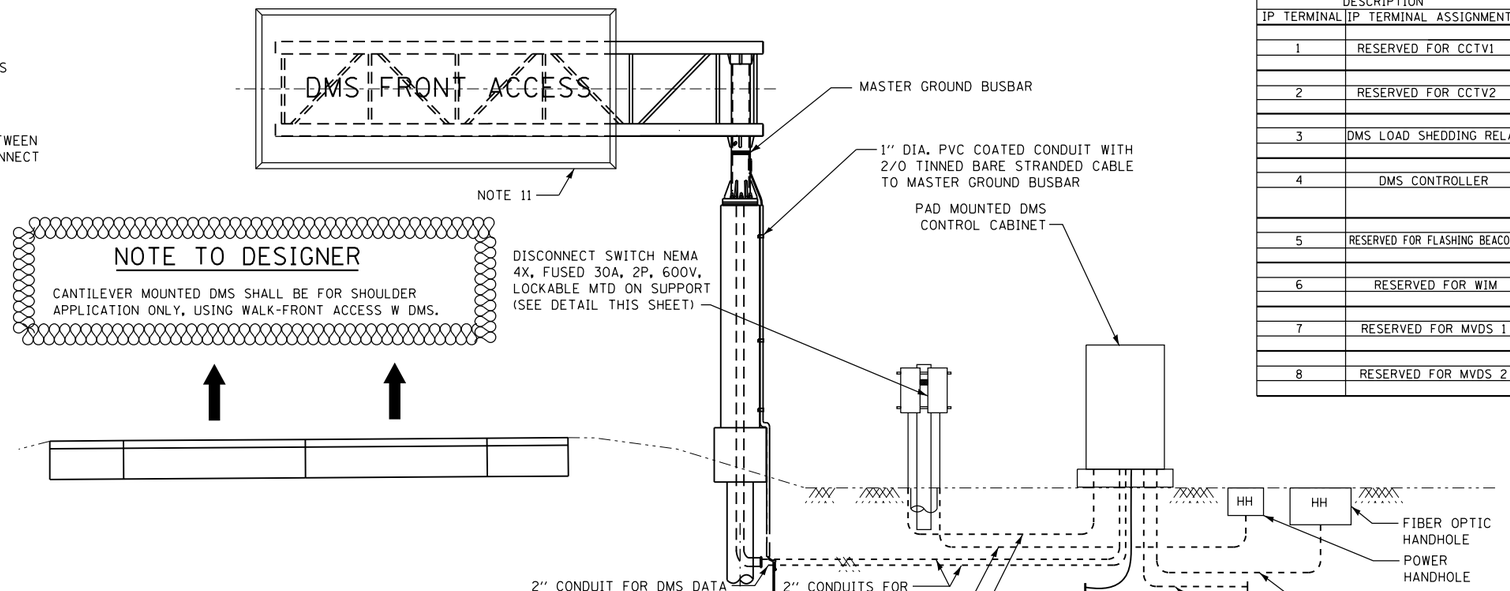
DMS WALK-IN
TYPICAL SITE WIRING DETAIL

DATE
3-01-2020



30A-2P NEMA 4X DISC MTD ON SUPPORT DETAIL

(NOT TO SCALE)



DMS CABINET - IP RELAY WIRING TABLE					
DESCRIPTION		CONNECTION FROM		CONNECTION TO	
IP TERMINAL	IP TERMINAL ASSIGNMENT	DEVICE	CONNECTION	DEVICE	CONNECTION
1	RESERVED FOR CCTV1				
2	RESERVED FOR CCTV2				
		IP_RELAY	12VDC (+)	CB	CB1A
3	DMS LOAD SHEDDING RELAY	CB	CB1B	IP_RELAY	3 COMM
		IP_RELAY	3 NC	LOAD SHED RELAY	COIL (+)
		SPLICE BLOCK	120 V	IP_RELAY	NC
4	DMS CONTROLLER				
		IP_RELAY	4 NC	POWER OUTLET #1 (COMMUNICATION)	HOT
5	RESERVED FOR FLASHING BEACONS				
6	RESERVED FOR WIM				
7	RESERVED FOR MVDS 1				
8	RESERVED FOR MVDS 2				

NOTE TO DESIGNER

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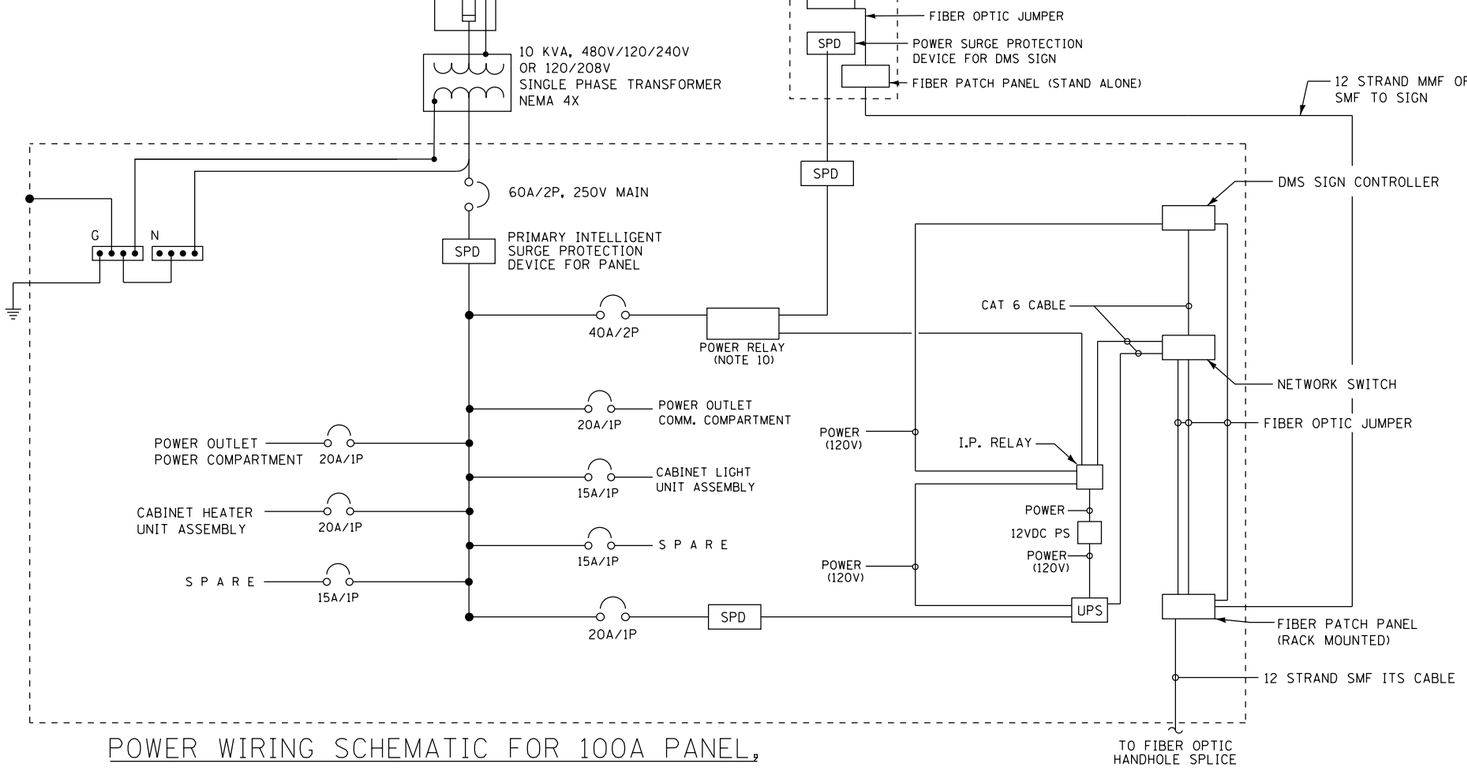


POWER WIRING SCHEMATIC FOR 100A PANEL, 120 / 240V LOAD CENTER OF DMS CABINET

(NOT TO SCALE)

COMMUNICATION RISER

(NOT TO SCALE)

GENERAL NOTES:

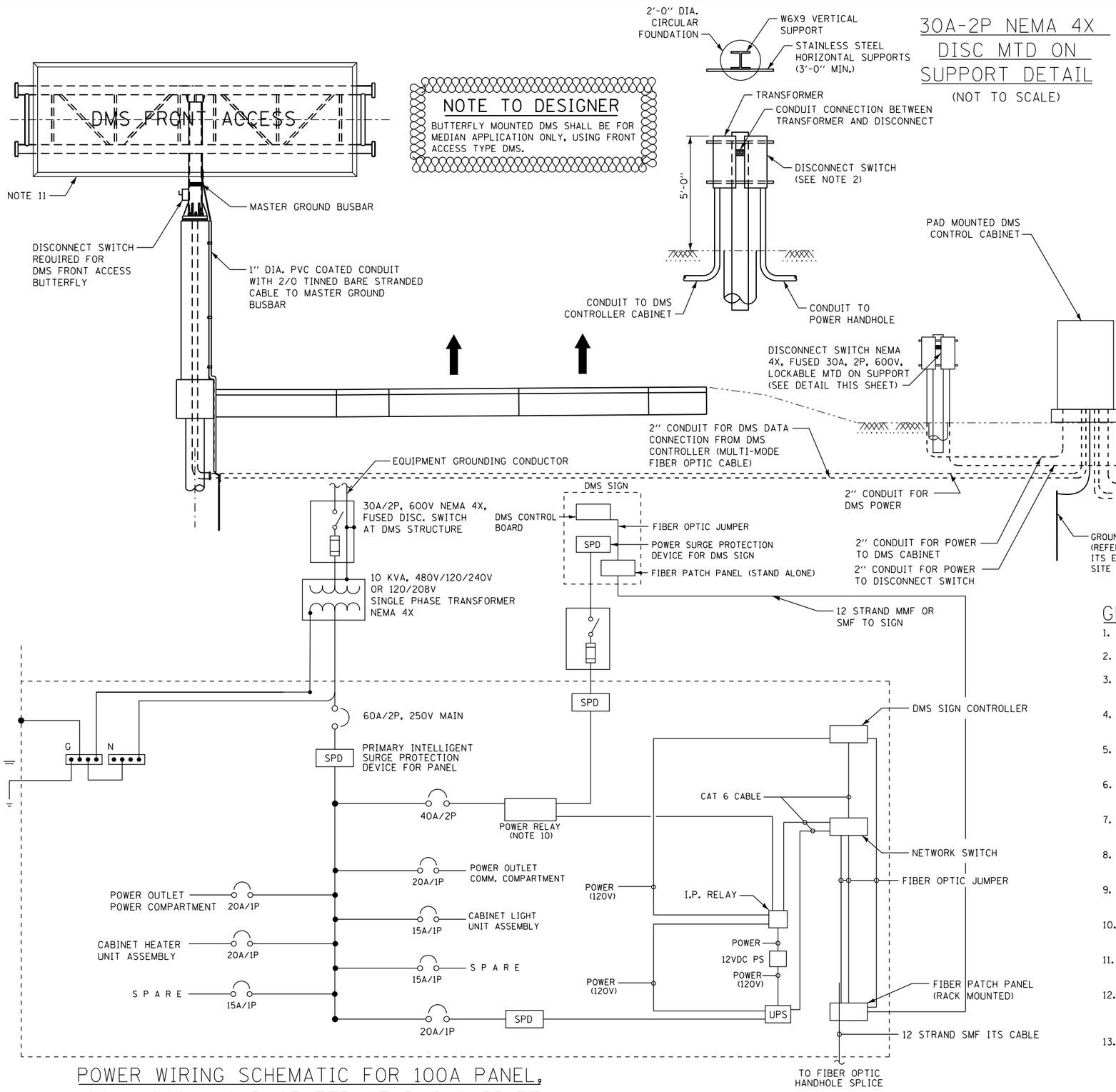
1. FURNISH AND INSTALL SERVICE DISCONNECT ON W6X9 SUPPORT.
2. 10KVA, 480V/120/240V SINGLE PHASE TRANSFORMER.
3. THIS IS A DIAGRAMMATIC SCHEMATIC, ALL BREAKERS, TRANSFORMER LOAD CENTER SHALL BE SIZED AND WIRED AS PER MANUFACTURER RECOMMENDATIONS.
4. ENTIRE COMPLETED SYSTEM SHALL BE GROUNDED AND BONDED IN ACCORDANCE WITH MOTOROLA R56 MANUAL AND THE APPLICABLE ARTICLES OF SECTION 250 OF THE NATIONAL ELECTRICAL CODE.
5. ALL UNDERGROUND CONDUITS SHALL BE NON-METALLIC CNC AND ABOVE GRADE CONDUITS SHALL BE RGS PVC COATED. COUPLERS SHALL BE USED WHEN TRANSITIONING FROM CNC TO PRGS.
6. MOUNT CLAMPS ON 5'-0" ON CENTER MOUNTING. HARDWARE SHALL BE USED AS PER CONDUIT MANUFACTURER RECOMMENDATION.
7. CONTRACTOR SHALL SUPPLY AND INSTALL CABLE REDUCER LUGS WHERE SIZE OF CABLE ENTERING THE DISCONNECT IS MORE THAN RECOMMENDED SIZE DUE TO VOLTAGE DROP.
8. ALL ELECTRICAL WORK FOR DMS FRONT ACCESS SHALL BE PAID UNDER PAY ITEM JT132622 - DMS ELECTRICAL WORK - FRONT ACCESS.
9. THIS SCHEMATIC IS FOR GUIDANCE ONLY. CONTRACTOR SHALL WIRE THE DMS CABINET AS PER MANUFACTURER RECOMMENDATIONS AND INDUSTRY STANDARDS.
10. THE COM (COMMON) CONTACT AND NC (NORMALLY CLOSED) CONTACT ON RELAY CONTACTS OF DIN RELAY SHALL FOLLOW THE TABLE ABOVE.
11. REFER TO ILLINOIS TOLLWAY STANDARD DRAWING F4 FOR OVERHEAD SIGN STRUCTURE CANTILEVER TYPE STRUCTURE DETAILS.
12. PAD MOUNTED TRANSFORMER SHALL BE FURNISHED BY UTILITY COMPANY. FOUNDATION AND TRANSFORMER GROUNDING BY CONTRACTOR SHALL BE IN ACCORDANCE WITH UTILITY COMPANY REQUIREMENTS AND MUST BE TIED INTO DMS SITE GROUNDING ELECTRODE SYSTEM.
13. FOR THE DISCONNECT SWITCH, HORIZONTAL SUPPORT SHALL BE SIZED TO ALLOW CONDUITS TO VERTICALLY DROP OUTSIDE OF THE FOUNDATION WITHOUT BENDS.
14. FIBER PATCH PANEL IN DMS SIGN HOUSING SHALL BE A FACTORY TERMINATED UNIT WITH A 12-STRAND PIGTAIL CONNECTING TO RACK MOUNTED FIBER PATCH PANEL IN DMS CONTROLLER CABINET.

M-ITS-1103

Illinois Tollway

DMS FRONT ACCESS-CANTILEVER ELECTRICAL PLAN

DATE 3-01-2020



NOTE TO DESIGNER

BUTTERFLY MOUNTED DMS SHALL BE FOR MEDIAN APPLICATION ONLY, USING FRONT ACCESS TYPE DMS.

30A-2P NEMA 4X DISC MTD ON SUPPORT DETAIL

(NOT TO SCALE)

DMS CABINET - IP RELAY WIRING TABLE					
DESCRIPTION		CONNECTION FROM		CONNECTION TO	
IP TERMINAL	IP TERMINAL ASSIGNMENT	DEVICE	CONNECTION	DEVICE	CONNECTION
1	RESERVED FOR CCTV1				
2	RESERVED FOR CCTV2				
		IP_RELAY	12VDC (+)	CB	CB1A
3	DMS LOAD SHEDDING RELAY	CB	CB1B	IP_RELAY	3 COMM
		IP_RELAY	3 NC	LOAD SHED RELAY	COIL (+)
		SPLICE BLOCK	120 V	IP_RELAY	NC
4	DMS CONTROLLER				
		IP_RELAY	4 NC	POWER OUTLET #1 (COMMUNICATION)	HOT
5	RESERVED FOR FLASHING BEACONS				
6	RESERVED FOR WIM				
7	RESERVED FOR MVDS 1				
8	RESERVED FOR MVDS 2				

NOTE TO DESIGNER

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GENERAL NOTES:

1. FURNISH AND INSTALL SERVICE DISCONNECT ON W6X9 SUPPORT.
2. 10KVA, 480V/120/240V SINGLE PHASE TRANSFORMER.
3. THIS IS A DIAGRAMMATIC SCHEMATIC, ALL BREAKERS, TRANSFORMER LOAD CENTER SHALL BE SIZED AND WIRED AS PER MANUFACTURER RECOMMENDATIONS.
4. ENTIRE COMPLETED SYSTEM SHALL BE GROUNDED AND BONDED IN ACCORDANCE WITH ALL APPLICABLE SECTIONS OF NFPA 70 (NATIONAL ELECTRIC CODE) SECTION 250.
5. ALL UNDERGROUND CONDUITS SHALL BE NON-METALLIC CNC AND ABOVE GRADE CONDUITS SHALL BE RGS PVC COATED. COUPLERS SHALL BE USED WHEN TRANSITIONING FROM CNC TO PRGS.
6. MOUNT CLAMPS ON 5'-0" ON CENTER MOUNTING. HARDWARE SHALL BE USED AS PER CONDUIT MANUFACTURER RECOMMENDATION.
7. CONTRACTOR SHALL SUPPLY AND INSTALL CABLE REDUCER LUGS WHERE SIZE OF CABLE ENTERING THE DISCONNECT IS MORE THAN RECOMMENDED SIZE DUE TO VOLTAGE DROP.
8. ALL ELECTRICAL WORK FOR DMS TYPE 2 SHALL BE PAID UNDER PAY ITEM JT132622 - DMS ELECTRICAL WORK - FRONT ACCESS.
9. THIS SCHEMATIC IS FOR GUIDANCE ONLY. CONTRACTOR SHALL WIRE THE DMS CABINET AS PER MANUFACTURER RECOMMENDATIONS AND INDUSTRY STANDARDS.
10. THE COM (COMMON) CONTACT AND NC (NORMALLY CLOSED) CONTACT ON RELAY CONTACTS OF DIN RELAY SHALL FOLLOW THE TABLE ABOVE.
11. REFER TO ILLINOIS TOLLWAY STANDARD DRAWING F14 FOR OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE STRUCTURE DETAILS.
12. FOR THE DISCONNECT SWITCH, HORIZONTAL SUPPORT SHALL BE SIZED TO ALLOW CONDUITS TO VERTICALLY DROP OUTSIDE OF THE FOUNDATION WITHOUT BENDS.
13. FIBER PATCH PANEL IN DMS SIGN HOUSING SHALL BE A FACTORY TERMINATED UNIT WITH A 12-STRAND PIGTAIL CONNECTING TO RACK MOUNTED FIBER PATCH PANEL IN DMS CONTROLLER CABINET.

POWER WIRING SCHEMATIC FOR 100A PANEL, 120 / 240V LOAD CENTER OF DMS CABINET

(NOT TO SCALE)

COMMUNICATION RISER

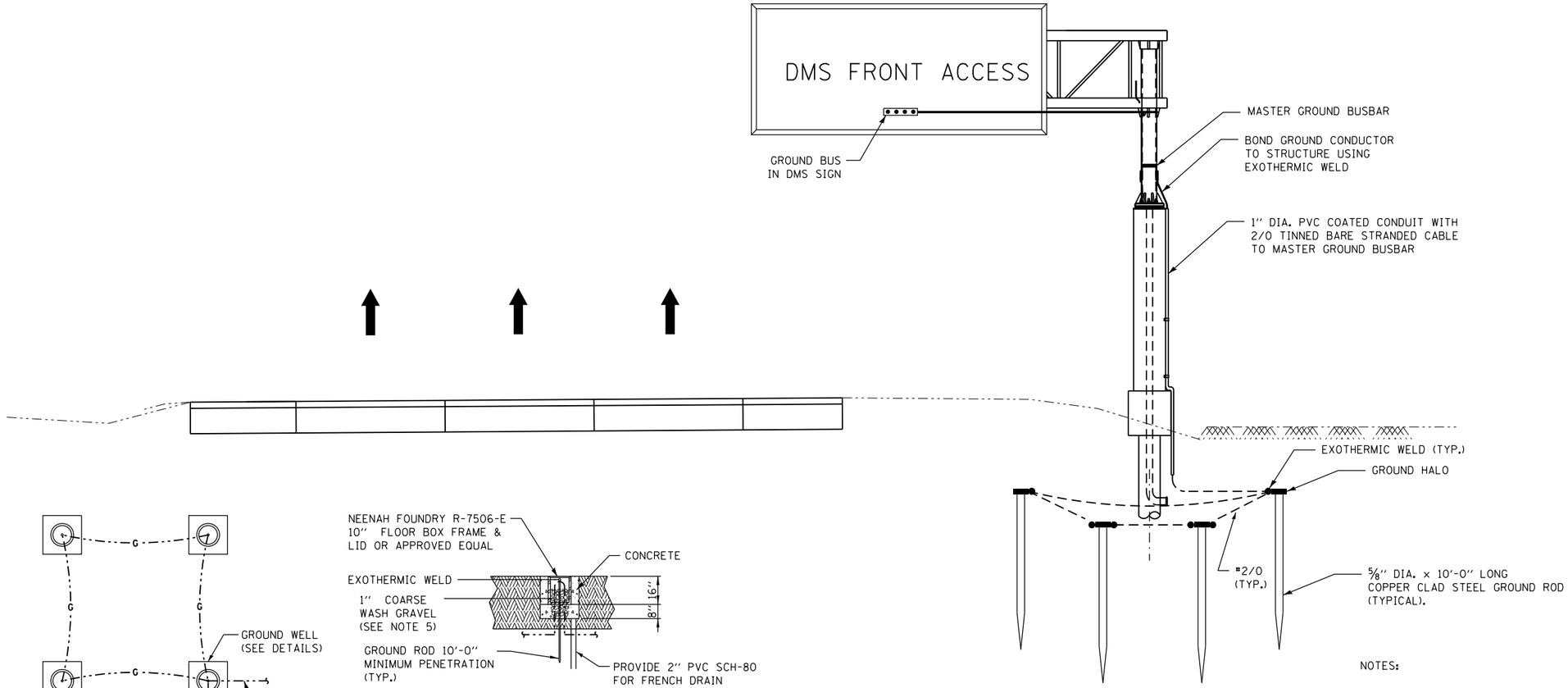
(NOT TO SCALE)

M-ITS-1104

Illinois Tollway

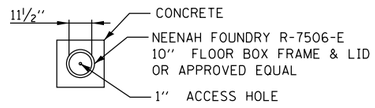
DMS FRONT ACCESS-BUTTERFLY ELECTRICAL PLAN

DATE 3-01-2020

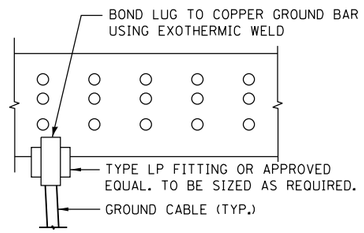


GROUND HALO DETAIL
N.T.S.

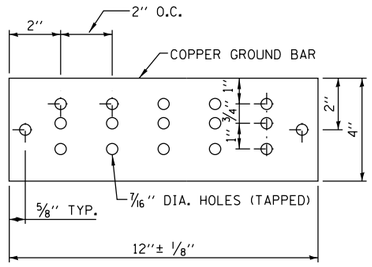
GROUND WELL ELEVATION DETAIL
(NOT TO SCALE, NOTE 3)



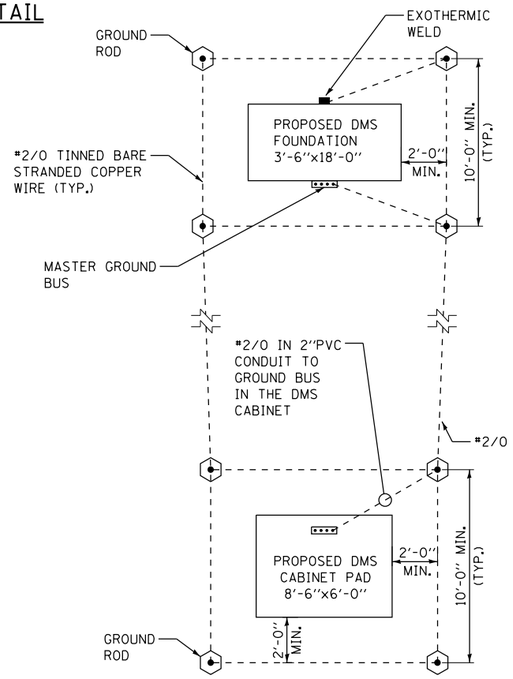
GROUND WELL PLAN DETAIL
(NOT TO SCALE, NOTE 3)



MASTER GROUND BUSBAR CONNECTION DETAIL
(NOT TO SCALE)



MASTER GROUND BUSBAR SUPPORT SPACING DETAIL
(NOT TO SCALE)



GROUNDING SCHEMATIC

NOTES:

1. GROUNDING SYSTEM SHALL BE PLACED WITHIN ILLINOIS TOLLWAY RIGHT-OF-WAY.
2. GROUND MOUNTED CONTROL CABINET SHALL BE PLACED UP STREAM OF THE STRUCTURE AT THE LOCATION SHOWN ON THE PLAN VIEW.
3. INSTALL MARKER TAPE DIRECTLY ABOVE GROUNDING ELECTRODES AND CONDUCTORS.
4. THE COST OF ALL MATERIALS, ALL GROUND BUSBARS, EXOTHERMIC WELDING, GROUND WELL, OTHER ITEMS TO COMPLETE THE GROUNDING SYSTEMS SHALL BE INCLUDED IN PAY ITEM JT132622 - DMS ELECTRICAL WORK - FRONT ACCESS.
5. CA-11, A QUALITY, IN ACCORDANCE WITH SSRBC 1004.

NOTE TO DESIGNER

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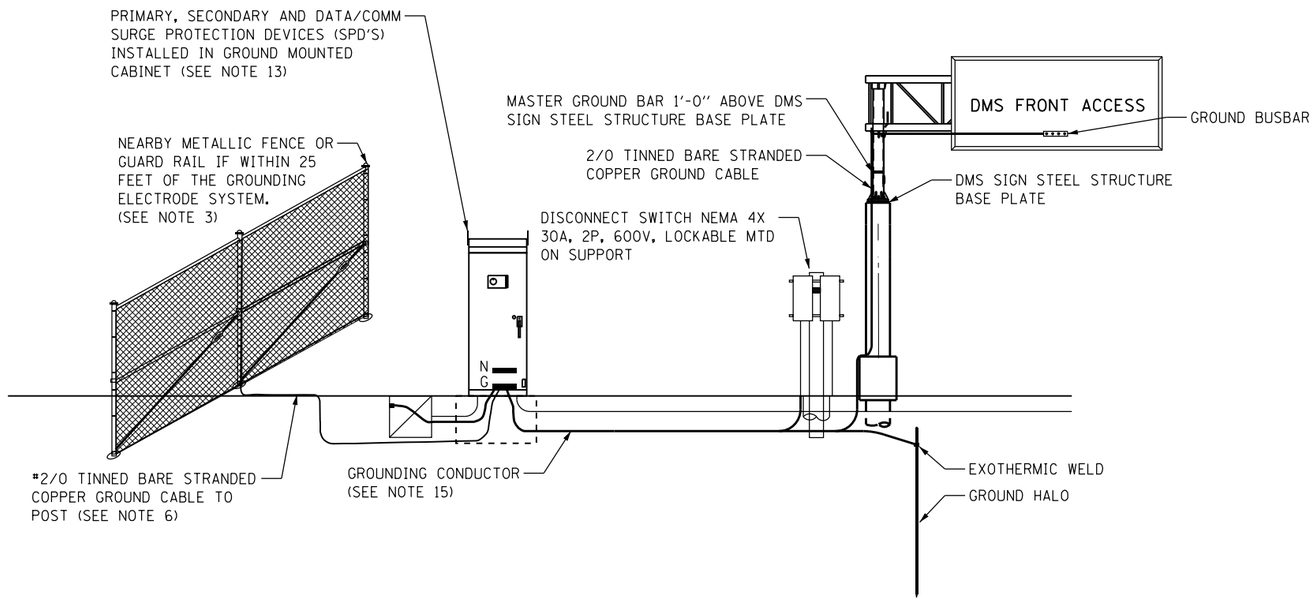
THIS TYPICAL DMS FRONT ACCESS GROUNDING PLAN IS APPLICABLE TO BOTH DMS FRONT ACCESS CANTILEVER AND BUTTERFLY SIGNS. DMS FRONT ACCESS CANTILEVER SIGN IS SHOWN ON THIS DRAWING FOR CLARITY. DESIGNER SHALL MODIFY AND COMPLETE THIS DRAWING FOR DMS FRONT ACCESS BUTTERFLY SIGN.

M-ITS-1105

Illinois Tollway

DMS FRONT ACCESS
SITE GROUNDING PLAN

DATE
3-01-2020



DMS SITE GROUNDING DETAIL

NOTE TO DESIGNER

THIS BASE SHEET SHOWS TYPICAL NEW CONSTRUCTION BUT IT IS NOT A STANDARD DRAWING. IT REQUIRES COMPLETION BY THE DESIGNER PRIOR TO INSERTION INTO A CONTRACT. MICROSTATION FILES AND THE "CADD STANDARDS MANUAL" ARE AVAILABLE ON THE ILLINOIS TOLLWAY WEBSITE. THE DESIGNER SHALL ACCEPT THE RESPONSIBILITY OF THE DESIGN OF THIS SHEET UPON ITS COMPLETION AND INSERTION INTO A CONTRACT. ALL "NOTE TO DESIGNER" BOXES SHALL BE REMOVED PRIOR TO INSERTION OF THE DRAWING INTO THE PLAN SET.

THIS TYPICAL DMS FRONT ACCESS GROUNDING PLAN IS APPLICABLE TO BOTH DMS FRONT ACCESS CANTILEVER AND BUTTERFLY SIGNS. DMS FRONT ACCESS CANTILEVER SIGN IS SHOWN ON THIS DRAWING. FOR CLARITY, DESIGNER SHALL MODIFY AND COMPLETE THIS DRAWING FOR DMS FRONT ACCESS BUTTERFLY SIGN.

NOTES:

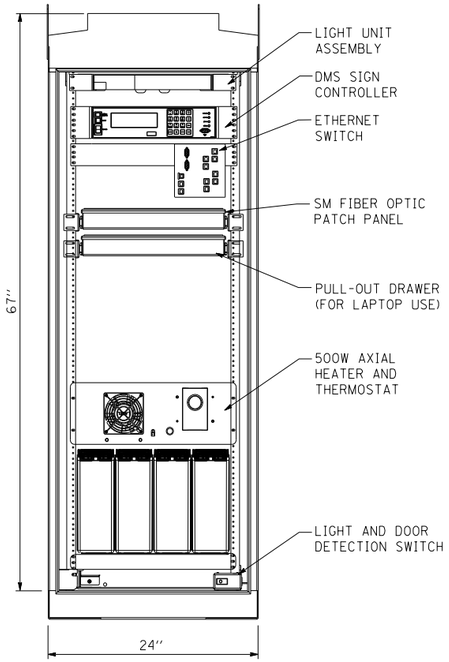
1. ADDITIONAL GROUND RODS SHALL BE ADDED TO GROUNDING ELECTRODE CONDUCTOR AS REQUIRED UNTIL RESISTANCE TO GROUND IS 5 OHMS OR LESS. FOR DEVICE AND POWER SERVICE LOCATIONS. IF ADDITIONAL GROUND ROD ELECTRODES ARE REQUIRED IN ORDER TO ACHIEVE REQUIRED RESISTANCE THEY SHALL RADIATE OUT FROM EXISTING GROUND ROD ELECTRODES, THESE SHALL BE CONNECTED WITH #2/0 TINNED BARE STRANDED CONDUCTOR, AND SHALL BE 20' FROM CONNECTED GROUND ROD. ALL COMMUNICATION EQUIPMENT GROUNDING SITES SHALL BE TESTED FOR RESISTANCE TO GROUND USING THE THREE-POINT FALL-OF-POTENTIAL TEST PER ANSI/IEEE STD 81. SEE ITS ELEMENT SITE GROUNDING SPECIAL PROVISIONS FOR PROCEDURES.
2. GROUND RODS SHALL NOT BE ROUTED THROUGH FOUNDATIONS.
3. FENCES AND OTHER METALLIC STRUCTURES WITH PATHS TO GROUND SHALL BE CONNECTED TO EQUIPMENT GROUND IF THEY ARE LOCATED WITHIN 25' OF THE GROUNDING ELECTRODE SYSTEM OR ANY OBJECT GROUNDED TO THE GROUNDING ELECTRODE SYSTEM.
4. GROUND RODS SHALL BE INSTALLED IN GROUND WELLS IN FINISHED GRADE.
5. ALL EQUIPMENT GROUNDS SHALL BE PROPERLY CONNECTED TO A CHASSIS: ALL PAINT AND OTHER COATINGS, INCLUDING GALVANIZATION, SHALL BE REMOVED PRIOR TO TERMINATION OF A GROUND, AFTER THE GROUND IS TERMINATED A NON-OXIDIZING COATING SHALL BE PAINTED OVER THE EXPOSED METAL SURFACES.
6. GROUNDING ELECTRODE SYSTEM CONNECTIONS TO FENCING SHALL BE MADE USING HEAVY DUTY TINNED LISTED PIPE CLAMPS DESIGNED FOR GROUNDING AND STAINLESS STEEL HARDWARE.
7. ALL GROUNDING DIAGRAMS ARE SCHEMATIC ONLY.
8. ALL METALLIC MEMBERS OF THE DMS TRUSS AND THE DMS SIGN WITHIN 6 FEET OF EACH OTHER SHALL BE BONDED TOGETHER. WELDS SHALL BE CONSIDERED AN ACCEPTABLE BONDING METHOD. U-BOLT CONNECTIONS SHALL NOT BE CONSIDERED AN ACCEPTABLE BONDING METHOD.
9. AT LEAST AN 8 INCH MINIMUM BENDING RADIUS SHALL BE MAINTAINED ON ALL GROUNDING ELECTRODE CONDUCTORS. THE ANGLE OF ANY BENDING SHALL NOT BE LESS THAN 90 DEGREES.
10. GROUNDING CONDUCTORS SHALL ALWAYS ROUTE AS STRAIGHT AS POSSIBLE. "U" FORM JUMPERS SHALL BE ACCEPTABLE ONLY FOR GATES AND DOORS.
11. THE QUANTITY OF GROUNDING ELECTRODE CONDUCTORS CONNECTED TO A GROUND ROD ELECTRODE SHALL BE LIMITED TO THREE.
12. WHENEVER POSSIBLE, GROUND ROD ELECTRODES SHALL BE INSTALLED NO CLOSER THAN 11' FROM A FOUNDATION.
13. EVERY COPPER CONDUCTOR OR CABLE ENTERING OR LEAVING A DMS ENCLOSURE, THE DMS CONTROLLER, OR THE CCTV ELECTRONICS ENCLOSURE SHALL BE PROTECTED WITH A SURGE PROTECTION DEVICE.
14. DIAGRAM OMITS EQUIPMENT GROUNDING INSIDE ENCLOSURES.
15. GROUNDING CONDUCTOR SHALL BE #2/0 TINNED BARE STRANDED COPPER. CONTRACTOR SHALL INSTALL GROUND RODS AS NECESSARY TO ENSURE GROUND RESISTANCE AT DMS CABINET IS 5 OHMS OR LESS.
16. IF THERE IS A METAL HANDRAIL WITHIN 20 FEET OF CONTROL CABINET CONNECT HANDRAIL TO GROUNDING SYSTEM WITH #2/0 TINNED BARE STRANDED COPPER CONDUCTOR.

M-ITS-1106

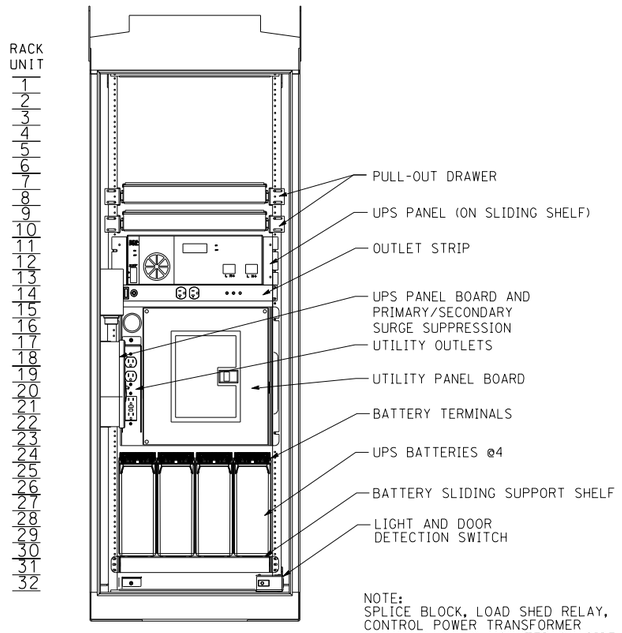
Illinois Tollway

DMS FRONT ACCESS
SITE WIRING DETAIL

DATE
3-01-2020

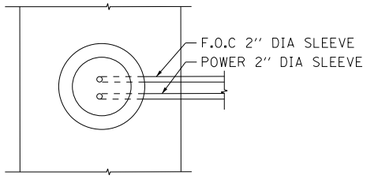


SECTION B-B FRONT VIEW
(NO DOOR SHOWN)

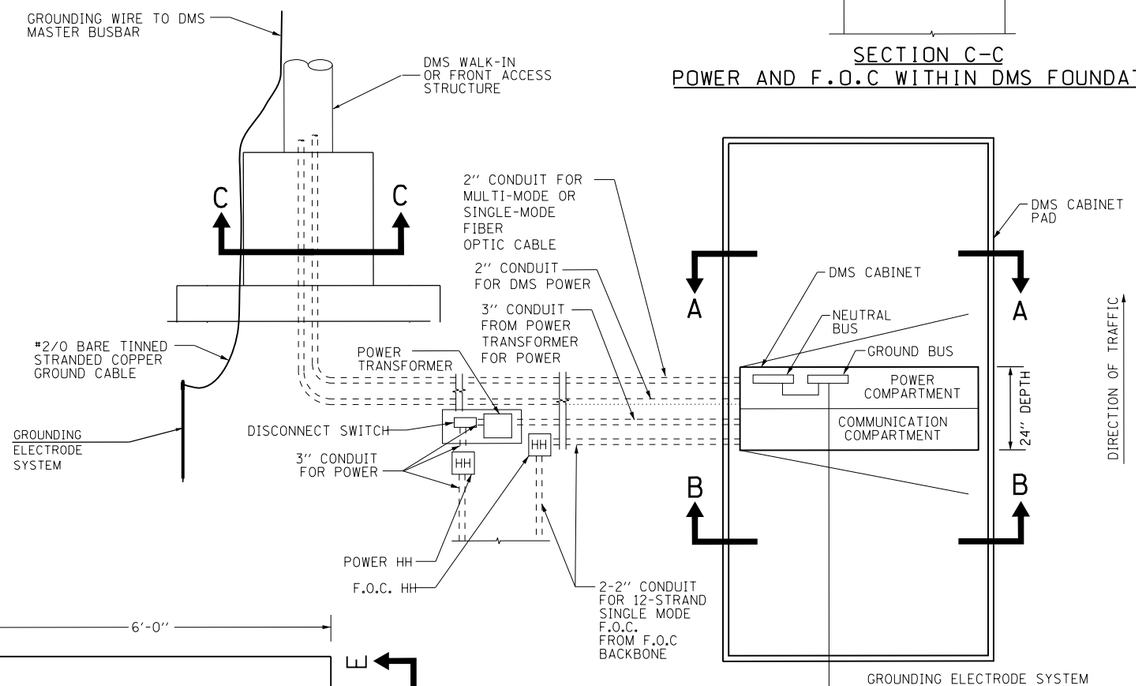


NOTE:
SPLICE BLOCK, LOAD SHED RELAY, CONTROL POWER TRANSFORMER & DIN IP RELAY MOUNTED ON SIDE WALL ADJACENT UTILITY PANEL BOARD.

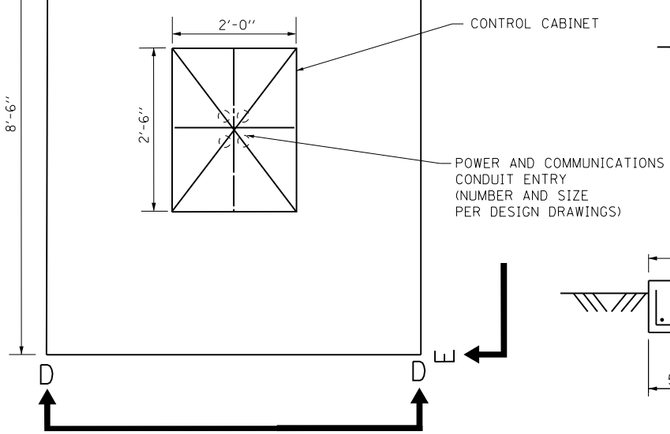
SECTION A-A REAR VIEW
(NO DOOR SHOWN)



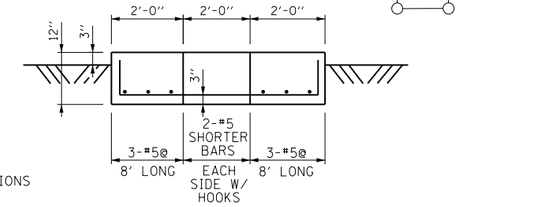
SECTION C-C
POWER AND F.O.C WITHIN DMS FOUNDATION



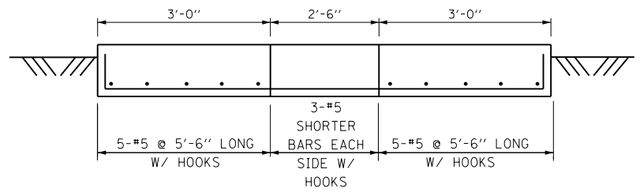
PLAN/ELEVATION
SCALE: NTS



PLAN
(NOT TO SCALE)



SECTION D-D
(NOT TO SCALE)



SECTION E-E
(NOT TO SCALE)

TYPE 334 DMS CABINET LAYOUT DETAILS
(NOT TO SCALE)

DMS CABINET NOTES:

1. PAD MOUNT CONFIGURATION
2. 0.125'' ALUMINUM 5052-H34 CONSTRUCTION WITH CONTINUOUSLY WELDED EXTERNAL SEAMS
3. THREE POINT LATCH WITH SST HANDLE
4. DOUBLE FLANGED DOOR SEAL WITH ½'' X 2'' CLOSED CELL NEOPRENE GASKET
5. FULL LENGTH EIA GAGE FOR 19'' EQUIPMENT
6. ADJUSTABLE PULL OUT DRAWER
7. DOOR OPENING: 21.50'' X 54.75''
8. FULL LENGTH STAINLESS STEEL HINGE
9. ALL STAINLESS STEEL HARDWARE
10. CORBIN #2 LOCK
11. NEMA 4X ENCLOSURE
12. SHIPPED ON WOOD PALLET
13. MOUNT LAYER 2 ETHERNET SWITCH (DIN-RAIL MOUNT) USING DIN-RAIL MOUNT
14. BATTERIES AND UPS SHALL BE PLACED ON A SLIDING SHELF
15. CABINET DIMENSION 24''X30''X67''

NOTE TO DESIGNER

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DMS CABINET FOUNDATION NOTES:

1. COORDINATE SIZE OF OPENING WITH DMS CONTROLLER CABINET BOTTOM CONDUIT CUT-OUTS
2. CONCRETE = 4,000 PSI (MIN.)
3. REBAR=EPOXY COATED FY=60,000 PSI (MIN.)
4. PROVIDE SHOP DRAWINGS PRIOR TO CONSTRUCTION
5. INCLUDE CONDUITS

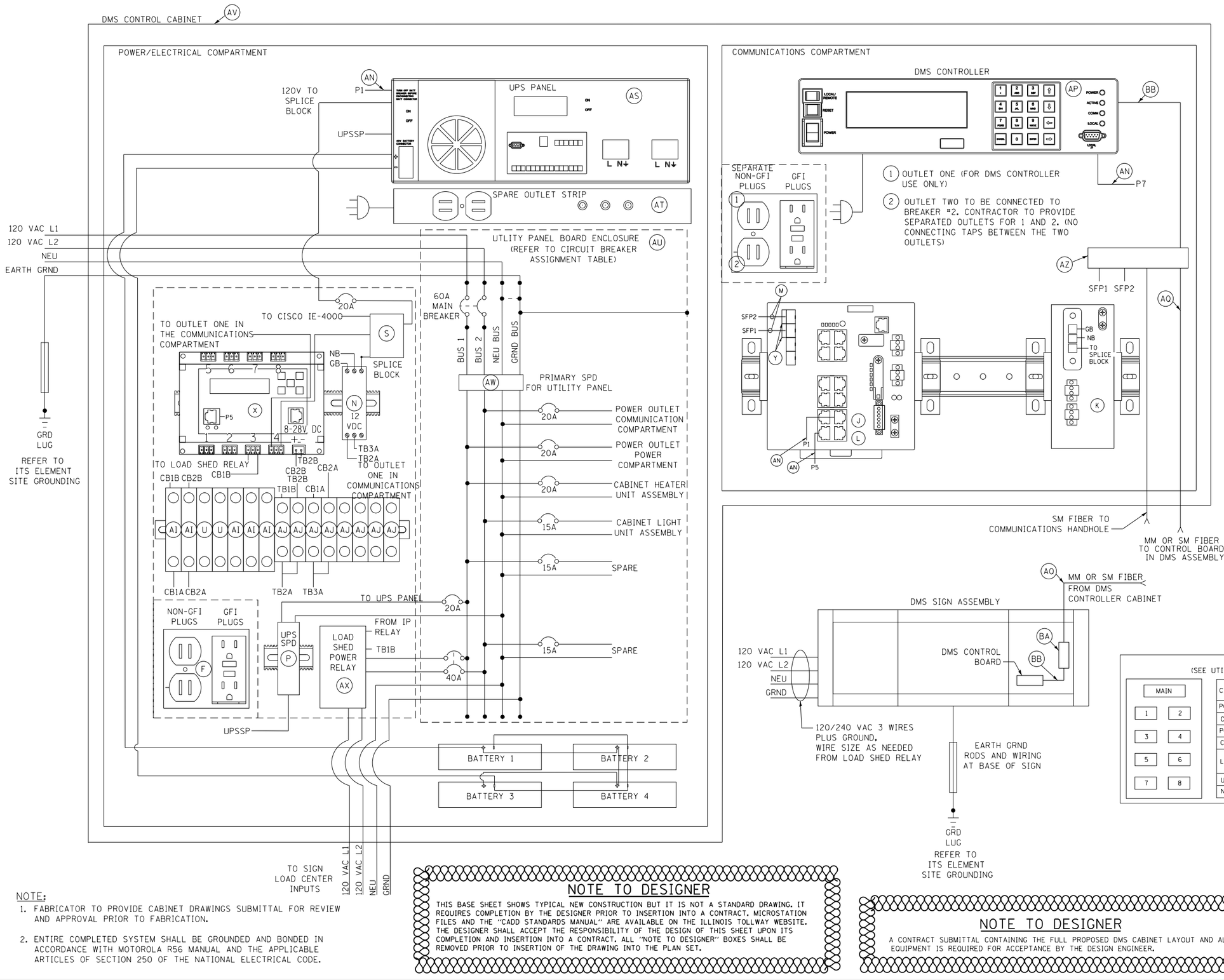
DMS CONTROLLER FOUNDATION DETAILS
(NOT TO SCALE)

M-ITS-1107

Illinois Tollway

DMS CABINET LAYOUT DETAIL

DATE
3-01-2020



ITEM	DESCRIPTION
A-E	NOT USED
F	TWO DUPLEX 120V RECEPTACLES, ONE GFCI (HUBBELL GFR5362TR) AND ONE STANDARD (HUBBELL BR20WR)
G-I	NOT USED
J	NETWORK SWITCH CISCO IE-4000-8T4G-E
K	CISCO POWER SUPPLY, PWR-IE170W-PC-AC=
L	IP SERVICES LICENSE: L-IE4000-RTU=
M	2 METER - SMFO LC-SC DUPLEX JUMPERS, CORNING/047202R5120002M
N	AC/DC POWER SUPPLY, 12VDC, 10 WATTS, MEAN WELL/MDR-10-12
O	SMF PATCH PANEL WITH SC CONNECTORS FIBER CONNECTIONS G620U012 LAN-100-0
P	120VAC SURGE SUPPRESSOR, MOUNTED ON DIN RAIL COOPER CROUSE HINDS/MA15/D/1/SI OR APPROVED EQUAL
Q-R	NOT USED
S	SPLICE BLOCK, ALTECH/38041
T	NOT USED
U	5A CIRCUIT BREAKER, ALLEN BRADLEY/1492-SPM1B050
V-W	NOT USED
X	POWER CONTROLLER, 8-CHANNEL DIN ETHERNET RELAY DIGITAL LOGGERS/DIN 4
Y	(2) GLC-LX-SM-RGD = 1 GBPS SM SFP MODULES
Z	NOT USED
AA-AH	NOT USED
AI	2A CIRCUIT BREAKER, ALLEN BRADLEY/1492-SPM1B020
AJ	TERMINAL BLOCK, ALLEN BRADLEY/1492-CD8
AK-AM	NOT USED
AN	INDOOR/OUTDOOR RATED CAT6 (1000MBS, TEMPERATURE HARDENED) THESE ARE THE CAT6 CABLES ROUTED INSIDE CABINET
AO	NOT USED
AP	DMS CONTROLLER
AQ	12-STRAND MULTI-MODE OR SINGLE-MODE FIBER OPTIC CABLE
AR	NOT USED
AS	UPS PANEL ALPHA TECHNOLOGIES FXM1100 WITH BATTERIES
AT	OUTLET STRIP
AU	DMS MANUFACTURER UTILITY PANEL ENCLOSURE
AV	DMS CONTROL CABINET TYPE 334 NEMA 4X
AW	120/240VAC MTL ZONE DEFENDER MODEL ZD16100
AX	LOAD SHED POWER RELAY MAGNECRAFT MODEL 199X-12 WITH COVER
AZ	RACK MOUNTED FIBER PATCH PANEL
BA	STAND ALONE FIBER PATCH PANEL
BB	2 METER FIBER JUMPER, CORNING (TYPE AND CONNECTION PER DMS MANUFACTURER)

CIRCUIT BREAKER ASSIGNMENT TABLE
(SEE UTILITY PANEL BOARD CIRCUIT BREAKER LOCATIONS)

MAIN		
1	2	
3	4	
5	6	
7	8	

CIRCUIT BREAKER DESCRIPTION	AMPS	CIRCUIT BREAKER LOCATION
POWER OUTLET POWER COMPARTMENT	20	1
CABINET HEATER UNIT ASSEMBLY	20	2
POWER OUTLET COMMUNICATION COMPARTMENT	20	3
CABINET LIGHT UNIT ASSEMBLY	15	4
LOAD SHED RELAY	40	5
		7
UPS PANEL	20	6
NOT USED	-	8

NOTE:
1. FABRICATOR TO PROVIDE CABINET DRAWINGS SUBMITTAL FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
2. ENTIRE COMPLETED SYSTEM SHALL BE GROUNDED AND BONDED IN ACCORDANCE WITH MOTOROLA R56 MANUAL AND THE APPLICABLE ARTICLES OF SECTION 250 OF THE NATIONAL ELECTRICAL CODE.

NOTE TO DESIGNER

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NOTE TO DESIGNER

A CONTRACT SUBMITTAL CONTAINING THE FULL PROPOSED DMS CABINET LAYOUT AND ALL EQUIPMENT IS REQUIRED FOR ACCEPTANCE BY THE DESIGN ENGINEER.

M-ITS-1108
SHEET 1 OF 1

Illinois Tollway

DMS CABINET WIRING DIAGRAM

DATE
3-01-2020