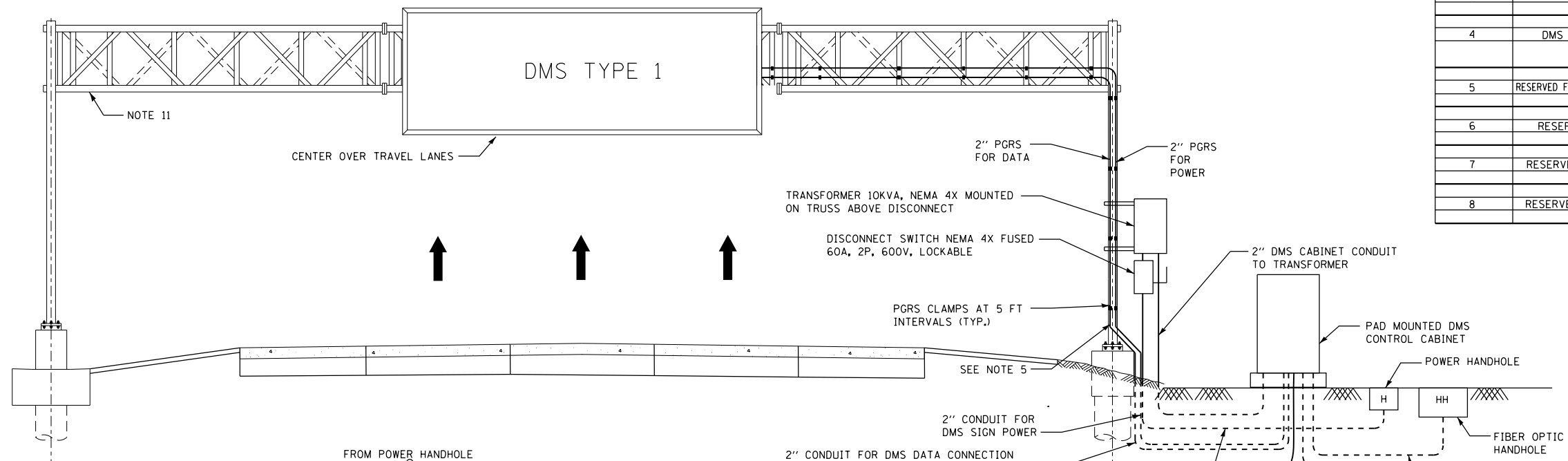


<b>Illinois Tollway Base Sheet Revisions</b>
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Section M	Base Sheet Drawings		Effective: 2018-03-01
Drawing	Modification Summary		
<b>Pole Assembly (ITS)-Series 1000</b>			
<b>M-ITS-1000</b>	<b>Elevation Views Pole Mounted ITS Element Assembly</b>		
	Added disconnect switch detail sheet.		
	Minor editorial changes.		
<b>Dynamic Message Sign (ITS)-Series 1100</b>			
<b>M-ITS-1100</b>	<b>DMS Type 1 Electrical Plan</b>	Minor editorial changes.	
<b>M-ITS-1101</b>	<b>DMS Type 1 Site Grounding Plan</b>	Minor editorial changes.	
<b>M-ITS-1102</b>	<b>DMS Type 1 Typical Site Wiring Detail</b>	Minor editorial changes.	
<b>M-ITS-1103</b>	<b>DMS Type 2-Cantilever Electrical Plan</b>	Minor editorial changes.	
<b>M-ITS-1104</b>	<b>DMS Type 2-Butterfly Electrical Plan</b>	Minor editorial changes.	
<b>M-ITS-1105</b>	<b>DMS Type 2 Site Grounding Plan</b>	Clarified coarse wash gravel specifications. Minor editorial changes.	
<b>M-ITS-1106</b>	<b>DMS Type 2 Site Wiring Details</b>	Minor editorial changes.	
<b>M-ITS-1107</b>	<b>DMS Cabinet Layout Detail</b>	Minor editorial changes.	
<b>M-ITS-1108</b>	<b>DMS Cabinet Wiring Diagram</b>	Minor editorial changes.	
<b>Cabinet Wiring (ITS)-Series 1200</b>			
<b>M-ITS-1200 to M-ITS-1255</b>	<b>Cabinet Wiring Diagrams</b>	Revised DIN3 IP relay to DIN4.	
<b>M-ITS-1200 to M-ITS-1207, M-ITS-1210, M-ITS-1255</b>	<b>Cabinet Wiring Diagrams</b>	Added single mode fiber patch panel.	
<b>M-ITS-1200 to M-ITS-1202, M-ITS-1223 to M-ITS-1254</b>	<b>Cabinet Wiring Diagrams</b>	Added power over ethernet injector(s).	
<b>M-ITS-1200</b>	<b>ITS Pole Mounted Enclosure (CCTV and MVDS)</b>	Added second sheet showing scale layout.	
<b>M-ITS-1203 to M-ITS-1205, M-ITS-1211 to M-ITS-1222, M-ITS-1231 to M-ITS-1254</b>	<b>Cabinet Wiring Diagrams</b>	Clarified MVDS wiring.	
<del>M-ITS-1256</del>	<del><b>Tower Mounted CCTV ITS Assembly, 300' CAT6 or Less</b></del>	Retired.	
<b>Roadway Weather Information System (ITS)-Series 1300</b>			
<b>M-ITS-1300</b>	<b>RWIS Pole, Sensor Mounting Detail</b>	Sheet redrawn with new pole-mounted RWIS design.	
<b>M-ITS-1301</b>	<b>RWIS Cabinet Wiring Diagram</b>	Sheet redrawn with new pole-mounted RWIS design. RWIS connected to fiber.	
<b>M-ITS-1302</b>	<b>Typical RWIS Site Installation Plan</b>	Sheet redrawn with new pole-mounted RWIS design. Added non-intrusive pavement sensor.	
<del>M-ITS-1303</del>	<del><b>RWIS Road Surface Sensor Pole</b></del>	Retired.	
<b>Tower Mounted CCTV (ITS)-Series 1500</b>			
<b>M-ITS-1502</b>	<b>ITS Details Tower Mount Camera Assembly</b>	Reference to M-ITS-1256 changed to M-ITS-1255 to reflect changes in 1200 series.	
<b>Plaza Electrical (Business System)-Series 2500</b>			
<b>M-BUS-2501</b>	<b>Legend, Symbol List, Abbreviations and Equipment Schedules</b>	Minor editorial changes.	
<b>M-BUS-2525</b>	<b>I-Pass Only (IPO) Lane Island Plan and Details 12 Foot Wide Lane</b>	Minor editorial changes.	
<b>M-BUS-2526</b>	<b>Toll Equipment Wiring Diagram ACM and IPO Lanes</b>	Minor editorial changes.	
<b>M-BUS-2558</b>	<b>VES Wash System Suggested Conduit Routing</b>	Minor editorial changes.	

New Sheet

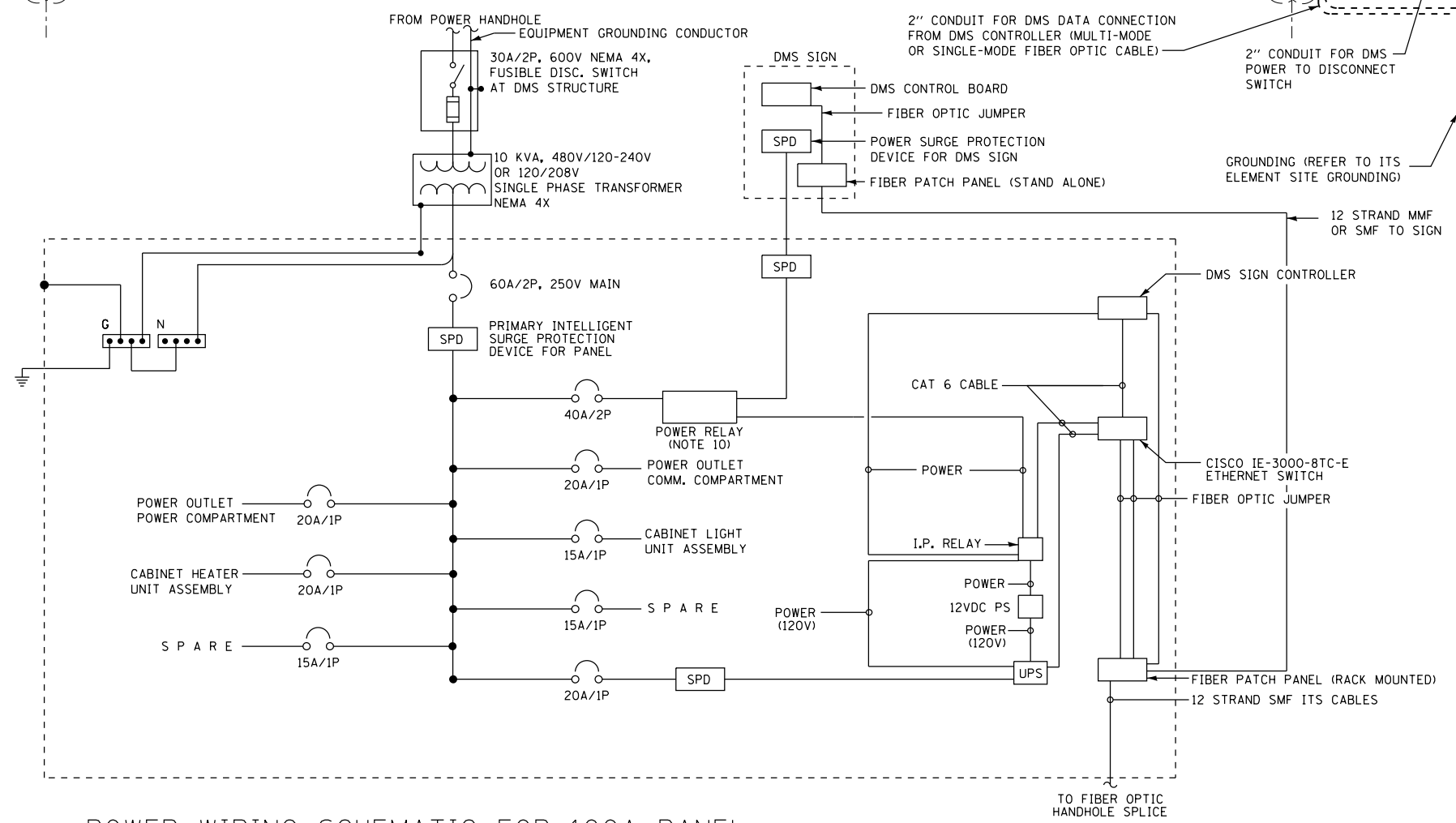
X Retired Sheet



DMS CABINET - IP RELAY WIRING TABLE					
IP TERMINAL	DESCRIPTION	CONNECTION FROM		CONNECTION TO	
		IP TERMINAL ASSIGNMENT	DEVICE	CONNECTION	DEVICE
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 (+)
4	DMS CONTROLLER	SPLICE BLOCK	120 V	IP_RELAY	NC
		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:**

- FURNISH AND INSTALL LOCKABLE SERVICE DISCONNECT AT PROPOSED STRUCTURE.
- 10KVA, 480V/120/240V SINGLE PHASE TRANSFORMER SHALL BE MOUNTED ABOVE DISCONNECT.
- THIS IS A DIAGRAMMATIC SCHEMATIC, ALL BREAKERS, TRANSFORMER LOAD CENTER SHALL BE SIZED AND WIRED AS PER MANUFACTURER RECOMMENDATIONS.
- NEUTRAL AND GROUNDING SHALL BE BONDED AT SERVICE ENTRANCE DISCONNECT.
- 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.
- MOUNT CLAMPS ON 5'-0" ON CENTER MOUNTING. HARDWARE SHALL BE USED AS PER CONDUIT MANUFACTURER RECOMMENDATION.
- CONTRACTOR SHALL SUPPLY AND INSTALL CABLE REDUCER LUGS WHERE SIZE OF CABLE ENTERING THE DISCONNECT IS MORE THAN RECOMMENDED SIZE DUE TO VOLTAGE DROP.
- ALL ELECTRICAL WORK FOR DMS TYPE 1 SHALL BE PAID UNDER PAY ITEM "JT132621 - DMS ELECTRICAL WORK - TYPE 1".
- THIS SCHEMATIC IS FOR GUIDANCE ONLY. CONTRACTOR SHALL WIRE THE DMS CABINET AS PER MANUFACTURER RECOMMENDATIONS AND INDUSTRY STANDARDS.
- THE COM (COMMON) CONTACT AND NC (NORMALLY CLOSED) CONTACT ON RELAY CONTACTS OF DIN RELAY SHALL FOLLOW THE TABLE ABOVE.
- REFER TO ILLINOIS TOLLWAY STANDARD DRAWING F17 FOR OVERHEAD SIGN STRUCTURE SPAN TYPE (STEEL) STRUCTURE DETAILS.
- 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)

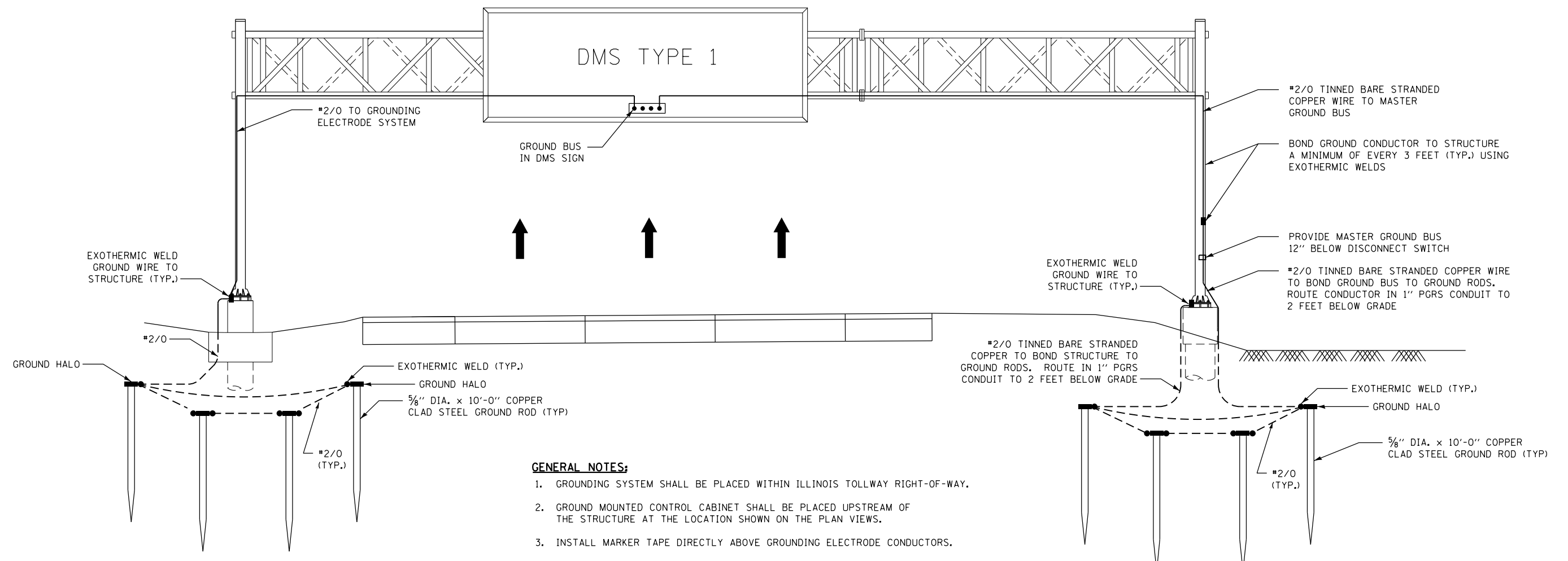
**COMMUNICATION RISER**  
(NOT TO SCALE)

M-ITS-1100

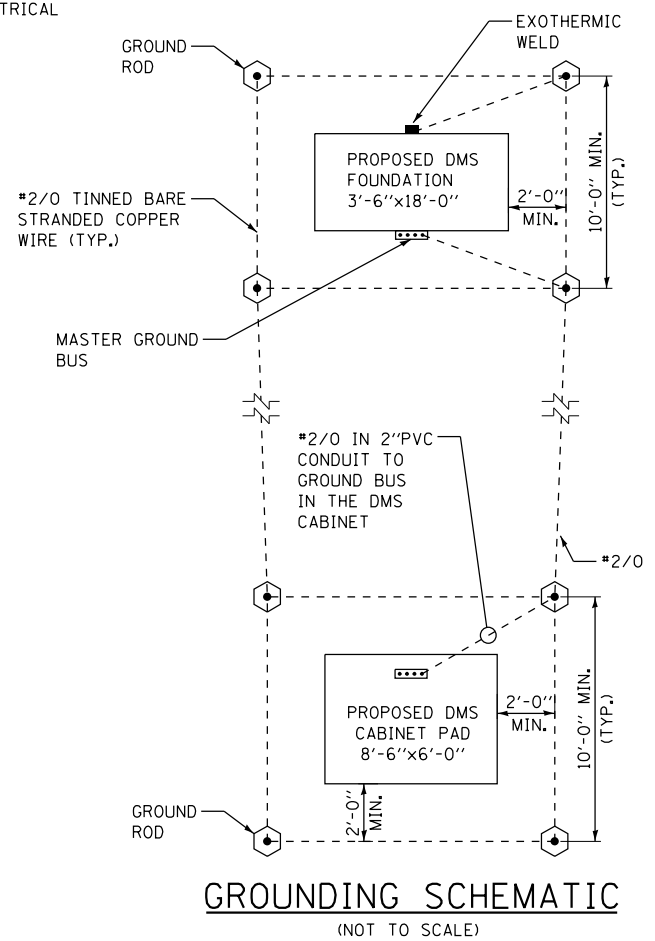
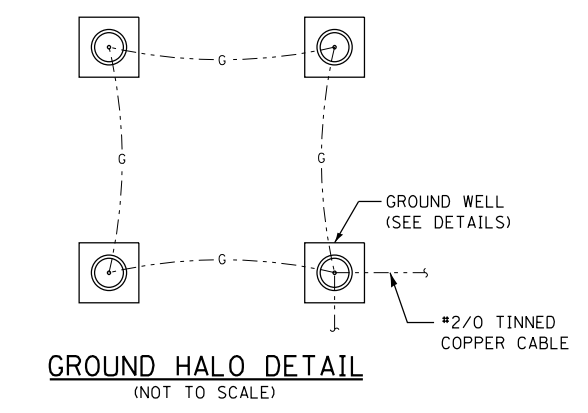
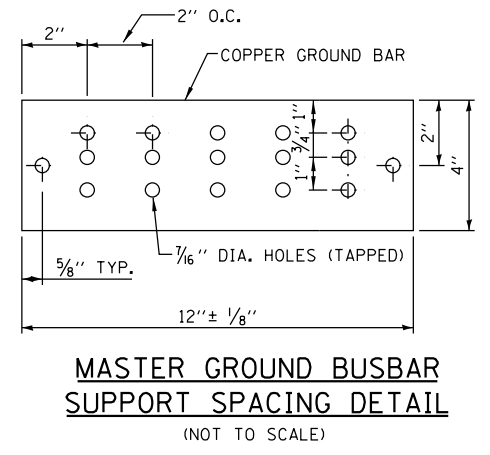
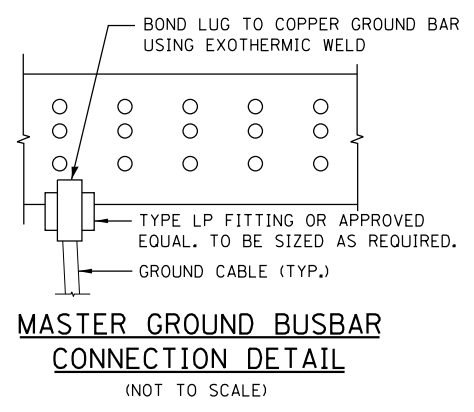
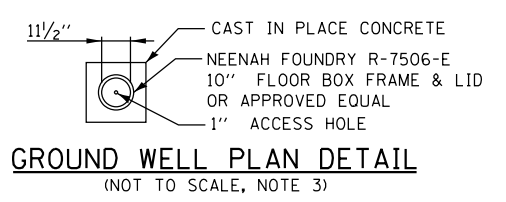
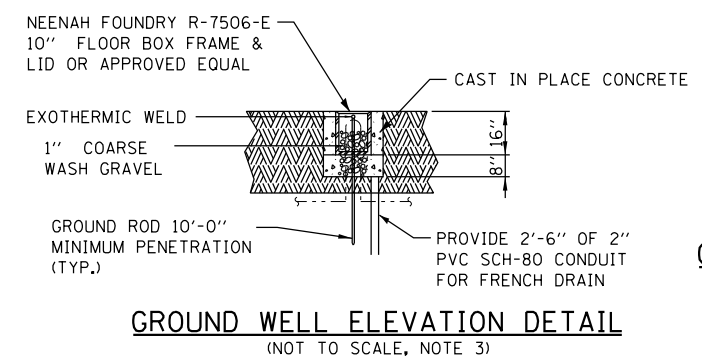


**DMS TYPE 1  
ELECTRICAL PLAN**

DATE  
3-01-2018



- 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 - TYPE 1.
  5. REFER TO SHEET M-ITS-1102 FOR DMS TYPICAL SITE WIRING DETAIL.



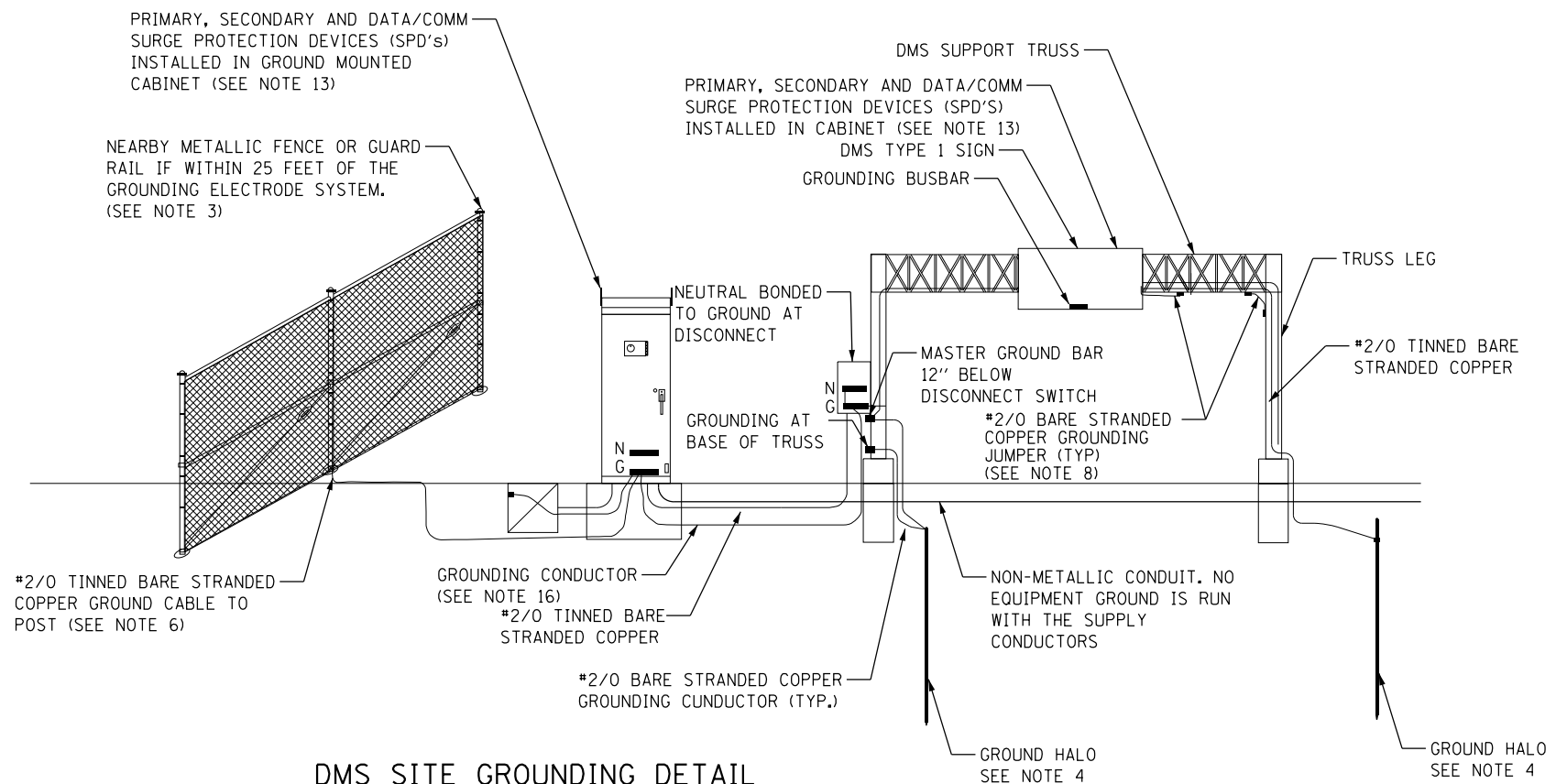
**NOTE TO DESIGNER**

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.

M-ITS-1101

DMS TYPE 1  
SITE GROUNDING PLAN

DATE  
3-01-2018



**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 GROUND 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 OMITTS 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**

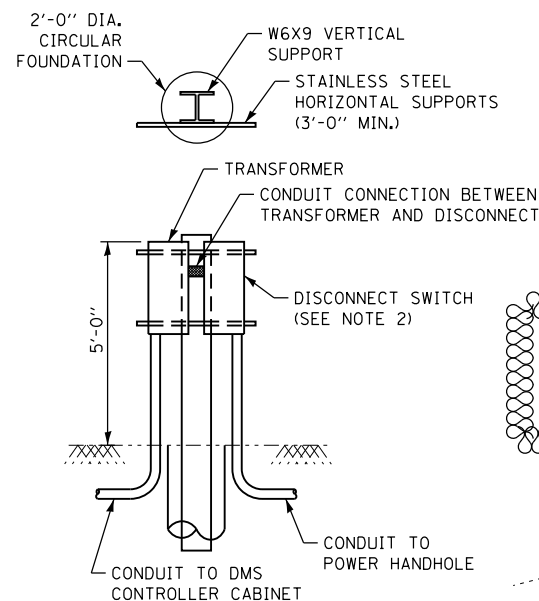
THIS BASE SHEET SHOWS TYPICAL NEW CONSTRUCTION BUT IT IS NOT A STANDARD DRAWING. IT REQUIRES COMPLETION BY THE DESIGNER PRIOR TO INSERTION INTO A CONTRACT. MICROSTATION FILES AND THE "CADD STANDARDS MANUAL" ARE AVAILABLE ON THE ILLINOIS TOLLWAY WEBSITE. THE DESIGNER SHALL ACCEPT THE RESPONSIBILITY OF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

M-ITS-1102

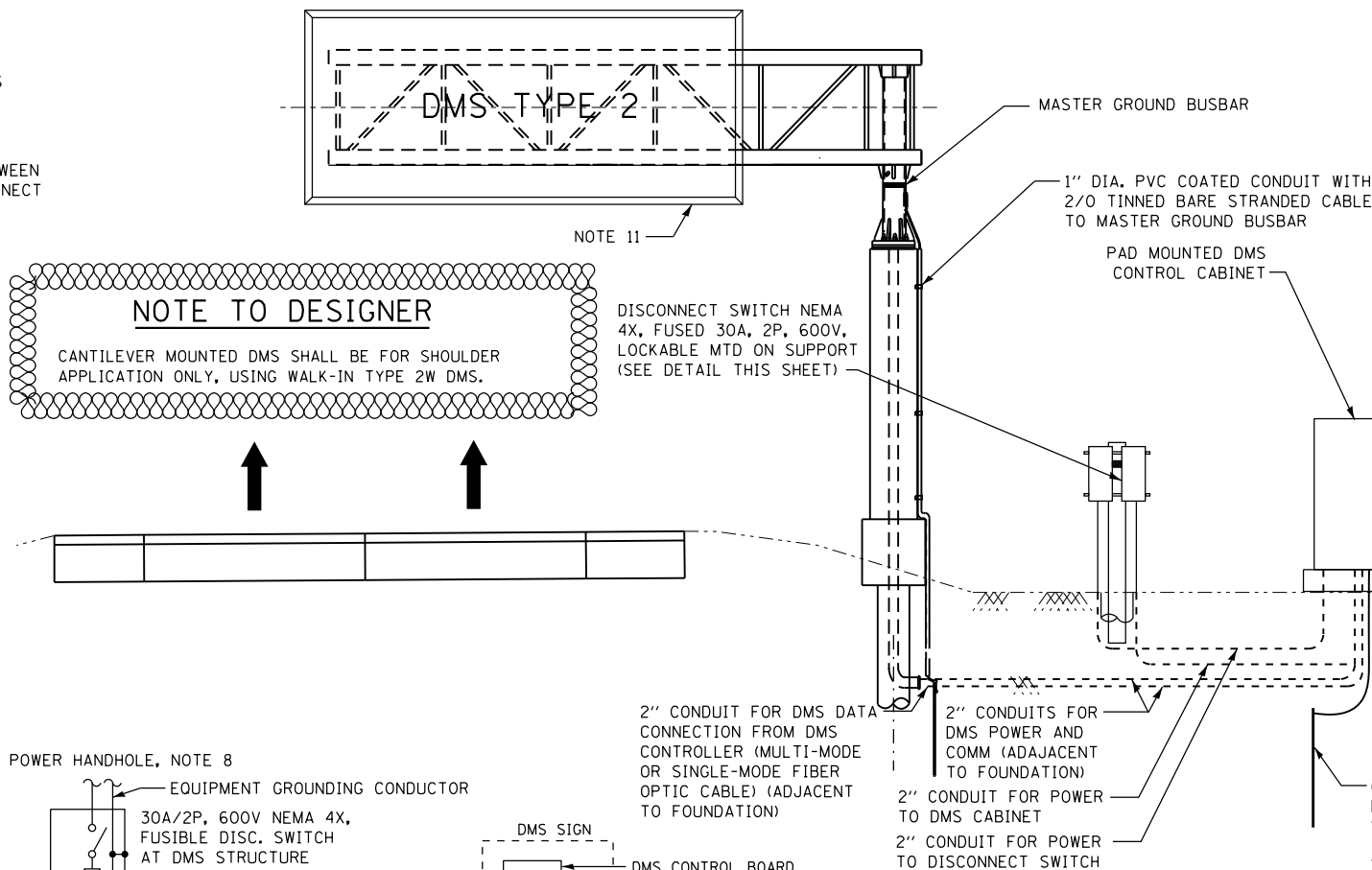


DMS TYPE 1  
TYPICAL SITE WIRING DETAIL

DATE  
3-01-2018



30A-2P NEMA 4X  
DISC MTD ON  
SUPPORT DETAIL  
(NOT TO SCALE)



**NOTE TO DESIGNER**

CANTILEVER MOUNTED DMS SHALL BE FOR SHOULDER APPLICATION ONLY, USING WALK-IN TYPE 2W DMS.

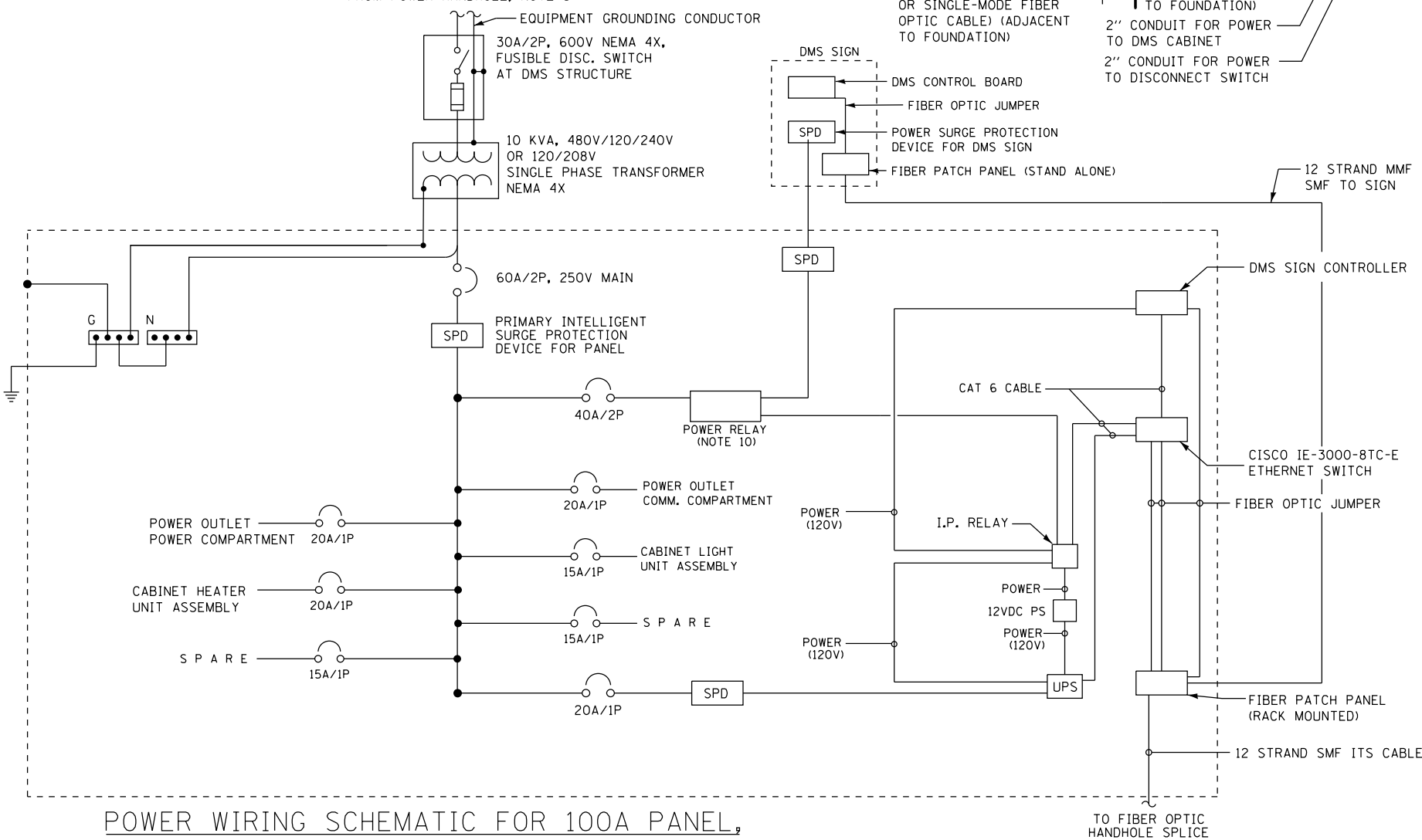
DISCONNECT SWITCH NEMA 4X, FUSED 30A, 2P, 600V, LOCKABLE MTD ON SUPPORT (SEE DETAIL THIS SHEET)

**NOTE TO DESIGNER**

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DMS CABINET - IP RELAY WIRING TABLE					
IP TERMINAL	IP TERMINAL ASSIGNMENT	CONNECTION FROM		CONNECTION TO	
		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
4	DMS CONTROLLER	IP_RELAY	3 NC	LOAD SHED RELAY	COIL (+)
		SPLICE BLOCK	120 V	IP_RELAY	NC
		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				

FROM POWER HANDHOLE, NOTE 8



POWER WIRING SCHEMATIC FOR 100A PANEL,  
120 / 240V LOAD CENTER OF DMS CABINET  
(NOT TO SCALE)

COMMUNICATION RISER  
(NOT TO SCALE)

**GENERAL NOTES:**

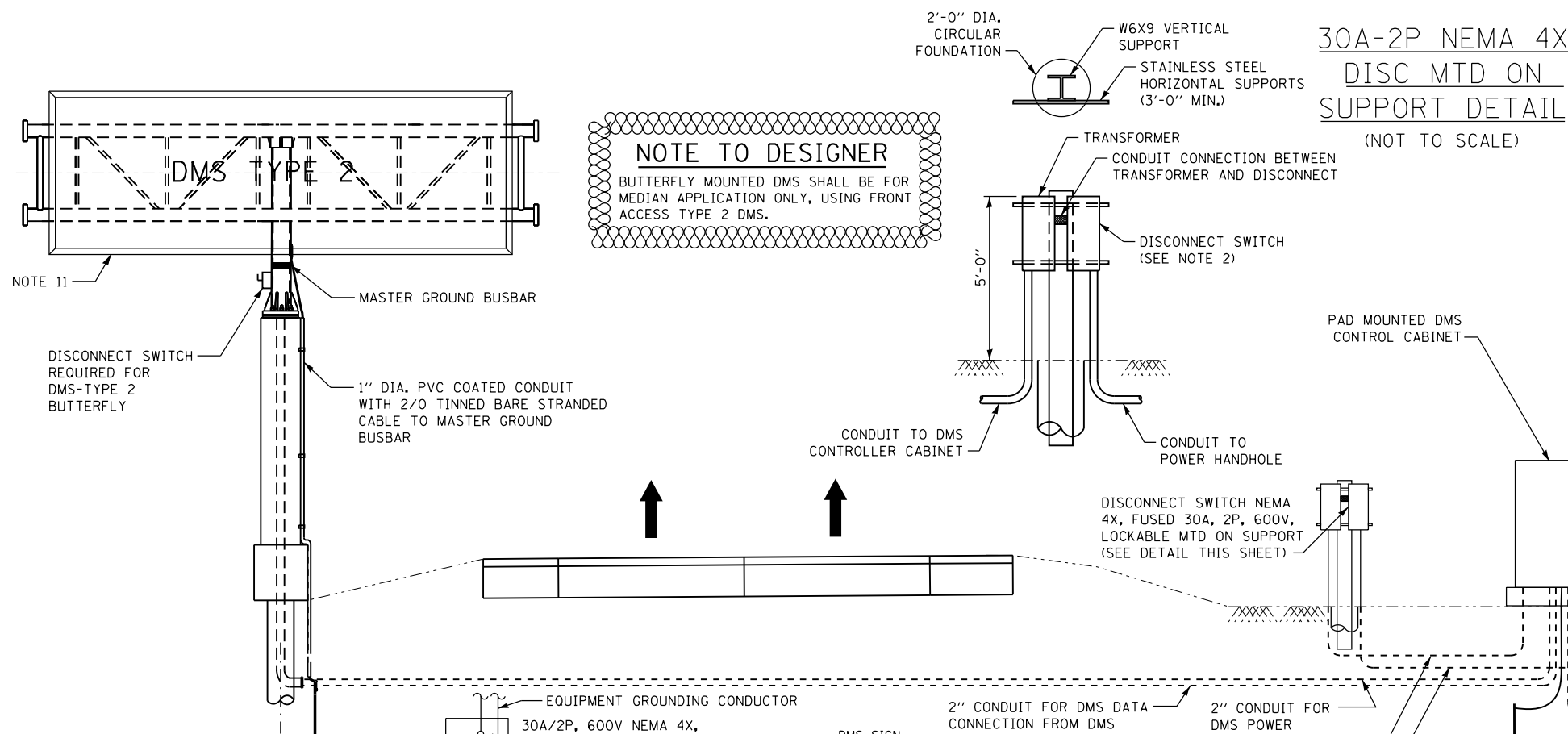
- FURNISH AND INSTALL SERVICE DISCONNECT ON W6X9 SUPPORT.
- 10KVA, 480V/120/240V SINGLE PHASE TRANSFORMER.
- THIS IS A DIAGRAMMATIC SCHEMATIC, ALL BREAKERS, TRANSFORMER LOAD CENTER SHALL BE SIZED AND WIRED AS PER MANUFACTURER RECOMMENDATIONS.
- ENTIRE COMPLETED SYSTEM SHALL BE GROUNDED AND BONDED IN ACCORDANCE WITH MOTOROLA R56 MANUAL AND THE APPLICABLE ARTICLES OF SECTION 250 OF THE NATIONAL ELECTRICAL CODE.
- ALL UNDERGROUND CONDUITS SHALL BE NON-METALLIC PVC AND ABOVE GRADE CONDUITS SHALL BE RGS PVC COATED. COUPLERS SHALL BE USED WHEN TRANSITIONING FROM CNC TO PRGS.
- MOUNT CLAMPS ON 5'-0" ON CENTER MOUNTING. HARDWARE SHALL BE USED AS PER CONDUIT MANUFACTURER RECOMMENDATION.
- CONTRACTOR SHALL SUPPLY AND INSTALL CABLE REDUCER LUGS WHERE SIZE OF CABLE ENTERING THE DISCONNECT IS MORE THAN RECOMMENDED SIZE DUE TO VOLTAGE DROP.
- ALL ELECTRICAL WORK FOR DMS TYPE 2 SHALL BE PAID UNDER PAY ITEM JT132622 - DMS ELECTRICAL WORK - TYPE 2.
- THIS SCHEMATIC IS FOR GUIDANCE ONLY. CONTRACTOR SHALL WIRE THE DMS CABINET AS PER MANUFACTURER RECOMMENDATIONS AND INDUSTRY STANDARDS.
- THE COM (COMMON) CONTACT AND NC (NORMALLY CLOSED) CONTACT ON RELAY CONTACTS OF DIN RELAY SHALL FOLLOW THE TABLE ABOVE.
- REFER TO ILLINOIS TOLLWAY STANDARD DRAWING F4 FOR OVERHEAD SIGN STRUCTURE CANTILEVER TYPE STRUCTURE DETAILS.
- 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.
- FOR THE DISCONNECT SWITCH, HORIZONTAL SUPPORT SHALL BE SIZED TO ALLOW CONDUITS TO VERTICALLY DROP OUTSIDE OF THE FOUNDATION WITHOUT BENDS.
- 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



DMS TYPE 2-CANTILEVER  
ELECTRICAL PLAN

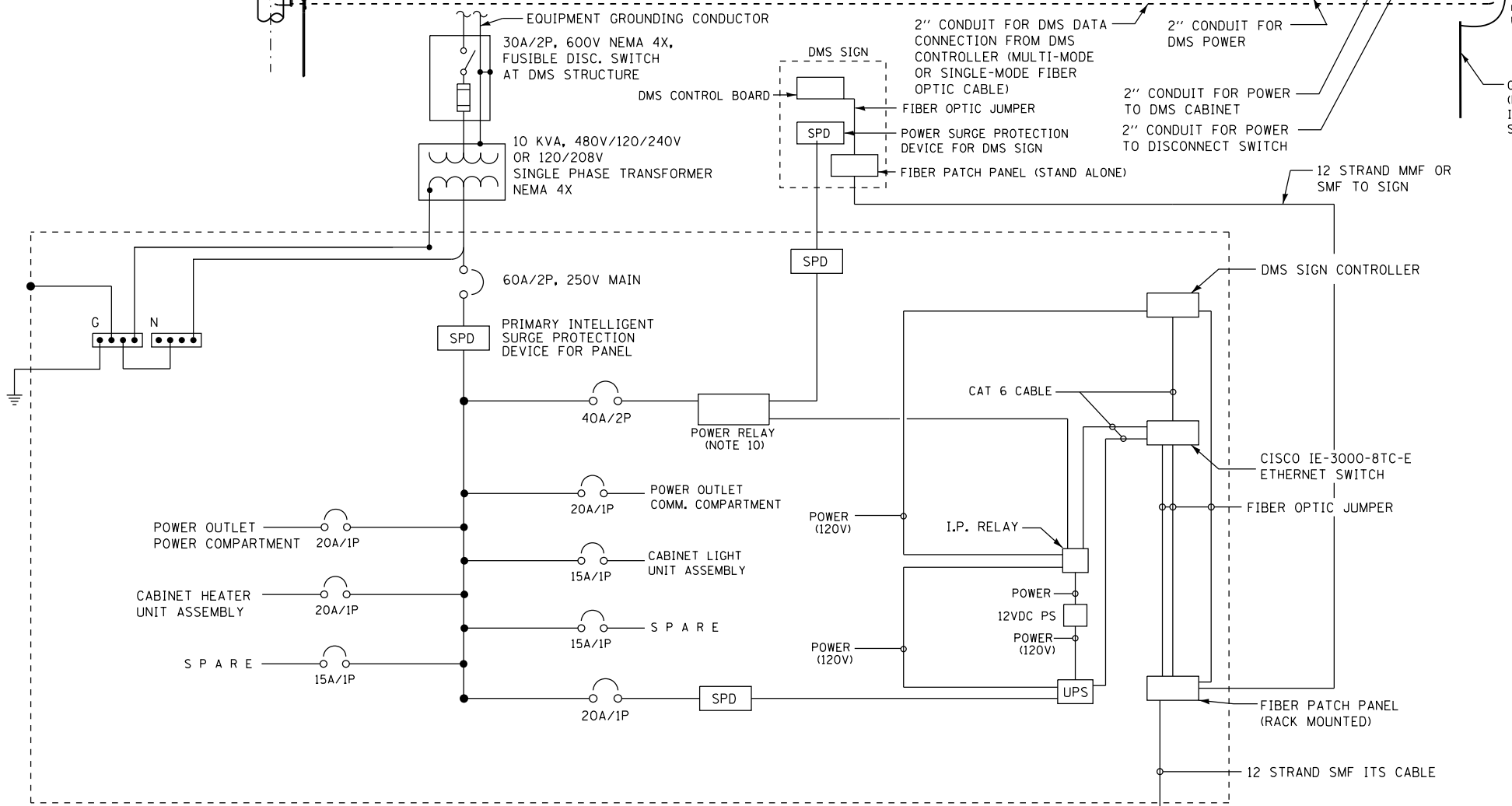
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**NOTE TO DESIGNER**  
 BUTTERFLY MOUNTED DMS SHALL BE FOR MEDIAN APPLICATION ONLY, USING FRONT ACCESS TYPE 2 DMS.

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



**POWER WIRING SCHEMATIC FOR 100A PANEL,  
 120 / 240V LOAD CENTER OF DMS CABINET**  
 (NOT TO SCALE)

**COMMUNICATION RISER**  
 (NOT TO SCALE)

**GENERAL NOTES:**

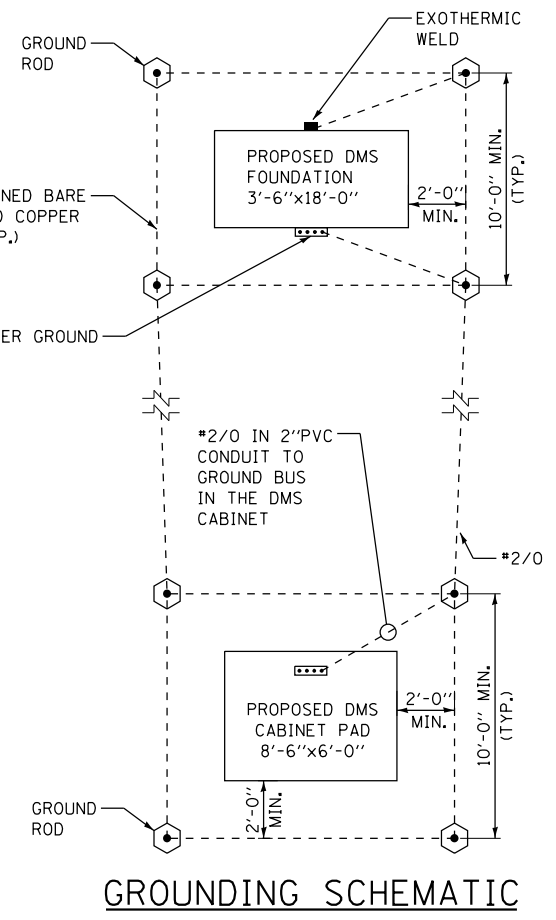
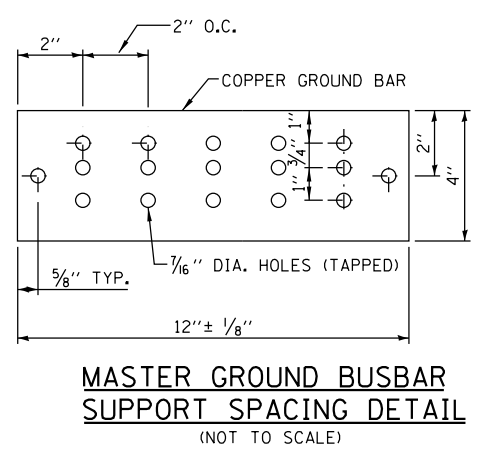
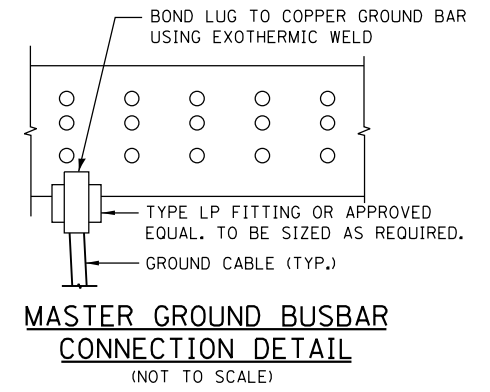
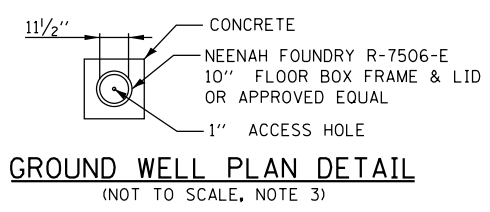
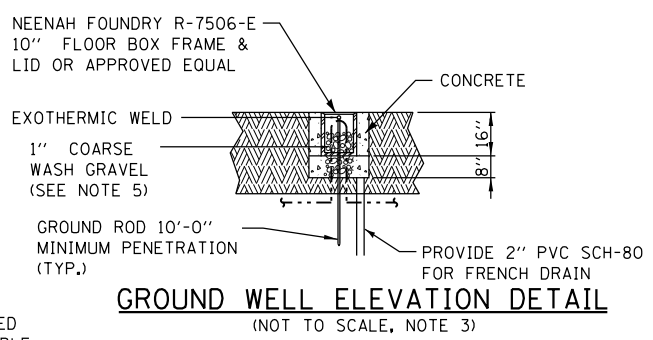
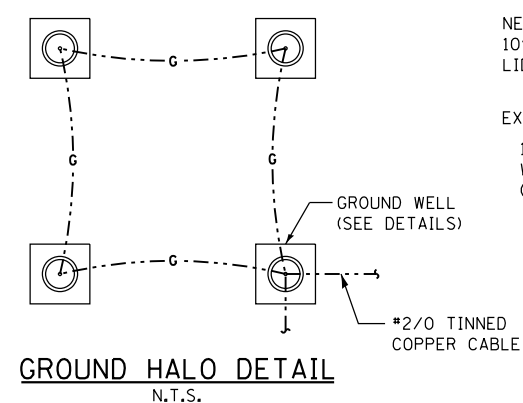
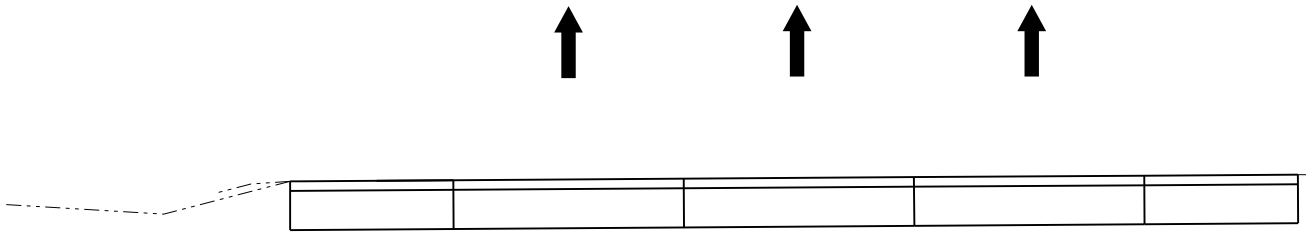
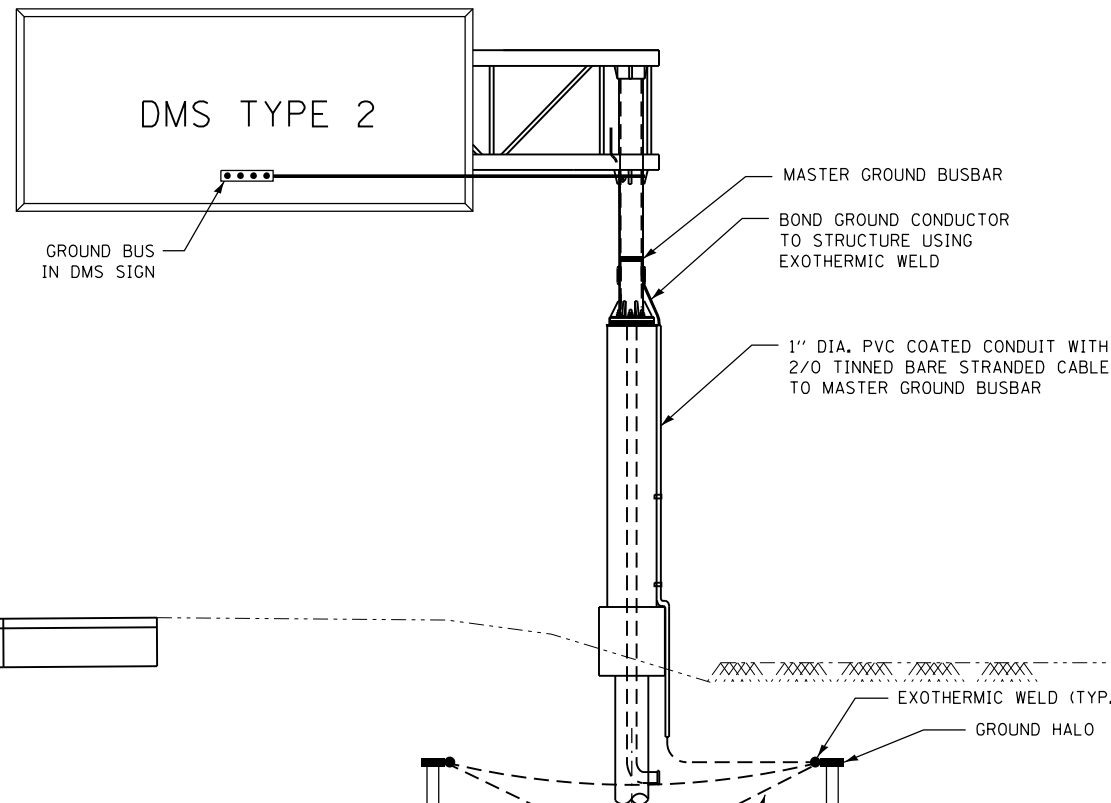
- FURNISH AND INSTALL SERVICE DISCONNECT ON W6X9 SUPPORT.
- 10KVA, 480V/120/240V SINGLE PHASE TRANSFORMER.
- THIS IS A DIAGRAMMATIC SCHEMATIC, ALL BREAKERS, TRANSFORMER LOAD CENTER SHALL BE SIZED AND WIRED AS PER MANUFACTURER RECOMMENDATIONS.
- ENTIRE COMPLETED SYSTEM SHALL BE GROUNDED AND BONDED IN ACCORDANCE WITH ALL APPLICABLE SECTIONS OF NFPA 70 (NATIONAL ELECTRIC CODE) SECTION 250.
- ALL UNDERGROUND CONDUITS SHALL BE NON-METALLIC PVC AND ABOVE GRADE CONDUITS SHALL BE RGS PVC COATED. COUPLERS SHALL BE USED WHEN TRANSITIONING FROM CNC TO PRGS.
- MOUNT CLAMPS ON 5'-0" ON CENTER MOUNTING. HARDWARE SHALL BE USED AS PER CONDUIT MANUFACTURER RECOMMENDATION.
- CONTRACTOR SHALL SUPPLY AND INSTALL CABLE REDUCER LUGS WHERE SIZE OF CABLE ENTERING THE DISCONNECT IS MORE THAN RECOMMENDED SIZE DUE TO VOLTAGE DROP.
- ALL ELECTRICAL WORK FOR DMS TYPE 2 SHALL BE PAID UNDER PAY ITEM JT132622 - DMS ELECTRICAL WORK - TYPE 2.
- THIS SCHEMATIC IS FOR GUIDANCE ONLY. CONTRACTOR SHALL WIRE THE DMS CABINET AS PER MANUFACTURER RECOMMENDATIONS AND INDUSTRY STANDARDS.
- THE COM (COMMON) CONTACT AND NC (NORMALLY CLOSED) CONTACT ON RELAY CONTACTS OF DIN RELAY SHALL FOLLOW THE TABLE ABOVE.
- REFER TO ILLINOIS TOLLWAY STANDARD DRAWING F14 FOR OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE STRUCTURE DETAILS.
- FOR THE DISCONNECT SWITCH, HORIZONTAL SUPPORT SHALL BE SIZED TO ALLOW CONDUITS TO VERTICALLY DROP OUTSIDE OF THE FOUNDATION WITHOUT BENDS.
- 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-1104



**DMS TYPE 2-BUTTERFLY  
 ELECTRICAL PLAN**

DATE  
 3-01-2018



- 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 - TYPE 2.
  5. CA-11, A QUALITY, IN ACCORDANCE WITH SSRBC 1004.

**NOTE TO DESIGNER**

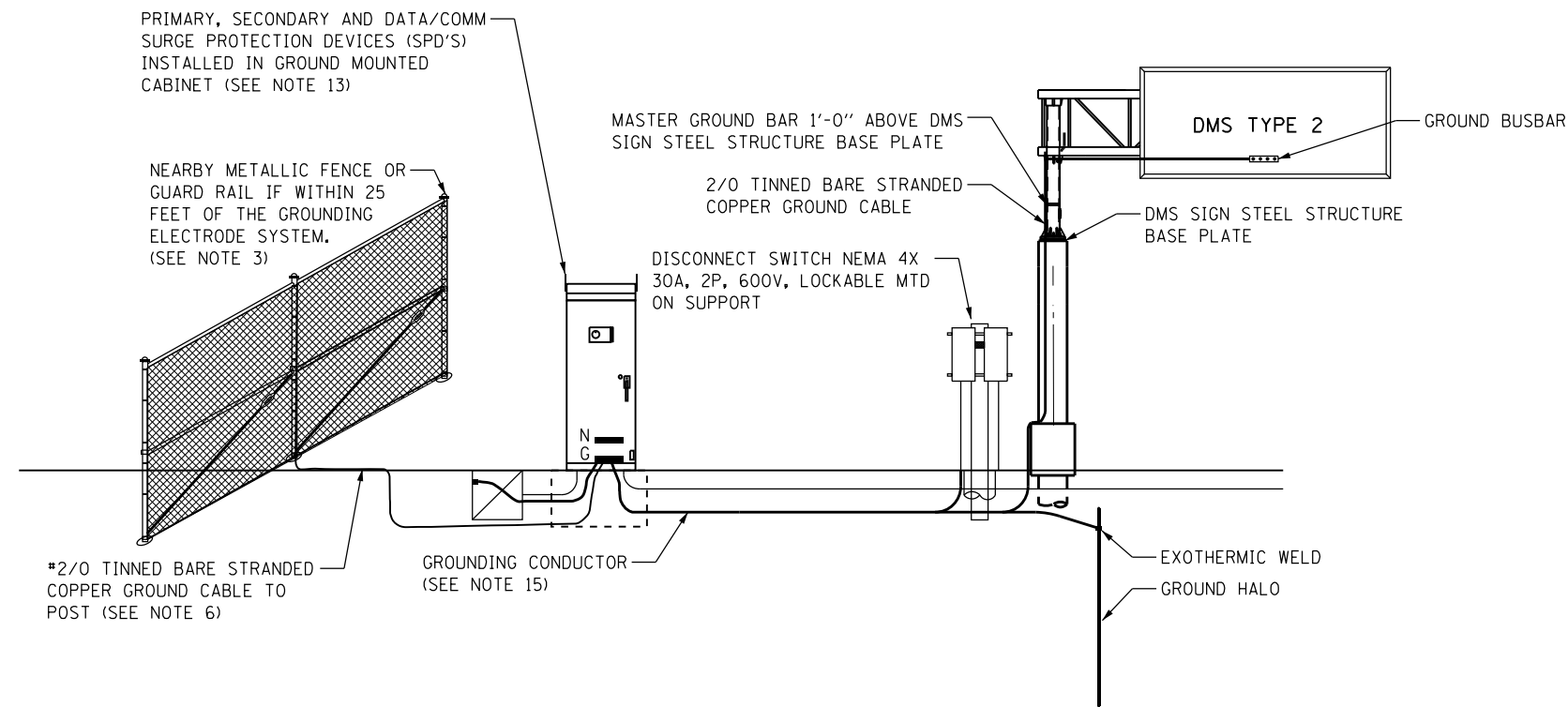
THIS BASE SHEET SHOWS TYPICAL NEW CONSTRUCTION BUT IT IS NOT A STANDARD DRAWING. IT REQUIRES COMPLETION BY THE DESIGNER PRIOR TO INSERTION INTO A CONTRACT. MICROSTATION FILES AND THE "CADD STANDARDS MANUAL" ARE AVAILABLE ON THE ILLINOIS TOLLWAY WEBSITE. THE DESIGNER SHALL ACCEPT THE RESPONSIBILITY OF 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 TYPE 2 GROUNDING PLAN IS APPLICABLE TO BOTH DMS TYPE 2 CANTILEVER AND BUTTERFLY SIGNS. DMS TYPE 2 CANTILEVER SIGN IS SHOWN ON THIS DRAWING FOR CLARITY. DESIGNER SHALL MODIFY AND COMPLETE THIS DRAWING FOR DMS TYPE 2 BUTTERFLY SIGN.

M-ITS-1105

**DMS TYPE 2  
SITE GROUNDING PLAN**

DATE  
3-01-2018



**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 TYPE 2 GROUNDING PLAN IS APPLICABLE TO BOTH DMS TYPE 2 CANTILEVER AND BUTTERFLY SIGNS. DMS TYPE 2 CANTILEVER SIGN IS SHOWN ON THIS DRAWING. FOR CLARITY, DESIGNER SHALL MODIFY AND COMPLETE THIS DRAWING FOR DMS TYPE 2 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 GROUND 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 OMITTS 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.

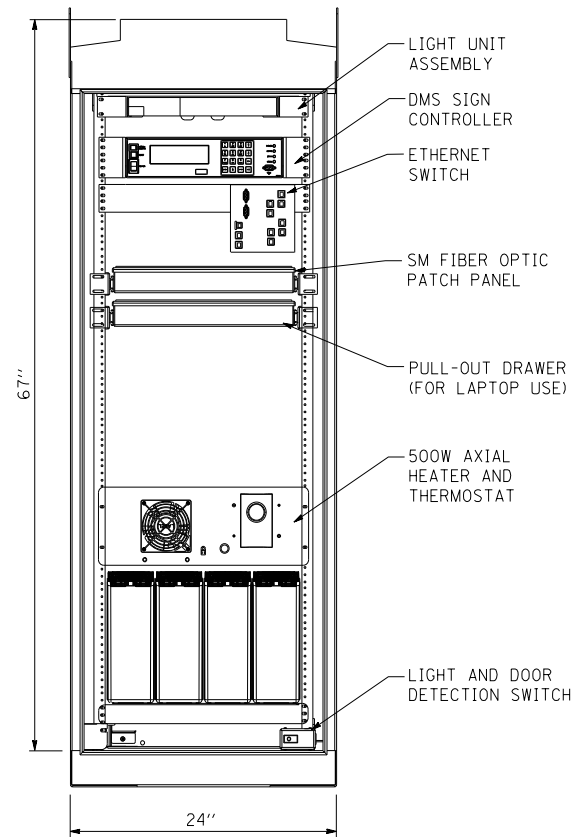
M-ITS-1106



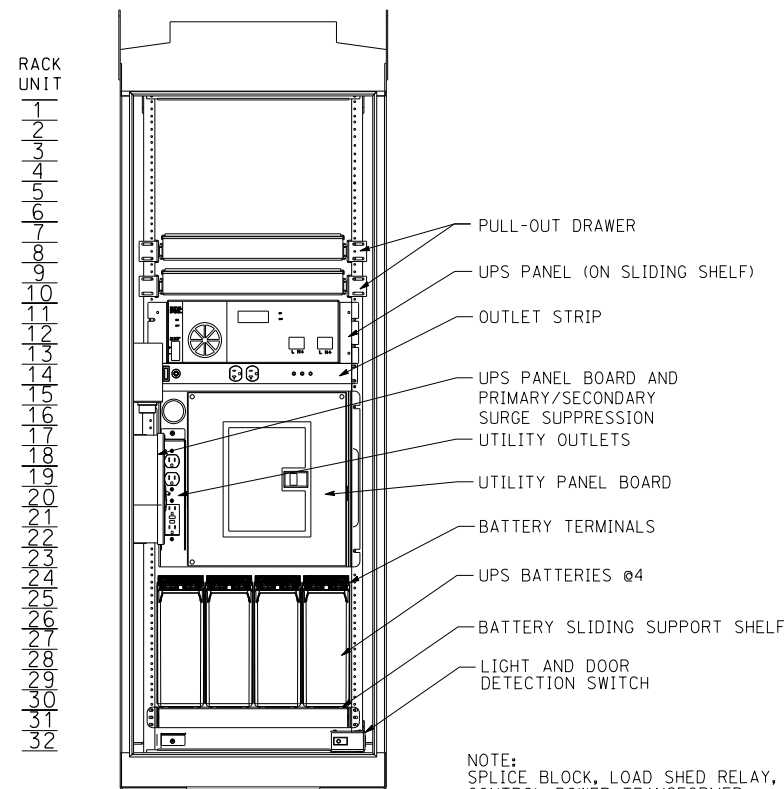
**DMS TYPE 2  
SITE WIRING DETAIL**

DATE  
3-01-2018





SECTION B-B FRONT VIEW  
(NO DOOR SHOWN)



SECTION A-A REAR VIEW  
(NO DOOR SHOWN)

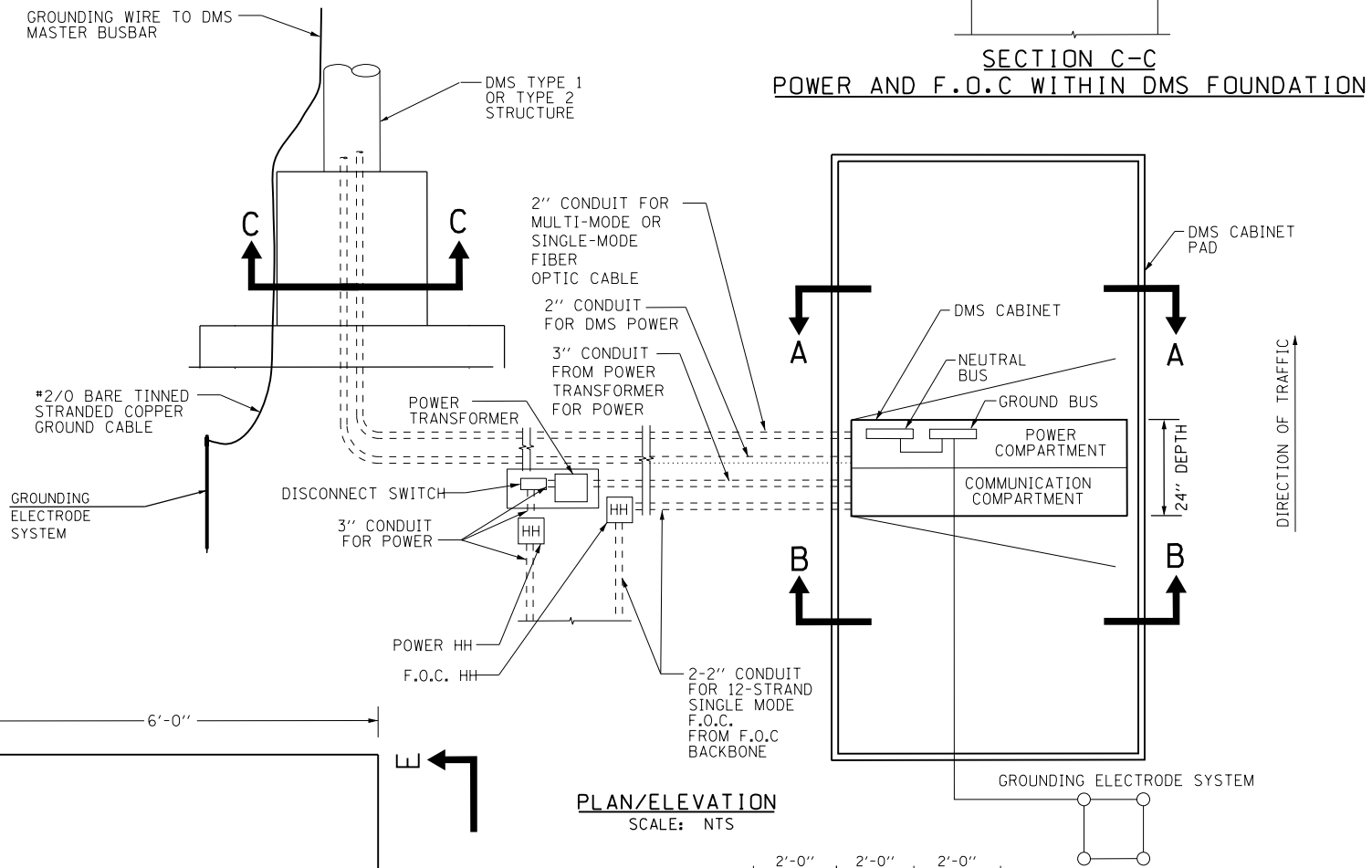
**TYPE 334 DMS CABINET LAYOUT DETAILS**  
(NOT TO SCALE)

**DMS CABINET NOTES:**

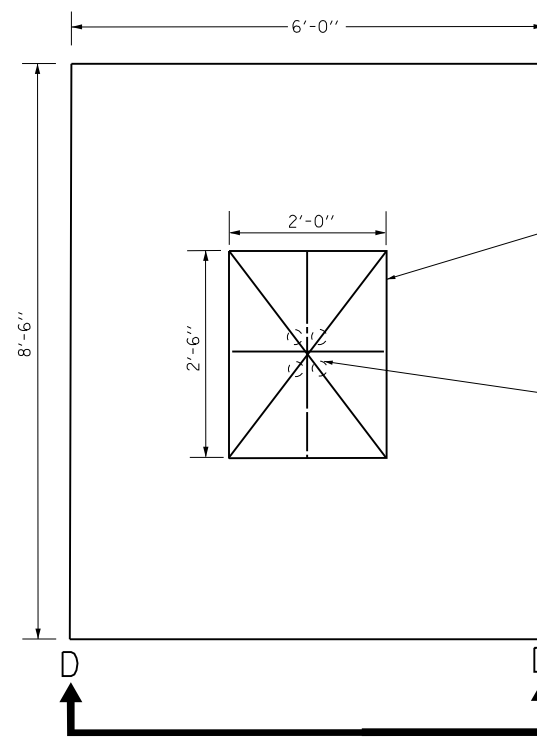
- PAD MOUNT CONFIGURATION
- 0.125" ALUMINUM 5052-H34 CONSTRUCTION WITH CONTINUOUSLY WELDED EXTERNAL SEAMS
- THREE POINT LATCH WITH SST HANDLE
- DOUBLE FLANGED DOOR SEAL WITH 1/2" X 2" CLOSED CELL NEOPRENE GASKET
- FULL LENGTH EIA GAGE FOR 19" EQUIPMENT
- ADJUSTABLE PULL OUT DRAWER
- DOOR OPENING: 21.50"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

**NOTE TO DESIGNER**

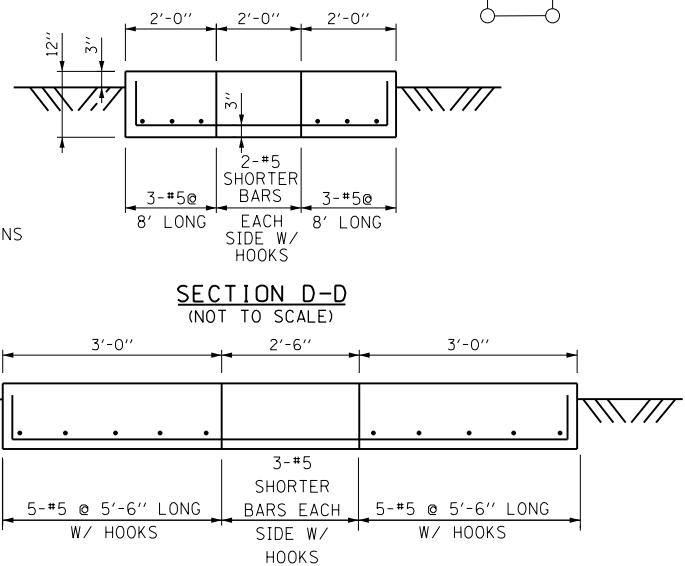
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PLAN/ELEVATION  
SCALE: NTS



PLAN  
(NOT TO SCALE)



SECTION E-E  
(NOT TO SCALE)

**DMS CABINET FOUNDATION NOTES:**

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

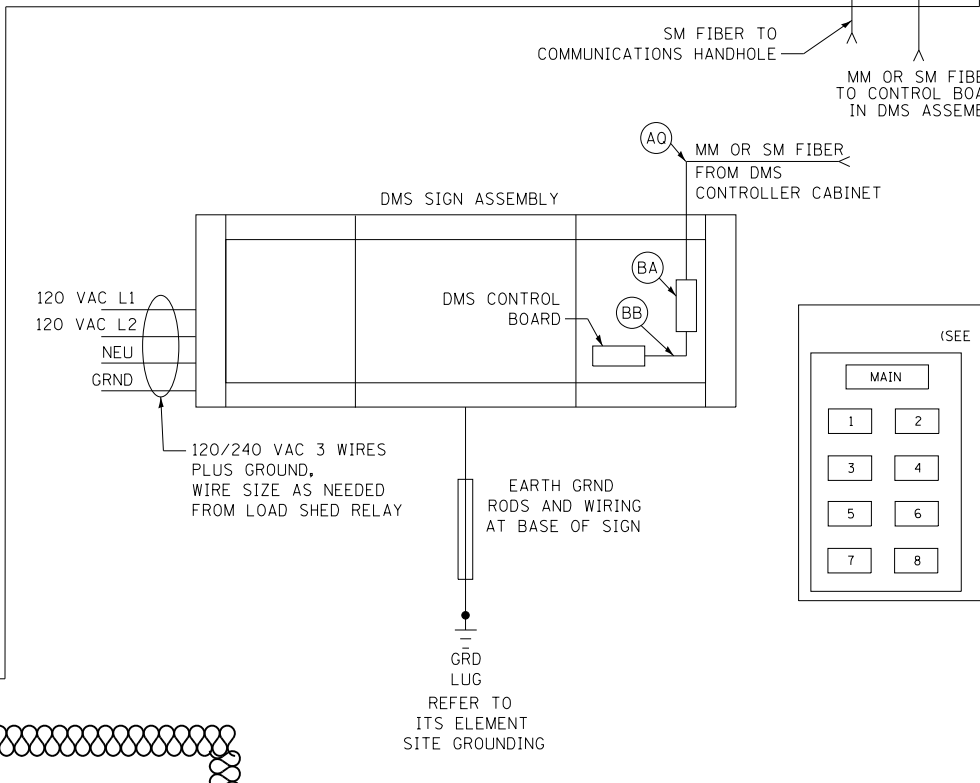
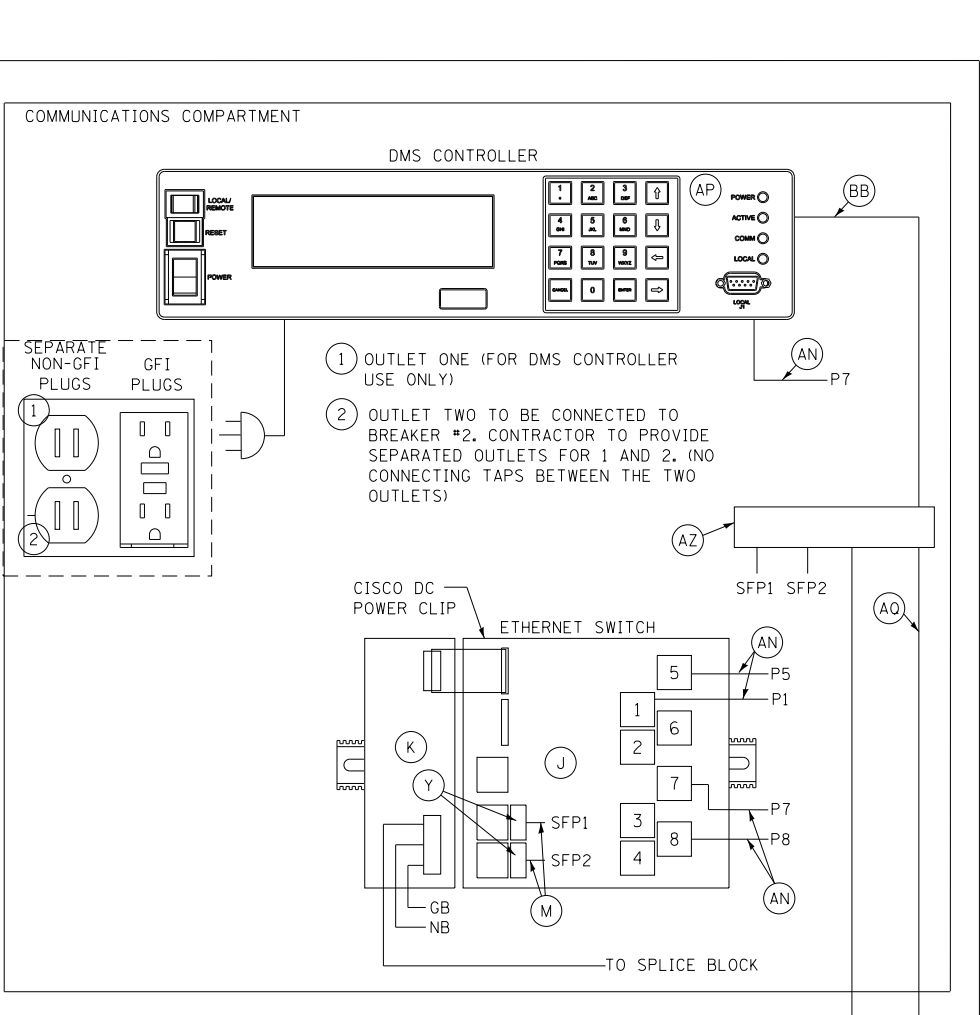
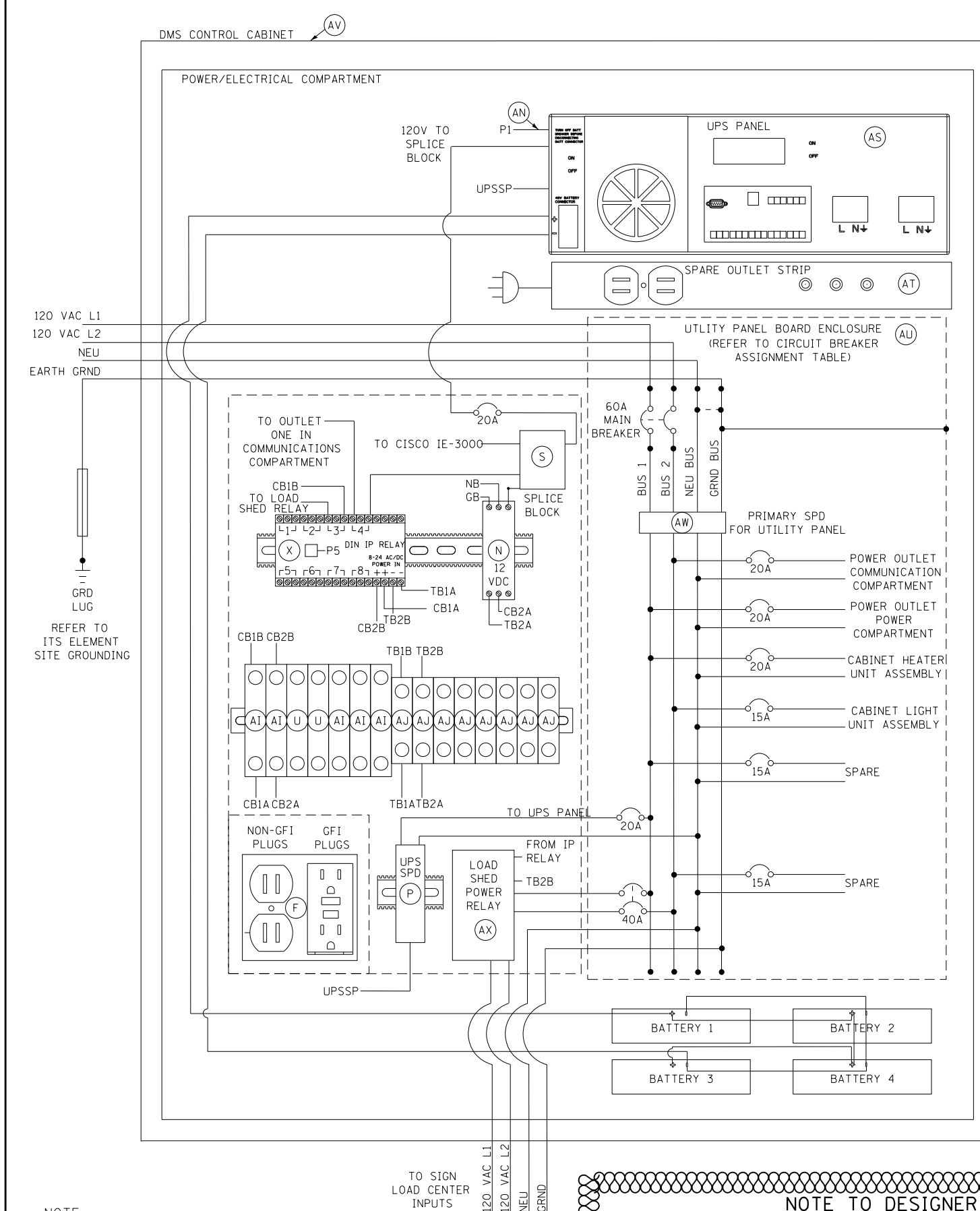
**DMS CONTROLLER FOUNDATION DETAILS**  
(NOT TO SCALE)

M-ITS-1107



**DMS CABINET LAYOUT  
DETAIL**

DATE  
3-01-2018



- 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 CISCO MODEL 8 ELECTRICAL PORT AND TWO FOC PORT SWITCH CISCO/IE-3000-8TC-E
  - K CISCO POWER SUPPLY, CISCO/PWR-IE-3000-AC-
  - L NOT USED
  - 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-SPMIB050
  - V-W NOT USED
  - X POWER CONTROLLER, 8-CHANNEL DIN ETHERNET RELAY DIGITAL LOGGERS/DIN 3
  - 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-SPMIB020
  - 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 3R
  - 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	CIRCUIT BREAKER DESCRIPTION	AMPS	CIRCUIT BREAKER LOCATION
1	POWER OUTLET POWER COMPARTMENT	20	1
2	CABINET HEATER UNIT ASSEMBLY	20	2
3	POWER OUTLET COMMUNICATION COMPARTMENT	20	3
4	CABINET LIGHT UNIT ASSEMBLY	15	4
5	LOAD SHED RELAY	40	5
6	UPS PANEL	20	6
7			7
8	NOT USED	-	8

- NOTE:
- FABRICATOR TO PROVIDE CABINET DRAWINGS SUBMITTAL FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
  - 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.

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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

**DMS CABINET WIRING DIAGRAM**

DATE  
3-01-2018