### Section M  Base Sheet Drawings

<table>
<thead>
<tr>
<th>Drawing</th>
<th>Modification Summary</th>
</tr>
</thead>
</table>
| M-ITS-1000 | **Pole Assembly (ITS)-Series 1000**  
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. |
| M-ITS-1100 to M-ITS-1108 | **Dynamic Message Sign (ITS)-Series 1100**  
DMS  
(Typical) Revised Type 1 nomenclature to Walk-in  
(Typical) Revised Type 2 nomenclature to Front Access |
| M-ITS-1108 | **DMS Cabinet Wiring Diagram**  
Clarified wiring diagram  
Updated switch model |
| M-ITS-1200 to M-ITS-1217 | **Cabinet Wiring (ITS)-Series 1200**  
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 |
| M-ITS-1300 | **Roadway Weather Information System (ITS)-Series 1300**  
RWIS Pole, Sensor Mounting Detail  
General note to have manufacturer to supervise installation and commissioning  
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

<table>
<thead>
<tr>
<th>Drawing</th>
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<th>Effective: 2020-03-01</th>
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<tbody>
<tr>
<td>M-ITS-1400</td>
<td>Solar Power Generator Details, Enclosure changed to Nema 4X</td>
<td></td>
</tr>
<tr>
<td>M-ITS-1500</td>
<td>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</td>
<td></td>
</tr>
<tr>
<td>M-ITS-1501</td>
<td>ITS Details Tower Mount Camera Details, 300’ Cat6 or More</td>
<td>Retired</td>
</tr>
<tr>
<td>M-ITS-1502</td>
<td>ITS Details Tower Mount Camera Details, 300’ Cat6 or Less</td>
<td></td>
</tr>
<tr>
<td>M-ITS-1503</td>
<td>Cabinet Wiring Diagram Tower Mounted CCTV ITS Assembly, showed revised grounding around service pad</td>
<td></td>
</tr>
</tbody>
</table>

#### 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.
- M-ITS-1503: Cabinet Wiring Diagram Tower Mounted CCTV ITS Assembly, showed revised grounding around service pad.

#### Weigh-In-Motion (ITS)-Series 1600
- M-ITS-1600: Weigh-In-Motion Cabinet and Foundation Details, showed two permanent antennas installed on top of WIM cabinet.
- M-ITS-1603: Weigh-In-Motion Detector Loop and Quartz Sensor Detail, showed 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

#### 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, pipe cap to use hex head screws, showed revised grounding around service pad.

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New Sheet | Retired Standard
GENERAL NOTES:

1. Furnish and install junction boxes as shown.
2. For safety, all junction boxes shall be installed above ground.
3. All junction boxes shall be labeled with the manufacturer's name and model number.
4. For maximum safety, all junction boxes shall be provided with a ground terminal.
5. Junction boxes shall be protected from the elements.
6. Junction boxes shall be located in a dry area.
7. Junction boxes shall be securely fastened to the structure.
8. Junction boxes shall be painted black.
9. Junction boxes shall be provided with a cover.
10. Junction boxes shall be provided with a lock.

NOTE TO DESIGNER

This drawing is for guidance only. The contractor shall wire the equipment according to the manufacturer's instructions.

DMS WALK-IN ELECTRICAL PLAN

Date: 3-01-2020

M-ITS-1100

Illinois Tollway

DMS WALK-IN DRAWING INTO THE PLAN SET.

DESIGNERbox shall be removed prior to insertion of the designer box.

Responsive to 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 notes to designer boxes shall be removed prior to insertion of the designer box into the plan set.

DMS WALK-IN - IP RELAY WIRING TABLE

<table>
<thead>
<tr>
<th>Description</th>
<th>Connection</th>
<th>Power</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMS Controller</td>
<td>CB1A</td>
<td>120V (+)</td>
<td>CB</td>
</tr>
<tr>
<td></td>
<td>CB1B</td>
<td>12VDC (+)</td>
<td>CB</td>
</tr>
<tr>
<td></td>
<td>3-01-2020</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-ITS-1100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
GENERAL NOTES:

1. Exothermic Welds shall be used to connect ground rods to ground bars at every 3 feet (typ.) using exothermic alloy.

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 buses, exothermic welding, ground well, ground rods and all other items to complete the grounding system shall be included in pay item JT132621 - DMS Electrical.

5. Refer to SHEET M-ITS-1102 for DMS Typical Site Wiring Details.

6. Ground rods shall be installed in ground wells in finished grade unless installed under sidewalks or pathways.

NOTE TO DESIGNER

1. The base sheet shows typical new construction. It is not a standard drawing or required connection by the Illinois Tollway. It shall not be included in the "ILLINOIS TOLLWAY STANDARDS MANUAL" are available on the Illinois Tollway website. The designer shall accept the responsibility of the design of this sheet during its completion and insertion into a contract. All "NOTE TO DESIGNER" notes shall be removed prior to insertion of the drawing into the plan set.
NOTES:
1. Additional ground rods shall be added to grounding electrode conductor as required until resistance to ground is 5 ohms or less, for electric and power service locations, if additional ground rod electrodes are required in order to achieve desired resistance they shall be installed in accordance with the grounding electrode system.
2. Ground rods shall not be routed through foundations.
3. Poles and other metallic structures with pipes 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 holes in finished grade unless installed under scaffolding 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-conducting coating shall be applied 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 conductors are to be connected to equipment ground if they are located within 25' of the grounding electrode system.
8. All metallic members of the DMS truss and the DMS sign within 6 feet of each other shall be bonded together. Wires 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 shall be limited to three. If additional ground rods are required in order to achieve desired resistance, they shall be installed in accordance with the grounding electrode system.
12. Wherever possible, ground rod electrodes shall be installed no closer than 25' to a foundation.
13. Every copper conductor on a cable entering or leaving a grounding enclosure shall be insulated with a surge protection device.
14. Diagram shows equipment grounding inside enclosures.
15. Grounding conductor shall be 5/0 tinned bare stranded copper. Contract shall install ground rods as necessary to achieve ground resistance at DMS cabinet is 5 ohms or less.
16. If there is a metallic member within 20 feet of control cabinet, connect manual to grounding system with 5/0 tinned bare stranded copper conductor.

NOTE TO DESIGNER
This base sheet shows typical new construction but it is not a standard drawing. It is required completion by the designer prior to insertion into a contract. Specifications files and the "CADD Standards Manual" are available on the Illinois Tollway website. The designer shall accept the responsibility for the design of this sheet up on completion and insertion into a contract. All notes to designer boxes shall be removed prior to insertion of the drawing into the plan set.
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 SYSTEM SHALL BE INCLUDED IN PAY ITEM JT132622 - DMS ELECTRICAL WORK - FRONT ACCESS.
5. CA-11, A QUALITY, IN ACCORDANCE WITH SSRBC 1004.

GENERAL
1. THIS TYPICAL DMS FRONT ACCESS GROUNDING PLAN IS APPLICABLE TO BOTH DMS FRONT ACCESS CANTILEVER AND BUTTERFLY SIGNS.
2. THIS TYPICAL DMS FRONT ACCESS GROUNDING PLAN IS SHOWN ON THIS DRAWING FOR CLARITY. DESIGNER SHALL MODIFY AND COMPLETE THIS DRAWING INTO THE PLAN SET.
3. MASTER GROUND BUSBAR SUPPORT SPACING DETAIL (NOT TO SCALE) FOR CLARITY. DESIGNER SHALL MODIFY AND COMPLETE THIS DRAWING INTO THE PLAN SET.
4. PROPOSED DMS FOUNDATION (4'-0"X3'-0") TO STRUCTURE, EXOTHERMIC WELD TO STRUCTURE USING BOND GROUND CONDUCTOR.
5. NOTE TO DESIGNER:
   - THIS BASE SHEET SHOWS TYPICAL NEW CONSTRUCTION HUB 2371 IS NOT A STANDARD DRAWING. IT REQUIRES COMPLETION BY THE DESIGNER PRIOR TO INSERTION INTO A CONTRACT. INFORMATION SHOWN ON THIS SHEET IS ONLY FOR THE DESIGNER'S USE AND DOES NOT CONSTITUTE A CONTRACTUAL AGREEMENT.
   - THE DESIGNER SHALL ACCEPT THE RESPONSIBILITY OF THE DESIGN OF THIS SHEET AND ITS COMPLETION AND INSERTION INTO A CONTRACT. ALL WORK TO BE PERFORMED SHALL BE MANAGED 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.

NOTICE TO DESIGNER
THE DESIGNER SHALL COMPLETE THIS DRAWING INTO THE PLAN SET. DESIGNER SHALL REMOVE PRIOR TO INSERTION INTO THE CONTRACT. THIS SHEET IS NOT A STANDARD DRAWING. IT REQUIRES COMPLETION BY THE DESIGNER PRIOR TO INSERTION INTO A CONTRACT. INFORMATION SHOWN ON THIS SHEET IS ONLY FOR THE DESIGNER'S USE AND DOES NOT CONSTITUTE A CONTRACTUAL AGREEMENT. THE DESIGNER SHALL ACCEPT THE RESPONSIBILITY OF THE DESIGN OF THIS SHEET AND ITS COMPLETION AND INSERTION INTO A CONTRACT. ALL WORK TO BE PERFORMED SHALL BE MANAGED PRIOR TO INSERTION OF THE DRAWING INTO THE PLAN SET.
DMS SITE GROUNDING DETAIL

**NOTES:**

1. Additional ground rods shall be added to grounding electrode conductor as needed until resistance to ground is 5 ohms or less, for device and power service locations. If additional ground rods are required in order to achieve required resistance, these shall be installed at least 25 feet from existing ground rods.

2. All communication equipment grounding systems shall be tested for resistance to ground using the three-point fall-of-potential test per ANSI/IEEE 81. See its element site grounding special provisions for procedures.

3. Ground rods shall not be received through foundations.

4. Fences and other metallic structures within 50 feet of the grounds shall be connected to the ground system or any object grounded to the grounding electrode system.

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, non-metallic coatings shall be painted over the exposed metal surfaces.

6. Grounding electrode system connections to fences 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; however, connections shall not be considered an acceptable bonding method.

9. At least an 8 inch minimum bonding jumpers shall be maintained on all grounding electrode conductors. The angle of any bonding 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. Where possible, ground rod electrodes shall be installed no closer than 11 feet from the foundation.

13. Heavy-duty tinned bare stranded copper conductors shall be installed no closer than 20 feet of the control cabinet. All equipment grounds shall be properly connected to a chassis: all paint and other coatings, including galvanization, shall be removed prior to protection of the bonding to the chassis.

14. Ground trays shall be installed in floor-level enclosures.

15. Grounding conductors shall be heavy-duty tinned bare stranded copper conductors shall be installed no closer than 11 feet from the foundation.

16. If there is a metal handrail within 20 feet of control cabinet, conductors shall be installed to the control cabinet within 20 feet of control cabinet.