

Illinois Tollway M-ITS Base Sheet Revisions

Section M Base Sheet Drawings		
Drawing	Modification Summary	Effective: 2021-03-01
	<div style="display: flex; align-items: center; justify-content: center;"> New Sheet Retired Standard </div>	
Pole Assembly (ITS)-Series 1000		
M-ITS-1000	Elevation Views Pole Mounted ITS Element Assembly	
	<ul style="list-style-type: none"> . Sheet 1of3: Added title for one section detail; Added note on wires from solar panels to battery box then to ITS enclosure then Cat6 cables to ITS devices installed on the ITS pole . Sheet 2of3: Added title for ITS Disconnect Switch Cast-in place . Sheet 3of3: Added new assembly detail for ITS Disconnect Switch Pre-cast (simplified installation) 	
M-ITS-1001	General Notes Pole Mounted ITS Element Assembly	
	<ul style="list-style-type: none"> . Added Note 22.: Cables shall enter poles through a gromet. Gromet size shall be chosen so that the center hole forms a water tight seal around the cables 	
Dynamic Message Sign (ITS)-Series 1100		
M-ITS-1103	DMS Front Access-Cantilever Electrical Plan	
	<ul style="list-style-type: none"> . Revised assembly details for DMS Type 2 Cantilever pushed further away so the edge of the DMS clears Lane 1 	
M-ITS-1104	DMS Front Access-Butterfly Electrical Plan	
	<ul style="list-style-type: none"> . Revised assembly details for DMS Butterfly Type 2 Front Access pushed further away to the edge of the DMS clears Lane 1 	
Cabinet Wiring (ITS)-Series 1200		
M-ITS-1200 to M-ITS-1213	<p>M-ITS-1200: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (1-MVDS) M-ITS-1201: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (2-MVDS) M-ITS-1202: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (3-MVDS) M-ITS-1203: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (1-CCTV camera) M-ITS-1204: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (1-CCTV and 1-MVDS) M-ITS-1205: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (1-CCTV camera and 2-MVDS) M-ITS-1206: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (1-CCTV and 3-MVDS) M-ITS-1207: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (2-CCTV cameras) M-ITS-1208: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (2-CCTV Cameras and 1-MVDS) M-ITS-1209: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (2-CCTV cameras and 2-MVDS) M-ITS-1210: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (2-CCTV cameras and 3-MVDS) M-ITS-1211: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (1-MVDS) Solar Generator and FOC M-ITS-1212: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (2-MVDS) Solar Generator and FOC M-ITS-1213: Cabinet Layout and Wiring ITS Pole Mounted Enclosure (3-MVDS) Solar Generator and FOC</p>	
	<ul style="list-style-type: none"> . Revised to show the fiber optic conduit and power conduit interface with the ITS Enclosure for location and size . Added Note 13: Fiber cable shall run straight down from the Gator patch through the left most conduit. Power cable shall be pulled through the conduit to the right of the fiber conduit. No slack shall be placed in the cabinet, slack shall be put in power and fiber optic handholes . Revised layout to remove Cohu Surge Suppressor Part AS . Revised details for Part V to remove dash line for DITEK surge suppressor . Revised description for Item V to remove Cohu camera . Revised Item AQ to remove reference to Cohu PoE power injector . Remove Item AS for Cohu PoE injector not required anymore . Revised Note 4: to say Not used 	
M-ITS-1217	Cabinet Wiring Diagram In Pavement Detection System AP, PoE and Injector ITS Assembly	
	<ul style="list-style-type: none"> . Revised to show the fiber optic conduit and power conduit interface with the ITS Enclosure for location and size . Added Note 13: Fiber cable shall run straight down from the Gator patch through the left most conduit. Power cable shall be pulled through the conduit to the right of the fiber conduit. No slack shall be placed in the cabinet, slack shall be put in power and fiber optic handholes . Added Note to Designer: The DSE shall specify the Gator Patch length per site 	
Roadway Weather Information System (ITS)-Series 1300		
M-ITS-1300	RWIS Pole, Sensor Mounting Detail	
	<ul style="list-style-type: none"> . Added Note 8: Wind sensor can be installed on the secondary pole if primary pole is close to tree line . Added Note 9: All cables installed in a pole shall use a grommet to connect to ITS device installed on the pole 	
M-ITS-1302	Typical RWIS Site Installation Plan	
	<ul style="list-style-type: none"> . Added Note 5: Note to Designer: In the event the Primary and Secondary poles cannot be installed within the 40 foot maximum radius of the bridge deck, the DSE shall consult with the Tollway and GEC on an alternate placement solution . Added Note 6: Note to Designer: Installation of the Primary and Secondary pole for bridge installation: pole to be installed near immediate entrance of the bridge so non-invasive laser temperature sensor can monitor bridge deck temperature and bridge approach temperature 	

Illinois Tollway Base Sheet Revisions
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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
	. Added Note to Designer: The simplified solar power arrangement shall only be used for a maximum of 3 MVDS. For all other arrangements use the 1400 Series
Tower Mounted CCTV (ITS)-Series 1500	
M-ITS-1500	ITS Details Tower Mount Camera Details
	. Added note to Designer: The 2 CCTV shall be placed on the leg facing the roadway with a clear field of view . Added Note 23: The CCTV cameras shall be mounted on the same tower leg with an Axis T92B62 mounting arm with T94A01D pendant kit, or equivalent as approved by the engineer. There will be 24in vertical spacing between the cameras
M-ITS-1503	. Removed details for Part AS: removed PoE power injector . Remove Item AS: removed reference to Cohu PoE injector
Flashing Sign Beacon (ITS)-Series 1700	
M-ITS-1700	Flashing Sign Beacon Installation Breakaway Electrical Detail
	. Added details for power cable disconnect box Breakaway . Added details for the 4 flashing lights installed on the static sign with flashing sequence and light mounting details onto the sign . Added Note 1: see plans for required conductor sizes . Added Note 2: All three conductors shall be in one harness . Added Note 3: As an alternative to the conduit body on foundation, use thermoplastic junction boxes . Added Note 4: Slack in line side cable shall be provided in handhole . Added Note to Designer: Install new CCTV within 500 feet upstream of the static beacon sign . Added note to Designer: If an existing ITS enclosure lies within the immediate proximity of the flashing sign then power can be connected to that enclosure, otherwise install a new ITS enclosure near the flashing sign
M-ITS-1701	Cabinet Layout and Wiring ITS Pole Mounted Enclosure
	. Added wires for second pair of flashing lights and connection to the circuit breakers . Added Item AT: ELTEC FS-4 DC Flasher . Added Item AU: 9 PIN Harness for FS-4 . Rved dashline for DITEK surge sypressor for Cohu camera . Revised Item V: removed reference to DITEK for Cohu camera . Revised Item AS to say N/A
IPDC Facility (ITS)-Series 1800	
M-ITS-1815	IPDC and Combination Plaza/IPDC Concrete Foundation
	. Added new sheet for IPDC and Combination Plaza/IPDC Concrete Foundation details
Conduit Details at Integral Abutment Bridge (ITS)-Series 1900	
M-ITS-1900	Conduit Details at Integral Abutment Bridge with MSE Wall (Sheet 3)
	. Added material type for ITS conduit attached to bridge: PVC coated steel or FRE conduit per plan
100 FT. Monopole (ITS)-Series 2000	
M-ITS-2000	100 FT. Monopole Closed Circuit Television (CCTV) Camera Tower
	. Sheet 1of4: Added details for ITS and support for ITS Enclosure foundation: 16" Dia. X 4' @ 3000PSI Circular Concrete Foundation . Sheet 4of4: Added details to install the ITS Enclosure and ITS Disconnect Switch onto the concrete slab of 100 foot monotube
Video Power Junction Box (ITS)-Series 2100	
M-ITS-2100	Video Power Junction Box Model A: 4 PoE CCTV arrangment without communication switch
	. New drawing created to standardize Video Power Junction Box arrangment - Without Cisco switch when the box is installed and can use Cat 6 cables when distance is less than 300 feet from Plaza Communication room
M-ITS-2101	Video Power Junction Box Model B: 4 PoE CCTV arrangment Cosco 4000 switch
	. New drawing created to standardize Video Power Junction Box arrangment - With Cisco 4000 switch when the box is installed at a distance greater than 300 feet from the Cisco switch in the Plaza Communication Room

NOTES:

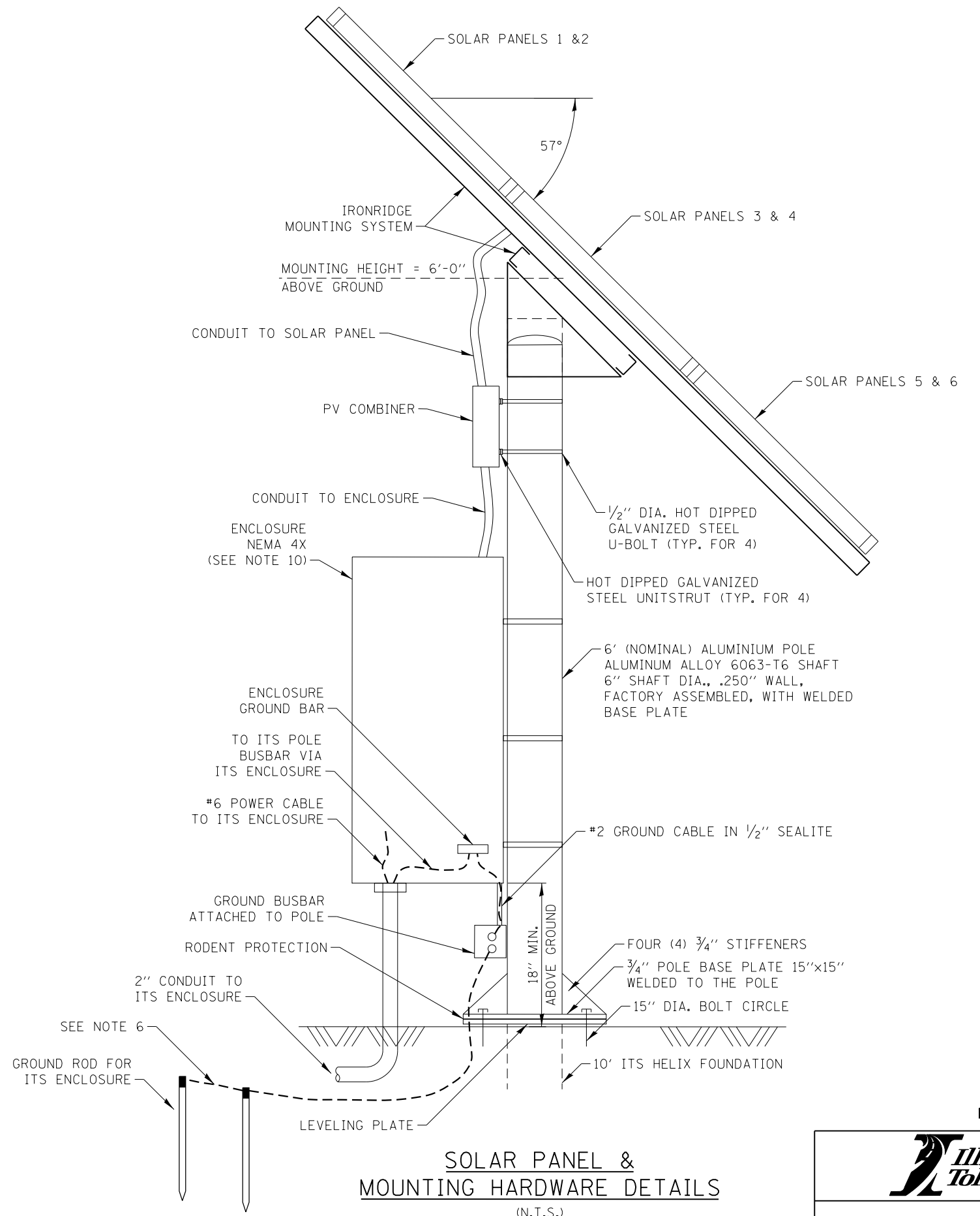
1. SOLAR POWER GENERATOR TO INCLUDE PANEL, BRACKETS, CABINET, CHARGER REGULATOR, BATTERIES, AND CABLES. STRUCTURE TO BE DESIGNED TO MEET STRUCTURAL DESIGN CRITERIA IN SPECIFICATION.
2. THE BATTERIES SHALL BE WIRED TO PROVIDE 24V DC POWER TO AN INVERTER FOR 120V AC DELIVERY TO ITS ENCLOSURE.
3. CONTRACTOR SHALL LOCATE THE GROUND MOUNTED SOLAR PANEL SYSTEM LESS THAN 20' FROM THE POLE-MOUNTED ITS SYSTEM AND ENSURE THAT THE SOLAR PANELS HAVE UNOBSTRUCTED SUN EXPOSURE.
4. GROUND MOUNTED SOLAR PANEL POLES INSTALLED WITHIN THE CLEAR ZONE SHALL BE SHIELDED BY BARRIER, LOCATED A MINIMUM OF 5' BEHIND THE PLANE OF ANY GUARDRAIL POSTS. SEE ILLINOIS TOLLWAY GUARDRAIL STANDARD (SECTION C OF STANDARDS) FOR MORE INFORMATION. ALL OTHER POLES SHALL BE LOCATED OUTSIDE THE CLEAR ZONE OR AS DIRECTED BY THE ENGINEER. FINAL LOCATION TO BE APPROVED BY THE ENGINEER.
5. ALL EQUIPMENT MUST BE CONNECTED TO A COMMON GROUND THROUGH THE ADJACENT ITS POLE BUSBAR. CONNECT A #2 AWG GROUND CABLE FROM THE EXTERNAL SOLAR POLE MOUNTED GROUND BUSBAR TO THE GROUND BAR IN THE SOLAR ENCLOSURE. ANY GROUND CONNECTED TO THE EXTERNAL GROUND BUSBAR SHALL BE EXOTHERMIC WELDED TO THE BUSBAR. SEALTITE CONDUIT SHOULD BE GROMMETTED ON END GOING TO BUSBAR TO PREVENT RODENTS AND INSECTS FROM ENTERING. A #2 AWG GROUND CABLE SHALL BE ATTACHED TO THE GROUND BUSBAR ATTACHED TO THE ADJACENT ITS POLE AND ROUTED THROUGH THE CONDUIT CONNECTING THE TWO ENCLOSURES AND ATTACHED TO THE GROUND BUSBAR ATTACHED TO THE SOLAR POLE. THE GROUND BUSBAR SHALL CONNECT TO A GROUND ROD (IN AN INSPECTION WELL) FOR THE SOLAR GENERATOR.
6. THE SOLAR POWER GENERATOR GROUND ROD SHALL BE CONNECTED TO THE GROUND ROD FOR THE ITS ENCLOSURE VIA A #2 AWG BARE GROUND CABLE EXOTHERMIC WELDED TO BOTH GROUND RODS.
7. CONTRACTOR TO PROVIDE ALL POWER AND GROUND WIRING REQUIRED FOR SYSTEM OPERATION WITHIN AND OUTSIDE THE ENCLOSURE.
8. BACKFILL HELIX FOUNDATION TO THE TOP OF THE POLE BASE ON ALL SIDES.
9. ALL CABLING (INCLUDING CABLING INSIDE THE ENCLOSURE) SHALL BE OUTDOOR RATED. THE GROUND WIRE (WHITE) IN THE POWER CABLE SHALL BE TAPED GREEN.
10. ENCLOSURE SHALL BE VENTED AND CONTAIN BATTERIES AND SOLAR CONTROLLER.
11. SOLAR PANELS SHALL FACE 186 DEGREES FROM MAGNETIC NORTH AND SHALL BE TILTED 57 DEGREES FROM THE HORIZON.

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.

NOTE TO DESIGNER

THE SOLAR POWER GENERATOR ASSEMBLY SHALL BE USED WITH SITES WITH CCTV AND OTHER DEVICES WITH GREATER POWER DEMAND. FOR SITES WITH ONLY MVDS, REFER TO M-ITS-1000 SERIES.



SOLAR PANEL & MOUNTING HARDWARE DETAILS

(N.T.S.)

M-ITS-1400



SOLAR POWER GENERATOR DETAILS

DATE
3-01-2021

NEMA 4X ELECTRICAL BOX
(SHALL CONTAIN SOLAR CONTROLLER, INVERTER, BATTERIES AND ELECTRONICS)

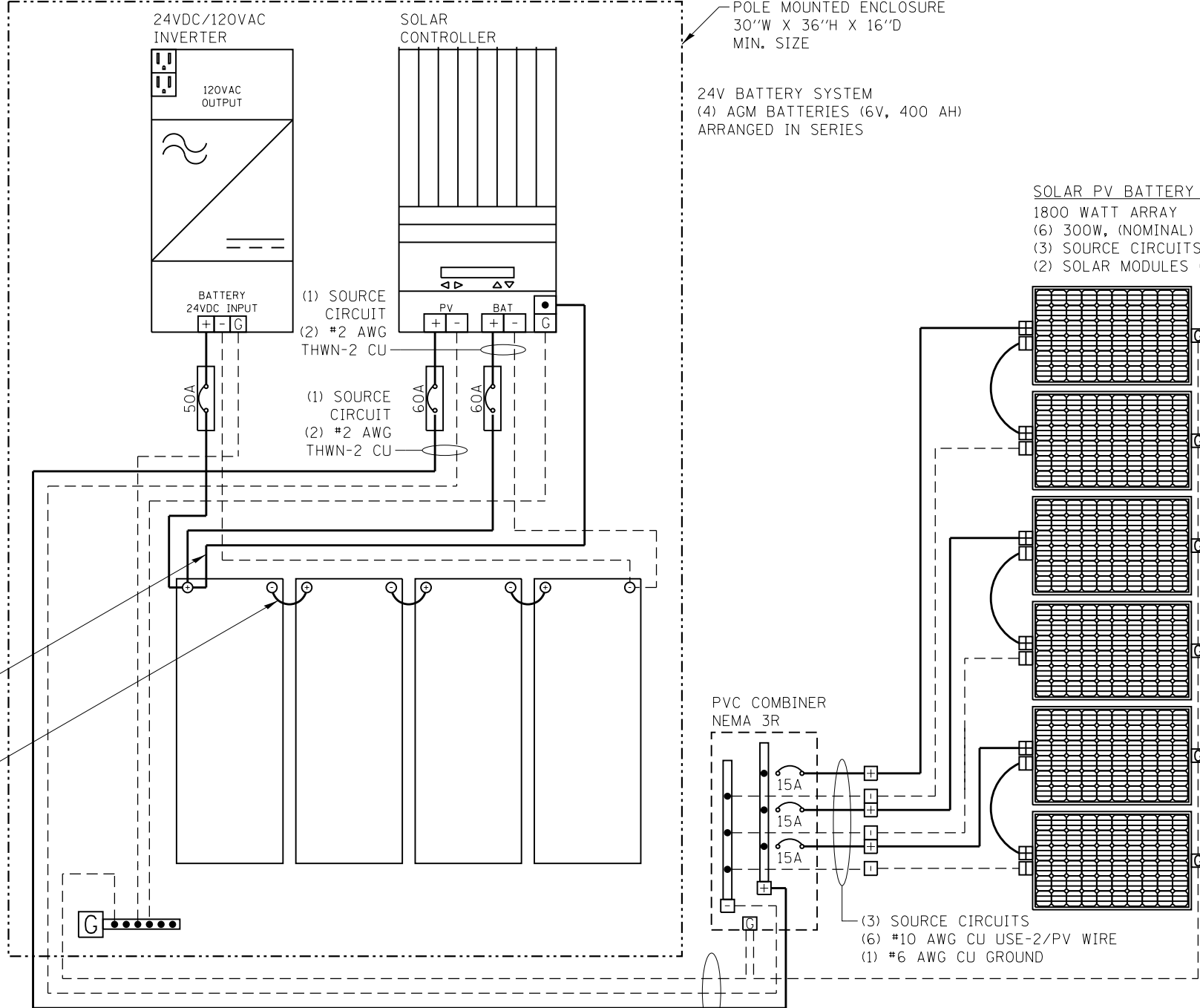
POLE MOUNTED ENCLOSURE
30"W X 36"H X 16"D
MIN. SIZE

24V BATTERY SYSTEM
(4) AGM BATTERIES (6V, 400 AH)
ARRANGED IN SERIES

SOLAR PV BATTERY SYSTEM
1800 WATT ARRAY
(6) 300W, (NOMINAL) SOLAR PANELS
(3) SOURCE CIRCUITS (IN PARALLEL)
(2) SOLAR MODULES (IN SERIES)

TEMPERATURE
SENSOR CABLE

BATTERY TO BATTERY CONDUCTORS
2/0 AWG THWN-2 CU
(SHALL BE EQUAL LENGTH TO
EQUALIZE BATTERY SYSTEM)



PVC COMBINER
NEMA 3R

(3) SOURCE CIRCUITS
(6) #10 AWG CU USE-2/PV WIRE
(1) #6 AWG CU GROUND

(1) SOURCE CIRCUIT
(2) #6 AWG THWN-2 CU
(1) #10 AWG THWN-2 CU GND
3/4" EMT CONDUIT

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M-ITS-1401



SOLAR POWER
GENERATOR CABINET
1-LINE ELECTRICAL DIAGRAM

DATE
3-1-2019