

Illinois Tollway Base Sheet Revisions
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Section M	Base Sheet Drawings		
	Drawing	Modification Summary	Effective: 03-01-2023
	Solar Powered Generator (ITS)-Series 1400		
		NO CHANGES	

- New Sheet
- Retired Standard

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PLOT NAME: M-ITS-1400  
PLOT DATE: 11/27/2022  
PLOT TIME: 12:59:28 AM  
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PLOT NAME: p:\m\pdp-us-pw-02\Documents\Illinois Tollway GEG (997688)\Standard Drawings and Base Sheets\Section - M-1400\ITS-1400.dgn

NOTES:

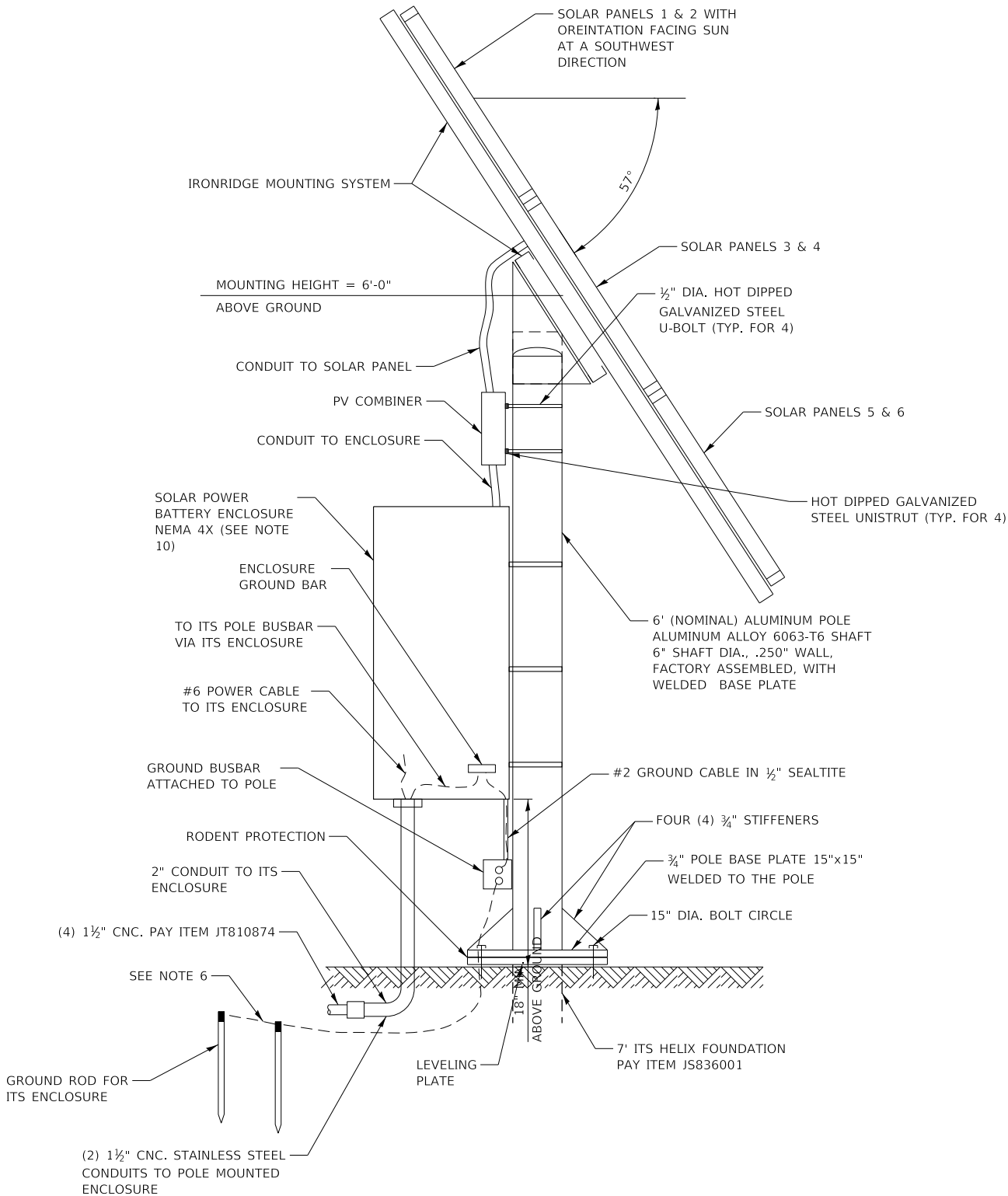
- SOLAR POWER GENERATOR TO INCLUDE PANEL, BRACKETS, CABINET, CHARGER REGULATOR, BATTERIES, POLES, AND CABLES. STRUCTURE TO BE DESIGNED TO MEET STRUCTURAL DESIGN CRITERIA IN SPECIFICATION.
- THE BATTERIES SHALL BE WIRED TO PROVIDE 24V DC POWER TO AN INVERTER FOR 120V AC DELIVERY TO ITS ENCLOSURE.
- CONTRACTOR 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.
- GROUND MOUNTED SOLAR PANEL POLES INSTALLED OUTSIDE THE CLEAR ZONE AND 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.
- 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.
- 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.
- CONTRACTOR TO PROVIDE ALL POWER AND GROUND WIRING REQUIRED FOR SYSTEM OPERATION WITHIN AND OUTSIDE THE ENCLOSURE.
- BACKFILL HELIX FOUNDATION TO THE TOP OF THE POLE BASE ON ALL SIDES.
- ALL CABLING (INCLUDING CABLING INSIDE THE ENCLOSURE) SHALL BE OUTDOOR RATED. THE GROUND WIRE (WHITE) IN THE POWER CABLE SHALL BE TAPED GREEN.
- ENCLOSURE SHALL BE VENTED AND CONTAIN BATTERIES AND SOLAR CONTROLLER.
- SOLAR PANELS SHALL FACE 186 DEGREES FROM MAGNETIC NORTH AND SHALL BE TILTED 57 DEGREES FROM THE HORIZON.
- THE LOCATION OF THE SOLAR POWER GENERATOR SHALL BE AT A LOCATION FACING SOUTH WEST AND CLEAR FROM THE SHADOW OF TREES AND OTHER STRUCTURES. SHALL HAVE DIRECT SUNLIGHT FACING THE SOLAR PANELS.

NOTE TO DESIGNER

THIS BASE SHEET SHOWS TYPICAL 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 BY THE DESIGNER PRIOR TO INSERTION OF THE SHEET 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  
NOT TO SCALE



SOLAR POWER GENERATOR  
DETAILS

VERSION: 2022-03	STANDARD: M-ITS-1400	SHEET: 1 OF 1
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PLOT SCALE: 0:2.000000"=1' (in.) PAGE SIZE: 17x11 (in.)

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

TEMPERATURE  
SENSOR CABLE

TO ITS ENCLOSURE  
FOR 120 VAC

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

24VDC/120VAC  
INVERTER

120VAC  
OUTPUT

BATTERY  
24VDC INPUT

SOLAR  
CONTROLLER

PV

BAT

+

+

-

-

G

G

(1) SOURCE  
CIRCUIT  
(2) #2 AWG  
THWN-2 CU

(1) SOURCE  
CIRCUIT  
(2) #2 AWG  
THWN-2 CU

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

CONTRACTOR TO SPECIFY THE PURCHASE  
ORDER NUMBER AND PROJECT NUMBER OF  
THE SOLAR CONTROLLER AND INVERTER TO  
THE ILLINOIS TOLLWAY. ORIGINAL P.O. AND  
PROJECT NUMBERS ARE REQUIRED FOR THE  
MANUFACTURER TO PROVIDE AFTER SALE  
SERVICE TO THE ILLINOIS TOLLWAY ITS  
MAINTENANCE TEAM.

#### SOLAR PV BATTERY SYSTEM

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

PVC COMBINER  
NEMA 3R

15A

15A

15A

(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  
¾" EMT CONDUIT



#### SOLAR POWER GENERATOR CABINET 1-LINE ELECTRICAL DIAGRAM

VERSION:  
2022-03

STANDARD:  
M-ITS-1401

SHEET:  
1 OF 1