

2

3

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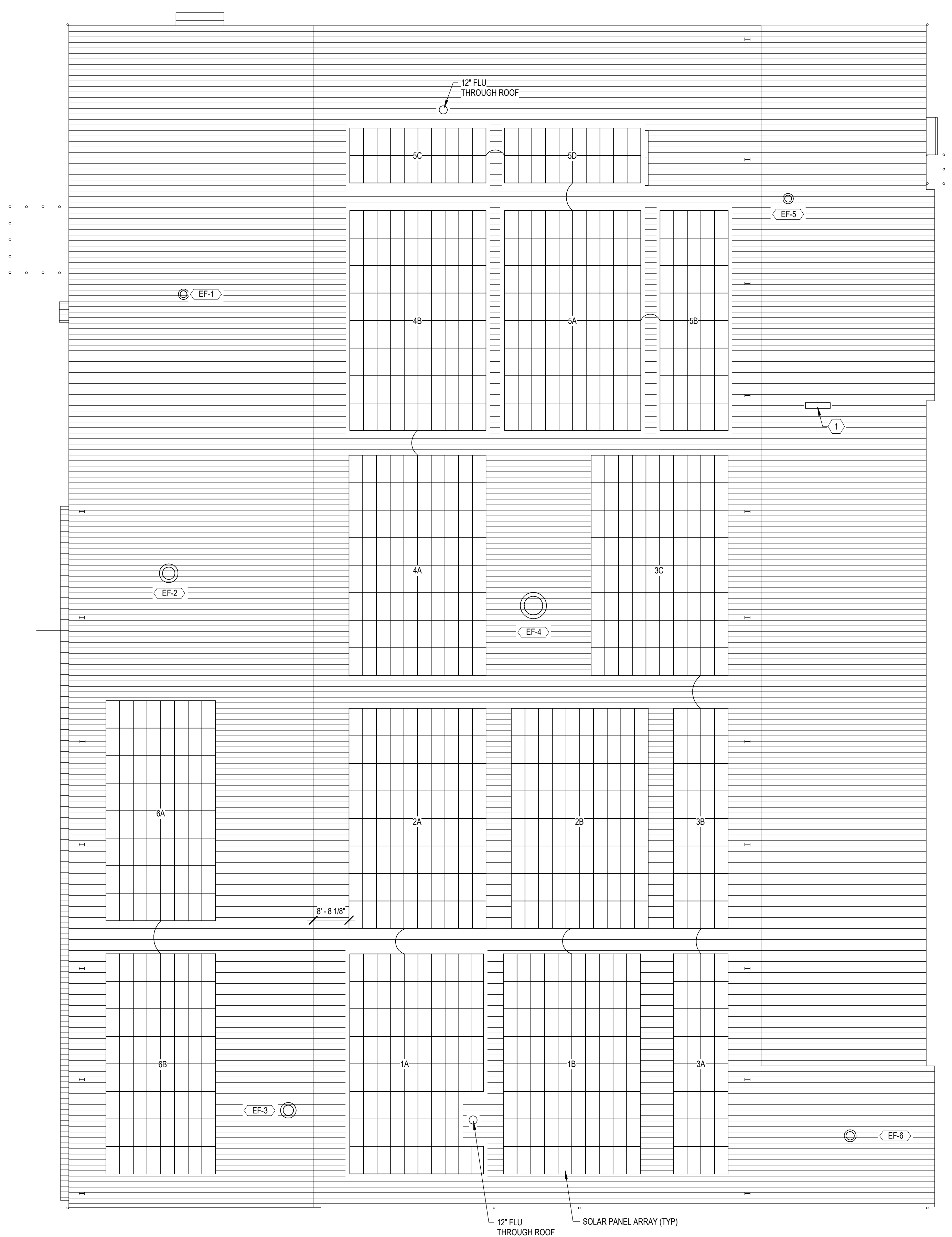
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D

C

B

A



KEYED NOTES:
 ① OPENING IN ROOF FOR PV DC STRING CONDUCTOR CONDUITS TO INVERTERS BELOW.
 COORDINATE OPENING AND SEALING OF CONDUITS WITH G.C. AND ROOFING INSTALLER.

NOTES:
 1. ALL WORK ITEMS ON THIS SHEET ARE ALTERNATE NO. 4.

C&S Engineers, Inc.
 499 Col. Eileen Collins Blvd.
 Syracuse, New York 13212
 Phone: 315-455-2000
 Fax: 315-455-9667
 www.cscos.com

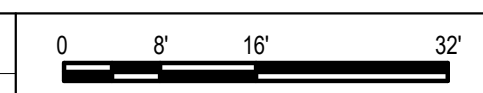


**NEW HIGHWAY FACILITY
 MADISON COUNTY
 BROWN ROAD
 EATON, NY 13334**

MARK	DATE	DESCRIPTION
REVISIONS		
PROJECT NO:	178.024.001	
DATE:	FEBRUARY 20, 2020	
DRAWN BY:	D.W.BARLEY	
DESIGNED BY:	D.W.BARLEY	
CHECKED BY:	J.L.ROBBINS, P.E.	
NO ALTERATION PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK EDUCATION LAW		

ELECTRICAL ROOF PLAN

E-106



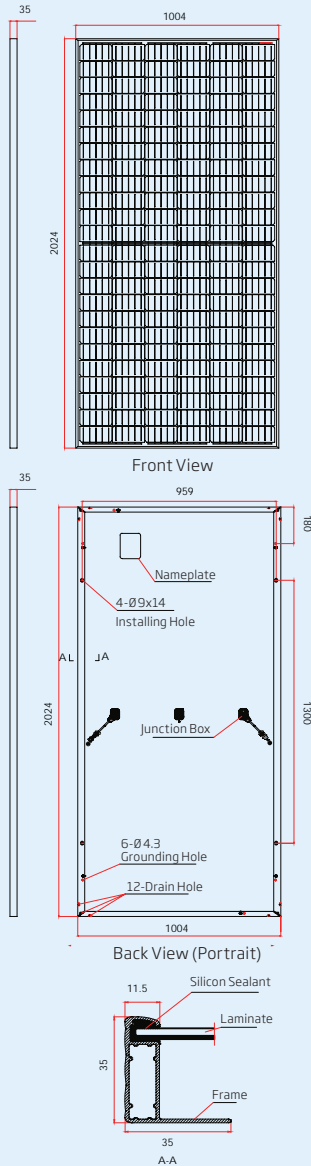
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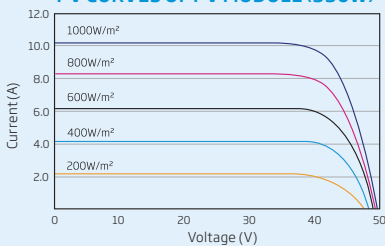
3

4

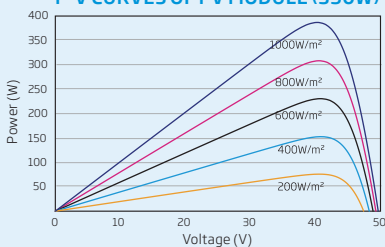
DIMENSIONS OF PV MODULE TSM-DE15H(II) (unit: mm)



I-V CURVES OF PV MODULE (390W)



P-V CURVES OF PV MODULE (390W)



ELECTRICAL DATA @ STC	TSM-380 DE15H(II)	TSM-385 DE15H(II)	TSM-390 DE15H(II)	TSM-395 DE15H(II)	TSM-400 DE15H(II)
Peak Power Watts-P _{MAX} (Wp)*	380	385	390	395	400
Power Output Tolerance-P _{MAX} (W)	0/+5	0/+5	0/+5	0/+5	0/+5
Maximum Power Voltage-U _{MPP} (V)	39.6	40.1	40.5	40.8	41.1
Maximum Power Current-I _{MPP} (A)	9.59	9.61	9.64	9.69	9.74
Open Circuit Voltage-U _{OC} (V)	48.1	48.5	49.7	50.1	50.4
Short Circuit Current-I _{SC} (A)	9.99	10.03	10.08	10.13	10.18
Module Efficiency η_m (%)	18.7	18.9	19.2	19.4	19.7

STC: Irradiance 1000 W/m², Cell Temperature 25°C, Air Mass AM1.5
* Measuring tolerance: $\pm 3\%$

ELECTRICAL DATA @ NMOT	TSM-380 DE15H(II)	TSM-385 DE15H(II)	TSM-390 DE15H(II)	TSM-395 DE15H(II)	TSM-400 DE15H(II)
Maximum Power-P _{MAX} (Wp)	287	291	295	298	302
Maximum Power Voltage-U _{MPP} (V)	37.4	37.9	38.4	38.7	38.9
Maximum Power Current-I _{MPP} (A)	7.66	7.67	7.68	7.71	7.76
Open Circuit Voltage-U _{OC} (V)	44.4	45.6	46.8	47.2	47.4
Short Circuit Current-I _{SC} (A)	8.05	8.09	8.13	8.17	8.21

NMOT: Irradiance 800 W/m², Ambient Temperature 20°C, Wind Speed 1 m/s.

MECHANICAL DATA

Solar Cells	Monocrystalline
Cell Orientation	144 cells (6 x 24)
Module Dimensions	2024 x 1004 x 35 mm
Weight	22.8 kg
Glass	3.2 mm, High Transmission, AR Coated Heat Strengthened Glass
Encapsulant Material	EVA
Backsheet	White
Frame	35 mm Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Cable 4.0mm ² , Portrait: N 140mm/P 285mm, Landscape: N 1400 mm /P 1400 mm
Connector	TS4

TEMPERATURE RATINGS

NMOT (Nominal Module Operating Temperature)	41°C ($\pm 3K$)
Temperature Coefficient of P _{MAX}	-0.37%/K
Temperature Coefficient of U _{OC}	-0.29%/K
Temperature Coefficient of I _{SC}	0.05%/K

MAXIMUM RATINGS

Operational Temperature	-40 to +85°C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	20 A
Snow Load	5400 Pa (3600 Pa*)
Wind Load	2400 Pa (1600 Pa*)

*design load with safety factor 1.5
(DO NOT connect Fuse in Combiner Box with two or more strings in parallel connection)

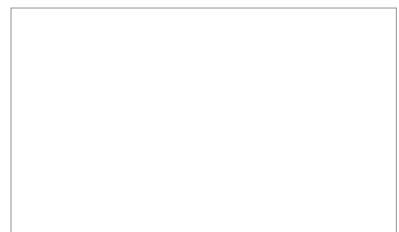
PACKAGING CONFIGURATION

Modules per box:	30 pieces
Modules per 40' container:	660 pieces

WARRANTY

10 year Product Workmanship Warranty
25 year Linear Performance Warranty

(Please refer to product warranty for details)



TSM_EN_2019_A