



HISTORIC PRESERVATION COMMISSION

Marc Elrich
County Executive

Sandra I. Heiler
Chairman

Date: December 6, 2019

MEMORANDUM

TO: Hadi Mansouri
Department of Permitting Services

FROM: Dan Bruechert
Historic Preservation Section
Maryland-National Capital Park & Planning Commission

SUBJECT: Historic Area Work Permit #896242: Solar Panel Installation

The Montgomery County Historic Preservation Commission (HPC) has reviewed the attached application for a Historic Area Work Permit (HAWP). This application was **Approved** at the December 4, 2019 HPC meeting.

The HPC staff has reviewed and stamped the attached construction drawings.

THE BUILDING PERMIT FOR THIS PROJECT SHALL BE ISSUED CONDITIONAL UPON ADHERENCE TO THE ABOVE APPROVED HAWP CONDITIONS AND MAY REQUIRE APPROVAL BY DPS OR ANOTHER LOCAL OFFICE BEFORE WORK CAN BEGIN.

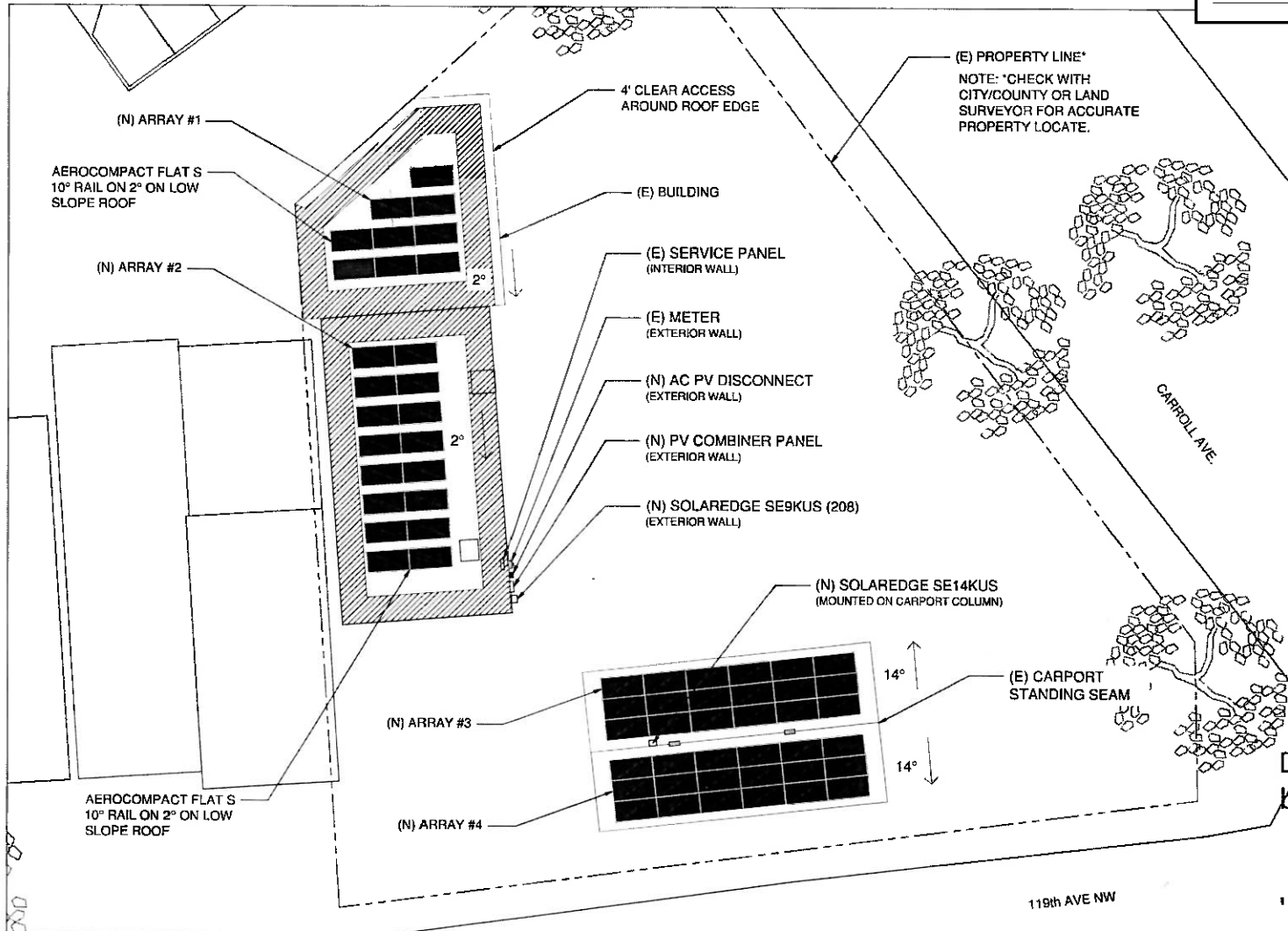
Applicant: Depeswar Doley(Sarah Feit, Agent)
Address: 7224 Carroll Ave., Takoma Park

This HAWP approval is subject to the general condition that the applicant will obtain all other applicable Montgomery County or local government agency permits. After the issuance of these permits, the applicant must contact this Historic Preservation Office if any changes to the approved plan are made. Once work is complete the applicant will contact Dan Bruechert at 301.563.3400 or dan.bruechert@montgomeryplanning.org to schedule a follow-up site visit.



APPROVED
 Montgomery County
 Historic Preservation Commission
Sandra L. Heiler

REVIEWED
 By Dan.Bruechert at 2:37 pm, Dec 06, 2019



OFFICIAL USE

LEGEND:
 (E) = EXISTING
 (N) = NEW
 (F) = FUTURE

SITE PLAN
 SCALE: 1/16" = 1'-0"

PE STAMP



Digitally signed
 by David R. Hall
 Date:
 2019.11.01
 '11:46:27 -04'00

CONTRACTOR
 REVOLUTION SOLAR
 10746 JUDY LANE
 COLUMBIA, MD 21044
 Ph: (443)-865-5039
 Contractor# 101139



RS AUTO INC.
 Residential Building Grid Interactive Solar Installation
 7224 CARROLL AVE, TAKOMA PARK, MD 20912
 Ph: (240) 620-3471

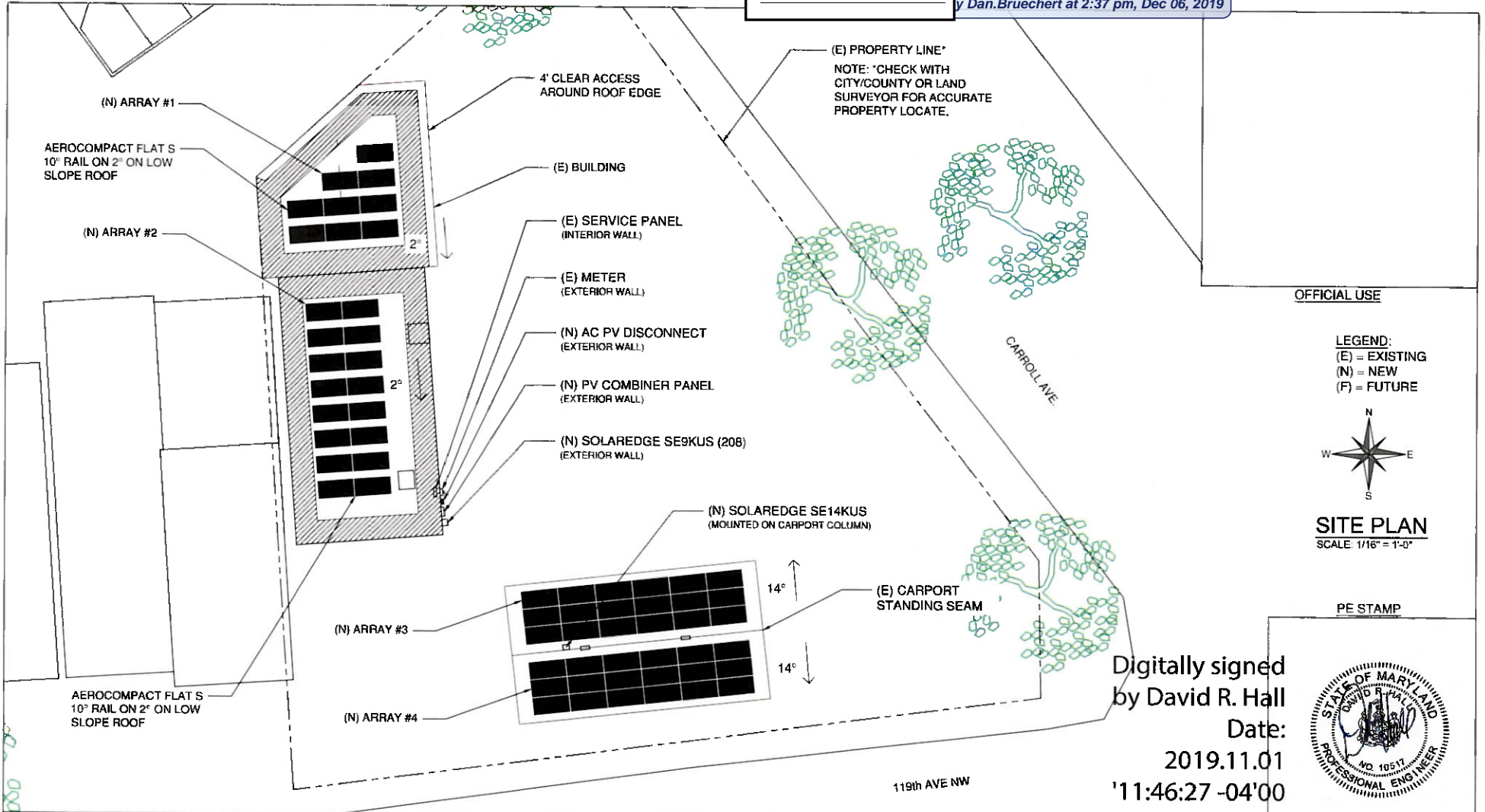
SITE PLAN		Page:
System AC Size @ STC: 23.4 kW	System DC Size @ STC: 22.57 kW	PV-1
(61) TRINA TSM-370DE14A(II) PV MODULES & (61) SE P400 POWER OPTIMIZERS		
(1) SOLAREDGE SE9KUS (208) INVERTER & (1) SOLAREDGE SE 14KUS (208) INVERTER		
Drawn by: DA	Rev: PERMIT SET	Date: 10/26/2019

SITE PLAN

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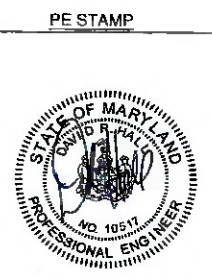


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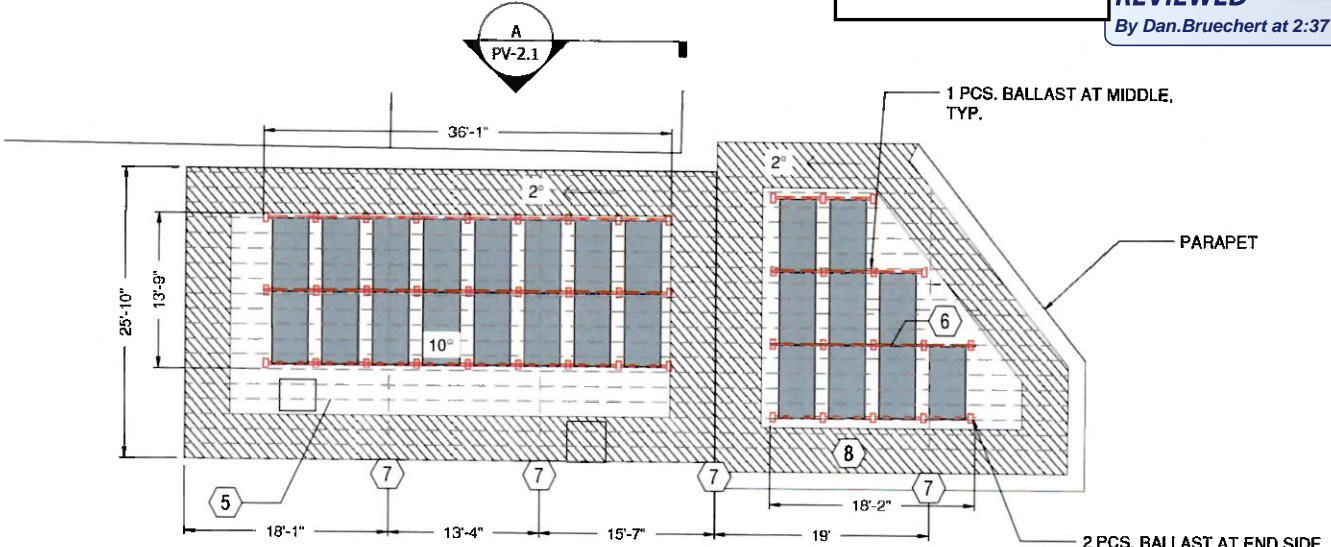
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(61) TRINA TSM-370DE14A(II) PV MODULES & (61) SE P400 POWER OPTIMIZERS		
(1) SOLAREEDGE SE9KUS (208) INVERTER & (1) SOLAREEDGE SE 14KUS (206) INVERTER		
Drawn by: DA	Rev: PERMIT SET	Date: 10/26/2019

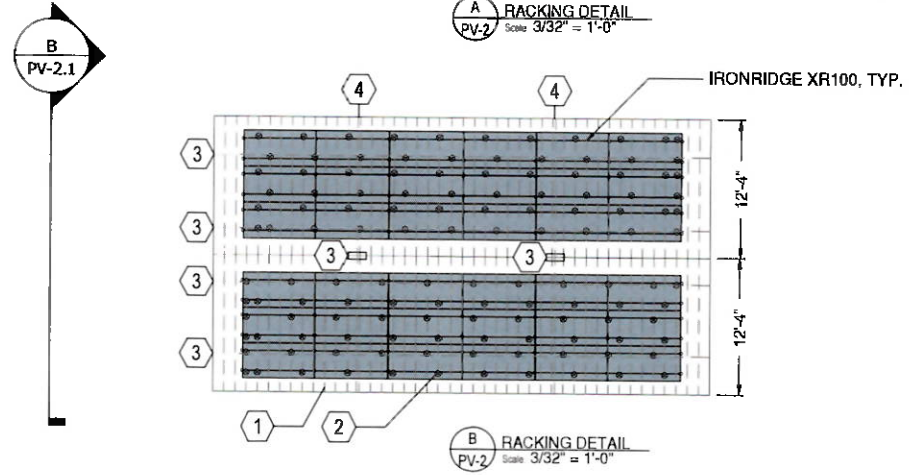
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A RACKING DETAIL
 Scale 3/32" = 1'-0"



B RACKING DETAIL
 Scale 3/32" = 1'-0"

- OFFICIAL USE**
- KEYED NOTES:**
- 1 STANDING SEA W/ 4" PURLINS ON EXISTING CARPORT.
 - 2 ACE CLAMP, TYP. FIELD VERIFY SEMA PROFILE AND SPACING
 - 3 6X12 STEEL TUBES
 - 4 W 9"x12.5"
 - 5 2x12 @ 12" O.C., TYP.
 - 6 AEROCOMPACT FLAT S 10° RAIL, TYP.
 - 7 16" X 7.25" I-BEAM MID SUPPORT, TYP.
 - 8 4'-0" SET BACK, TYP.

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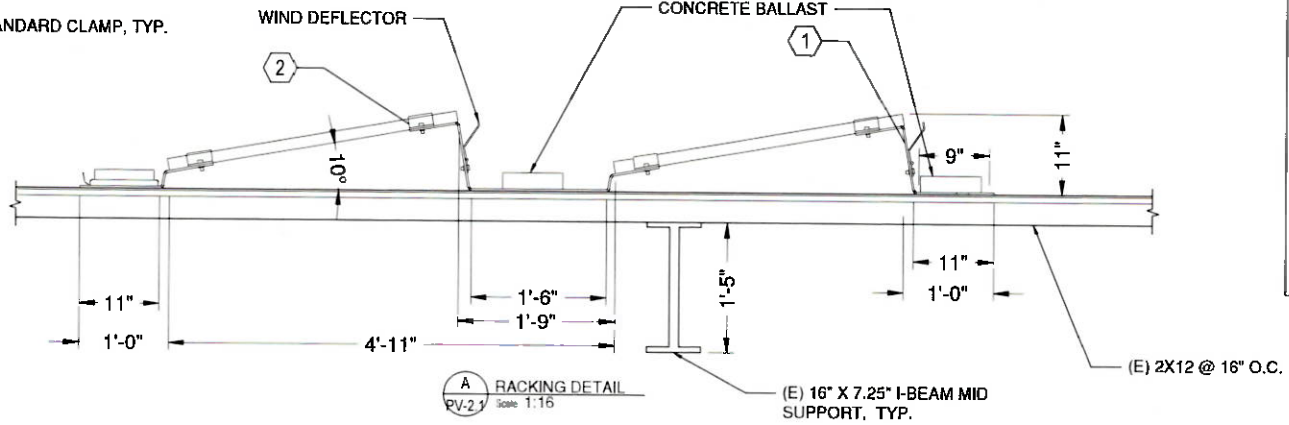
FRAMING PLAN		Page
System AC Size @ STC 23.4 kW	System DC Size @ STC 22.57 kW	PV-2
(61) TRINA TSM-370DE14A(I) PV MODULES & (61) SE P400 POWER OPTIMIZERS		
(1) SOLAREEDGE SE8KUS (208) INVERTER & (1) SOLAREEDGE SE 14KUS (208) INVERTER		
Drawn by DA	Rev PERMIT SET	Date 10/26/2018

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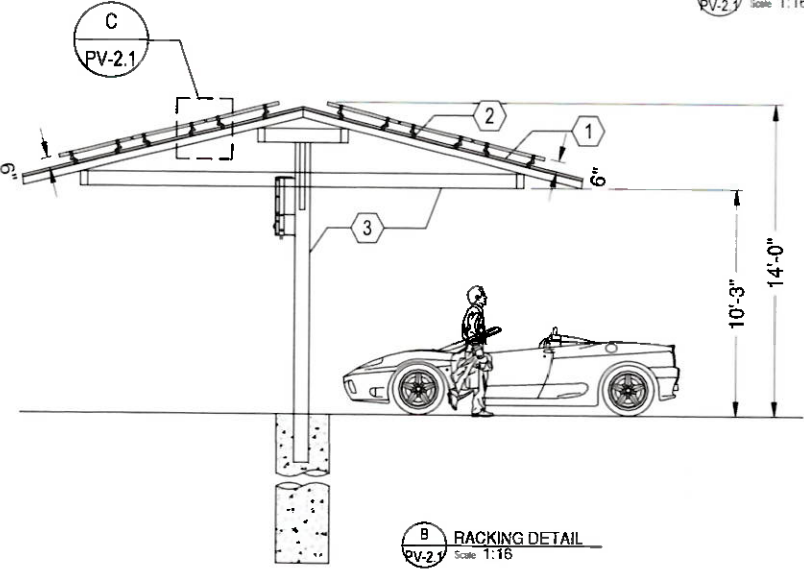
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KEYED NOTES:

- 1 AEROCOMPACT FLAT S 10° RAIL, TYP.
- 2 AEROCOMPACT STANDARD CLAMP, TYP.



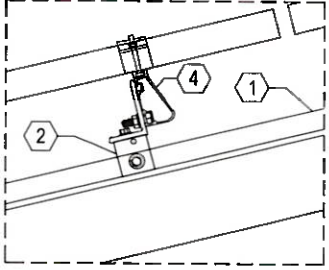
A RACKING DETAIL
 Scale 1:16



B RACKING DETAIL
 Scale 1:16

KEYED NOTES:

- 1 STANDING SEAM ROOF PANEL N EXISTING CARPORT
- 2 ACE CLAMP, FIELD VERIFY SEAM PROFILE AND SPACING
- 3 4X10 STEEL TUBE, 5/8\" GAGE
- 4 IRONRIDGE XR100



C CONNECTION DETAIL
 Scale NTS

OFFICIAL USE

GENERAL NOTES:

- A. REFER TO STRUCTURAL CALCULATIONS.

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MECHANICAL DETAILS	
System AC Size @ STC 23.4 kW	System DC Size @ STC 22.57 kW
(51) TRINA TSM-370DE14A(II) PV MODULES & (61) SE P400 POWER OPTIMIZERS	
(1) SOLAREEDGE SE9KUS (208) INVERTER & (1) SOLAREEDGE SE 14KUS (208) INVERTER	
Drawn by: DA	Date: 10/26/2019
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Page
 PV-2.1

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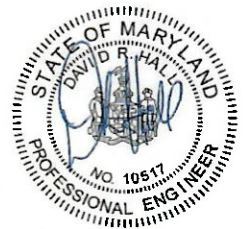
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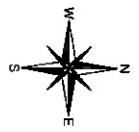
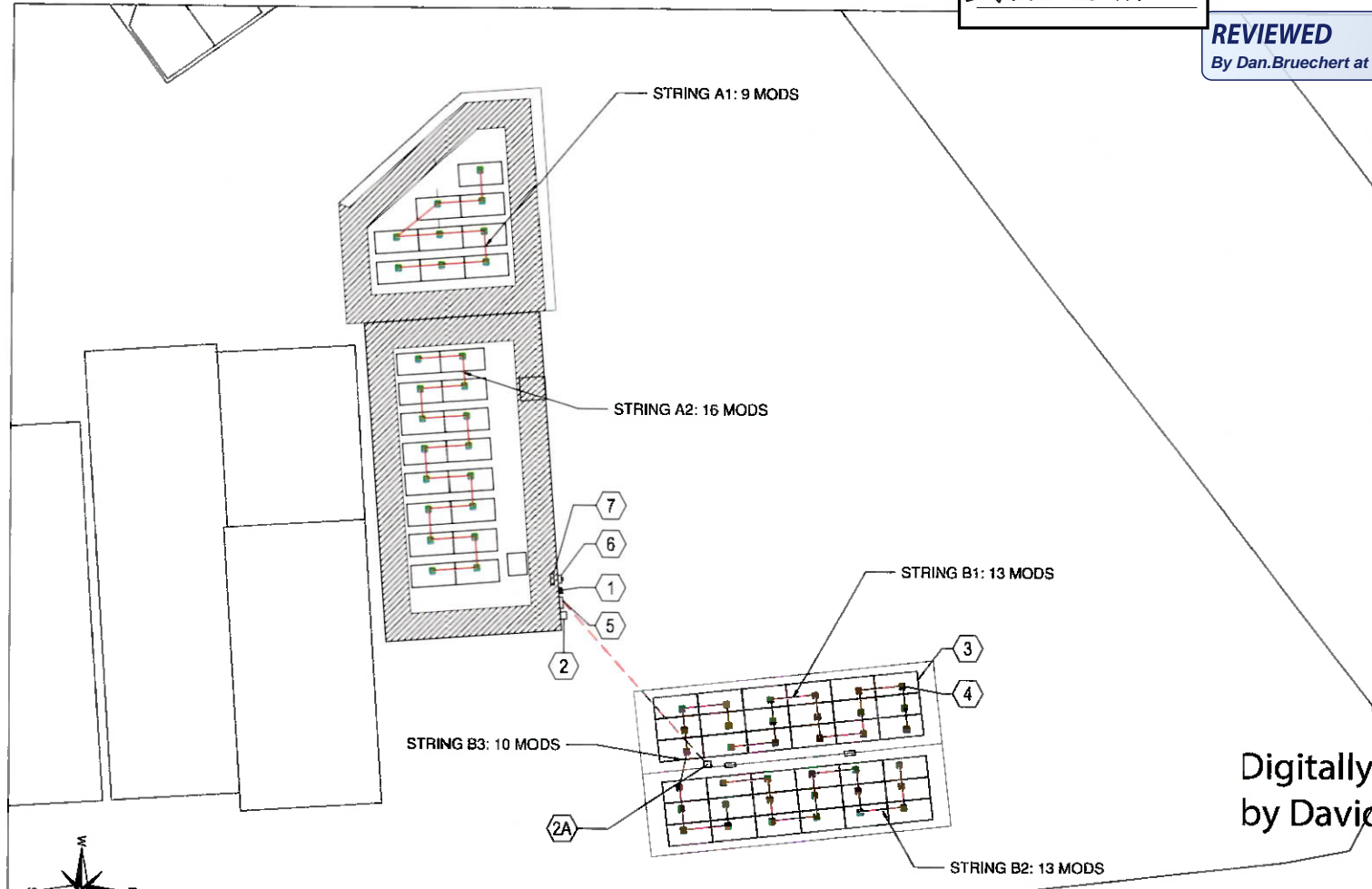
KEYED NOTES:

- ① (N) AC DISCONNECT
- ② (N) SOLAREEDGE SE9KUS (208)
- ②A (N) SOLAREEDGE SE14KUS (208)
- ③ (N) PV MODULE
- ④ (N) SE P400 POWER OPTIMIZER
- ⑤ (N) AC PV COMBINER
- ⑥ (E) METER
- ⑦ (E) SERVICE PANEL

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ELECTRICAL PLAN
 SCALE: 1/8" = 1'-0"

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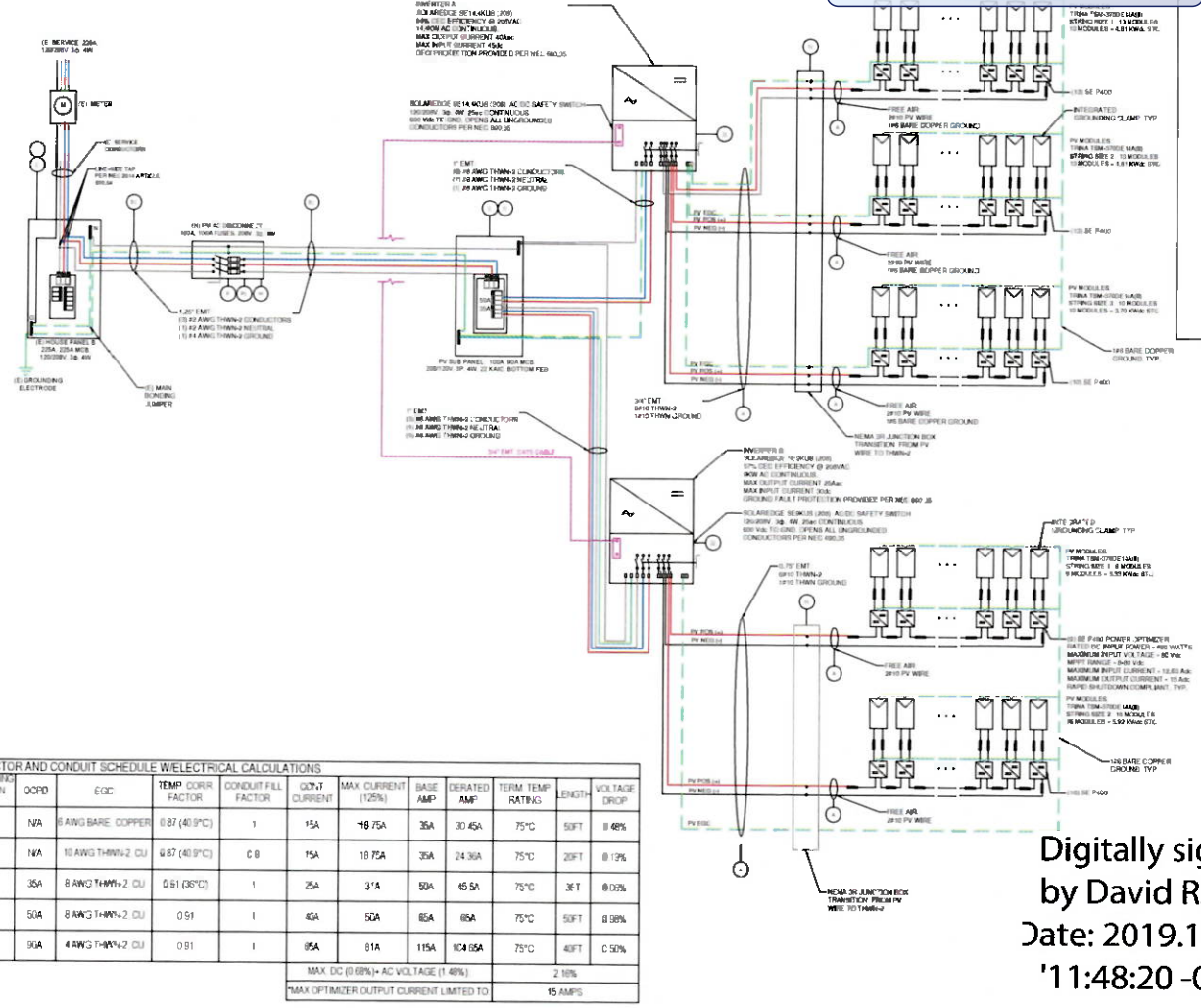
ELECTRICAL PLAN		Page:
System AC Size @ STC 23.4 kW	System DC Size @ STC 22.57 kW	PV-3
(61) TRINA TSM-370DE14A(II) PV MODULES & (61) SE P400 POWER OPTIMIZERS		
(1) SOLAREEDGE SE9KUS (208) INVERTER & (1) SOLAREEDGE SE 14KUS (208) INVERTER		
Drawn by: DA	Rev PERMIT SET	Date: 10/26/2019

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Sandra Skiles

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By Dan.Bruechert at 2:37 pm, Dec 06, 2019

ELECTRICAL NOTES

- 1 THE OUTPUT VOLTAGE OF THE POWER OPTIMIZERS ARE REGULATED BY THE INVERTER. THEY ARE NOT IMPACTED BY THE NUMBER OF MODULES IN THE STRING. THE CONTINUOUS CURRENT OF A SINGLE STRING IS EQUAL TO THE MAXIMUM OUTPUT CURRENT OF THE OPTIMIZER.
- 2 THE SOLAR EDGE INVERTER IS EQUIPPED WITH A RAPID SHUTDOWN FEATURE WHICH CONFORMS TO NEC 690.12 (2014), WHICH REQUIRES THAT A RAPID SHUTDOWN FEATURE EXISTS TO DE-ENERGIZE PV SOURCE CIRCUITS FROM ALL SOURCES TO LESS THAN 30 VOLTS WITHIN 10 SECONDS.
- 3 UNGROUNDED SYSTEM DC CONDUCTORS SHALL BE COLOR-CODED AS FOLLOWS. DC POSITIVE SHALL BE RED (OR MARKED RED) AND DC NEGATIVE SHALL BE BLACK (OR MARKED BLACK).
- 4 DC VOLTAGE RANGE OF THE ARRAY IS REGULATED BY INVERTER AND WILL BE CONSTANT AT 400V MAX DC VOLTAGE OF THE PV MODULE IS EXPECTED TO BE 53.52V AT -12.3°C (-12.3°C - 25°C) X 0.29%/°C + 48.3V + 53.52V WHICH IS LESS THAN SE P400 POWER OPTIMIZER MAX INPUT VOLTAGE OF 60V.
- 5 INTEGRATED DC DISCONNECT IS PROVIDED WITH INVERTER. DISCONNECT IS LISTED FOR USE WITH SOLAR EDGE UL 1741 LISTED STRING INVERTERS.
- 6 PER MANUFACTURER'S RECOMMENDATIONS FOR SINGLE PHASE 10-11 KW INVERTERS AND FOR THREE-PHASE INVERTERS. USE ONLY COPPER CONDUCTORS RATED FOR A MINIMUM OF 90°C/194°F.

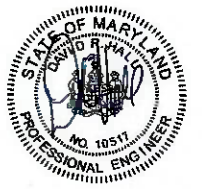


MODULE SPECIFICATIONS	
MAKE AND MODEL	TRINA TSM-370DE 14A(I)II
POWER STC	370W
Imp	9.33A
Vmp	39.7V
Voc	48.3V
Isc	9.94A

CONDUCTOR AND CONDUIT SCHEDULE W/ELECTRICAL CALCULATIONS															
CIRCUIT	TYPICAL	CONDUCTOR	CONDUIT	CURRENT CARRYING CAPACITY IN CONDUIT	ODPD	EGC	TEMP CORR FACTOR	CONDUIT FILL FACTOR	CONF. CURRENT	MAX CURRENT (125%)	BASE AMP	DERATED AMP	TEMP CORR FACTOR	LENGTH	VOLTAGE DROP
PV STRING TO J-BOX	1	10 AWG PV WIRE CU	FREE AIR	2	N/A	8 AWG BARE COPPER	0.87 (40.9°C)	1	15A	18.75A	35A	30.45A	75°C	50FT	0.48%
J-BOX TO INVERTER	1	10 AWG PV WIRE CU	3/75" DIA EMT	6	N/A	10 AWG THHN-2 CU	0.87 (40.9°C)	0.8	15A	18.75A	35A	24.36A	75°C	20FT	0.13%
INVERTER B TO PV COMBINER PANEL	1	8 AWG THHN-2 CU	1" DIA EMT	3	35A	8 AWG THHN-2 CU	0.91 (35°C)	1	25A	31A	50A	45.5A	75°C	3FT	0.03%
INVERTER A TO PV COMBINER PANEL	1	8 AWG THHN-2 CU	1" DIA EMT	3	50A	8 AWG THHN-2 CU	0.91	1	40A	50A	65A	65A	75°C	50FT	0.38%
PV COMBINER PANEL TO INTERCONNECTION	1	2 AWG THHN-2 CU	1.25" DIA EMT	3	90A	4 AWG THHN-2 CU	0.91	1	95A	81A	115A	104.05A	75°C	40FT	0.50%
														2.10%	
														15 AMPS	

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LINE DIAGRAM		Page
System AC Size @ STC 23.4 kW	System DC Size @ STC 22.57 kW	PV-4
(61) TRINA TSM-370DE 14A(I)II PV MODULES & (61) SE P400 POWER OPTIMIZERS	(1) SOLAREEDGE SE8KUS (208) INVERTER & (1) SOLAREEDGE SE 14KUS (208) INVERTER	
Drawn by: DA	Rev: PERMIT SET	Date: 10/26/2019

A **WARNING - PHOTOVOLTAIC POWER SOURCE**

LABEL EVERY 10'

B1 **CAUTION SOLAR CIRCUIT**

LABEL EVERY 10'

C **WARNING**
DUAL POWER SUPPLY
 SOURCES: UTILITY GRID AND SOLAR PHOTOVOLTAIC SYSTEM

REQUIRED BY: NEC 705.12(D)(3)
 PLACEMENT: MAIN SERVICE PANEL

M **PHOTOVOLTAIC SYSTEM AC DISCONNECT**

OPERATING AMPS 65A
 OPERATING VOLTAGE 208V

LOCATION: MAIN AC DISCONNECT

N **WARNING**
DC JUNCTION BOX
 THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

O **PHOTOVOLTAIC SYSTEM DC DISCONNECT**

RATED MPP CURRENT 33A
 RATED MPP VOLTAGE 400V
 MAXIMUM SYSTEM VOLTAGE 600V
 SHORT CIRCUIT CURRENT 45A

LOCATION: BUILT IN DC DISCONNECT
 REQUIRED BY NEC 690.53. ON SOLAREEDGE SE9KUS (208)

J **PHOTOVOLTAIC SYSTEM DC DISCONNECT**

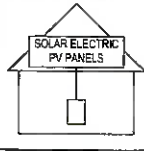
RATED MPP CURRENT 23A
 RATED MPP VOLTAGE 400V
 MAXIMUM SYSTEM VOLTAGE 500V
 SHORT CIRCUIT CURRENT 30A

LOCATION: BUILT IN DC DISCONNECT
 REQUIRED BY NEC 690.53. ON SOLAREEDGE SE14.4KUS (208)

P **RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM**

P1 **SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN**

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY

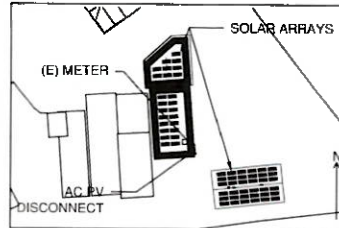


LABEL FOR PV SYSTEMS THAT SHUT DOWN THE ARRAY AND THE CONDUCTORS LEAVING THE ARRAY

THE LABEL SHALL UTILIZE CAPITALIZED CHARACTERS WITH A MINIMUM HEIGHT OF 3/8" IN BLACK ON YELLOW BACKGROUND, AND THE REMAINING CHARACTERS SHALL BE CAPITALIZED WITH A MINIMUM HEIGHT OF 3/16" IN BLACK ON WHITE BACKGROUND.

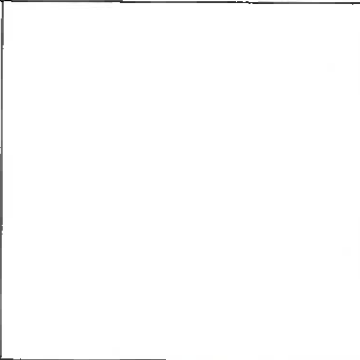
D **CAUTION**

POWER TO THIS BUILDING IS SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN:



WARNING
ELECTRIC SHOCK HAZARD
 DO NOT TOUCH TERMINALS
 TERMINALS ON BOTH LINE AND
 LOAD SIDE MAY BE ENERGIZED IN
 THE OPEN POSITION

LOCATION: BUILDING MAIN SERVICE PANEL



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LABELS		Page
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