MASON
AND ASSOCIATES LTD
PO BOX HM1477
HAMILTON, HMFX BERMUDA

17th December 2021

Department of Planning
Dame Lois Brown-Evans Building, 5th Floor
58 Court Street,
Hamilton, HM 12

Attn: Planning Department

Dear Sirs,

Re: Microgrid Solar Project, National Sports Centre, Devonshire

Our firm has been engaged by Atlantic Energy Solutions Group to submit the above application for the installation of a microgrid system at the National Sports Centre. The carport and solar panel system will be installed over the existing parking area on the west side of the property.

The proposed work includes the erection of a 390ft x 100ft carport structure that will support 1498 solar panels. A 15ft x 9ft electrical room will be constructed to house auxiliary equipment.

The total system will be 756kW split across three (3) electrical meters as follows:

- North Pavilion – 254 panels (128kW)
- Aquatic Centre – 990 panels (500kW)
- Grand Stand – 254 panels (128kW)

The details of the proposed system are included in the attached documents.

We look forward to your favorable review of this application.

Sincerely,

Mason and Associates Ltd

BERMUDA NSC
756.49 kW (DC) PHOTOVOLTAIC PV SYSTEM
65 ROBERTS AVENUE, DEVONSHIRE, BM

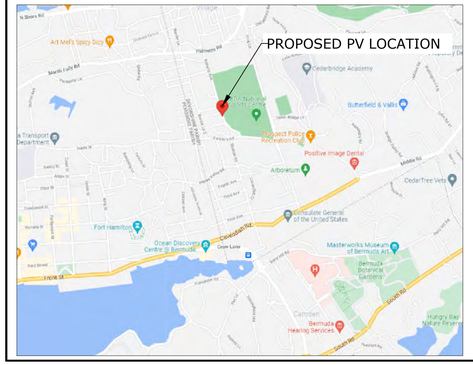
SHEET CATALOG

APPLICABLE CODES:

2011 NATIONAL ELECTRICAL CODE
2012 INTERNATIONAL BUILDING CODE
2012 INTERNATIONAL FIRE CODE
ADDITIONALLY, CONFORM TO ALL LOCAL ORDINANCES AND REQUIREMENTS

SCOPE OF WORK:
DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM TEMPERATURE: 20°C
MAXIMUM TEMPERATURE: 40°C

VICINITY MAP



GENERAL NOTES

1. EXISTING PLUMBING VENTS, SKYLIGHTS, EXHAUST OUTLETS, VENTILATION INTAKE AIR OPENINGS(EXCEPT THOSE DESIGNED TO GO UNDER SOLAR PANEL SUCH AS THE ONES ON THIS BUILDING) SHALL NOT BE COVERED BY THE SOLAR PHOTOVOLTAIC SYSTEM.
2. ALL EQUIPMENT INTENDED FOR USE IN PHOTOVOLTAIC POWER SYSTEMS SHALL BE IDENTIFIED AND LISTED FOR THE APPLICATION. (NEC 690.4(D))
3. ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED, INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.
4. ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250.
5. ALL CIRCUITS CONNECTED TO MORE THAN ONE SOURCE SHALL HAVE OVERCURRENT DEVICES LOCATED SO AS TO PROVIDE OVERCURRENT PROTECTION FROM ALL SOURCES. [NEC 690.9(A)]
6. ALL PHOTOVOLTAIC (PV) MODULES SHALL BE MOUNTED ON THE ROOF.
7. THE UTILITY INTERACTIVE INVERTERS SHALL AUTOMATICALLY DE-ENERGIZE ITS OUTPUT TO THE CONNECTED ELECTRICAL PRODUCTION AND DISTRIBUTION NETWORK UPON LOSS OF VOLTAGE IN THE SYSTEM AND SHALL REMAIN IN THAT STATE UNTIL THE ELECTRICAL PRODUCTION AND DISTRIBUTION NETWORK VOLTAGE HAS BEEN RESTORED.[NEC 690.61]
8. DUE TO THE FACT THAT PV MODULES ARE ENERGIZED WHENEVER EXPOSED TO LIGHT, PV CONTRACTOR SHALL DISABLE THE ARRAY DURING INSTALLATION AND SERVICE BY SHORT CIRCUITING, OPEN CIRCUITING, OR COVERING THE ARRAY WITH OPAQUE COVERING. [NEC 690.18]
9. ALL CONDUCTOR EXPOSED TO WEATHER SHALL BE LISTED AND IDENTIFIED FOR USE IN DIRECT SUNLIGHT. [NEC 690.31(B), 310.8(D)]
10. THE MODULE CONDUCTORS MUST BE TYPE USE-2 OR LISTED FOR PHOTOVOLTAIC (PV) WIRE. (NEC 690.31(B))
11. ALL CONDUCTORS SHALL BE MARKED ON EACH END FOR UNIQUE IDENTIFICATION.
12. ALL GROUNDED CONDUCTORS SHALL BE PROPERLY COLOR IDENTIFIED AS WHITE. [NEC 200.6]
13. PV SYSTEM CONNECTED ON THE LOAD SIDE OF THE SERVICE DISCONNECTING MEANS OF THE OTHER SOURCE(S) AT ANY DISTRIBUTION EQUIPMENT ON THE PREMISES SHALL MEET THE FOLLOWING [NEC 705.12(D)]:
14. EACH SOURCE CONNECTION SHALL BE MADE AT A DEDICATED CIRCUIT BREAKER OR FUSIBLE DISCONNECTING [NEC 705.12(D)(1)] THE SUM OF THE AMPERE RATING OF THE OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO THE BUSBAR OR CONDUCTOR SHALL NOT EXCEED 120% OF THE RATING OF BUSBAR OR CONDUCTOR. [NEC 705.12(D)(2)]
15. THE INTERCONNECTION POINT SHALL BE ON THE LOAD SIDE OF ALL GROUND-FAULT PROTECTION EQUIPMENT. [NEC 705.12(D)(3)]
16. EQUIPMENT CONTAINING OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO A BUS BAR OR CONDUCTOR SHALL BE MARKED TO INDICATE THE PRESENCE OF ALL SOURCES. [NEC 705.12(D)(4)]
17. CIRCUIT BREAKER, IF BACKFEED, SHALL BE SUITABLE FOR SUCH OPERATION. [NEC 705.12(D)(5)]
18. TO MINIMIZE OVERHEATING OF THE BUSBAR IN PANELBOARD, THE PANELBOARD MAIN CIRCUIT BREAKER AND THE PV POWER SOURCE CIRCUIT BREAKER SHALL BE PHYSICALLY LOCATED AT THE OPPOSITE END OF THE BUSBAR.
19. ALL THE NEC REQUIRED WARNING SIGNS, MARKINGS, AND LABELS SHALL BE POSTED ON EQUIPMENT AND DISCONNECTS PRIOR TO ANY INSPECTIONS TO BE PERFORMED BY THE BUILDING DEPARTMENT INSPECTOR.
20. METALLIC RACEWAYS OR METALLIC ENCLOSURES ARE REQUIRED AS WIRING METHOD FOR INSIDE THE BUILDING FOR PV SYSTEM. [NEC 690.31(E)]
21. FLEXIBLE, FINE-STRANDED CABLES SHALL BE TERMINATED ONLY WITH TERMINALS, LUGS, DEVICES OR CONNECTOR THAT ARE IDENTIFIED AND LISTED FOR SUCH USE. [NEC 690.31(F)]
22. CONNECTORS SHALL BE OF LATCHED OR LOCKING TYPE. CONNECTORS THAT ARE READILY ACCESSIBLE AND OPERATING AT OVER 30 VOLTS SHALL REQUIRE TOOL TO OPEN AND MARKED "DO NOT DISCONNECT UNDER LOAD" OR "NOT FOR CURRENT INTERRUPTING". [NEC 690.33(C) & (E)(2)]
23. EQUIPMENT GROUNDING CONDUCTOR FOR PV SYSTEMS WITHOUT GROUND FAULT PROTECTION (GFP) AND INSTALLED ON NON-DWELLING UNIT MUST HAVE AMPACITY OF AT LEAST #10 AWG.
24. GROUNDING BUSHINGS ARE REQUIRED AROUND PRE-PUNCHED CONCENTRIC KNOCKOUTS ON THE DC SIDE OF THE SYSTEM (NEC 250.64 C)
25. GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS. (NEC 250.64 C)
26. EQUIPMENT PROPOSED TO BE MOUNTED ON EXTERIOR WALLS ARE TO MAINTAIN CLEARANCE TO OPERABLE WINDOWS PER MANUFACTURERS RECOMMENDATION AND CODE.

AERIAL VIEW

GENERAL CONDUCTOR INSULATION KEY	
DC CONDUCTORS	
POSITIVE(UNGROUNDED)	RED
NEGATIVE(UNGROUNDED)	BLACK
120/208V OR 240V AC CONDUCTORS	
PHASE A	BLACK
PHASE B	RED (SEE NOTE)
PHASE C	BLUE
480/277V AC CONDUCTORS	
PHASE A	BROWN
PHASE B	ORANGE
PHASE C	YELLOW
NEUTRAL	WHITE OR GREY
GROUND	GREEN OR BARE Cu

NOTE: ON THREE PHASE,HIGH LEG MUST BE ORANGE, AS PER REQUIRED BY NFPA 70.

LEGEND:
- MODULES
- XX - EQUIPMENT
- CONDUIT RUN
- DRIVE WAY
- PROPERTY LINE

ABBREVIATIONS:
- AC - ALTERNATING CURRENT
- AWG -AMERICAN WIRE GAUGE
- AHJ -AUTHORITY HAVING JURISDICTION
- APPOX-APPROXIMATE
- AL - ALUMINUM
- CU - COPPER
- DC - DIRECT CURRENT
- (E) -EXISTING
- EMT - ELECTRICAL METALLIC TUBING
- Ø -ELECTRICAL PHASE
- IMC - INTERMEDIATE METAL CONDUIT
- (N) -NEW
- NEMA -NATIONAL ELECTRIC MANUFACTURERS ASSOCIATION
- NEC -NATIONAL ELECTRICAL CODE
- PVC -POLYVINYLCHLORIDE CONDUIT
- TYP -TYPICAL

ENGINEERING SCOPE OF WORK:
1. THESE PERMIT DRAWINGS ARE INTENDED TO BE PRELIMINARY DRAFT FOR A LICENSED PROFESSIONAL ENGINEER OR THE RESPECTIVE ENGINEER OF RECORD (EOR) TO REVIEW AND APPROVE. NO ACTUAL ENGINEERING WORK, ENGINEERING REVIEW OR ENGINEERING APPROVAL HAS BEEN CONDUCTED BY ILLUMINE INDUSTRIES INC.
2. REGARDLESS OF JURISDICTIONAL REQUIREMENT, IT IS HIGHLY RECOMMENDED THAT A LICENSED PROFESSIONAL ENGINEER OR AN EOR REVIEWS AND APPROVES THE FINAL DESIGN OF ALL THE COMPONENTS OF THEIR RESPECTIVE DISCIPLINE (STRUCTURAL/ELECTRICAL) SHOWN ON THESE PERMIT DRAWINGS. WHEN A PROFESSIONAL ENGINEER APPROVES AND SEALS THE DESIGN (STRUCTURAL/ELECTRICAL) SHOWN ON THESE PERMIT DRAWINGS, HE/SHE:
   a. TAKES FULL DIRECT CONTROL OF THE ENGINEERED DESIGN
   b. IS GIVEN ACCESS TO PERSONALLY SUPERVISE AND RECTIFY ANY ASPECT OF THE ENGINEERED DESIGN
   c. HAS FULLY ACCEPTED RESPONSIBILITY FOR THE ENGINEERED DESIGN
3. NO PART OF THESE PERMIT DRAWINGS IS READY FOR CONSTRUCTION UNLESS EXPLICITLY APPROVED AND SEALED BY A PROFESSIONAL ENGINEER OR EOR FOR THE RESPECTIVE ENGINEERING DISCIPLINE (STRUCTURAL/ELECTRICAL).

Optimal Tech

SYSTEM INFORMATION

DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM TEMPERATURE: 20°C
MAXIMUM TEMPERATURE: 40°C

REGISTERED PROFESSIONAL ENGINEER No. 136 BERMUDA

SOLAR PV PROJECT FOR BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION

NAME:BERMUDA NSC

ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM

32.301639, -64.771827
APN:21936

AHJ:BM-CITY OF DEVONSHIRE

PRN NUMBER:GTO-CU-2021-302

ILLUMINE i
Because quality matters

GENERAL NOTES

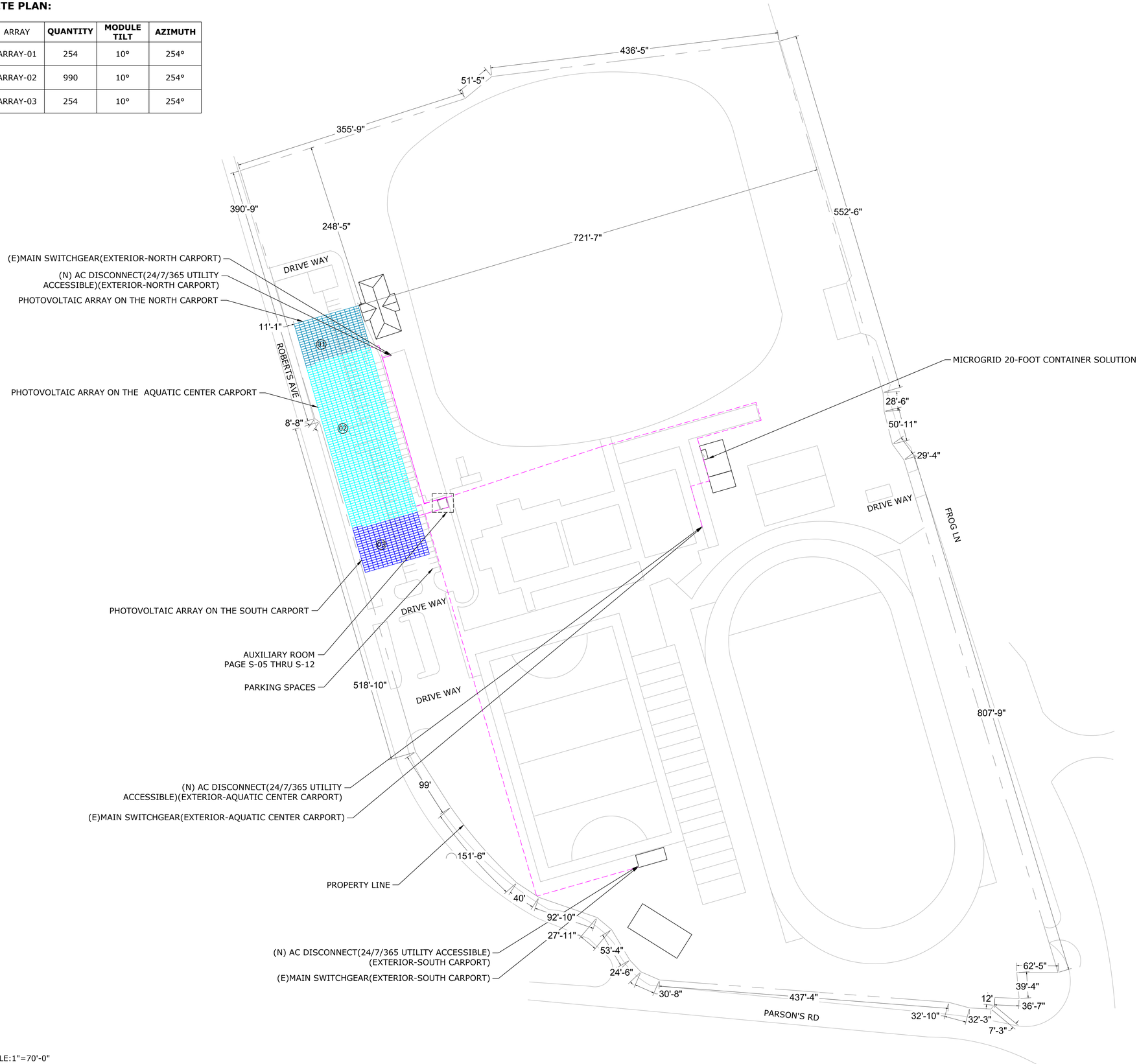
DRAFTED BY/QC'ED BY:
V.PRIYA/VANITHA

SCALE:AS NOTED | REV:A

DATE:3/21/22 | CS-01

SITE PLAN:

ARRAY	QUANTITY	MODULE TILT	AZIMUTH
ARRAY-01	254	10°	254°
ARRAY-02	990	10°	254°
ARRAY-03	254	10°	254°



SCALE:1"=70'-0"

SYSTEM INFORMATION

DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER
PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM
TEMPERATURE: 20°C
MAXIMUM
TEMPERATURE: 40°C

REGISTERED PROFESSIONAL ENGINEER No. 135 BERMUDA

SOLAR PV PROJECT
FOR
BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION

NAME:BERMUDA NSC

ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM

32.301639, -64.771827
APN:21936

AHJ:BM-CITY OF DEVONSHIRE

PRN NUMBER:GTO-CU-2021-302

ILLUMINE i
Because quality matters

SITE PLAN

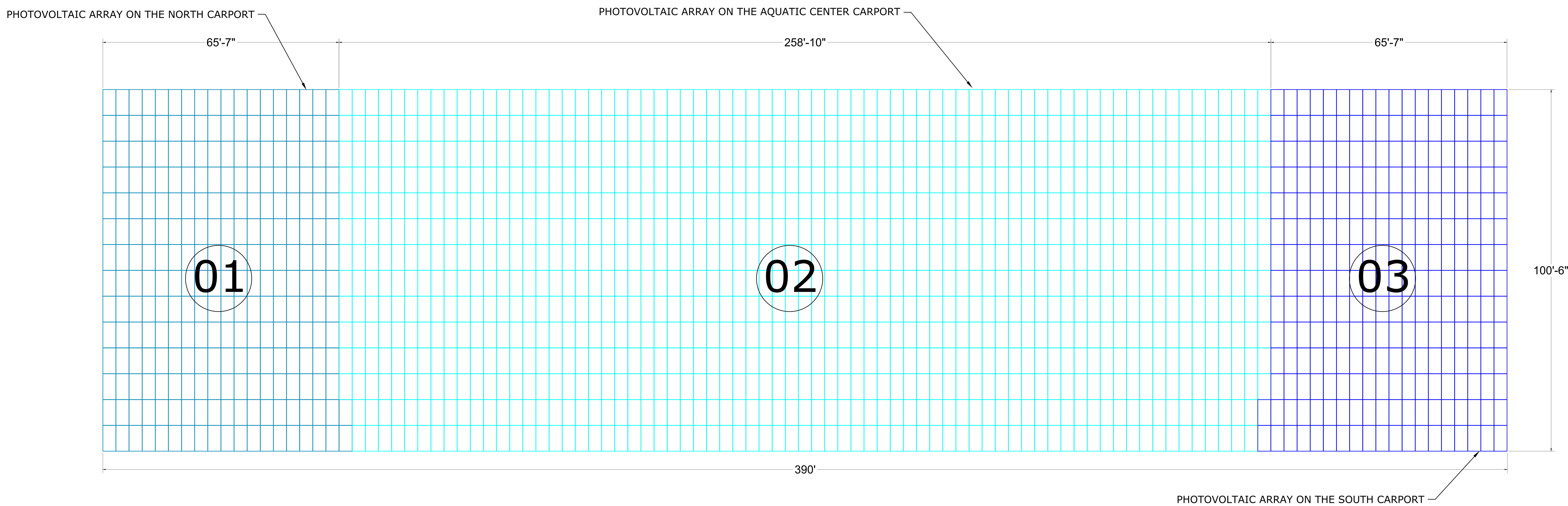
DRAFTED BY/QC'ED BY:
V.PRIYA/VANITHA

SCALE:AS NOTED | REV:A

DATE:3/21/22 | E-01

ENLARGED SITE PLAN :

ARRAY	QUANTITY	MODULE TILT	AZIMUTH
ARRAY-01	254	10°	254°
ARRAY-02	990	10°	254°
ARRAY-03	254	10°	254°



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

SYSTEM INFORMATION

DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER
PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM
TEMPERATURE: 20°C
MAXIMUM
TEMPERATURE: 40°C

SOLAR PV PROJECT
FOR
BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION

NAME:BERMUDA NSC

ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM

32.301639, -64.771827
APN:21936

AHJ:BM-CITY OF DEVONSHIRE

PRN NUMBER:GTO-CU-2021-302

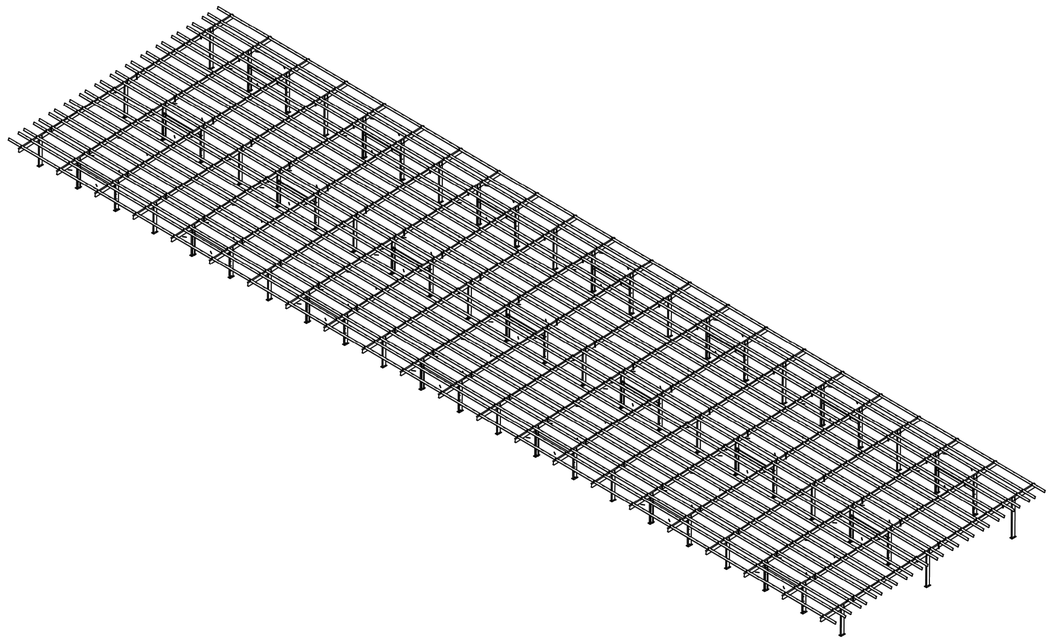
ILLUMINE i
Because quality matters

ENLARGED SITE PLAN

DRAFTED BY/QC'ED BY:
V.PRIYA/VANITHA

SCALE:AS NOTED	REV:A
DATE:3/21/22	E-05

ISOMETRIC VIEW:



SCALE:NTS

MAIN COMPONENTS BILL OF MATERIALS

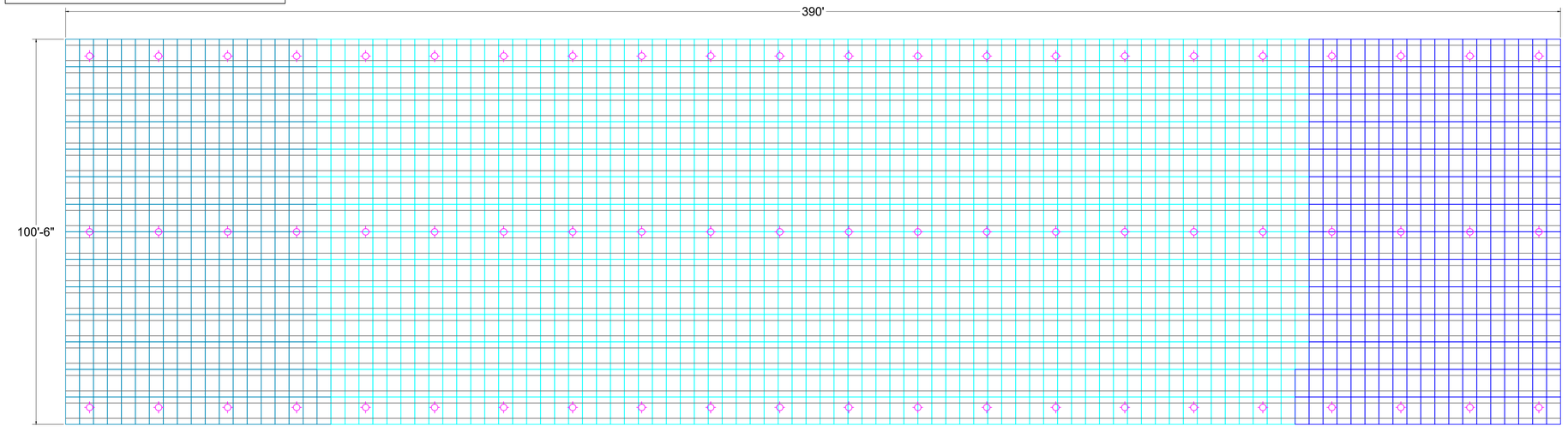
ITEM#	PART NUMBER	DESCRIPTION	QTY
1	300516001	PURLIN, Z8x3x1, GA12, 7315MM, G210, 1098 MM PV WIDTH	28
2	300523001	PURLIN, Z8x3x1, GA12, 5475MM, G210, 1098 MM PV WIDTH	28
3	300524001	PURLIN, Z8x3x1, GA12, 5475MM, G210, 1098 MM PV WIDTH	28
4	300524002	PURLIN, Z8x3x1, GA12, 5475MM, G210, 1098 MM PV WIDTH	28
5	300526001	PURLIN, Z8x3x1, GA12, 7250MM, G210, 1098 MM PV WIDTH	28
6	300542001	PURLIN, Z8x3x1, GA12, 5475MM, G210, 1098 MM PV WIDTH	112
7	300542002	PURLIN, Z8x3x1, GA12, 5475MM, G210, 1098 MM PV WIDTH	112
8	300542003	PURLIN, Z8x3x1, GA12, 5475MM, G210, 1098 MM PV WIDTH	112
9	300542004	PURLIN, Z8x3x1, GA12, 5475MM, G210, 1098 MM PV WIDTH	112
10	300543001	BRACKET, TOP BEAM TO PURLIN, L6x3.5x0.3125, 140mm	616
11	900516001	BEAM, TOP, CENTER TO HIGH END, ASSY, W410x39, 360.25",WELDED, HDG	22
12	900517001	BEAM, TOP, CENTER TO LOW END, ASSY, W410x39, 360.25",WELDED, HDG	22
13	900519001	BEAM, VERTICAL SUPPORT, LH, ASSY, W250x25, 125", WELDED, HDG	21
14	900520001	BEAM, VERTICAL SUPPORT, RH, ASSY, W250x25, 125", WELDED, HDG	21
15	900525001	COLUMN, HIGH END, ASSY, W410x46, 180.95", WELDED, HDG	8
16	900525002	COLUMN, CENTER, ASSY, W410x46, 156.3", WELDED, HDG	8
17	900525003	COLUMN, LOW END, ASSY, W410x46, 180.95", WELDED, HDG	8
18	900526001	BEAM, TOP, HIGH END, ASSY, W460x52, 181", WELDED, HDG	22
19	900527001	BEAM, TOP, CENTER, ASSY, W460x52, 120.21", WELDED, HDG	22
20	900528001	BEAM, TOP, LOW END, ASSY, W460x52, 181", WELDED, HDG	22
21	900529001	CROSSBEAM, ASSY, W310x24,195.16", WELDED, HDG	21
22	900532001	COLUMN, HIGH END, W/DRILLED HOLES, ASSY, W410x46, 180.95", WELDED, HDG	14
23	900532002	COLUMN, CENTER, W/DRILLED HOLES, ASSY, W410x46, 156.3", WELDED, HDG	14
24	900532003	COLUMN, LOW END, W/DRILLED HOLES, ASSY, W410x46, 131.65", WELDED, HDG	14

HARDWARE BILL OF MATERIALS

ITEM#	DESCRIPTION	QTY
25	WASHER, FLAT, 1/2"x1.375" O.D., HDG	2464
26	NUT, HEX FLANGE, SERRATED, 1/2"-13, GR.5, MAGNI565	2464
27	BOLT, HEX FLANGE, SERRATED, 1/2"-13x1-1/2", GR.5, MAGNI565	2464
28	ANCHOR BOLT, 1", A325, 24" LENGTH	528
29	LOCKNUT, ANCHOR BOLT, 1", A325	528
30	FLAT WASHER, ANCHOR BOLT, 1", A325	1056
31	BOLT, HEX, 1"-8x3.25"L, GRADE A325	528
32	BOLT, HEX, 1"-8x3.25"L, GRADE A325	704
33	NUT, HEX, 1"-8, 55/64" THICKNESS, GRADE 8	1232
34	WASHER, FLAT, 2" O.D, 1 1/8"ID, 0.136"-0.177" THICKNESS, TO BOLT GRADE A325	1232
35	BOLT, HEX, 5/8"-11x2"L, GRADE A325	1568
36	NUT, HEX, 5/8", A325	1568
37	WASHER, FLAT, 1 5/16" O.D, 11/16" ID, 0.122"-0.177" THICKNESS	2800
38	BOLT, HEX, 3/4"-16x 2.5"L, GRADE A325	168
39	NUT, HEX, 3/4"-16, 41/64" THICKNESS, GRADE 8	168
40	WASHER, FLAT, 1 5/16" O.D, 13/16" ID, 0.122"-0.177" THICKNESS, TO BOLT A325	336
41	BOLT, HEX FLANGE, SERRATED, 5/16"-18x1", MAGNI 565	5992
42	NUT, HEX FLANGE, SERRATED, 5/16"-18, MAGNI 565	5992
43	WASHER, FLAT, 3/8"x1" O.D., HDG	11984
44	WASHER, SPLIT LOCK, 3/8", HDG	5992
45	TURNBUCKLE, CLOSED BODY, CLEVIS-TO-EYE, 316 STAINLESS STEEL, 2800 LBS. CAPCITY	112
46	TENSION CABLE, 10MM DIA, 105 METER LENGTH	7
47	ROPE CLAMPS, 3/8"	672
48	THIMBLE, ROPE DIA 5/8"	224

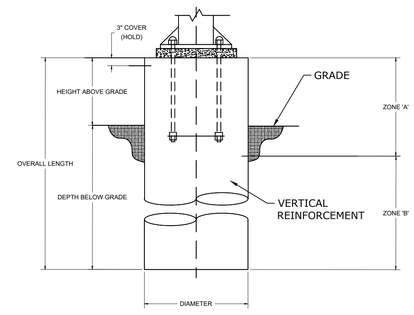
ARRAY PLAN VIEW :

-COLUMN LOCATION
-PURLIN
-NORTH CARPORT PANELS
-CENTER CARPORT PANELS
-SOUTH CARPORT PANELS



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

TYPICAL FOUNDATION VIEW :



SCALE:NTS

Optimal Tech

SYSTEM INFORMATION

DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER
PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM
TEMPERATURE: 20°C
MAXIMUM
TEMPERATURE: 40°C

SOLAR PV PROJECT
FOR
BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION

NAME:BERMUDA NSC

ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM

32.301639, -64.771827
APN:21936

AHJ:BM-CITY OF DEVONSHIRE

PRN NUMBER:GTO-CU-2021-302

ILLUMINEi
Because quality matters

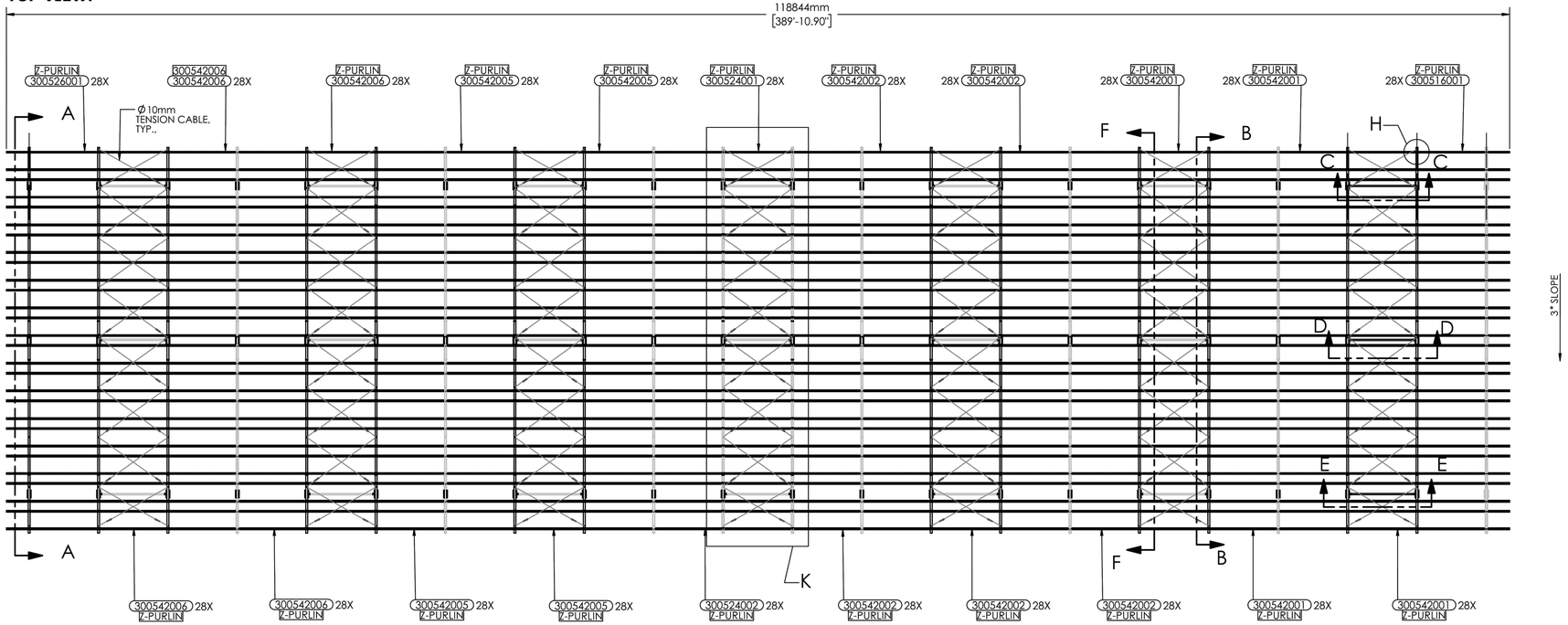
ARRAY PLAN & BILL OF MATERIALS

DRAFTED BY/QC'ED BY:
V.PRIYA/VANITHA

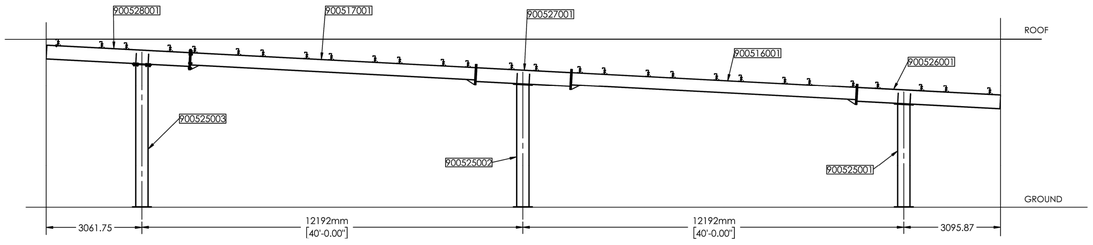
SCALE:AS NOTED | REV:A

DATE:3/21/22 | S-01

TOP VIEW:

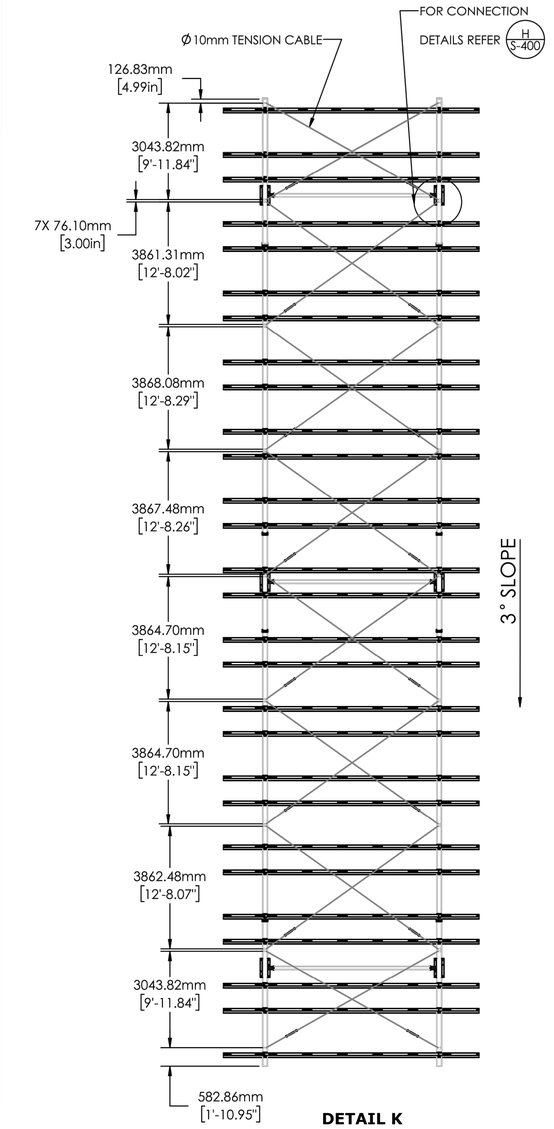


SCALE:NTS



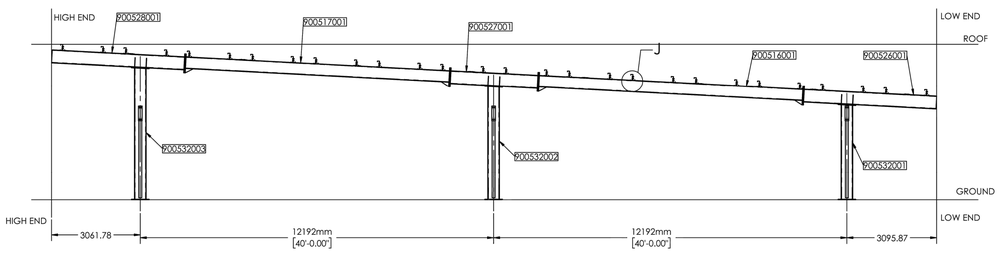
SCALE:NTS

SECTION A-A
(ROTATED 90° COUNTER CLOCKWISE)
(ONLY AT SECTION-01, 04, 07, 10, 13, 16, 19, 22)



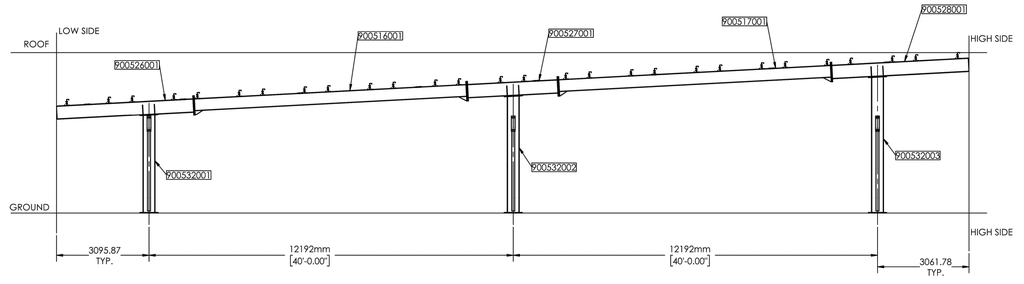
SCALE:NTS

DETAIL K
TENSION CABLE DETAILS
(ONLY AT SECTION 2, 3, 5, 6, 9, 11, 12, 14, 15, 17, 18, 20, 21)TYPICAL 7 PLACES



SCALE:NTS

SECTION B-B
(ROTATED 90° COUNTER CLOCKWISE)
(ONLY AT SECTION-03, 06, 09, 12, 15, 18, 21)



SCALE:NTS

SECTION F-F
(ROTATED 90° CLOCKWISE)
(ONLY AT SECTION-02, 05, 08, 11, 14, 17, 20)

Optimal Tech

SYSTEM INFORMATION

DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER
PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM
TEMPERATURE: 20°C
MAXIMUM
TEMPERATURE: 40°C

SOLAR PV PROJECT
FOR
BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION

NAME:BERMUDA NSC

ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM

32.301639, -64.771827
APN:21936

AHJ:BM-CITY OF DEVONSHIRE

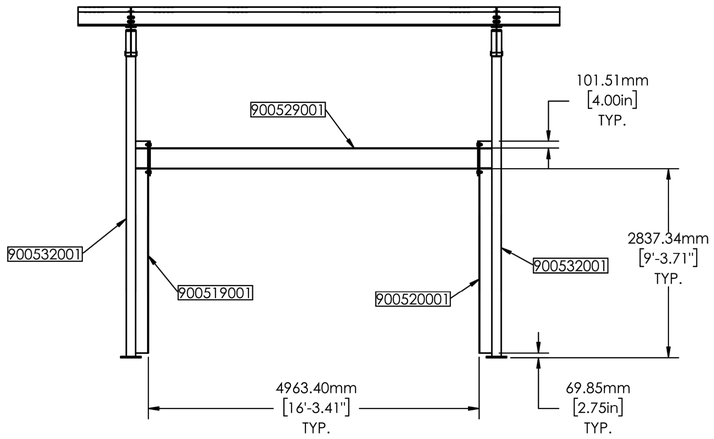
PRN NUMBER:GTO-CU-2021-302

ILLUMINE i
Because quality matters

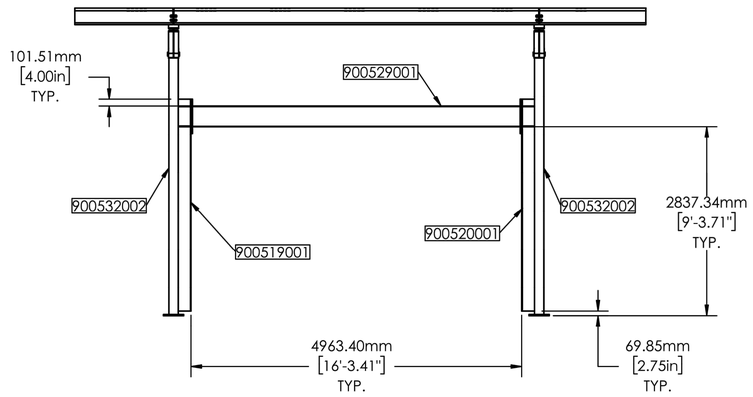
STRUCTURAL DETAILS-01

DRAFTED BY/QC'ED BY:
V.PRIYA/VANITHA

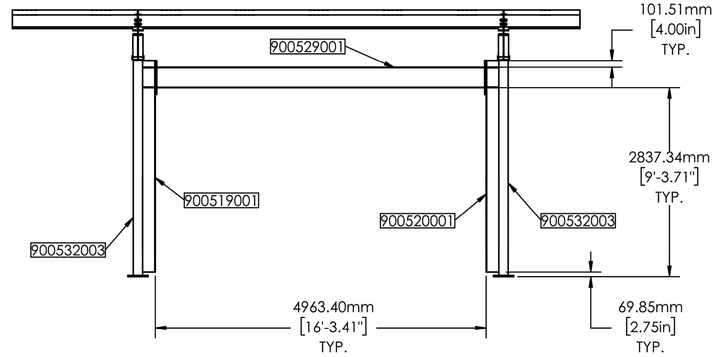
SCALE:AS NOTED	REV:A
DATE:3/21/22	S-02



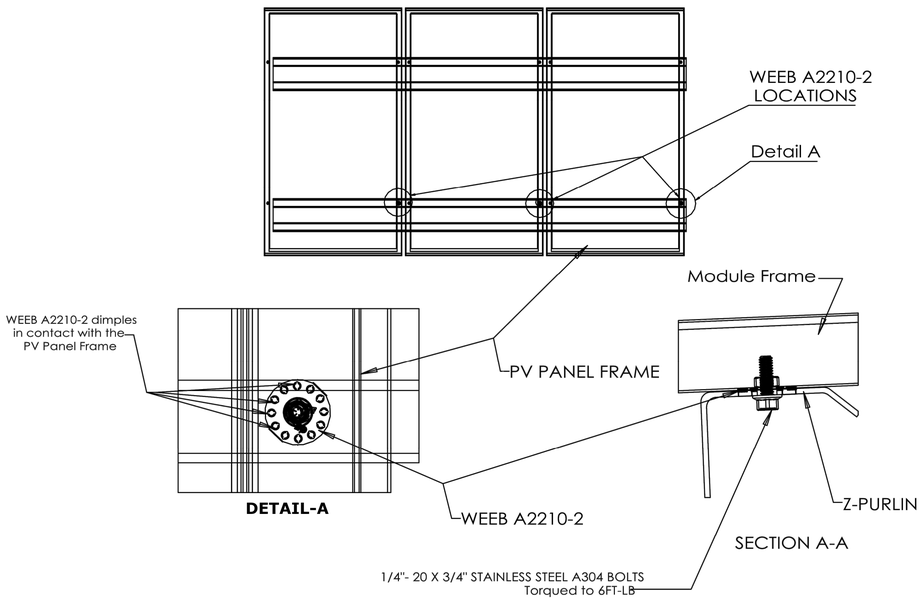
SECTION C-C
(ONLY AT SECTION-02-03, 05-06, 08-09, 11-12, 14-15, 17-18, 20-21)



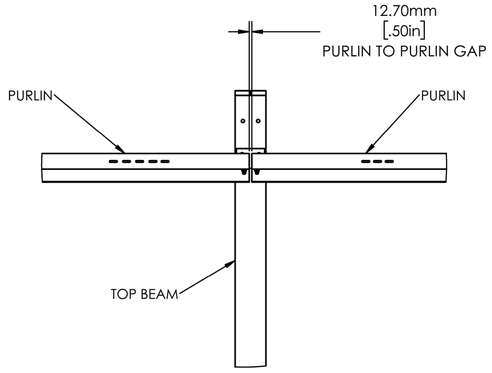
SECTION D-D
(ONLY AT SECTION-02-03, 05-06, 08-09, 11-12, 14-15, 17-18, 20-21)



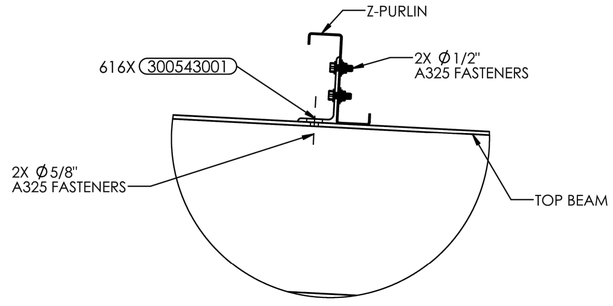
SECTION E-E
(ONLY AT SECTION-02-03, 05-06, 08-09, 11-12, 14-15, 17-18, 20-21)



WEEB BONDING WASHER-DETAILS
CARPORT RACKING CONFIGURATION



DETAIL-H



DETAIL-J
PURLIN TO BRACKET & TOP BEAM
CONNECTION DETAIL

NOTE:
1.MINIMUM 3 DIMPLES MUST BE IN CONTACT WITH THE ALUMINUM MODULE FRAME AND 1-PURLIN.
2.GAP BETWEEN MODULES TO BE NO GREATER THAN 25.4MM.
3.DO NOT FASTEN WITH IMPACT TOOL TO AVOID OVER TORQUING AND DEFORMATION.
4.ONE WEEB A2210-2 PER MODULE IS REQUIRED. INSTALLING MORE WEEB A2210-2 THAN REQUIRED WILL NOT NEGATIVELY IMPACT THE ELECTRICAL BOND BETWEENTHE MODULE FRAME AND THE Z-PURLIN.

Optimal Tech

SYSTEM INFORMATION

DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER
PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM
TEMPERATURE: 20°C
MAXIMUM
TEMPERATURE: 40°C

SOLAR PV PROJECT
FOR
BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION

NAME:BERMUDA NSC

ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM

32.301639, -64.771827
APN:21936

AHJ:BM-CITY OF DEVONSHIRE

PRN NUMBER:GTO-CU-2021-302

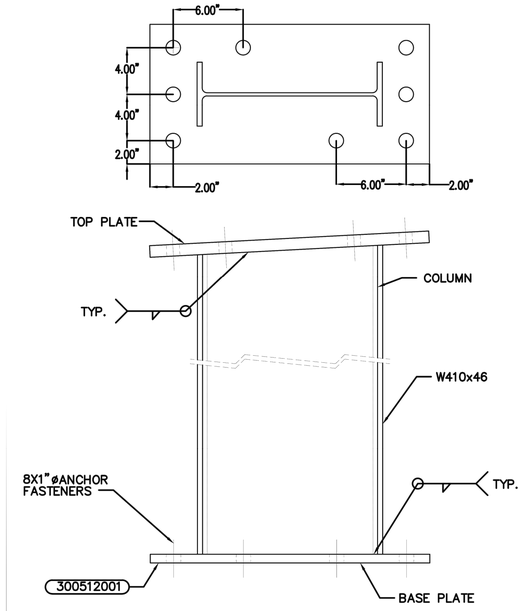
ILLUMINE i
Because quality matters

STRUCTURAL DETAILS-02

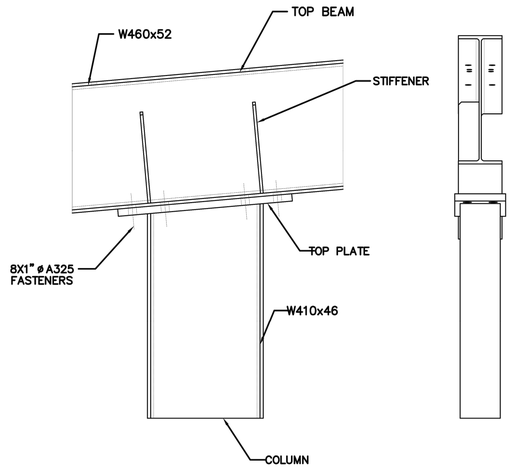
DRAFTED BY/QC'ED BY:
V.PRIYA/VANITHA

SCALE:AS NOTED | REV:A

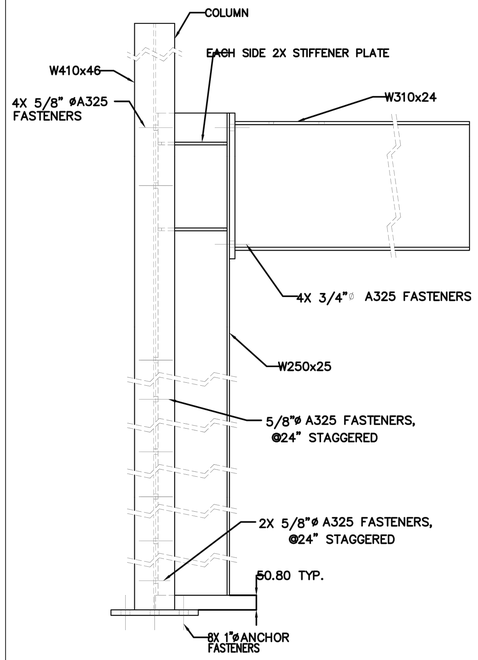
DATE:3/21/22 | S-03



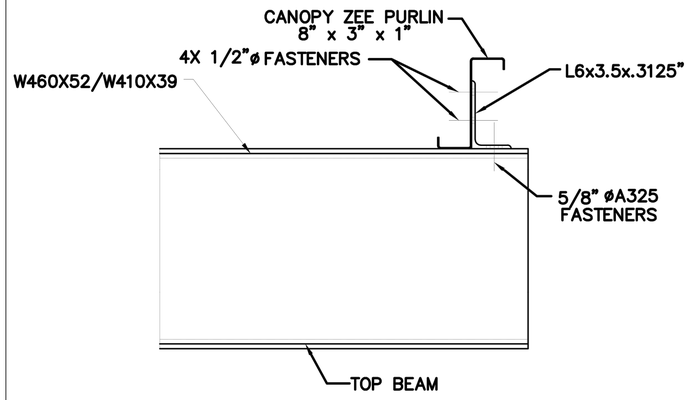
COLUMN TO BASE PLATE CONNECTION DETAIL-TYPICAL 66 PLACES



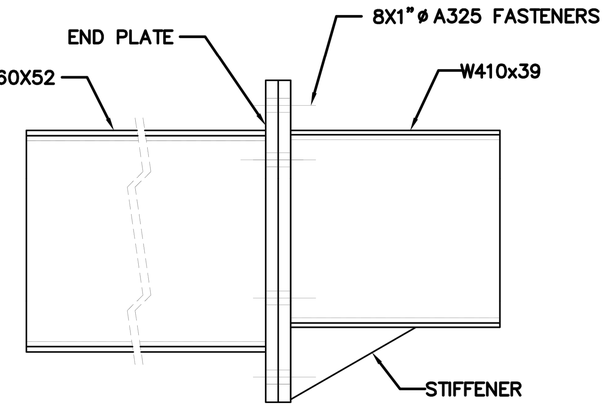
COLUMN TO TOP BEAM CONNECTION DETAIL-TYPICAL 66 PLACES



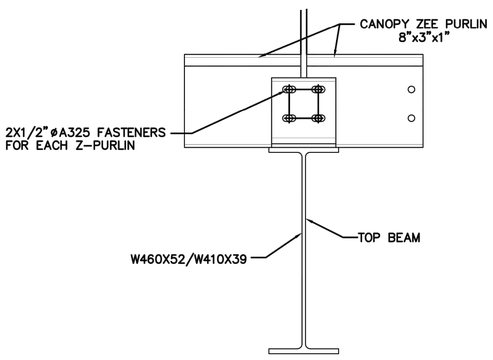
COLUMN TO BASE PLATE CONNECTION DETAIL-TYPICAL 42 PLACES

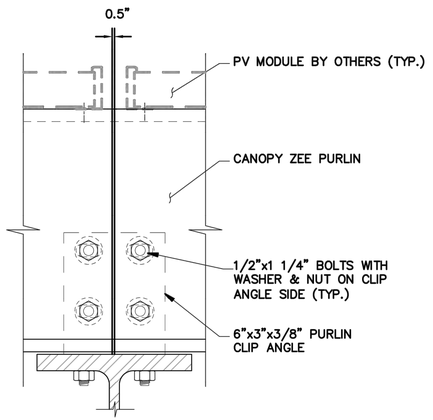


CANOPY ZEE PURLIN CONNECTIONS DETAIL WITH END TOP BEAMS- TYPICAL 56 PLACES

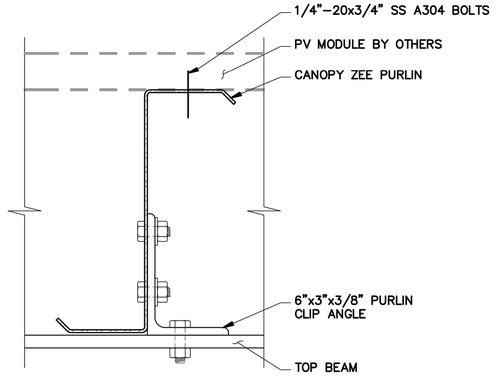


TOP BEAMS CONNECTION DETAILS - TYPICAL 88 PLACES

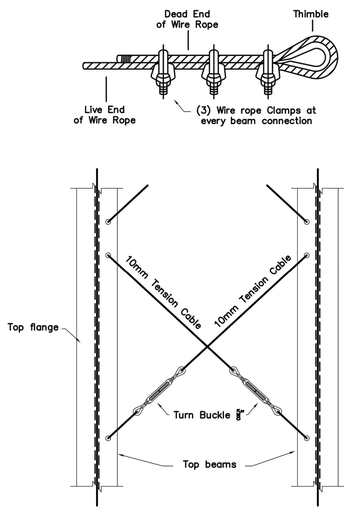




CANOPY ZEE PURLIN CONNECTION DETAIL WITH MIDDLE TOP BEAMS - TYPICAL 560 PLACES



CANOPY ZEE PURLIN CONNECTION - MODULE CONNECTION-TYPICAL 5992 PLACES



TENSION CABLE CONNECTION DETAILS - TYPICAL 88 PLACES

Optimal Tech

SYSTEM INFORMATION

DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM TEMPERATURE: 20°C
MAXIMUM TEMPERATURE: 40°C

SOLAR PV PROJECT
FOR
BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION

NAME:BERMUDA NSC

ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM

32.301639, -64.771827
APN:21936

AHJ:BM-CITY OF DEVONSHIRE

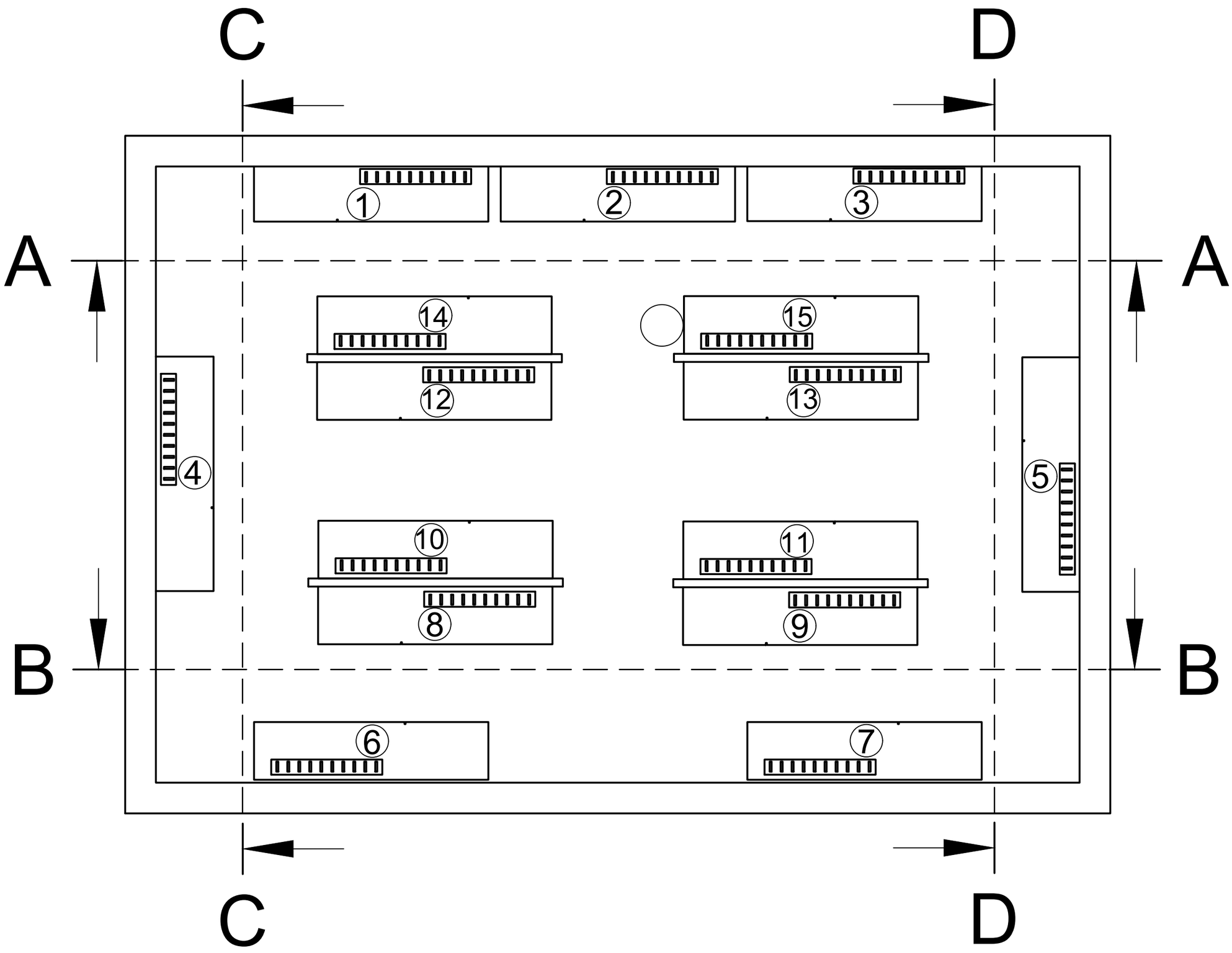
PRN NUMBER:GTO-CU-2021-302

ILLUMINEi
Because quality matters

STRUCTURAL CONNECTION DETAILS

DRAFTED BY/QC'ED BY:
V.PRIYA/VANITHA

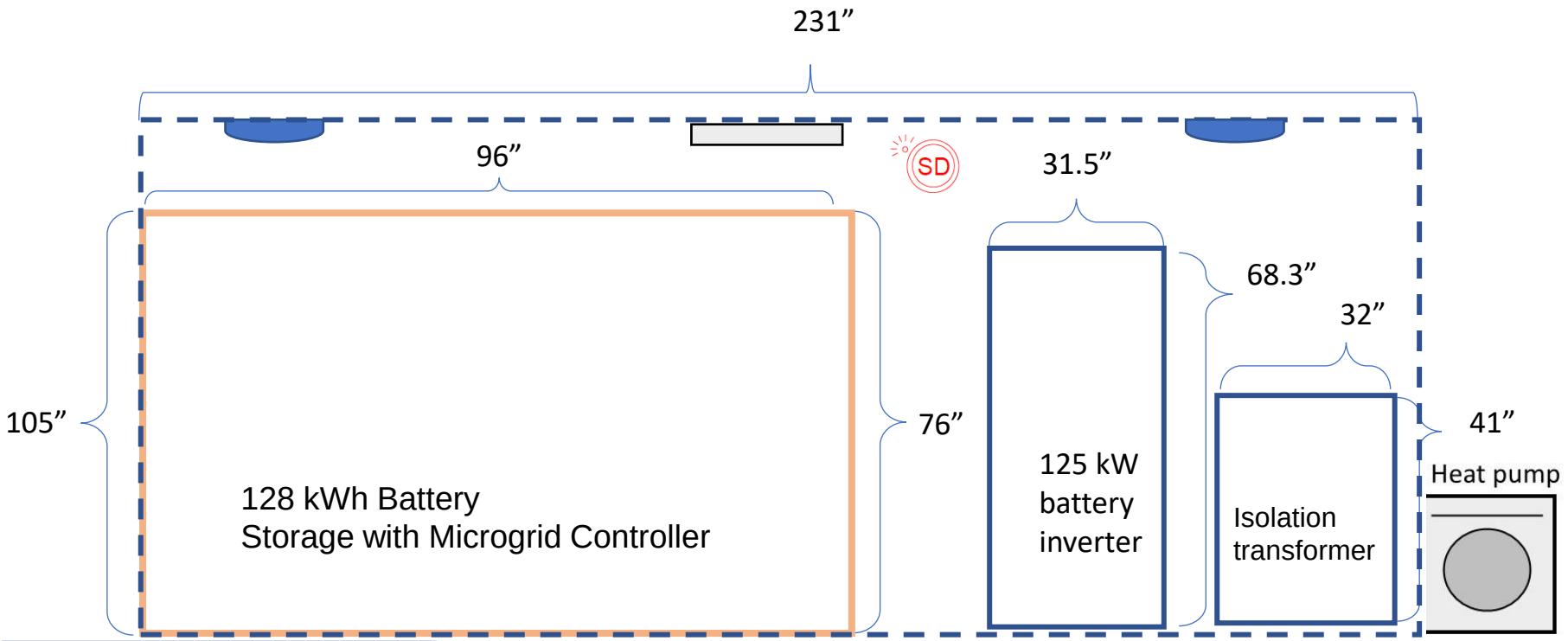
SCALE:AS NOTED	REV:A
DATE:3/21/22	S-04



		Inverter(PVS-60-TL-US)	15pcs
		AC Accumulation Panels	4pc
NO.	DATE	REVISION	BY

REGISTERED PROFESSIONAL ENGINEER
No. 135
E.K.W
ELLSWORTH K.WAINWRIGHT
11/4/22
Electrical
BERMUDA

ENGINEER	CHECKED BY SLC
JOB NO JOB#	DRAWN BY SLC
SCALE 1:1	DATE 2/18/2022
DWG NO SECTION_PLAN	
SHEET NO SH# OF SHTS	



Heat Calculations

Max Power	120 kW
Inverter	97.5%
Battery	99%
Transformer	97%

Total heat energy
= 3 kW + 1.2 + 3.6
= 7.8 kW
= 26,615 BTU/hour

Calculation for Cooling unit
Roundup(Conversion to tons / 12,000,1)
= 2.5 tons

Optimal Tech

GENERAL NOTES

SHEET SUMMARY

Lights

Air handling
Mini split

SD
Smoke
detector

REGISTERED PROFESSIONAL ENGINEER
No. 135
E. K. W
ELLSWORTH K.WAINWRIGHT
11/4/22
Electrical
BERMUDA

Rev	Description	Date	Drawn By

Engineering Stamp

Company Contact Info

Company: Optimal Technology Corporation
Address: 135 Riverside Pkwy SW, #2P
Phone #: +1 (678) 348 – 6781
Email: info@getoptimaltech.com

Optimal Tech

Customer: Bermuda National Sports Center
Project: BNS Hybrid Solar Sytem
Hybrid Grid Tie Solar
Location: 50 Frog Lane, Devonshire, Bermuda

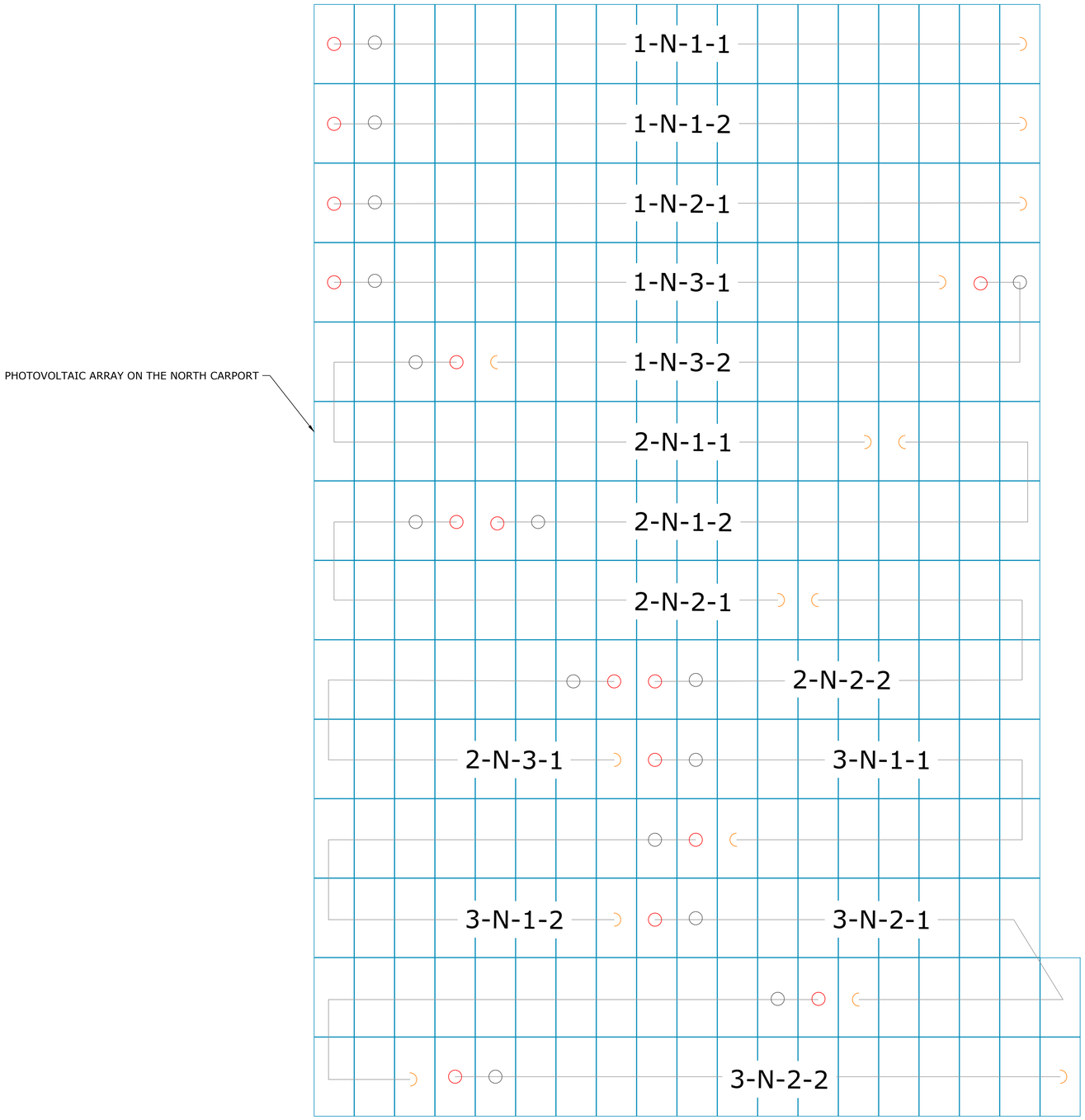
Bermuda
---- 001

Sheet Name: 20 ft long, high cube container layout

Designed By
Project number ----

Sheet Title | Issue | Sheet Number: S-13

LEGEND-CARPORT NSC NORTH					
STRING	QTY.	STRING	QTY.	STRING	QTY.
1-N-1-1	18	2-N-1-1	18	3-N-1-1	18
1-N-1-2	18	2-N-1-2	18	3-N-1-2	18
1-N-2-1	18	2-N-2-1	16	3-N-2-1	16
1-N-3-1	16	2-N-2-2	16	3-N-2-2	16
1-N-3-2	16	2-N-3-1	16	3-N-3-1	16

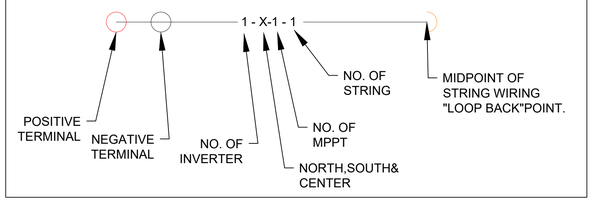


SCALE:3/16"=1'-0"

WIRING AND WIRING METHODS:

1. EXPOSED PV SOLAR MODULE WIRING AND PV SOURCE CIRCUITS TO BE UV RESISTANT 1,000V PV WIRE, 90° C, AND RATED FOR WET CONDITIONS.
2. ALL EXPOSED CABLES, SUCH AS MODULE LEADS SHALL BE SECURED IN A NEAT WORKMAN LIKE MANNER TO PREVENT CHAFFING, SWINGING, AND EXCEEDING MINIMUM BEND RADIUS WITH PROPER MECHANICAL SUNLIGHT RESISTANT MEANS AND ROUTED TO AVOID DIRECT EXPOSURE TO SUNLIGHT AT ALL TIMES.
3. ALL FIELD WIRING THAT IS NOT COLOR CODED SHALL BE TAGGED AT BOTH ENDS WITH PERMANENT WIRE MARKERS TO IDENTIFY POLARITY AND GROUND.
4. FLEXIBLE METAL CONDUIT IS SUITABLE FOR INSTALLATION IN DRY LOCATIONS. SHOULD IT BE EMPLOYED, SUPPORTS WILL BE NO MORE THAN 12 INCHES FROM BOXES (JUNCTION BOX, CABINETS OR CONDUIT FITTING) AND NO MORE THAN 48 INCHES APART.
5. LIQUID TIGHT FLEXIBLE METAL AND NON-METALLIC CONDUIT IS SUITABLE FOR INSTALLATION IN WET AND DRY LOCATIONS. SHOULD IT BE EMPLOYED, SUPPORTS WILL BE NO MORE THAN 12 INCHES FROM BOXES (JUNCTION BOX, CABINETS, OR CONDUIT FITTING) AND NO MORE THAN 36 INCHES APART.
6. PVC CONDUIT AND FITTINGS SHALL NOT BE USED ON ROOFTOP CONDITIONS OR EXPOSED TO DIRECT SUNLIGHT. WHEN USED IN ACCEPTABLE LOCATION CONDUIT SHALL BE SCHEDULE 80 UV RESISTANT UNLESS NOTED OTHERWISE.
7. FUSES AND WIRES SUBJECT TO TEMPERATURES CONDITIONS GREATER THAN 100°F OR TRANSFORMER INRUSH CURRENT SHALL BE SIZED ACCORDINGLY.
8. THE PHOTOVOLTAIC SOURCE CIRCUITS AND PHOTOVOLTAIC OUTPUT CIRCUITS OF THIS PROPOSED SOLAR SYSTEM SHALL NOT BE CONTAINED IN THE SAME RACEWAY CABLE TRAY, CABLE, OUTLET BOX, JUNCTION BOX, OR SIMILAR FITTING AS FEEDERS OR BRANCH CIRCUITS OF OTHER SYSTEMS UNLESS THE CONDUCTORS OF THE DIFFERENT SYSTEMS ARE SEPARATED BY A PARTITION OR ARE CONNECTED TOGETHER.
9. ALL TERMINATIONS SHALL HAVE ANTI-OXIDANT COMPOUND AND BE TORQUED PER DEVICE LISTING, OR MANUFACTURER'S RECOMMENDATIONS.
10. SPLIT BOLTS /SPLICES / CONNECTORS ARE PERMITTED ON THE AC CONDUCTORS AND SHALL BE INSULATED WITH APPROVED MEANS. SPLICES ON THE DC CONDUCTORS IS NOT PERMITTED IN ANY LOCATION.
11. NO PVC CONDUIT ALLOWED ON ROOF, UNLESS OPEN ENDED WIRE MANAGEMENT <10'.

NOTE:



Optimal Tech

SYSTEM INFORMATION

DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER
PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM
TEMPERATURE: 20°C
MAXIMUM
TEMPERATURE: 40°C

REGISTERED PROFESSIONAL ENGINEER No. 135 E. K. J. BERMUDA

SOLAR PV PROJECT
FOR
BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION

NAME:BERMUDA NSC

ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM

32.301639, -64.771827
APN:21936

AHJ:BM-CITY OF DEVONSHIRE

PRN NUMBER:GTO-CU-2021-302

ILLUMINEi
Because quality matters

STRINGING DIAGRAM - CARPORT NSC NORTH

DRAFTED BY/QC'ED BY:
V.PRIYA/VANITHA

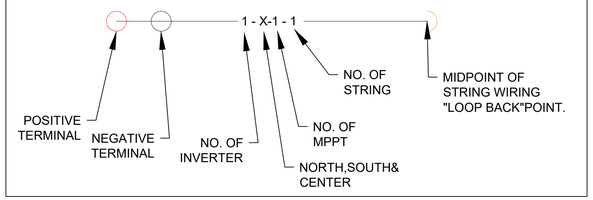
SCALE:AS NOTED	REV:A
DATE:3/21/22	E-06

LEGEND-CARPORT AQUATIC CENTER		LEGEND-CARPORT AQUATIC CENTER		LEGEND-CARPORT AQUATIC CENTER	
STRING	QTY.	STRING	QTY.	STRING	QTY.
1-C-1-1	19	4-C-1-1	19	7-C-1-1	19
1-C-1-2	19	4-C-1-2	19	7-C-1-2	19
1-C-2-1	18	4-C-2-1	18	7-C-2-1	18
1-C-2-2	18	4-C-2-2	18	7-C-2-2	18
1-C-3-1	18	4-C-3-1	18	7-C-3-1	18
1-C-3-2	18	4-C-3-2	18	7-C-3-2	18
STRING	QTY.	STRING	QTY.	STRING	QTY.
2-C-1-1	19	5-C-1-1	19	8-C-1-1	19
2-C-1-2	19	5-C-1-2	19	8-C-1-2	19
2-C-2-1	18	5-C-2-1	18	8-C-2-1	18
2-C-2-2	18	5-C-2-2	18	8-C-2-2	18
2-C-3-1	18	5-C-3-1	18	8-C-3-1	18
2-C-3-2	18	5-C-3-2	18	8-C-3-2	18
STRING	QTY.	STRING	QTY.	STRING	QTY.
3-C-1-1	19	6-C-1-1	19	9-C-1-1	19
3-C-1-2	19	6-C-1-2	19	9-C-1-2	19
3-C-2-1	18	6-C-2-1	18	9-C-2-1	18
3-C-2-2	18	6-C-2-2	18	9-C-2-2	18
3-C-3-1	18	6-C-3-1	18	9-C-3-1	18
3-C-3-2	18	6-C-3-2	18	9-C-3-2	18

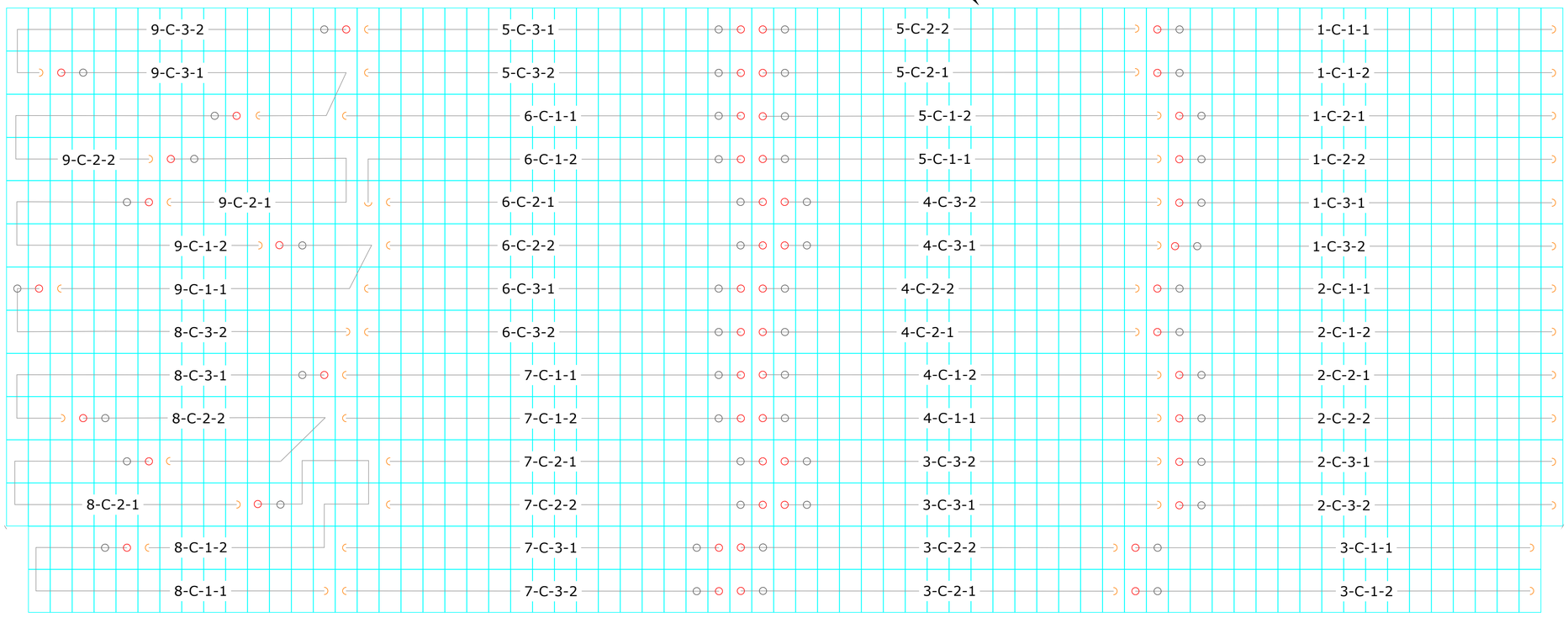
WIRING AND WIRING METHODS:

1. EXPOSED PV SOLAR MODULE WIRING AND PV SOURCE CIRCUITS TO BE UV RESISTANT 1,000V PV WIRE, 90° C, AND RATED FOR WET CONDITIONS.
2. ALL EXPOSED CABLES, SUCH AS MODULE LEADS SHALL BE SECURED IN A NEAT WORKMAN LIKE MANNER TO PREVENT CHAFFING, SWINGING, AND EXCEEDING MINIMUM BEND RADIUS WITH PROPER MECHANICAL SUNLIGHT RESISTANT MEANS AND ROUTED TO AVOID DIRECT EXPOSURE TO SUNLIGHT AT ALL TIMES.
3. ALL FIELD WIRING THAT IS NOT COLOR CODED SHALL BE TAGGED AT BOTH ENDS WITH PERMANENT WIRE MARKERS TO IDENTIFY POLARITY AND GROUND.
4. FLEXIBLE METAL CONDUIT IS SUITABLE FOR INSTALLATION IN DRY LOCATIONS. SHOULD IT BE EMPLOYED, SUPPORTS WILL BE NO MORE THAN 12 INCHES FROM BOXES (JUNCTION BOX, CABINETS OR CONDUIT FITTING) AND NO MORE THAN 48 INCHES APART.
5. LIQUID TIGHT FLEXIBLE METAL AND NON-METALLIC CONDUIT IS SUITABLE FOR INSTALLATION IN WET AND DRY LOCATIONS. SHOULD IT BE EMPLOYED, SUPPORTS WILL BE NO MORE THAN 12 INCHES FROM BOXES (JUNCTION BOX, CABINETS, OR CONDUIT FITTING) AND NO MORE THAN 36 INCHES APART.
6. PVC CONDUIT AND FITTINGS SHALL NOT BE USED ON ROOFTOP CONDITIONS OR EXPOSED TO DIRECT SUNLIGHT. WHEN USED IN ACCEPTABLE LOCATION CONDUIT SHALL BE SCHEDULE 80 UV RESISTANT UNLESS NOTED OTHERWISE.
7. FUSES AND WIRES SUBJECT TO TEMPERATURES CONDITIONS GREATER THAN 100°F OR TRANSFORMER INRUSH CURRENT SHALL BE SIZED ACCORDINGLY.
8. THE PHOTOVOLTAIC SOURCE CIRCUITS AND PHOTOVOLTAIC OUTPUT CIRCUITS OF THIS PROPOSED SOLAR SYSTEM SHALL NOT BE CONTAINED IN THE SAME RACEWAY CABLE TRAY, CABLE, OUTLET BOX, JUNCTION BOX, OR SIMILAR FITTING AS FEEDERS OR BRANCH CIRCUITS OF OTHER SYSTEMS UNLESS THE CONDUCTORS OF THE DIFFERENT SYSTEMS ARE SEPARATED BY A PARTITION OR ARE CONNECTED TOGETHER.
9. ALL TERMINATIONS SHALL HAVE ANTI-OXIDANT COMPOUND AND BE TORQUED PER DEVICE LISTING, OR MANUFACTURER'S RECOMMENDATIONS.
10. SPLIT BOLTS /SPLICES / CONNECTORS ARE PERMITTED ON THE AC CONDUCTORS AND SHALL BE INSULATED WITH APPROVED MEANS. SPLICES ON THE DC CONDUCTORS IS NOT PERMITTED IN ANY LOCATION.
11.NO PVC CONDUIT ALLOWED ON ROOF, UNLESS OPEN ENDED WIRE MANAGEMENT <10'.

NOTE:



PHOTOVOLTAIC ARRAY ON THE AQUATIC CENTER CARPORT



SCALE:1"=10'-0"

Optimal Tech

SYSTEM INFORMATION

DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER
PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM
TEMPERATURE: 20°C
MAXIMUM
TEMPERATURE: 40°C

BERMUDA REGISTERED PROFESSIONAL ENGINEER No. 135 E. K. J. Electrical BERMUDA

SOLAR PV PROJECT
FOR
BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION

NAME:BERMUDA NSC

ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM

32.301639, -64.771827
APN:21936

AHJ:BM-CITY OF DEVONSHIRE

PRN NUMBER:GTO-CU-2021-302

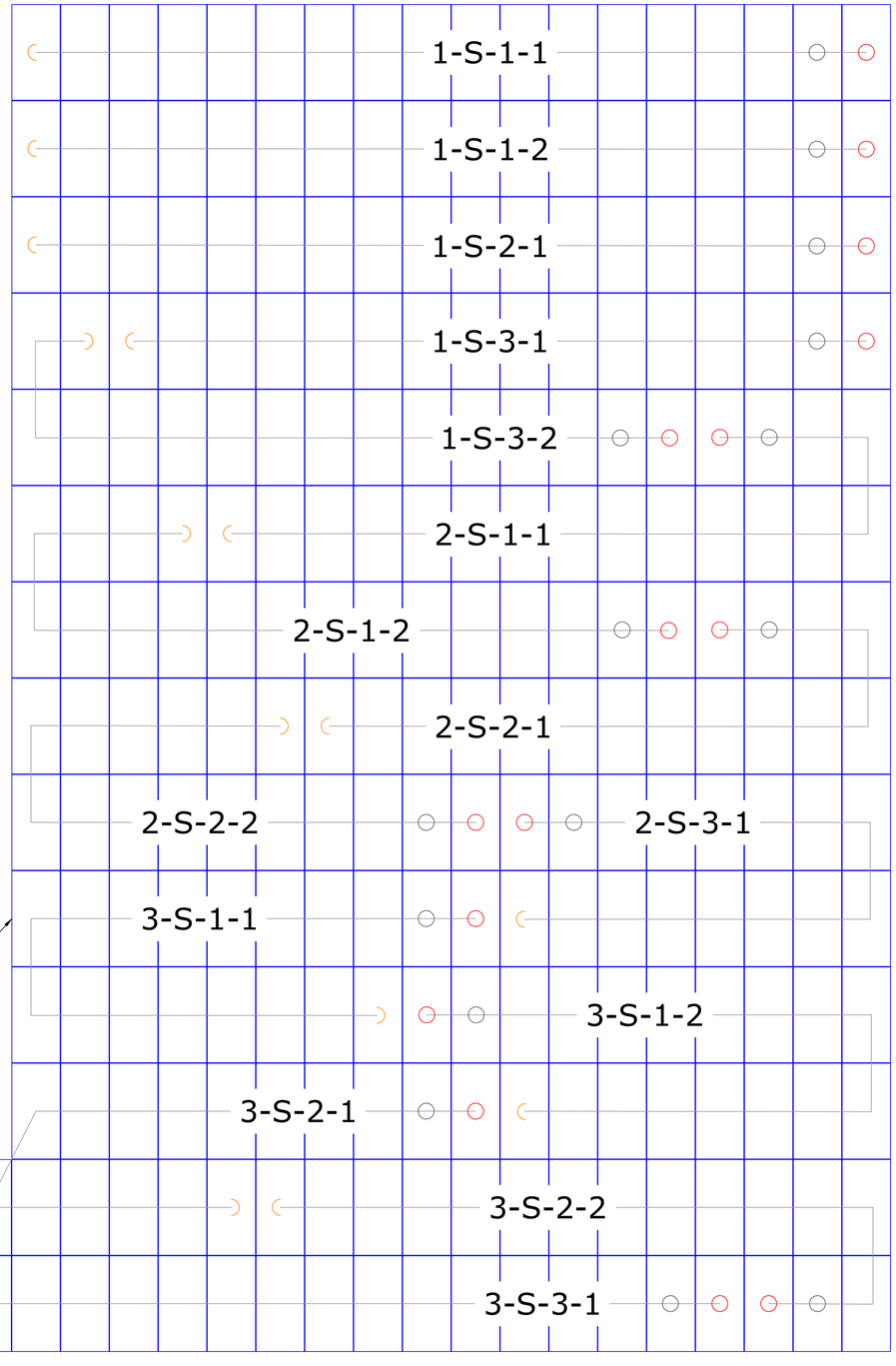
ILLUMINE i
Because quality matters

STRINGING DIAGRAM-
AQUATIC CENTER CARPORT

DRAFTED BY/QC'ED BY:
V.PRIYA/VANITHA

SCALE:AS NOTED	REV:A
DATE:3/21/22	E-07

LEGEND-CARPORT NSC SOUTH					
STRING	QTY.	STRING	QTY.	STRING	QTY.
1-S-1-1	18	2-S-1-1	18	3-S-1-1	18
1-S-1-2	18	2-S-1-2	18	3-S-1-2	18
1-S-2-1	18	2-S-2-1	16	3-S-2-1	16
1-S-3-1	16	2-S-2-2	16	3-S-2-2	16
1-S-3-2	16	2-S-3-1	16	3-S-3-1	16

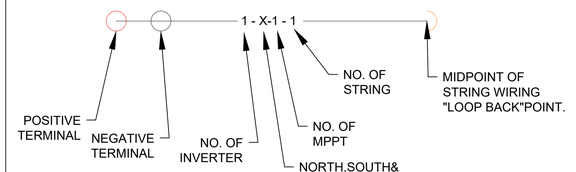


SCALE:3/16"=1'-0"

WIRING AND WIRING METHODS:

1. EXPOSED PV SOLAR MODULE WIRING AND PV SOURCE CIRCUITS TO BE UV RESISTANT 1,000V PV WIRE, 90° C, AND RATED FOR WET CONDITIONS.
2. ALL EXPOSED CABLES, SUCH AS MODULE LEADS SHALL BE SECURED IN A NEAT WORKMAN LIKE MANNER TO PREVENT CHAFFING, SWINGING, AND EXCEEDING MINIMUM BEND RADIUS WITH PROPER MECHANICAL SUNLIGHT RESISTANT MEANS AND ROUTED TO AVOID DIRECT EXPOSURE TO SUNLIGHT AT ALL TIMES.
3. ALL FIELD WIRING THAT IS NOT COLOR CODED SHALL BE TAGGED AT BOTH ENDS WITH PERMANENT WIRE MARKERS TO IDENTIFY POLARITY AND GROUND.
4. FLEXIBLE METAL CONDUIT IS SUITABLE FOR INSTALLATION IN DRY LOCATIONS. SHOULD IT BE EMPLOYED, SUPPORTS WILL BE NO MORE THAN 12 INCHES FROM BOXES (JUNCTION BOX, CABINETS OR CONDUIT FITTING) AND NO MORE THAN 48 INCHES APART.
5. LIQUID TIGHT FLEXIBLE METAL AND NON-METALLIC CONDUIT IS SUITABLE FOR INSTALLATION IN WET AND DRY LOCATIONS. SHOULD IT BE EMPLOYED, SUPPORTS WILL BE NO MORE THAN 12 INCHES FROM BOXES (JUNCTION BOX, CABINETS, OR CONDUIT FITTING) AND NO MORE THAN 36 INCHES APART.
6. PVC CONDUIT AND FITTINGS SHALL NOT BE USED ON ROOFTOP CONDITIONS OR EXPOSED TO DIRECT SUNLIGHT. WHEN USED IN ACCEPTABLE LOCATION CONDUIT SHALL BE SCHEDULE 80 UV RESISTANT UNLESS NOTED OTHERWISE.
7. FUSES AND WIRES SUBJECT TO TEMPERATURES CONDITIONS GREATER THAN 100°F OR TRANSFORMER INRUSH CURRENT SHALL BE SIZED ACCORDINGLY.
8. THE PHOTOVOLTAIC SOURCE CIRCUITS AND PHOTOVOLTAIC OUTPUT CIRCUITS OF THIS PROPOSED SOLAR SYSTEM SHALL NOT BE CONTAINED IN THE SAME RACEWAY CABLE TRAY, CABLE, OUTLET BOX, JUNCTION BOX, OR SIMILAR FITTING AS FEEDERS OR BRANCH CIRCUITS OF OTHER SYSTEMS UNLESS THE CONDUCTORS OF THE DIFFERENT SYSTEMS ARE SEPARATED BY A PARTITION OR ARE CONNECTED TOGETHER.
9. ALL TERMINATIONS SHALL HAVE ANTI-OXIDANT COMPOUND AND BE TORQUED PER DEVICE LISTING, OR MANUFACTURER'S RECOMMENDATIONS.
10. SPLIT BOLTS /SPLICES / CONNECTORS ARE PERMITTED ON THE AC CONDUCTORS AND SHALL BE INSULATED WITH APPROVED MEANS. SPLICES ON THE DC CONDUCTORS IS NOT PERMITTED IN ANY LOCATION.
11. NO PVC CONDUIT ALLOWED ON ROOF, UNLESS OPEN ENDED WIRE MANAGEMENT <10'.

NOTE:



Optimal Tech

SYSTEM INFORMATION

DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER
PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM
TEMPERATURE: 20°C
MAXIMUM
TEMPERATURE: 40°C

REGISTERED PROFESSIONAL ENGINEER No. 135 E. K. J. BERMUDA

SOLAR PV PROJECT
FOR
BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION

NAME:BERMUDA NSC

ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM

32.301639, -64.771827
APN:21936

AHJ:BM-CITY OF DEVONSHIRE

PRN NUMBER:GTO-CU-2021-302

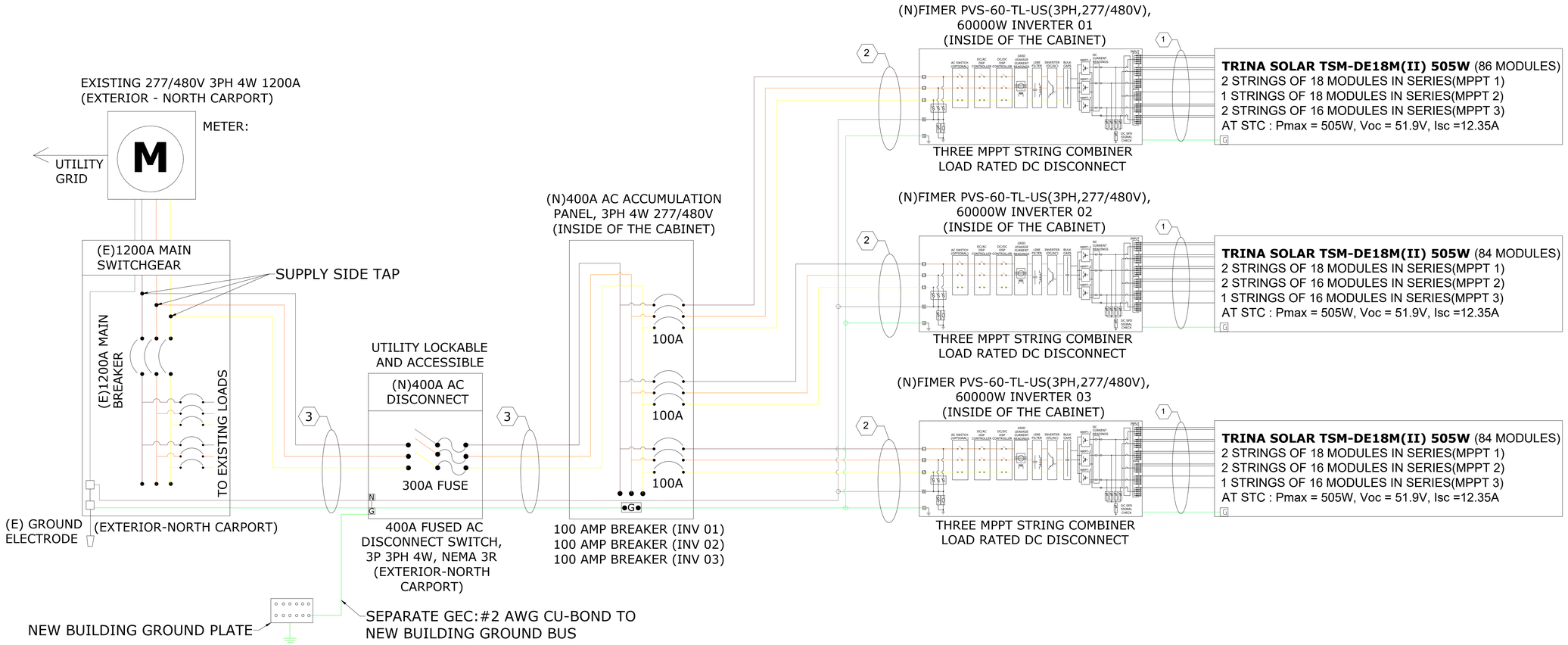
ILLUMINE i
Because quality matters

STRINGING DIAGRAM-CARPORT NSC SOUTH

DRAFTED BY/QC'ED BY:
V.PRIYA/VANITHA

SCALE:AS NOTED	REV:A
DATE:3/21/22	E-08

ELECTRICAL DIAGRAM **128.27 kW DC SYSTEM SIZE 180.00 kW AC SYSTEM SIZE**



OCPD CALCULATIONS
MAIN PANEL RATING:1200A, MAIN BREAKER RATING:1200A
LINE SIDE TAP INTERCONNECTION ALLOWABLE BACKFEED IS =1200A
OCPD CALCULATIONS: INVERTER OVERCURRENT PROTECTION
=INVERTER O/P I X CONTINUOUS LOAD(1.25) =((77AX3)x1.25=288.75A=>PV BREAKER/FUSE = 300A
TOTAL REQUIRED PV BREAKER/FUSE SIZE =>300A PV BREAKER/FUSE
THE DESIGNED INTERCONNECTION MEETS THE 705.12(A)(2) REQUIREMENTS.

SYSTEM INFO:
128.27 kW DC SYSTEM SIZE
(254) TRINA SOLAR TSM-DE18M(II) 505W MODULES
(3) FIMER PVS-60-TL-US(3PH,277/480V)

SYSTEM CHARACTERISTICS-INV-01 TO INV-03:
OPERATING VOLTAGE = (MODULE VMP) X (# MODULES / STRING) =43.0V X 18=774V
MAX OPEN CIRCUIT VOLTAGE = {[((TEMP COEF VOC) X (VOC)) / 100] X [LOW TEMP - STC TEMP] + VOC} X (# MODULES / STRING) = {[(-0.26 %/°C X51.9V) / 100] X [20 °C - 25 °C] +51.9V} X 18=946.34V
OPERATING CURRENT = (MODULE IMP) * (# STRINGS) =11.75 A X 5=58.75A
SHORT CIRCUIT CURRENT = 1.25 X (MODULE ISC) X (# STRINGS) = 1.25 X 12.35 A X 5= 77.18A
DC WIRE SIZING
MAX CIRCUIT CURRENT = (MODULE ISC) X (CONTINUOUS LOAD)[690.53] = 12.35A X 1.25 X 1.25 =19.29A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(2)(a)]] X (CONDUIT FILL) [PER TABLE 310.15(B)(3)(a)X (CONDUCTOR AMPACITY) [PER TABLE 310.15(B)(16)] = 0.71X 0.8 X 40A =22.72A
TERMINAL RATING, [PER NEC 110.14(C)] - 10 AWG, 75°C RATED =35A
35A > 19.29A, SO THE TERMINAL RATING GOVERNS THE CONDUCTOR SIZING
ALSO, 22.72A > 15.43A, AND **10 AWG** IS SUFFICIENT.
AC WIRE SIZING-INV-01 TO INV-03:
MAX AC OUTPUT CURRENT = (MAX INVERTER OUTPUT) X (CONTINUOUS LOAD) [PER NEC 690.52] =77A X 1.25 = 96.25A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(2)(a)] X (CONDUIT FILL) [PER TABLE 310.15(B)(3)(a)] X (CONDUCTOR AMPACITY) [PER TABLE 310.15(B)(16)] =0.91 X 1 X 115A =104.65A
TERMINAL RATING, [PER NEC 110.14(C)] - 3 AWG, 75°C RATED = 100A
100A >96.25A, SO THE ADJUSTED CONDUCTOR AMPACITY GOVERNS THE CONDUCTOR SIZING
ALSO,104.65A >77A **3 AWG** IS SUFFICIENT
INVERTER OVERCURRENT PROTECTION
(INVERTER MAX CURRENT) X (CONTINOUS LOAD) =77A X 1.25 = 96.25A --> 100A OVERCURRENT PROTECTION
AC ACCUMULATION PANEL TO POI:
MAX AC OUTPUT CURRENT = (MAX INVERTER OUTPUT) X (CONTINUOUS LOAD) [PER NEC 690.52]
= 77AX 3 X 1.25 =288.75A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(2)(a)] X (CONDUIT FILL) [PER TABLE 310.15(B)(3)(a)] X (CONDUCTOR AMPACITY) [PER TABLE 310.15(B)(16)] =0.91 X1 X 350A =318.5A
TERMINAL RATING, [PER NEC 110.14(C)] - 350 kcmil, 75°C RATED =310A
310A >288.75A, SO THE ADJUSTED CONDUCTOR AMPACITY GOVERNS THE CONDUCTOR SIZING
ALSO,318.5A >231A, AND **350 kcmil** IS SUFFICIENT
INVERTER OVERCURRENT PROTECTION
(INVERTER MAX CURRENT) X (CONTINOUS LOAD) = 77AX 3X 1.25 = 288.75A --> 300A OVERCURRENT PROTECTION

CONDUIT SCHEDULE

TAG ID	CONDUIT SIZE	CONDUCTOR	NEUTRAL	GROUND
1	1-1/4" EMT 1-1/4" EMT	(6) 10 AWG PV WIRE 2K (4) 10 AWG PV WIRE 2K	NONE	(1) 6 AWG BARE COPPER
2	1-1/4" EMT	(3) 3 AWG THHN/THWN-2	(1) 8 AWG THHN/THWN-2	(1) 8 AWG THHN/THWN-2
3	2-1/2" EMT/ 3" PVC	(3) 350 kcmil THHN/THWN-2	(1) 4 AWG THHN/THWN-2	(1) 4 AWG THHN/THWN-2

MODULE SPECIFICATION	
MODEL	TRINA SOLAR TSM-DE18M(II) 505W
MODULE POWER @ STC	505W
OPEN CIRCUIT VOLTAGE:**Voc**	51.9V
MAX POWER VOLTAGE:**Vmp**	43.0V
SHORT CIRCUIT VOLTAGE:**Isc**	12.35A
MAX POWER CURRENT:**Imp**	11.75A

INVERTER SPECIFICATIONS	
MODEL	FIMER PVS-60-TL-US(3PH,277/480V)
POWER RATING	60000W
RATED DC INPUT POWER	61800W
MAX OUTPUT CURRENT	77A
CEC WEIGHTED EFFICIENCY	98.00%
MAX INPUT CURRENT(PER MPPT)	36A
MAX DC VOLTAGE	1000V

DC VOLTAGE DROP CALCULATION (NSC NORTH CARPORT)

SOURCE	TERMINATION	TAG	CONDUIT TYPE	CURRENT (IMP)	STRING VOLTAGE AT 2%DB (VMP)	#SET OF PARALLEL CONDUCTOR	CONDUCTOR	CONDUCTOR MATERIAL	RESISTENCE AT 75 DEG C	RESISTENCE AT 2%DB	MAX CONDUTOR LENGTH(ft)	%V.DROP
MODULES	INVERTER 01	1	PVC	11.75	774	1	C AWG 10	Cu	0.00124	0.00104775	420	1.34%
MODULES	INVERTER 02	1	PVC	11.75	774	1	C AWG 10	Cu	0.00124	0.00104775	450	1.43%
MODULES	INVERTER 03	1	PVC	11.75	774	1	C AWG 10	Cu	0.00124	0.00104775	500	1.59%
											MAX Vdrop	1.59%
											AVERAGE Vdrop	1.45%

3 PHASE AC VOLTAGE DROP CALCULATION

SOURCE	TERMINATION	TAG	CONDUIT TYPE	CURRENT	VOLTAGE	#SET OF PARALLEL CONDUCTOR	CONDUCTOR	CONDUCTOR MATERIAL	RESISTENCE AT 75 DEG C	RESISTENCE AT 2%DB	MAX CONDUTOR LENGTH(ft)	%V.DROP
INVERTER TO COLLECTION												
INVERTER 01	AC ACCUMULATION	2	PVC	77	480	1	G AWG 03	Cu	0.00025	0.00021124	10	0.06%
INVERTER 02	AC ACCUMULATION	2	PVC	77	480	1	G AWG 03	Cu	0.00025	0.00021124	20	0.12%
INVERTER 03	AC ACCUMULATION	2	PVC	77	480	1	G AWG 03	Cu	0.00025	0.00021124	30	0.18%
COLLECTION TO POI												
AC ACCUMULATION	AC DISCONNECT	3	PVC	231	480	1	P 350 KCMIL	Cu	0.000043	3.63333E-05	320	0.97%
AC DISCONNECT	POI	3	EMT	231	480	1	P 350 KCMIL	Cu	0.000043	3.63333E-05	10	0.03%
											MAX Vdrop	1.18%
											AVERAGE Vdrop	1.12%
											TOTAL SYSTEM VDROP	2.77%

NOTE:
1.THIS INSTALLATION IS TO BE CONSIDERED SUPERVISED.ALL NEW ADDITIONS AND ALTERATIONS TO ANY EQUIPMENT IDENTIFIED IN THIS DOCUMENT MUST BE MADE WITH ENGINEERING SUPERVISION AND ALL WORK MUST BE COMPLETED BY QUALIFIED PERSONNEL.
2.ALL EQUIPMENT AND TERMINALS MUST BE MINIMUM 75°C RATED.
3.ALL CONDUCTORS ARE COPPER, UNLESS OTHERWISE SPECIFIED.
4.ALL TERMINATIONS OF ALUMINUM CONDUCTORS SHALL BE PROPERLY INSTALLED WITH BEST PRACTICE PROCEDURES THAT INCLUDE BUT NOT LIMITED TO: USE OF TERMINATION EQUIPMENT RATED FOR ALUMINUM AT THE CONDUCTOR TEMPERATURE, CURRENT, AND VOLTAGE; ALLOWANCE FOR MOVEMENT DUE TO THERMAL EXPANSION/CONTRACTION; EXPOSED ALUMINUM SHALL BE PROPERLY COATED WITH ANTI-OXIDATION COMPOUND; TERMINALS ARE TORQUE AND MARKED TO REQUIRED SETTINGS WITH CALIBRATED DEVICE
5.TAP DISCONNECTS ARE WITHIN THE 10 FOOT PER TAP RULE.
6.TAPS ARE MADE USING LISTED DEVICES.

Optimal Tech

SYSTEM INFORMATION
DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM TEMPERATURE: 20°C
MAXIMUM TEMPERATURE: 40°C

REGISTERED PROFESSIONAL ENGINEER No. 135 E. K. J. BERMUDA

SOLAR PV PROJECT
FOR
BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION
NAME:BERMUDA NSC
ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM
32.301639, -64.771827
APN:21936
AHJ:BM-CITY OF DEVONSHIRE
PRN NUMBER:GTO-CU-2021-302

ILLUMINEi Because quality matters

ELECTRICAL DIAGRAM & CALC-CARPORT NSC NORTH

DRAFTED BY/QC'ED BY:
V.PRIYA/VANITHA

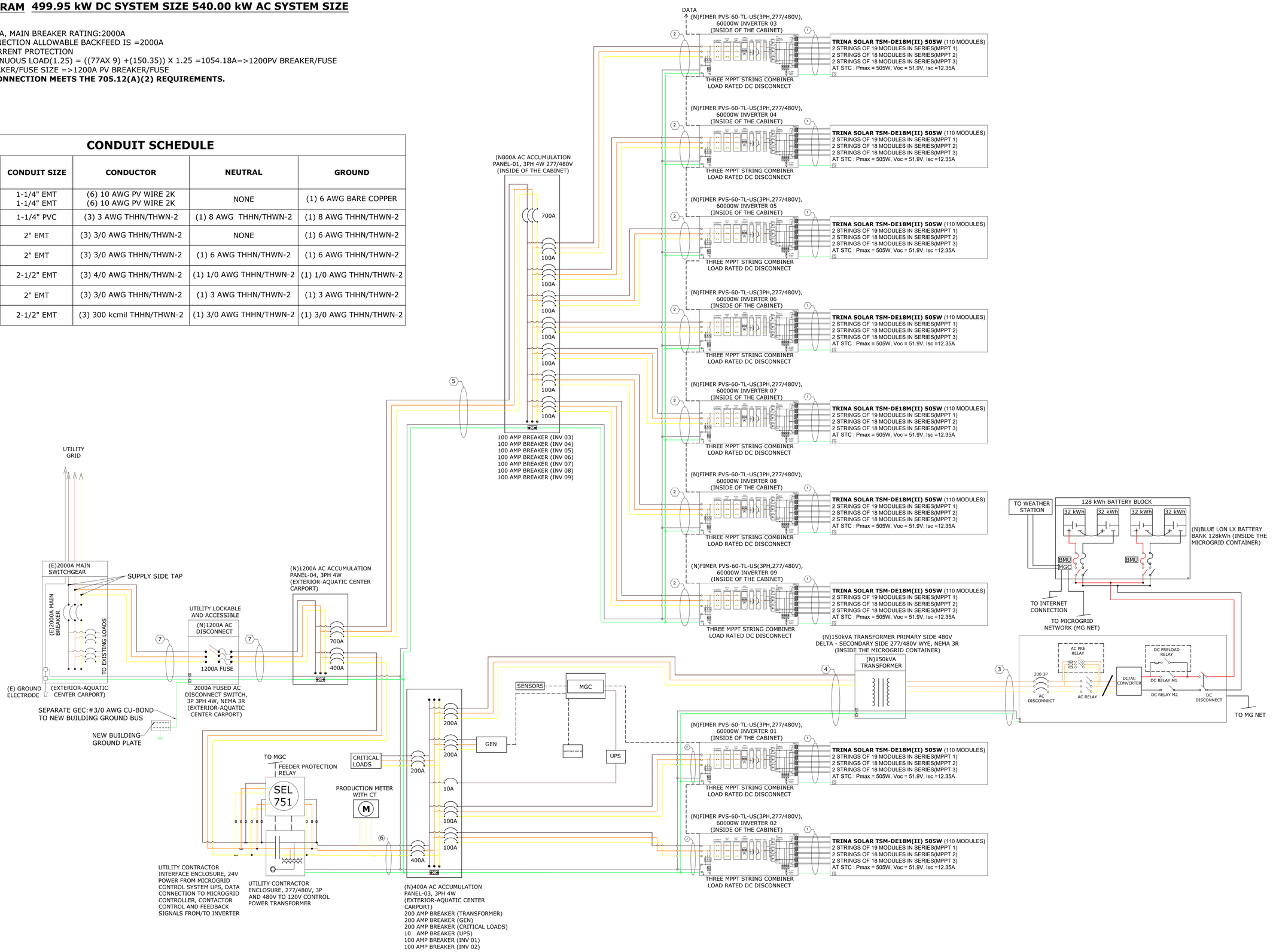
SCALE:AS NOTED	REV:A
DATE:3/21/22	E-10

ELECTRICAL DIAGRAM 499.95 kW DC SYSTEM SIZE 540.00 kW AC SYSTEM SIZE

OCPD CALCULATIONS
MAIN PANEL RATING:2000A, MAIN BREAKER RATING:2000A
LINE SIDE TAP INTERCONNECTION ALLOWABLE BACKFEED IS =2000A
OCPD:INVERTER OVERCURRENT PROTECTION
=INVERTER O/P I X CONTINUOUS LOAD(1.25) = ((77AX 9) +(150.35)) X 1.25 =1054.18A=>1200PV BREAKER/FUSE
TOTAL REQUIRED PV BREAKER/FUSE SIZE =>1200A PV BREAKER/FUSE
THE DESIGNED INTERCONNECTION MEETS THE 705.12(A)(2) REQUIREMENTS.

CONDUIT SCHEDULE

TAG ID	PARALLEL FEEDERS	CONDUIT SIZE	CONDUCTOR	NEUTRAL	GROUND
1	1	1-1/4" EMT 1-1/4" EMT	(6) 10 AWG PV WIRE 2K (6) 10 AWG PV WIRE 2K	NONE	(1) 6 AWG BARE COPPER
2	1	1-1/4" PVC	(3) 3 AWG THHN/THWN-2	(1) 8 AWG THHN/THWN-2	(1) 8 AWG THHN/THWN-2
3	1	2" EMT	(3) 3/0 AWG THHN/THWN-2	NONE	(1) 6 AWG THHN/THWN-2
4	1	2" EMT	(3) 3/0 AWG THHN/THWN-2	(1) 6 AWG THHN/THWN-2	(1) 6 AWG THHN/THWN-2
5	3	2-1/2" EMT	(3) 4/0 AWG THHN/THWN-2	(1) 1/0 AWG THHN/THWN-2	(1) 1/0 AWG THHN/THWN-2
6	2	2" EMT	(3) 3/0 AWG THHN/THWN-2	(1) 3 AWG THHN/THWN-2	(1) 3 AWG THHN/THWN-2
7	4	2-1/2" EMT	(3) 300 kcmil THHN/THWN-2	(1) 3/0 AWG THHN/THWN-2	(1) 3/0 AWG THHN/THWN-2



SYSTEM INFORMATION

DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM TEMPERATURE: 20°C
MAXIMUM TEMPERATURE: 40°C

REGISTERED PROFESSIONAL ENGINEER No. 135 E. K. J. BERMUDA

SOLAR PV PROJECT FOR BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION

NAME:BERMUDA NSC

ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM

32.301639, -64.771827
APN:21936

AHJ:BM-CITY OF DEVONSHIRE

PRN NUMBER:GTO-CU-2021-302

ILLUMINEi Because quality matters

ELECTRICAL DIAGRAM - CARPORT AQUATIC CENTER

DRAFTED BY/QC'ED BY:
V.PRIYA/VANITHA

SCALE:AS NOTED | REV:A

DATE:3/21/22 | E-11

SYSTEM INFO:
499.95 kW DC SYSTEM SIZE
(990) TRINA SOLAR TSM-DE18M(II) 505W MODULES
(9) FIMER PVS-60-TL-US(3PH,277/480V)

SYSTEM CHARACTERISTICS-INV-01 TO INV-09:
OPERATING VOLTAGE = (MODULE VMP) X (# MODULES / STRING) =43.0V X 19=817V
MAX OPEN CIRCUIT VOLTAGE = {[((TEMP COEF VOC) X (VOC)) / 100] X [LOW TEMP - STC TEMP] + VOC} X (# MODULES / STRING) = {[(-0.26 %/°C X51.9V) / 100] X [20 °C - 25 °C] +51.9V} X 19=998.91V
OPERATING CURRENT = (MODULE IMP) * (# STRINGS) =11.75 A X 6=70.5A
SHORT CIRCUIT CURRENT = 1.25 X (MODULE ISC) X (# STRINGS) = 1.25 X 12.35 A X 6= 92.62A

DC WIRE SIZING(TAG 01):
MAX CIRCUIT CURRENT = (MODULE ISC) X (CONTINUOUS LOAD)[690.53] = 12.35A X 1.25 X 1.25 =19.29A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(2)(a)]] X (CONDUIT FILL) [PER TABLE 310.15(B)(3)(a)X (CONDUCTOR AMPACITY) [PER TABLE 310.15(B)(16)] = 0.71X 0.8 X 40A =22.72A
TERMINAL RATING, [PER NEC 110.14(C)] - 10 AWG, 75°C RATED =35A
35A > 19.29A, SO THE TERMINAL RATING GOVERNS THE CONDUCTOR SIZING
ALSO, 22.72A > 15.43A, AND **10 AWG** IS SUFFICIENT.

AC WIRE SIZING-INV-01 TO INV-09(TAG 02):
MAX AC OUTPUT CURRENT = (MAX INVERTER OUTPUT) X (CONTINUOUS LOAD) [PER NEC 690.52] =77A X 1.25 = 96.25A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(2)(a)] X (CONDUIT FILL) [PER TABLE 310.15(B)(3)(a)] X (CONDUCTOR AMPACITY) [PER TABLE 310.15(B)(16)] =0.91 X 1 X 115A =104.65A
TERMINAL RATING, [PER NEC 110.14(C)] - 3 AWG, 75°C RATED = 100A
100A >96.25A, SO THE ADJUSTED CONDUCTOR AMPACITY GOVERNS THE CONDUCTOR SIZING
ALSO,104.65A >77A **3 AWG** IS SUFFICIENT
INVERTER OVERCURRENT PROTECTION
(INVERTER MAX CURRENT) X (CONTINOUS LOAD) =77A X 1.25 = 96.25A --> 100A OVERCURRENT PROTECTION

BATTERY INVERTER TO TRANSFORMER (TAG 03):
MAX OUTPUT CURRENT = (BATTERY INVERTER OUTPUT) X (CONTINUOUS LOAD) [PER NEC 690.52] = 150.4AX 1 X 1.25 =188.00A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(2)(a)] X (CONDUIT FILL) [PER TABLE 310.15(B)(3)(a)] X (CONDUCTOR AMPACITY) [PER TABLE 310.15(B)(16)] =0.91 X1 X 225A =204.75A
TERMINAL RATING, [PER NEC 110.14(C)] - 3/0 AWG, 75°C RATED =200A
310A >188.00A, SO THE ADJUSTED CONDUCTOR AMPACITY GOVERNS THE CONDUCTOR SIZING
ALSO,204.75A >150.4A, AND **3/0 AWG** IS SUFFICIENT
INVERTER OVERCURRENT PROTECTION
(INVERTER MAX CURRENT) X (CONTINOUS LOAD) = 150.4A X 1.25 = 188.00A --> 200A OVERCURRENT PROTECTION

TRANSFORMER TO AC ACCUMULATION PANEL (TAG 04):
MAX OUTPUT CURRENT = (INVERTER VA) / (VOLTS X 1.732) X 1.25= (125000X1.25)/(480X1.732) =187.95A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(2)(a)] X (CONDUIT FILL) [PER TABLE 310.15(B)(3)(a)] X (CONDUCTOR AMPACITY) [PER TABLE 310.15(B)(16)] =0.91 X1 X 225A =204.75A
TERMINAL RATING, [PER NEC 110.14(C)] - 3/0 AWG, 75°C RATED =200A
310A >188.00A, SO THE ADJUSTED CONDUCTOR AMPACITY GOVERNS THE CONDUCTOR SIZING
ALSO,204.75A >150.4A, AND **3/0 AWG** IS SUFFICIENT
INVERTER OVERCURRENT PROTECTION
(INVERTER MAX CURRENT) X (CONTINOUS LOAD) = 150.4A X 1.25 = 188.00A --> 200A OVERCURRENT PROTECTION

AC ACCUMULATION PANEL-01 TO AC ACCUMULATION PANEL-03 (TAG 05):
NO.OF PARALLEL FEEDERS:3
MAX AC OUTPUT CURRENT = (MAX INVERTER OUTPUT) X (CONTINUOUS LOAD) [PER NEC 690.52] = 77AX 7 X 1.25 =673.75/3=224.58A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(2)(a)] X (CONDUIT FILL) [PER TABLE 310.15(B)(3)(a)] X (CONDUCTOR AMPACITY) [PER TABLE 310.15(B)(16)] =0.91 X1 X 260A =236.6A
TERMINAL RATING, [PER NEC 110.14(C)] - 4/0 AWG, 75°C RATED =230A
230A >224.58A, SO THE ADJUSTED CONDUCTOR AMPACITY GOVERNS THE CONDUCTOR SIZING
ALSO,224.58A >179.66A, AND **4/0 AWG** IS SUFFICIENT
INVERTER OVERCURRENT PROTECTION
(INVERTER MAX CURRENT) X (CONTINOUS LOAD) = 77AX 7X 1.25 = 673.75A --> 700A OVERCURRENT PROTECTION

AC ACCUMULATION PANEL-02 TO AC ACCUMULATION PANEL-03 (TAG 06):
NO.OF PARALLEL FEEDERS:2
MAX AC OUTPUT CURRENT = ((MAX INVERTER OUTPUT) + CRITICAL LOADS) X (CONTINUOUS LOAD) [PER NEC 690.52] = ((77AX 2)+(150.35)) X 1.25 =380.43/2=190.21A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(2)(a)] X (CONDUIT FILL) [PER TABLE 310.15(B)(3)(a)] X (CONDUCTOR AMPACITY) [PER TABLE 310.15(B)(16)] =0.91 X1 X 225A =204.75A
TERMINAL RATING, [PER NEC 110.14(C)] - 3/0 AWG, 75°C RATED =200A
200A >190.21A, SO THE ADJUSTED CONDUCTOR AMPACITY GOVERNS THE CONDUCTOR SIZING
ALSO,204.75A >152.16A, AND **3/0 AWG** IS SUFFICIENT
INVERTER OVERCURRENT PROTECTION
(INVERTER MAX CURRENT) X (CONTINOUS LOAD) =((77AX 2)+(150.35)) X 1.25 =380.43A --> 400A OVERCURRENT PROTECTION

AC ACCUMULATION PANEL-03 TO POI (TAG 07):
NO.OF PARALLEL FEEDERS:4
MAX AC OUTPUT CURRENT = (MAX INVERTER OUTPUT) X (CONTINUOUS LOAD) [PER NEC 690.52] = ((77AX 9) +(150.35)) X 1.25 =1054.18/4=263.54A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(2)(a)] X (CONDUIT FILL) [PER TABLE 310.15(B)(3)(a)] X (CONDUCTOR AMPACITY) [PER TABLE 310.15(B)(16)] =0.91 X1 X 320A =291.2A
TERMINAL RATING, [PER NEC 110.14(C)] - 300 kcmil, 75°C RATED =285A
285A >263.54A, SO THE ADJUSTED CONDUCTOR AMPACITY GOVERNS THE CONDUCTOR SIZING
ALSO,291.2A >210.83A, AND **300 kcmil** IS SUFFICIENT
INVERTER OVERCURRENT PROTECTION
(INVERTER MAX CURRENT) X (CONTINOUS LOAD) = ((77AX 9) +(150.35)) X 1.25 =1054.18A --> 1200A OVERCURRENT PROTECTION

NOTE:
1.THIS INSTALLATION IS TO BE CONSIDERED SUPERVISED.ALL NEW ADDITIONS AND ALTERATIONS TO ANY EQUIPMENT IDENTIFIED IN THIS DOCUMENT MUST BE MADE WITH ENGINEERING SUPERVISION AND ALL WORK MUST BE COMPLETED BY QUALIFIED PERSONNEL.
2.ALL EQUIPMENT AND TERMINALS MUST BE MINIMUM 75°C RATED.
3.ALL CONDUCTORS ARE COPPER, UNLESS OTHERWISE SPECIFIED.
4.ALL TERMINATIONS OF ALUMINUM CONDUCTORS SHALL BE PROPERLY INSTALLED WITH BEST PRACTICE PROCEDURES THAT INCLUDE BUT NOT LIMITED TO: USE OF TERMINATION EQUIPMENT RATED FOR ALUMINUM AT THE CONDUCTOR TEMPERATURE, CURRENT, AND VOLTAGE; ALLOWANCE FOR MOVEMENT DUE TO THERMAL EXPANSION/CONTRACTION; EXPOSED ALUMINUM SHALL BE PROPERLY COATED WITH ANTI-OXIDATION COMPOUND; TERMINALS ARE TORQUE AND MARKED TO REQUIRED SETTINGS WITH CALIBRATED DEVICE
5.TAP DISCONNECTS ARE WITHIN THE 10 FOOT PER TAP RULE.
6.TAPS ARE MADE USING LISTED DEVICES.

CONDUIT SCHEDULE

TAG ID	PARALLEL FEEDERS	CONDUIT SIZE	CONDUCTOR	NEUTRAL	GROUND
1	1	1-1/4" EMT 1-1/4" EMT	(6) 10 AWG PV WIRE 2K (6) 10 AWG PV WIRE 2K	NONE	(1) 6 AWG BARE COPPER
2	1	1-1/4" PVC	(3) 3 AWG THHN/THWN-2	(1) 8 AWG THHN/THWN-2	(1) 8 AWG THHN/THWN-2
3	1	2" EMT	(3) 3/0 AWG THHN/THWN-2	NONE	(1) 6 AWG THHN/THWN-2
4	1	2" EMT	(3) 3/0 AWG THHN/THWN-2	(1) 6 AWG THHN/THWN-2	(1) 6 AWG THHN/THWN-2
5	3	2-1/2" EMT	(3) 4/0 AWG THHN/THWN-2	(1) 1/0 AWG THHN/THWN-2	(1) 1/0 AWG THHN/THWN-2
6	2	2" EMT	(3) 3/0 AWG THHN/THWN-2	(1) 3 AWG THHN/THWN-2	(1) 3 AWG THHN/THWN-2
7	4	2-1/2" EMT	(3) 300 kcmil THHN/THWN-2	(1) 3/0 AWG THHN/THWN-2	(1) 3/0 AWG THHN/THWN-2

INVERTER SPECIFICATIONS

MODEL	FIMER PVS-60-TL-US(3PH,277/480V)
POWER RATING	60000W
RATED DC INPUT POWER	61800W
MAX OUTPUT CURRENT	77A
CEC WEIGHTED EFFICIENCY	98.00%
MAX INPUT CURRENT(PER MPPT)	36A
MAX DC VOLTAGE	1000V

MODULE SPECIFICATION

MODEL	TRINA SOLAR TSM-DE18M(II) 505W
MODULE POWER @ STC	505W
OPEN CIRCUIT VOLTAGE:**Voc**	51.9V
MAX POWER VOLTAGE:**Vmp**	43.0V
SHORT CIRCUIT VOLTAGE:**Isc**	12.35A
MAX POWER CURRENT:**Imp**	11.75A

BATTERY INVERTER SPECIFICATION

NOMINAL POWER	125 kWac
MAX APPARENT POWR	125 kVA
OPERATING VOLTAGE(LINE TO LINE)	480 Vac
MAX CURRENT	150.4 Aac
OUTPUT FREQUENCY	60 Hz

DC VOLTAGE DROP CALCULATION (AQUATIC CARPORT CENTER)

SOURCE	TERMINATION	TAG	CONDUIT TYPE	CURRENT (IMP)	STRING VOLTAGE AT 2%DB (VMP)	#SET OF PARALLEL CONDUCTOR	CONDUCTOR	CONDUCTOR MATERIAL	RESISTENCE AT 75 DEG C	RESISTENCE AT 2%DB	MAX CONDUTOR LENGTH(ft)	%V.DROP
MODULES	INVERTER 01	1	PVC	11.75	817	1	C AWG 10	Cu	0.00124	0.00104775	190	0.57%
MODULES	INVERTER 02	1	PVC	11.75	817	1	C AWG 10	Cu	0.00124	0.00104775	240	0.72%
MODULES	INVERTER 03	1	PVC	11.75	817	1	C AWG 10	Cu	0.00124	0.00104775	340	1.02%
MODULES	INVERTER 04	1	PVC	11.75	817	1	C AWG 10	Cu	0.00124	0.00104775	300	0.90%
MODULES	INVERTER 05	1	PVC	11.75	817	1	C AWG 10	Cu	0.00124	0.00104775	320	0.96%
MODULES	INVERTER 06	1	PVC	11.75	817	1	C AWG 10	Cu	0.00124	0.00104775	340	1.02%
MODULES	INVERTER 07	1	PVC	11.75	817	1	C AWG 10	Cu	0.00124	0.00104775	400	1.21%
MODULES	INVERTER 08	1	PVC	11.75	817	1	C AWG 10	Cu	0.00124	0.00104775	450	1.36%
MODULES	INVERTER 09	1	PVC	11.75	817	1	C AWG 10	Cu	0.00124	0.00104775	420	1.27%
											MAX Vdrop	1.36%
											AVERAGE Vdrop	1.00%

3 PHASE AC VOLTAGE DROP CALCULATION

SOURCE	TERMINATION	TAG	CONDUIT TYPE	CURRENT	VOLTAGE	#SET OF PARALLEL CONDUCTOR	CONDUCTOR	CONDUCTOR MATERIAL	RESISTENCE AT 75 DEG C	RESISTENCE AT 2%DB	MAX CONDUTOR LENGTH(ft)	%V.DROP
INVERTER TO COLLECTION												
INVERTER 01	AC ACCUMULATION PANEL	2	PVC	77	480	1	G AWG 03	Cu	0.00025	0.00021124	50	0.29%
INVERTER 02	AC ACCUMULATION PANEL	2	PVC	77	480	1	G AWG 03	Cu	0.00025	0.00021124	50	0.29%
INVERTER 03	AC ACCUMULATION PANEL	2	PVC	77	480	1	G AWG 03	Cu	0.00025	0.00021124	55	0.32%
INVERTER 04	AC ACCUMULATION PANEL	2	PVC	77	480	1	G AWG 03	Cu	0.00025	0.00021124	60	0.35%
INVERTER 05	AC ACCUMULATION PANEL	2	PVC	77	480	1	G AWG 03	Cu	0.00025	0.00021124	60	0.35%
INVERTER 06	AC ACCUMULATION PANEL	2	PVC	77	480	1	G AWG 03	Cu	0.00025	0.00021124	65	0.38%
INVERTER 07	AC ACCUMULATION PANEL	2	PVC	77	480	1	G AWG 03	Cu	0.00025	0.00021124	50	0.29%
INVERTER 08	AC ACCUMULATION PANEL	2	PVC	77	480	1	G AWG 03	Cu	0.00025	0.00021124	50	0.29%
INVERTER 09	AC ACCUMULATION PANEL	2	PVC	77	480	1	G AWG 03	Cu	0.00025	0.00021124	55	0.32%
COLLECTION TO POI												
AC ACCUMULATION	AC DISCONNECT	3	PVC	231	480	3	P 350 KCMIL	Cu	0.000043	0.00003633	500	0.50%
AC DISCONNECT	POI	4	EMT	231	480	3	P 350 KCMIL	Cu	0.000043	0.00003633	10	0.01%
											MAX Vdrop	0.90%
											AVERAGE Vdrop	0.84%
											TOTAL SYSTEM VDROP	2.25%

MICROGRID 3 PHASE AC VOLTAGE DROP CALCULATION

SOURCE	TERMINATION	TAG	CONDUIT TYPE	CURRENT	VOLTAGE	#SET OF PARALLEL CONDUCTOR	CONDUCTOR	CONDUCTOR MATERIAL	RESISTENCE AT 75 DEG C	RESISTENCE AT 2%DB	MAX CONDUTOR LENGTH(ft)	%V.DROP
INVERTER TO COLLECTION												
BATTERY INVERTER	TRANSFORMER	5	EMT	150.4	480	1	L AWG 3/0	Cu	0.000082	0.00006929	10	0.04%
TRANSFORMER	AC ACCUMULATION PANEL	6	EMT	150.35	480	1	L AWG 3/0	Cu	0.000082	0.00006929	660	2.48%
											MAX Vdrop	2.48%
											AVERAGE Vdrop	1.26%

Optimal Tech

SYSTEM INFORMATION
DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM TEMPERATURE: 20°C
MAXIMUM TEMPERATURE: 40°C

SOLAR PV PROJECT FOR BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION
NAME:BERMUDA NSC
ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM
32.301639, -64.771827
APN:21936
AHJ:BM-CITY OF DEVONSHIRE
PRN NUMBER:GTO-CU-2021-302

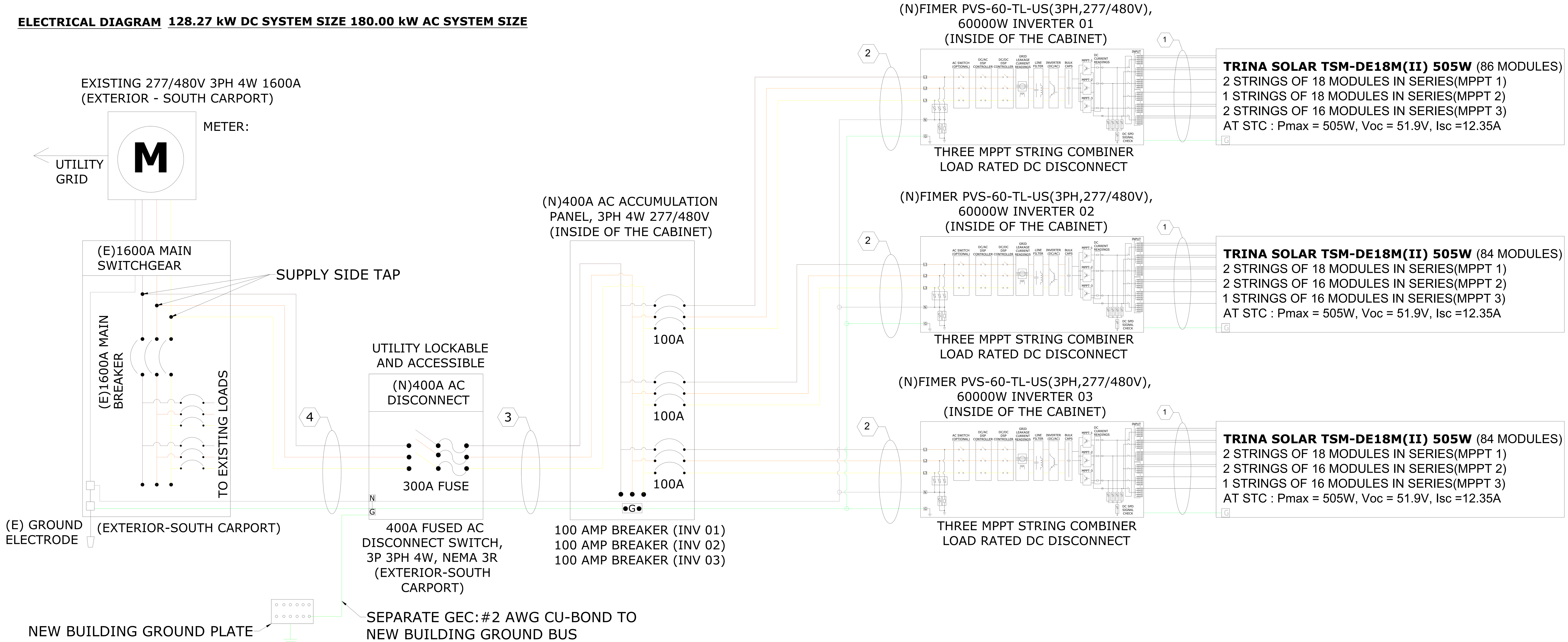
ILLUMINE i
Because quality matters

ELECTRICAL CALCULATION-CARPORT AQUATIC CENTER

DRAFTED BY/QC'ED BY:
V.PRIYA/VANITHA

SCALE:AS NOTED	REV:A
DATE:3/21/22	E-12

ELECTRICAL DIAGRAM 128.27 kW DC SYSTEM SIZE 180.00 kW AC SYSTEM SIZE



OCPD CALCULATIONS

MAIN PANEL RATING:1600A, MAIN BREAKER RATING:1600A
LINE SIDE TAP INTERCONNECTION ALLOWABLE BACKFEED IS =1600A
OCPD CALCULATIONS: INVERTER OVERCURRENT PROTECTION
=INVERTER O/P I X CONTINUOUS LOAD(1.25) =((77AX3)x1.25=288.75A=>PV BREAKER/FUSE = 300A
TOTAL REQUIRED PV BREAKER/FUSE SIZE =>300A PV BREAKER/FUSE
THE DESIGNED INTERCONNECTION MEETS THE 705.12(A)(2) REQUIREMENTS.

SYSTEM INFO:
128.27 kW DC SYSTEM SIZE
(254) TRINA SOLAR TSM-DE18M(II) 505W MODULES
(3) FIMER PVS-60-TL-US(3PH,277/480V)

SYSTEM CHARACTERISTICS-INV-01 TO INV-03:
OPERATING VOLTAGE = (MODULE VMP) X (# MODULES / STRING) =43.0V X 18=774V
MAX OPEN CIRCUIT VOLTAGE = {[((TEMP COEF VOC) X (VOC)) / 100] X [LOW TEMP - STC TEMP] + VOC} X (# MODULES / STRING) = {[(-0.26 %/°C X51.9V) / 100] X [20 °C - 25 °C] +51.9V} X 18=946.34V
OPERATING CURRENT = (MODULE IMP) * (# STRINGS) =11.75 A X 5=58.75A
SHORT CIRCUIT CURRENT = 1.25 X (MODULE ISC) X (# STRINGS) = 1.25 X 12.35 A X 5= 77.18A

DC WIRE SIZING
MAX CIRCUIT CURRENT = (MODULE ISC) X (CONTINUOUS LOAD)[690.53] = 12.35A X 1.25 X 1.25 =19.29A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(2)(a)]] X (CONDUIT FILL) [PER TABLE 310.15(B)(3)(a)X (CONDUCTOR AMPACITY) [PER TABLE 310.15(B)(16)] = 0.71X 0.8 X 40A =22.72A
TERMINAL RATING, [PER NEC 110.14(C)] - 10 AWG, 75°C RATED =35A
35A > 19.29A, SO THE TERMINAL RATING GOVERNS THE CONDUCTOR SIZING
ALSO, 22.72A > 15.43A, AND **10 AWG** IS SUFFICIENT.

AC WIRE SIZING-INV-01 TO INV-03:
MAX AC OUTPUT CURRENT = (MAX INVERTER OUTPUT) X (CONTINUOUS LOAD) [PER NEC 690.52] =77A X 1.25 = 96.25A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(2)(a)] X (CONDUIT FILL) [PER TABLE 310.15(B)(3)(a)] X (CONDUCTOR AMPACITY) [PER TABLE 310.15(B)(16)] =0.91 X 1 X 115A =104.65A
TERMINAL RATING, [PER NEC 110.14(C)] - 3 AWG, 75°C RATED = 100A
100A >96.25A, SO THE ADJUSTED CONDUCTOR AMPACITY GOVERNS THE CONDUCTOR SIZING
ALSO,104.65A >77A **3 AWG** IS SUFFICIENT
INVERTER OVERCURRENT PROTECTION
(INVERTER MAX CURRENT) X (CONTINOUS LOAD) =77A X 1.25 = 96.25A --> 100A OVERCURRENT PROTECTION

AC WIRE SIZING(TAG 03):
MAX AC OUTPUT CURRENT = (MAX INVERTER OUTPUT) X (CONTINUOUS LOAD) [PER NEC 690.52] = 77AX 3 X 1.25 =288.75A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(2)(a)] X (CONDUIT FILL) [PER TABLE 310.15(B)(3)(a)] X (CONDUCTOR AMPACITY) [PER TABLE 310.15(B)(16)] =0.91 X1 X 430A =391.3A
TERMINAL RATING, [PER NEC 110.14(C)] - 500 kcmil, 75°C RATED =380A
380A >288.75A, SO THE ADJUSTED CONDUCTOR AMPACITY GOVERNS THE CONDUCTOR SIZING
ALSO,391.3A >231A, AND **500 kcmil** IS SUFFICIENT
INVERTER OVERCURRENT PROTECTION
(INVERTER MAX CURRENT) X (CONTINOUS LOAD) = 77AX 3X 1.25 = 288.75A --> 300A OVERCURRENT PROTECTION

CONDUIT SCHEDULE

TAG ID	CONDUIT SIZE	CONDUCTOR	NEUTRAL	GROUND
1	1-1/4" EMT 1-1/4" EMT	(6) 10 AWG PV WIRE 2K (4) 10 AWG PV WIRE 2K	NONE	(1) 6 AWG BARE COPPER
2	1-1/4" EMT	(3) 3 AWG THHN/THWN-2	(1) 8 AWG THHN/THWN-2	(1) 8 AWG THHN/THWN-2
3	3" PVC	(3) 500 kcmil THHN/THWN-2	(1) 4 AWG THHN/THWN-2	(1) 4 AWG THHN/THWN-2
4	2-1/2" EMT	(3) 350 kcmil THHN/THWN-2	(1) 4 AWG THHN/THWN-2	(1) 4 AWG THHN/THWN-2

INVERTER SPECIFICATIONS

MODEL	FIMER PVS-60-TL-US(3PH,277/480V)
POWER RATING	60000W
RATED DC INPUT POWER	61800W
MAX OUTPUT CURRENT	77A
CEC WEIGHTED EFFICIENCY	98.00%
MAX INPUT CURRENT(PER MPPT)	36A
MAX DC VOLTAGE	1000V

MODULE SPECIFICATION

MODEL	TRINA SOLAR TSM-DE18M(II) 505W
MODULE POWER @ STC	505W
OPEN CIRCUIT VOLTAGE:**Voc**	51.9V
MAX POWER VOLTAGE:**Vmp**	43.0V
SHORT CIRCUIT VOLTAGE:**Isc**	12.35A
MAX POWER CURRENT:**Imp**	11.75A

NOTE:
1.THIS INSTALLATION IS TO BE CONSIDERED SUPERVISED.ALL NEW ADDITIONS AND ALTERATIONS TO ANY EQUIPMENT IDENTIFIED IN THIS DOCUMENT MUST BE MADE WITH ENGINEERING SUPERVISION AND ALL WORK MUST BE COMPLETED BY QUALIFIED PERSONNEL.
2.ALL EQUIPMENT AND TERMINALS MUST BE MINIMUM 75°C RATED.
3.ALL CONDUCTORS ARE COPPER, UNLESS OTHERWISE SPECIFIED.
4.ALL TERMINATIONS OF ALUMINUM CONDUCTORS SHALL BE PROPERLY INSTALLED WITH BEST PRACTICE PROCEDURES THAT INCLUDE BUT NOT LIMITED TO: USE OF TERMINATION EQUIPMENT RATED FOR ALUMINUM AT THE CONDUCTOR TEMPERATURE, CURRENT, AND VOLTAGE; ALLOWANCE FOR MOVEMENT DUE TO THERMAL EXPANSION/CONTRACTION; EXPOSED ALUMINUM SHALL BE PROPERLY COATED WITH ANTI-OXIDATION COMPOUND; TERMINALS ARE TORQUE AND MARKED TO REQUIRED SETTINGS WITH CALIBRATED DEVICE
5.TAP DISCONNECTS ARE WITHIN THE 10 FOOT PER TAP RULE.
6.TAPS ARE MADE USING LISTED DEVICES.

AC WIRE SIZING(TAG 04):
MAX AC OUTPUT CURRENT = (MAX INVERTER OUTPUT) X (CONTINUOUS LOAD) [PER NEC 690.52] = 77AX 3 X 1.25 =288.75A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(2)(a)] X (CONDUIT FILL) [PER TABLE 310.15(B)(3)(a)] X (CONDUCTOR AMPACITY) [PER TABLE 310.15(B)(16)] =0.91 X1 X 350A =318.5A
TERMINAL RATING, [PER NEC 110.14(C)] - 350 kcmil, 75°C RATED =310A
310A >288.75A, SO THE ADJUSTED CONDUCTOR AMPACITY GOVERNS THE CONDUCTOR SIZING
ALSO,318.5A >231A, AND 350 kcmil IS SUFFICIENT
INVERTER OVERCURRENT PROTECTION
(INVERTER MAX CURRENT) X (CONTINOUS LOAD) = 77AX 3X 1.25 = 288.75A --> 300A OVERCURRENT PROTECTION

Optimal Tech

SYSTEM INFORMATION
DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM TEMPERATURE: 20°C
MAXIMUM TEMPERATURE: 40°C

REGISTERED PROFESSIONAL ENGINEERS · BERMUDA · No. 135

SOLAR PV PROJECT FOR BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION
NAME:BERMUDA NSC
ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM
32.301639, -64.771827
APN:21936
AHJ:BM-CITY OF DEVONSHIRE
PRN NUMBER:GTO-CU-2021-302

ILLUMINE i — Because quality matters

ELECTRICAL DIAGRAM & CALC-CARPORT NSC SOUTH
DRAFTED BY/QC'ED BY: V.PRIYA/VANITHA
SCALE:AS NOTED | REV:A
DATE:3/21/22 | E-13

PLACARDS

⚠ WARNING

ELECTRIC SHOCK HAZARD
THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

LABEL LOCATION
DC DISCONNECT,INVERTER
[PER CODE: NEC 690.35(F)]
[To be used when inverter is ungrounded]

⚠ WARNING

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

DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR MODULES ARE EXPOSED TO SUNLIGHT

LABEL LOCATION
AC DISCONNECT,POINT OF INTERCONNECTION
[PER CODE: NEC 690.17(E)]

⚠ WARNING

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

LABEL LOCATION
AC DISCONNECT,POINT OF INTERCONNECTION
[PER CODE: NEC 690.17(E)]

WARNING-Electric Shock Hazard
No User Serviceable Parts inside
Contact authorized service provide for assistance

LABEL LOCATION
INVERTER, JUNCTION BOXES(ROOF),
AC DISCONNECT
[PER CODE: NEC 690.13.G.3 & NEC 690.13.G.4]

WARNING:PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION
CONDUIT, COMBINER BOX
[PER CODE: NEC690.31(G)(3)(4) & NEC 690.13(G)(4)]

WARNING
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS OVER-CURRENT DEVICE

LABEL LOCATION
POINT OF INTERCONNECTION
(PER CODE: NEC 705.12(D)(7)
(Not Required if Panel board is rated not less than sum of ampere ratings of all overcurrent devices supplying it)

CAUTION: SOLAR CIRCUIT

LABEL LOCATION
MARKINGS PLACED ON ALL INTERIOR AND EXTERIOR DC CONDUIT, RACEWAYS, ENCLOSURES AND CABLE ASSEMBLES AT LEAST EVERY 10 FT, AT TURNS AND ABOVE/BELOW PENETRATIONS AND ALL COMBINER/JUNCTION BOXES.
(PER CODE: IFC605.11.1.4)

SOLAR DISCONNECT

LABEL LOCATION
DISCONNECT, POINT OF INTERCONNECTION
[PER CODE: NEC690.13(B)]

⚠ WARNING
TRI POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION
POINT OF INTERCONNECTION
[PER CODE: NEC705.12(D)(4)]

CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED

LABEL LOCATION
WEATHER RESISTANT MATERIAL, DURABLE ADHESDIVE, UL969 AS STANDARD TO WEATHER RATING (UL LISTING OF MARKINGS NOT REQUIRED), MIN 3/8" LETTER HEIGHT ARIAL OR SIMILAR FONT NON-BOLD,PLACED WITHIN THE MAIN SERVICE DISCONNECT,PLACED ON THE OUTSIDE OF THE COVER WHEN DISCONNECT IS OPERATED WITH THE SERVICE PANEL CLOSED.
(PWER CODE: NEC690.15 ,690.13(B))

(CARPORT NSC NORTH)

PHOTOVOLTAIC SYSTEM AC DISCONNECT SWITCH
RATED AC OPERATING CURRENT 231 AMPS AC
AC NOMINAL OPERATING VOLTAGE 480 VAC

LABEL LOCATION
AC DISCONNECT , POINT OF INTERCONNECTION
[PER CODE: NEC 690.54]

(CARPORT NSC SOUTH)

PHOTOVOLTAIC SYSTEM AC DISCONNECT SWITCH
RATED AC OPERATING CURRENT 231 AMPS AC
AC NOMINAL OPERATING VOLTAGE 480 VAC

LABEL LOCATION
AC DISCONNECT , POINT OF INTERCONNECTION
[PER CODE: NEC 690.54]

(CARPORT AQUATIC CENTER)

PHOTOVOLTAIC SYSTEM AC DISCONNECT SWITCH
RATED AC OPERATING CURRENT 693 AMPS AC
AC NOMINAL OPERATING VOLTAGE 480 VAC

LABEL LOCATION
AC DISCONNECT , POINT OF INTERCONNECTION
[PER CODE: NEC 690.54]

INVERTER 01 TO 03(CARPORT NSC NORTH)

RATED MAXIMUM POWER-POINT CURRENT(Imp) 58.75 A
RATED MAXIMUM POWER-POINT VOLTAGE(Vmp) 774 V
MAXIMUM SYSTEM VOLTAGE(Voc) 946.34 V
MAXIMUM CIRCUIT CURRENT(Isc) 77.18 A

LABEL LOCATION
DC DISCONNECT[PER CODE: NEC690.14(C)(2)]

INVERTER 01 TO 03(CARPORT NSC SOUTH)

RATED MAXIMUM POWER-POINT CURRENT(Imp) 58.75 A
RATED MAXIMUM POWER-POINT VOLTAGE(Vmp) 774 V
MAXIMUM SYSTEM VOLTAGE(Voc) 946.34 V
MAXIMUM CIRCUIT CURRENT(Isc) 77.18 A

LABEL LOCATION
DC DISCONNECT[PER CODE: NEC690.14(C)(2)]

INVERTER 01 TO 09(CARPORT AQUATIC CENTER)

RATED MAXIMUM POWER-POINT CURRENT(Imp) 70.5 A
RATED MAXIMUM POWER-POINT VOLTAGE(Vmp) 817 V
MAXIMUM SYSTEM VOLTAGE(Voc) 998.91 V
MAXIMUM CIRCUIT CURRENT(Isc) 92.62 A

LABEL LOCATION
DC DISCONNECT[PER CODE: NEC690.14(C)(2)]

SYSTEM LABELING REQUIREMENTS:
1.LABELS MUST BE OF REFLECTIVE PHENOLIC MATERIAL WITH WHITE LETTERS AND RED BACKGROUND.
2.LABELS TO BE MECHANICALLY FASTENED AND PLACED AS REQUIRED PER NEC 690.
3.LABELS TO BE IN A CAPITALIZED ARIAL FONT WITH A MINIMUM OF 3/8" IN HEIGHT.
4.DC CONDUIT LABEL MADE OF DURABLE ADHESIVE MATERIALS PLACED EVERY 10 FEET AND NEAR ALL JUNCTIONS AND PENETRATIONS.
5.LABELS SHOWN FOR REFERENCE ONLY, CONTRACTOR RESPONSIBLE TO MEET LOCAL AUTHORITY AND UTILITY REQUIREMENTS.

DC VOLTAGE DROP CALCULATION (NSC SOUTH CARPORT)

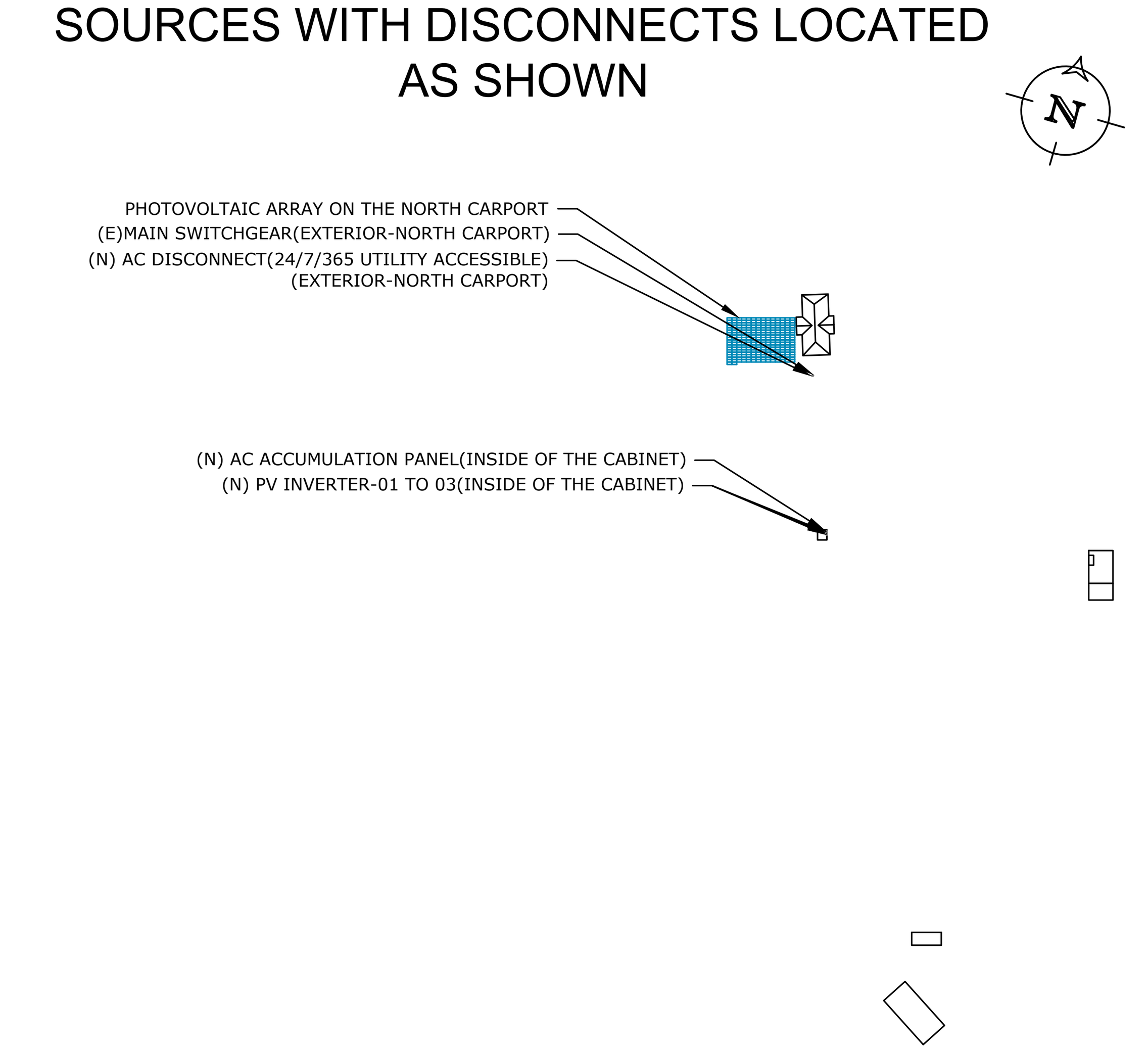
SOURCE	TERMINATION	TAG	CONDUIT TYPE	CURRENT (IMP)	STRING VOLTAGE AT 2%DB (VMP)	#SET OF PARALLEL CONDUCTOR	CONDUCTOR	CONDUCTOR MATERIAL	RESISTENCE AT 75 DEG C	RESISTENCE AT 2%DB	MAX CONDUTOR LENGTH(ft)	%V.DROP
MODULES	INVERTER 01	1	PVC	11.75	774	1	C AWG 10	Cu	0.00124	0.00104775	180	0.57%
MODULES	INVERTER 02	1	PVC	11.75	774	1	C AWG 10	Cu	0.00124	0.00104775	220	0.70%
MODULES	INVERTER 03	1	PVC	11.75	774	1	C AWG 10	Cu	0.00124	0.00104775	260	0.83%
											MAX Vdrop	0.83%
											AVERAGE Vdrop	0.70%

3 PHASE AC VOLTAGE DROP CALCULATION

SOURCE	TERMINATION	TAG	CONDUIT TYPE	CURRENT	VOLTAGE	#SET OF PARALLEL CONDUCTOR	CONDUCTOR	CONDUCTOR MATERIAL	RESISTENCE AT 75 DEG C	RESISTENCE AT 2%DB	MAX CONDUTOR LENGTH(ft)	%V.DROP
INVERTER TO COLLECTION												
INVERTER 01	AC ACCUMULATION	2	PVC	77	480	1	G AWG 03	Cu	0.00025	0.00021124	45	0.26%
INVERTER 02	AC ACCUMULATION	2	PVC	77	480	1	G AWG 03	Cu	0.00025	0.00021124	50	0.29%
INVERTER 03	AC ACCUMULATION	2	PVC	77	480	1	G AWG 03	Cu	0.00025	0.00021124	50	0.29%
COLLECTION TO POI												
AC ACCUMULATION	AC DISCONNECT	3	PVC	231	480	1	R 500 KCMIL	Cu	0.000032	2.70387E-05	820	1.85%
AC DISCONNECT	POI	4	EMT	231	480	1	P 350 KCMIL	Cu	0.000043	3.63333E-05	10	0.03%
											MAX Vdrop	2.17%
											AVERAGE Vdrop	2.16%
											TOTAL SYSTEM VDROP	3.00%

WARNING: ⚠

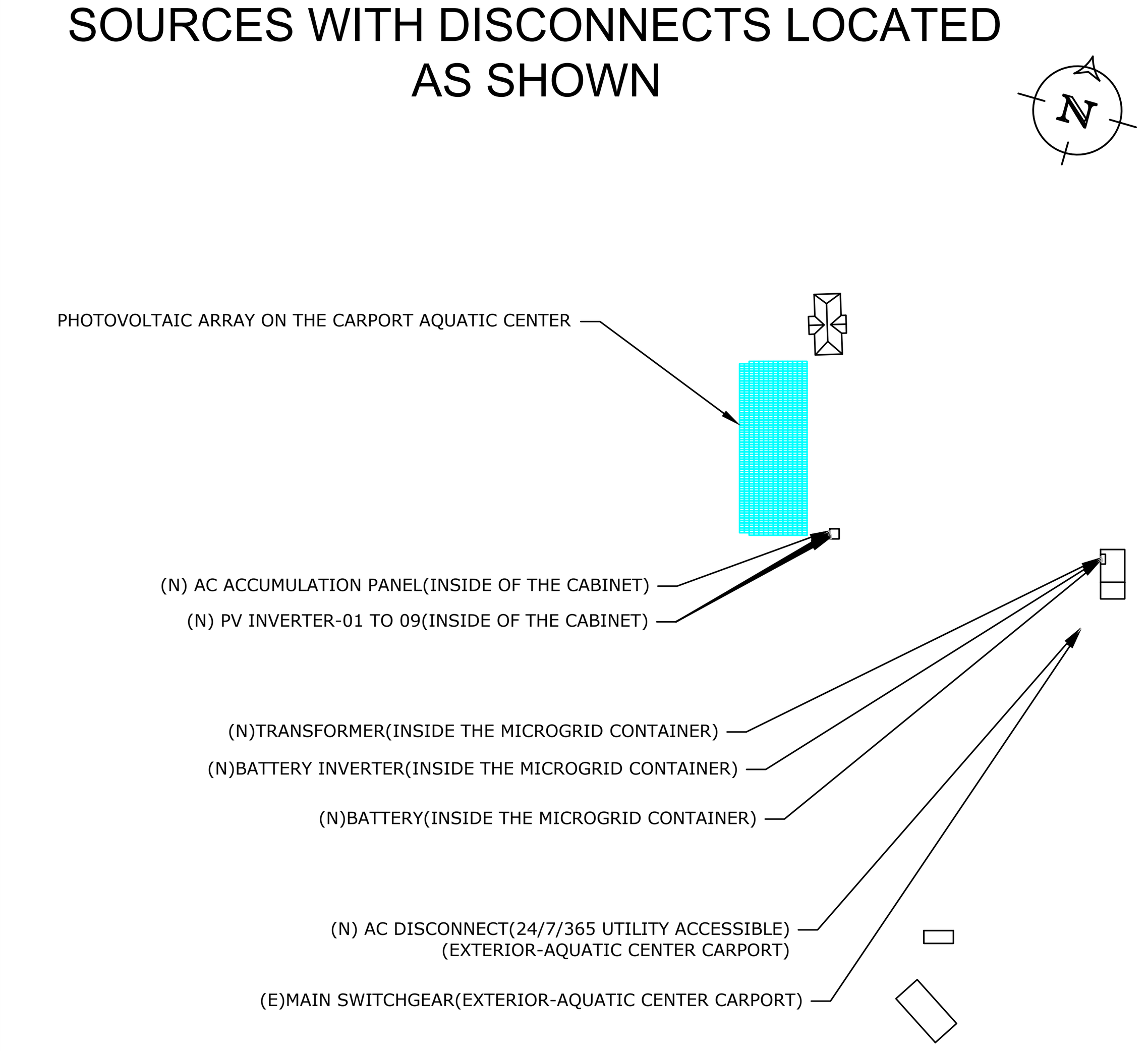
POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN



ALL PLACARDS SHALL BE OF WEATHER PROOF CONSTRUCTION, BACKGROUND ON ALL PLACARDS SHALL BE RED WITH WHITE LETTERING U.O.N.
PLACARD SHALL BE MOUNTED DIRECTLY ON THE EXISTING UTILITY ELECTRICAL SERVICE.
FASTENERS APPROVED BY THE LOCAL JURISDICTION

WARNING: ⚠

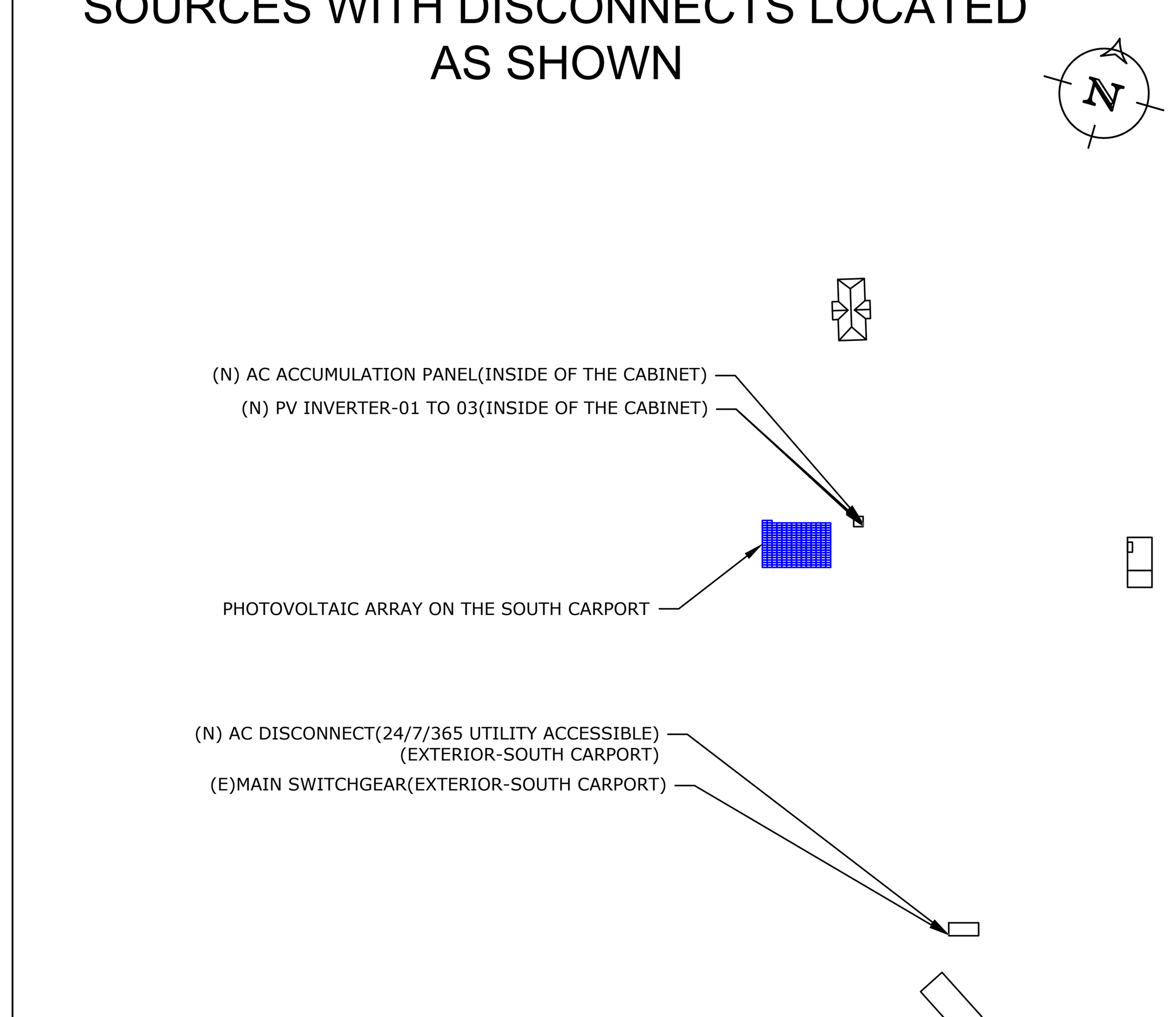
POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN



ALL PLACARDS SHALL BE OF WEATHER PROOF CONSTRUCTION, BACKGROUND ON ALL PLACARDS SHALL BE RED WITH WHITE LETTERING U.O.N.
PLACARD SHALL BE MOUNTED DIRECTLY ON THE EXISTING UTILITY ELECTRICAL SERVICE.
FASTENERS APPROVED BY THE LOCAL JURISDICTION

WARNING: ⚠

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



ALL PLACARDS SHALL BE OF WEATHER PROOF CONSTRUCTION, BACKGROUND ON ALL PLACARDS SHALL BE RED WITH WHITE LETTERING U.O.N.
PLACARD SHALL BE MOUNTED DIRECTLY ON THE EXISTING UTILITY ELECTRICAL SERVICE.
FASTENERS APPROVED BY THE LOCAL JURISDICTION

Optimal Tech

SYSTEM INFORMATION
DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM TEMPERATURE: 20°C
MAXIMUM TEMPERATURE: 40°C

REGISTERED PROFESSIONAL ENGINEER No. 135 BERMUDA

SOLAR PV PROJECT FOR BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION

NAME:BERMUDA NSC

ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM

32.301639, -64.771827
APN:21936

AHJ:BM-CITY OF DEVONSHIRE

PRN NUMBER:GTO-CU-2021-302

ILLUMINE i
Because quality matters

ELECTRICAL PLACARDS

DRAFTED BY/QC'ED BY:
V.PRIYA/VANITHA

SCALE:AS NOTED | REV:A

DATE:3/21/22 | E-14

Mono Multi Solutions

THE Vertex

BACKSHEET MONOCRYSTALLINE MODULE

500W+
MAXIMUM POWER OUTPUT

21.1%
MAXIMUM EFFICIENCY

0~+5W
POSITIVE POWER TOLERANCE

PRODUCTS TSM-DE18M(II) | POWER RANGE 480-505W

Founded in 1997, Trina Solar is the world's leading total solution provider for solar energy. With local presence around the globe, Trina Solar is able to provide exceptional service to each customer in each market and deliver our innovative, reliable products with the backing of Trina as a strong, bankable brand. Trina Solar now distributes its PV products to over 100 countries all over the world. We are committed to building strategic, mutually beneficial collaborations with installers, developers, distributors and other partners in driving smart energy together.

Comprehensive Products and System Certificates

IEC61215/IEC61730/IEC61701/IEC62716
ISO 9001: Quality Management System
ISO 14001: Environmental Management System
ISO14064: Greenhouse Gases Emissions Verification
OHSAS18001: Occupational Health and Safety Management System

Trinasolar

High customer value
- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance Of System) cost, shorter payback time
- Lower guaranteed first year and annual degradation
- Designed for compatibility with existing mainstream system components
- Higher return on Investment

High power up to 505W
- Large area cells based on 210mm silicon wafers and 1/3-cut cell technology
- Up to 21.1% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection

High reliability
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load

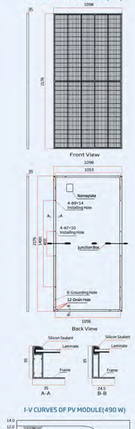
High energy yield
- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.36%) and operating temperature

Trina Solar's VERTEX Backsheet Performance Warranty

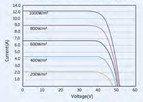
Vertex

BACKSHEET MONOCRYSTALLINE MODULE

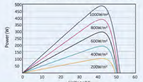
DIMENSIONS OF PV MODULE(mm)



I-V CURVES OF PV MODULE(490 W)



P-V CURVES OF PV MODULE(490W)



ELECTRICAL DATA (STC)

Peak Power Watts-P_{MAX} (Wp)*	480	485	490	495	500	505
Power Tolerance-P_{MAX} (W)	0 ~ +5					
Maximum Power Voltage-V_{MPP} (V)	42.0	42.2	42.4	42.6	42.8	43.0
Maximum Power Current-I_{MPP} (A)	11.42	11.49	11.56	11.63	11.69	11.75
Open Circuit Voltage-V_{OC} (V)	50.8	51.1	51.3	51.5	51.7	51.9
Short Circuit Current-I_{SC} (A)	11.99	12.07	12.14	12.21	12.28	12.35
Module Efficiency η_m (%)	20.1	20.3	20.5	20.7	20.9	21.1

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

ELECTRICAL DATA (NMOT)

Maximum Power- P_{MAX} (Wp)	363	367	371	375	379	382
Maximum Power Voltage-V_{MPP} (V)	39.6	39.8	40.0	40.2	40.4	40.6
Maximum Power Current-I_{MPP} (A)	9.15	9.20	9.26	9.32	9.37	9.43
Open Circuit Voltage-V_{OC} (V)	48.0	48.2	48.4	48.6	48.8	49.0
Short Circuit Current-I_{SC} (A)	9.65	9.72	9.77	9.83	9.89	9.94

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

MECHANICAL DATA

Solar Cells	Monocrystalline
Cell Orientation	150 cells
Module Dimensions	2176 × 1098 × 35 mm (85.67 × 43.23 × 1.38 inches)
Weight	26.3 kg (58.0 lb)
Glass	3.2 mm (0.13 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant Material	EVA
Backsheet	White
Frame	35 mm (1.38 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm² (0.006 inches²). Portrait: N 280mm/P 280mm(11.02/11.02inches) Landscape: N 1400 mm /P 1400 mm (55.12/55.12 inches)
Connector	MC4 EVO2 / TS4*

*Please refer to regional datasheet for specified connector.

TEMPERATURE RATINGS

NMOT (Nominal Module Operating Temperature)	41℃ (±3℃)
Temperature Coefficient of P_{MAX}	- 0.36%/℃
Temperature Coefficient of V_{OC}	- 0.26%/℃
Temperature Coefficient of I_{SC}	0.04%/℃

(Do not connect Fuse in Combiner Box with two or more strings in parallel connection)

MAXIMUM RATINGS

Operational Temperature	-40~+85℃
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	20A

WARRANTY

12 year Product Workmanship Warranty
25 year Power Warranty
2% first year degradation
0.55% Annual Power Attenuation

(Please refer to product warranty for details)

PACKAGING CONFIGUREATION

Modules per box: 30 pieces
Modules per 40' container: 600 pieces

Trinasolar

Version number: TSM_EN_2020_A
www.trinasolar.com

FIMER

Solar inverter PVS-60-TL-US

The PVS-60-TL is FIMER's cloud connected three-phase string solution enabling cost efficient large decentralized photovoltaic systems for both commercial and utility applications.

60 kW

String inverter - PVS-60-TL-US

Technical data and types

Type code	PVS-60-TL-US
Input side	
Absolute maximum DC input voltage ($V_{max,abs}$)	1000 V
Start-up DC input voltage (V_{start})	420...700 V (Default 500 V)
Operating DC input voltage range (V_{dcmin}...V_{dcmax})	0.7xV_{start} ...950 V (min 360 V)
Rated DC input voltage (V_{dcr})	720 Vdc
Rated DC input power (P_{dcr})	61800 W
Number of independent MPPT	3 (S and SC version) / 1 (standard version)
Maximum DC input power for each MPPT ($P_{MPPTmax}$)	21000W@45°C
MPPT input DC voltage range ($V_{MPPTmin}$ ... $V_{MPPTmax}$) at P_{dcr}	570-800 Vdc
Maximum DC input current (I_{dcmax}) for each MPPT	36 A
Maximum input short circuit current for each MPPT	55 A (165 A in case of parallel MPPT)
Number of DC input pairs for each MPPT	5 (S and SC version) / 1 (Standard version)
DC connection type	Screw terminal block (Standard and -S version) or PV quick fit connector [1] (-SC version)
Input protection	
Reverse polarity protection	Yes, from limited current source
Input over voltage protection for each MPPT	Type 2
Photovoltaic array isolation control	According to local standard
DC switch rating for each MPPT (version with DC switch)	75 A / 1000 V for each MPPT (180A in case of parallel MPPT)
Fuse rating (version with fuses)	15 A / 1000 V
Output side	
AC grid connection type	Three-phase (3PH/N/PE or 3PH/PE), grounded WYE system only
Rated AC power (P_{acr} @cosφ=1)	60000 W
Maximum AC output power (P_{acmax} @cosφ=1)	60000 W
Maximum apparent power (S_{max})	60000 VA
Nominal power factor and adjustable range	> 0.995; 0...1 inductive/capacitive with maximum Sn
Rated AC grid voltage (V_{acr})	480 V
AC voltage range	384...571 V [2]
Maximum AC output current (I_{acmax})	77 A
Contributory fault current	92 A
Rated output frequency (fr)	60 Hz
Output frequency range (f_{min}...f_{max})	50...64 Hz [3]
Nominal power factor and adjustable range	> 0.995; 0...1 inductive/capacitive with maximum Sn
Total current harmonic distortion	<3%
Maximum AC cable	AWG 3/0 copper/aluminum
AC connection type	Screw terminal block
Output protection	
Anti-islanding protection	According IEEE 1547
Maximum external AC overcurrent protection	100 A
Output overvoltage protection - plug in modular surge arrester	Type 2
Operating performance	
Maximum efficiency (hmax)	98.5%
CEC efficiency	98.0%
Communication	
Embedded communication interfaces	3x RS485, 2X Ethernet (RJ45), WLAN (IEEE802.11 b/g/n @ 2.4 GHz)
Communication protocol	Modbus RTU / TCP (Sunspec compliant); Aurora Protocol
Remote monitoring services	Standard level access to Aurora Vision monitoring portal
Advanced features	Integrated Web User Interface; Embedded logging and direct transferring of data to Cloud

Delta Power Conditioning System 125kW / 480Vac

Industry Leading Power for Energy Storage Applications

Our Power Conditioning System (PCS) is a bi-directional inverter for grid-tied energy storage system (ESS). It demonstrates industry leading power performance with high power efficiency and low stand-by power loss. It is compact for space saving and offers the scalability for various system configurations and integration with mainstream branded battery systems.

Delta PCS enables your ESS to maximize the value of your storage for such applications:
- Peak shaving for demand charge management
- Load shifting for time-of-use savings
- Real and reactive power compensation to improve power quality
- Standalone operation in off-grid mode for power backup

LF_PCS_125kW_OD_EN_V1.7

DELTA

Technical Specifications

AC GRID CONNECTION	
Rated Grid Voltage	480 Vac, 3 phase
Grid Voltage Range	423 to 528 Vac (-12%, +10%)
Rated Grid Frequency	60 Hz
Frequency Range	59.3 to 60.5 Hz, adjustable
Rated AC Power	125 kVA
Rated AC Current	150.4 A
Max. Continuous AC Current	167 Arms
Current THD	IEEE 1547 Compliant, <5% at rated power
Power Factor	-1 to 1, continuously adjustable
DC CONNECTION	
DC Voltage Range	750 to 1,000 Vdc
Rated DC Voltage	900 Vdc
Rated Discharge Power	129 kW
Rated Charge Power	122 kW
Max. Discharge DC Current	172 A (129 kW @ 750 Vdc)
Max. Charge DC Current	163 A (122 kW @ 750 Vdc)
STANDALONE OPERATION	
Rated Output Voltage	480 Vac, 3P3W (In 3P4W case, an external Dyn Transformer is required)
Rated Output Power	125 kVA/125 kW with linear load 100 kVA with non-linear/RCD load
Rated Output Current	150.4 A with linear load 120 A with non-linear/RCD load
Rated Output Frequency	60 Hz ±1%
Power Factor	0.8 to 1
Output Voltage Accuracy	1%
Output Voltage THD	<3% @ 12.5~100% liner load < 5% @ 12.5~100% non-liner load
Output Voltage Regulation	<10%, at dynamic; Recovering within tolerance in 100ms

LF_PCS_125kW_OD_EN_V1.7

DELTA

ENVIRONMENTAL	
Max Altitude	3,000 m (9,843 ft)
Operating Temperature	-25~60ºC (-13~140ºF), derating >50ºC (3%/ºC), ≤2000m -25~40ºC (-13~104ºF), >2000m
Storage Temperature	-25 ~70ºC (-13~158ºF)
Humidity	0 to 95% RH, no-condensing
Cooling	Forced air w/ speed control
Acoustic Noise	<72 dBA @ 1 m (6.6 ft) at rated condition
Enclosure Type	Type 3R (IP54 Equivalent)
Ingress Rating	IP54
INTERFACE	
User Interface	4.9 in LCD screen with operation button, Fault LEDs
Emergency Stop	Local EPO button & remote control
Communication	RS-485 / Modbus RTU, CAN
PERFORMANCE	
Peak Efficiency / CEC Efficiency	97.8% / 97.5%
Standby Loss	<20 W
MECHANICAL	
Dimensions (W x D x H) (excl. Package)	600 mm x 800 mm x 1,734 mm / 23.6 in x 31.5 in x 68.3 in
Net Weight (excl. Package)	305 kg / 672 lb
COMPLIANCE	
Certificate (in progress)	UL1741, UL 1741 SA, IEEE1547, Rule 21, FCC part 15 class A

Delta Products Corporation
46101 Fremont Blvd, Fremont, CA 94538, U.S.A.
TEL : +1-510-668-5100
FAX : +1-510-668-0680
E-mail : energy.storage@deltaww.com
www.delta-americas.com

LF_PCS_125kW_OD_EN_V1.7

DELTA

Optimal Tech

SYSTEM INFORMATION

DC SYSTEM SIZE: 756.49KW
AC SYSTEM SIZE: 900.00KW
NORTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
CENTER CARPORT:
DC SYSTEM SIZE: 499.95KW
AC SYSTEM SIZE: 540.00KW
MODULES:
(990)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(9)FIMER
PVS-60-TL-US(3PH,277/480V)
SOUTH CARPORT:
DC SYSTEM SIZE: 128.27KW
AC SYSTEM SIZE: 180.00KW
MODULES:
(254)TRINA SOLAR
TSM-DE18M(II) 505W
INVERTERS:
(3)FIMER
PVS-60-TL-US(3PH,277/480V)
WIND SPEED: 150MPH
SNOW LOAD: 0PSF
MINIMUM TEMPERATURE: 20°C
MAXIMUM TEMPERATURE: 40°C

REGISTERED PROFESSIONAL ENGINEER No. 135 BERMUDA

SOLAR PV PROJECT
FOR
BERMUDA NSC
65 ROBERTS AVENUE, DEVONSHIRE, BM

REVISION

DATE	DESCRIPTION	REV
03/21/22	PERMIT PLANS	A

PROJECT INFORMATION

NAME:BERMUDA NSC

ADDRESS:65 ROBERTS AVENUE, DEVONSHIRE, BM

32.301639, -64.771827
APN:21936

AHJ:BM-CITY OF DEVONSHIRE

PRN NUMBER:GTO-CU-2021-302

ILLUMINEi Because quality matters

SPEC SHEETS -01

DRAFTED BY/QC'ED BY:
V.PRIYA/VANITHA

SCALE:AS NOTED | REV:A

DATE:3/21/22 | E-15