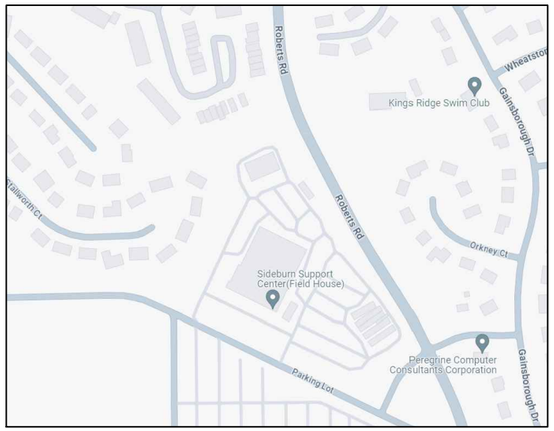
GENERAL INFORMATION

PROJECT LOCATION

VICINITY MAP:



GOVERNING REGULATIONS

CODE SUMMARY - ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE FOLLOWING:

1. VIRGINIA CONSTRUCTION CODE, USBC, PART I, 2021
2. VIRGINIA MECHANICAL CODE, 2021
3. VIRGINIA PLUMBING CODE, 2021
4. VIRGINIA ENERGY CONSERVATION CODE ,2021
5. VIRGINIA STATEWIDE FIRE PREVENTION CODE, 2021
6. VIRGINIA FUEL GAS CODE, 2021
7. VIRGINIA MAINTENANCE CODE, USBC, PART III, 2021
8. VIRGINIA EXISTING BUILDING CODE, USBC, PART II, 2021
9. NFPA 70, "THE NATIONAL ELECTRIC CODE", 2020
10. ICC/ANSI 117.1, "ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES, 2009
11. FAIRFAX COUNTY, VA CODE OF ORDINANCES, CHAPTERS 61-69.1, MAY 7, 2021

IN ADDITION, REQUIREMENTS OF THE FOLLOWING SHALL ALSO APPLY TO WORK PERFORMED UNDER THIS CONTRACT:

1. LICENSING REQUIREMENTS OF THE LOCAL GOVERNMENT, GOVERNMENT AGENCY, OR AUTHORITY HAVING JURISDICTION.
2. NFPA 72, "THE NATIONAL FIRE ALARM CODE", 2007
3. OSHA REGULATIONS
4. NFPA REGULATIONS
5. ASHRAE STANDARDS AND GUIDELINES
6. SMACNA STANDARDS AND GUIDELINES
7. PLUMBING AND DRAINAGE INSTITUTE STANDARDS AND GUIDELINES
8. REQUIREMENTS OF THE OWNER'S FIRE INSURANCE AGENCY

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF THE INSTALLATION OF A 32.98kW, 68 MODULE, GRID-TIED PHOTOVOLTAIC SYSTEM. RACKING WILL UTILIZE ROOF DECK ATTACHMENTS. THE PV SYSTEM WILL TIE TO UTILITY VIA LINE SIDE INTERCONNECTION.

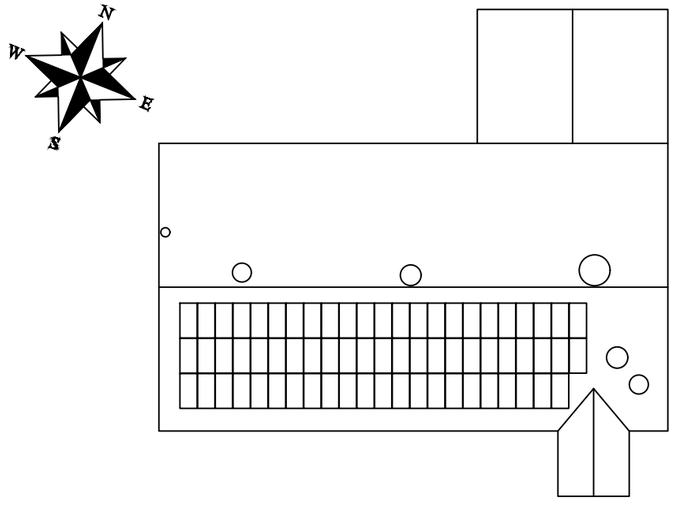
32.98kW DC PHOTOVOLTAIC RAILED ROOF SYSTEM

FOR

Fairfax County Public Schools

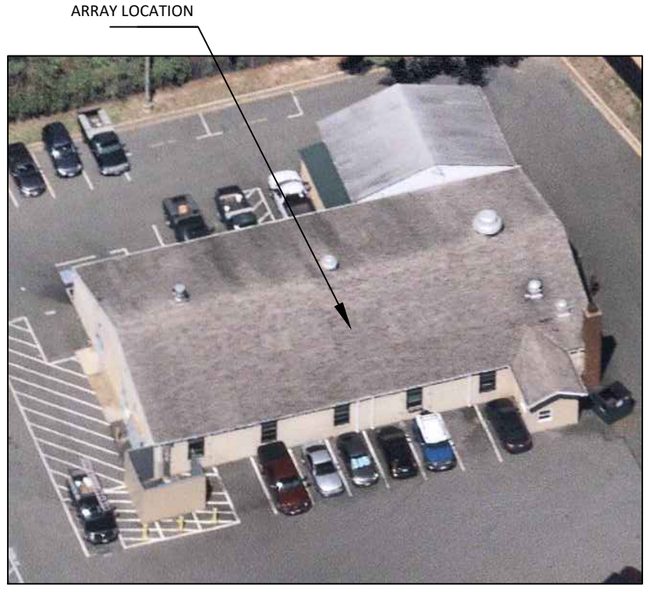
System Summary - Sideburn Support Satellite	
System Size	32.98kW
Module Quantity	68
Inverter Quantity	1
Annual Production Estimate (Year 1)	40,672 kWh

Index	
PV 001	Cover Sheet
PV 002	General Notes
PV 101	Site Plan
PV 102	Plot Plan
PV 201	UADS Location
PV 202	Conduit Plan
PV 203	Single Line - Power
PV 204	Single Line - Communications
PV 205	Electrical Calculations
PV 206	System Labels
PV 301	Attachment and String Plan
PV 401	Module Specification
PV 402	Optimizer Specification
PV 403	Inverter Specification
PV 404	Racking Specification
PV 405	Attachment Specification
PV 406	Meter Specification
PV 407	SolaDeck Specification



1 SITE OVERVIEW

SCALE: NTS



2 ROOFTOP VIEW OF SITE

CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

Cover Sheet

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV001

GENERAL NOTES:

1. EACH CONTRACTOR, PROPOSER, SUPPLIER AND/ OR MANUFACTURER SHALL REFER TO ALL DOCUMENTS PERTAINING TO THIS PROJECT AND COORDINATE ACCORDINGLY SO AS TO ENSURE ADEQUACY OF FIT, COMPLIANCE WITH SPECIFICATIONS, PROPER VOLTAGE AND CURRENT CHARACTERISTICS TO AVOID CONFLICT WITH ANY OTHER BUILDINGS SYSTEMS. VERIFY SAME WITH SHOP DRAWINGS.
2. ALL OFFSETS, TURNS, FITTINGS, TRIM , DETAIL ECT. MAY NOT BE INDICATED, BUT SHALL BE PROVIDED AS REQUIRED. ADDITIONAL ALLOWANCES SHALL BE INCLUDED FOR SAME AT EACH PROPOSERS DISCRETION.
3. INSTALL NO CONDUIT, ECT. IN A LOCATION OR IN A MANNER WHICH WILL ALLOW FREEZING AND THE COLLECTION OF CONDENSATION THEREON. IF IN DOUBT, CONTACT THE ENGINEERS.
4. ADVISE THE ENGINEERS OF ANY CONFLICTS, ERRORS, OR EMISSIONS, ECT. AT LEAST 10 DAYS PRIOR TO BID DATE, TO ALLOW CLARIFICATION BY WRITTEN ADDENDUM.
5. DEVIATION FROM SPECIFICATIONS OR PLANS REQUIRES PRIOR WRITTEN APPROVAL FROM THE ENGINEERS AND MUST BE SUBMITTED IN WRITING NO LATER THAN TEN DAYS PRIOR TO THE BID DATE.
6. OBSERVE ALL APPLICABLE CODES, RULES AND REGULATIONS THAT MAY APPLY TO THE WORK UNDER THIS CONTRACT. (CITY, COUNTY, LOCAL, STATE, FEDERAL, MUNICIPALITY, UTILITY COMPANY, OSHA ECT.).
7. INSTALL EQUIPMENT, MATERIALS, ET. IN STRICT ACCORD WITH MANUFACTURERS RECOMMENDATIONS AND DIRECTIONS. IF IN CONFLICT WITH THE DESIGN INDICATED IN CONTRACT DOCUMENTS, ADVISE THE ENGINEER PRIOR TO INSTALLATION FOR CLARIFICATION.
8. DO NOT RECESS PANEL BOARD TUBS OR OTHER FLUSH-MOUNTED EQUIPMENT IN WALLS THAT HAVE A FIRE RATING, AS REQUIRED BY CODES. NO INSTALLATION SHALL DIMINISH OR VOID FIRE RESISTIVE RATINGS IN ANYWAY.
9. THE PURPOSE AND INTENT OF ALL OF THE DOCUMENTS PERTAINING TO THIS PROJECT IS TO PROVIDE A COMPLETE, FUNCTIONAL, SAFE, LIKE-NEW FACILITY. ANYTHING LESS SHALL BE UNACCEPTABLE.
10. ALL SYSTEMS, EQUIPMENT AND MATERIALS ARE TO BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. WORK NOT MEETING THIS CRITERION SHALL BE REMOVED AND REINSTALLED SATISFACTORILY. FINAL DETERMINATION OF THE ACCEPTABILITY OF THE QUALITY OF WORK RESIDES WITH THE ENGINEER.
11. ALL WORK, MATERIALS, EQUIPMENT, ECT. SHALL BE FULLY GUARANTEED FOR ONE FULL CALENDAR YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION AS DOCUMENTED BY THE ENGINEER, UNLESS LONGER WARRANTY PERIODS FOR EQUIPMENT ARE SPECIFIED.
12. UNLESS OTHERWISE SPECIFIED OR INDICATED, ALL EQUIPMENT AND/OR MATERIALS WITHIN OCCUPIED SPACES OR EXPOSED TO VIEW ON THE BUILDING EXTERIOR SHALL BE PRIMED AND FINISHED SO AS TO COMPLEMENT ADJACENT SURFACE, UNLESS OTHERWISE NOTED. COORDINATE WORK AND COLORS WITH OWNER REPRESENTATIVE.
13. WHERE PENETRATING EXISTING ROOFING MEMBRANE OR OTHER MATERIALS USED FOR WEATHER PROOFING THE BUILDING, MAKE SUCH PENETRATION IN A WAY THAT WILL NOT DIMINISH THE ROOFING WARRANTY OR INTEGRITY IN ANYWAY. COORDINATE ALL SUCH PENETRATIONS WITH THE ROOFING MANUFACTURER OR OWNER REPRESENTATIVE.
14. THE CONTRACTOR IS RESPONSIBLE FOR ALL UTILITY COMPANY FEES, CASH CONTRIBUTIONS OR OTHER COSTS THAT THE UTILITY COMPANY MAY REQUIRE TO COMPLETE THEIR WORK. (ELECTRIC, ECT.)
15. PROVIDE DETAILED SHOP DRAWINGS TO ENGINEERS PRIOR TO PURCHASING OR INSTALLING ANY EQUIPMENT.
16. DEVIATIONS IN SIZES, CAPACITIES, FIT, FINISH, ECT. FOR EQUIPMENT FROM THAT PRIME SPECIFIED SHALL BE THE RESPONSIBILITY OF THE PURCHASER OF THAT EQUIPMENT. ANY PROVISIONS REQUIRED TO ACCOMMODATE A DEVIATION, WHETHER APPROVED BY THE ENGINEER OR NOT, SHALL BE THE RESPONSIBILITY OF THE PURCHASER.
17. THE CONSTRUCTION MANAGER, GENERAL CONTRACTOR OR WHOMEVER HOLDS THE PRIME CONTRACT(S) FOR THIS CONSTRUCTION IS RESPONSIBLE FOR THE COORDINATION, APPEARANCE, SCHEDULING AND TIMELINESS OF THE WORK OF ALL TRADES, CONTRACTORS, SUPPLIERS, INSTALLERS, ECT. POOR OR UNTIMELY WORK ON THE PART OF ANY SUBCONTRACTORS SHALL BE RESOLVED BY THE PARTY WHO ENGAGED THEM ON THIS PROJECT.
18. WHERE MOUNTING HEIGHTS ARE NOT INDICATED OR ARE IN CONFLICT WITH OTHER BUILDING SYSTEM, CONTACT THE ENGINEER BEFORE AFFECTING INSTALLATION. REFER ALSO TO ARCHITECTURAL, INTERIOR AND EXTERIOR ELEVATIONS, CEILING HEIGHTS, AND OTHER DETAILS OF THESE DOCUMENTS, AS APPLICABLE.
19. ALL ELECTRICAL COMPONENTS OR EQUIPMENT SHALL BE LISTED AND LABELED BY UNDERWRITERS LABORATORIES OR OTHER APPROVED LISTING AGENCY, APPROVAL AND LABELING OF INDIVIDUAL COMPONENTS ON AN ASSEMBLY IS NOT ACCEPTABLE AS MEETING THIS REQUIREMENT, UNLESS WAIVED BY THE ENGINEER IN WRITING.
20. ALL WIRING SYSTEMS SHALL BE INSTALLED WITH A MINIMUM OF SPLICES, CONDUCTORS, WHETHER SINGLE OR MULTI-PAIR, SHALL BE INSTALLED, CONTINUOUS INSOFAR AS POSSIBLE FROM TERMINAL POINT TO TERMINAL POINT.
21. ALL CONTRACTORS SHALL EXERCISE EXTREME CARE IN THE COURSE OF THEIR WORK SO AS TO INSURE THAT THEY DO NOT INTERRUPT ANY EXISTING SERVICE, OR SUB-SERVICE FOR SAFETY PURPOSES. PAY PARTICULAR ATTENTION TO THIS PRECAUTION RELATIVE TO NATURAL GAS AND ELECTRICAL LINES. VERIFY THE LOCATION, SIZE, AND TYPE, ECT. OF EACH UNDERGROUND OR OVERHEAD UTILITY. ALL WORK SHALL BE PERFORMED IN ACCORD WITH ALL FEDERAL, STATE AND.OR LOCAL RULES, REGULATIONS, STANDARD AND SAFETY REQUIREMENTS, UTILITIES SHALL BE INSTALLED IN ACCORD WITH THE APPLICABLE MUNICIPALITY OR UTILITY COMPANY STANDARDS. IN ALL CASES, THE MOST STRINGENT REQUIREMENTS SHALL APPLY.
22. ALL SUPPORTS FOR EQUIPMENT, DEVICES OR FIXTURES SHALL BE UNIQUE, DIRECTLY, FROM THE BUILDING STRUCTURE. DO NOT SUPPORT WORK FROM OTHER TRADES EQUIPMENT OR SUPPORTS WITHOUT WRITTEN PERMISSION FROM THE ENGINEER AND CONSENT FORM THE OTHER TRADE, IN WRITING.
23. WHERE INTERRUPTING AN EXISTING UTILITY OR SERVICE DELIBERATELY OR ACCIDENTALLY, THE RESPONSIBLE CONTRACTOR SHALL WORK CONTINUOUSLY AS NEEDED TO RESTORE SAME, PROVIDING PREMIUM TIME AS NEEDED.
24. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED FOR HIS WORK. ALL CUTTING AND PATCHING SHALL BE IN ACCORD WITH THE ARCHITECTS STANDARDS FOR SUCH WORK.
25. ALL WORK SHALL BE CONCEALED UNLESS SPECIFICALLY INDICATED TO BE EXPOSED, OR REQUIRED TO BE EXPOSED. IF IN DOUBT, CONTACT THE ENGINEER FOR CLARIFICATION PRIOR TO INSTALLING ANY SUCH WORK.
26. INTERRUPTION OF ANY EXISTING SERVICES SHALL BE COORDINATED WITH THE OWNER, GENERAL CONTRACTOR, UTILITY COMPANY AS NECESSARY, AND THE OWNER REPRESENTATIVE, AT LEAST TWO WEEKS IN ADVANCE OF ANTICIPATED INTERRUPTION. A SCHEDULE FOR THESE OUTAGES SHALL BE DEVELOPED AND AGREED UPON BETWEEN THE PARTIES MENTIONED, TO AVOID UNNECESSARY INCONVENIENCE TO THE OWNER OR ANY AFFECTED PARTY. NOTIFY THE UTILITY COMPANY OF ANY ANTICIPATED SERVICES REQUIRED TWO WEEKS IN ADVANCE, IN WRITING. IF UTILITY COMPANY REQUIRES A LONGER NOTIFICATION PERIOD, SO PROVIDE.
27. ALL MATERIALS FURNISHED AND ALL WORK INSTALLED SHALL COMPLY WITH THE CURRENT EDITION OF THE NATIONAL ELECTRIC CODES, NATIONAL FIRE CODES OF THE NATIONAL FIRE PROTECTION ASSOCIATION, THE REQUIREMENTS OF LOCAL UTILITY COMPANIES AND WITH THE REQUIREMENT OF ALL GOVERNMENTAL AGENCIES OR DEPARTMENTS HAVING JURISDICTION. IF ANY CONFLICT OR DISCREPANCIES OCCUR THE MOST STRINGENT WILL APPLY.
28. DO NOT SCALE FROM DRAWINGS, AS PRINTING DISTORTS SCALE. WORK SHALL BE LAID OUT FROM DIMENSIONED DRAWINGS, OR DIMENSIONS SUPPLIED TO CONTRACTOR.
29. NOISY WORK, WORK OUTSIDE CONSTRUCTION BARRIERS, WORKS IN OCCUPIED AREAS, ECT. SHALL BE PERFORMED AFTER HOURS OR ON WEEKENDS OR DURING SUMMER BREAK, COORDINATE EXACT SCHEDULING WITH FACILITY PRIOR TO CONSTRUCTION.
30. PROVIDE NEMA RATINGS THAT ARE APPROPRIATE FOR THE ENVIRONMENT, WHERE NO NEMA RATING IS LISTED, THE ENGINEER SHALL MAKE THE FINAL DETERMINATION.
31. THIS PROJECT IS DESIGNED IN ACCORDANCE WITH THE 2017 NEC ELECTRICAL CODE AND SHALL BE CONSTRUCTED AS SUCH.

ELECTRICAL LEGEND

CIRCUIT CONDUCTORS:

EQUIPMENT GROUNDING CONDUCTORS:

TERMINAL/GROUNDING BLOCK:

FUSE:

GROUNDING ELECTRODE SYSTEM:

INVERTER:

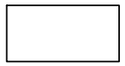
METER/MONITORING DEVICE:

SITE PLAN LEGEND

IBC ROOF EDGE SETBACK:

2' ROOF VENT/DRAIN & OBSTRUCTION SETBACK:

SOLAR PV MODULE:



ROOF VENTS/DRAINS:

CONDUIT TO BE INSTALLED:

ABBREVIATIONS

A	AMPS
ATS	AUTOMATIC TRANSFER SWITCH
C	CONDUIT
CT	CURRENT TRANSFORMER
CU	COPPER
EMT	ELECTRIC METALLIC TUBING
GEC	GROUNDING ELECTRODE CONDUCTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTOR
INV	INVERTER
M	METER
MSD	MAIN SERVICE DISCONNECT
MDS	MAIN DISTRIBUTION SWITCHBOARD
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
OCPD	OVER CURRENT PROTECTION DEVICE
TCC	TEMPERATURE CONTROLS CONTRACTOR
UAD	UTILITY ACCESSIBLE DISCONNECT
VMP	MAXIMUM POWER VOLTAGE
VOC	OPEN CIRCUIT VOLTAGE
W	WATTS

CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

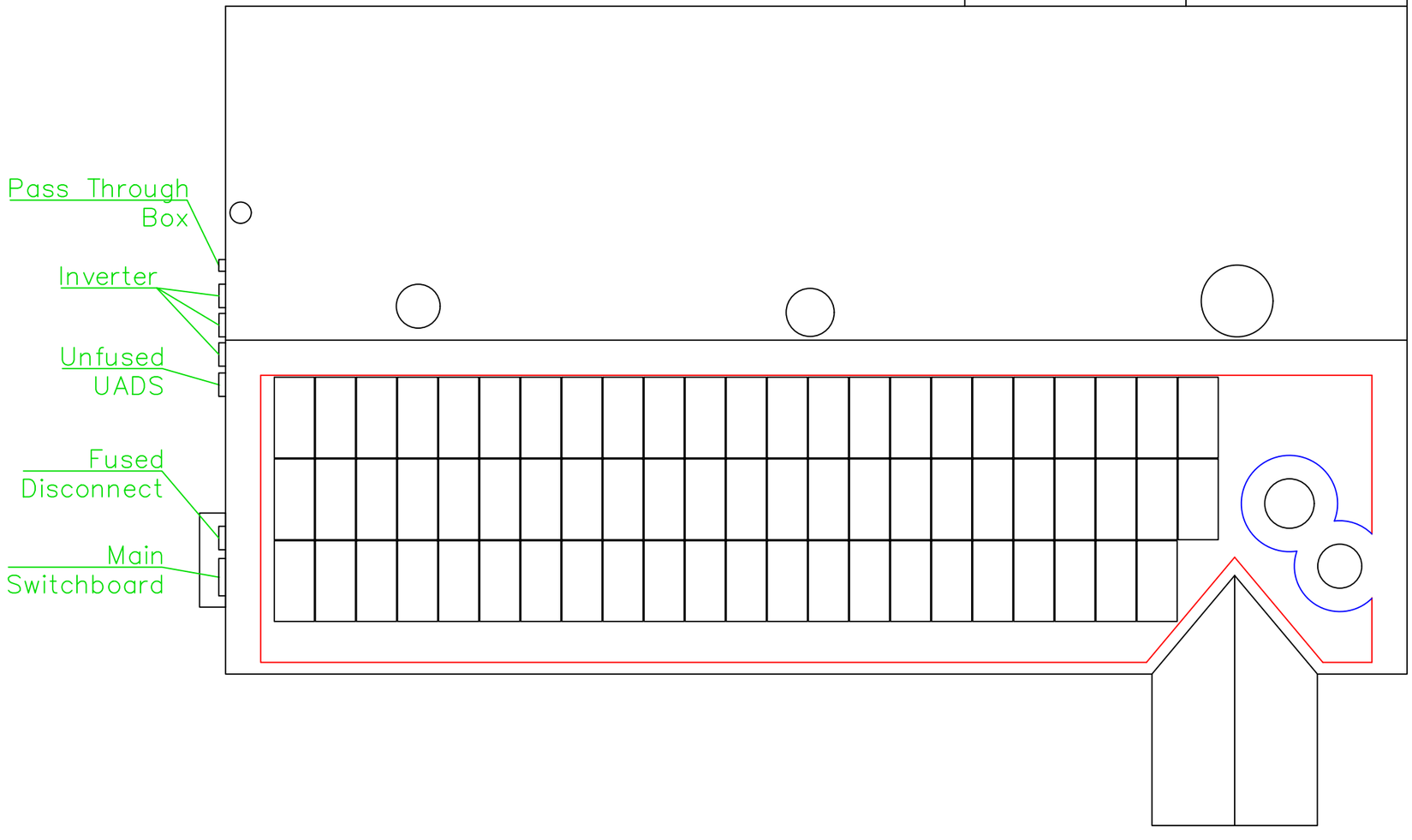
Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

General Notes

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV002



SCALE: NTS

System Summary

Electrical Equipment:

68 – 485W QCell Commercial Solar Module

34 – SolarEdge P1101 Power Optimizer

1 – 50kW SolarEdge Commercial Inverter

32.98kW DC System Size
50.0kW AC System Size

Roof Details:

Roof Type: Asphalt Shingle
Roof Pitch: 4:12 (18.4 degrees)
Roof Azimuth: 158 degrees
Racking Type: Unirac SolarMount
Attachment Type: RT Mini II

Legend:

Solar Module

Roof Edge Setback

2' Roof Obstruction Setback

CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

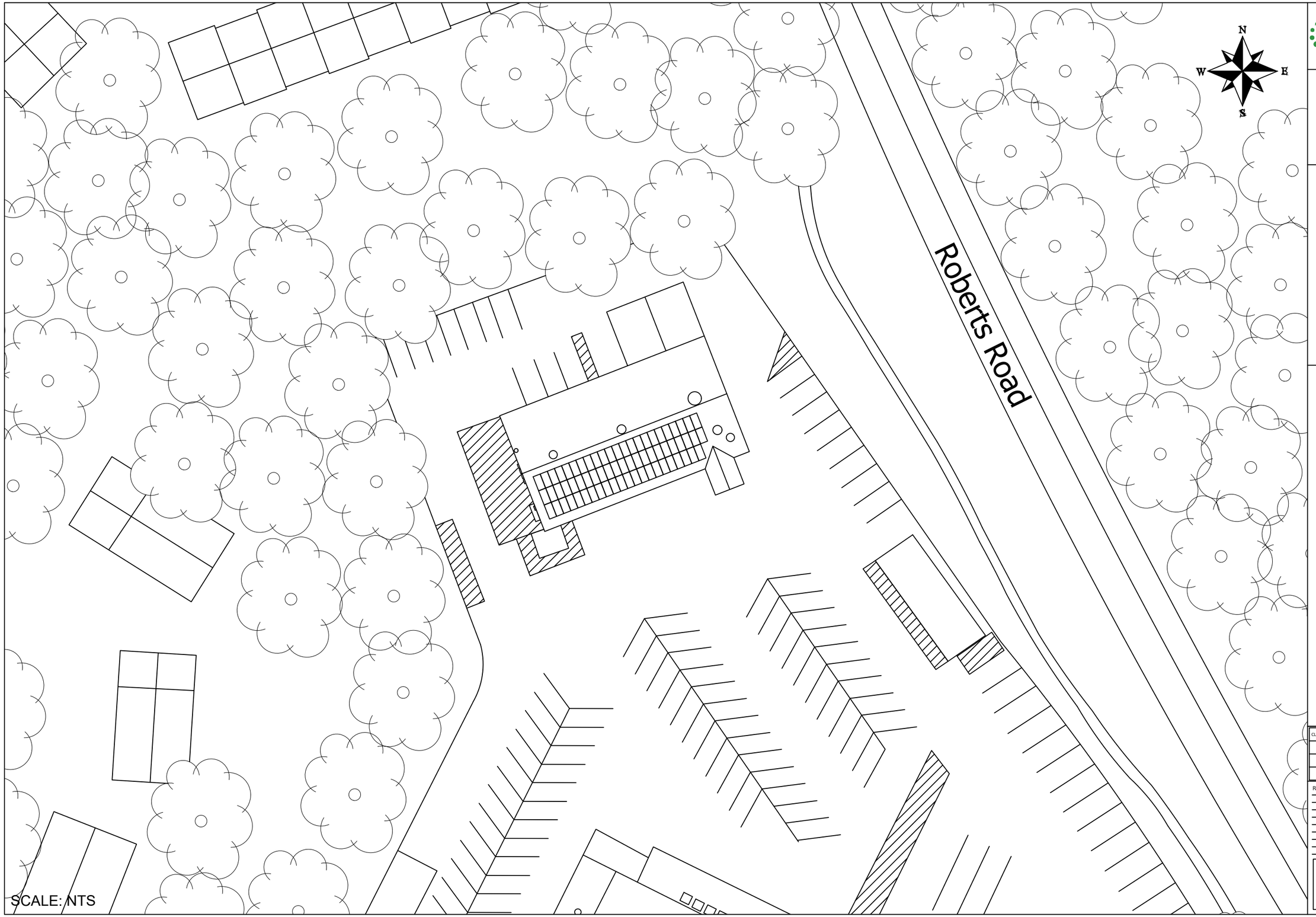
Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

Site Plan

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV101



CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

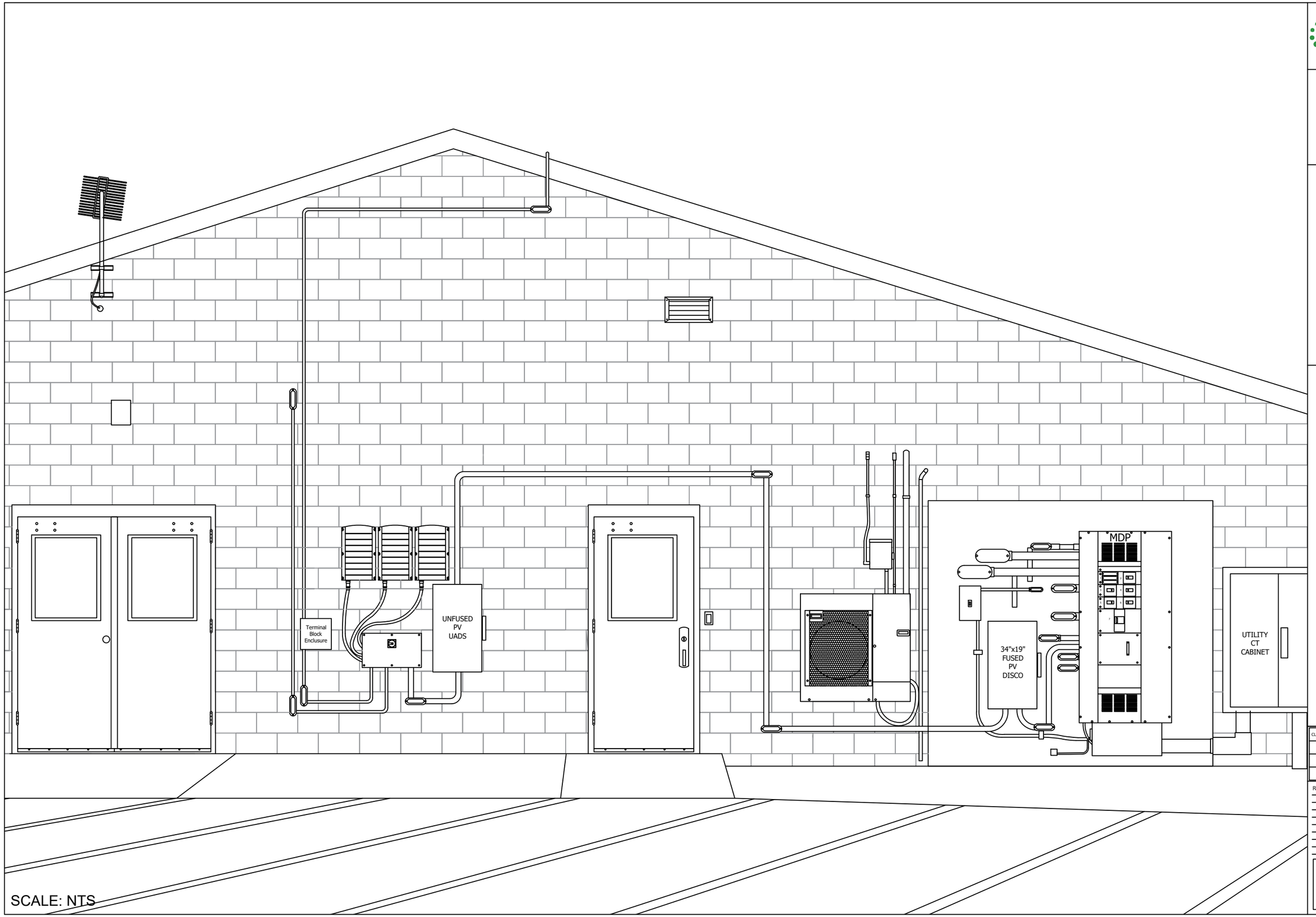
Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

Plot Plan

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV102



CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

UADS Location

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

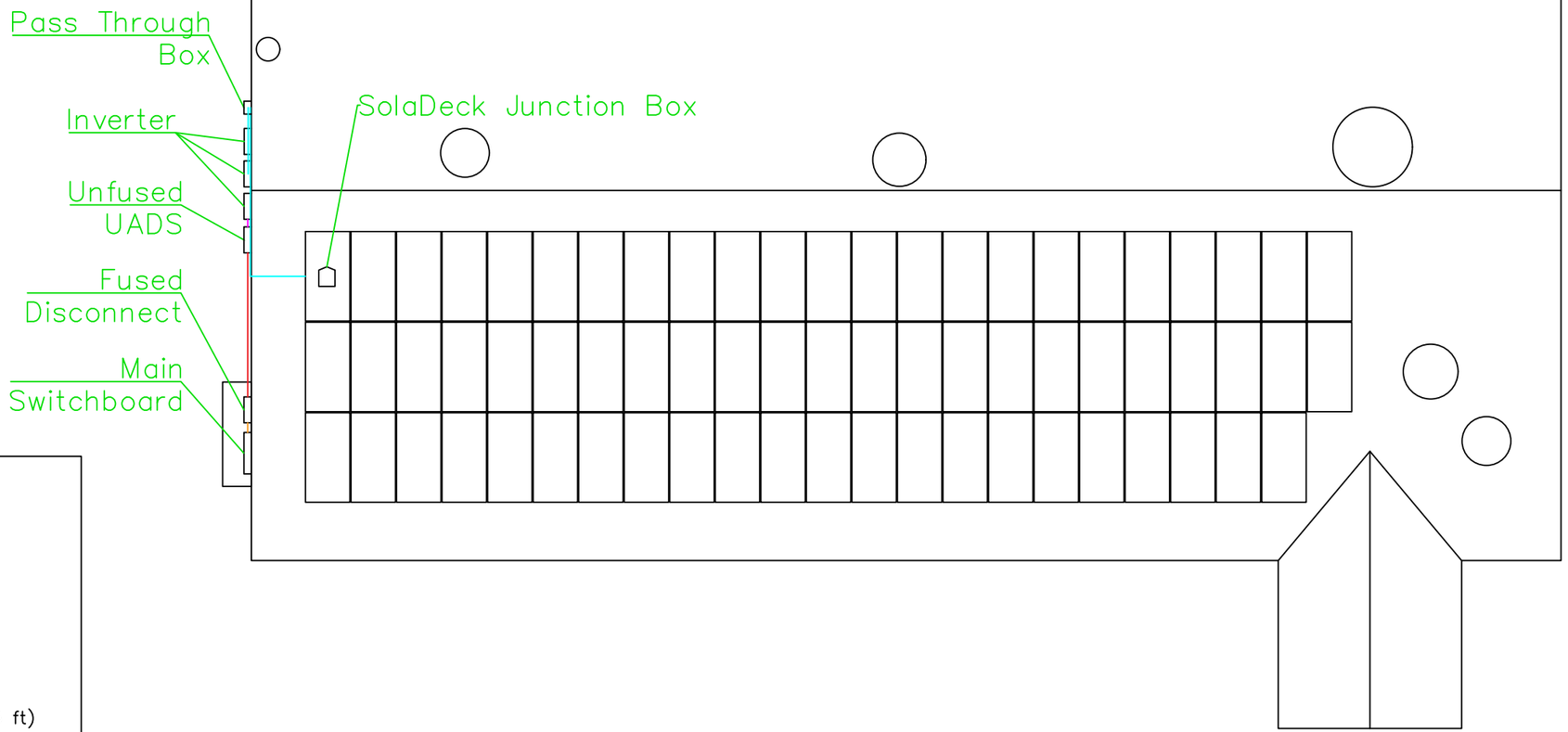
REVISIONS

SCALE: NTS

PV201

GENERAL NOTES:

1. CONDUIT SUPPORTS SHALL BE SPACED 10' O.C. CONDUIT MUST BE APPROPRIATELY LABELED AND STRAPPED.
2. WHERE CONDUIT BODIES ARE NOT USED ON AC RUNS TO THE UADS, ALL JUNCTION BOXES SHALL BE NEMA4X. TROUGHS MUST INCLUDE APPROPRIATE SEALANT.
3. FOR ALL CONDUIT RUNS LONGER THAN 100', CONTRACTOR SHALL USE EXPANSION JOINTS.
4. AT LOW POINTS IN CONDUIT WHERE WATER IS LIKELY TO SETTLE, CONTRACTOR IS REQUIRED TO INSTALL 0.25" WEEP HOLES. DO NOT ADD WEEP HOLES TO ANY EQUIPMENT WITHOUT PERMISSION FROM CMTA, AS THIS MAY INVALIDATE WARRANTIES.
5. 2-PART EPOXY IS REQUIRED ON ALL OUTDOOR PLACARDS, INCLUDING THOSE INSTALLED ON INVERTERS.
6. EQUIPMENT GROUNDING CONDUCTOR MUST BE BARE OR PV-WIRE WHEN EXPOSED TO FREE AIR.



Key:

DC Conduit Home Runs

- Modules to Inverter (40 ft)

AC Conduit Home Runs

- Inverter to UADS (5 ft)
- UADS to Fused Disconnect (35 ft)
- Fused Disconnect to MSB (7 ft)

SCALE: NTS

CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

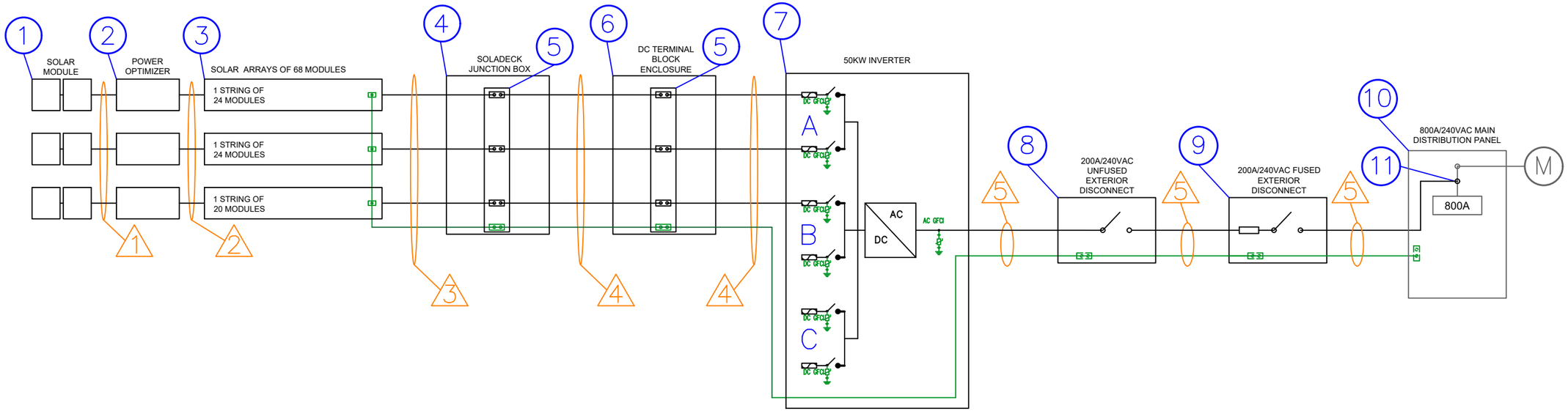
Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

Conduit Plan

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV202



△	Conductor and Raceway Schedule				
TAG	Description or Conductor Type	Conductor Guage	Number of Conductors	Conduit or Raceway Type	Raceway Size
1	USE-2 (MFG Cables & Connectros)	12 CU	136	FREE AIR	N/A
2	USE-2 (MFG Cables & Connectros)	10 CU	68	FREE AIR	N/A
3	PV WIRE	10 CU	6	FREE AIR	N/A
	Bare Copper Equipment Ground (EGC)	6 CU	1		
4	THHN	10 CU	6	RMC	3/4"
	Bare Copper Equipment Ground (EGC)	6 CU	1		
5	THWN-2	2/0 CU	4	RMC	2"
	Bare Copper Equipment Ground (EGC)	6 CU	1		

○	Equipment Schedule			
TAG	Description	Quantity	Part Number	Notes
1	Solar PV Module	68	HQC-485WXLG103QPD-BFG	QCell 485w Commercial Solar Module
2	Power Optimizer	34	SE P1101	SolarEdge 2:1 Power Optimizer
3	Arrays Connected to Inverter	1		68 Solar Modules in 3 Strings
4	Soladeck Junction Box	1	SolaDeck 0999	115A/1000Vdc Roof Mount PV Junction Box
5	DC Terminal Block	1	SquareD - 9080GR6	DC Terminal Block Mounted on Din-Rail (6 Inputs & Outputs w/ Ground)
6	DC Terminal Block Enclosure	1	NEMA 4X	12"x12"x4" NEMA 4X Enclosure
7	Inverter	1	SE-50K-US	SolarEdge 50kW 208V 3P Inverter
8	Unused Exterior Disconnect/UADS	1	Siemens / NEMA 3R	200A/240V 3P Unfused Disconnect
9	Fused Exterior Disconnect/UADS	1	Siemens / NEMA 3R	200A/240V 3P Fused Disconnect w/ (3) 175A Fuses
10	Exisiting Main Distribution Panel	1		800A/240V Main Distribtion Panel
11	Line Side Interconnection	1		Lugs On Load Side of MDP. (1) 2/0 CU connection per phase.

ELECTRICAL NOTES:

1. ALL EQUIPMENT IS LISTED FOR USE.
2. NEC AND LOCAL JURISDICTION GUIDELINES TO BE FOLLOWED.
3. ALL WIRE, VOLTAGES, AMPERAGES AND EQUIPMENT IS SIZED ACCORDING TO TEMPERATURE DERATING AND LOCATIONS.
4. DISCONNECTS SHALL BE WIRED SO THAT SOLAR DC WIRES ARE ON THE LOAD SIDE AND AC UTILITY WIRE ARE ON THE LINE SIDE.
5. MAXIMUM VOLTAGE DOES NOT EXCEED 1000 VDC.
6. ALL MODULES AND RACKING SHALL BE GROUNDED USING EITHER APPROVED STAINLESS STEEL WEEBS OR TIN PLATED DIRECT BURIAL RATED LUGS USING STAINLESS STEEL HARDWARE, STAR WASHERS, AND THREAD FORMING BOLTS.
7. ALL EQUIPMENT SHALL BE GROUNDED, INCLUDING BONDING JUMPERS WHERE NECESSARY ACROSS RAIL SPLICE PLATES TO BOND INDIVIDUAL PIECES OF RAIL.
8. ONLY COPPER (CU) CONDUCTORS SHALL BE USED. STRANDED OR SOLID WITH PROPERLY RATED CONNECTORS.
9. INVERTER(S) CONTAIN A GROUND FAULT DETECTION AND INTERRUPTION DEVICE.
10. ALL EQUATIONS ACCOUNT FOR WORST CASE SCENARIO CONDITIONS.
11. NEUTRAL CONDUCTORS, IF USED, MAY BE DOWNSIZED TO MATCH GROUND CONDUCTOR SIZE PER ARTICLE 705.95 (B).
12. INSTALLATION, LABELS, MARKINGS, AND PLACARDS SHALL BE IN ACCORDANCE WITH NEC2017.690.
13. FERRULES ARE REQUIRED FOR PROPER TERMINATION ON WIRES SMALLER THAN #8.

CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

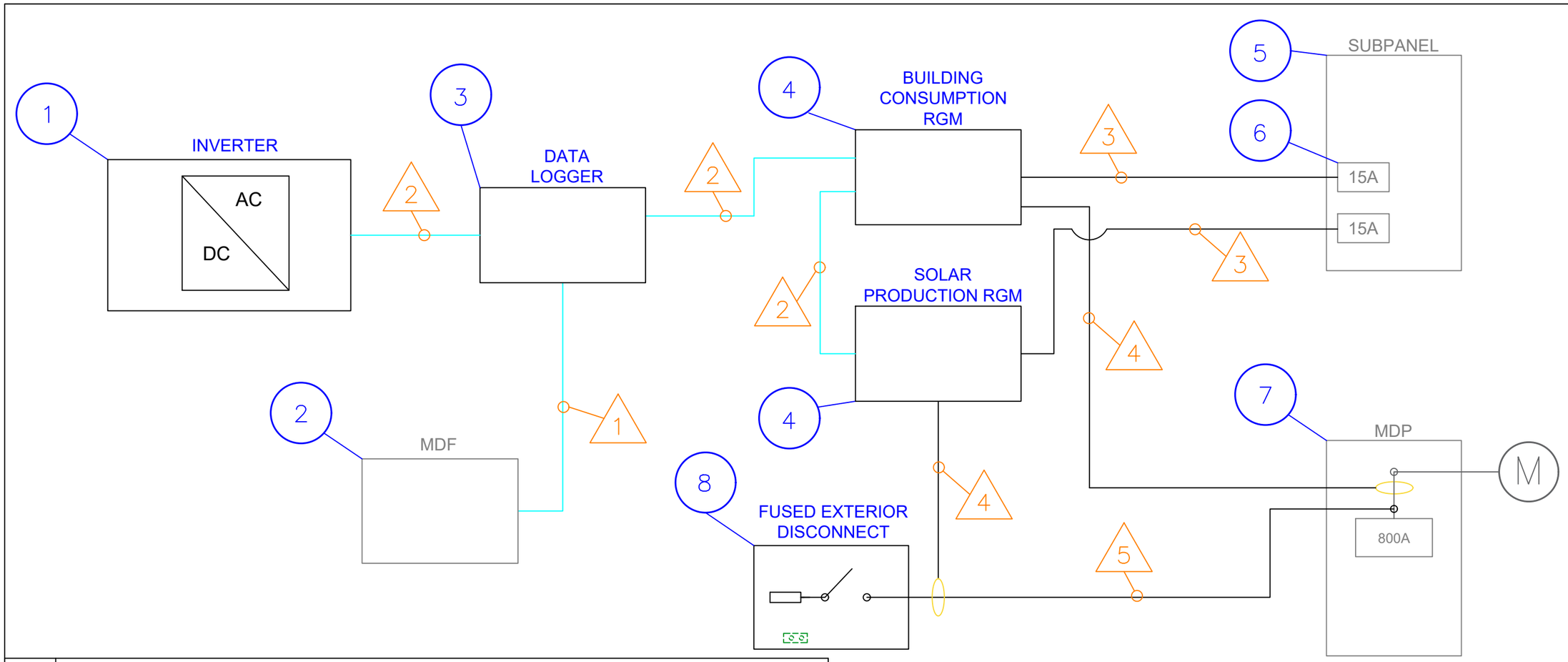
Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

Single Line Diagram – Power

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV203



△	Conductor and Raceway Schedule				
TAG	Description or Conductor Type	Conductor Guage	Number of Conductors	Conduit or Raceway Type	Raceway Size
1	Shielded CAT6	24 CU	1	RMC	0.75"
2	RS485	24 CU	1	RMC	0.75"
3	THWN-2	14 CU	3	RMC	0.75"
4	CTs	14 CU	3	RMC	0.75"
5	THWN-2	2/0 CU	4	RMC	2"
◯	Equipment Schedule (Existing Equipment in Gray)				
TAG	Description	Quantity	Part Number	Notes	
1	Inverter	1	SE50KUS	SolarEdge 50kW 208V 3P Inverter w/ (3) Synergy Units	
2	MDF	1		Building Main Distribution Frame	
3	Data Logger	1	SE-1000-DTLG-S1	SolarEdge Data Logger with Intergrated Power Supply	
4	SolarEdge Revenue Grade Meter	1	SE-RGMTR-3Y-208VA	SolarEdge 3P 4 Wire Wye Revenue Grade Meter	
5	208/120V Panel	1		Field specified by contractor, CMTA to Approve	
6	15A Breaker	3			
7	800A MDP	1		Existing Main Distribution Panel	
8	Fused Exterior Disconnect/UADS	1	Siemens / NEMA 3R	200A/240V 3P Fused Disconnect w/ (3) 175A Fuses	

ELECTRICAL NOTES:

1. ALL EQUIPMENT IS LISTED FOR USE.
2. NEC AND LOCAL JURISDICTION GUIDELINES TO BE FOLLOWED.
3. ALL WIRE, VOLTAGES, AMPERAGES AND EQUIPMENT IS SIZED ACCORDING TO TEMPERATURE DERATING AND LOCATIONS.
4. DISCONNECTS SHALL BE WIRED SO THAT SOLAR DC WIRES ARE ON THE LOAD SIDE AND AC UTILITY WIRE ARE ON THE LINE SIDE.
5. MAXIMUM VOLTAGE DOES NOT EXCEED 1000 VDC.
6. ALL MODULES AND RACKING SHALL BE GROUNDED USING EITHER APPROVED STAINLESS STEEL WEEBS OR TIN PLATED DIRECT BURIAL RATED LUGS USING STAINLESS STEEL HARDWARE, STAR WASHERS, AND THREAD FORMING BOLTS.
7. ALL EQUIPMENT SHALL BE GROUNDED, INCLUDING BONDING JUMPERS WHERE NECESSARY ACROSS RAIL SPLICE PLATES TO BOND INDIVIDUAL PIECES OF RAIL.
8. ONLY COPPER (CU) CONDUCTORS SHALL BE USED. STRANDED OR SOLID WITH PROPERLY RATED CONNECTORS.
9. INVERTER(S) CONTAIN A GROUND FAULT DETECTION AND INTERRUPTION DEVICE.
10. ALL EQUATIONS ACCOUNT FOR WORST CASE SCENARIO CONDITIONS.
11. NEUTRAL CONDUCTORS, IF USED, MAY BE DOWNSIZED TO MATCH GROUND CONDUCTOR SIZE PER ARTICLE 705.95 (B).
12. INSTALLATION, LABELS, MARKINGS, AND PLACARDS SHALL BE IN ACCORDANCE WITH NEC2017.690.
13. FERRULES ARE REQUIRED FOR PROPER TERMINATION ON WIRES SMALLER THAN #8.

CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

Single Line Diagram – Communications

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV204

DC WIRE SIZE

ISOURCE CIRCUIT [690.8(A)(1)](ISC): Isc * 1.25
OUTPUT CIRCUIT [690.8(A)(2)](ISC): Isc * 1.25 * #STRINGS
MIN. DC WIRE AMPACITY:
[690.8(A), 690.8(B), 210.19 (A), 215.2(A), 110.14(C)
THE MAXIMUM OF;
1. (Isc * 1.25)/(CONDITIONS OF USE)
2. (Isc * 1.25 *1.25)
DERATE WIRES FOR TERMINALS DEPENDING ON TEMP.

CODE SECTIONS REFER TO 2017 NEC

AC WIRE SIZE

INVERTER OUTPUT [690.8(A)](ISC): INV. OUTPUT*1.25
MIN. AC WIRE AMPACITY:
[690.8(A), 690.8(B), 210.19 (A), 215.2(A), 110.14(C)
THE MAXIMUM OF;
1. (INV. OUTPUT * 1.25)
2. (INV. OUTPUT)/ CONDITIONS OF USE
DERATE WIRES FOR TERMINALS DEPENDING ON TEMP.

CODE SECTIONS REFER TO 2017 NEC

GROUNDING SIZE

GEC
NEC 690.47
Sized per Table 250.66 for AC
Sized per Table 250.166 for DC
DC EGC
NEC 250.122
Use 1.56 * Isc * # of strings (if applicable)
AC EGC
NEC 250.122
Sized based on OCPD
CODE SECTIONS REFER TO 2017 NEC

MAXIMUM SYSTEM VOLTAGE

NEC 690.7(A)

METHOD 1: {[(T min °C - 25°C)*(V/°C)]+Voc}*# of modules in series

METHOD 2: Voc*#of modules in series*NEC Coefficient [Table 690.7(A)]

120% RULE

NEC 2017: 705.12(B)(2)

MINIMUM BUSBAR OR CONDUCTOR=
TOTAL RATING OF OVERCURRENT PROTECTION DEVICES FOR BREAKERS FEEDING/1.2

OCPD SIZING

MIN DC: ISC*156
MIN AC: INVERTER OUTPUT*1.25

VOLTAGE DROP

(2KID/CM)/VOLTAGE*100= VOLTAGE DROP %
K=12.9 FOR COPPER
I= CURRENT(IMP OR OUTPUT AC)
D=DISTANCE IN FEET, ONEWAY
CM=CIRCULAR MILS

AC Voltage Drop								
Equipment Supplied	Fed From	Voltage	Full Load Amps	Conductors per Phase	Conductor Size	Feeder Length (ft)	Segment Voltage Drop at FLA	Total Voltage Drop at FLA
Main Switchboard	Fused Disconnect	208	139.5	1	2/0 CU	7	0.10%	-
Fused Disconnect	UADS	208	139.5	1	2/0 CU	35	0.49%	-
UADS	Inverter	208	139.5	1	2/0 CU	5	0.07%	0.66%

Interactive Photovoltaic Power Source	
AC Output Current	138.5A
Nominal AC Voltage	208V

Optimizer Ratings	
Optimizer Make	SolarEdge
Optimizer Model	P1101
Max Isc Input (A)	14.1A
Max Volt Input Rating (V)	125V
Max Power Input (W)	1,100W
Max Output Current (A)	18A
Max Output Voltage (V)	80A

Inverter Ratings	
Inverter Make	SolarEdge
Inverter Model	SE50KUS
Number of Inverters	2
Max DC Volt Rating (V)	600V
Max Power at 40C (W)	50,000W
Nominal AC Voltage (V)	208V
Max AC Current	139.5A
Max OCPD Rating (A)	175A

PV Module Ratings at Standard Test Conditions	
Module Make	QCells
Module Model	Q.Peak Duo
Max Power-Point Current (IMP)	10.63A
Max Power-Point Voltage (VMP)	45.63V
Open-Circuit Voltage (VOC)	53.63V
Short Circuit Current (ISC)	11.16A
Max Series Fuse (OCPD)	20A
Maximum Power (PMAX)	485W
Max Voltage	1500V
PWR Temperature Coefficient	-.34%/C

Inverter 1 MPPT DC Disconnect	
Rated MPP Current	3 x 46.5A
Rated MPPT Voltage	600V
Max System Voltage	600V
Max Circuit Current	30A

NOTES FOR ARRAY CIRCUIT WIRING:

1.) LOWEST EXPECT AMBIENT TEMPERATURE BASED ON ASHRAE MINIMUM MEAN EXTREME DRY BULB TEMPERATURE FOR ASHRAE LOCATION MOST SIMILAR TO INSTALLATION LOCATION. LOWEST EXPECTED AMBIENT TEMPERATURE -23 C.
2.) HIGHEST CONTINUOUS AMBIENT TEMPERATURE BASED ON ASHRAE HIGHEST MONTH 2% DRY BULB TEMPERATURE FOR ASHRAE LOCATION MOST SIMILAR TO INSTALLATION LOCATION. HIGHEST CONTINUOUS TEMPERATURE 32 C.
2.) 2005 ASHRAE FUNDEMENTALS 2% DESIGN TEMPERATURES DO NOT EXCEED 47.0 C IN THE UNITED STATES (PALM SPRINGS, CA IS 44.1 C). FOR LESS THAN 9 CURRENT-CARRYING CONDUCTORS IN ROOF-MOUNTED SUNLIT CONDUIT AT LEAST 0.5" ABOVE ROOF AND USING THE OUTDOOR DESIGN TEMPERATURE OF 47.0 C OR LESS (ALL OF UNITED STATES),
a) 12 AWG, 90 C CONDUCTORS ARE GENERALLY ACCEPTABLE FOR MODULES WITH Isc OF 7.68 AMPS OR LESS WHEN PROTECTED BY A 12-AMP OR SMALLER FUSE.
b) 10 AWG, 90 C CONDUCTORS ARE GENERALLY ACCEPTABLE FOR MODULES WITH Isc OF 9.6 AMPS OR LESS WHEN PROTECTED BY A 15-AMP OR SMALLER FUSE.

NOTES FOR INVERTER CIRCUITS:

1) IF UTILITY REQUIRES A VISIBLE-BREAK SWITCH, DOES THIS SWITCH MEET THE REQUIREMENT? YES X NO N/A
2) IF GENERATION METER REQUIRED, DOES THIS METER SOCKET MEET THE REQUIREMENT? YES NO N/A X
3) SIZE PHOTOVOLTAIC POWER SOURCE (DC) CONDUCTORS BASED ON MAX CURRENT ON NEC 690.53 SIGN OR OCPD RATING AT DISCONNECT.
4) SIZE INVERTER OUTPUT CIRCUIT (AC) CONDUCTORS ACCORDING TO INVERTER OCPD AMPERE RATING. (See Guide Section 9)
5) DOES TOTAL SUPPLY BREAKERS COMPLY WITH 120% BUSBAR EXCEPTION IN 705.12(B)(3)? YES NO N/A X

CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

Electrical Calculations

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV205

① NEC 690.31(G) (3) (4)

WARNING: PHOTOVOLTAIC POWER SOURCE

Location: EMT, Conduit Raceways, Combiner/Transition box

② NEC 690.13 (B)

⚠ WARNING

ELECTRICAL SHOCK HAZARD

TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

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

Location: Inverter, DC Transition Box

③ NEC 690.54

PHOTOVOLTAIC AC DISCONNECT

RATED AC OUTPUT CURRENT 139.5A
NOMINAL OPERATING AC VOLTAGE 208V

Location: Inverter, AC Disconnect, Interconnection Point

④ NEC 690.13 (B)

PHOTOVOLTAIC AC DISCONNECT

Location: AC Disconnect

⑤ NEC 690.13 (B)

⚠ WARNING

ELECTRICAL SHOCK HAZARD

TERMINALS ON THE LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

Location: AC Disconnect, Interconnection Point

⑥ NEC 110.27(C) & OSHA 1910.145(f)(7)

⚠ WARNING

TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL

Location: Interconnection point

⑦ NEC 690.13 (B)

PHOTOVOLTAIC DC DISCONNECT

Location: DC Disconnect (Inverter)

⑧ NEC 690.13 (B)

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

Location: AC Disconnect (Utility Accessible Disconnect)

⑨ NEC 690.13 (B)

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

Location: DC Disconnect/Inverter

⑩ NEC 690.15(C) & NEC 690.33(E) (2)

DO NOT DISCONNECT UNDER LOAD

Location: Breaker Panel, Pull Boxes

⑪ NEC 690.13(F) NEC 750.12 (D) (3-4) NEC 690.59

⚠ CAUTION

PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED

Location: Breaker Panel, Pull Boxes

⑫ NEC 705.12 (B)(2)(c) & NEC 690.59

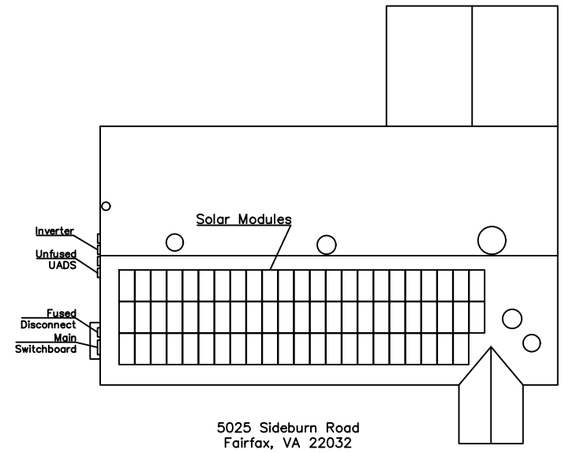
⚠WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

Location: Breaker Panel, Pull Boxes

⑬ NEC 705.10 & 690.56 (B)

CAUTION:

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



Location: At building, near UAD

Adhesive Fastened Signs

ANSI Z535.4-2011 Product Safety Signs and Labels, provides guidelines for suitable font sizes, words, colors, Symbols, and location requirements for labels. NEC 110.21(B)(1)

The label shall be of sufficient durability to withstand the environment involved. NEC 110.21(B)(3)

Adhesive fastened signs may be acceptable if properly adhered. Vinyl signs shall be weather resistant. IFC 605.11.1.3

CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

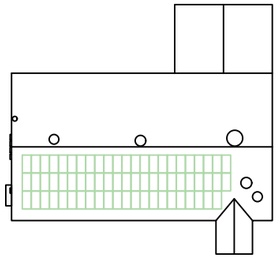
Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

System Labels

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV206



50kW INVERTER		
STRING	# MODS	# OPTIMIZERS
1	24	12
2	24	12
3	20	10
STRING	# MODS	CONNECTED TO
1	24	INPUT A1
2	24	INPUT A2
3	20	INPUT B1

GENERAL NOTES/KEY:

1. Wire management shall be neat and professional. No wires shall be laying on roof surfaces.
2. Should strings change or run differently be sure to create as built drawings and give to Construction Manager.
3. Transitions from subarray to subarray shall be in conduit and on roof caddies with NEC-compliant grounding on either side of conduit.
4. Attachments shall be laid according to Unirac attachment plan. Contractor shall not deviate from attachment plan.

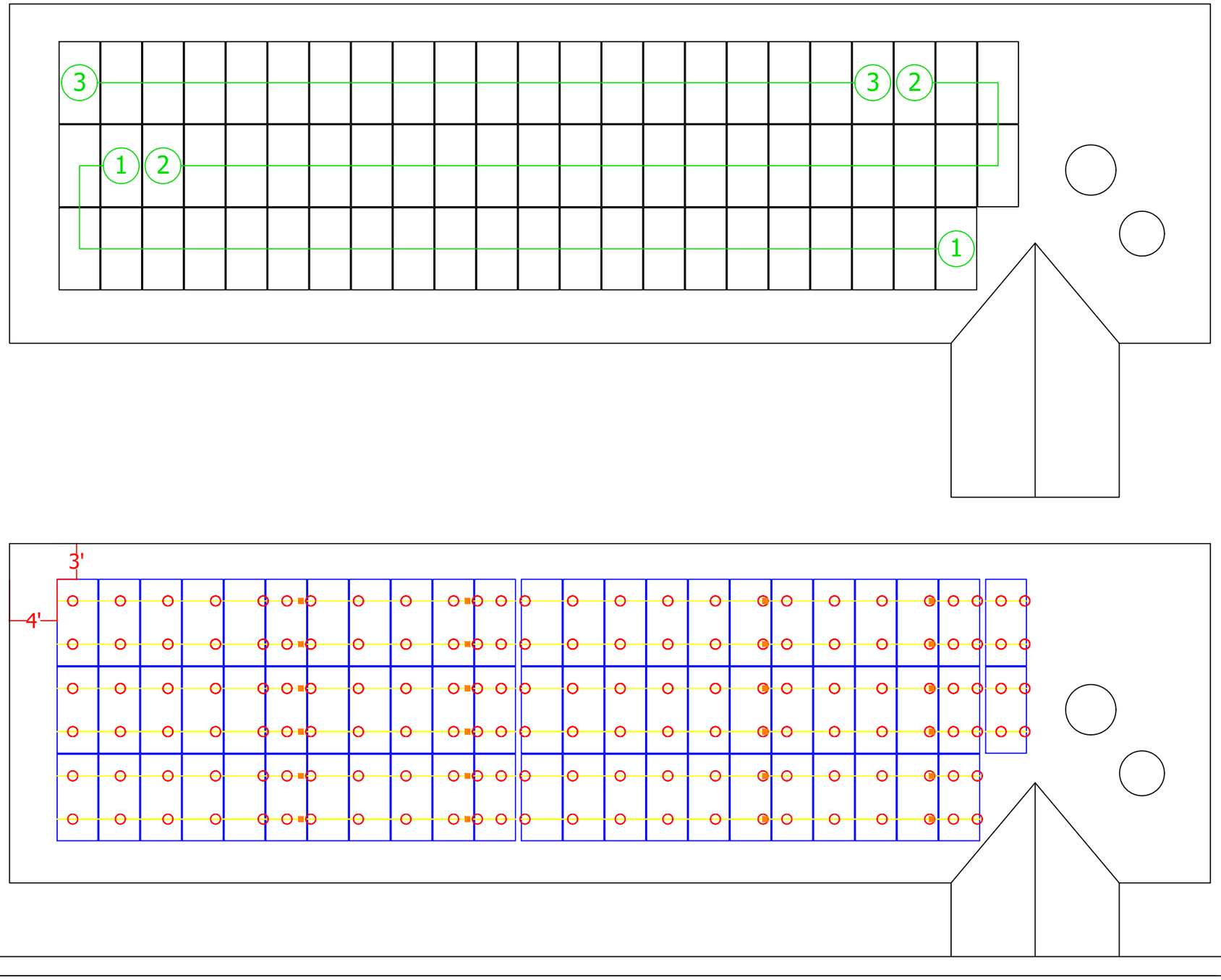
Attachment

Splice

Module

Rail Line

SolarMount Torque	
Mid Clamp	11 ft-lbs
MLPE Mount	10 ft-lbs
End Clamp	5 ft-lbs
L-Foot to Rail	30 ft-lbs
Rail Splice	10 ft-lbs



CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

Attachment and Strings

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

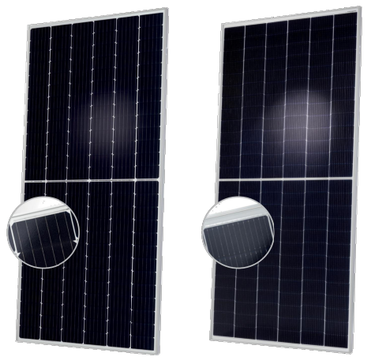
REVISIONS

PV301

Q.PEAK DUO XL-G10 SERIES

475 - 490 Wp | 156 Cells
21.2 % Maximum Module Efficiency

MODEL Q.PEAK DUO XL-10.3 / BFG



6 busbar cell technology

12 busbar cell technology

Bifacial energy yield gain of up to 20 %

Bifacial Q.ANTUM solar cells with zero gap cell separation and innovative wiring with Q.ANTUM Technology for higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 21.2%.

Low electricity generation costs

Q.ANTUM DUO Z combines cutting edge cell separation and innovative wiring with Q.ANTUM Technology for higher yield per surface area, lower BOS costs, higher power classes, and an efficiency rate of up to 21.2%.

A reliable investment

Double glass module design enables extended lifetime with 12-year product warranty and improved 30-year performance warranty[1].

Enduring high performance

Long-term yield security with Anti LeTID Technology, Anti PID Technology[2], Hot-Spot Protect.

Frame for versatile mounting options

High-tech aluminum alloy frame protects from damage, enables use of a wide range of mounting structures and is certified regarding IEC for high snow (5400 Pa) and wind loads (2400 Pa).

Innovative all-weather technology

Optimal yields, whatever the weather with excellent low-light and temperature behavior.

[1] See data sheet on rear for further information.
[2] APT test conditions according to IEC / TS 62804-1:2015 method B (−1500 V, 168 h) including post treatment according to IEC 61215-1-1 Ed. 2.0 (CD)

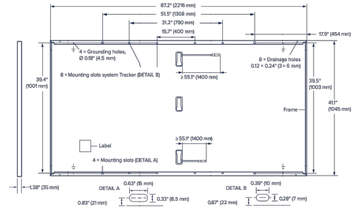
The ideal solution for:

Ground mounted solar panels

Q.PEAK DUO XL-G10 SERIES

■ Mechanical Specification

Format	87.2 in × 41.1 in × 1.38 in (including frame) (2216 mm × 1045 mm × 35 mm)
Weight	64.2 lbs (29.1 kg)
Front Cover	0.08 in (2.0 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	0.08 in (2.0 mm) semi-tempered glass
Frame	Anodized aluminum
Cell	6 × 26 monocrystalline Q.ANTUM solar half cells
Junction box	2.09-3.98 in × 1.26-2.36 in × 0.59-0.71 in (53-101 mm × 32-60 mm × 15-18 mm), IP67, with bypass diodes
Cable	4 mm² Solar cable; (+) ≥ 55.1 in (1400 mm), (−) ≥ 55.1 in (1400 mm)
Connector	Stäubli MC4, Stäubli MC4-Evo2, Hanwha Q CELLS HQC4, IP68



■ Electrical Characteristics

POWER CLASS			475		480		485		490	
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / −0 W)				BSTC*		BSTC*		BSTC*		BSTC*
Minimum — Power at MPP[1]	P_{MPP}	[W]	475	519.6	480	525.0	485	530.5	490	536.0
Minimum — Short Circuit Current[1]	I_{SC}	[A]	11.08	12.12	11.12	12.17	11.16	12.21	11.20	12.26
Minimum — Open Circuit Voltage[1]	V_{OC}	[V]	53.15	53.34	53.39	53.58	53.63	53.82	53.86	54.06
Minimum — Current at MPP	I_{MPP}	[A]	10.55	11.54	10.59	11.58	10.63	11.63	10.67	11.67
Minimum — Voltage at MPP	V_{MPP}	[V]	45.03	45.02	45.33	45.32	45.63	45.62	45.93	45.92
Minimum — Efficiency[1]	η	[%]	≥ 20.5		≥ 20.7		≥ 20.9		≥ 21.2	

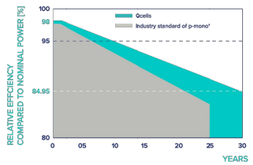
Bifaciality of P_{MPP} and I_{SC} 70 % ± 5 % • Bifaciality given for rear side irradiation on top of STC (front side) • According to IEC 60904-1-2

[1] Measurement tolerances P_{MPP} ± 3 %; I_{SC}, V_{OC} ± 5 % at STC: 1000 W/m²; *at BSTC: 1000 W/m² + φ × 135 W/m², φ = 70 % ± 5 %, 25 ± 2 °C, AM 1.5 according to IEC 60904-3

MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]						
Minimum — Power at MPP	P_{MPP}	[W]	357.6	361.4	365.1	368.9
Minimum — Short Circuit Current	I_{SC}	[A]	8.92	8.96	8.99	9.02
Minimum — Open Circuit Voltage	V_{OC}	[V]	50.27	50.49	50.72	50.95
Minimum — Current at MPP	I_{MPP}	[A]	8.30	8.34	8.37	8.40
Minimum — Voltage at MPP	V_{MPP}	[V]	43.06	43.35	43.63	43.92

[2] 800 W/m², NMOT, spectrum AM 1.5

Qcells PERFORMANCE WARRANTY

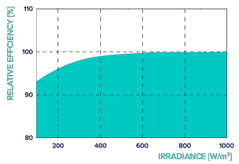


At least 98 % of nominal power during first year. Thereafter max. 0.45 % degradation per year. At least 93.95 % of nominal power up to 10 years. At least 84.95 % of nominal power up to 30 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Qcells sales organisation of your respective country.

*Standard terms of guarantee for the 5 PV companies with the highest production capacity in 2021 (February 2021)

PERFORMANCE AT LOW IRRADIANCE



Typical module performance under low irradiance conditions in comparison to STC conditions (25 °C, 1000 W/m²).

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{SC}	α	[%/K]	+0.04	Temperature Coefficient of V_{OC}	β	[%/K]	−0.27
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.34	Nominal Module Operating Temperature	NMOT	[°F]	109 ± 5.4 (43 ± 3 °C)

■ Properties for System Design

Maximum System Voltage	V_{SYS}	[V]	1500	PV module classification	Class II
Maximum Series Fuse Rating		[A DC]	20	Fire Rating based on ANSI / UL 61730	TYPE 29[4]
Max. Design Load, Push / Pull[3]		[lbs / ft²]	75 (3600 Pa) / 33 (1600 Pa)	Permitted Module Temperature on Continuous Duty	−40 °F up to +185 °F (−40 °C up to +85 °C)
Max. Test Load, Push / Pull[3]		[lbs / ft²]	113 (5400 Pa) / 50 (2400 Pa)		

[3] See Installation Manual

[4] New Type is similar to Type 3 but with metallic frame

■ Qualifications and Certificates

Quality Controlled PV - TÜV Rheinland; UL 61730, CE-compliant, IEC 61215:2016, IEC 61730:2016, U.S. Patent No. 9,893,215 (solar cells)

Qcells pursues minimizing paper output in consideration of the global environment.

Note: Installation instructions must be followed. Contact our technical service for further information on approved installation of this product.
Hanwha Q CELLS America Inc. 400 Spectrum Center Drive, Suite 1400, Irvine, CA 92618, USA | TEL +1 949 748 59 96 | EMAIL hqc-inquiry@qcells.com | WEB www.qcells.com

CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

Module Specification

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV401

Power Optimizer

For North America

P1101

POWER OPTIMIZER

PV power optimization at the module level

The most cost-effective solution for commercial and large field installations

- Specifically designed to work with SolarEdge inverters
- High efficiency with module-level MPPT, for maximized system energy production and revenue, and fast project ROI
- Superior efficiency (99.5%)
- Balance of System cost reduction; 50% less cables, fuses, and combiner boxes; over 2x longer string lengths possible
- Fast installation with a single bolt
- Advanced maintenance with module-level monitoring
- Module-level voltage shutdown for installer and firefighter safety
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)

solaredge.com

solaredge

Power Optimizer

For North America

P1101

Power Optimizer Model (Typical Module Compatibility)		P1101 (for up to 2 x high power or bi-facial modules)	Units
INPUT			
Rated Input DC Power(1)		1100	W
Connection Method		Single input for series connected modules	
Absolute Maximum Input Voltage (Voc at lowest temperature)		125	Vdc
MPPT Operating Range		12.5 – 105	Vdc
Maximum Short Circuit Current (Isc)		14.1	Adc
Maximum Short Circuit Current per Input (Isc)		-	Adc
Maximum Efficiency		99.5	%
Weighted Efficiency		98.6	%
Overvoltage Category		II	
OUTPUT DURING OPERATION (POWER OPTIMIZER CONNECTED TO OPERATING SOLAREDGE INVERTER)			
Maximum Output Current		18	Adc
Maximum Output Voltage		80	Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM SOLAREDGE INVERTER OR SOLAREDGE INVERTER OFF)			
Safety Output Voltage per Power Optimizer		1 ± 0.1	Vdc
STANDARD COMPLIANCE			
Photovoltaic Rapid Shutdown System		Compliant with NEC 2014, 2017, 2020	
EMC		FCC Part 15 Class A, IEC61000-6-2, IEC61000-6-3	
Safety		IEC62109-1 (class II safety), UL1741, UL3741, CSA C22.2#107.1	
Material		UL94 V-0, UV resistant	
RoHS		Yes	
INSTALLATION SPECIFICATIONS			
Compatible SolarEdge Inverters		All commercial three phase inverters	
Maximum Allowed System Voltage		1000	Vdc
Dimensions (W x L x H)		129 x 162 x 59 / 5.1 x 6.4 x 2.32	mm / in
Weight		1064 / 2.34	gr / lb
Input Connector		MC4(2)	
Input Wire Length Options	1	1.6 / 5.2	m / ft
	2		
	3		
Output Wire Type / Connector		Double insulated; MC4	
Output Wire Length		2.4 / 7.8	m / ft
Operating Temperature Range(3)		-40 to +85 / -40 to +185	°C / °F
Protection Rating		IP68 / NEMA6P	
Relative Humidity		0 – 100	%

(1) Rated power of the module at STC will not exceed the Power Optimizer "Rated Input DC Power". Modules with up to +5% power tolerance are allowed.
(2) For other connector types please refer to the Power Optimizer Input Connector Compatibility Technical Note.
(3) For ambient temperatures above +70°C / +158°F power de-rating is applied. Refer to Power Optimizers De-Rating Application Note for more details.

PV System Design Using a SolarEdge Inverter(4)(5)		208V Grid SE10K	208V Grid SE17.3K*	277/480V Grid SE30K	277/480V Grid SE40K*	
Compatible Power Optimizers		P1101				
Minimum String Length	Power Optimizers	8	10	14	14	
	PV Modules	15	19	27	27	
Maximum String Length	Power Optimizers	30	30	30	30	
	PV Modules	60	60	60	60	
Maximum Continuous Power per String		7200	8820	15300	15300	W
Maximum Allowed Connected Power per String(6)		1 string – 8400	1 string – 10020	1 string – 17550	2 strings or less – 17550	W
		2 strings or more – 9800	2 strings or more – 12020	2 strings or more – 20300	3 strings or more – 20300	
Parallel Strings of Different Lengths or Orientations		Yes				
Maximum Difference in Number of Power Optimizers Allowed Between the Shortest and Longest String Connected to the Same Inverter Unit		5 Power Optimizers				

* The same rules apply for Synergy units of equivalent power ratings, that are part of the modular Synergy Technology inverter.
(4) For each string, a Power Optimizer may be connected to a single PV module if 1) each Power Optimizer is connected to a single PV module or 2) it is the only Power Optimizer connected to a single PV module in the string.
(5) Design with three phase 208V inverters is limited. Use the SolarEdge Designer for verification.
(6) To connect more STC power per string, design your project using SolarEdge Designer.

RoHS

Intertek

CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

Optimizer Specification

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV402

Three Phase Inverter with Synergy Technology

For the 208V Grid for North America

SE50KUS

INVERTERS

Powered by unique pre-commissioning process for rapid system installation

- Pre-commissioning feature for automated validation of system components and wiring during the site installation process and prior to grid connection
- Easy 2-person installation with lightweight, modular design (each inverter consists of 3 Synergy units and one Synergy Manager)
- Independent operation of each Synergy unit enables higher uptime and easy serviceability
- Built-in thermal sensors detect faulty wiring ensuring enhanced protection and safety
- Built-in arc fault protection and rapid shutdown
- Built-in PID mitigation for maximized system performance
- Monitored* and field-replaceable surge protection devices, to better withstand surges caused by lightning or other events
- Built-in module-level monitoring with Ethernet or cellular communication for full system visibility

*Applicable only for DC and AC SPDs

solaredge.com

solaredge

Three Phase Inverter with Synergy Technology

For the 208V Grid for North America

SE50KUS

Applicable to inverter with Part Numbers	SExxK-US02Ixxxx SE50KUS	
OUTPUT		
Rated AC Active Output Power	50000	W
Maximum AC Apparent Output Power	50000	VA
AC Output Line Connections	3W + PE, 4W + PE	
Supported Grids	WYE: TN-C, TN-S, TN-C-S, TT, IT; Delta: IT	
AC Output Voltage Minimum-Nominal-Maximum[1] (L-N)	105-120-132.5	Vac
AC Output Voltage Minimum-Nominal-Maximum[1] (L-L)	183-208-229	Vac
AC Frequency Min-Nom-Max[1]	59.5 - 60 - 60.5	Hz
Maximum Continuous Output Current (per Phase, PF=1)	139.5	Aac
GFDI Threshold	1	A
Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds	Yes	
Total Harmonic Distortion	≤ 3	%
Power Factor Range	+/-0.2 to 1	
INPUT		
Maximum DC Power (Module STC) Inverter / Synergy Unit	75000 / 25000	W
Transformer-less, Ungrounded	Yes	
Maximum Input Voltage DC+ to DC-	600	Vdc
Operating Voltage Range	370 - 600	Vdc
Maximum Input Current	3 x 46.5	Adc
Reverse-Polarity Protection	Yes	
Ground-Fault Isolation Detection	167kΩ sensitivity per Synergy Unit[2]	
CEC Weighted Efficiency	97	%
Nighttime Power Consumption	< 12	W
ADDITIONAL FEATURES		
Supported Communication Interfaces[3]	2 x RS485, Ethernet, Wi-Fi (optional), Cellular (optional)	
Smart Energy Management	Export Limitation	
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi access point for local connection	
Arc Fault Protection	Built-in, User Configurable (According to UL1699B)	
Photovoltaic Rapid Shutdown System	NEC 2014, 2017 and 2020, Built-in	
PID Rectifier	Nighttime, built-in	
RS485 Surge Protection (ports 1+2)	Type II, field replaceable, integrated	
AC, DC Surge Protection	Type II, field replaceable, integrated	
DC Fuses (Single Pole)	25A, integrated	
DC SAFETY SWITCH		
DC Disconnect	Built-in	
STANDARD COMPLIANCE		
Safety	UL1699B, UL1741, UL1741 SA, UL1998, CSA C22.2#107.1, Canadian AFCI according to T.I.L. M-07	
Grid Connection Standards	IEEE 1547, Rule 21, Rule 14 (HI)	
Emissions	FCC part 15 class A	

(1) For other regional settings please contact SolarEdge support
(2) Where permitted by local regulations
(3) For specifications of the optional communication options, visit https://www.solaredge.com/products/communication or the Resource Library webpage: https://www.solaredge.com/downloads#, to download the relevant product datasheet

CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

Inverter Specification

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV403

SOLARMOUNT

UNIRAC

SOLARMOUNT is the professionals' choice for residential PV mounting applications. Every aspect of the system is designed for an easier, faster installation experience. **SOLAR**MOUNT is a complete solution with revolutionary universal clamps, **FLASHKIT** PRO, full system UL 2703 certification and 25-year warranty. Not only is **SOLAR**MOUNT easy to install, but best-in-class aesthetics make it the most attractive on any block!

New & Improved:

THE PROFESSIONALS' CHOICE

With Superior Aesthetics

NOW FEATURING FLASHKIT PRO

The Complete Roof Attachment Solution

FEATURING SHED & SEAL TECHNOLOGY

NOW WITH UNIVERSAL MIDCLAMPS

Accommodates 30mm-51mm module frames
One tool, one-person installs are here!

REVOLUTIONARY NEW ENDCLAMPS

Concealed design and included End Caps

THE PROFESSIONALS' CHOICE FOR RESIDENTIAL RACKING

BEST INSTALLATION EXPERIENCE • CURB APPEAL • COMPLETE SOLUTION • UNIRAC SUPPORT

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

SOLARMOUNT

UNIRAC

BETTER DESIGNS

TRUST THE INDUSTRY'S BEST DESIGN TOOL

Start the design process for every project in our U-Builder on-line design tool. It's a great way to save time and money.

BETTER SYSTEMS

ONE SYSTEM - MANY APPLICATIONS

Quickly set modules flush to the roof on steep pitched roofs. Orient a large variety of modules in Portrait or Landscape. Tilt the system up on flat or low slow roofs. Components available in mill, clear, and dark finishes to optimize your design financials and aesthetics.

BETTER RESULTS

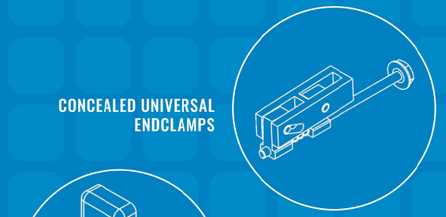
MAXIMIZE PROFITABILITY ON EVERY JOB

Trust Unirac to help you minimize both system and labor costs from the time the job is quoted to the time your teams get off the roof. Faster installs. Less Waste. More Profits.

BETTER SUPPORT

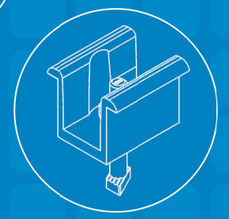
WORK WITH THE INDUSTRIES MOST EXPERIENCED TEAM

Professional support for professional installers and designers. You have access to our technical support and training groups. Whatever your support needs, we've got you covered. Visit Unirac.com/solarmount for more information.



CONCEALED UNIVERSAL ENDCLAMPS

END CAPS INCLUDED WITH EVERY ENDCLAMP



UNIVERSAL SELF STANDING MIDCLAMPS

U-BUILDER ONLINE DESIGN TOOL SAVES TIME & MONEY

Visit design.unirac.com

LISTED **UL2703** BONDING & GROUNDING
MECHANICAL LOADING
SYSTEM FIRE CLASSIFICATION

UNIRAC CUSTOMER SERVICE MEANS THE HIGHEST LEVEL OF PRODUCT SUPPORT

UNMATCHED EXPERIENCE | CERTIFIED QUALITY | ENGINEERING EXCELLENCE | BANKABLE WARRANTY | DESIGN TOOLS | PERMIT DOCUMENTATION

TECHNICAL SUPPORT

Unirac's technical support team is dedicated to answering questions & addressing issues in real time. An online library of documents including engineering reports, stamped letters and technical data sheets greatly simplifies your permitting and project planning process.

CERTIFIED QUALITY PROVIDER

Unirac is the only PV mounting vendor with ISO certifications for 9001:2008, 14001:2004 and OHSAS 18001:2007, which means we deliver the highest standards for fit, form, and function. These certifications demonstrate our excellence and commitment to first class business practices.

BANKABLE WARRANTY

Don't leave your project to chance. Unirac has the financial strength to back our products and reduce your risk. Have peace of mind knowing you are providing products of exceptional quality. SOLARMOUNT is covered by a 25 year limited product warranty and a 5 year limited finish warranty.

ENHANCE YOUR REPUTATION WITH QUALITY RACKING SOLUTIONS BACKED BY ENGINEERING EXCELLENCE AND A SUPERIOR SUPPLY CHAIN

PUB201BAUG31 - PRINTED UPDATE

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

Racking Specification

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV404

RT-MINI II

A Self-flashing PV Mount Featuring Roof Tech´s AlphaSeal®

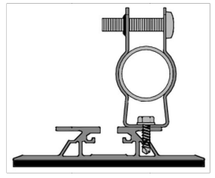
RT-MINI II is suitable for all systems with any L-Foot

- No Caulking or Pre-Drilling Required
- Universal Attachment to Any Slope
- Metal, EPDM, TPO, SBS, & Asphalt Roofs
- Wide Range of Applications & Ultimate Flexibility on the Roof
- No Need to Bend Rails
  N-S & Rotational Adjustments

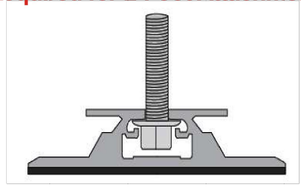
Installation Manual

ICC ESR 3575

Conduit Strap Installation



RT2-04-FBN25
Hex Flange Bolt and Nut Set
Required for L-Foot Attachment



Roof Tech

The Standard for Waterproof Flexible Flashing Since 1994

www.roof-tech.us info@roof-tech.us

CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

Attachment Specification

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV405

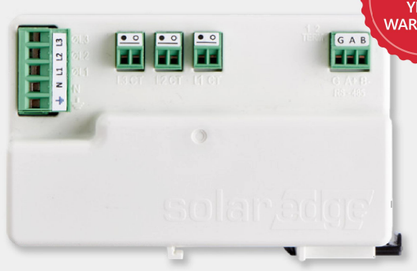
Revenue Grade Energy Meter with Modbus Connection for 208V Grid

for North America

SE-RGMTR-3D-208V-A
SE-RGMTR-3Y-208V-A

ACCESSORIES

5 YEAR WARRANTY



Revenue Grade Energy Meter for Commercial Installations

- High accuracy revenue grade meter readings for production monitoring
- Small and easy to install - fits in standard electrical panel
- Supports commercial and utility-size installations
- Supports RS485 120Ω line termination
- Communicates over RS485 to provide monitoring data

solaredge.com

solaredge

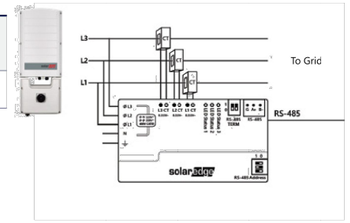
Revenue Grade Energy Meter with Modbus Connection for 208V Grid for North America

SE-RGMTR-3D-208V-A, SE-RGMTR-3Y-208V-A

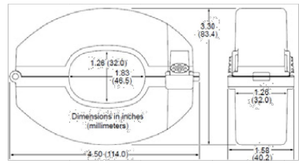
WHEN ORDERING A METER, ORDER CURRENT TRANSFORMERS AS WELL[1]:

CURRENT TRANSFORMER MODELS[2]	CLASS	RATED RMS CURRENT	DIMENSIONS (INTERNAL/ EXTERNAL)
SEACTL-1250-150-C3	0.3	150 A	1.83 x 1.26 in. / 4.50 x 3.30 in.
SEACTL-1250-300-C3	0.3	300 A / 600 A[3]	

[1] Current Transformers should be ordered separately
[2] One current transformer per phase; Sold in kits of 3 CTs. For other ratings contact SolarEdge
[3] 600 A is achieved by connecting two SEACTL-1250-300-C3 in parallel



Current Transformer Dimensions



		SE-RGMTR-3D-208V-A	SE-RGMTR-3Y-208V-A	UNITS
ELECTRICAL SERVICE				
Nominal Voltage Range	Line to Line	202-240	208-240	Vac
	Line to Neutral		120-277	Vac
Operating Voltage Range	Line to Line	182-264	187-264	Vac
	Line to Neutral		108-305	Vac
Grids[4]		3 Phase 3 Wire Delta	3 Phase 4 Wire Wye	
AC Frequency		55-65[5]		Hz
Accuracy (@ 77°F/ 25°C, PF: 0.7-1)[6]		ANSI C12.20 Edition 2010 (class 0.5 system)		
Power Consumption		1 - 1.5 (Typical) 3 (Max)		W
COMMUNICATION				
Supported Communication Interfaces		RS485 half-duplex, 3 wires (A, B, GND)		
Response Time		≤1		sec
Default Device ID (Modbus)		1		
STANDARD COMPLIANCE				
Safety		UL 61010-1; CAN/CSA-C22.2 No. 61010-1-04, IEC 61010-1		
Immunity		EN 61326: 2002; EN 61000-4-2; EN 61000-4-3; EN 61000-4-4; EN 61000-4-5; EN61000-4-6; EN 61000-4-11		
Emissions		FCC Part 15, Class B; EN 55022: 1994, Class B		
INSTALLATION SPECIFICATIONS				
Dimensions (HxWxD)		4.40 x 1.38 x 2.95		in
Weight		0.45		lb
Operating Temperature Range[7]		-40 to +185		°F
Relative Humidity (noncondensing)		5% to 90% up to 104°F decreasing linearity to 50% RH at 131°F		%
Protection Rating		IP20 - Suitable for indoor use IP65 - Suitable for outdoor use when mounted inside an electrical enclosure that is rated NEMA 3R or 4		
Mounting Type		DIN Rail		

[4] PE (Protective Earth) connection is not required for meter operation
[5] When used for RGM C12.20 appliation. 45 - 65 Hz for all other applications.
[6] Using Opt C0.3 CT models available from CCS
[7] Current Transformers operating Temperature Range: -30 to +75°C / -22 to + 167°F

FC RoHS

CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

Meter Specification

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV406

SOLADECK
PROFESSIONAL SOLUTIONS FOR PROFESSIONAL INSTALLERS

0799 & 0999 Specification Sheet

The Original Roof Mount PV Junction Box

0799 Ratings

- ETL listed and labeled
- Conforms to UL 1741 Standard
- UL50 Type 3R, 11th edition electrical equipment enclosures
- CSA C22.2 No. 290 Nema Type 3R
- 600 VDC/115 amps
- 240 VAC/60 amps
- Ambient temperature rating (-35°C) - (+75°C)
- 2/12—12/12 slopes

0999 Ratings

- ETL listed and labeled
- Conforms to UL 1741 Standard
- UL50 Type 3R, 11th edition electrical equipment enclosures
- CSA C22.2 No. 290 Nema Type 3R
- 1000 VDC/115 amps
- 240 VAC/60 amps
- Ambient temperature rating (-35°C) - (+75°C)
- 2/12—12/12 slopes

0799 and 0999 Specifications

- Base material options:
  - 18 gauge G90 galvanized steel, powder coated black or gray
  - Stainless steel
- Seamless draw (stamped) with a 15.75” x 17.25” flashing
- 3” height with an interior workspace of 225 cubic inches
- Approximate weight of 9.2lb
- 35mm slotted din rail, installed
- Eight roof deck knockouts, size (6) .5”, (1) .75” and (1) 1”
- Slotted cover with one preinstalled set screw
- Two, 3/4" holes in the bottom sidewall for conduit or fittings (UL listed plugs provided)
- Multiple ground block options:

	Position	Ground Wire Size
0799/0999-2	2 Position Ground	2/0-14
0799/0999-5	5 Position Ground	14-4
0799/0999-D	Lay In Ground	14-8

WWW.SOLADECK.COM - PHONE: 715-830-9997

CMTA

BID DRAWINGS

NOT FOR CONSTRUCTION

Sideburn Support Satellite
5025 Sideburn Road
Fairfax, VA 22032

SolaDeck Specification

CLIENT/CMTA JOB #:	ZFC23-01
DATE:	4/5/2024
DRAWN:	AS
CHECKED:	KK

REVISIONS

PV407