DeKalb County Historic Preservation Commission

Monday, December 16, 2024- 6:00 P.M.

Staff Report

Regular Agenda

A. 1722 Coventry Road, Gaines Moore. Install solar panels on front roof of house. **1247315.**

Built in 1946 (18 004 05 024)

This property is in the Chelsea Height Character Area but is not in a National Register Historic District.

05-00 1722 Coventry Road (DH), James J. Hasken. Construct wooden storage shed in backyard. **Approved.**
03-17 1722 Coventry Road (DH), Alice Johnson Design. Replace nonhistoric windows in an enclosed porch, build a rear addition and modify the front steps. 21441. **Approved.**
01-21 1722 Coventry Road (DH), Marion Carter. Add a shed dormer to the rear roof slope. 1244662. **Approved.**
11-24 1722 Coventry Road, Gaines Moore. Install solar panels on front roof of house. 1247315. **Deferred.**

Summary

December 2024

The applicant provided a planting plan to assist in mitigating the appearance of the installed solar panels. The applicant proposes planting four (4) Sweet shrub bushes along the retaining wall in the front yard, near the sidewalk running along Coventry Road. The retaining wall measures three feet in height and the bushes will be planted three feet from the retaining wall. The applicant also proposes planting two (2) small Redbud trees closer to the house, estimated at 20 feet from the house, and an estimated 15 feet apart.

November 2024

The applicant proposes installing a solar energy system to the roof of a historic house. The solar energy system will consist of a total of 16 solar panels installed on the roof of the house, facing toward Coventry Road. The panels will be located on the main roof of the house and the attached sunroom located on the right side of the house.

Recommendation

Approve. The proposed changes do not appear to have a substantial adverse effect on the property or the district. This application appears to meet the guidelines and the staff recommends approval.

Relevant Guidelines

5.0 *Design Review Objective* (p45) - When making a material change to a structure that is in view from a public right-of-way, a higher standard is required to ensure that design changes are compatible with the architectural style of the structure and retain character-defining features. When a proposed material change to a structure is not in view from the public-right-way, the Preservation Commission may review the project with a less strict standard so as to allow the owner more flexibility. Such changes, however, shall not have a substantial adverse effect on the overall architectural character of the structure.

9.3 *Vegetation* (p83) Recommendation – The plant list is intended to assist in the selection of appropriate plant materials. Olmsted's list and the list from the Georgia Landscapes Project provide guidance in selecting materials appropriate for

historic landscape projects. There are other sources that can be consulted to identify additional plants used by Olmsted in Druid Hills, such as historic planting plans and particularly the archival record at the Olmsted National Historic Site in Brookline, Massachusetts. The Olmsted list presented in this document should be considered a beginning. Residents of Druid Hills are encouraged to add to this list with historic plants that can be documented as having been used by Olmsted. The native list should be used for natural areas within the district, such as creek corridors and drainage ways. Places within the district where the retention of healthy ecological environments is critical are best landscaped with native varieties. Since native plants have been available since the colony of Georgia was established in 1733, native plants are also appropriate for historic landscapes.

17.0 *Special note regarding materials* – In general, materials should be in keeping with those that are endemic to the neighborhood, namely, wood, granite, brick and asphalt. However, newer material may be introduced into the neighborhood if in keeping with the historical context of these older materials. For example, the use of cementitious siding that mimics the profile and texture of wood (commonly referred to as Hardieplank) may be consistent with some exterior applications. The introduction of some "green" materials, for example, solar shingling and panels, may be appropriate and should be given special design consideration.

DeKalb County
GEORGIA

Development Services Center
178 Sams Street
Decatur, GA 30030
www.dekalbcountyga.gov/planning
404-371-2155 (o); 404-371-4556 (f)

Chief Executive Officer
Michael Thurmond

DEPARTMENT OF PLANNING & SUSTAINABILITY

Interim Director
Cedric Hudson

Application for Certificate of Appropriateness

Date submitted: 10/14/24 Date Received: _____

Address of Subject Property: 1722 Coventry Rd Decatur, Ga 30030

Applicant: Gaines Moore E-Mail: gaines@bettertomorrowsolar.com

Applicant Mailing Address: 1074 Memorial Dr SE Atlanta, GA 30316

Applicant Phone: 404-398-2840

Applicant's relationship to the owner: Owner ☐ Architect ☐ Contractor/Builder ☒ Other ☐

****

Owner(s): Marion Carter Email: mwcarter@fastmail.com

Owner(s): _____ Email: _____

Owner(s) Mailing Address: 1722 Coventry Rd Decatur, Ga 30030

Owner(s) Telephone Number: 404-825-6101

Approximate date of construction of the primary structure on the property and any other structures affected by this project: _____

Nature of work (check all that apply):

New construction	☐	New Accessory Building	☐	Other Building Changes	☐
Demolition	☐	Landscaping	☐	Other Environmental Changes	☐
Addition	☐	Fence/Wall	☐	Other	☒
Moving a Building	☐	Sign Installation	☐		

Solar Panels

Description of Work:

Installation of rooftop solar system

This form must be completed in its entirety and be accompanied by supporting documents, such as plans, list of materials, color samples, photographs, etc. All documents should be in PDF format, except for photographs, which may be in JPEG format. Email the application and supporting material to plansustain@dekalbcountyga.gov and pvjennings@dekalbcountyga.gov. An incomplete application will not be accepted.

Signature of Applicant: _____

DeKalb County
GEORGIA

DEPARTMENT OF PLANNING & SUSTAINABILITY

Authorization of a Second Party to Apply for a Certificate of Appropriateness

This form is required if the individual making the request is **not** the owner of the property.

I/ We: Marion Carter

being owner(s) of the property at: 1722 Coventry Rd Decatur, Ga 30033

hereby delegate authority to: Gaines Moore

to file an application for a certificate of appropriateness in my/our behalf.

Signature of Owner(s): Marion Carter

Date: Oct 11 2024

Please review the following information

Approval of this Certificate of Appropriateness does not release the recipient from compliance with all other pertinent county, state, and federal regulations.

Before making any changes to your approved plans, contact the preservation planner (404/371- 2155). Some changes may fall within the scope of the existing approval, but others will require review by the preservation commission. If work is performed which is not in accordance with your certificate, a Stop Work Order may be issued.

If your project requires that the county issue a Certificate of Occupancy at the end of construction, an inspection may be made to verify that the work has been completed in accord with the Certificate of Appropriateness. If the work as completed is not the same as that approved in the Certificate of Appropriateness you will not receive a Certificate of Occupancy. You may also be subject to other penalties including fines and/or required demolition of the non-conforming work.

If you do not commence construction within twelve months of the date of approval, your Certificate of Appropriateness will become void and you will need to apply for a new certificate if you still intend to do the work.

PHOTOVOLTAIC ROOF MOUNT SYSTEM

16 MODULES-ROOF MOUNTED - 6.400 kW DC, 7.600 kW AC

1722 COVENTRY RD,DECATUR GA 30030, USA

PHOTOVOLTAIC SYSTEM SPECIFICATIONS:

SYSTEM SIZE:	6.400 kW DC 7.600 kW AC
MODULE TYPE & AMOUNT:	(16) Q CELL Q.PEAK DUO BLK ML-G10+ (400W) MODULES
MODULE DIMENSIONS:	(L/W/H) 74.0"/41.1"/1.26"
INVERTER:	(1) EP CUBE HYBRID INVERTER
RAPID SHUTDOWN	(16) TIGO: TS4-A-F MODULE-LEVEL RAPID SHUTDOWN
INTERCONNECTION METHOD:	BACKFEED BREAKER
BATTERY:-	EP CUBE HYBRID NA510G BATTERY (9.9kwh)
SMART GATEWAY:-	(1) EP CUBE: SMART GATEWAY

GOVERNING CODES

ALL WORK SHALL CONFORM TO THE FOLLOWING CODES

INTERNATIONAL BUILDING CODE 2018 (IBC 2018),
INTERNATIONAL RESIDENTIAL CODE 2018 (IRC 2018),
INTERNATIONAL FIRE CODE 2018 (IFC 2018),
INTERNATIONAL ENERGY CONSERVATION CODE 2015 (IECC 2015),
NATIONAL ELECTRICAL CODE, 2020,

1 SATELLITE VIEW

PV 0.0

SCALE: NTS

1. ALL COMPONENTS ARE UL LISTED AND NEC CERTIFIED, WHERE WARRANTED.
2. THE SOLAR PV SYSTEM WILL BE INSTALLED IN ACCORDANCE WITH ARTICLE 690 OF THE NEC 2020.
3. THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION.
4. ALL CONDUCTORS OF A CIRCUIT, INCLUDING THE EGC, MUST BE INSTALLED IN THE SAME RACEWAY, OR CABLE, OR OTHERWISE RUN WITH THE PV ARRAY CIRCUIT CONDUCTORS WHEN THEY LEAVE THE VICINITY OF THE PV ARRAY.
5. WHERE METALLIC CONDUIT CONTAINING DC CONDUCTORS IS USED INSIDE THE BUILDING, IT SHALL BE IDENTIFIED AS "CAUTION: SOLAR CIRCUIT" EVERY 10FT.
6. HEIGHT OF THE AC DISCONNECT SHALL NOT EXCEED 6'-7" PER NEC CODE 240.24.
7. A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH NEC 2020 690.47 AND 250.50 THROUGH 60 AND 250-166 SHALL BE PROVIDED. PER NEC GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED AND BONDED TO THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE OR INADEQUATE A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8 FT. GROUND ROD WITH ACORN CLAMP. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO LARGER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE SYSTEM.
8. PHOTOVOLTAIC MODULES ARE TO BE CONSIDERED NON-COMBUSTIBLE.
9. PHOTOVOLTAIC INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
10. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE. WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF THE ROOF SURFACE.
11. ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH THE LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.
12. INVERTER(S) USED IN UNGROUNDED SYSTEM SHALL BE UL 1741 LISTED.
13. THE INSTALLATION OF EQUIPMENT AND ALL ASSOCIATED WIRING AND INTERCONNECTION SHALL BE PERFORMED ONLY BY QUALIFIED PERSONS [NEC 690.4(C)]
14. ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED (OR BETTER), INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.
15. ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250.
16. SYSTEM GROUNDING SHALL BE IN ACCORDANCE WITH NEC 690.41.
17. PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION IN ACCORDANCE WITH NEC 690.12
18. DISCONNECTING MEANS SHALL BE LOCATED IN A VISIBLE, READILY ACCESSIBLE LOCATION WITHIN THE PV SYSTEM EQUIPMENT OR A MAXIMUM OF 10 FEET AWAY FROM THE SYSTEM [NEC 690.13(A)]
19. ALL WIRING METHODS SHALL BE IN ACCORDANCE WITH NEC 690.31
20. WORK CLEARANCES AROUND ELECTRICAL EQUIPMENT WILL BE MAINTAINED PER NEC 110.26(A)(1), 110.26(A)(2) AND 110.26(A)(3).
21. ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED & IDENTIFIED IN ACCORDANCE WITH UL1703
22. ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.
23. THE ENCHARGE BATTERY AS PART OF THE ENSEMBLE SYSTEM DOES NOT EXPORT POWER TO THE GRID IN ANY STORAGE MODE.
24. IN ACCORDANCE WITH 2021 IFC 1205.5, 2018 IFC 1204.4, AND 2015 IFC 605.11.2 A CLEAR, BRUSH-FREE AREA OF 10 FEET(3048 MM) SHALL BE REQUIRED FOR GROUND-MOUNTED PHOTOVOLTAIC ARRAYS.
25. PANEL LAYOUT ORIENTATION IS SUBJECT TO CHANGE ON DESIGNED MOUNTING PLANES.
26. ALL PERMANENTLY INSTALLED LUMINARIES, EXCLUDING THOSE IN KITCHEN APPLIANCES, SHALL HAVE AN EFFICIENCY OF AT LEAST 45 LUMENS-PER-WATT OR SHALL UTILIZE LAMPS WITH AN EFFICIENCY OF NOT LESS THAN 65 LUMENS-PER-WATT.

SHEET INDEX:

SIGNATURE

2 VICINITY MAP

PV 0.0

SCALE: NTS

BETTER TOMORROW SOLAR
1074 Memorial Dr SE, Atlanta, GA 30316

CONTRACTOR

REVISIONS

Description	Date	Rev
Initial Design	10-02-2024	
	10-05-2024	01

Signature with Seal

Project Name & Address

MARION CARTER RESIDENCE
1722 COVENTRY RD
DECATUR GA 30030, USA
APN #: 1800405024

Service #

Sheet Name: COVER SHEET

Sheet Size: ANSI B 11" X 17"

Sheet Number: PV 0.0

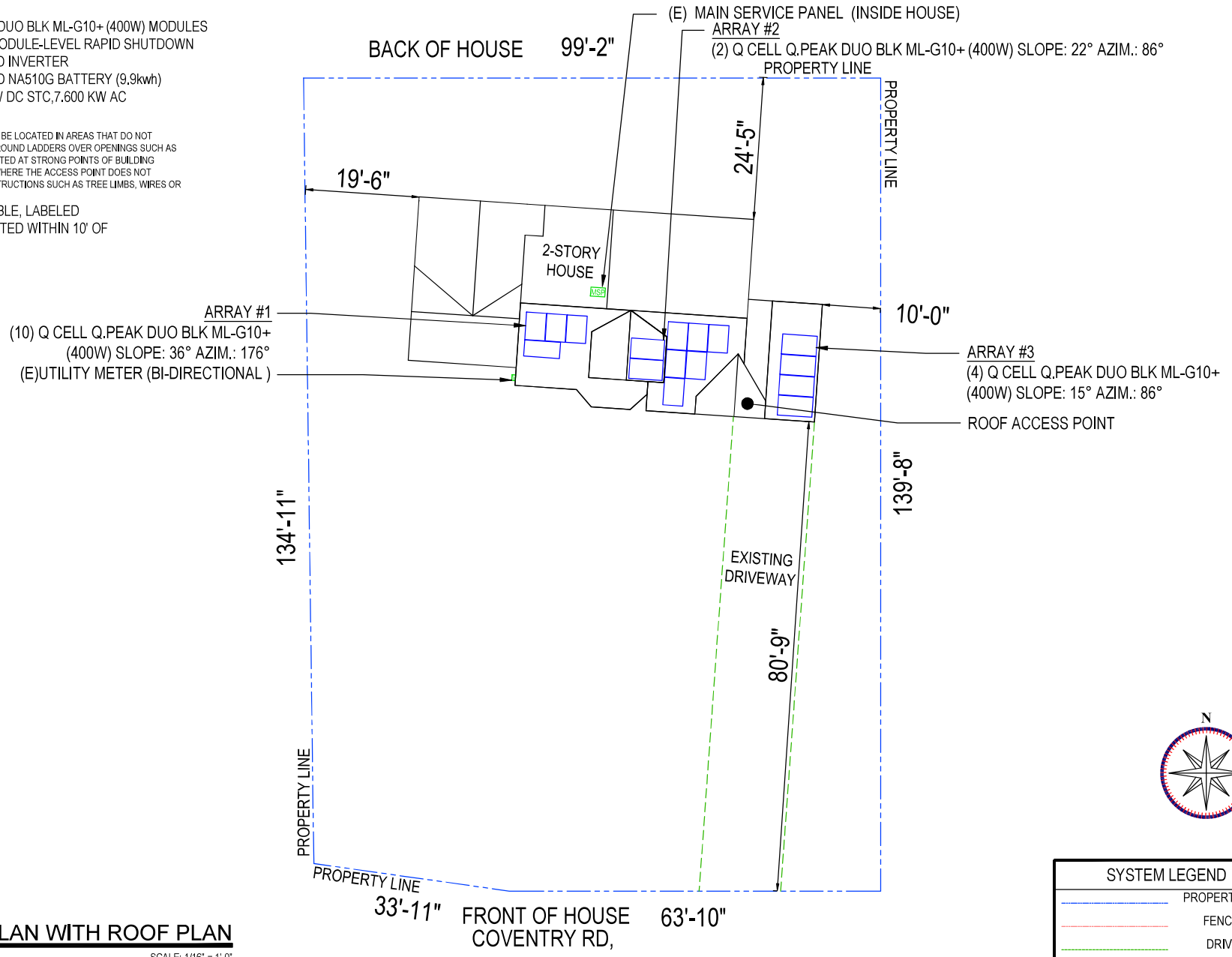
SYSTEM SUMMARY

16 Q CELL Q.PEAK DUO BLK ML-G10+ (400W) MODULES
16 TIGO: TS4-A-F MODULE-LEVEL RAPID SHUTDOWN
1 EP CUBE HYBRID INVERTER
1 EP CUBE HYBRID NA510G BATTERY (9.9kwh)
SYSTEM SIZE: 6.400 KW DC STC,7.600 KW AC

ROOF ACCESS POINT

ROOF ACCESS POINT SHALL NOT BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION IN LOCATIONS WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREE LIMBS, WIRES OR SIGNS.

NOTE: VISIBLE, LOCKABLE, LABELED AC DISCONNECT LOCATED WITHIN 10' OF UTILITY METER



SYSTEM LEGEND

PROPERTY LINE
FENCE LINE
DRIVEWAY

1 PLOT PLAN WITH ROOF PLAN
PV 0.1
SCALE: 1/16" = 1'-0"

Better Tomorrow Solar

BETTER TOMORROW SOLAR
1074 Memorial Dr SE, Atlanta, GA 30316

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Signature with Seal

Project Name & Address

MARION CARTER RESIDENCE
1722 COVENTRY RD
DECATUR GA 30030, USA
APN #: 18004050024

Service #

Sheet Name
PLOT PLAN WITH ROOF PLAN

Sheet Size
ANSI B
11" X 17"

Sheet Number
PV 0.1

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 16 MODULES
MODULE TYPE = Q CELL Q.PEAK DUO BLK ML-G10+ (400W) MODULES
MODULE WEIGHT = 48.5 LBS / 22.0 KG.
MODULE DIMENSIONS = 74.0"X 41.1" = 21.12 SF
UNIT WEIGHT OF ARRAY = 2.30 PSF

SYSTEM SUMMARY

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16	TIGO: TS4-A-F MODULE-LEVEL RAPID SHUTDOWN
1	EP CUBE HYBRID INVERTER
1	EP CUBE HYBRID NA510G BATTERY (9.9kwh)

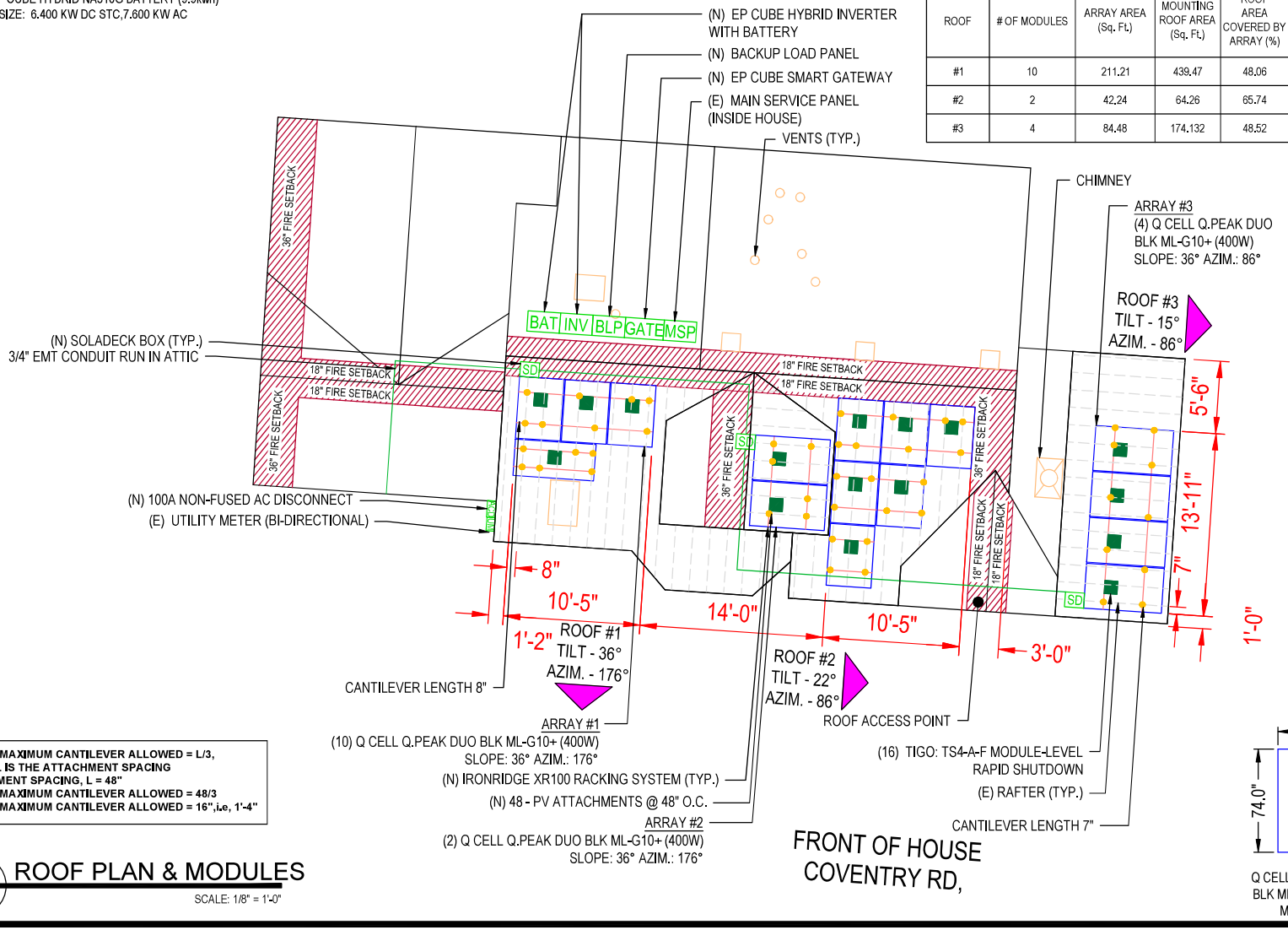
SYSTEM SIZE: 6.400 KW DC STC,7.600 KW AC

RACKING MATERIAL LIST	
RAIL:	8
END CLAMP:	28
MID CLAMP:	18
ATTACHMENT:	48
GROUNDING LUG:	7
SPLICE KIT:	0

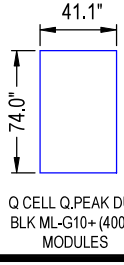
ROOF DESCRIPTION				
ROOF TYPE			COMPOSITE SHINGLE	
ROOF	ROOF TILT	AZIMUTH	FRAMING SIZE	FRAMING SPACING
#1	36°	176°	2"X4"	16"
#2	22°	86°	2"X4"	16"
#3	15°	86°	2"X4"	16"

TOTAL ARRAY AREA WITH MOUNTING ROOF AREA				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	MOUNTING ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	10	211.21	439.47	48.06
#2	2	42.24	64.26	65.74
#3	4	84.48	174.132	48.52

BACK OF HOUSE



ACTUAL MAXIMUM CANTILEVER ALLOWED = L/3,
WHERE L IS THE ATTACHMENT SPACING
ATTACHMENT SPACING, L = 48"
ACTUAL MAXIMUM CANTILEVER ALLOWED = 48/3
ACTUAL MAXIMUM CANTILEVER ALLOWED = 16",i.e, 1'-4"



Q CELL Q.PEAK DUO BLK ML-G10+ (400W) MODULES

SYSTEM LEGEND

- M — (E) MAIN SERVICE PANEL (INSIDE OF HOUSE)
- UM — (E) UTILITY METER (BI-DIRECTIONAL) N/A
- ACD — (N) PHOTOVOLTAIC UTILITY DISCONNECT SWITCH. LOCATED WITHIN 10'
- INV — (N) EP CUBE HYBRID INVERTER
- BAT — (N) EP CUBE HYBRID NA510G BATTERY (9.9kwh)
- BLP — (E) BACKUP LOAD PANEL
- SD — (N) SOLADECK BOX
- 16 NEW Q CELL Q.PEAK DUO BLK ML-G10+ (400W) MODULES WITH 16-TIGO: TS4-A-F MODULE-LEVEL RAPID SHUTDOWN MOUNTED ON THE BACK OF EACH MODULE.
- FIRE SETBACK
- = ROOF OBSTRUCTIONS
- = EMT CONDUIT
- = ROOF RAIL
- = ROOF ATTACHMENT

ROOF SECTIONS

ROOF #01
MODULE - 10
SLOPE - 36°
AZIMUTH - 176°
MATERIAL - COMP SHINGLE
RAFTER SIZE & SPACING - 2"X4" @ 16" O.C.

ROOF #02
MODULE - 2
SLOPE - 22°
AZIMUTH - 86°
MATERIAL - COMP SHINGLE
RAFTER SIZE & SPACING - 2"X4" @ 16" O.C.

ROOF #03
MODULE - 4
SLOPE - 15°
AZIMUTH - 86°
MATERIAL - COMP SHINGLE
RAFTER SIZE & SPACING - 2"X4" @ 16" O.C.

1 ROOF PLAN & MODULES

PV 1.1

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

Better Tomorrow Solar

BETTER TOMORROW SOLAR
1074 Memorial Dr SE, Atlanta, GA 30316

CONTRACTOR

REVISIONS

Description	Date	Rev
Initial Design	10-02-2024	
	10-05-2024	01

Signature with Seal

Project Name & Address

MARION CARTER RESIDENCE
1722 COVENTRY RD
DECATUR GA 30030, USA
APN #: 1800405024

Service #

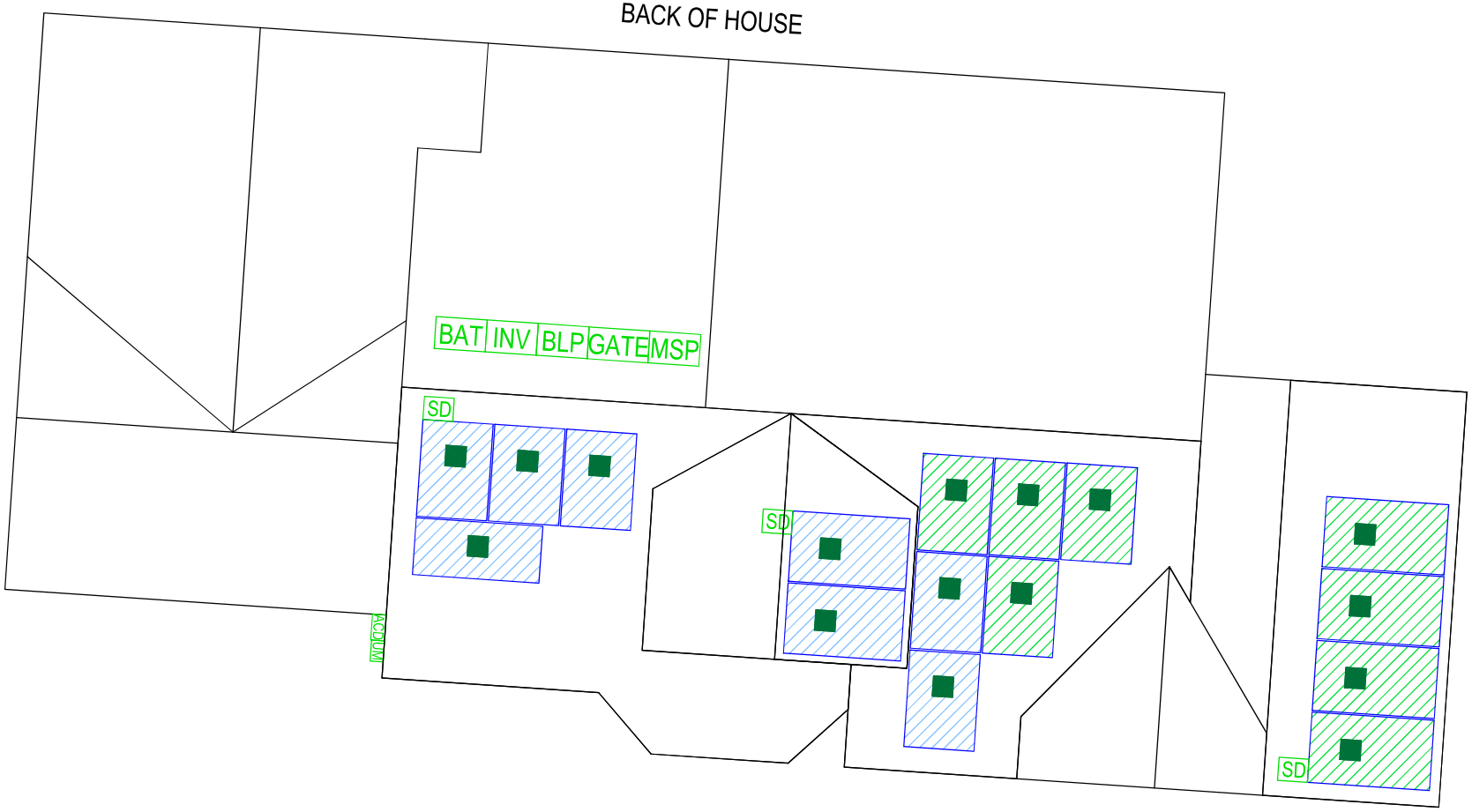
Sheet Name
ROOF PLAN WITH MODULES

Sheet Size
ANSI B
11" X 17"

Sheet Number
PV 1.1

SYSTEM SUMMARY

16 Q CELL Q.PEAK DUO BLK ML-G10+ (400W) MODULES
16 TIGO: TS4-A-F MODULE-LEVEL RAPID SHUTDOWN
1 EP CUBE HYBRID INVERTER
1 EP CUBE HYBRID NA510G BATTERY (9.9kwh)
SYSTEM SIZE: 6.400 KW DC STC,7.600 KW AC



CIRCUIT(S)

- CIRCUIT #1 - 8 MODULES
- CIRCUIT #2 - 8 MODULES

1 CIRCUIT LAYOUT
PV 1.2
SCALE: 3/16" = 1'-0"

BETTER TOMORROW SOLAR
1074 Memorial Dr SE, Atlanta, GA 30316

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Project Name & Address

MARION CARTER RESIDENCE
1722 COVENTRY RD
DECATUR GA 30030, USA
APN #: 18004050024

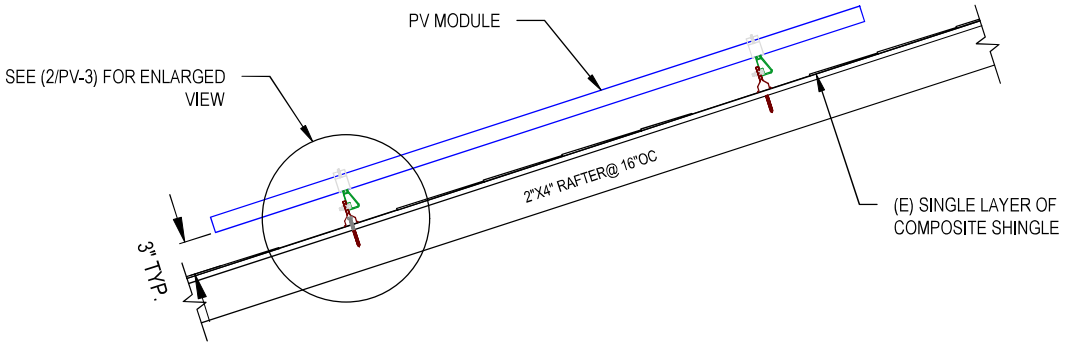
Service #

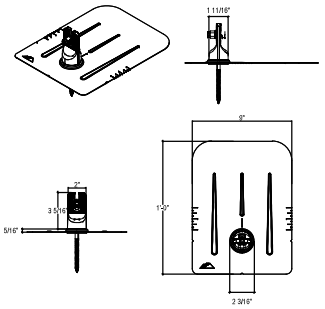
Sheet Name
STRING LAYOUT

Sheet Size
ANSI B
11" X 17"

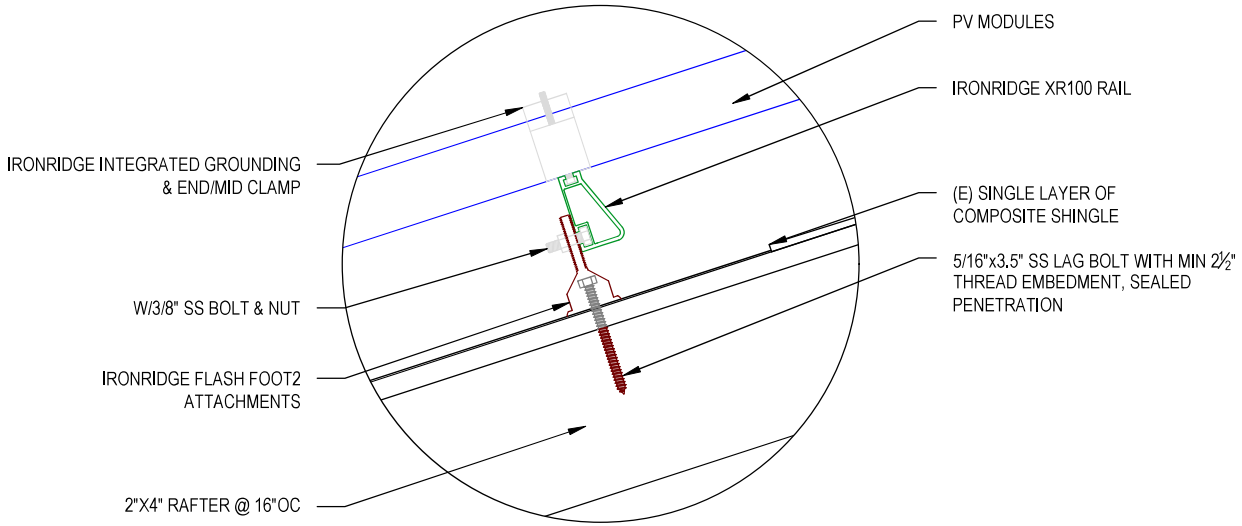
Sheet Number
PV 1.2

SYSTEM SUMMARY
16 Q CELL Q.PEAK DUO BLK ML-G10+ (400W) MODULES
16 TIGO: TS4-A-F MODULE-LEVEL RAPID SHUTDOWN
1 EP CUBE HYBRID INVERTER
1 EP CUBE HYBRID NA510G BATTERY (9.9kwh)
SYSTEM SIZE: 6.400 KW DC STC,7.600 KW AC





1 ATTACHMENT DETAIL
PV-3 SCALE: NTS



2 ATTACHMENT DETAIL (ENLARGED VIEW)
PV-3 SCALE: NTS

BETTER TOMORROW SOLAR
1074 Memorial Dr SE, Atlanta, GA 30316

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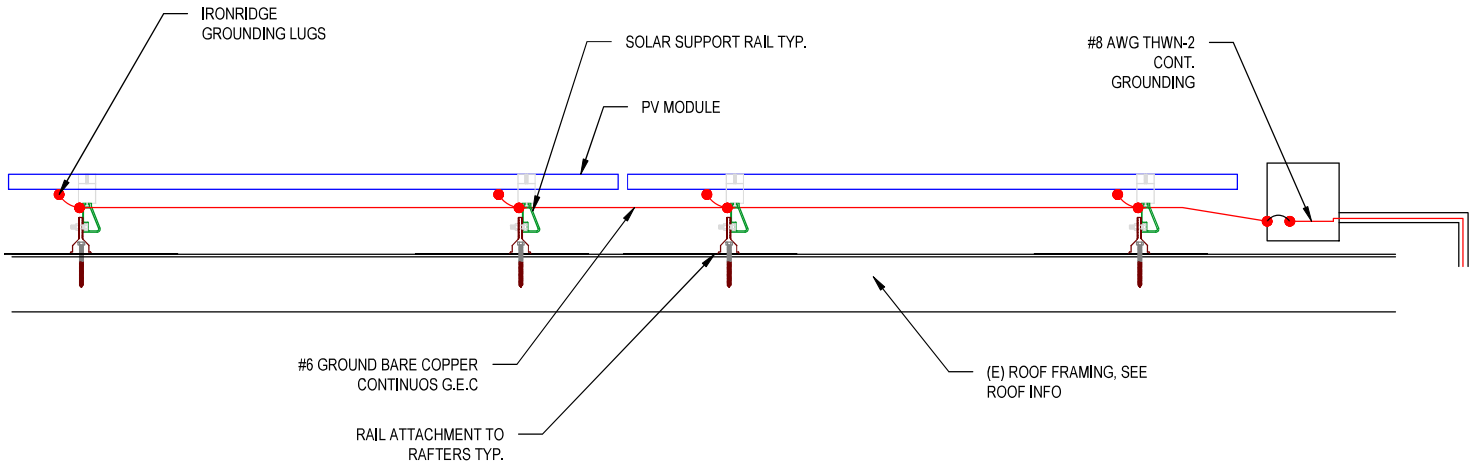
MARION CARTER RESIDENCE
1722 COVENTRY RD
DECATUR GA 30030, USA
APN #: 18004405024

Service #

Sheet Name
ATTACHMENT DETAIL

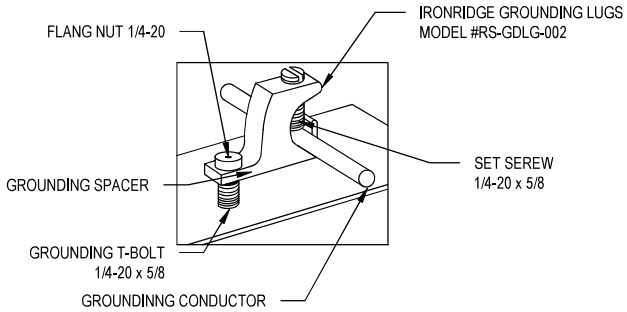
Sheet Size
ANSI B
11" X 17"

Sheet Number
PV 1.3

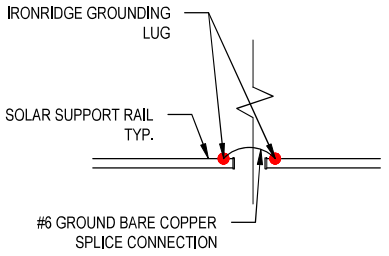


1 PV-3A **GROUNDING DETAIL** SCALE: NTS

2 PV 1.4 **GROUNDING DETAIL** SCALE: N.T.S



3 PV-3A **DETAIL** SCALE: NTS



4 PV-3A **DETAIL** SCALE: NTS

BETTER TOMORROW SOLAR
1074 Memorial Dr SE, Atlanta, GA 30316

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Project Name & Address

MARION CARTER RESIDENCE
1722 COVENTRY RD
DECATUR GA 30030, USA
APN #: 18004405024

Service #

Sheet Name
ATTACHMENT DETAIL

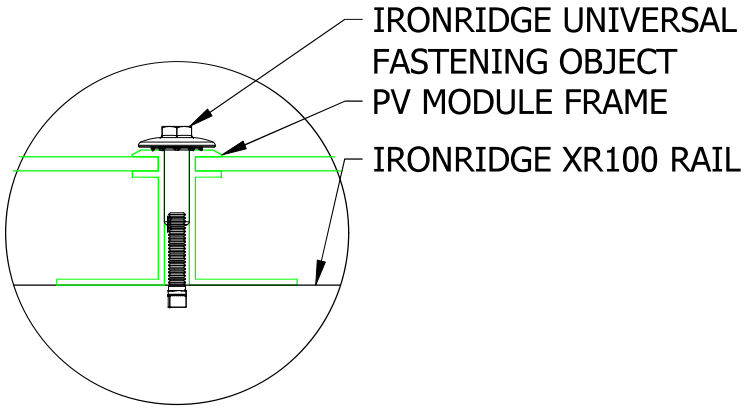
Sheet Size
ANSI B
11" X 17"

Sheet Number
PV 1.4

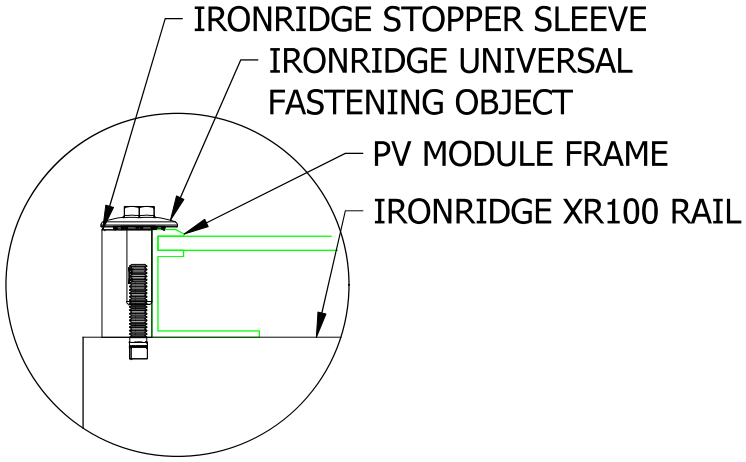
SYSTEM SUMMARY

16	Q CELL Q.PEAK DUO BLK ML-G10+ (400W) MODULES
16	TIGO: TS4-A-F MODULE-LEVEL RAPID SHUTDOWN
1	EP CUBE HYBRID INVERTER
1	EP CUBE HYBRID NA510G BATTERY (9.9kwh)

SYSTEM SIZE: 6.400 KW DC STC,7.600 KW AC



1 DETAIL, MID CLAMP FRONT
PV 1.5 Scale: 6" = 1'-0"



2 DETAIL, END CLAMP (UFO) FRONT
PV 1.5 Scale: 6" = 1'-0"

Better Tomorrow Solar

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1074 Memorial Dr SE, Atlanta, GA 30316

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Project Name & Address

MARION CARTER RESIDENCE
1722 COVENTRY RD
DECATUR GA 30030, USA
APN #: 1800405024

Service #

Sheet Name
ATTACHMENT DETAIL

Sheet Size
ANSI B
11" X 17"

Sheet Number
PV 1.5

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 16 MODULES
MODULE TYPE = Q CELL Q.PEAK DUO BLK ML-G10+ (400W) MODULES
MODULE WEIGHT = 48.5 LBS / 22.0 KG.
MODULE DIMENSIONS = 74.0"X 41.1" = 21.12 SF
UNIT WEIGHT OF ARRAY = 2.30 PSF

SYSTEM SUMMARY

16 Q CELL Q.PEAK DUO BLK ML-G10+ (400W) MODULES
16 TIGO: TS4-A-F MODULE-LEVEL RAPID SHUTDOWN
1 EP CUBE HYBRID INVERTER
1 EP CUBE HYBRID NA510G BATTERY (9.9kwh)

SYSTEM SIZE: 6.400 KW DC STC,7.600 KW AC

BILL OF MATERIALS

BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULE	16	Q CELL Q.PEAK DUO BLK ML-G10+ (400W) MODULES
INVERTER	1	EP CUBE HYBRID INVERTER
RAPID SHUTDOWN	16	TIGO: TS4-A-F MODULE-LEVEL RAPID SHUTDOWN
BATTERY	1	EP CUBE HYBRID NA510G BATTERY (9.9kwh)
SOLADECK	3	SOLADECK
AC DISCONNECT	1	100A NON-FUSED AC DISCONNECT 240A UL LISTED
ATTACHMENTS	48	FALSHFOOT 2 PV ATTACHMENTS [FF2-01-B1]
RAILS	8	IRONRIDGE XR100 RAIL-168" SECTION
RAIL SPLICE	0	SPLICE KIT
MID CLAMPS	18	MID CLAMPS / UFO
END CLAMPS	28	END CLAMPS / STOPPER SLEEVE
GROUNDING LUG	7	GROUNDING LUG

DISCLAIMER: MATERIALS REQUIRED LIST FOR CONCEPTUAL USE ONLY THE INTENT IS TO AID CONTRACTOR FOR ORDERING REQUIRED MATERIALS FOR THE PROJECT. CONTRACTOR RESPONSIBLE TO VERIFY PRIOR TO SOLAR EQUIPMENT ORDERING

BETTER TOMORROW SOLAR
1074 Memorial Dr SE, Atlanta, GA 30316

CONTRACTOR

REVISIONS

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	10-05-2024	01

Signature with Seal

Project Name & Address

MARION CARTER RESIDENCE
1722 COVENTRY RD
DECATUR GA 30030, USA
APN #: 1800405024

Service #

Sheet Name
EQUIPMENT SPECIFICATION

Sheet Size
ANSI B
11" X 17"

Sheet Number
BOM1.1

SYSTEM SIZE: 6.400 KW DC STC,7.600 kW AC
(16) Q CELL Q.PEAK DUO BLK ML-G10+ (400W) MODULES
(16) TIGO: TS4-A-F MODULE-LEVEL RAPID SHUTDOWN
(1) EP CUBE HYBRID INVERTER
(1) EP CUBE HYBRID NA510G BATTERY (9.9kwh)
(02) STRINGS OF 08 MODULES CONNECTED IN SERIES PER STRING

NOTE:
VISIBLE, LABELED, LOCKABLE DISCONNECT LOCATED LESS THAN 10' FROM UTILITY METER

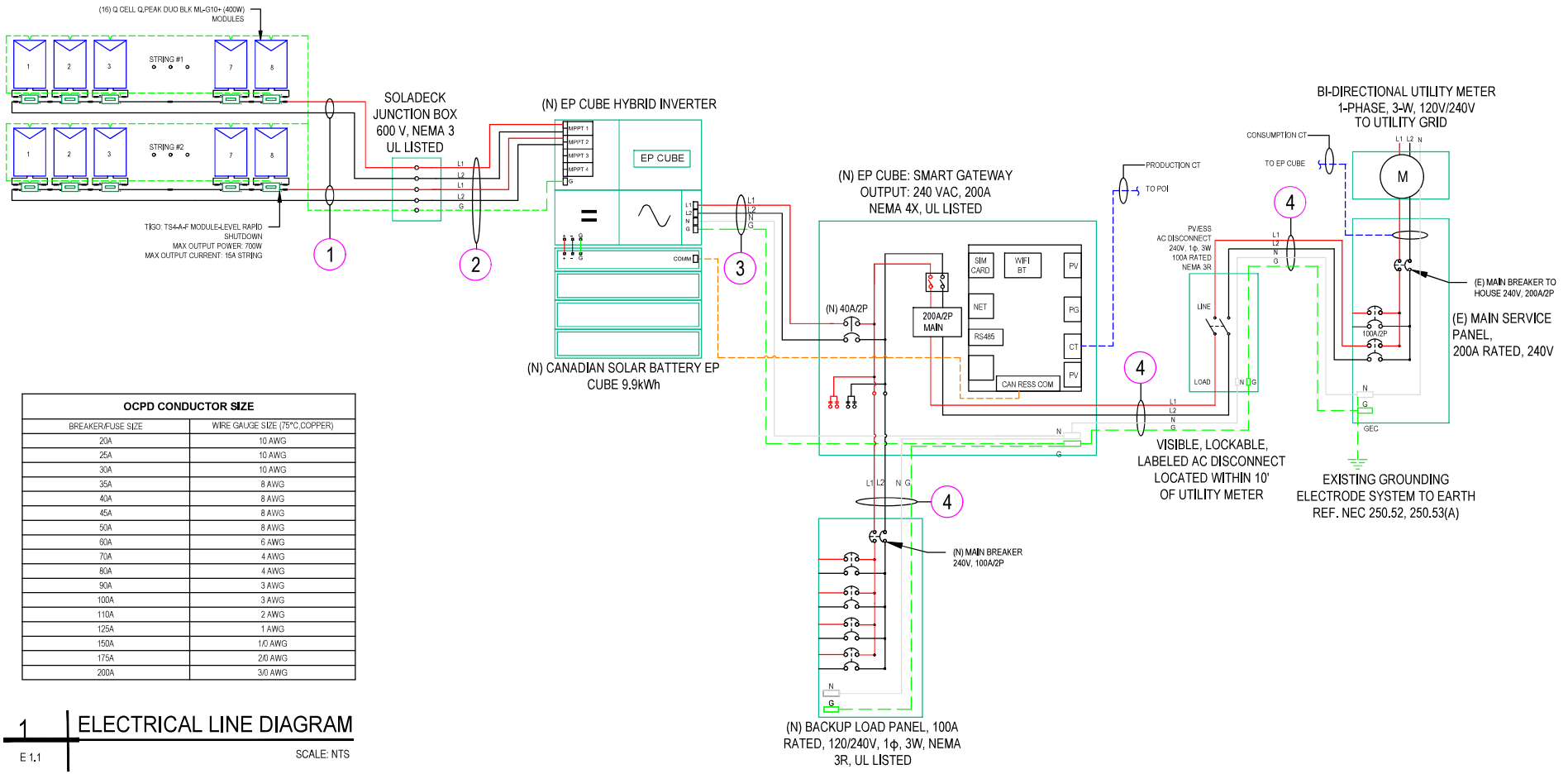
	QTY	CONDUCTOR INFORMATION		CONDUIT TYPE	CONDUIT SIZE
1	(4)	#10AWG -	PV WIRE/USE-2	N/A	N/A
	(1)	#6AWG -	BARE COPPER IN FREE AIR		
2	(4)	#10AWG -	THWN-2	EMT OR LFMC IN ATTIC	3/4"
	(1)	#8AWG -	THWN-2 GND		
3	(2)	#8AWG -	THWN-2	EMT,LFMC OR PVC	3/4"
	(1)	#8AWG -	THWN-2 N		
	(1)	#8AWG -	THWN-2 GND		
4	(2)	#3AWG -	THWN-2	EMT, LFMC OR PVC	1"
	(1)	#3AWG -	THWN-2 N		
	(1)	#8AWG -	THWN-2 GND		

INTERCONNECTION NOTES:
1. INTERCONNECTION SIZING, LIMITATIONS AND COMPLIANCE DETERMINED IN ACCORDANCE WITH [NEC 705.12], AND [NEC 690.59].
2. GROUND FAULT PROTECTION IN ACCORDANCE WITH [NEC 215.9], [NEC 230.95].
3. ALL EQUIPMENT TO BE RATED FOR BACKFEEDING.
4. PV BREAKER TO BE POSITIONED AT THE OPPOSITE END OF THE BUSBAR RELATIVE TO THE MAIN BREAKER.

DISCONNECT NOTES:
1. DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED THE CONDUCTORS REMAINING LIVE ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS)
2. AC DISCONNECT MUST BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE LOCKABLE, AND BE A VISIBLE-BREAK SWITCH
3. DISCONNECT MEANS AND THEIR LOCATION SHALL BE IN ACCORDANCE WITH [NEC 225.31] AND [NEC 225.32].

RACKING NOTE:
1. BOND EVERY OTHER RAIL WITH #6 BARE COPPER

GROUNDING & GENERAL NOTES:
1. PV GROUNDING ELECTRODE SYSTEM NEEDS TO BE INSTALLED IN ACCORDANCE WITH [NEC 690.43]
2. PV INVERTER IS UNGROUNDED, TRANSFORMER-LESS TYPE.
3. DC GEC AND AC EGC TO REMAIN UNSPLICED, OR SPLICED TO EXISTING ELECTRODE
4. ANY EXISTING WIRING INVOLVED WITH PV SYSTEM CONNECTION THAT IS FOUND TO BE INADEQUATE PER CODE SHALL BE CORRECTED PRIOR TO FINAL INSPECTION.
5. SOLADECK BOX QUANTITIES, AND PLACEMENT SUBJECT TO CHANGE IN THE FIELD - SOLADECK BOX DEPICTED ON ELECTRICAL DIAGRAM REPRESENT WIRE TYPE TRANSITIONS.
6. AC DISCONNECT NOTED IN EQUIPMENT SCHEDULE OPTIONAL IF OTHER AC DISCONNECTING MEANS IS LOCATED WITHIN 10' OF SERVICE DISCONNECT.
7. RACEWAYS AND CABLES EXPOSED TO SUNLIGHT ON ROOFTOPS SHOULD BE INSTALLED MORE THAN 7/8" ABOVE THE ROOF USING CONDUIT SUPPORTS.



OCPD CONDUCTOR SIZE	
BREAKER/FUSE SIZE	WIRE GAUGE SIZE (75°C,COPPER)
20A	10 AWG
25A	10 AWG
30A	10 AWG
35A	8 AWG
40A	8 AWG
45A	8 AWG
50A	8 AWG
60A	6 AWG
70A	4 AWG
80A	4 AWG
90A	3 AWG
100A	3 AWG
110A	2 AWG
125A	1 AWG
150A	1/0 AWG
175A	2/0 AWG
200A	3/0 AWG

1 ELECTRICAL LINE DIAGRAM
E 1.1
SCALE: NTS

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BETTER TOMORROW SOLAR
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Sheet Name
3-LINE DIAGRAM

Sheet Size
ANSI B
11" X 17"

Sheet Number
E 1.1

PV MODULE RATING @ STC	
MANUFACTURER	Q CELL Q.PEAK DUO BLK ML-G10+ (400W)
MAX. POWER-POINT CURRENT (IMP)	10.77 AMPS
MAX. POWER-POINT VOLTAGE (VMP)	37.13 VOLTS
OPEN-CIRCUIT VOLTAGE (VOC)	45.30 VOLTS
SHORT-CIRCUIT CURRENT (ISC)	11.14 AMPS
MAX. SERIES FUSE (OCPD)	20 AMPS
NOM. MAX. POWER AT STC (PMAX)	400 WATTS
MAX. SYSTEM VOLTAGE	1000V
VOC TEMPERATURE COEFFICIENT	-0.27* %/°C

Rooftop conductor ampacities designed in compliance with art. 690.8, Tables 310.15(B)(2)(a), 310.15(B)(3)(a), 310.15(B)(3)(c), 310.15(B)(16), Chapter 9 Table 4, 5, & 9. Location specific temperature obtained from ASHRAE 2017 data tables

RECORD LOW TEMP	-9°
AMBIENT TEMP (HIGH TEMP 2%)	36°
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	58°
CONDUCTOR TEMPERATURE RATE	90°

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	EP CUBE HYBRID INVERTER
AC POWER(PV+ BATTERY)	7.600 KW
NOMINAL OUTPUT VOLTAGE	240 VAC
NOMINAL OUTPUT CURRENT(FULL SUN)	31.6A
NOMINAL OUTPUT CURRENT(NO SUN)	20.6A

PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN CONDUIT
.80	4-6
.70	7-9
.50	10-20

DC FEEDER CALCULATIONS

CIRCUIT ORIGIN	CIRCIUT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT SIZE	CONDUIT FILL (%)
STRING 1	JUNCTION BOX	600	15.00	18.75	20	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	36	2	40	0.91	1	36.4	PASS	38	1.24	0.236	N/A	#N/A
STRING 2	JUNCTION BOX	600	15.00	18.75	20	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	36	2	40	0.91	1	36.4	PASS	37	1.24	0.229	N/A	#N/A
JUNCTION BOX	INVERTER	600	15.00	18.75	20	CU #8 AWG	CU #10 AWG	35	PASS	36	6	40	0.91	0.8	29.12	PASS	50	1.24	0.310	3/4" EMT	30.61914
																		String 1 Voltage Drop	0.546		
																		String 2 Voltage Drop	0.539		

AC FEEDER CALCULATIONS

CIRCUIT ORIGIN	CIRCIUT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	NEUTRAL SIZE	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT SIZE	CONDUIT FILL (%)
INVERTER	GATEWAY	240	31.6	39.5	40	CU #8 AWG	CU #8 AWG	CU #8 AWG	50	PASS	36	2	55	0.91	1	50.05	PASS	5	0.778	0.102	3/4" EMT	27.4672
GATEWAY	BACKUP LOAD PANEL	240	100	100	100	CU #3 AWG	CU #8 AWG	CU #3 AWG	100	PASS	36	2	115	0.91	1	104.65	PASS	5	0.245	0.102	1" EMT	38.0208
BACKUP LOAD PANEL	AC DISCONNECT	240	100	100	100	CU #3 AWG	CU #8 AWG	CU #3 AWG	100	PASS	36	2	115	0.91	1	104.65	PASS	5	0.245	0.102	1" EMT	38.0208
AC DISCONNECT	MSP	240	100	100	100	CU #3 AWG	CU #8 AWG	CU #3 AWG	100	PASS	36	2	115	0.91	1	104.65	PASS	19	0.245	0.388	1" EMT	38.0208
																		CUMULATIVE VOLTAGE		0.695		

ELECTRICAL NOTES

1. ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
2. ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
3. WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
4. WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
5. DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
6. WHERE SIZES OF SOLADECK BOX, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
7. ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
8. MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
9. MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
10. TEMPERATURE RATINGS OF ALL CONDUCTORS, TERMINATIONS, BREAKERS, OR OTHER DEVICES ASSOCIATED WITH THE SOLAR PV SYSTEM SHALL BE RATED FOR AT LEAST 75 DEGREE C.
11. CONDUIT INSTALLED AT MINIMUM DISTANCE OF 7/8 INCHES ABOVE ROOF .....NEC 310.15(B)(3)(C)

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Sheet Name
WIRE CALCS

Sheet Size
ANSI B
11" X 17"

Sheet Number
E 1.2

WARNING
SOLAR SYSTEM CONNECTED AND ENERGISED

LABEL 6
AT UTILITY METER [NEC 690.13(B)]

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL LOCATION:
UTILITY SERVICE ENTRANCE/METER, INVERTER/DC DISCONNECT IF REQUIRED BY LOCAL AHJ, OR OTHER LOCATIONS AS REQUIRED BY LOCAL AHJ.
PER CODE(S): NEC 2020: 690.56(C)(2)

WARNING
POWER SOURCE OUTPUT CONNECTION
DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL LOCATION:
ADJACENT TO PV BREAKER AND ESS OCPD (IF APPLICABLE).
PER CODE(S): NEC 2020: 705.12(B)(3)(2)

PHOTOVOLTIC AC DISCONNECT
RATED AC OUTPUT CURRENT: 31.60A
NOMINAL OPERATING AC VOLTAGE: 240V

NEC 690.54

MAXIMUM DC VOLTAGE
OF PV SYSTEM

PER CODE(S): NEC 690.53

WARNING
THIS EQUIPMENT FED BY MULTIPLE SOURCES. TOTAL RATING OF ALL OVERCURRENT DEVICES EXCLUDING MAIN POWER SUPPLY SHALL NOT EXCEED AMPACITY OF BUSBAAR

WARNING DAUL POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL 8
POINT OF INTERCONNECTION
(PER NEC 705.12(D)(3) & NEC 690.59)
NET METER, PRODUCTION METER
(PER AHJ, UTILITY OPERATIONS)

WARNING
ELECTRICAL SHOCK HAZARD
TERMINALS ON LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

LABEL LOCATION:
INVERTER(S), AC DISCONNECT(S), AC COMBINER PANEL (IF APPLICABLE).
PER CODE(S): NEC 2020: 690.13(B)

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL LOCATION:
INTERIOR AND EXTERIOR DC CONDUIT EVERY 10 FT, AT EACH TURN, ABOVE AND BELOW PENETRATIONS, ON EVERY JB/PULL BOX CONTAINING DC CIRCUITS.
PER CODE(S): NEC 2020: 690.31(D)(2)

CAUTION: MULTIPLE POWER SOURCES

PER CODE(S): NEC 2020 690.56(B), NEC 2020 705.10

WARNING
THE DISCONNECTION OF THE GROUNDED CONDUCTOR(S) MAY RESULT IN OVERVOLTAGE ON THE EQUIPMENT

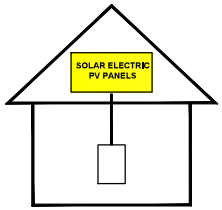
NEC 690.31 (E)

6"

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

3.5"

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



LABEL LOCATION:
ON OR NO MORE THAT 1 M (3 FT) FROM THE SERVICE DISCONNECTING MEANS TO WHICH THE PV SYSTEMS ARE CONNECTED.
PER CODE(S): NEC 2020: 690.56(C), NEC 2020: 690.56(C)(1)(a)

WARNING
TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANNEL

LABEL 8
AT MAIN SERVICE DISCONNECT [NEC 110.27(C)]

CAUTION: BATTERY AC INVERTER POWER SOURCE

LABEL LOCATION:
ON HYBRID INVERTER CONDUIT & RACEWAYS EVERY 10 FEET
CODE REF: NEC 690.31(G)(3)

PV & BATTERY INVERTER AC DISCONNECT LOCATED INSIDE EP CUBE SMART GATEWAY MAXIMUM VOLTAGE – 240VAC MAXIMUM CURRENT – 32A AC

LABEL LOCATION:
EP CUBE SMART GATEWAY COVER
CODE REF: NEC 706.15(C) & 690.54

ESS & PV REMOTE DISCONNECT & RAPID POWER SHUTDOWN

LABEL LOCATION:
EMERGENGY STOP BUTTON

BATTERY SYSTEM FUSE
LOCATED INSIDE HYBRID INVERTER COVER
DO NOT DISCONNECT OR OPEN UNDER LOAD
MAXIMUM VOLTAGE – 263VDC
MAXIMUM CURRENT – 55A DC

LABEL LOCATION:
RIGHT SIDE OF EP CUBE HYBRID INVERTER

PV SYSTEM RAPID SHUTDOWN SWITCH DC DISCONNECT LOCATED INSIDE EP CUBE HYBRID INVERTER COVER

LABEL LOCATION:
LEFT SIDE OF EP CUBE HYBRID INVERTER COVER

PHOTOVOLTAIC SYSTEM DC DISCONNECT
OPERATING VOLTAGE – 445VDC
OPERATING CURRENT – 12.84A DC
MAXIMUM SYSTEM VOLTAGE – 579VDC
MAXIMUM SHORT CIRCUIT CURRENT – 13.6A DC

LABEL LOCATION:
PV SYSTEM DC DISCONNECT ON HYBRID INVERTER
CODE REF: 690.59

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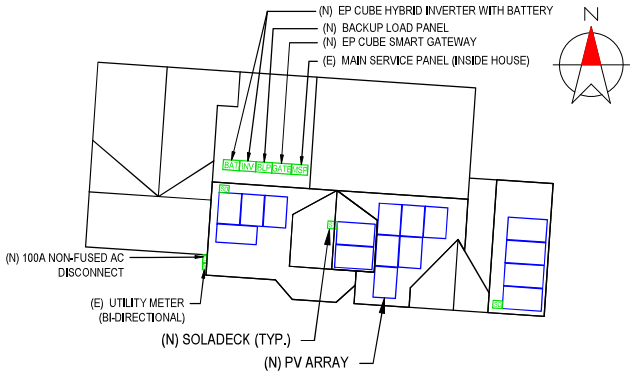
Sheet Name
PLACARDS

Sheet Size
ANSI B
11" X 17"

Sheet Number
E 1.3

CAUTION:

MULTIPLE SOURCES OF POWER



1722 COVENTRY RDDECATUR GA, 30030, USA

DIRECTORY

PERMANENT PLAQUE OR DIRECTORY PROVIDING THE LOCATION OF THE SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC SYSTEM.

(ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS OUTLINED WITHIN: NEC 690.56(A)(B), NEC 705.10)

LABELING NOTES:

1. LABELS CALLED OUT ACCORDING TO ALL COMMON CONFIGURATIONS. ELECTRICIAN TO DETERMINE EXACT REQUIREMENTS IN THE FIELD PER CURRENT NEC AND LOCAL CODES AND MAKE APPROPRIATE ADJUSTMENTS.
2. LABELING REQUIREMENTS BASED ON THE 2020 NATIONAL ELECTRIC CODE, OSHA STANDARD 19010.145(f)(7), ANSI Z535.4-2011
3. MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
4. LABELS TO BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED [NEC 110.21(B)(1)]
5. LABELS TO BE A MINIMUM LETTER HEIGHT OF 3/8", WHITE ON RED BACKGROUND; REFLECTIVE, AND PERMANENTLY AFFIXED [IFC 605.11.1.3]

BETTER TOMORROW SOLAR
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Sheet Name

PLACARDS

Sheet Size

ANSI B
11" X 17"

Sheet Number

E 1.4

powered by Q.ANTUM DUO Z

Q.PEAK DUO BLK ML-G10+

385-405

ENDURING HIGH PERFORMANCE

TÜVRheinland CERTIFIED — Quality Controlled PV — www.tuv.com ID 111/222615

ASSEMBLED IN THE USA

25 YR Warranty — Product & Performance

EUPD RESEARCH TOP BRAND PV MODULES EUROPE 2021

Q CELLS — Yield Security

5 BUSBAR CELL TECHNOLOGY

12 BUSBAR CELL TECHNOLOGY

BREAKING THE 20% EFFICIENCY BARRIER
Q.ANTUM DUO Z Technology with zero gap cell layout boosts module efficiency up to 20.9%.

THE MOST THOROUGH TESTING PROGRAMME IN THE INDUSTRY
Q CELLS is the first solar module manufacturer to pass the most comprehensive quality programme in the industry: The new "Quality Controlled PV" of the independent certification institute TÜV Rheinland.

INNOVATIVE ALL-WEATHER TECHNOLOGY
Optimal yields, whatever the weather with excellent low-light and temperature behavior.

ENDURING HIGH PERFORMANCE
Long-term yield security with Anti LID Technology, Anti PID Technology[1], Hot-Spot Protect and Traceable Quality Tra.Q™.

EXTREME WEATHER RATING
High-tech aluminum alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa).

A RELIABLE INVESTMENT
Inclusive 25-year product warranty and 25-year linear performance warranty[2].

[1] APT test conditions according to IEC/TS 62804-1:2015, method A (-1500 V, 96 h)
[2] See data sheet on rear for further information.

THE IDEAL SOLUTION FOR:

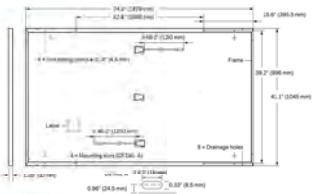
Rooftop arrays on residential buildings

Engineered in Germany

Q CELLS

MECHANICAL SPECIFICATION

Format	74.0 in × 41.1 in × 1.26 in (including frame) (1879 mm × 1045 mm × 32 mm)
Weight	48.5 lbs (22.0 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6 × 22 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; (+) ≥ 49.2 in (1250 mm), (-) ≥ 49.2 in (1250 mm)
Connector	Stäubli MC4; IP68

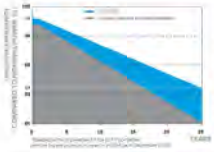


ELECTRICAL CHARACTERISTICS

POWER CLASS			385	390	395	400	405
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W / -0 W)							
Minimum	Power at MPP[2]	P_{MPP} [W]	385	390	395	400	405
	Short Circuit Current[2]	I_{SC} [A]	11.04	11.07	11.10	11.14	11.17
	Open Circuit Voltage[2]	V_{OC} [V]	45.19	45.23	45.27	45.30	45.34
	Current at MPP	I_{MPP} [A]	10.59	10.65	10.71	10.77	10.83
	Voltage at MPP	V_{MPP} [V]	36.36	36.62	36.88	37.13	37.39
	Efficiency[3]	η [%]	≥19.6	≥19.9	≥20.1	≥20.4	≥20.6
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[1]							
Minimum	Power at MPP	P_{MPP} [W]	288.6	292.6	296.3	300.1	303.8
	Short Circuit Current	I_{SC} [A]	8.90	8.92	8.95	8.97	9.00
	Open Circuit Voltage	V_{OC} [V]	42.62	42.65	42.69	42.72	42.76
	Current at MPP	I_{MPP} [A]	8.36	8.41	8.46	8.51	8.57
	Voltage at MPP	V_{MPP} [V]	34.59	34.81	35.03	35.25	35.46

[1] Measurement tolerances P_{MPP} ±3 %; I_{SC}; V_{OC} ±5 % at STC: 1000 W/m², 25 ± 2 °C, AM 1.5 according to IEC 60904-3 • 800 W/m², NMOT, spectrum AM 1.5

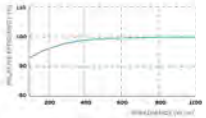
Q CELLS PERFORMANCE WARRANTY



At least 98 % of nominal power during first year. Thereafter max. 0.5 % degradation per year. At least 93.5 % of nominal power up to 10 years. At least 86 % of nominal power up to 25 years.

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

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]	1000 (IEC) / 1000 (UL)	PV module classification	Class II
Maximum Series Fuse Rating	[A DC]	20	Fire Rating based on ANSI / UL 61730	TYPE 2
Max. Design Load, Push / Pull[4]	[lbs/ft²]	75 (3600 Pa) / 55 (2660 Pa)	Permitted Module Temperature on Continuous Duty	−40 °F up to +185 °F (−40 °C up to +85 °C)
Max. Test Load, Push / Pull[4]	[lbs/ft²]	113 (5400 Pa) / 84 (4000 Pa)		

[3] See Installation Manual

QUALIFICATIONS AND CERTIFICATES

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

PACKAGING INFORMATION

Horizontal packaging	76.4 in 1940 mm	43.3 in 1100 mm	48.0 in 1220 mm	165 lbs 75 kg	24 pallets	24 pallets	32 modules

Note: Installation instructions must be followed. See the installation and operating manual or contact our technical service department for further information on approved installation and use 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 inquiry@us.q-cells.com | WEB www.q-cells.us

Better Tomorrow Solar

BETTER TOMORROW SOLAR
1074 Memorial Dr SE, Atlanta, GA 30316

CONTRACTOR

REVISIONS

Description	Date	Rev
Initial Design	10-02-2024	
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Signature with Seal

Project Name & Address

MARION CARTER RESIDENCE
1722 COVENTRY RD
DECATUR GA 30030, USA
APN #: 1800405024

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EQUIPMENT SPECIFICATION

Sheet Size
ANSI B
11" X 17"

Sheet Number
D 1.1

TS4-A-F

Module-level rapid shutdown

The TS4-A-F (Fire Safety) is the advanced add-on rapid shutdown solution that brings smart module functionality to standard PV modules for higher reliability. Ensure safety by upgrading existing PV systems or by adding safety features to new installations.

The TS4-A-F complies with NEC 2017, 2020, and 2023 690.12 Rapid Shutdown specifications when installed with the Tigo RSS Transmitter or an inverter with a built-in Tigo certified transmitter.

Features

- High input current rating – now rated for 20 A I_{MP}/25 A I_{SC} to better accommodate bifacial and high-current modules
- Simple, fast installation – snaps to a standard PV module frame or mounts to racking
- Power-line communications (PLC) signaling – rapid shutdown signaling over PV conductors
- Automatic shutdown – PV array enters rapid shutdown mode in the event of AC grid loss
- UL Standards-certified – tested and certified with hundreds of top inverter models
- 25-year warranty

Specifications

	20 A	25 A
Electrical		
Maximum current (I_{MP}/I_{SC})	15 A/20 A	20 A/25 A
Input voltage range (V_{MP})	16 – 80 V	
Maximum input voltage	80 V	
Maximum system voltage (V_{MAX})	1000 V/1500 V*	
Maximum output current (I_{MAX})	15 A	
Maximum output power (P_{MAX})	700 W	
Maximum fuse rating	25 A	30 A
Maximum efficiency	99.9%	
Rapid Shutdown		
TS4 conductor AWG	12	
Rapid shutdown time limit	<30 sec.	
PVRSE-controlled conductor limits	≤240 VA, ≤8 A, ≤30 V_{DC}	
UL 1741-compliant PVRSE	Yes	
Communications	PLC	
Connections		
Input (from module) cable lengths	0.12/0.62 m	
Output (to string) cable lengths	1.2/2 m	
Connectors	MC4/EVO2	

* Depending on UL/IEC certification

tigoenergy.com

Specifications

	20 A	25 A
Environmental		
Operating temperature range	-40 – 85 °C (-40 – 185 °F)	
Storage temperature range	-40 – 85 °C (-40 – 185 °F)	
Maximum elevation	3000 m (9840 ft.)	
Outdoor IP rating	IP68/NEMA 3R	
Mechanical		
Dimensions (H/W/D)	139.7 x 138.4 x 22.9 mm (5.4 x 5.5 x 0.9 in.)	
Weight	490 g (1.1 lb.)	
General		
Standards compliance	UL 1741 PVSRE, UL 1741 PVRSS, CSA 22.2, IEC 62109, NEC 690.12	
Warranty	25 years	

* 20 A UL rating: -30 – 75 °C (-22 – 167 °F)

More Resources

Home | Help Center | Downloads

Ordering Information

Part Number	V_{MAX} Certifications UL/IEC	Cable Lengths	Connectors
20 A I_{SC}			
481-00252-20	1500 V/1000 V	1.2/2 m	MC4
481-00252-32	1500 V/1000 V	0.12/1.2 m	MC4
481-00252-62	1500 V/1000 V	0.62/1.2 m	MC4
481-00261-32	1500 V/1500 V	0.12/1.2 m	EVO2
481-00261-62	1500 V/1500 V	0.62/1.2 m	EVO2
481-01252-32	1500 V/1000 V	0.12/1.2 m	MC4
481-01252-62	1500 V/1000 V	0.62/1.2 m	MC4
481-01261-32	1500 V/1500 V	0.12/1.2 m	EVO2
481-01261-62	1500 V/1500 V	0.62/1.2 m	EVO2
25 A I_{SC}			
486-00252-32	1500 V/1000 V	0.12/1.2 m	MC4
486-00252-62	1500 V/1000 V	0.62/1.2 m	MC4
486-00261-32	1500 V/1500 V	0.12/1.2 m	EVO2
486-00261-62	1500 V/1500 V	0.62/1.2 m	EVO2
488-00252-32	1000 V*	0.12/1.2 m	MC4
488-00252-62	1000 V*	0.62/1.2 m	MC4
488-00261-32	1500 V*	0.12/1.2 m	EVO2
488-00261-62	1500 V*	0.62/1.2 m	EVO2

* IEC certified only

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CanadianSolar

EP CUBE

EP CUBE HYBRID INVERTER + BATTERIES

Hybrid NA510G | Hybrid NA611G | Hybrid NA716G | Hybrid NA720G

EP Cube system				
Hybrid inverter	1			
Battery module	3	4	5	6
Base	1			
Hybrid inverter				
MPPTs	4			
Input current	I_{DC} 16A / I_{sc} 20A per MPPT			
PV maximum input voltage	$600V_{DC}$			
MPPT operating voltage	$90V_{DC}$ - $550V_{DC}$			
Allowable DC-AC ratio	2			
Nominal grid voltage	$240V_{AC}$			
Frequency	60Hz			
Maximum AC output, on-grid	7.6 kW			
Maximum inverter CEC efficiency	93.93%			
Imbalance for split-phase loads	100% (maximum 3.8kW for each phase			
Energy storage				
Total energy	9.9 kWh	13.3 kWh	16.6 kWh	19.9 kWh
AC output, PV + battery				
Full Sun, off-grid	7.6 kW, 31.6A (Continuous) 22 kVA (10s)			
AC output, battery only				
No Sun, off-grid	5 kW, 20.8A (Continuous) 7.6 kVA (10s)	6.5 kW, 27.0A (Continuous) 9.7 kVA (10s)	7.6 kW, 31.6A (Continuous) 11.4 kVA (10s)	7.6 kW, 31.6A (Continuous) 11.4 kVA (10s)
Safety & compliance				
Protections	Integrated arc fault circuit interrupter (AFCI), PV RSD *			
Certifications	UL 1699B, UL 1741-SB, IEEE 1547, IEEE 1547.1, IEEE 2030.5, UL 1998, UL 1642, UL 1973, UL 9540, UL 9540A, UN 38.3, UL 60730-1 ANNEX H, FCC Part 15 (Class B), IEEE 693-2005 (high),			
Listing	CEC, HECO			
General parameters				
Enclosure	NEMA 4X			
Noise	< 50dB @ 1m, front side			
Dimensions	23.62" x 48.03" x 9.25" 600 x 1220 x 235 mm	23.62" x 56.50" x 9.25" 600 x 1435 x 235 mm	23.62" x 64.96" x 9.25" 600 x 1650 x 235 mm	23.62" x 73.43" x 9.25" 600 x 1865 x 235 mm
System weight	286.6 lbs / 130 kg	352.7 lbs / 160 kg	418.9 lbs / 190 kg	485 lbs / 220 kg
Battery module weight	70lbs / 32kg			
Inverter weight	77lbs / 35kg			
Base weight	5.5lbs / 2.5kg			
Mounting options	Floor or wall mount			
Max. elevation	9,843 ft / 3,000 m			
Ambient operating temperature	14°F to 122°F / -10°C to 50°C **			
Recommended operating temperature	32°F to 86°F / 0°C to 30°C			
Limited warranty				
System warranty	> 80% capacity, up to 10 years or 6,000 cycles ***			

Notes

* PVRSD support Tigo and APSmart transmitter

** Performance may be de-rated in extreme operating temperatures.

*** Battery capacity warranty up to 10 years or 6,000 cycles (whichever occurs first)

EP CUBE SMART GATEWAY

Smart Gateway

Grid and load	
Nominal grid voltage	$120 / 240V_{AC}$
Frequency	60 Hz
Max current	200A
Short circuit current protection	10 kA
Microgrid interconnection	
Rated current	200A
Switchover time (on-grid / off-grid)	Seamless
EP Cube hybrid interface *	
Output voltage	$120 / 240V_{AC}$
Overcurrent protection	40A
AC extend interface **	
Output voltage	$120 / 240V_{AC}$
Max current	100A
Generator control request	Yes
Generator start type	2-wire start (IO)
EV Charger communication (optional)	RS-485
Communication	
Internet connection	Wifi, Cellular (LTE, 4G)
User interface	EP Cube APP (Android & IOS)
Safety & compliance	
Certifications	UL1741, ICES-003 (Class B) FCC Part 15 (Class B), FCC ID IEEE 693-2005 (high)
General parameters	
Enclosure	NEMA 4X
Noise	< 50dB
Dimensions	23.62" x 23.62" x 7.09" 600 x 600 x 180 mm
Weight	44.1 lbs 20 kg
Mounting options	Wall mount
Max. elevation	9,843 ft / 3,000 m
Ambient operating temperature	-40 °F to 122 °F / -40 °C to 50 °C
Limited warranty	
System warranty	10 years

Notes

* The Smart Gateway EP Cube interface includes one EP Cube hybrid connection.

** The Smart Gateway includes two AC extend interface hardware.

Contact: CSI SOLAR (USA) CO., LTD. Add: 1350 Treat Blvd. Suite 500, Walnut Creek, CA 94597, USA Tel: +1 800 761 2990 E-mail: service.epcube@csisolar.com

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Tech Brief

IRONRIDGE

XR Rail Family

Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.

Force-Stabilizing Curve

Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

Compatible with Flat & Pitched Roofs

XR Rails are compatible with FlashFoot and other pitched roof attachments.

IronRidge offers a range of tilt leg options for flat roof mounting applications.

Corrosion-Resistant Materials

All XR Rails are made of marine-grade aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

Datasheet

XR Rails

XR10 Rail

A low-profile mounting rail for regions with light snow.

- 6' spanning capability
- Moderate load capability
- Clear & black anod. finish

XR100 Rail

The ultimate residential solar mounting rail.

- 8' spanning capability
- Heavy load capability
- Clear & black anod. finish

XR1000 Rail

A heavyweight mounting rail for commercial projects.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish

Internal Splices

All rails use internal splices for seamless connections.

- Self-tapping screws
- Varying versions for rails
- Grounding Straps offered

Attachments

FlashFoot

Anchor, flash, and mount with all-in-one attachments.

- Ships with all hardware
- IBC & IRC compliant
- Certified with XR Rails

Slotted L-Feet

Drop-in design for rapid rail attachment.

- High-friction serrated face
- Heavy-duty profile shape
- Clear & black anod. finish

Standoffs

Raise flush or tilted systems to various heights.

- Works with vent flashing
- Ships pre-assembled
- 4" and 7" Lengths

Tilt Legs

Tilt assembly to desired angle, up to 45 degrees.

- Attaches directly to rail
- Ships with all hardware
- Fixed and adjustable

Clamps & Grounding

End Clamps

Slide in clamps and secure modules at ends of rails.

- Mill finish & black anod.
- Sizes from 1.22" to 2.3"
- Optional Under Clamps

Grounding Mid Clamps

Attach and ground modules in the middle of the rail.

- Parallel bonding T-bolt
- Reusable up to 10 times
- Mill & black stainless

T-Bolt Grounding Lugs

Ground system using the rail's top slot.

- Easy top-slot mounting
- Eliminates pre-drilling
- Swivels in any direction

Accessories

Provide a finished and organized look for rails.

- Snap-in Wire Clips
- Perfected End Caps
- UV-protected polymer

Free Resources

Design Assistant

Go from rough layout to fully engineered system. For free.

Go to IronRidge.com/rm

NABCEP Certified Training

Earn free continuing education credits, while learning more about our systems.

Go to IronRidge.com/training

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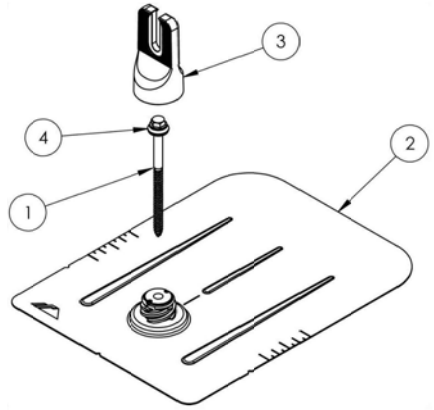
Sheet Size
ANSI B
11" X 17"

Sheet Number
D 1.4

Cut Sheet

IRONRIDGE

FlashFoot2

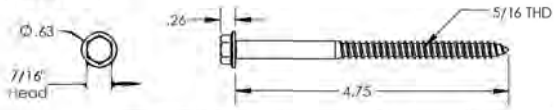


ITEM NO.	DESCRIPTION
1	BOLT LAG 5/16 X 4.75"
2	ASSY, FLASHING
3	ASSY, CAP
4	WASHER, EPDM BACKED

FLASHFOOT 2

Part Number	Description
FF2-01-M1	FLASHFOOT2, MILL
FF2-01-B1	FLASHFOOT2, BLACK

1) Bolt, Lag 5/16 x 4.75

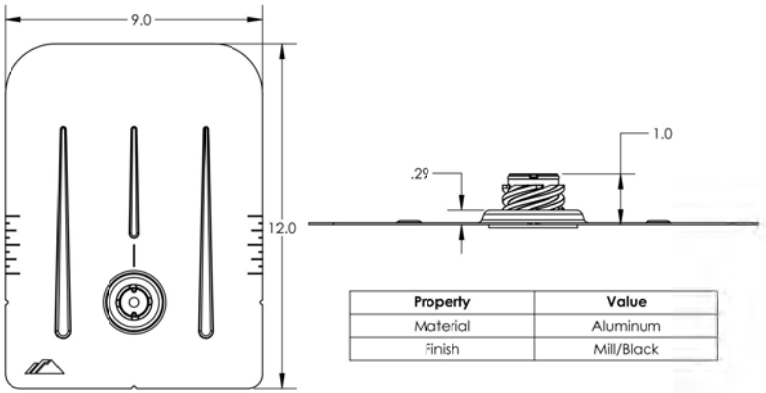


Property	Value
Material	300 Series Stainless Steel
Finish	Clear

v1.21

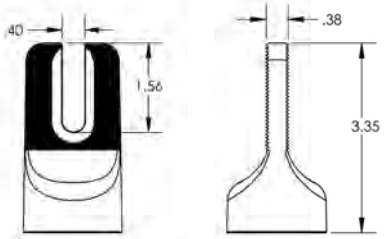
Cut Sheet

2) Assy, Flashing



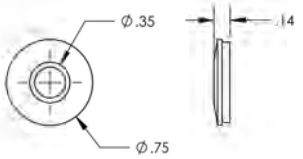
Property	Value
Material	Aluminum
Finish	Mill/Black

3) Assy, Cap



Property	Value
Material	Aluminum
Finish	Mill/Black

4) Washer, EPDM Backed



Property	Value
Material	300 Series Stainless Steel
Finish	Clear

v1.21

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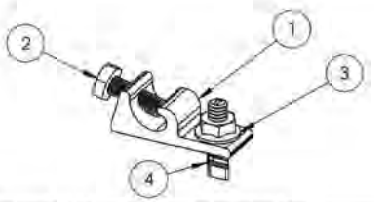
Cut Sheet

IRONRIDGE

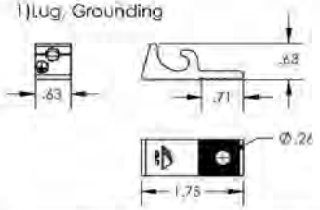
Grounding Lug



ITEM NO.	DESCRIPTION
1	LUG, GROUNDING, LAY-IN - LOW PROFILE
2	BOLT, 1/4-28 X .750" HEX CS SST
3	NUT, FLANGE HEX 1/4-20 SST
4	BOLT, T CSTM 1/4-20 X 1.188" LOCK SS

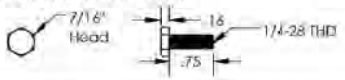
Part Number	Description	Wire Size Range (AWG)
XR-LUG-03-A1	GROUNDING LUG, LOW PROFILE	4-10

1) Lug, Grounding



Property	Value
Material	Tin Plated Copper
Finish	Clear Matte

2) Bolt, 1/4-28 x .750 Hex

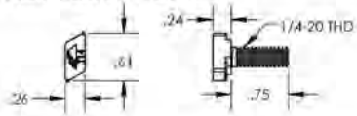


Property	Value
Material	300 Series Stainless Steel
Finish	Clear

3) Nut, Flange Hex 1/4-20

Property	Value
Material	300 Series Stainless Steel
Finish	Clear

4) Bolt, T CSTM 1/4-20 x .750



Property	Value
Material	300 Series Stainless Steel
Finish	Clear

v1.10

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Intertek

25800 Commercentre Drive
Lake Forest, CA 92630 USA

Telephone: 949.448.4100
Facsimile: 949.448.4111
www.intertek.com

Test Verification of Conformity

In the basis of the tests undertaken, the sample(s) of the below product have been found to comply with the requirements of the referenced specifications at the time the tests were carried out.

Applicant Name & Address:	IronRidge, Inc. 1495 Zephyr Ave. Hayward, CA 94544
Product Description:	XR Rails with Integrated Grounding.
Ratings & Principle Characteristics:	Fire Class Resistance Rating: - Class A for Steep Slope Flush-Mount (symmetrical) Applications when using Type 1 and Type 2, Listed Photovoltaic Module. - Class A for Low Slope Flush-Mount and Tilt-Mount (symmetrical and asymmetrical) Applications when using Type 1, Listed Photovoltaic Module.
Models:	51-61GD-005, 51-61GD-005B, 51-5000-001, and 51-65-001
Brand Name:	N/A
Relevant Standards:	UL Subject 2703 (Section 15.2 and 15.3) Outline of Investigation for Rack Mounting Systems and Clamping Devices for Flat-Plate Photovoltaic Modules and Panels, Issue Number: 2, Nov 13, 2012 **Referencing** UL1703 (Section 31.2) Standard for Safety for Flat-Plate Photovoltaic Modules and Panels, May 20, 2014
Verification Issuing Office:	Intertek Testing Services NA, Inc. 25800 Commercentre Dr. Lake Forest, CA 92630
Date of Tests:	08/27/2014 to 01/07/2015
Test Report Number(s):	101541132LAX-002

This verification is part of the full test report(s) and should be read in conjunction with them. This report does not automatically imply product certification.

Completed by:	Amar Kacel	**Reviewed by:**	Andrew Koretoff
Title:	PV Engineer	**Title:**	Reviewer
Signature:		**Signature:**	
Date:	01/26/2015	**Date:**	01/26/2015

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HARRIS


HARRIS

From: Warner McConaughey
To: Paige V. Jennings
Subject: Re: Questions Regarding COA Application - 1122 Springdale Road
Date: Thursday, November 14, 2024 9:09:21 AM

Double hung. The addition built about 20 years ago is essentially one large living room. The windows on the north facing wall are double hung windows. For some reason they installed two oversized glass block openings on the southside. We will be changing these out to match the other regular windows.

Please let me know if you need additional information.

W

Warner McConaughey
HammerSmith, Inc
807 Church Street
Decatur, Georgia 30030
404.886.0847 c 404.377.1021 o

www.hammersmith.net

Please like us on Facebook

we want to thank you for your trust and confidence as we celebrate
30 Years of Design-Build Excellence

On Thu, Nov 14, 2024 at 9:12 AM Paige V. Jennings <pvjennings@dekalbcountyga.gov> wrote:

> Good Morning,
>
> Hope that this email finds you well!
>
> We are finalizing our staff reviews for the upcoming HPC meeting on Monday, November 18th. Before finalizing our report on the application for 1122 Springdale Road. , could you please provide information for the following questions?
>
> 1. Will the windows be casement or double-hung windows?

Please provide all information that you can, as soon as possible. Our reports will be finalized no later than Friday afternoon and will be sent out along with the agenda for the meeting to applicants.

Thank You,

Paige

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GEORGIA

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