GENERAL NOTES

1.1.1 PROJECT NOTES:

1.1.2 THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 690, ALL MANUFACTURER'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION (AHJ).

1.1.3 THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION.

1.1.4 DC PV ARRAYS SHALL BE PROVIDED WITH DC GROUND-FAULT DETECTION AND INTERRUPTION (GFDI), COMPLYING WITH NEC 690.41 TO REDUCE FIRE HAZARDS.

1.1.5 ALL PV SYSTEM COMPONENTS; MODULES, UTILITY-INTERACTIVE INVERTERS, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEMS AS REQUIRED BY NEC 690.4(B):

PV MODULES: UL1703, IEC61730, AND IEC61215, AND NFPA 70 CLASS C FIRE RATING
INVERTERS: UL 1741, IEEE 1547
COMBINER BOX(ES): UL 1703 OR UL 1741 ACCESSORY

1.1.6 MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMPERATURE COEFFICIENT FOR VOC. IF UNAVAILABLE, MAX DC VOLTAGE CALCULATED ACCORDING TO NEC 690.7.

1.1.7 ALL INVERTERS, PHOTOVOLTAIC MODULES, PHOTOVOLTAIC PANELS, AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER NEC 690.4(D). SHALL BE INSTALLED ACCORDING TO INSTRUCTIONS FROM LISTING OR LABELING [NEC 110.3(B)].

1.1.8 ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH 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.

1.2.1 SCOPE OF WORK:

1.2.2 PRIME CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND SPECIFICATIONS OF THE GRID-TIED PHOTOVOLTAIC SYSTEM RETROFIT. PRIME CONTRACTOR WILL BE RESPONSIBLE FOR COLLECTING EXISTING ONSITE REQUIREMENTS TO DESIGN, SPECIFY, AND INSTALL THE EXTERIOR ROOF-MOUNTED PORTION OF THE PHOTOVOLTAIC SYSTEMS DETAILED IN THIS DOCUMENT.

1.3.1 **WORK INCLUDES:**

1.3.2 PV ROOF ATTACHMENTS - SUNMODO TOPTILE
1.3.3 PV RACKING SYSTEM INSTALLATION - IRONRIDGE XR-100
1.3.4 PV MODULE AND INVERTER INSTALLATION - HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430 / HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER
1.3.5 ESS INSTALL - (2) POWERWALL 3 EXPANSION (1807000-XX-Y), 13.5 kWh / (1) TESLA 1707000-XX-Y 13.5 kWh
1.3.6 PV EQUIPMENT GROUNDING
1.3.7 PV SYSTEM WIRING TO A ROOF-MOUNTED JUNCTION BOX
1.3.8 PV LOAD CENTERS (IF INCLUDED)
1.3.9 PV METERING/MONITORING (IF INCLUDED)
1.3.10 PV DISCONNECTS
1.3.11 PV GROUNDING ELECTRODE & BONDING TO (E) GEC
1.3.12 PV FINAL COMMISSIONING
1.3.13 (E) ELECTRICAL EQUIPMENT RETROFIT FOR PV
1.3.14 SIGNAGE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE

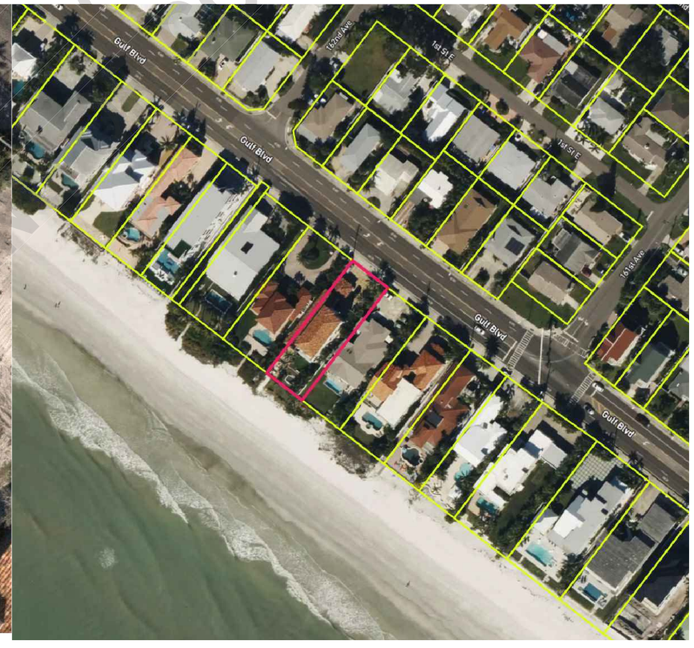
SCOPE OF WORK

SYSTEM SIZE:	STC: 103 x 430W = 44.29kW PTC: 103 X 235.4W = 24.246KW (103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430 (103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER (2) POWERWALL 3 EXPANSION (1807000-XX-Y), 13.5 kWh (1) TESLA 1707000-XX-Y 13.5 KWH (1) TESLA GATEWAY 3
ATTACHMENT TYPE:	SUNMODO TOPTILE
MSP UPGRADE:	NO

NEW PV SYSTEM: 44.290 kWp
NEW BESS SYSTEM: 40.5 kWh
XXXXXXXXXXXXX

XXX XXXXXXX,
XXXXXXXX, XX XXXXX
ASSESSOR'S #: XXXXXXXX

01 AERIAL PHOTO
NOT TO SCALE



02 VICINITY MAP
NOT TO SCALE

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
G-1	COVER SHEET
G-2	NOTES
A-1	SITE PLAN
A-2	PV ROOF PLAN
A-3	SOLAR ATTACHMENT PLAN
E-1	SINGLE LINE DIAGRAM
E-2	ELECTRICAL TABLES
E-3	LABELS
S-1	MOUNTING DETAILS
D-1	DATASHEET
D-2	DATASHEET
D-3	DATASHEET
D-4	DATASHEET
D-5	DATASHEET
D-6	DATASHEET

PROJECT INFORMATION

OWNER
NAME: XXXXXXXX
PROJECT MANAGER
NAME: XXXXXXXXXX
E-MAIL: XXXXXXXXXXXXX
CONTRACTOR
NAME: XXXXXXXXXXX
PHONE: XXXXXXXXXXX
AUTHORITIES HAVING JURISDICTION
BUILDING: XXXXXXX
ZONING: XXXXXXX
UTILITY: XXXXXXX
DESIGN SPECIFICATIONS
OCCUPANCY: GROUP R-3
CONSTRUCTION: TYPE III
ZONING: RESIDENTIAL
GROUND SNOW LOAD: 3 PSF
WIND EXPOSURE: D
WIND SPEED: 147 MPH
APPLICABLE CODES & STANDARDS
BUILDING: FBC 2023/ASCE 7-22
ELECTRICAL: NEC 2020
FIRE: FFPC, 8TH ED. (2023)/NFPA 1 2021 ED

XXXXXXX

RESIDENTIAL GRID INTERACTIVE SOLAR AND ENERGY STORAGE INSTALLATION
XXX XXXXXXX, XXXXXXXX, XX XXXXX
APN: XXXXXXXX
PHONE:

LOGO

CONTRACTOR
XXXXXXXXX
ADDRESS: XXXXXXXXX, XXXXXXXXX,XX
XXXXX
PHONE: XXXXXXXXXX
LICENSE: XXXXXXXXX

COVER SHEET

SYSTEM AC SIZE @ STC: 35.947 kW SYSTEM DC SIZE @ STC: 44.290 kW BESS CAPACITY: 40.5 kWh
(103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430, (N) (1) TESLA 1707000-XX-Y 13.5 kWh
(103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER, (2) POWERWALL 3 EXPANSION (1807000-xx-y), 13.5 kWh

DRAWN BY: V.H. REV: DATE: 06.20.2026

PAGE: G-1

2.1.1 SITE NOTES:

2.1.2 A LADDER WILL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
2.1.3 THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A UTILITY INTERACTIVE SYSTEM WITH STORAGE BATTERIES.
2.1.4 THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING, MECHANICAL, OR BUILDING ROOF VENTS.
2.1.5 PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER NEC 110.26.
2.1.6 ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S INSTRUCTIONS SUCH THAT THE ROOF COVERING SERVES TO PROTECT THE BUILDING OR STRUCTURE.

2.2.1 EQUIPMENT LOCATIONS:

2.2.2 ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26.
2.2.3 WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED OPERATING TEMPERATURE AS SPECIFIED BY NEC 690.31(A), (C) AND NEC TABLE 310.16.
2.2.4 JUNCTION AND PULL BOXES PERMITTED TO BE INSTALLED UNDER PV MODULES ACCORDING TO NEC 690.34.
2.2.5 ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT WITHIN SIGHT OF THE AC SERVICING DISCONNECT PER NEC 690.15.
2.2.6 ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL ACCORDING TO APPLICABLE NEC CODES.
2.2.7 ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR USAGE WHEN APPROPRIATE.

2.3.1 STRUCTURAL NOTES:

2.3.2 RACKING SYSTEM & PV ARRAY WILL BE INSTALLED ACCORDING TO CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUST ALSO EXTEND A MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY, ACCORDING TO RAIL MANUFACTURER'S INSTRUCTIONS.
2.3.3 JUNCTION BOX WILL BE INSTALLED PER MANUFACTURERS' SPECIFICATIONS. IF ROOF-PENETRATING TYPE, IT SHALL BE FLASHED & SEALED PER LOCAL REQUIREMENTS.
2.3.4 ROOFTOP PENETRATIONS FOR PV RACEWAY WILL BE COMPLETED AND SEALED WITH APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED CONTRACTOR.
2.3.5 ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER.
2.3.6 WHEN POSSIBLE, ALL PV RELATED RACKING ATTACHMENTS WILL BE STAGGERED AMONGST THE ROOF FRAMING MEMBERS.

2.4.1 GROUNDING NOTES:

2.4.2 GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND GROUNDING DEVICES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH USE.
2.4.3 PV SYSTEMS REQUIRE AN EQUIPMENT GROUNDING CONDUCTOR. ALL METAL ELECTRICAL EQUIPMENT AND STRUCTURAL COMPONENTS BONDED TO GROUND, IN ACCORDANCE WITH NEC 250.134 OR 250.136(A). DC CONDUCTORS IN UNGROUNDED SYSTEMS MUST HAVE GFDI PER NEC 690.41.
2.4.4 PV EQUIPMENT SHALL BE GROUNDED ACCORDING TO NEC 690.43 AND EQUIPMENT GROUNDING CONDUCTORS SIZED PER NEC TABLE 250.122.
2.4.5 METAL PARTS OF MODULE FRAMES, MODULE RACKING, AND ENCLOSURES CONSIDERED GROUNDED IN ACCORDANCE WITH NEC 250.134 AND 250.136(A).
2.4.6 EACH MODULE WILL BE GROUNDED USING WEEB GROUNDING CLIPS AS SHOWN IN MANUFACTURER DOCUMENTATION AND APPROVED BY THE AHJ. IF WEEBS ARE NOT USED, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE SPECIFIED GROUNDING LUG HOLES PER THE MANUFACTURERS' INSTALLATION REQUIREMENTS.
2.4.7 THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT THE REMOVAL OF A MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO ANOTHER MODULE [NEC 690.43(D)].
2.4.8 GROUNDING AND BONDING CONDUCTORS, IF INSULATED, SHALL BE GREEN OR GREEN WITH YELLOW STRIPE(S). IF #4 AWG OR LARGER, SHALL BE GREEN, GREEN WITH YELLOW STRIPE(S), OR BARE [NEC 250.119].
2.4.9 THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 690.47 AND NEC 250.50 THROUGH 250.106. IF EXISTING SYSTEM IS INACCESSIBLE OR INADEQUATE, A GROUNDING ELECTRODE SYSTEM SHALL BE PROVIDED ACCORDING TO NEC 250.52 AND NEC 690.47.
2.4.10 DC PV ARRAYS SHALL BE PROVIDED WITH DC GROUND-FAULT DETECTION AND INTERRUPTION (GFDI), COMPLYING WITH NEC 690.41 TO REDUCE FIRE HAZARDS.

2.5.1 INTERCONNECTION NOTES:

2.5.2 LOAD-SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH NEC 705.12(B).
2.5.3 THE SUM OF 125 PERCENT OF THE POWER SOURCE(S) OUTPUT CIRCUIT CURRENT AND THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE BUSBAR SHALL NOT EXCEED 120 PERCENT OF THE AMPACITY OF THE BUSBAR. PV DEDICATED BACKFEED BREAKERS MUST BE LOCATED AT OPPOSITE END OF THE BUS FROM THE UTILITY SOURCE OCPD [NEC 705.12(B)(3)(2)].
2.5.4 AT MULTIPLE ELECTRIC POWER SOURCES OUTPUT COMBINER PANEL, TOTAL RATING OF ALL OVERCURRENT DEVICES SHALL NOT EXCEED AMPACITY OF BUSBAR PER NEC 705.12(B)(3)(3).
2.5.5 FEEDER TAP INTERCONNECTION (LOAD SIDE) ACCORDING TO NEC 705.12(B)(1), IF APPLICABLE.
2.5.6 SUPPLY-SIDE INTERCONNECTION ACCORDING TO NEC 705.11 WITH SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42.
2.5.7 BACKFEEDING BREAKER FOR ELECTRIC POWER SOURCES OUTPUT IS EXEMPT FROM ADDITIONAL FASTENING [NEC 705.12(B)(3)(5)].

2.6.1 DISCONNECTION AND OVER-CURRENT PROTECTION NOTES:

2.6.2 DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH IS OPENED, THE CONDUCTORS REMAINING ENERGIZED ARE CONNECTED TO THE TERMINALS MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS).
2.6.3 DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED PERSONNEL, BE LOCKABLE IN THE OPEN POSITION, AND BE A VISIBLE-BREAK SWITCH.
2.6.4 BOTH POSITIVE AND NEGATIVE PV CONDUCTORS ARE UNGROUNDED. THEREFORE BOTH MUST OPEN WHERE A DISCONNECT IS REQUIRED, ACCORDING TO NEC 690.13.
2.6.5 ISOLATING DEVICES OR EQUIPMENT DISCONNECTING MEANS SHALL BE INSTALLED IN CIRCUITS CONNECTED TO EQUIPMENT AT A LOCATION WITHIN THE EQUIPMENT, OR WITHIN SIGHT AND WITHIN 10 FT OF THE EQUIPMENT. AN EQUIPMENT DISCONNECTING MEANS SHALL BE PERMITTED TO BE REMOTE FROM THE EQUIPMENT WHERE THE EQUIPMENT DISCONNECTING MEANS CAN BE REMOTELY OPERATED FROM WITHIN 10 FT OF THE EQUIPMENT, ACCORDING TO NEC 690.15(A).
2.6.6 PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN (RSD) FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY RESPONDERS IN ACCORDANCE WITH NEC 690.12. MODULE-LEVEL SHUTDOWN (MLS) PER NEC 690.12(B)(2) IS REQUIRED DUE TO DC OPTIMIZERS.
2.6.7 ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690.9, NEC 705.30, AND NEC 240.
2.6.8 BOTH POSITIVE AND NEGATIVE PV CONDUCTORS ARE UNGROUNDED, THEREFORE BOTH REQUIRE OVER-CURRENT PROTECTION, ACCORDING TO NEC 240.21 (SEE EXCEPTION IN NEC 690.9).
2.6.9 ARC-FAULT CIRCUIT PROTECTION (AFCI) IS REQUIRED FOR ALL PV DC CIRCUITS OPERATING AT ≥80V ON OR IN A BUILDING, ACCORDING TO NEC 690.11 AND UL1699B.

2.7.1 WIRING & CONDUIT NOTES:

2.7.2 ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE REQUIREMENTS AND ARE NOT MEANT TO LIMIT UP-SIZING.
2.7.3 ALL DC CONDUCTORS SIZED ACCORDING TO NEC 690.8(A) (SOURCE/OUTPUT CIRCUIT) AND AMPACITY PER NEC 310.16.
2.7.4 EXPOSED PV SOURCE CIRCUITS AND OUTPUT CIRCUITS SHALL USE WIRE LISTED AND IDENTIFIED AS PHOTOVOLTAIC (PV) WIRE [NEC 690.31(C)]. PV MODULES WIRE LEADS SHALL BE LISTED FOR USE ON PV ARRAYS, ACCORDING TO NEC 690.31(A).
2.7.5 MODULE WIRING SHALL BE LOCATED AND SECURED UNDER THE ARRAY.
2.7.6 ACCORDING TO NEC 690.31(B)(2), UNGROUNDED SYSTEMS DC CONDUCTORS COLORED OR MARKED AS FOLLOWS:
DC POSITIVE - RED, OR OTHER COLOR EXCLUDING WHITE, GRAY AND GREEN
DC NEGATIVE - BLACK, OR OTHER COLOR EXCLUDING WHITE, GRAY AND GREEN
2.7.7 AC CONDUCTORS COLORED OR MARKED AS FOLLOWS:
PHASE A OR L1 - BLACK
PHASE B OR L2 - RED, OR OTHER CONVENTION IF THREE PHASE
PHASE C OR L3 - BLUE, YELLOW, OR OTHER CONVENTION
NEUTRAL - WHITE OR GRAY
IN 4-WIRE DELTA CONNECTED SYSTEMS THE PHASE WITH HIGHER VOLTAGE TO GROUND SHALL BE IDENTIFIED BY ORANGE OUTER FINISH OR OTHER EFFECTIVE MEANS [NEC 110.15].

2.8.1 ENERGY STORAGE SYSTEMS (ESS) NOTES:

2.8.2 NEC 706.5: ENERGY STORAGE SYSTEMS SHALL BE LISTED.
2.8.3 NEC 706.6: MULTIPLE ESS UNITS SHALL BE PERMITTED TO BE INSTALLED IN OR ON A BUILDING OR STRUCTURE.
2.8.4 NEC 706.9: THE MAXIMUM VOLTAGE OF AN ESS SHALL MATCH THE RATED INPUT AND OUTPUT VOLTAGES INDICATED ON THE ESS NAMEPLATE.
2.8.5 NEC 706.15(A): A DISCONNECTING MEANS SHALL BE PROVIDED FOR ALL UNGROUNDED CONDUCTORS DERIVED FROM AN ESS AND MAY BE INTEGRAL TO LISTED ESS EQUIPMENT. THE DISCONNECT SHALL BE READILY ACCESSIBLE, LOCATED WITHIN SIGHT OF THE ESS OR AS CLOSE AS PRACTICABLE IF WITHIN-SIGHT INSTALLATION IS NOT FEASIBLE, AND SHALL BE LOCKABLE IN THE OPEN POSITION.
2.8.6 CIRCUIT SIZING AND CURRENT SHALL BE CALCULATED PER NEC 706.30(A)(1) THROUGH (A)(5).
2.8.7 OVERCURRENT PROTECTION SHALL BE RATED IN ACCORDANCE WITH NEC 240 AND THE REQUIREMENTS OF NEC 706.31(B) THROUGH (F).
2.8.8 SEE NOTES FOR LOAD-SIDE SOURCE CONNECTION OF ESS WITH POWER CONTROL SYSTEM (PCS).
2.8.9 INSTALLATION SHALL COMPLY WITH CURRENTLY APPLICABLE BUILDING CODE, ELECTRICAL CODE, AND FIRE CODE REGARDING LIMITATIONS ON QUANTITY, SIZE, AND MINIMUM SPACING REQUIREMENTS APPROPRIATE TO THE STRUCTURE CATEGORY, AS WELL AS MANUFACTURER'S INSTRUCTIONS AND PRODUCT LISTING.
2.8.10 ESS PCS (POWER CONTROL SYSTEM) SHALL BE LISTED TO UL 1741-SB. ESS BATTERY MODULES SHALL BE LISTED TO UL 1973.
2.8.11 AT THE END OF SYSTEM LIFE OR UPON ABANDONMENT, THE ENERGY STORAGE SYSTEM (ESS), INCLUDING BATTERY UNITS AND ASSOCIATED EQUIPMENT, SHALL BE DECOMMISSIONED AND REMOVED IN ACCORDANCE WITH MANUFACTURER REQUIREMENTS AND APPLICABLE CODES AND REGULATIONS.

XXXXXXX

RESIDENTIAL GRID INTERACTIVE SOLAR AND ENERGY STORAGE INSTALLATION
XXX XXXXXXX, XXXXXXXX, XX XXXXX
APN: XXXXXXXX
PHONE:

LOGO

CONTRACTOR
XXXXXXXXX
ADDRESS: XXXXXXXXX, XXXXXXXXX,XX
XXXXX
PHONE: XXXXXXXXXX
LICENSE: XXXXXXXXX

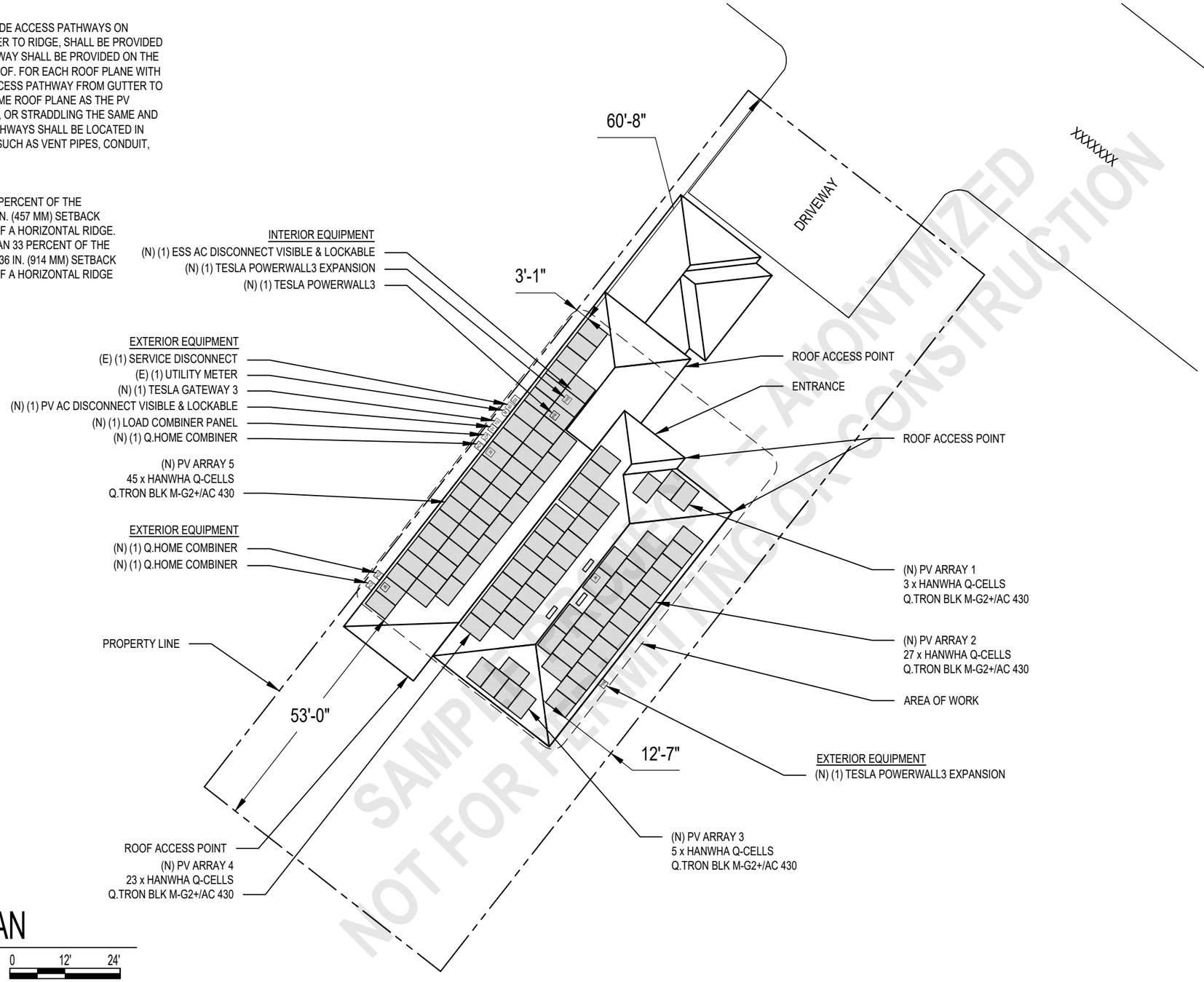
NOTES

SYSTEM AC SIZE @ STC: 35.947 kW SYSTEM DC SIZE @ STC: 44.290 kW BESS CAPACITY: 40.5 kWh
(103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430, (N) (1) TESLA 1707000-XX-Y 13.5 kWh
(103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER, (2) POWERWALL 3 EXPANSION (1807000-xx-y), 13.5 kWh

DRAWN BY: V.H. REV: DATE: 06.20.2026

ACCESS PATHWAYS:
NOT LESS THAN TWO 36 IN. (914 MM) WIDE ACCESS PATHWAYS ON SEPARATE ROOF PLANES, FROM GUTTER TO RIDGE, SHALL BE PROVIDED ON ALL BUILDINGS. ONE ACCESS PATHWAY SHALL BE PROVIDED ON THE STREET OR DRIVEWAY SIDE OF THE ROOF. FOR EACH ROOF PLANE WITH A PV ARRAY, A 36 IN. (914 MM) WIDE ACCESS PATHWAY FROM GUTTER TO RIDGE SHALL BE PROVIDED ON THE SAME ROOF PLANE AS THE PV ARRAY, ON AN ADJACENT ROOF PLANE, OR STRADDLING THE SAME AND ADJACENT ROOF PLANES. ACCESS PATHWAYS SHALL BE LOCATED IN AREAS WITH MINIMAL OBSTRUCTIONS SUCH AS VENT PIPES, CONDUIT, OR MECHANICAL EQUIPMENT.

SETBACKS AT RIDGE:
FOR PV ARRAYS OCCUPYING UP TO 33 PERCENT OF THE PLAN VIEW ROOF AREA, A MINIMUM 18 IN. (457 MM) SETBACK SHALL BE PROVIDED ON EITHER SIDE OF A HORIZONTAL RIDGE. FOR PV ARRAYS OCCUPYING MORE THAN 33 PERCENT OF THE PLAN VIEW ROOF AREA, A MINIMUM OF 36 IN. (914 MM) SETBACK SHALL BE PROVIDED ON EITHER SIDE OF A HORIZONTAL RIDGE



01 SITE PLAN
1/24" = 1'-0"
0 12' 24'

GENERAL NOTES

1. FIELD VERIFY ALL MEASUREMENTS
2. ITEMS BELOW MAY NOT BE ON THIS PAGE

—— – – —— PROPERTY LINE

NOTE: MAX 10' DISTANCE BETWEEN THE AC DISCONNECT AND THE UTILITY METER.

TOTAL ROOF AREA: 4849.99 SQ. FT.
PV ARRAY AREA: 2162.91 SQ. FT.
PV ROOF COVERAGE: 44.60%

N
W E
S

XXXXXXX
RESIDENTIAL GRID INTERACTIVE SOLAR AND ENERGY STORAGE INSTALLATION
XXX XXXXXXX, XXXXXXXX, XX XXXXX
APN: XXXXXXXX
PHONE:

LOGO

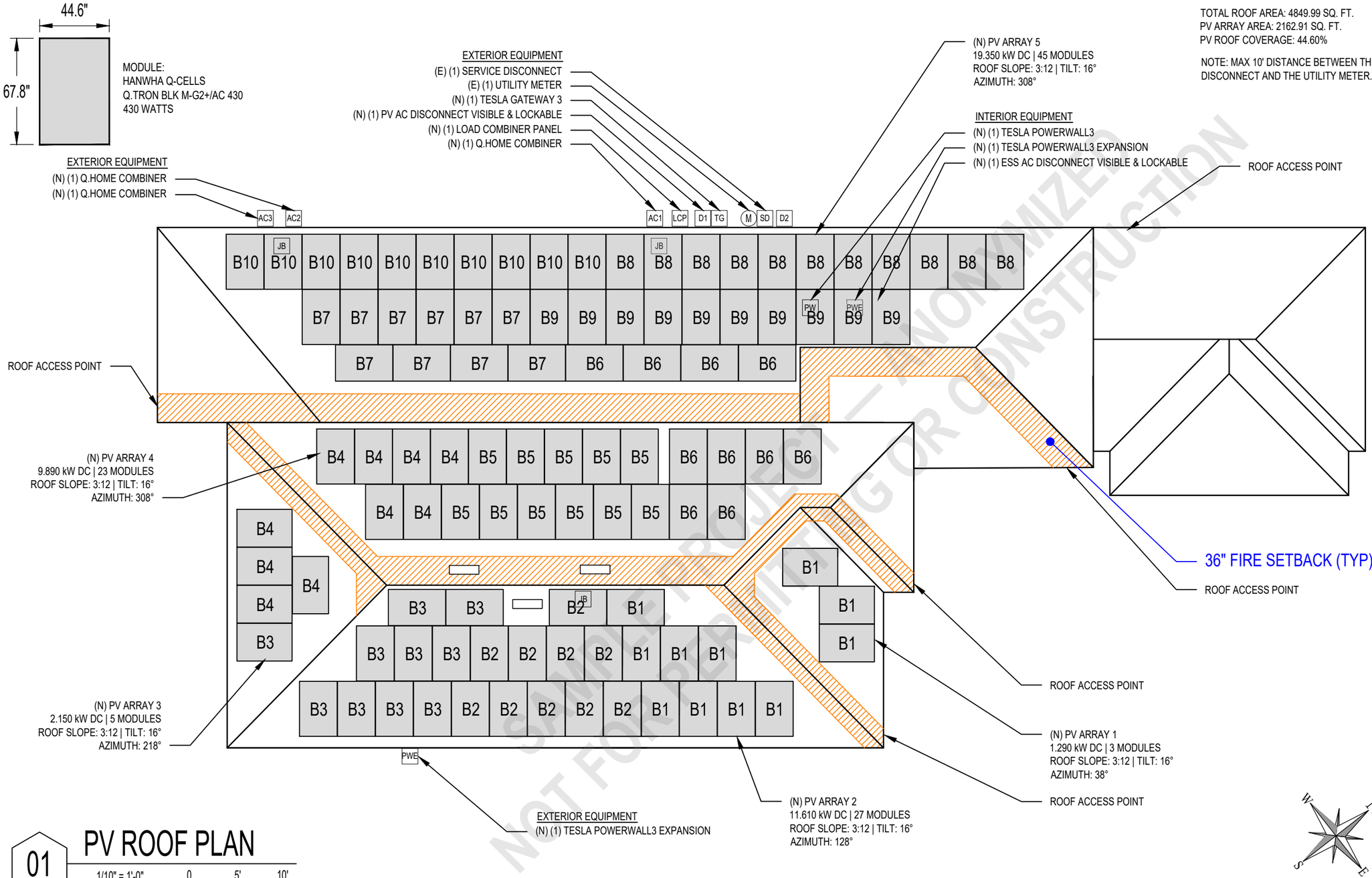
CONTRACTOR
XXXXXXXXX
ADDRESS: XXXXXXXXX, XXXXXXXXX,XX XXXXX
PHONE: XXXXXXXXXX
LICENSE: XXXXXXXXX

SITE PLAN

SYSTEM AC SIZE @ STC: 35.947 kW SYSTEM DC SIZE @ STC: 44.290 kW BESS CAPACITY: 40.5 kWh
(103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430, (N) (1) TESLA 1707000-XX-Y 13.5 kWh
(103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER, (2) POWERWALL 3 EXPANSION (1807000-xx-y), 13.5 kWh

DRAWN BY: V.H. REV: DATE: 06.20.2026

PAGE: A-1



GENERAL NOTES

1. FIELD VERIFY ALL MEASUREMENTS
2. ITEMS BELOW MAY NOT BE ON THIS PAGE

PV FIRE SETBACK

EXTERIOR EQUIPMENT

- SD — (E) (1) SERVICE DISCONNECT
- M — (E) (1) UTILITY METER
- TG — (N) (1) TESLA GATEWAY 3
- D1 — (N) (1) PV AC DISCONNECT VISIBLE & LOCKABLE
- TG — (N) (1) TESLA GATEWAY 3
- LCP — (N) (1) LOAD COMBINER PANEL
- AC — (N) (1) Q.HOME COMBINER
- PWE — (N) (1) TESLA POWERWALL3 EXPANSION
- JB — (N) (1) JUNCTION BOX

INTERIOR EQUIPMENT

- PW — (N) (1) TESLA POWERWALL3
- PWE — (N) (1) TESLA POWERWALL3 EXPANSION
- D2 — (N) (1) ESS AC DISCONNECT VISIBLE & LOCKABLE

- B1 (11) PV MODULES ON AC BRANCH
- B2 (10) PV MODULES ON AC BRANCH
- B3 (10) PV MODULES ON AC BRANCH
- B4 (10) PV MODULES ON AC BRANCH
- B5 (11) PV MODULES ON AC BRANCH
- B6 (10) PV MODULES ON AC BRANCH
- B7 (10) PV MODULES ON AC BRANCH
- B8 (11) PV MODULES ON AC BRANCH
- B9 (10) PV MODULES ON AC BRANCH
- B10 (10) PV MODULES ON AC BRANCH

01 PV ROOF PLAN

1/10" = 1'-0" 0 5' 10'

XXXXXXX

RESIDENTIAL GRID INTERACTIVE SOLAR AND ENERGY STORAGE INSTALLATION
XXX XXXXXXX, XXXXXXXX, XX XXXXX
APN: XXXXXXXX
PHONE:

LOGO

CONTRACTOR
XXXXXXXXX
ADDRESS: XXXXXXXXX, XXXXXXXXX,XX XXXXX
PHONE: XXXXXXXXXX
LICENSE: XXXXXXXXX

PV ROOF PLAN

SYSTEM AC SIZE @ STC: 35.947 kW SYSTEM DC SIZE @ STC: 44.290 kW BESS CAPACITY: 40.5 kWh
(103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430, (N) (1) TESLA 1707000-XX-Y 13.5 kWh
(103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER, (2) POWERWALL 3 EXPANSION (1807000-xx-y), 13.5 kWh

DRAWN BY: V.H. REV: DATE: 06.20.2026

PAGE: A-2

STRUCTURAL WIND LOAD SUMMARY — ASCE 7-22 (ASD Load Combination)							
STRUCT	ARRAYS	PRESET	ZONES TESTED	GOV	CLAMP D/A (lbs)	ANCHOR D/A (lbs)	STATUS
1	Array 1, Array 2, Array 3, Array 4, Array 5 (103 mod)	SUNMODO TOPTILE	Interior, Edge	Edge	217 / 316	307 / 316	PASS

STRUCTURE 1 — governing zone: Edge
Arrays: Array 1, Array 2, Array 3, Array 4, Array 5 | Modules: 103 | Preset: SUNMODO TOPTILE

Structure 1 — Per-zone Comparison					
ZONE	GCp	PRESSURE (psf)	CLAMP D/A (lbs)	ANCHOR D/A (lbs)	STATUS
Interior	-0.9	19.08	100 / 316	142 / 316	PASS
Edge (GOV)	-1.3	41.34	217 / 316	307 / 316	PASS

Technical Parameters	
Solar Panel Size	67.8 x 44.6 in
Panel Weight	50.6 lbs
Panel Area	21.00 sq ft
Basic Wind Speed (V)	147.0 mph
Panel Height (h2)	7.0 in
Mean Roof Height	25.0 ft
Dominant Roof Slope	0 - 16.0 deg

Velocity Pressure	
qh Formula	0.00256 Kd Kz Kzt Ke V2
Kz	1.12
Kzt	1.0
Ke	0.9998
V	147.0 mph
qh	61.94 psf

IBC 2024/IRC 2024/ASCE 7-22 Pressure Calculations		
(G Cp)	-1.3	External pressure coef.
Kd	0.85	
Ye	1.5	Array edge factor
Ya	0.6711	Equalization factor
Design Wind Pressure (p)	0.6 x qh x Kd x GCp x Ye x Ya = 41.34 psf	ASD uplift
Uplift Force (F)	41.34 psf x 21.00 sq ft = 868.11 lbs	Total per panel

Uplift - Clamp	
Clamps per Panel	4
Uplift per Clamp	868.11 lbs / 4 = 217.03 lbs demand
Clamp Allowable	316.0 lbs (PASS)

Dead Loads	
Distributed Load	2.41 psf
Point Load	12.65 lbs

Load Combinations (ASD per ASCE 7-22 Sec 2.4)		
COMBINATION	VALUE (psf)	STATUS
LC1: D	2.41	downward
LC2: D + S	5.41	downward
LC3: D + W	-38.93	net uplift
LC4: D + 0.75W + 0.75S	-26.35	net uplift
LC5: 0.6D + W	-39.89	net uplift <-- governing
Net uplift per anchor (LC5): 39.89 psf x 7.43 sq ft = 296.38 lbs		
Anchors must resist 296.38 lbs uplift (see Anchor check)		

Uplift - Anchor (Worst Case)	
Nom Span	24.0 in
Tributary Area	7.43 sq ft
Uplift per Anchor	41.34 psf x 7.43 sq ft = 307.16 lbs demand
Anchor Allowable	316.0 lbs

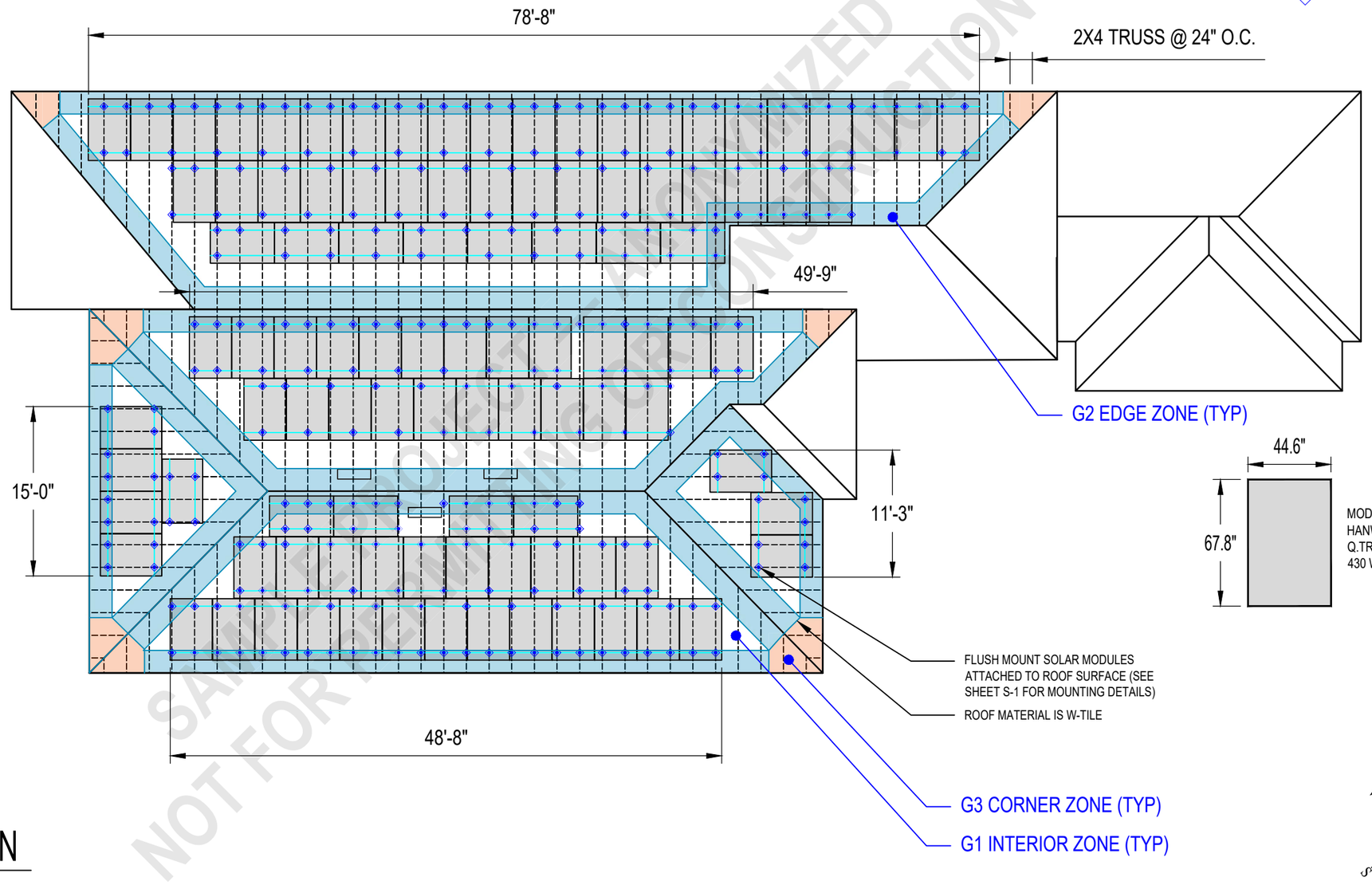
System Summary		
CHECK	DEMAND vs ALLOWABLE	STATUS
Clamp Uplift	217.03 lbs vs 316.0 lbs	PASS
Anchor Uplift	307.16 lbs vs 316.0 lbs	PASS SF: 1.03
RESULT	PASS - System adequate per ASCE 7-22	

Zone Dimensions (Gable/Hip roof) -- ASCE 26.5	
a = min(0.4h, 0.04W, 3 ft)	0.4h=10.0 ft | 0.04W=2.06 ft | 3 ft
Zone dimension a	2.06 ft (24.7 in)
G2 Edge width	2.06 ft (24.7 in) from array/roof edge
G3 Corner size	2.06 ft x 2.06 ft (24.7 x 24.7 in)
G1 Interior	Remaining array area

GENERAL NOTES

1. FIELD VERIFY ALL MEASUREMENTS
2. ITEMS BELOW MAY NOT BE ON THIS PAGE

— — — — TRUSS 2X4 @ 24" O.C.
IRONRIDGE XR-100
SUNMODO TOPTILE



MODULE:
HANWHA Q-CELLS
Q.TRON BLK M-G2+/AC 430
430 WATTS

01 SOLAR ATTACHMENT PLAN

3/32" = 1'-0" 0 5'-4" 10'-8"

XXXXXXX

RESIDENTIAL GRID INTERACTIVE SOLAR AND ENERGY STORAGE INSTALLATION
XXX XXXXXXX, XXXXXXXX, XX XXXXX
APN: XXXXXXXX
PHONE:

LOGO

CONTRACTOR
XXXXXXXXX
ADDRESS: XXXXXXXXX, XXXXXXXXX,XX XXXXX
PHONE: XXXXXXXXX
LICENSE: XXXXXXXXX

SOLAR ATTACHMENT PLAN

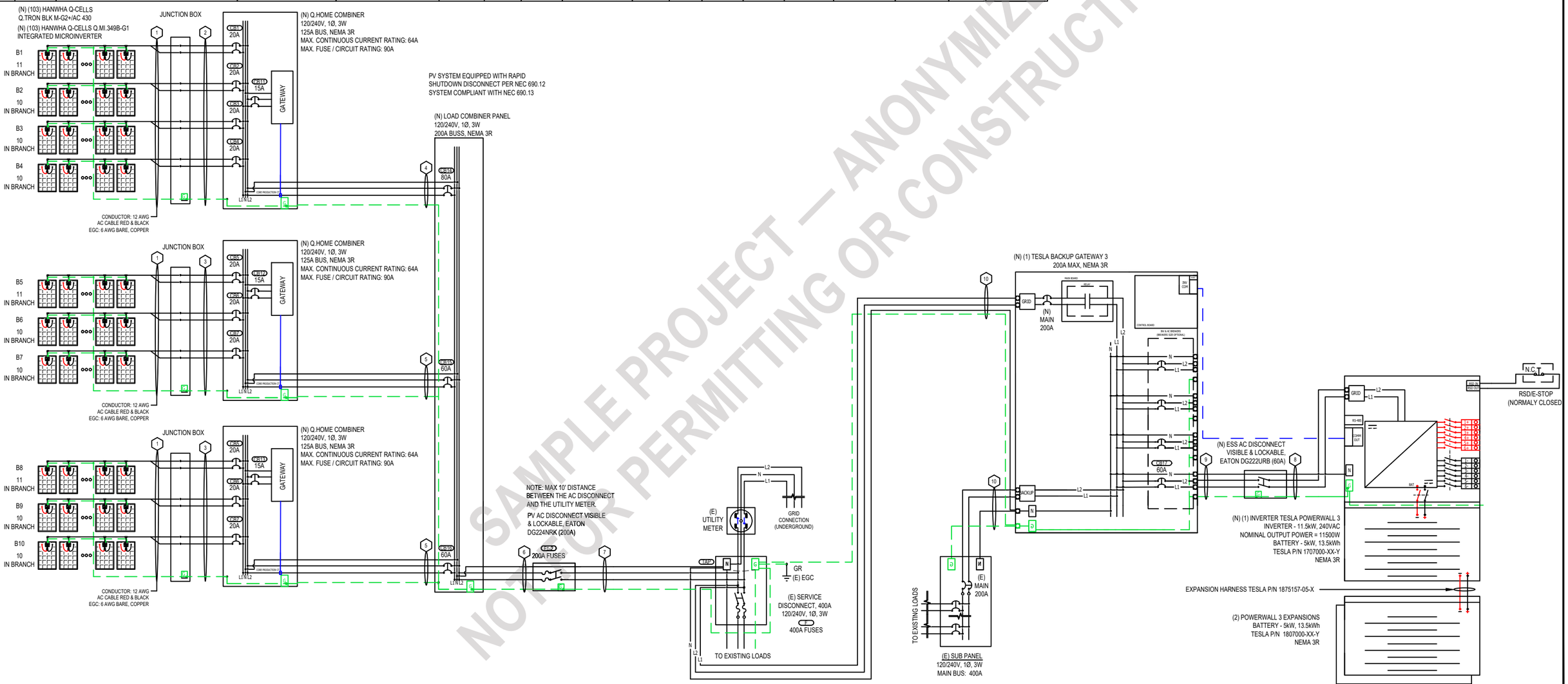
SYSTEM AC SIZE @ STC: 35.947 kW SYSTEM DC SIZE @ STC: 44.290 kW BESS CAPACITY: 40.5 kWh
(103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430, (N) (1) TESLA 1707000-XX-Y 13.5 kWh
(103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER, (2) POWERWALL 3 EXPANSION (1807000-xx-y), 13.5 kWh

DRAWN BY: V.H. REV: DATE: 06.20.2026

PAGE: A-3

CONDUCTOR AMPACITY & CONDUIT SCHEDULE

ID	TYPICAL	CONDUCTOR	EGC	NEUTRAL	CONDUIT	# C.C. COND.	CONDUIT FILL, %	TEMP. CORR. FACTOR	FILL FACTOR	OCPD	CONT. CURRENT	MAX. CURRENT (125%)	BASE AMP. (90°C)	DERATED AMP. (FROM 90°C)	AMP. @ TERMINAL (75°C)	LENGTH	VOLTAGE DROP @ 75°C (NEC T8)
1	10	12 AWG THWN-2 COPPER AC CABLE RED & BLACK	6 AWG BARE, COPPER	—	FREE AIR	2	—	0.96 (33.0 °C)	1	N/A	15.95A	19.94A	25A	24A	25A	42 FT	0.62%
2	1	10 AWG THWN-2, COPPER	10 AWG THWN-2, COPPER	—	3/4" EMT	8	35.63%	0.96 (33.0 °C)	0.7	20A	15.95A	19.94A	40A	26.88A	35A	15 FT	0.24%
3	2	10 AWG THWN-2, COPPER	10 AWG THWN-2, COPPER	—	3/4" EMT	6	27.71%	0.96 (33.0 °C)	0.8	20A	15.95A	19.94A	40A	30.72A	35A	15 FT	0.24%
4	1	4 AWG THWN-2, COPPER	8 AWG THWN-2, COPPER	4 AWG THWN-2, COPPER	1" EMT	2	32.85%	0.96 (33.0 °C)	1	80A	59.45A	74.31A	95A	91.2A	85A	5 FT	0.08%
5	2	6 AWG THWN-2, COPPER	8 AWG THWN-2, COPPER	6 AWG THWN-2, COPPER	3/4" EMT	2	35.40%	0.96 (33.0 °C)	1	60A	44.95A	56.19A	75A	72A	65A	40 FT	0.73%
6	1	3/0 AWG THWN-2, COPPER	6 AWG THWN-2, COPPER	3/0 AWG THWN-2, COPPER	2" EMT	2	25.46%	0.96 (33.0 °C)	1	200A	149.35A	186.69A	225A	216A	200A	5 FT	0.05%
7	1	3/0 AWG THWN-2, COPPER	6 AWG THWN-2, COPPER	3/0 AWG THWN-2, COPPER	2" EMT	2	25.46%	0.96 (33.0 °C)	1	N/A	149.35A	186.69A	225A	216A	200A	5 FT	0.05%
8	1	6 AWG THWN-2, COPPER	8 AWG THWN-2, COPPER	6 AWG THWN-2, COPPER	3/4" EMT	2	35.40%	0.96 (33.0 °C)	1	N/A	48A	60A	75A	72A	65A	-	-
9	1	6 AWG THWN-2, COPPER	8 AWG THWN-2, COPPER	6 AWG THWN-2, COPPER	3/4" EMT	2	35.40%	0.96 (33.0 °C)	1	60A	48A	60A	75A	72A	65A	-	-
10	2	3/0 AWG THWN-2, COPPER	6 AWG THWN-2, COPPER	3/0 AWG THWN-2, COPPER	2" EMT	2	25.46%	0.96 (33.0 °C)	1	N/A	-	200A	225A	216A	200A	-	-



XXXXXXX

RESIDENTIAL GRID INTERACTIVE SOLAR AND ENERGY STORAGE INSTALLATION
XXX XXXXXXX, XXXXXXXX, XX XXXXX
APN: XXXXXXXX
PHONE:

LOGO

CONTRACTOR
XXXXXXXXX
ADDRESS: XXXXXXXXX, XXXXXXXXX,XX XXXXX
PHONE: XXXXXXXXXX
LICENSE: XXXXXXXXX

SINGLE LINE DIAGRAM

SYSTEM AC SIZE @ STC: 35.947 kW SYSTEM DC SIZE @ STC: 44.290 kW BESS CAPACITY: 40.5 kWh
(103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430, (N) (1) TESLA 1707000-XX-Y 13.5 kWh
(103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER, (2) POWERWALL 3 EXPANSION (1807000-xx-y), 13.5 kWh

DRAWN BY: V.H. REV: DATE: 06.20.2026

PAGE: E-1

MICROINVERTER — SYSTEM SUMMARY										
	SYSTEM SUMMARY									
	(103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER									
BRANCH NAME	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
MODULES QTY	11	10	10	10	11	10	10	11	10	10
MICROINVERTERS QTY	11	10	10	10	11	10	10	11	10	10
AC CURRENT	15.95A	14.5A	14.5A	14.5A	15.95A	14.5A	14.5A	15.95A	14.5A	14.5A
AC OUTPUT	3,839W	3,490W	3,490W	3,490W	3,839W	3,490W	3,490W	3,839W	3,490W	3,490W
STC POWER	44,290W									
PTC POWER	24,246W									
AC CURRENT	149.35A									
AC OUTPUT	35,947W									

MODULES										
REF.	QTY.	MAKE AND MODEL	P_dc	P_ptc	Isc (A)	Imp (A)	Voc (V)	Vmp (V)	V_oc Temp Coeff. / B_Voc	FUSE RATING
PM1-103	103	HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430	430W	235.4W	13.74A	13.05A	39.32V	32.94V	-0.094V/°C (-0.24%/°C)	25A

INVERTERS										
REF.	QTY.	MAKE AND MODEL	AC VOLTAGE	GROUND	OCPD RATING	RATED POWER	MAX OUTPUT CURRENT	MAX INPUT CURRENT	MAX INPUT VOLTAGE	CEC WEIGHTED EFFICIENCY
I1-103	103	HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER	240V	NEGATIVE	20A	349W	1.45A	25A	60V	97%

AC DISCONNECTS								
REF.	QTY.	MAKE AND MODEL	TYPE	CURRENT	VOLTAGE	AC/DC	PHASES	ENCLOSURE
D1	1	EATON DG224NRK	FUSED	200A	240V	AC	1PH	NEMA 3R
D2	1	EATON DG222URB	NON-FUSED	60A	240V	AC	1PH	NEMA 3R

BATTERY STORAGE SYSTEM									
REF.	QTY.	MAKE AND MODEL	CAPACITY (kWh)	POWER (kW)	VOLTAGE	TECHNOLOGY	COUPLING	UL9540	UL9540A
B1-2	2	TESLA POWERWALL 3 EXPANSION (1807000-XX-Y)	13.5 kWh	—	52-92V	LFP	DC	Yes	Yes
B1	1	TESLA 1707000-XX-Y 11.5 KW	13.5 kWh	13.5 kWh	52-92V	LFP	DC	Yes	Yes

OCPDs			
REF.	QTY.	RATED CURRENT	MAX VOLTAGE
CB1-10	10	20A	240VAC
CB11-13	3	15A	240VAC
CB14	1	80A	240VAC
CB15-17	3	60A	240VAC
F1-2	2	200A	240VAC

DESIGN TEMPERATURES		
PARAMETER	VALUE	SOURCE
ASHRAE EXTREME LOW	0.5°C (32.9°F)	ALBERT WHITTED, (27.75°; -82.64°)
ASHRAE 2% HIGH	33.0°C (91.4°F)	ALBERT WHITTED, (27.75°; -82.64°)

XXXXXXX

RESIDENTIAL GRID INTERACTIVE SOLAR AND ENERGY STORAGE INSTALLATION
XXX XXXXXXX, XXXXXXXX, XX XXXXX
APN: XXXXXXXX
PHONE:

LOGO

CONTRACTOR
XXXXXXXXX
ADDRESS: XXXXXXXXX, XXXXXXXXX,XX
XXXXX
PHONE: XXXXXXXXXX
LICENSE: XXXXXXXXX

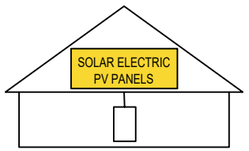
ELECTRICAL TABLES

SYSTEM AC SIZE @ STC: 35.947 kW SYSTEM DC SIZE @ STC: 44.290 kW BESS CAPACITY: 40.5 kWh
(103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430, (N) (1) TESLA 1707000-XX-Y 13.5 kWh
(103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER, (2) POWERWALL 3 EXPANSION (1807000-xx-y), 13.5 kWh

DRAWN BY: V.H. REV: DATE: 06.20.2026

LABELING NOTES
1.1 LABELING REQUIREMENTS BASED ON THE NATIONAL ELECTRICAL CODE (NEC 2020), INTERNATIONAL FIRE CODE (IFC) 605.11, OSHA 1910.145, ANSI Z535.
1.2 MATERIAL BASED ON THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION (AHJ).
1.3 LABELS SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.
1.4 LABELS SHALL BE PERMANENTLY AFFIXED AND HAVE LETTER HEIGHT AS REQUIRED BY APPLICABLE CODE SECTIONS AND/OR AHJ (3/8" MIN WHERE REQUIRED).
1.5 SIGNAL WORDS SHALL BE COLOR CODED: "DANGER" RED; "WARNING" ORANGE; "CAUTION" YELLOW. [ANSI Z535]
1.6 ALL SIGNAGE SHALL BE WEATHER RESISTANT / SUNLIGHT (UV) RESISTANT, PERMANENTLY ATTACHED, AND NOT HAND-WRITTEN, PER NEC 110.21(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 ARRAY

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN AT SERVICE EQUIPMENT / MAIN PANEL LOCATION (3.75" X 5.25")

INTERACTIVE PHOTOVOLTAIC SYSTEM CONNECTED
PHOTOVOLTAIC SYSTEM DISCONNECT
LOCATED ON THE WEST SIDE OF THE HOUSE

AT SERVICE EQUIPMENT (5.75" × 1.125")

AC DISCONNECT
PHOTOVOLTAIC SYSTEM POWER SOURCE
RATED AC OUTPUT CURRENT 149.35 AMPS
NOMINAL OPERATING AC VOLTAGE 240 VOLTS

AT POINT OF INTERCONNECTION, MARKED AT DISCONNECTING MEANS (4" × 2.5")

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM (5 1/4" × 1 3/4")

WARNING
AC MICROINVERTERS LOCATED ON ROOF UNDER MODULES

AC MICROINVERTERS LOCATED ON ROOF UNDER MODULES (4" × 2")

CAUTION
MULTIPLE SOURCES OF POWER

AT SERVICE EQUIPMENT (5.75" × 1.125")

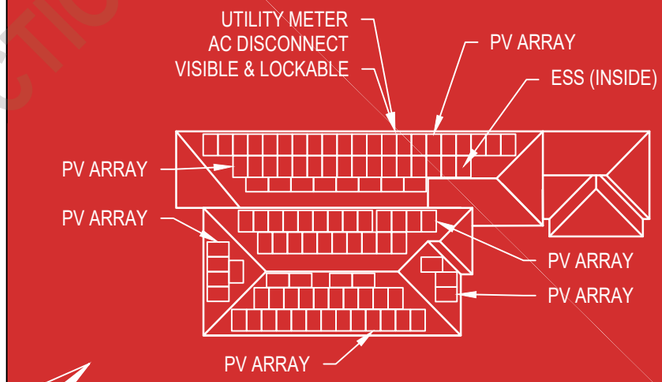
PHOTOVOLTAIC SOLAR SYSTEM DISCONNECT

PHOTOVOLTAIC SYSTEM DISCONNECT AT AC DISCONNECT (4" × 2")

WARNING
PHOTOVOLTAIC SYSTEM COMBINER PANEL
DO NOT ADD LOADS

PHOTOVOLTAIC SYSTEM COMBINER PANEL DO NOT ADD LOADS (4" × 2")

CAUTION
THIS SERVICE IS SUPPLIED BY ALTERNATIVE POWER SOURCES WITH DISCONNECTS LOCATED AS SHOWN:



XXXXXXXXXX, XXXXXXXXXXX, XXXXXXXXXX

ENERGY STORAGE SYSTEM DISCONNECT
NOMINAL ESS AC VOLTAGE: 240 V
NOMINAL ESS DC VOLTAGE: 92 V

ESS DISCONNECT (4" × 2")

ENERGY STORAGE SYSTEM DISCONNECT

ESS DISCONNECT (4" × 1")

WARNING
THREE POWER SOURCES
SOURCES: UTILITY GRID, BATTERY, AND PV SOLAR ELECTRIC SYSTEM

AT POINT OF INTERCONNECTION (4" x 2")

XXXXXXX
RESIDENTIAL GRID INTERACTIVE SOLAR AND ENERGY STORAGE INSTALLATION
XXX XXXXXXX, XXXXXXXX, XX XXXXX
APN: XXXXXXXX
PHONE:

LOGO

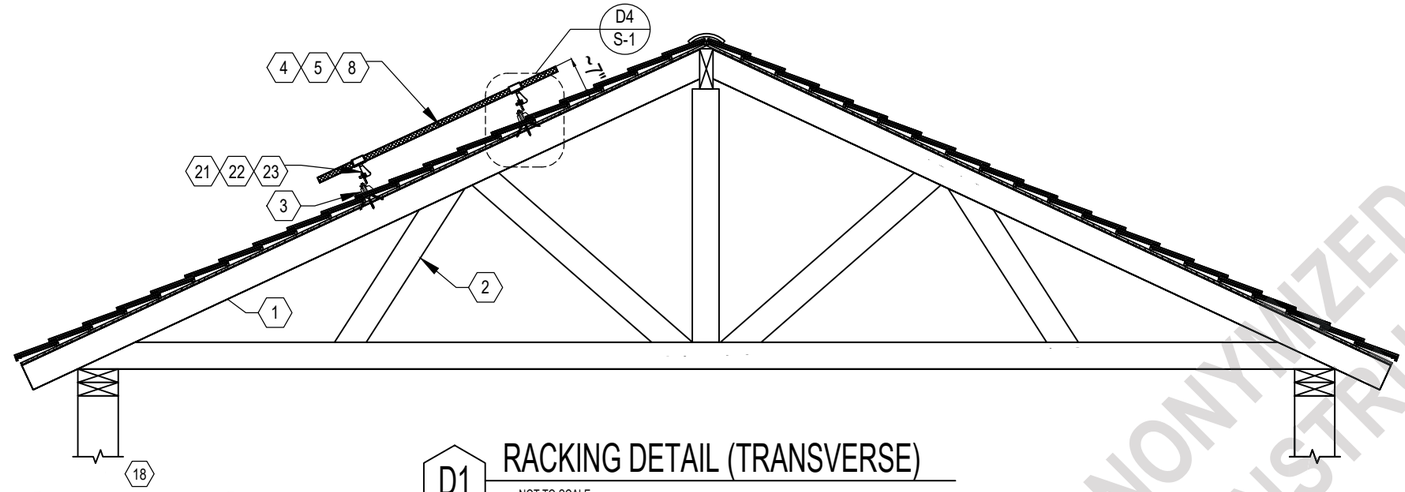
CONTRACTOR
XXXXXXXXX
ADDRESS: XXXXXXXXX, XXXXXXXXX,XX XXXXX
PHONE: XXXXXXXXXX
LICENSE: XXXXXXXXX

LABELS
SYSTEM AC SIZE @ STC: 35.947 kW SYSTEM DC SIZE @ STC: 44.290 kW BESS CAPACITY: 40.5 kWh
(103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430, (N) (1) TESLA 1707000-XX-Y 13.5 kWh
(103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER, (2) POWERWALL 3 EXPANSION (1807000-xx-y), 13.5 kWh
DRAWN BY: V.H. REV: DATE: 06.20.2026

PAGE: E-3

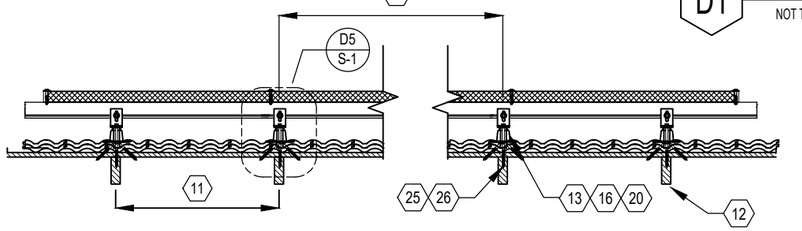
GENERAL NOTES

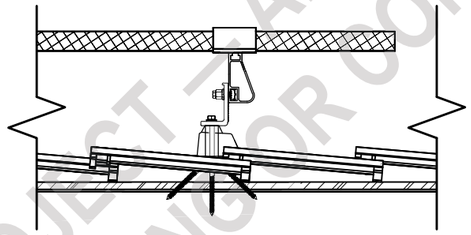
1. FIELD VERIFY ALL MEASUREMENTS



D1 RACKING DETAIL (TRANSVERSE)

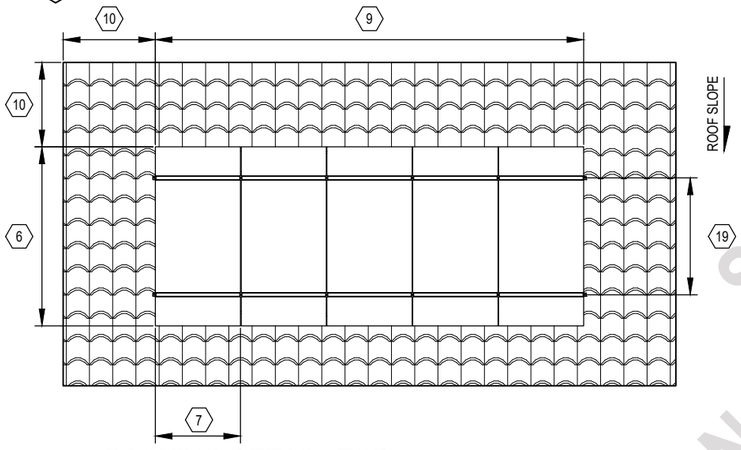
NOT TO SCALE





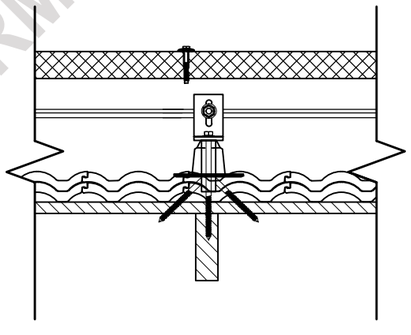
D2 RACKING DETAIL (LONGITUDINAL)

NOT TO SCALE



D4 DETAIL (TRANSVERSE)

NOT TO SCALE



D3 RACKING DETAIL (TOP)

NOT TO SCALE

D5 DETAIL (LONGITUDINAL)

NOT TO SCALE

SHEET KEYNOTES

1. ROOF MATERIAL: W-TILE
2. ROOF STRUCTURE: TRUSS
3. ATTACHMENT TYPE: SUNMODO TOPTILE
4. MODULE MANUFACTURER: HANWHA Q-CELLS
5. MODULE MODEL: Q.TRON BLK M-G2+/AC 430
6. MODULE LENGTH: 67.8"
7. MODULE WIDTH: 44.6"
8. MODULE WEIGHT: 50.6 LBS.
9. SEE SHEET A-3 FOR DIMENSION(S)
10. MIN. FIRE OFFSET: 3' FROM RIDGE, 3' FROM RAKE
11. TRUSS SPACING: 24" O.C.
12. TRUSS SIZE: 2X4 NOMINAL
13. LAG BOLT DIAMETER: 5/16 IN.
14. LAG BOLT EMBEDMENT: 2 1/2 IN.
15. TOTAL # OF ATTACHMENTS: 296.
16. TOTAL AREA: 2162.91 SQ. FT.
17. TOTAL WEIGHT: 5766.61 LBS.
18. WEIGHT PER ATTACHMENT: 19.48 LBS.
19. DISTRIBUTED LOAD: 2.67 PSF
20. MAX. HORIZONTAL STANDOFF: 48".
21. MAX. VERTICAL STANDOFF: IN ACCORDANCE WITH MODULE MANUFACTURER'S INSTRUCTIONS.
22. STANDOFF STAGGERING: YES
23. RAIL MANUFACTURER (OR EQUIV.): IRONRIDGE
24. RAIL MODEL (OR EQUIVALENT): XR-100
25. RAIL WEIGHT: 0.68 PLF

XXXXXXX

RESIDENTIAL GRID INTERACTIVE SOLAR AND ENERGY STORAGE INSTALLATION
XXX XXXXXXX, XXXXXXXX, XX XXXXX
APN: XXXXXXXX
PHONE:

LOGO

CONTRACTOR
XXXXXXXXX
ADDRESS: XXXXXXXXX, XXXXXXXXX,XX
XXXXX
PHONE: XXXXXXXXXX
LICENSE: XXXXXXXXX

MOUNTING DETAILS

SYSTEM AC SIZE @ STC: 35.947 kW SYSTEM DC SIZE @ STC: 44.290 kW BESS CAPACITY: 40.5 kWh
(103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430, (N) (1) TESLA 1707000-XX-Y 13.5 kWh
(103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER, (2) POWERWALL 3 EXPANSION (1807000-xx-y), 13.5 kWh

DRAWN BY: V.H. REV: DATE: 06.20.2026

PAGE: S-1

Solar Simplified.

Q.TRON AC

AC module powered by
Q.ANTUM NEO Technology

Monitoring and Control

- The Q.OMMAND PRO App enables installers to monitor system performance at the module level, while the user-friendly Q.OMMAND HOME App provides homeowners with real-time PV production insights.

Streamlined Installation and Product Management

- Fast installation enabled by integrated Qcells microinverter
- Improved inventory management enabled by reduced SKU counts and one complete module and MLPE solution
- Seamlessly couples with Qcells' residential energy storage system to form one complete Q.HOME SMART system

Superior Module Performance

- Q.TRON AC is powered by Q.ANTUM NEO Technology, boosting module efficiency up to 22.5% which results in more power production over time.

Top Quality Customer Support

- While the detachable microinverter simplifies on-site maintenance, Qcells' first-class customer support offers rapid system troubleshooting.

Dependably Backed by One Warrantor

- 25-year product and performance warranty with an integrated module and microinverter solution from Qcells.

Includes Domestic Content

- Q.TRON BLK M-G2.XY+/AC contains U.S. manufactured components which can contribute to qualifying for the 10% domestic content bonus for applicable investment and production tax credits.[1]
- Module and microinverter both assembled in the USA by America's No.1 residential module manufacturer

[1] This statement should not be relied on as tax advice and is subject to change based on changes made to the applicable rules and regulations. Please consult a qualified tax professional for specific guidance.

Q.TRON AC

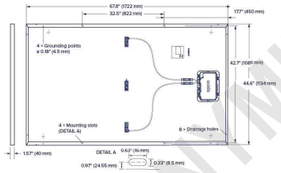
Q.TRON BLK M-G2+/AC
Q.TRON BLK M-G2.C1+/AC
Q.TRON BLK M-G2.H1+/AC
Q.TRON BLK M-G2.XY+/AC

Description

The Q.TRON AC SERIES is a N-type TOPCon PV module with an integrated microinverter. The module, with its embedded microinverter, provides optimized power output while also acting as a rapid shutdown compliant solution for optimal system safety. The solution includes a microinverter, DC cables and a junction box, enabling a streamlined installation experience.

Mechanical Specification

Format	67.8 in × 44.6 in × 1.57 in (including frame) (1722 mm × 1134 mm × 40 mm)
Weight	50.59 lbs (22.95 kg)
Front Cover	0.13 in (3.2 mm) thermally pre-stressed ARC solar glass
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6 × 18 monocrystalline Q.ANTUM NEO 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), Protection class IP68, with bypass diodes
Microinverter	9.61 in × 5.79 in × 1.17 in (244 mm × 147 mm × 29.6 mm), Protection class IP67/NEMA Type 6
DC Cable	4 mm² Solar cable; (+) ≥ 25.8 in (655 mm), (-) ≥ 25.2 in (640 mm)
DC Connector	Stäubli MC4; IP68



AC Output Electrical Characteristics

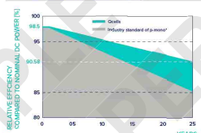
Q.MI.349B-G1 (Model Name)					
Peak Output Power	[VA]	366	**Power Factor (adjustable)**		0.85 leading...0.85 lagging
Max Continuous Output Power	[VA]	349	**Max. number of AC Modules per Q.HOME COMBINER 80 G1**	[ea]	44 (Q.HOME COMBINER CB : Max 4)
Nominal (L-L) Voltage/Range	[V]	240/211 to 264	**Max Units per 20 A (L-L) Branch Circuit**	[ea]	11
Nominal Rated Output Current	[A]	1.45	**Total Harmonic Distortion**	[%]	<5
Nominal Frequency/Range	[Hz]	60/59.3 to 60.5	**Overvoltage Class AC Port**		III
Extended Frequency Range	[Hz]	50 to 66	**Night-Time Power Consumption**	[mW]	60
Power Factor at Rated Power		1.0	**CEC Efficiency**	[%]	97

DC Power Electrical Characteristics

Power Class			**420**	**425**	**430**	**435**	**440**
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC[1] (POWER TOLERANCE +5 W/−0 W)							
Minimum	**Power at MPP[2]**	P_{MPP} [W]	420	425	430	435	440
Minimum	**Short Circuit Current[1]**	I_{SC} [A]	13.58	13.66	13.74	13.82	13.90
Minimum	**Open Circuit Voltage[1]**	V_{OC} [V]	38.75	39.03	39.32	39.60	39.88
Minimum	**Current at MPP**	I_{MPP} [A]	12.91	12.98	13.05	13.13	13.20
Minimum	**Voltage at MPP**	V_{MPP} [V]	32.54	32.74	32.94	33.14	33.33
Minimum	**Efficiency[1]**	η [%]	≥ 21.5	≥ 21.8	≥ 22.0	≥ 22.3	≥ 22.5
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NMOT[2]							
Minimum	**Power at MPP**	P_{MPP} [W]	318.2	322.0	325.8	329.5	333.3
Minimum	**Short Circuit Current**	I_{SC} [A]	10.94	11.00	11.07	11.14	11.20
Minimum	**Open Circuit Voltage**	V_{OC} [V]	36.77	37.04	37.31	37.58	37.84
Minimum	**Current at MPP**	I_{MPP} [A]	10.15	10.21	10.27	10.33	10.38
Minimum	**Voltage at MPP**	V_{MPP} [V]	31.33	31.53	31.72	31.92	32.11

[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 • [2] 800 W/m², NMOT, spectrum AM 1.5

Qcells Performance Warranty

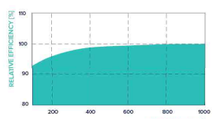


At least 98.5% of nominal DC power during first year. Thereafter max. 0.33% degradation per year. At least 95.53% of nominal DC power up to 10 years. At least 90.58% of nominal DC power up to 25 years.

All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Qcells sales organization 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]	−0.24
Temperature Coefficient of P_{MPP}	γ	[%/K]	−0.29	**Nominal Module Operating Temperature**	NMOT	[°F]	109 ± 5.4 (43 ± 3 °C)

Properties for System Design

Maximum System Voltage	V_{SYS}	[V]	1000	**PV Module Classification**	Class II
Maximum Series Fuse Rating		[A DC]	25	**Fire Rating Based on ANSI / UL 61730**	C / TYPE 2
Max. Design Load, Push / Pull[3]		[lbs / ft²]	113 (5400 Pa) / 75 (3600 Pa)	**Permitted Module Temperature on Continuous Duty[2]**	−40 °F up to +140 °F (−40 °C up to +60 °C)
Max. Test Load, Push / Pull[3]		[lbs / ft²]	169 (8100 Pa) / 113 (5400 Pa)	**Storage Temperature Range[2]**	−4 °F up to +113 °F (−20 °C up to +45 °C)

[2] According to the Q.MI.349B-G1, the maximum temperature is stated as "60 °C (+140 °F)", but the maximum temperature of the connected DC module is up to "+158 °F (+70 °C)".
[3] See Installation Manual

Qualifications and Certificates

Base DC module (Q.TRON BLK M-G2.Y+ solar module series, where "Y" can be any letter between A to W.)
UL 61730-1 & UL 61730-2, CE-compliant;
IEC 61215:2021; IEC 61730:2023.

Qcells Microinverter (Q.MI.349B-G1)
This product is UL listed as PV Rapid Shut Down Equipment UL1741, UL 1741SA, UL 1741SB, CSA C22.2 No 107.

AC Module (Q.TRON BLK M-G2.XY+/AC solar module series, where "X" can be any letter between A to W and "Y" can be any number between 1 to 9.)
UL 1741, CSA C22.2 No. 107, IEEE 1547.

Accessories (Additional parts, not included in AC module package)

Model		Category
 UL9703 E493181	CAS-HQ-SH-650 CAS-HQ-SH-800 CAS-HQ-SH-900	Short AC cable (L = 650/800/900 mm): short cable. Intended for connecting portrait oriented PV modules.
	CAS-HQ-LO-1000 CAS-HQ-LO-1300 CAS-HQ-LO-1400	Long AC cable (L = 1000/1300/1400 mm): long cable. Intended for connecting landscape oriented PV modules.
 UL9303 E533140	CAB-HQ-KIT-200	AC Cable (Raw) : 200 m cable without AC connector for the free design of AC PV installation. - Detail components : 200 meter (656 ft)
 UL6703 E479328	CON-HQ-KIT-20	AC Connector : To assemble the AC cable (CAB-HQ-KIT-200) by installer themselves. - Detail components : 20pcs Female + 20pcs Male
 UL9703 E493181	ECAP-HQ-KIT-20	End Cap : To close the end of AC cable. - Detail components : 20pcs Female + 20pcs Male
 UL9703 E493181	UNT-HQ-TOOL-G1	AC cable and DC cable Unlocking Tool

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. 300 Spectrum Center Drive, Suite 500, Irvine CA, 92618 USA I TEL 1(888) 249-7750 I EMAIL na.support@qcells.com I WEB www.qcells.com/us

XXXXXXX RESIDENTIAL GRID INTERACTIVE SOLAR AND ENERGY STORAGE INSTALLATION XXX XXXXXXX, XXXXXXXX, XX XXXXX APN: XXXXXXXX PHONE:	LOGO	CONTRACTOR XXXXXXXXXX ADDRESS: XXXXXXXXX, XXXXXXXXX,XX XXXXX PHONE: XXXXXXXXXX LICENSE: XXXXXXXXX

DATASHEET

SYSTEM AC SIZE @ STC: 35.947 kW SYSTEM DC SIZE @ STC: 44.290 kW BESS CAPACITY: 40.5 kWh
(103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430, (N) (1) TESLA 1707000-XX-Y 13.5 kWh
(103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER, (2) POWERWALL 3 EXPANSION (1807000-xx-y), 13.5 kWh

DRAWN BY: V.H. REV: DATE: 06.20.2026

PAGE: D-1

Solar Simplified.

qcells

Q.HOME COMBINER

Q.HOME COMBINER 80 G1

Q.HOME COMBINER

The Q.HOME SMART Residential Energy Solution Combiner Box

Flexible
- Network connectivity with Wi-Fi, Ethernet or Cellular

Consolidated
- Supports 64A input of Solar or Solar + Storage
- Supports up to 144 AC Modules (using external subpanel)

Robust
- NRTL-certified NEMA type 3R enclosure rated for outdoor installation

Streamlined
- Pre-installed revenue grade production meter
- 2 slim clamp CTs provided for consumption metering

Reliable
- 5-year warranty
- Automatic firmware updates

Complete
- Part of Qcells' complete Q.HOME SMART solution offering
- One brand. One warrantor.

qcells

■ Description

Q.HOME COMBINER 80 G1 consolidates up to 4 PV strings with a maximum of 44 AC Modules connected into a single enclosure. This enables a smooth interconnection across Q.HOME SMART products while ensuring easy and fast installations. Save time and costs by incorporating this user-friendly combiner box, optimally designed for residential applications.

■ Technical Specification

GENERAL PRODUCT INFORMATION	Q.HOME COMBINER 80 G1
Manufacturer	Hanwha Solutions Corporation
Product Warranty	5 years
Country of Manufacture	Vietnam

ACCESSORIES AND REPLACEMENT PARTS	
Supported AC Modules (Microinverter included)	Q.TRON BLK M-G2.XY+/AC, Q.PEAK DUO BLK ML-G10.XY+/AC *
Cellular Modem (CELLULAR-MT-MODEM-CAT4-TN5)	4G based LTE-CAT4 (+5year data plan included)
Wi-Fi Dongle (WIFI-HQ-DG-USB)	FCC Part 15 Subpart C / 2412.0 to 2462.0 MHz **
Circuit Breakers	Supports Eaton BR210, BR215**, BR220, BR230, BR240, BR250, and BR260 circuit breakers
Consumption Monitoring CT (CT-JS-CLAMP-200A-5.2m)	A pair of 200A clamp type current transformers (accuracy ±2.0%) ***

* Q.TRON BLK M-G2.XY+/AC and Q.PEAK DUO BLK ML-G10.XY+/AC solar modules, where "X" can be any letter between A to W and "Y" can be any number between 1 to 9.
** pre-assembled / *** included in the package (Others are not included, need to be ordered separately)

ELECTRICAL SPECIFICATIONS		
System Voltage	[V]	120/240 VAC, 60 Hz
Eaton BR Series Busbar Rating	[A]	125
Max. Continuous Current Rating (input from PV/storage)	[A]	64
Branch Circuits (Solar or Solar + Storage)	[pcs]	Up to four 2-pole Eaton BR series Distributed Generation (DG) breakers only (not included)
Max. Total Branch Circuit Breaker Rating (input)	[A]	80 A of distributed generation / 95 A with Gateway breaker included
Gateway Circuit Breaker	[A]	15 A rating Eaton BR215 included
Consumption Monitoring	[A]	Metering with a pair of 200 A slim clamp current transformers (accuracy ±2.0%)
Production Metering	[A]	Revenue Grade, ANSI C12.20-2015 0.5 Accuracy Class (pre-wired and add-on)

MECHANICAL DATA		
Max. AC Module Connection Q'ty	[pcs]	▪ Up to 44 AC Modules in 1 combiner (11 in series × 4 strings) ▪ Up to 144 AC Modules using 1 combiner with external subpanel
Dimensions (W × H × D)	[inch]	14.6 × 19.3 × 6.3 / height is 21.7 with mounting brackets (37.0 × 49.0 × 16.0 cm / height is 55.1cm with mounting brackets)
Weights (without connection cables)	[lb]	11.5 (5.2 kg)
Operating Temperature Range	[°F]	-40 to 140 (-40 to 60 °C)
Storage Temperature Range	[°F]	-40 to 140 (-40 to 60 °C)
Enclosure Environmental Rating		Outdoor, NRTL-certified, NEMA type 3R
Wire Sizes		▪ 20 A breaker inputs: 12 to 8 AWG copper conductors ▪ Main lug combined output: 10 to 2/0 AWG copper conductors ▪ Neutral and ground: 8 to 6 copper conductors ▪ Always follow local code requirements for conductor sizing
Cooling		Natural convection
Altitude	[ft]	Up to 6,561 (2,000 m)

INTERNET CONNECTION OPTIONS	
Wi-Fi	IEEE 802.11b/g/n
Cellular	CELLMODEM-CAT4 (4G based LTE-CAT4)
Ethernet	Optional, IEEE 802.3, CAT5E (or CAT6) STP Ethernet cable

COMPLIANCE	
AC Combiner	▪ UL 1741, CSA C22.2 No.107 ▪ FCC Part 15.B ▪ ANSI C 12.20 accuracy class 0.5 (production meter) ▪ NEMA type 3R ▪ IEEE 2030.5 / CSIP Compliant
Monitoring Board	UL 61010-1 / UL 61010-2-030 CSA 22.2 No. 61010-1-12 / CSA 22.2 No. 61010-2-030
CT Sensor	UL 2808 (XOBA)

■ Qualifications and Certificates

■ Accessories

Parts Included in the Package

WIFI-HQ-DG-USB — Wi-Fi dongle with 2.4 GHz bandwidth

FCC ID: OZ5C307-HW-WF

CT-JS-CLAMP-200A-5.2 m — A slim clamp type consumption CT with ±2.0% accuracy (5.2 m, 20 AWG)

UL 2808(XOBA) E498920

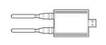
Additional Parts (Not Included in the Package)

CT-HQ-SOLID-200A-2 m — Add-on solid core production CT (2 m, 18 AWG)
- Required for >44 AC Modules solution
- Revenue grade metering (accuracy ±0.5%)
- Do not trim or extend CT leads

UL 2808(XOBA) E535456

CT-JS-CLAMP-200A-25 m — A slim clamp type consumption CT with ±2.0% accuracy (25 m, 20 AWG)

UL 2808(XOBA) E498920



CELLULAR-MT-MODEM-CAT4-TN5 — Cellular modem with 5 year data plan included

UL 62368-1 E150299

CELLULAR-TN-DP-5Y — 5 year data plan extension

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. 300 Spectrum Center Drive, Suite 500, Irvine, CA 92618 | TEL 1 (888) 249-7750 | EMAIL na.support@qcells.com | WEB www.qcells.com/us

qcells

XXXXXXX

RESIDENTIAL GRID INTERACTIVE SOLAR AND ENERGY STORAGE INSTALLATION
XXX XXXXXXX, XXXXXXXX, XX XXXXX
APN: XXXXXXXX
PHONE:

LOGO

CONTRACTOR
XXXXXXXXX
ADDRESS: XXXXXXXXX, XXXXXXXXX,XX
XXXXX
PHONE: XXXXXXXXX
LICENSE: XXXXXXXXX

DATASHEET

SYSTEM AC SIZE @ STC: 35.947 kW SYSTEM DC SIZE @ STC: 44.290 kW BESS CAPACITY: 40.5 kWh
(103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430, (N) (1) TESLA 1707000-XX-Y 13.5 kWh
(103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER, (2) POWERWALL 3 EXPANSION (1807000-xx-y), 13.5 kWh

DRAWN BY: V.H. REV: DATE: 06.20.2026

PAGE: D-2

Powerwall 3

Power Everything

Powerwall 3 is a fully integrated solar and battery system, designed to accelerate the transition to sustainable energy. Customers can receive whole home backup, cost savings, and energy independence by producing and consuming their own energy while participating in grid services. Once installed, customers can manage their system using the Tesla App to customize system behavior to meet their energy goals.

Powerwall 3 achieves this by supporting up to 20 kW DC of solar and providing up to 11.5 kW AC of continuous power per unit. It has the ability to start heavy loads rated up to 185 LRA, meaning a single unit can support the power needs of most homes. Powerwall 3 Expansions make it easier and more affordable to scale up customers' systems to meet their current or future needs. Powerwall 3 is designed for fast and efficient installations, modular system expansion, and simple connection to any electrical service.

Powerwall 3 Technical Specifications

System Technical Specifications

Model Number	1707000-xx-y			
Nominal Grid Voltage (Input & Output)	120/240 VAC			
Grid Type	Split phase			
Frequency	60 Hz			
Nominal Battery Energy	13.5 kWh AC[1]			
Nominal Output Power (AC)	5.8 kW	7.6 kW	10 kW	11.5 kW
Maximum Apparent Power	5,800 VA	7,600 VA	10,000 VA	11,500 VA
Maximum Continuous Current	24 A	31.7 A	41.7 A	48 A
Overcurrent Protection Device[2]	30 A	40 A	60 A	60 A
Configurable Maximum Continuous Discharge Power Off-Grid (PV Only, -20°C to 25°C)	15.4 kW[3]			
Maximum Continuous Charge Current / Power (Powerwall 3 only)	20.8 A AC / 5 kW			
Maximum Continuous Charge Current / Power (Powerwall 3 with up to (3) Expansion units)	33.3 A AC / 8 kW			
Output Power Factor Rating	0 - 1 (Grid Code configurable)			
Maximum Output Fault Current (1 s)	160 A			
Maximum Short-Circuit Current Rating	10 kA			
Load Start Capability	185 LRA			
Solar to Battery to Home/Grid Efficiency	89%[1,4]			
Solar to Home/Grid Efficiency	97.5%[5]			
Power Scalability	Up to 4 Powerwall 3 units supported			
Energy Scalability	Up to 3 Expansion units (for a maximum total of 7 units)			
Supported Islanding Devices	Gateway 3, Backup Switch, Backup Gateway 2			
Connectivity	Wi-Fi (2.4 and 5 GHz), Ethernet, Cellular (LTE/4G[6])			
Hardware Interface	Dry contact relay, Rapid Shutdown (RSD) certified switch and 2-pin connector, RS-485 for meters			
AC Metering	Revenue Grade (+/- 0.5%, ANSI C12.20)			
Protections	Integrated arc fault circuit interrupter (AFCI), Isolation Monitor Interrupter (IMI), PV Rapid Shutdown (RSD) using Tesla Mid-Circuit Interrupters			
Customer Interface	Tesla Mobile App			
Warranty	10 years			

[1] Values provided for 25°C (77°F), at beginning of life. 3.3 kW charge/discharge power.

[2] See Powerwall 3 Installation Manual for fuse requirements if using fuse for overcurrent protection.

[3] If enabling the 15.4 kW off-grid maximum continuous discharge power, Powerwall 3 must be installed with an 80 A breaker and appropriately sized conductors.

[4] Typical solar shifting use case.

[5] Tested using CEC weighted efficiency methodology.

[6] The customer is expected to provide internet connectivity for Powerwall 3; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.

Powerwall 3 Technical Specifications

Solar Technical Specifications

Maximum Solar STC Input	20 kW
Withstand Voltage	600 V DC
PV DC Input Voltage Range	60 — 550 V DC
PV DC MPPT Voltage Range	60 — 480 V DC
MPPTs	6
Maximum Current per MPPT (I_{mp})	13 A[7]
Maximum Short Circuit Current per MPPT (I_{sc})	15 A[7]

[7] Where the DC input current exceeds the MPPT rating, a jumper can be used to combine two MPPTs into a single input to intake DC current up to 26 A I_{MP} / 30 A I_{SC}.

Environmental Specifications

Operating Temperature	–20°C to 50°C (–4°F to 122°F)[8]
Operating Humidity (RH)	Up to 100%, condensing
Storage Temperature	–20°C to 30°C (–4°F to 86°F), up to 95% RH, non-condensing, State of Energy (SOE): 25% initial
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Rating	NEMA 3R
Ingress Rating	IP67 (Battery & Power Electronics) IP55 (Wiring Compartment)
Pollution Rating	PD3
Operating Noise @ 1 m	< 50 db(A) typical < 62 db(A) maximum

[8] Performance may be de-rated at operating temperatures above 40°C (104°F).

Compliance Information

Certifications	UL 1741, UL 9540, UL 9540A, UL 3741, UL 1741 PCS, UL 1741 SA, UL 1741 SB, UL 1973, UL 1699B, UL 1998, CSA C22.2 No. 0.8, CSA C22.2 No. 107.1, CSA C22.2 No. 330, CSA 22.3 No. 9, IEEE 1547, IEEE 1547A, IEEE 1547.1, CA Rule No.21
Grid Connection	United States and Canada
Emissions	FCC Part 15 Class B, ICES 003
Environmental	RoHS Directive 2011/65/EU
Seismic	AC156, IEEE 693-2005 (high)
Fire Testing	Meets the unit level performance criteria of UL 9540A

XXXXXXX

RESIDENTIAL GRID INTERACTIVE SOLAR AND ENERGY STORAGE INSTALLATION
XXX XXXXXXX, XXXXXXXX, XX XXXXX
APN: XXXXXXXX
PHONE:

LOGO

CONTRACTOR
XXXXXXXXX
ADDRESS: XXXXXXXXX, XXXXXXXXX,XX XXXXX
PHONE: XXXXXXXXX
LICENSE: XXXXXXXXX

DATASHEET

SYSTEM AC SIZE @ STC: 35.947 kW SYSTEM DC SIZE @ STC: 44.290 kW BESS CAPACITY: 40.5 kWh
(103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430, (N) (1) TESLA 1707000-XX-Y 13.5 kWh
(103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER, (2) POWERWALL 3 EXPANSION (1807000-xx-y), 13.5 kWh

DRAWN BY: V.H. REV: DATE: 06.20.2026

PAGE: D-3

Gateway 3

—

Tesla Gateway 3 controls connection to the grid in a Powerwall system, automatically detecting outages and providing seamless transition to backup power. It provides energy monitoring that is used by Powerwall for solar self-consumption, time-based control, and backup operation.

Performance Specifications

Model Number	1841000-x1-y
Nominal Grid Voltage	120/240 V AC
Grid Configuration	Split phase
Grid Frequency	60 Hz
Continuous Current Rating	200 A
Maximum Supply Short Circuit Current	22 kA with Square D or Eaton main breaker 25 kA with Eaton main breaker [16]
IEC Protective Class	Class I
Overvoltage Category	Category IV

[16] Only Eaton CSR or BWH main breakers are 25 kA rated.

AC Meter	+/- 0.5%
Communication	CAN
User Interface	Tesla App
Backup Transition	Automatic disconnect for seamless backup
Overcurrent Protection Device	100–200 A Service entrance rated Eaton CSR, BWH, or BW, or Square D QOM breakers
Internal Panelboard	200 A 8-space/16 circuit breakers Eaton BR, Siemens QP, or Square D HOM breakers rated to 10–125A
Warranty	10 years

Environmental Specifications

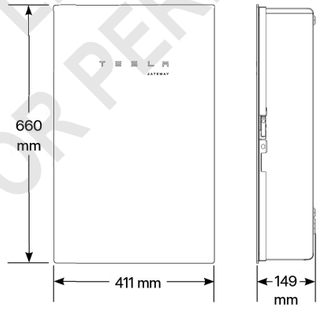
Operating Temperature	–20°C to 50°C (–4°F to 122°F)
Operating Humidity (RH)	Up to 100%, condensing
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R

Compliance Information

Certifications	UL 67, UL 869A, UL 916, UL 1741 PCS, CSA 22.2 107.1, CSA 22.2 29
Emissions	FCC Part 15, Class B, ICES 003

Mechanical Specifications

Dimensions	660 x 411 x 149 mm (26 x 16 x 6 in)
Weight	16.3 kg (36 lb)
Mounting options	Wall mount



Powerwall 3 Expansion Technical Specifications

Battery Technical Specifications

Model Number	1807000-xx-y
Nominal Battery Energy	13.5 kWh
Voltage Range	52 - 92 V DC [11]

[11] Powerwall 3 Expansion units are connected in parallel and are not field serviceable.

Environmental Specifications

Operating Temperature	–20°C to 50°C (–4°F to 122°F) [12]
Operating Humidity (RH)	Up to 100%, condensing
Storage Temperature	–20°C to 30°C (–4°F to 86°F), up to 95% RH, non-condensing, State of Energy (SOE): 25% initial
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Rating	NEMA 3R
Ingress Rating	IP67
Pollution Rating	PD3

[12] Performance may be de-rated at operating temperatures above 40°C (104°F).

Compliance Information

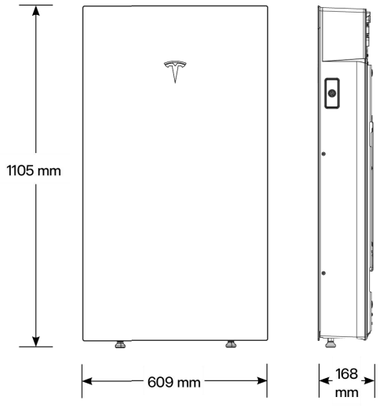
Certifications	UL 1973, UL 9540 Meets the unit level performance criteria of UL 9540A

Mechanical Specifications

Dimensions	1105 x 609 x 168 mm (43.5 x 24 x 6.6 in) [13]
Total Weight of Wall-Mounted Expansion Unit	118.5 kg (261.2 lb)
Weight of Expansion Unit	110 kg (242.5 lb)
Weight of Glass Front Cover	6.5 kg (14.5 lb)
Weight of Wall Bracket	1.9 kg (4.2 lb)
Weight of Expansion Accessories	0.7 kg (1.5 lb)
Mounting Options	Floor or wall mount
Stacking Capability (Floor Mount Only)	Up to (3) Expansion units behind a Powerwall 3
Compatibility with Other Systems	Only compatible with Powerwall 3
Connection to Powerwall 3 or Expansions	Powerwall 3 Expansion harness [14]

[13] These dimensions include the glass front cover being installed on Powerwall 3 Expansion.

[14] The Powerwall 3 Expansion harness is a listed component of the UL 9540 certification.



XXXXXXX RESIDENTIAL GRID INTERACTIVE SOLAR AND ENERGY STORAGE INSTALLATION XXX XXXXXXX, XXXXXXXX, XX XXXXX APN: XXXXXXXX PHONE:	LOGO	CONTRACTOR XXXXXXXXX ADDRESS: XXXXXXXXX, XXXXXXXXX,XX XXXXX PHONE: XXXXXXXXX LICENSE: XXXXXXXXX	DATASHEET SYSTEM AC SIZE @ STC: 35.947 kW SYSTEM DC SIZE @ STC: 44.290 kW BESS CAPACITY: 40.5 kWh (103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430, (N) (1) TESLA 1707000-XX-Y 13.5 kWh (103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER, (2) POWERWALL 3 EXPANSION (1807000-xx-y), 13.5 kWh DRAWN BY: V.H. REV: DATE: 06.20.2026	PAGE: D-4

Tech Brief

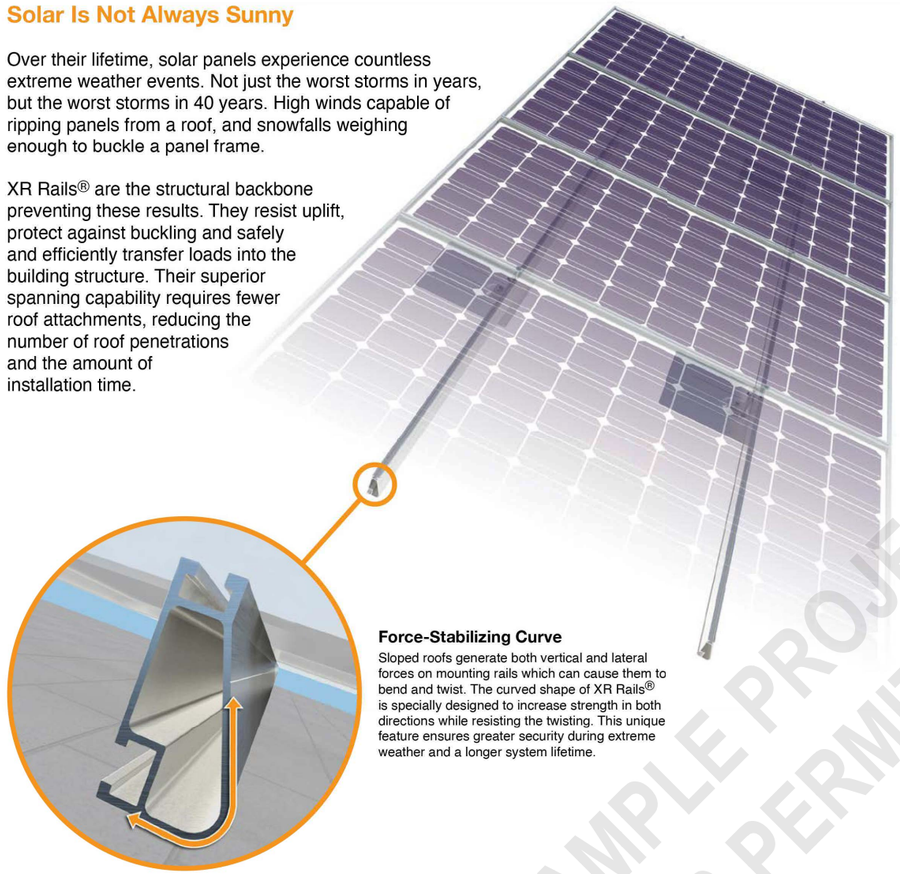
IRONRIDGE

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.

6000-Series Aluminum

All XR Rails® are made of 6000-series aluminum alloy, with anodized options. Anodizing prevents corrosion, while also providing a more attractive appearance. Available in mill and black-anodized finish.

Tech Brief

XR Rail® Family

The XR Rail® Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail® to match.

XR10

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves spans up to 6 feet, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Mill & black-anodized finish
- Internal splices available

XR100

XR100 is a residential and commercial mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 10 feet.

- 10' spanning capability
- Heavy load capability
- Mill & black-anodized finish
- Internal splices available

XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans up to 12 feet for commercial applications.

- 12' spanning capability
- Extreme load capability
- Mill, non-anodized finish
- Internal splices available

Rail Selection

The table below was prepared in compliance with applicable engineering codes and standards.* Values are based on the following criteria: ASCE 7-16, Gable Roof Flush Mount, Roof Zones 1 & 2e, Exposure B, Roof Slope of 8 to 20 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed certification letters.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	90	XR10		XR100		XR1000	
	120						
	140						
	160						
20	90						
	120						
	140						
	160						
30	90						
	160						
40	90						
	160						
80	160						
120	160						

*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance.

XXXXXXX

RESIDENTIAL GRID INTERACTIVE SOLAR AND ENERGY STORAGE INSTALLATION
XXX XXXXXXX, XXXXXXXX, XX XXXXX
APN: XXXXXXXX
PHONE:

LOGO

CONTRACTOR
XXXXXXXXXX
ADDRESS: XXXXXXXXX, XXXXXXXXX,XX XXXXX
PHONE: XXXXXXXXXX
LICENSE: XXXXXXXXX

DATASHEET

SYSTEM AC SIZE @ STC: 35.947 kW SYSTEM DC SIZE @ STC: 44.290 kW BESS CAPACITY: 40.5 kWh
(103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430, (N) (1) TESLA 1707000-XX-Y 13.5 kWh
(103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER, (2) POWERWALL 3 EXPANSION (1807000-xx-y), 13.5 kWh

DRAWN BY: V.H. REV: DATE: 06.20.2026

PAGE: D-5

TOPTILE®

THE TOPTILE ADVANTAGE

- CUT TILE ROOF MOUNT INSTALLATION TIME IN HALF.
- ADHESIVE MOLDABLE FLASHING FOR EASE OF APPLICATION.
- DECK MOUNT - NO NEED TO FIND RAFTERS.
- NO MORE LIFTING ROOF TILES, OR BROKEN TILES.
- HIGH-VELOCITY HURRICANE ZONE APPROVED - PASSED TAS 100 (A) WIND -DRIVEN RAIN TEST.

INSTALL VIDEO

WWW.SUNMODO.COM

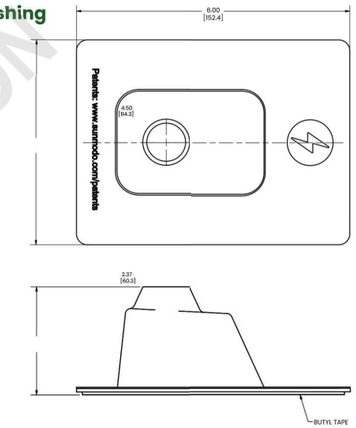
SUNMODO LEADING by DESIGN

CUT SHEET

TOPTILE®

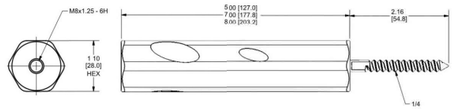
TOPTILE

1 - Flashing



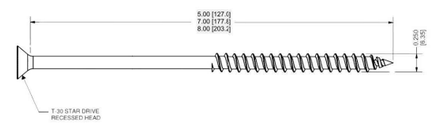
Material: Aluminum, EPDM and Butyl Tape

2 - Deck Stanchion Assembly



Material: Aluminum and Stainless Steel hardware

3 - #14 General Purpose Wood Screw



Material: Stainless Steel

Part Description: TopTile, 5"
P/N: TOPTILE-5-B

Part Description: TopTile, 7"
P/N: TOPTILE-7-B

ITEM NO.	DESCRIPTION	QTY
1	6"x4.5" Aluminum Flashing with EPDM Boot	1
2	Deck Stanchion Assembly - Deck Stanchion - Hanger Bolt ¼ x 2.0 - Washer	1
3	#14 General Purpose Wood Screw	3

D10261-V2.0
Dimensions shown are inches (and millimeters) Details are subject to change without notice

SUNMODO LEADING by DESIGN

XXXXXXX

RESIDENTIAL GRID INTERACTIVE SOLAR AND ENERGY STORAGE INSTALLATION
XXX XXXXXXX, XXXXXXXX, XX XXXXX
APN: XXXXXXXX
PHONE:

LOGO

CONTRACTOR
XXXXXXXXX
ADDRESS: XXXXXXXXX, XXXXXXXXX,XX
XXXXX
PHONE: XXXXXXXXXX
LICENSE: XXXXXXXXX

DATASHEET

SYSTEM AC SIZE @ STC: 35.947 kW SYSTEM DC SIZE @ STC: 44.290 kW BESS CAPACITY: 40.5 kWh
(103) HANWHA Q-CELLS Q.TRON BLK M-G2+/AC 430, (N) (1) TESLA 1707000-XX-Y 13.5 kWh
(103) HANWHA Q-CELLS Q.MI.349B-G1 INTEGRATED MICROINVERTER, (2) POWERWALL 3 EXPANSION (1807000-xx-y), 13.5 kWh

DRAWN BY: V.H. REV: DATE: 06.20.2026

PAGE: D-6