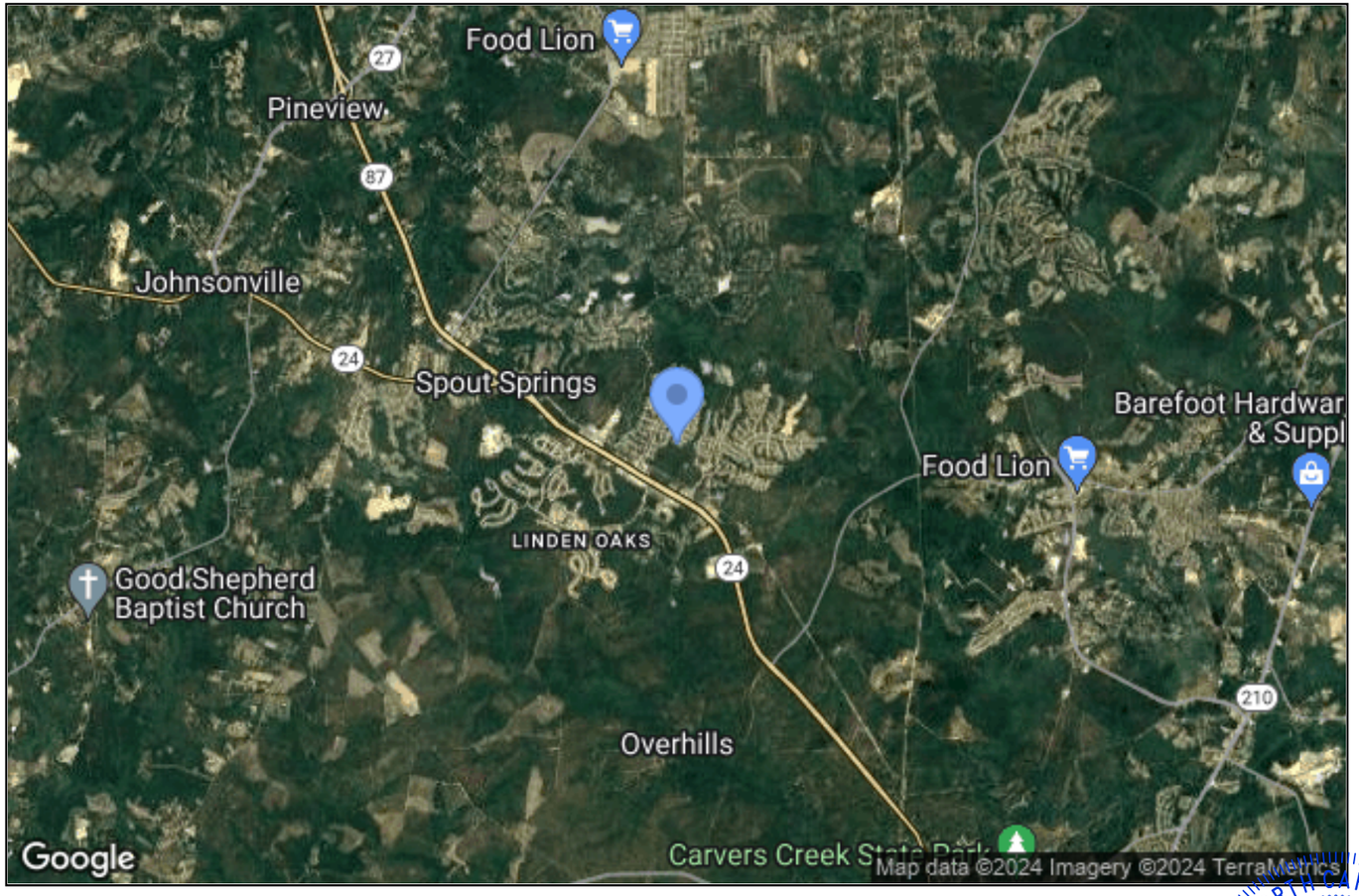
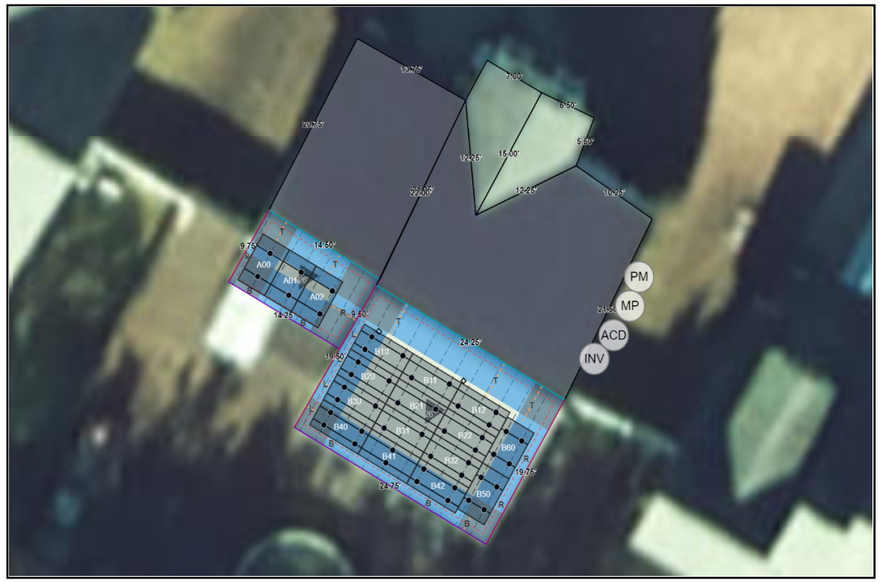
# BRAD JORDAN

42 BRITISH LANE CAMERON NORTH CAROLINA 28326 UNITED STATES
35.2610157,-79.0317290

SYSTEM TIER (UTILITY): TIER 1 (6.8 KWDC*0.85 = 5.78 KWAC)
SCOPE OF WORK: INSTALLATION OF SOLAR PANELS AND ASSOCIATED ELECTRICAL EQUIPMENT.




01 VICINITY




02 AERIAL

## PROJECT INFORMATION

DISTRICTS
COUNTY: HARNETT COUNTY
JURISDICTION: UN-INCORPORATED HARNETT

DESIGN SPECS
WIND EXPOSURE: B
RISK CATEGORY: II
WIND SPEED (MPH): 120
SNOW LOAD (PSF): 10

GOVERNING CODES
BUILDING: IBC 2015/ASCE 7-10
ELECTRICAL: NEC 2020
FIRE: IFC 2015

SYSTEM
SIZE (KWDC): 6.8
EST KWH/YR: 9633
# PANELS: 17
PANEL: REC400NP3
INVERTER(S): PWRCELL 7.6
VOLTAGE (V): 240

## SHEET INDEX



NOTICE TO CONTRACTOR
All construction must comply with current NC Building Codes and is subject to field inspection and verification.
APPROVED
Limited building only review
Permit holder responsible for full compliance with the code
05/02/2024
Harnett COUNTY NORTH CAROLINA

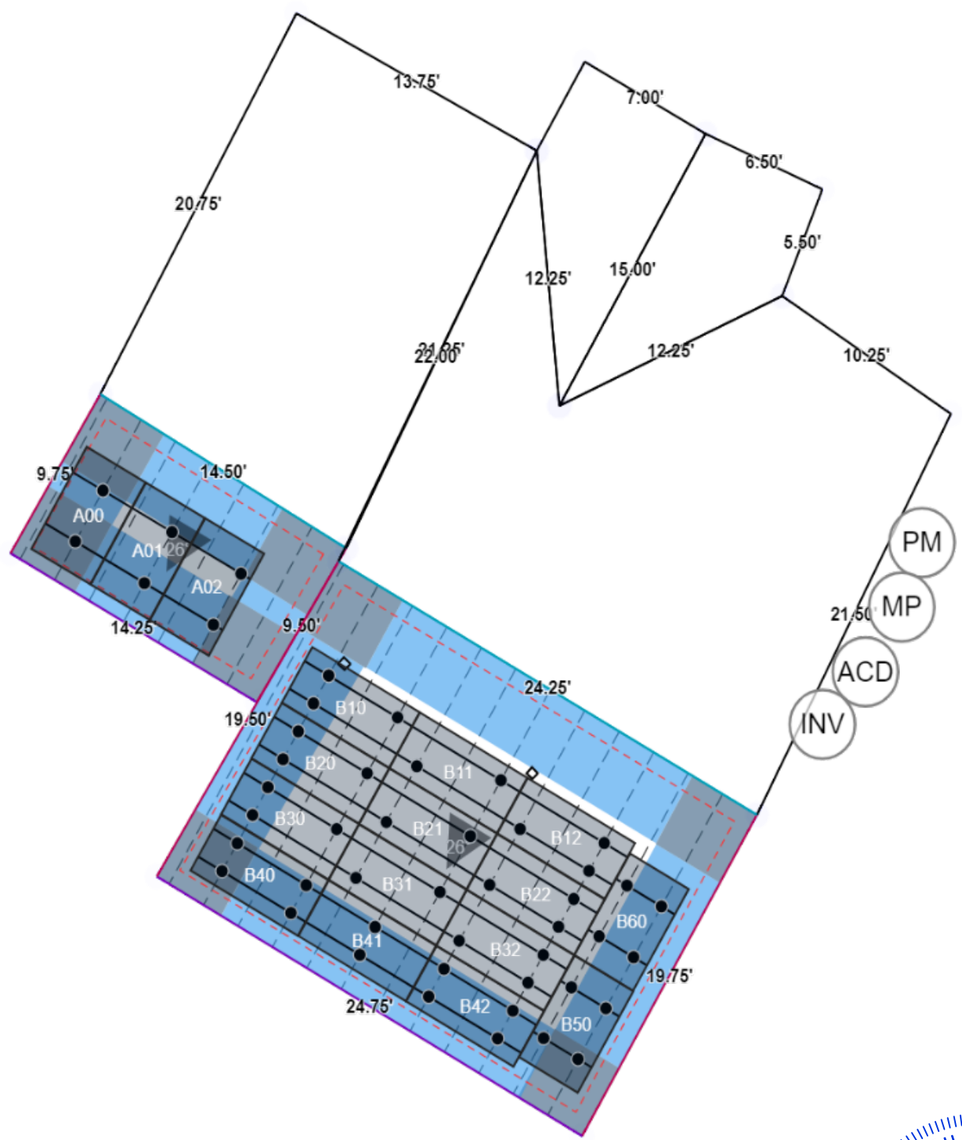
NORTH CAROLINA PROFESSIONAL SEAL 056354 ENGINEER MOHAMED SAID MAHMOUD

Mohamed S Mahmoud
Digitally signed by Mohamed S Mahmoud
Date: 2024.04.09 09:43:09 -07'00'

| | | | |
|---|---|---|---|
| BRAD JORDAN | CONTRACTOR: | ENGINEER: | |
| 42 BRITISH LANE CAMERON NORTH CAROLINA 28326 UNITED STATES | LOTUS ENERGY & SOLAR<br>220 W MAIN ST, TAVARES, FL 32778<br>(407) 377-7437 | MOHAMED SAID MAHMOUD, PE<br>8340 LAKE WILLOW WAY, ELK GROVE, CA 95758 | MOHAMED SAID MAHMOUD PE056354 |
| PROJECT ID: 452024-42 | | | |

| DATE | BY | VER | DESCRIPTION |
|---|---|---|---|
| 04.09.24 | RG | 1 | INITIAL DESIGN |

T1
PAPER: ARCHB
SCALE:


## 01 PLAN VIEW

EQUIPMENT LEGEND

| | |
|---|---|
| PM | -POWER METER |
| MP | -MAIN PANEL |
| ACD | -AC DISCONNECT |
| INV | -INVERTER/COMBIINER |

ZONE WIDTHS

PITCHED:

| | |
|---|---|
| < NA' > | -1 |
| < 3.7' > | -2 |
| < 3.7' > | -3 |

ROOF TYPE 1
MATERIAL: SHINGLE
ATTACHMENT: (48) IRONRIDGE HUG-TRUSS
RAIL: (184') IRONRIDGE-XR10
MAX POINT DEADLOAD: 28 lbs
MAX DIST DEADLOAD: 2.95 psf
MAX ANCHOR LOAD: -181 lbf
MIN SAFETY FACTOR: 4.76

RELEVANT DIMS
LEAST HORIZ DIM: 37'
ROOF HEIGHT(S), h/EXPOSED DIST, d1: 15'/7.5'
ZONE WIDTH, a: 3.7'

ARRAY(S)
MODULES: (17) REC400NP3
ARRAY AREA: 361 SQFT

## 02 SYSTEM SUMMARY

GENERAL
1.1 EXISTING VENTS, SKYLIGHTS OR EXHAUST OUTLETS SHALL NOT BE COVERED BY THE SOLAR PV SYSTEM.
1.2 MODULES SHALL NOT OVERHANG ANY RIDGE, HIP OR ROOF EDGE.
1.3 CONTRACTOR SHALL NOTIFY ENGINEER/DESIGNER OF ANY CHANGES.
1.4 PANELS SHALL BE A MINIMUM OF 10IN AWAY FROM ROOF EDGE.

## 03 NOTES

AN ANALYSIS OF THE ROOF CONSTRUCTION AT THE REFERENCED PROPERTY WAS DONE AND IT HAS BEEN DETERMINED THAT THE STRUCTURE IS ADEQUATE TO SUPPORT THE ADDITIONAL SOLAR PV LOAD.

BASED ON OUR REVIEW, THE EXISTING MEMBERS COMPLY WITH IBC 2015/ ASCE 7-10 DESIGN SPAN RATINGS WITH SUFFICIENT CAPACITY TO SUPPORT THE NEW LOADS IMPOSED BY THE PROPOSED SOLAR ARRAY.

THE SPECIFICATIONS SHOWN IN THIS CONSTRUCTION PLAN WERE DESIGNED PER IBC 2015/ASCE 7-10 FOR A WIND SPEED OF 120 MPH, EXPOSURE CATEGORY B FOR RISK CATEGORY II BUILDING WITH 10 PSF SNOW LOAD.

## 04 STRUC. EVALUATION/CERTIFICATION

NORTH CAROLINA PROFESSIONAL SEAL 056354 ENGINEER MOHAMED SAID MAHMOUD

BRAD JORDAN

42 BRITISH LANE CAMERON NORTH CAROLINA 28326 UNITED STATES

PROJECT ID: 452024-42

CONTRACTOR:
LOTUS ENERGY & SOLAR
220 W MAIN ST, TAVARES, FL 32778
(407) 377-7437

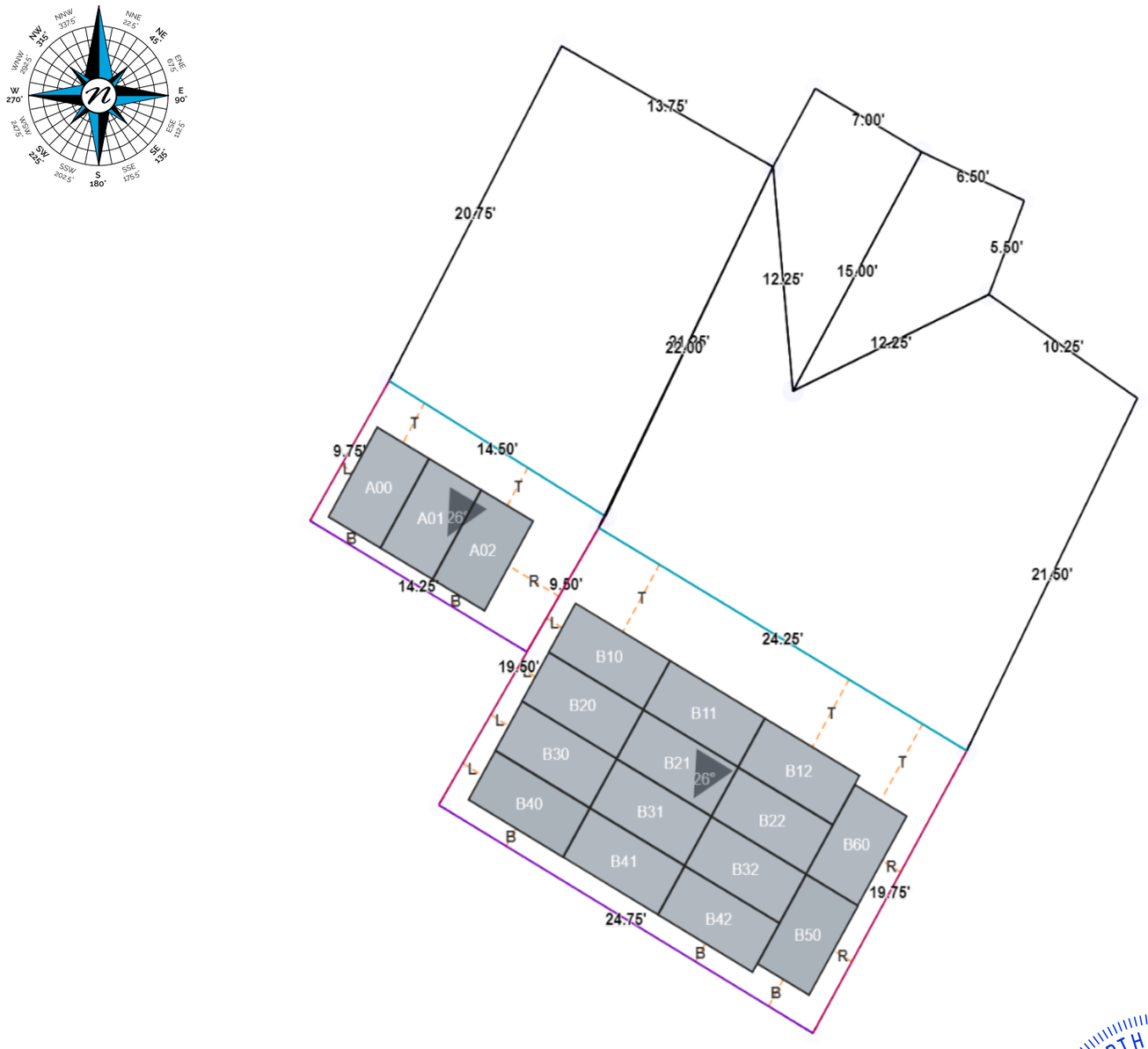
ENGINEER:
MOHAMED SAID MAHMOUD, PE
8340 LAKE WILLOW WAY,
ELK GROVE, CA 95758
MOHAMED SAID MAHMOUD
PE056354

| DATE | BY | VER | DESCRIPTION |
|---|---|---|---|
| 04.09.24 | RG | 1 | INITIAL DESIGN |

S1

PAPER: ARCHB

SCALE: 1"=7.63'



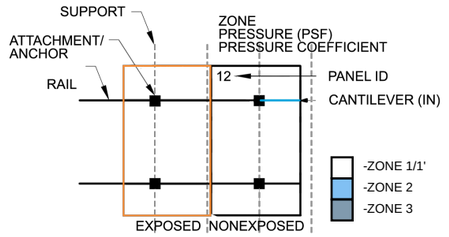

01 LOCATIONS PLAN

ARRAY OFFSETS

| PANEL ID | SIDE | DIM (ft) |
|---|---|---|
| A00 | T | 2.48 |
| A00 | B | 0.71 |
| A00 | L | 0.75 |
| A02 | T | 2.37 |
| A02 | R | 3.31 |
| A02 | B | 0.73 |
| B10 | T | 4.22 |
| B10 | L | 1.03 |
| B20 | L | 1.11 |
| B30 | L | 1.19 |
| B40 | B | 1.11 |
| B40 | L | 1.27 |
| B42 | B | 1.13 |
| B12 | T | 4.23 |
| B50 | R | 1.21 |
| B50 | B | 1.67 |
| B60 | T | 4.78 |
| B60 | R | 1.22 |

NORTH CAROLINA PROFESSIONAL SEAL 056354 ENGINEER MOHAMED SAID MAHMOUD

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BRAD JORDAN | CONTRACTOR: | ENGINEER: | | DATE | BY | VER | DESCRIPTION | SL1 |
| | LOTUS ENERGY & SOLAR | MOHAMED SAID MAHMOUD, PE | | 04.09.24 | RG | 1 | INITIAL DESIGN | |
| 42 BRITISH LANE CAMERON NORTH CAROLINA 28326 UNITED STATES | 220 W MAIN ST, TAVARES, FL 32778 | | | | | | | PAPER: ARCHB |
| | | 8340 LAKE WILLOW WAY, ELK GROVE, CA 95758 | MOHAMED SAID MAHMOUD PE056354 | | | | | SCALE: 1"=7.63' |
| PROJECT ID: 452024-42 | (407) 377-7437 | | | | | | | |




LEGEND

**ARRAY**
MODULE: (3) REC400NP3
TOTAL AREA: 63.74 SQFT

**HARDWARE**
RAIL: 21' IRONRIDGE-XR10
ATTACHMENT: (6) IRONRIDGE HUG-TRUSS
ANCHORAGE: RAFTER/TRUSS

**FRAMING**
SIZE: MIN. 2X4
SPACING: 24" OC

**ROOF**
MEAN HEIGHT: 15'
MATERIAL: SHINGLE
SHAPE: GABLE

**GEOGRAPHY**
EXPOSURE CAT: B
WIND SPEED: 120 MPH
SNOW LOAD: 10 LBS

PARAMETERS

**DEAD LOAD CALC**
LOADS:
Panel = 48lbs
Anchors = 1.2lbs
Rail = 0.72lbs/ft
Misc = 1.6lbs/panel

DEADLOAD PER ROW, Fdr:
Fdr = (lbs/panel*#panels/row) + (lbs/ft-rail*ft-rail/row)*2 + (lbs/anchor*#anchors/row) + (misc-lbs/panel*#panels/row) (lbf)

DIST DEADLOAD, Fdd:
Fdd = Fdr/(area/panel*#panels/row) (psf)

DEADLOAD PER ANCHOR, Fda:
Fda = Fdr/(#anchors/row) (lbs)

**COMPONENTS & CLADDING, 30 PT 1**
CRITERIA:
- Panels parallel to roof surface (within 2 deg)
- Max height of panel above roof, h1 & h2 OF 10"
- Min panel gap of 0.25"
- Min edge distance 2*h2
- Max panel chord length of 6.7'

UPLIFT ON ONE PANEL, Fup = P*A (lbf)
Per ASCE 2.4, 26.11-1 & 30.4
P = pasd = 0.6*p = 0.6*qh*(GCp-GCpi), A = load area

UPLIFT PER ROW, Fur = SUM(Fup(0):Fup(n)) (lbf)
Where Fup(0):Fup(n) = loads from first to last panel in row

UPLIFT PER ANCHOR, Fua = Fur/(#ANCHORS/ROW) (lbf)

LOAD PER ANCHOR, Fa = 0.6*Fda + Fua (lbf)

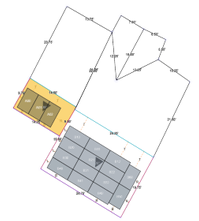
SAFETY FACTOR, SF = Ftest/Fa

VELOCITY PRESSURE qh = 0.00256*Kz*Kzt*Kd*V^2 = 18 (lb/sqft)
Where Kz = 0.57, Kzt = 1, Kd = 0.85, V = 120

EXT PRESSURE COEFFICIENT, GCp:
GCp varies per roof & zone, 30.4: Aeff = 21.25 sqft (1 panel)

LOAD CALCS PER IBC 2015/ASCE 7-10

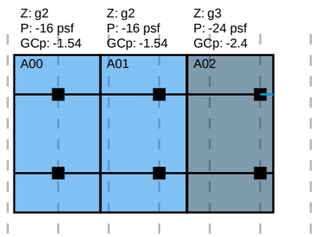
**ZONES**
f0: 1' (Flat)
f1: 1 (Flat)
f2: 2 (Flat)
f3: 3 (Flat)
g1: 1 (Gable)
g2: 2 (Gable)
g3: 3 (Gable)
h1: 1 (Hip)
h2: 2 (Hip)
h3: 3 (Hip)



0 TOF 100

PLANE A | AZ: 210° | P: 26° | TOF: 97%

**ROW: 0 (3 MODS)**
NOM SPAN: 48"
MAX SPAN: 66"
MAX CANTILEVER: 26"
UPLIFT/ROW, Fur: -1186 lbf
#ANCHORS: 6
LOAD/ANCHOR, Fa: -181 lbf
TEST LOAD/ANCHOR: -860 lbf
SF: 4.76
DIST LOAD, Fdd: 2.68 psf
POINT LOAD, Fda: 28.47 lbs
ROOF PITCH: 20-27 deg
PANEL TILT: 0 deg
AZIMUTH: 210 deg




01 ATTACHMENT PLAN



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PROJECT ID: 452024-42

CONTRACTOR:
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| DATE | BY | VER | DESCRIPTION |
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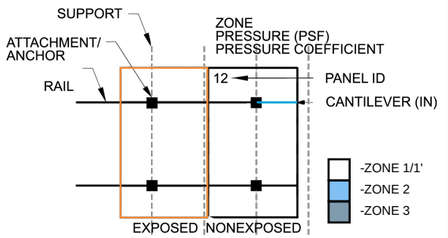
| 04.09.24 | RG | 1 | INITIAL DESIGN |

SP1

PAPER: ARCHB

SCALE:




LEGEND

**ARRAY**
MODULE: (14) REC400NP3
TOTAL AREA: 297.43 SQFT

**HARDWARE**
RAIL: 164' IRONRIDGE-XR10
ATTACHMENT: (42) IRONRIDGE HUG-TRUSS
ANCHORAGE: RAFTER/TRUSS

**FRAMING**
SIZE: MIN. 2X4
SPACING: 24" OC

**ROOF**
MEAN HEIGHT: 15'
MATERIAL: SHINGLE
SHAPE: GABLE

**GEOGRAPHY**
EXPOSURE CAT: B
WIND SPEED: 120 MPH
SNOW LOAD: 10 LBS

PARAMETERS

**DEAD LOAD CALC**
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UPLIFT PER ANCHOR, Fua = Fur/(#ANCHORS/ROW) (lbf)

LOAD PER ANCHOR, Fa = 0.6*Fda + Fua (lbf)

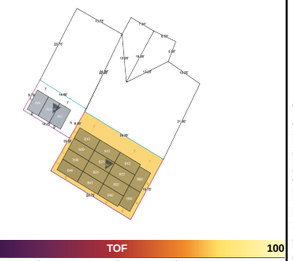
SAFETY FACTOR, SF = Ftest/Fa

VELOCITY PRESSURE qh = 0.00256*Kz*Kzt*Kd*V^2 = 18 (lb/sqft)
Where Kz = 0.57, Kzt = 1, Kd = 0.85, V = 120

EXT PRESSURE COEFFICIENT, GCp:
GCp varies per roof & zone, 30.4: Aeff = 21.25 sqft (1 panel)

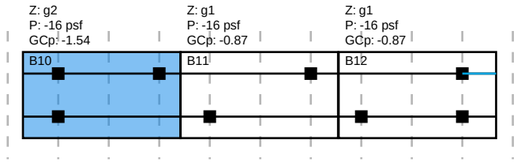
**ZONES**
f0: 1' (Flat)
f1: 1 (Flat)
f2: 2 (Flat)
f3: 3 (Flat)
g1: 1 (Gable)
g2: 2 (Gable)
g3: 3 (Gable)
h1: 1 (Hip)
h2: 2 (Hip)
h3: 3 (Hip)

LOAD CALCS PER IBC 2015/ASCE 7-10

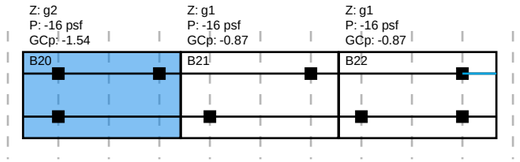



PLANE B | AZ: 210° | P: 26° | TOF: 97%

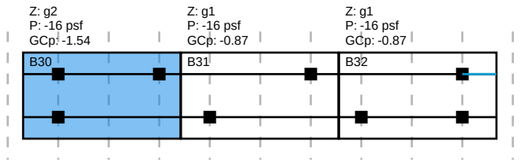
**ROW: 1 (3 MODS)**
NOM SPAN: 72"
MAX SPAN: 72"
MAX CANTILEVER: 32"
UPLIFT/ROW, Fur: -1020 lbf
#ANCHORS: 8
LOAD/ANCHOR, Fa: -114 lbf
TEST LOAD/ANCHOR: -860 lbf
SF: 7.57
DIST LOAD, Fdd: 2.91 psf
POINT LOAD, Fda: 23.17 lbs
ROOF PITCH: 20-27 deg
PANEL TILT: 0 deg
AZIMUTH: 210 deg



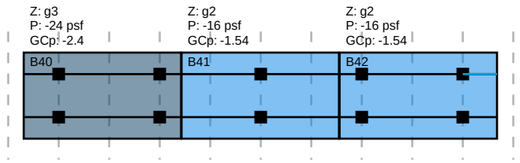

**ROW: 2 (3 MODS)**
NOM SPAN: 72"
MAX SPAN: 72"
MAX CANTILEVER: 32"
UPLIFT/ROW, Fur: -1020 lbf
#ANCHORS: 8
LOAD/ANCHOR, Fa: -114 lbf
TEST LOAD/ANCHOR: -860 lbf
SF: 7.57
DIST LOAD, Fdd: 2.91 psf
POINT LOAD, Fda: 23.17 lbs
ROOF PITCH: 20-27 deg
PANEL TILT: 0 deg
AZIMUTH: 210 deg



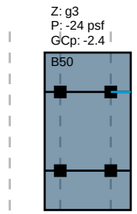

**ROW: 3 (3 MODS)**
NOM SPAN: 72"
MAX SPAN: 72"
MAX CANTILEVER: 32"
UPLIFT/ROW, Fur: -1020 lbf
#ANCHORS: 8
LOAD/ANCHOR, Fa: -114 lbf
TEST LOAD/ANCHOR: -860 lbf
SF: 7.57
DIST LOAD, Fdd: 2.91 psf
POINT LOAD, Fda: 23.18 lbs
ROOF PITCH: 20-27 deg
PANEL TILT: 0 deg
AZIMUTH: 210 deg



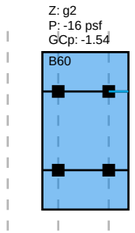

**ROW: 4 (3 MODS)**
NOM SPAN: 48"
MAX SPAN: 66"
MAX CANTILEVER: 26"
UPLIFT/ROW, Fur: -1186 lbf
#ANCHORS: 10
LOAD/ANCHOR, Fa: -107 lbf
TEST LOAD/ANCHOR: -860 lbf
SF: 8.01
DIST LOAD, Fdd: 2.95 psf
POINT LOAD, Fda: 18.78 lbs
ROOF PITCH: 20-27 deg
PANEL TILT: 0 deg
AZIMUTH: 210 deg




**ROW: 5 (1 MODS)**
NOM SPAN: 48"
MAX SPAN: 66"
MAX CANTILEVER: 26"
UPLIFT/ROW, Fur: -506 lbf
#ANCHORS: 4
LOAD/ANCHOR, Fa: -118 lbf
TEST LOAD/ANCHOR: -860 lbf
SF: 7.31
DIST LOAD, Fdd: 2.79 psf
POINT LOAD, Fda: 14.83 lbs
ROOF PITCH: 20-27 deg
PANEL TILT: 0 deg
AZIMUTH: 210 deg



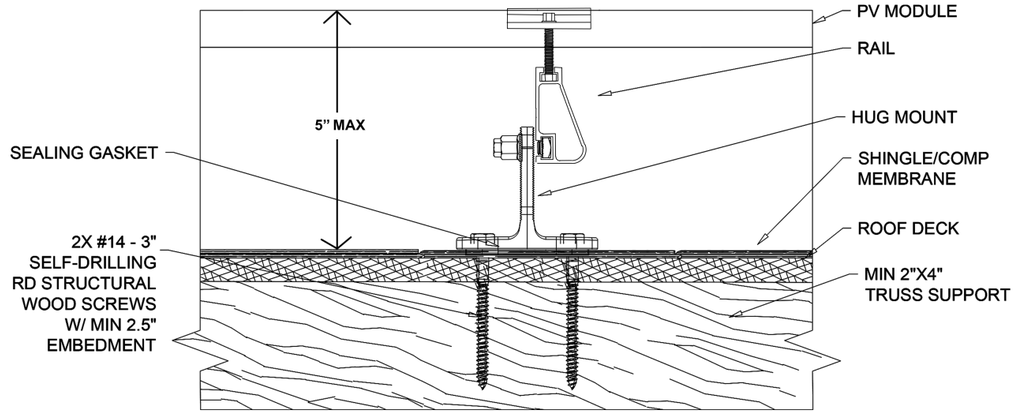

**ROW: 6 (1 MODS)**
NOM SPAN: 48"
MAX SPAN: 66"
MAX CANTILEVER: 26"
UPLIFT/ROW, Fur: -340 lbf
#ANCHORS: 4
LOAD/ANCHOR, Fa: -76 lbf
TEST LOAD/ANCHOR: -860 lbf
SF: 11.3
DIST LOAD, Fdd: 2.79 psf
POINT LOAD, Fda: 14.83 lbs
ROOF PITCH: 20-27 deg
PANEL TILT: 0 deg
AZIMUTH: 210 deg




## 01 ATTACHMENT PLAN



| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BRAD JORDAN | CONTRACTOR: | ENGINEER: | DATE | BY | VER | DESCRIPTION | SP2 |
| | LOTUS ENERGY & SOLAR | MOHAMED SAID MAHMOUD, PE | 04.09.24 | RG | 1 | INITIAL DESIGN | |
| 42 BRITISH LANE CAMERON NORTH CAROLINA 28326 UNITED STATES | 220 W MAIN ST, TAVARES, FL 32778 | | | | | | PAPER: ARCHB |
| | (407) 377-7437 | 8340 LAKE WILLOW WAY, ELK GROVE, CA 95758 | | | | | SCALE: |
| PROJECT ID: 452024-42 | | MOHAMED SAID MAHMOUD PE056354 | | | | | |

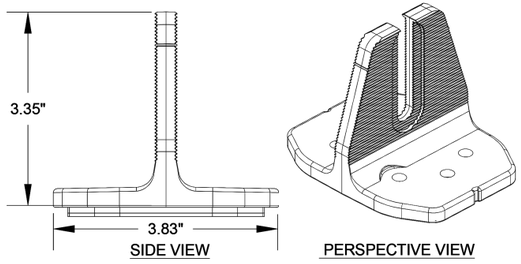



## 01 ANCHORAGE DETAIL

GENERAL

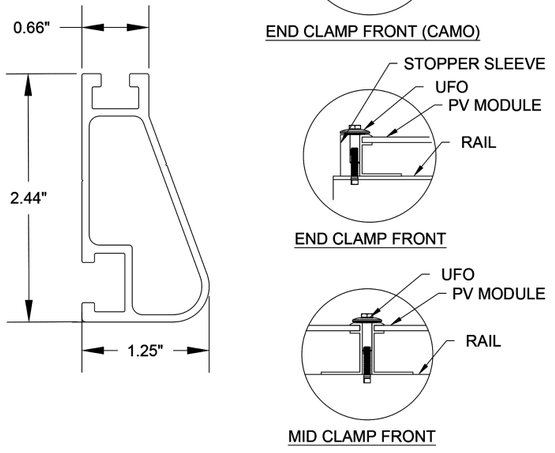
1.1 DESIGNED PER IBC 2015/ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.
1.2 CONTRACTOR IS RESPONSIBLE FOR INSTALLING PV MODULES, RACKING & RACKING SUPPORTS IN ACCORDANCE WITH THE MANUFACTURER INSTALLATION INSTRUCTIONS NOT SHOWN IN THIS PLAN.
1.3 WITHDRAWAL VALUES GIVEN PER NDS BASED ON SG OF 0.5 OR MANUFACTURER SUPPLIED 3RD PARTY UPLIFT TESTING REPORTS WITH APPLICABLE SAFETY FACTORS.
1.4 ALL PENETRATIONS SHALL BE FLASHED OR SEALED IN A MANNER THAT PREVENTS MOISTURE FROM ENTERING THE WALL AND ROOF USING ASTM C920 COMPLAINT SEALANT IN PILOT HOLES AND AROUND FASTENERS.
1.5 THE SUPPORTING ROOF STRUCTURE SHALL BE CONVENTIONAL WOOD FRAMED CONSTRUCTION WITH PRE-ENGINEERED TRUSSES OR ROOF FRAMING MEMBERS AT A SPACING OF 24 IN MAXIMUM ON CENTER.
1.6 EXISTING STRUCTURE IS ASSUMED TO BE IN COMPLIANCE WITH APPLICABLE BUILDING CODES AT THE TIME OF CONSTRUCTION.
1.7 CONTRACTOR SHALL NOTIFY ENGINEER OF ANY CONDITION CHANGES.

## 02 NOTES



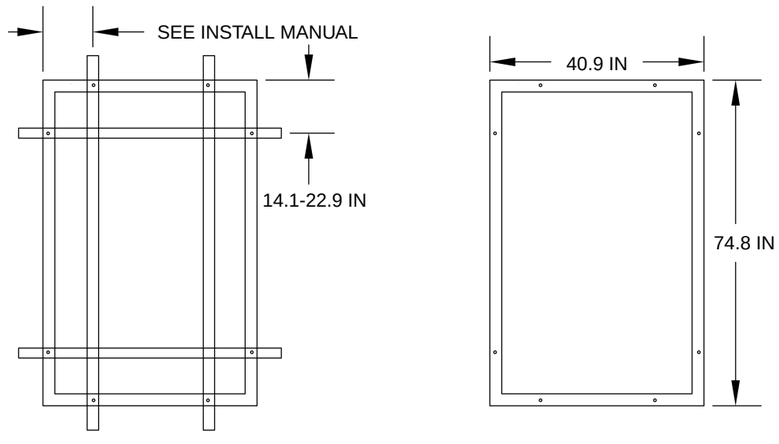

QM HALO ULTRAGRIP

## 03 ANCHOR DETAIL




IRONRIDGE XR-10 RAIL AND CLAMPS

## 04 RAIL & CLAMPS DETAIL




REC REC400NP3

## 05 MODULE DETAILS



| | | | |
|---|---|---|---|
| BRAD JORDAN | CONTRACTOR: LOTUS ENERGY & SOLAR | ENGINEER: MOHAMED SAID MAHMOUD, PE | |
| 42 BRITISH LANE CAMERON NORTH CAROLINA 28326 UNITED STATES | 220 W MAIN ST, TAVARES, FL 32778 | 8340 LAKE WILLOW WAY, ELK GROVE, CA 95758 | MOHAMED SAID MAHMOUD PE056354 |
| PROJECT ID: 452024-42 | (407) 377-7437 | | |

| DATE | BY | VER | DESCRIPTION |
|---|---|---|---|
| 04.09.24 | RG | 1 | INITIAL DESIGN |

SA1

PAPER: ARCHB

SCALE:

GENERAL
1.1 CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH IBC 2015/ASCE 7-10 AND NEC 2020 REQUIREMENTS AND EQUIPMENT INSTALLATION INSTRUCTIONS NOT SHOWN IN THIS PLAN.
1.2 ALL EQUIPMENT SHALL BE LISTED PER NEC 690.4(B).
1.3 PV SOURCE CONDUCTORS ARE SIZED BE EXPOSED TO DIRECT SUNLIGHT WHEN INSTALLED IN RACEWAYS 7/8" OR LESS ABOVE ROOF. ADJUSTMENTS ARE BASED ON MAX CURRENT OF 16A, 35C AMBIENT TEMP, NEC 310.15(B)(2) AND T310.15(B)(1).
1.4 ALL EQUIPMENT SHALL BE RATED FOR INSTALL LOCATION. ROOF & OUTDOOR JUNCTION BOXES SHALL BE OUTDOOR RATED
SYSTEM
2.1 THE OUTPUT VOLTAGE OF THE OPTIMIZERS ARE REGULATED BY THE INVERTER AND ARE NOT IMPACTED BY THE NUMBER OF MODULES IN THE SUB STRING. THE CONTINUOUS CURRENT OF A SINGLE STRING IS EQUAL TO THE MAXIMUM OUTPUT CURRENT OF THE OPTIMIZER.
2.2 THE INVERTER IS EQUIPPED WITH A RAPID SHUTDOWN FEATURE WHICH CONFORMS TO NEC 690.12 WITH SNAP RS DEVICES.
2.3 THE INVERTER IS NON-ISOLATED AND UNGROUNDED. NEITHER THE NEGATIVE NOR POSITIVE CONDUCTOR IS GROUNDED AND HAS A COMMON AC AND DC EQUIPMENT GROUNDING TERMINAL THEREFORE NO DC GEC IS REQUIRED.
2.4 UTILITY CONNECTION IS MADE ON THE SUPPLY SIDE AS PERMITTED BY 705.11 USING A BREAKER. NB LOADSIDE RULES OF 705.12(B) ARE NOT APPLICABLE.
2.5 INTEGRATED DC DISCONNECT AND AFCI IS PROVIDED WITH INVERTER.
GROUNDING
3.1 ALL EQUIPMENT SHALL BE PROPERLY GROUNDED PER THE REQUIREMENTS OF NEC ARTICLES 250 & 690.
3.2 FRAMED PV MODULES SHALL BE BONDED TOGETHER USING LUGS OR RACKING INTEGRATED GROUNDING CLAMPS.
3.3 EQUIPMENT GROUNDING SHALL BE INSTALLED PER NEC 250.120(C), SIZED PER 690.45 & BE A MINIMUM OF #6 WHEN EXPOSED TO DAMAGE.
3.4 INTERSYSTEM BONDING DEVICE REQUIRED AT SERVICE WHEN COMMUNICATION DEVICES ARE PRESENT PER 250.94.
3.5 EXISTING GROUNDING ELECTRODE SYSTEM (GES) SHALL COMPLY WITH 250.64, 250.53 & 250.62 & BE OF THE TYPES & SIZE LISTED IN 250.52.
3.6 EXISTING GROUNDING ELECTRODE SYSTEM (GES) SHALL BE SIZED PER 250.66 & T250.66 (FIELD VERIFY).
3.7 METAL WATER PIPES SHALL BE GROUNDED PER 250.104(A)

## 01 NOTES

## 02 MODULE RATINGS

| | |
|---|---|
| **MAKE** | REC |
| **MODEL** | REC400NP3 |
| **RATED POWER (W)** | 400 |
| **MPP VOLTAGE (V)** | 37.6 |
| **MPP CURRENT (A)** | 10.64 |
| **OC VOLTAGE (V)** | 45 |
| **SC CURRENT (A)** | 11.39 |

## 03 OPTIMIZER RATINGS

| | |
|---|---|
| **MAKE** | GENERAC |
| **MODEL** | PV LINK |
| **MPP VOLTAGE** | 60-360 |
| **MAX INPUT VOLTAGE (V)** | 420 |
| **MAX SC CURRENT (A)** | 18 |
| **MAX OUTPUT CURRENT (A)** | 8 |
| **RATED POWER (W)** | 2500 |

## 04 INVERTER RATINGS

| | |
|---|---|
| **MAKE** | GENERAC |
| **MODEL** | PWRCELL 7.6 |
| **MAX INPUT POWER (W)** | 11800 |
| **MAX INPUT VOLTAGE (V)** | 420 |
| **NOM INPUT VOLTAGE (V)** | 380 |
| **MAX INPUT CURRENT (A)** | 30 |
| **NOM AC VOLTAGE (V)** | 240 |
| **MAX AC CURRENT (A)** | 32 |
| **NOM AC POWER (W)** | 7600 |

## 05 SYSTEM

| | |
|---|---|
| **# PV MODULES** | 17 |
| **STC DC RATING (KW)** | 6.8 |
| **AC OUTPUT RATING (KW)** | 7.6 |
| **# SUBSTRINGS** | 3 |
| **MIN-MAX SUBSTRing SIZE** | 2-7 |
| **DC/AC RATIO** | 0.89 |
| **MPP CURRENT (A)** | 17.89 |

| | |
|---|---|
| **PV0** | (N) PWRCELL 7.6 |
| **PV1** | (E) 200A, MLO METER-MAIN PNL |
| **PV2** | (N) MIN 60A, MANUAL AC DISC |
| | |
| | |
| | |
| | |

| ID | RUN | VOLTAGE(V) | CURRENT(A) | VD(%) | LEN(FT) | CONDUCTOR | SIZE | OHM/KFT | CONDUIT | MIN SIZE | #CCC | EGC | OCPD(A) | TERM(C) | TEMP FAC | FILL FAC | BASE AMP | ADJ AMP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | STR-JBOX | 380 | 8 | 1 | 191 | PV WIRE | #10 | 1.24 | FREE AIR | NA | 2 | #6 | NA | 75 | 0.96 | 1 | 35 | 35 |
| B | JBOX-INV | 380 | 8 | 1 | 191 | THHN/THWN-2 | #10 | 1.24 | EMT/FMC | 3/4" | 2 | #10 | NA | 75 | 0.96 | 1 | 35 | 35 |
| C | INV-DISC | 240 | 32 | 1 | 48 | THHN/THWN-2 | #8 | 0.778 | PVC/EMT/FMC/NMLT | 3/4" | 3 | #10 | 40 | 75 | 0.96 | 1 | 50 | 50 |
| D | DISC-PCC | 240 | 32 | 1 | 76 | THHN/THWN-2 | #6 | 0.491 | PVC/EMT/FMC/NMLT | 3/4" | 3 | #10 | 60 | 75 | 0.96 | 1 | 65 | 65 |

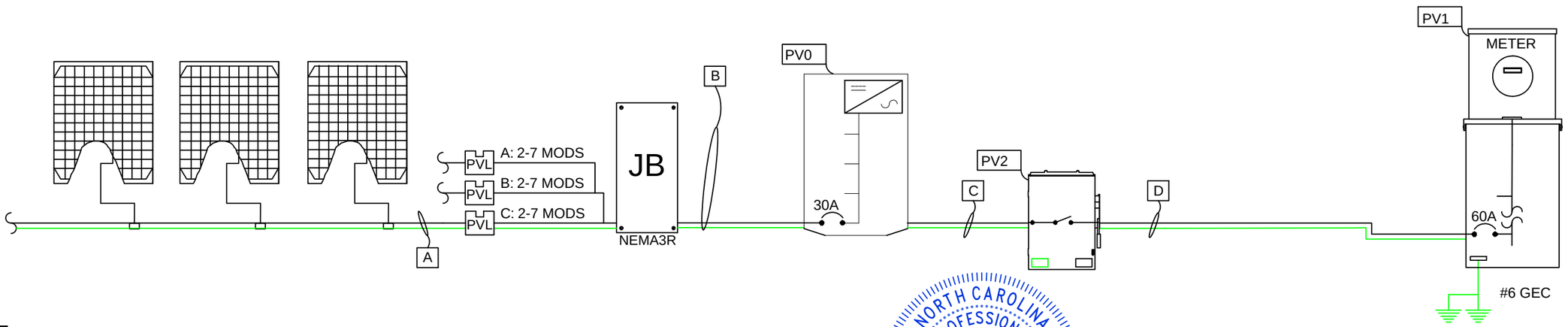
## 06 CONDUCTOR SCHEDULE

## 07 EQUIPMENT SCHEDULE

ENTRANCE:
UNDERGROUND

SERVICE WIRE SIZING

| | | |
|---|---|---|
| SIZE: | 200A | PVC/EMT |
| CU | #2/0 | 1-1/2" |




## 08 ELECTRICAL LINE DIAGRAM

NORTH CAROLINA PROFESSIONAL SEAL 056354 ENGINEER MOHAMED SAID MAHMOUD

BRAD JORDAN

42 BRITISH LANE CAMERON NORTH CAROLINA 28326 UNITED STATES

PROJECT ID: 452024-42

CONTRACTOR:
LOTUS ENERGY & SOLAR
220 W MAIN ST, TAVARES, FL 32778
(407) 377-7437

ENGINEER:
MOHAMED SAID MAHMOUD, PE
8340 LAKE WILLOW WAY,
ELK GROVE, CA 95758
MOHAMED SAID MAHMOUD
PE056354

| DATE | BY | VER | DESCRIPTION |
|---|---|---|---|
| 04.09.24 | RG | 1 | INITIAL DESIGN |

E1

PAPER: ARCHB

SCALE:

**WARNING**

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

NEC 690.13(B)
LOCATION(S): 3, 4

**PHOTOVOLTAIC DISCONNECT**

NEC 690.13(B)
LOCATION(S): 3, 4

**WARNING: PHOTOVOLTAIC POWER SOURCE**

NFPA 1 11.12.2.1.3, NEC 690.31(G)(3)
LOCATION(S): 1, 2

**CAUTION**
POWER TO THIS BUILDING IS ALSO SUPPLIED BY SOLAR PANLES WITH DISCONNECTS CO-LOCATED WITH METER

NFPA 1 11.12.2.1.4
LOCATION(S): 4, 5

SYSTEM SERVICED BY:
LOTUS ENERGY & SOLAR
(407) 377-7437

NFPA 1 11.12.2.1.5, NEC 690.56(B), 705.10
LOCATION(S): 5

**RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM**

NFPA 1 11.12.2.1.1.6, NEC 690.56(C)(3)
LOCATION(S): 4

**WARNING: DUAL POWER SOURCE**
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

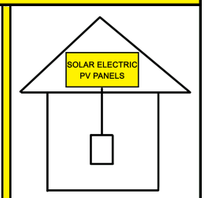
NEC 705.12(B)(3)
LOCATION(S): 5

| | | |
|---|---|---|
| MAXIMUM VOLTAGE | | V |
| MAXIMUM CIRCUIT CURRENT | | A |

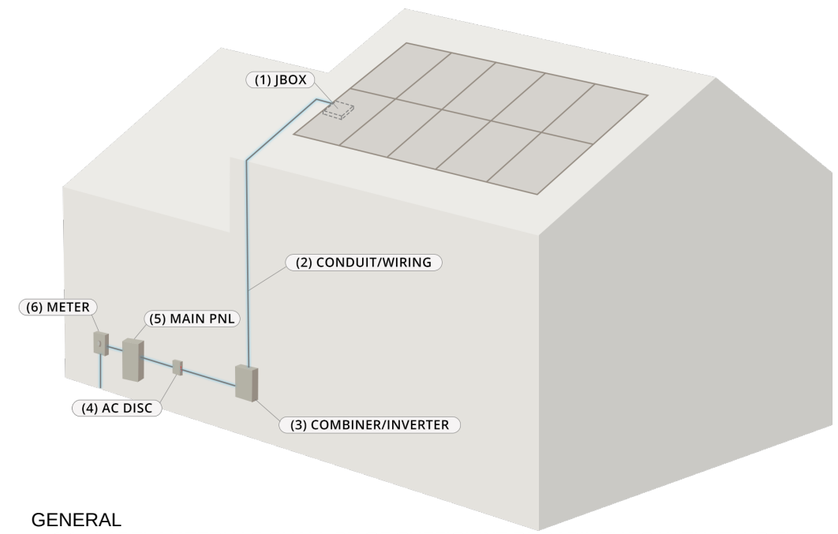
NEC 690.54
LOCATION(S): 5

**SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN**

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



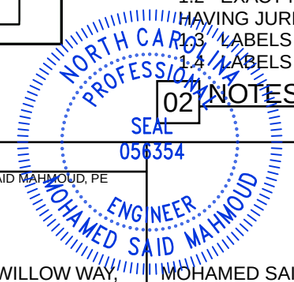

NFPA 1 11.12.2.1.1.1, NEC 690.56(C)(1)
LOCATION(S): 5




GENERAL
1.1 LABEL MATERIALS SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT, NEC 110.21(B)(3).
1.2 EXACT MATERIALS USED ARE SUBJECT TO THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
1.3 LABELS SHALL BE A MINIMUM LETTER HEIGHT OF 3/8" AND PERMANENTLY AFFIXED.
1.4 LABELS WILL BE REFLECTIVE AND MEET THE REQUIREMENTS OF NFPA 1-11.12.2.1.1.2

01 LABELS

02 NOTES




BRAD JORDAN

42 BRITISH LANE CAMERON NORTH CAROLINA 28326 UNITED STATES

PROJECT ID: 452024-42

CONTRACTOR:
LOTUS ENERGY & SOLAR
220 W MAIN ST, TAVARES, FL 32778
(407) 377-7437

ENGINEER:
MOHAMED SAID MAHMOUD, PE
8340 LAKE WILLOW WAY, ELK GROVE, CA 95758
MOHAMED SAID MAHMOUD PE056354

| DATE | BY | VER | DESCRIPTION |
|---|---|---|---|
| 04.09.24 | RG | 1 | INITIAL DESIGN |

EL1

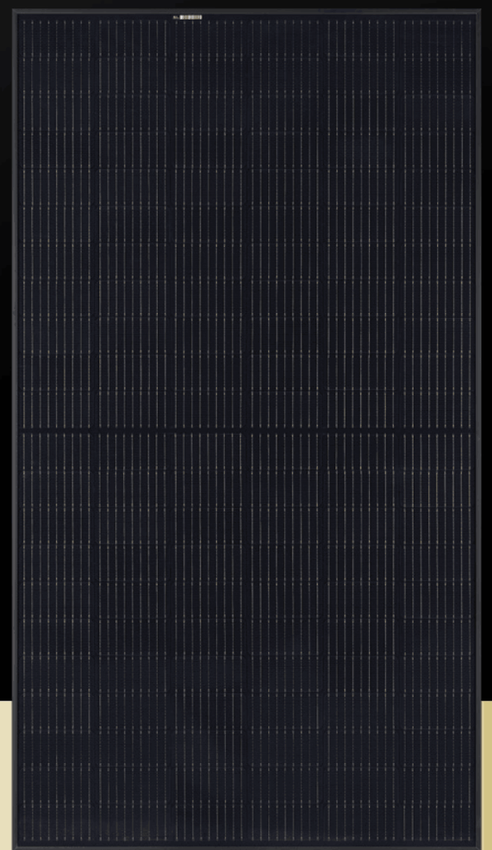
PAPER: ARCHB

SCALE:

SOLAR'S MOST TRUSTED REC

# REC N-PEAK 3 BLACK SERIES

## PREMIUM FULL BLACK MONO N-TYPE SOLAR PANELS



MONO N-TYPE: THE MOST EFFICIENT C-SI TECHNOLOGY

NO LIGHT INDUCED DEGRADATION

SUPER-STRONG FRAME UP TO 7000 PA SNOW LOAD

FLEXIBLE INSTALLATION OPTIONS

FEATURING REC'S PIONEERING TWIN DESIGN

BIFACIAL CELLS CAN PRODUCE ENERGY FROM BOTH SIDES

400 WP POWER

PRODUCT REC 25 YEAR PROTRUST WARRANTY PERFORMANCE LABOR

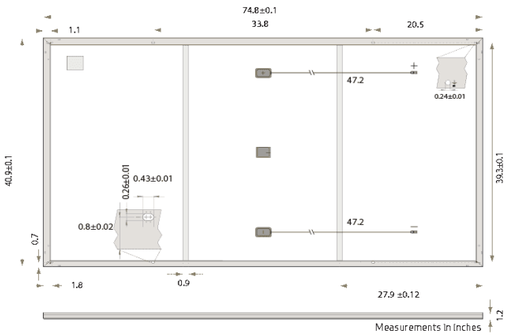
ELIGIBLE

REC
SOLAR'S MOST TRUSTED

# REC N-PEAK 3 BLACK SERIES
## PRODUCT SPECIFICATIONS

### GENERAL DATA

| | |
|---|---|
| Cell type: | 132 half-cut mono c-Si n-type cells 6 strings of 22 cells in series |
| Glass: | 0.13 in solar glass with anti-reflective surface treatment In accordance with EN 12150 |
| Backsheet: | Highly resistant polymer (black) |
| Frame: | Anodized aluminum (black) with silver support bars |
| Junction box: | 3-part, 3 bypass diodes, lead-free IP68 rated, in accordance with IEC 62790 |
| Connectors: | Stäubli MC4 PV-KBT4/KST4 (12 AWG) In accordance with IEC 62852, IP68 only when connected |
| Cable: | 12 AWG PV wire, 47.2 + 47.2 in In accordance with EN 50618 |
| Dimensions: | 74.8 x 40.9 x 1.2 in (19.7 sq-ft) |
| Weight: | 48.0 lbs |
| Origin: | Made in Singapore |




### ELECTRICAL DATA — Product Code*: RECxxxNP3 Black

| | | |
|---|---|---|
| STC | Power Output - $P_{MAX}$ (Wp) | 390 / 400 |
| | Watt Class Sorting - (W) | 0/+10 / 0/+10 |
| | Nominal Power Voltage - $V_{MPP}$ (V) | 36.8 / 37.6 |
| | Nominal Power Current - $I_{MPP}$ (A) | 10.60 / 10.64 |
| | Open Circuit Voltage - $V_{OC}$ (V) | 44.8 / 45.0 |
| | Short Circuit Current - $I_{SC}$ (A) | 11.31 / 11.39 |
| | Panel Efficiency (%) | 19.5 / 20.3 |
| NMOT | Power Output - $P_{MAX}$ (Wp) | 295 / 302 |
| | Nominal Power Voltage - $V_{MPP}$ (V) | 34.4 / 35.2 |
| | Nominal Power Current - $I_{MPP}$ (A) | 8.56 / 8.59 |
| | Open Circuit Voltage - $V_{OC}$ (V) | 41.9 / 42.1 |
| | Short Circuit Current - $I_{SC}$ (A) | 9.13 / 9.20 |

Values at standard test conditions (STC: air mass AM 1.5, irradiance 1000 W/m², temperature 25°C), based on a production spread with a tolerance of $P_{MAX}$, $V_{OC}$ & $I_{SC}$ ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM 1.5, irradiance 800 W/m², temperature 20°C, windspeed 1 m/s). *Where xxx indicates the nominal power class ($P_{MAX}$) at STC above.

### CERTIFICATIONS

| | |
|---|---|
| IEC 61215:2016, IEC 61730:2016, UL 61730 | |
| IEC 62804 | PID |
| IEC 61701 | Salt Mist |
| IEC 62716 | Ammonia Resistance |
| UL 61730 | Fire Type Class 2 |
| UL 790 | Fire Class Type C |
| IEC 62782 | Dynamic Mechanical Load |
| IEC 61215-2:2016 | Hailstone (1.37in) |

ISO 14001, ISO 9001, IEC 45001, IEC 62941

### TEMPERATURE RATINGS*

| | |
|---|---|
| Nominal Module Operating Temperature: | 44.3°C (±2°C) |
| Temperature coefficient of $P_{MAX}$: | -0.34 %/°C |
| Temperature coefficient of $V_{OC}$: | -0.26 %/°C |
| Temperature coefficient of $I_{SC}$: | 0.04 %/°C |

*The temperature coefficients stated are linear values

### MAXIMUM RATINGS

| | |
|---|---|
| Operational temperature: | -40 ... +185°F |
| Maximum system voltage: | 1000 V |
| Maximum test load (front): | +7000 Pa (146 lbs/sq-ft)* |
| Maximum test load (rear): | - 4000 Pa (83.5 lbs/sq-ft)* |
| Max series fuse rating: | 25 A |
| Max reverse current: | 25 A |

* See Installation manual for mounting instructions. Design load = Test load / 1.5 (safety factor)

### WARRANTY

| | Standard | REC ProTrust | |
|---|---|---|---|
| Installed by an REC Certified Solar Professional | No | Yes | Yes |
| System Size | All | <25 kW | 25-500 kW |
| Product Warranty (yrs) | 20 | 25 | 25 |
| Power Warranty (yrs) | 25 | 25 | 25 |
| Labor Warranty (yrs) | 0 | 25 | 10 |
| Power in Year 1 | 98% | 98% | 98% |
| Annual Degradation | 0.25% | 0.25% | 0.25% |
| Power in Year 25 | 92% | 92% | 92% |

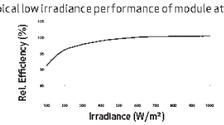
The REC ProTrust Warranty is only available on panels purchased through an REC Certified Solar Professional Installer. Warranty conditions apply. See www.recgroup.com for more details.

### DELIVERY INFORMATION

| | |
|---|---|
| Panels per pallet: | 33 |
| Panels per 40 ft GP/high cube container: | 792 (24 pallets) |
| Panels per 53 ft truck: | TBD |

### LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC:




Available from:

Founded in 1996, REC Group is an international pioneering solar energy company dedicated to empowering consumers with clean, affordable solar power. As Solar's Most Trusted, REC is committed to high quality, innovation, and a low carbon footprint in the solar materials and solar panels it manufactures. Headquartered in Norway with operational headquarters in Singapore, REC also has regional hubs in North America, Europe, and Asia-Pacific.

REC Solar PTE. LTD.
20 Tuas South Ave. 14
Singapore 637312
post@recgroup.com

REC
www.recgroup.com

Specifications subject to change without notice.

Ref: Rev 3 - 02.23



| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BRAD JORDAN | CONTRACTOR: | ENGINEER: | | DATE | BY | VER | DESCRIPTION | D1 |
| | LOTUS ENERGY & SOLAR | MOHAMED SAID MAHMOUD, PE | | 04.09.24 | RG | 1 | INITIAL DESIGN | |
| 42 BRITISH LANE CAMERON NORTH CAROLINA 28326 UNITED STATES | LOTUS ENERGY & SOLAR 220 W MAIN ST, TAVARES, FL 32778 | | | | | | | PAPER: ARCHB |
| | (407) 377-7437 | 8340 LAKE WILLOW WAY, ELK GROVE, CA 95758 | MOHAMED SAID MAHMOUD PE056354 | | | | | SCALE: |
| PROJECT ID: 452024-42 | | | | | | | | |

REC Solar Pte. Ltd.
20 Tuas South Avenue 14
Singapore 637312
Tel: +65 6495 9228 Fax: +65 6495 9052
Company registration number: 200723409E
www.recgroup.com

**IronRidge Inc.**
28357 Industrial Boulevard
Hayward, CA 94545

Singapore, January 12, 2023
REC Reference Number: IDR-23002

To whom it may concern,

**Special approval for the installation of REC N-Peak 3 Black series solar panels using Iron Ridge UFO clamp on Flush, Tilt, and Ground Mount System**

REC herewith grants approval for REC N-Peak 3 Black series solar panels to be installed using Iron Ridge UFO clamp on Flush, Tilt, and Ground Mount System according to the specifications in the table below and in **Appendix A** and **B:**

- The rails are parallel to short side of the panel and clamped on the long side of the frame between 390 and 580 mm from the corner.
- The UFO (Universal Fastening Object) clamp torque value is no less than 80 in-lbs (~9 Nm).
- The panels are not subjected to test loads more than +/- 5400 Pa.

| **Module** | **Mounting Configuration** | **Maximum Allowed Test Load** | **Design Load** (Safety factor of 1.5) |
|---|---|---|---|
| **REC N-Peak 3 Black series** | Clamp mounted on the long side of the frame as represented in **Appendix B** | +/- 5400 Pa | +/- 3600 Pa |

The terms and conditions as stated in the REC Limited Product Warranty Certificate and REC Installation Manual that are not addressed in this approval remain valid.

Best regards,
REC Solar Pte. Ltd.

Kay Hwa Wee
Chief Operating Officer



REC Solar Pte. Ltd.
20 Tuas South Avenue 14
Singapore 637312
Tel: +65 6495 9228 Fax: +65 6495 9052
Company registration number: 200723409E
www.recgroup.com

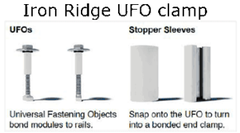
**Appendix A:**

Iron Ridge Flush Mount System


Iron Ridge Ground Mount System

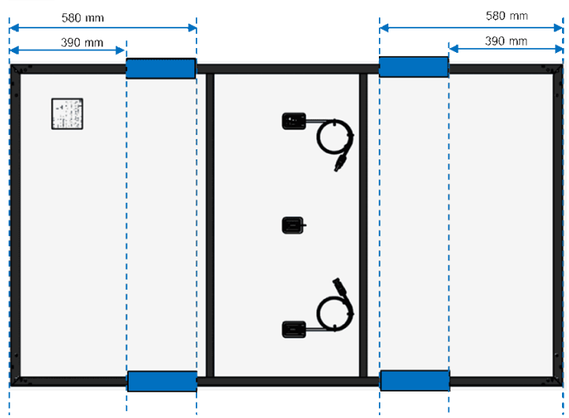

Iron Ridge Tilt Mount System


Iron Ridge UFO clamp




**Appendix B:**

Mounting configuration of REC N-Peak 3 Black series solar panels using Iron Ridge UFO clamp on Flush, Tilt and Ground Mount System.






| | | | | | | | |
|---|---|---|---|---|---|---|---|
| BRAD JORDAN | CONTRACTOR: LOTUS ENERGY & SOLAR | ENGINEER: MOHAMED SAID MAHMOUD, PE | | DATE | BY | VER | DESCRIPTION |
| 42 BRITISH LANE CAMERON NORTH CAROLINA 28326 UNITED STATES | 220 W MAIN ST, TAVARES, FL 32778 | | | 04.09.24 | RG | 1 | INITIAL DESIGN |
| PROJECT ID: 452024-42 | (407) 377-7437 | 8340 LAKE WILLOW WAY, ELK GROVE, CA 95758 | MOHAMED SAID MAHMOUD PE056354 | | | | |

D2

PAPER: ARCHB

SCALE:

**FEATURES:**

No autotransformer or battery inverter needed

User-selectable modes

Free system monitoring


GENERAC

# PWRCELL

Inverter
Model: X7602, X11402

Solar-plus-storage is simple with the Generac PWRcell Inverter. This bi-directional, REbus™-powered inverter offers a simple, efficient design for integrating smart batteries with solar. Ideal for self-supply, backup power, zero-export and energy cost management, the PWRcell inverter is the industry's most feature-rich line of inverters, available in single-phase and three-phase models.

## ADDITIONAL FEATURES

- Single inverter for grid-tied solar with smart battery integration
- Simplified system design: No autotransformer or battery inverter needed
- User-selectable modes for backup power, self-supply, time-of-use and zero-export
- Free system monitoring included via PWRview Web Portal and Mobile App

| AC OUTPUT/ GRID-TIE | MODEL X7602 | MODEL X11402 |
|---|---|---|
| RATED AC POWER OUTPUT | 7600 W | 11400 W |
| AC OUTPUT VOLTAGE | 120/240, 1Ø VAC | 120/208, 3Ø VAC |
| AC FREQUENCY | 60 Hz | 60 Hz |
| MAXIMUM CONTINUOUS OUTPUT CURRENT | 32 A, RMS | 32 A, RMS |
| GROUND-FAULT ISOLATION DETECTION | Included | Included |
| CHARGE BATTERY FROM AC | Yes | Yes |
| THD (CURRENT) | < 2 % | < 2 % |
| TYPICAL NIGHTTIME POWER CONSUMPTION | < 7 W | < 7 W |

| AC OUTPUT/ BACKUP | MODEL X7602 | MODEL X11402 |
|---|---|---|
| RATED AC BACKUP POWER OUTPUT | 8000 W | 8000 W |
| MAXIMUM AC BACKUP POWER OUTPUT | 12000 W | 12000 W |
| AC BACKUP OUTPUT VOLTAGE | 120/240, 1Ø VAC | 120/240, 1Ø VAC |
| AC FREQUENCY | 60 HZ | 60 HZ |
| AC CIRCUIT BREAKER | 50 A | 50 A |
| THD (VOLTAGE) | < 2 % | < 2 % |
| AUTOMATIC SWITCHOVER TIME | < 1 Seconds | < 1 Seconds |
| TYPICAL NIGHTTIME POWER CONSUMPTION | 30 W | 30 W |

| DC INPUT | MODEL X7602 | MODEL X11402 |
|---|---|---|
| DC INPUT VOLTAGE RANGE | 360-420 VDC | 360-420 VDC |
| NOMINAL DC BUS VOLTAGE | 380 VDC | 380 VDC |
| MAX INPUT CURRENT | 20 A | 30 A |
| REVERSE-POLARITY PROTECTION | YES | YES |
| GROUND-FAULT ISOLATION DETECTION | YES | YES |
| TRANSFORMERLESS, UNGROUNDED | YES | YES |

| DC INPUT/ BATTERY | MODEL X7602 | MODEL X11402 |
|---|---|---|
| MAXIMUM CONTINUOUS POWER | 8000 W | 8000 W |
| INTERNAL DC DISTRIBUTION BREAKERS | 4X 2P30A | 4X 2P30A |
| DC FUSES ON PLUS AND MINUS | 40 A | 40 A |
| 2-POLE DISCONNECTION | YES | YES |

| EFFICIENCY | MODEL X7602 | MODEL X11402 |
|---|---|---|
| PEAK EFFCIENCY | 97 % | 98 % |
| CEC WEIGHTED EFFCIENCY | 96.5 % | 97.5 % |

GENERAC

Generac Power Systems, Inc.
S45 W29290 Hwy. 59, Waukesha, WI 53189
www.Generac.com 1-888-GENERAC (1-888-436-3722)

# Specifications

| FEATURES AND MODES | |
|---|---|
| ISLANDING[3] | Yes |
| GRID SELL | Yes |
| SELF CONSUMPTION | Yes |
| PRIORITIZED CHARGING FROM RENEWABLES | Yes |
| GRID SUPPORT - ZERO EXPORT | Yes |

| ADDITIONAL FEATURES | |
|---|---|
| SUPPORTED COMMUNICATION INTERFACES | CANbus, RS4854, Ethernet |
| SYSTEM MONITORING | PWRview Web Portal and Mobile App |
| CRITICAL LOADS DISCONNECT[3] | Yes |
| MANUAL INVERTER BYPASS SWITCH | Automatic |
| WARRANTY | 10 Years |

| STANDARDS COMPLIANCE | |
|---|---|
| SAFETY | UL1741 SA, CSA 22.2 |
| GRID CONNECTION STANDARDS | IEEE1547, Rule 21, Rule 14H |
| EMISSIONS | FCC part15 class B |

| DIMENSIONS AND INSTALLATION SPECIFICATIONS | |
|---|---|
| WIRE GAUGE RANGE | 10 - 8 AWG |
| TOTAL AC KNOCKOUTS X SIZE | 2" x 0.75", 2 x 1" |
| TOTAL DC KNOCKOUTS X SIZE | 5" x 1" |
| DIMENSIONS (L,W,H) | 24.5" x 19.25" x 8" |
| WEIGHT | 62.7 lb |
| COOLING | Forced convection |
| NOISE | < 40 dBA |
| OPERATING TEMPERATURE | -20 to 50 °C* |
| PROTECTION RATING | NEMA 3R |

| INSTALLATION GUIDELINES | |
|---|---|
| BATTERY TYPES SUPPORTED | PWRcell battery module |
| MODULE STRING SIZE PER PV LINK OPTIMIZER | 2-9 PV modules |
| MAXIMUM RECOMMENDED DC POWER FROM PV | 10kW (1Ø), 15kW (3Ø) |
| BATTERIES PER INVERTER | Up to 2 |

[3] 3Ø inverters offer islanding for 1Ø loads, [4] Modbus,
*Reduced power at extreme temperatures

*Specifications subject to change without notice.*

GENERAC

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S45 W29290 Hwy. 59, Waukesha, WI 53189
www.Generac.com 1-888-GENERAC (1-888-436-3722)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| BRAD JORDAN | CONTRACTOR: LOTUS ENERGY & SOLAR | ENGINEER: MOHAMED SAID MAHMOUD, PE | | DATE | BY | VER | DESCRIPTION |
| 42 BRITISH LANE CAMERON NORTH CAROLINA 28326 UNITED STATES | 220 W MAIN ST, TAVARES, FL 32778 | | | 04.09.24 | RG | 1 | INITIAL DESIGN |
| PROJECT ID: 452024-42 | (407) 377-7437 | 8340 LAKE WILLOW WAY, ELK GROVE, CA 95758 | MOHAMED SAID MAHMOUD PE056354 | | | | |

D3

PAPER: ARCHB

SCALE:

Tech Brief

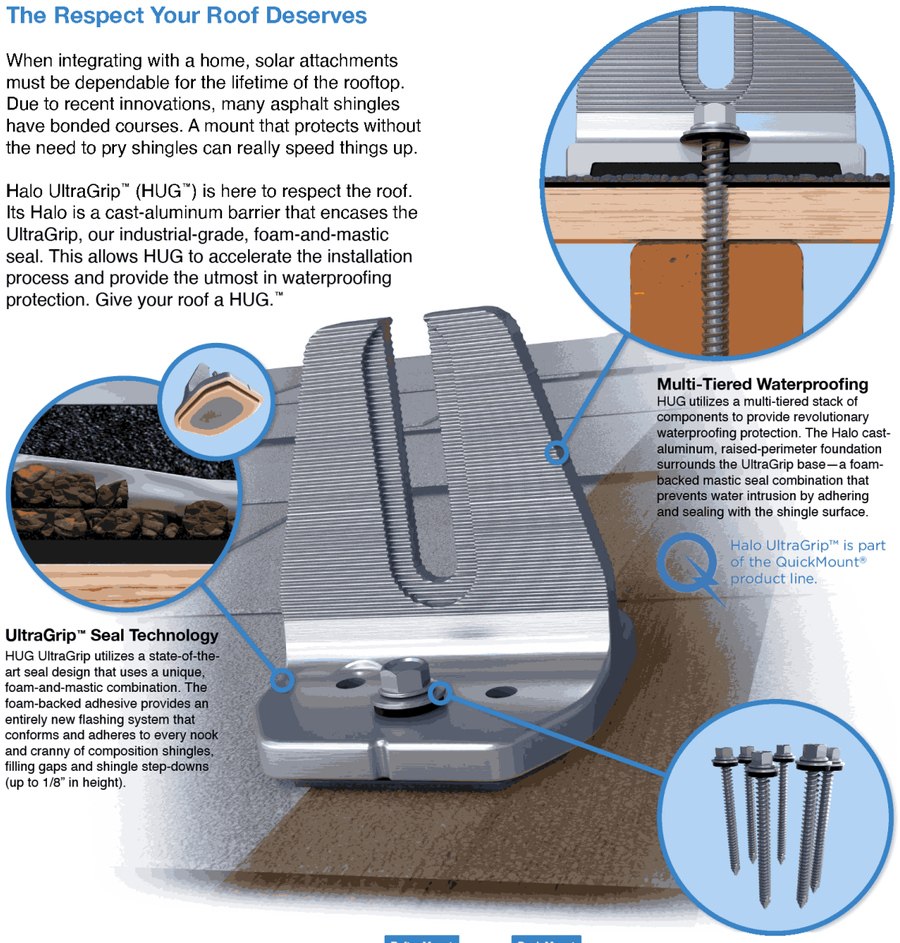
IRONRIDGE

QuickMount® HUG

## The Respect Your Roof Deserves

When integrating with a home, solar attachments must be dependable for the lifetime of the rooftop. Due to recent innovations, many asphalt shingles have bonded courses. A mount that protects without the need to pry shingles can really speed things up.

Halo UltraGrip™ (HUG™) is here to respect the roof. Its Halo is a cast-aluminum barrier that encases the UltraGrip, our industrial-grade, foam-and-mastic seal. This allows HUG to accelerate the installation process and provide the utmost in waterproofing protection. Give your roof a HUG.™



**Multi-Tiered Waterproofing**
HUG utilizes a multi-tiered stack of components to provide revolutionary waterproofing protection. The Halo cast-aluminum, raised-perimeter foundation surrounds the UltraGrip base—a foam-backed mastic seal combination that prevents water intrusion by adhering and sealing with the shingle surface.

Halo UltraGrip™ is part of the QuickMount® product line.

**UltraGrip™ Seal Technology**
HUG UltraGrip utilizes a state-of-the-art seal design that uses a unique, foam-and-mastic combination. The foam-backed adhesive provides an entirely new flashing system that conforms and adheres to every nook and cranny of composition shingles, filling gaps and shingle step-downs (up to 1/8" in height).



**Rafter & Deck Mounting Options**
Mount HUG to the roof rafters, the roof deck, or both with our custom-engineered RD (rafter-or-deck) Structural Screw. The RD Structural Screw anchors HUG to the roof with an EPDM sealing washer, completing the stack of waterproofing barriers. See backside for more installation information.

**Triple Rated & Certified to Respect the Roof™**
UL 2703, 441 (27)
TAS 100(A)-95

Intertek

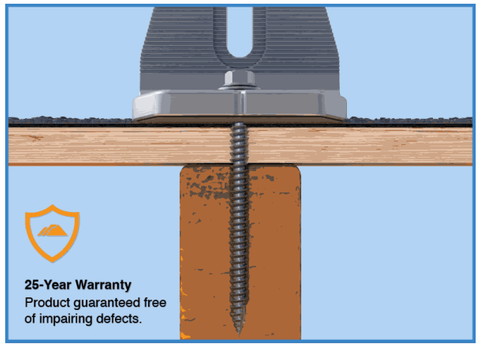
## Adaptive, Rafter-Friendly Installation

**Hit the rafter? Good to go!**
When you find a rafter, you can move on. Only 2 RD Structural Screws are needed.

**Miss the rafter? Try it again.**
Place another screw to the left or right. If rafter is found, install 3rd and final screw.

**Still no luck? Install the rest.**
If more than 3 screws miss the rafter, secure six screws to deck mount it.

## Trusted Strength & Less Hassle



**25-Year Warranty**
Product guaranteed free of impairing defects.

Structural capacities of HUG™ were reviewed in many load directions, with racking rail running cross-slope or up-slope in relation to roof pitch.

For further details, see the HUG certification letters for attaching to rafters and decking.

IronRidge designed the HUG, in combination with the RD Structural Screw to streamline installs, which means the following:

- No prying shingles
- No roof nail interference
- No pilot holes necessary
- No sealant (in most cases)
- No butyl shims needed

### Attachment Loading

The rafter-mounted HUG has been tested and rated to support 1004 (lbs) of uplift and 368 (lbs) of lateral load.

### Structural Design

Parts are designed and certified for compliance with the International Building Code & ASCE/SEI-7.

### Water Seal Ratings

HUG passed both the UL 441 Section 27 "Rain Test" and TAS 100(A)-95 "Wind Driven Rain Test" by Intertek.

### UL 2703 System

Systems conform to UL 2703 mechanical and bonding requirements. See Flush Mount Manual for more info.





| | | | | | | | |
|---|---|---|---|---|---|---|---|
| BRAD JORDAN | CONTRACTOR: LOTUS ENERGY & SOLAR | ENGINEER: MOHAMED SAID MAHMOUD, PE | | DATE | BY | VER | DESCRIPTION |
| 42 BRITISH LANE CAMERON NORTH CAROLINA 28326 UNITED STATES | 220 W MAIN ST, TAVARES, FL 32778 | 8340 LAKE WILLOW WAY, ELK GROVE, CA 95758 | MOHAMED SAID MAHMOUD PE056354 | 04.09.24 | RG | 1 | INITIAL DESIGN |
| PROJECT ID: 452024-42 | (407) 377-7437 | | | | | | |

D4

PAPER: ARCHB

SCALE:

Tech Brief

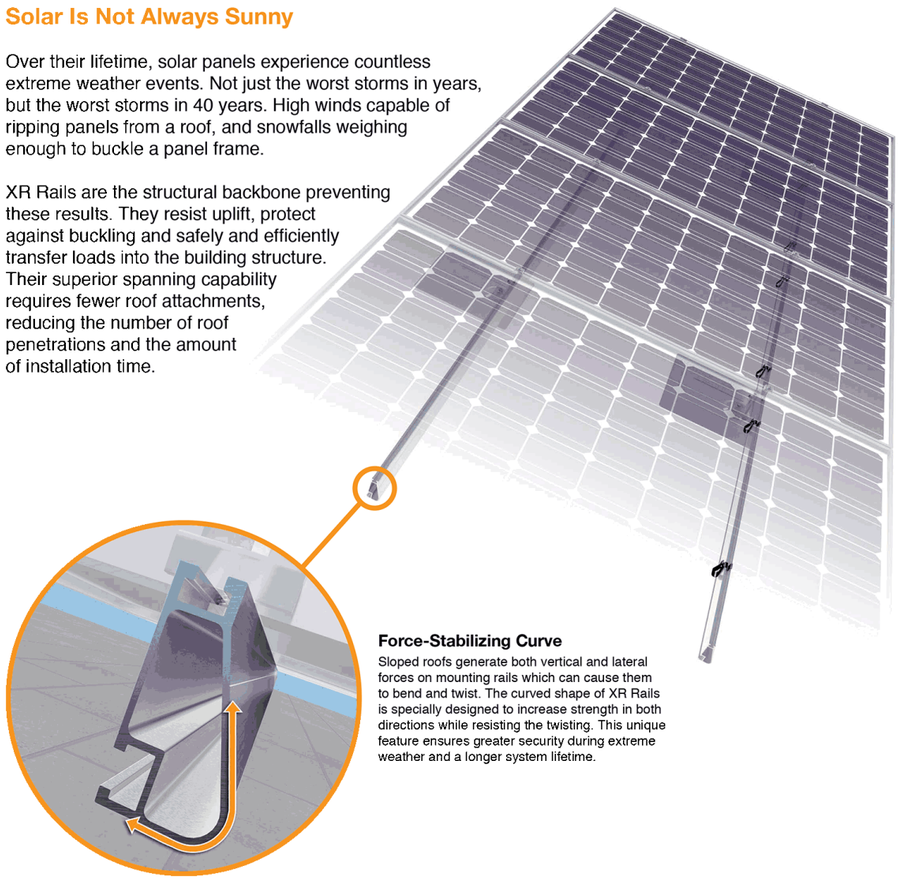
IRONRIDGE

# 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.

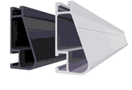
**Compatible with Flat & Pitched Roofs**

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.



## 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**

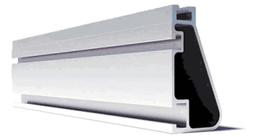
XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves 6 foot spans, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear anodized finish
- Internal splices available

**XR100**

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 8 feet.

- 8' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



**XR1000**

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

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

## Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed span tables and certifications.

| Load | | Rail Span | | | | | |
|---|---|---|---|---|---|---|---|
| Snow (PSF) | Wind (MPH) | 4' | 5' 4" | 6' | 8' | 10' | 12' |
| None | 100 | XR10 | | XR100 | | XR1000 | |
| | 120 | | | | | | |
| | 140 | | | | | | |
| | 160 | | | | | | |
| 10-20 | 100 | | | | | | |
| | 120 | | | | | | |
| | 140 | | | | | | |
| | 160 | | | | | | |
| 30 | 100 | | | | | | |
| | 160 | | | | | | |
| 40 | 100 | | | | | | |
| | 160 | | | | | | |
| 50-70 | 160 | | | | | | |
| 80-90 | 160 | | | | | | |





| | | | | | | | |
|---|---|---|---|---|---|---|---|
| BRAD JORDAN | CONTRACTOR: | ENGINEER: | | DATE | BY | VER | DESCRIPTION |
| | LOTUS ENERGY & SOLAR | MOHAMED SAID MAHMOUD, PE | | 04.09.24 | RG | 1 | INITIAL DESIGN |
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| | (407) 377-7437 | 8340 LAKE WILLOW WAY, ELK GROVE, CA 95758 | MOHAMED SAID MAHMOUD PE056354 | | | | |
| PROJECT ID: 452024-42 | | | | | | | |

D5

PAPER: ARCHB

SCALE:

Tech Brief

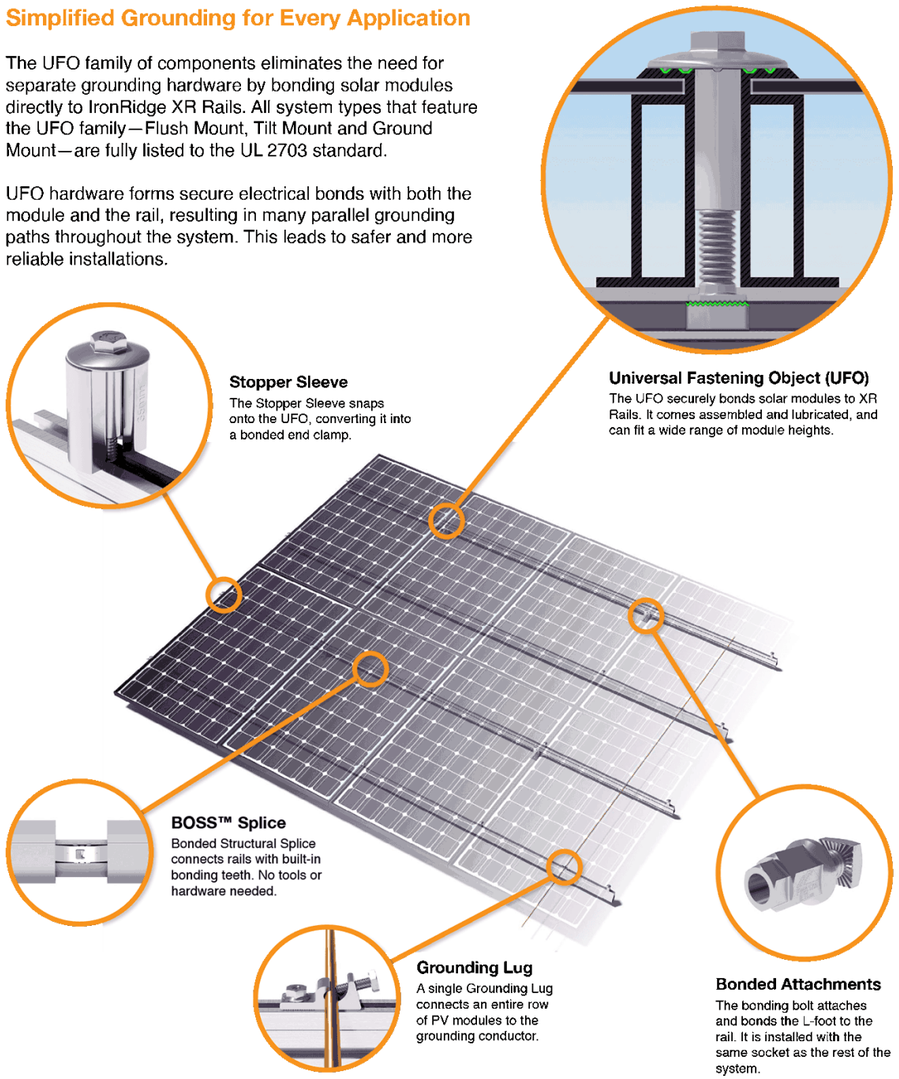
IRONRIDGE

# UFO Family of Components

## Simplified Grounding for Every Application

The UFO family of components eliminates the need for separate grounding hardware by bonding solar modules directly to IronRidge XR Rails. All system types that feature the UFO family—Flush Mount, Tilt Mount and Ground Mount—are fully listed to the UL 2703 standard.

UFO hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.



**Stopper Sleeve**
The Stopper Sleeve snaps onto the UFO, converting it into a bonded end clamp.

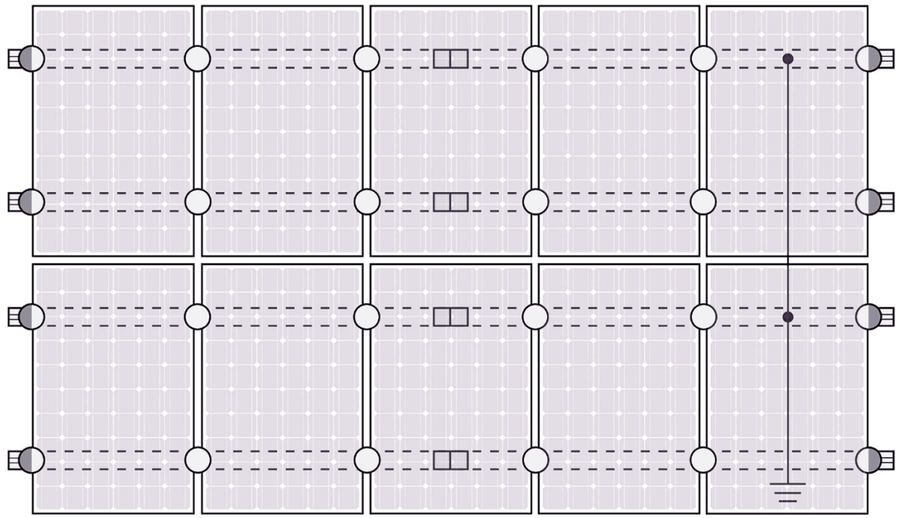
**Universal Fastening Object (UFO)**
The UFO securely bonds solar modules to XR Rails. It comes assembled and lubricated, and can fit a wide range of module heights.

**BOSS™ Splice**
Bonded Structural Splice connects rails with built-in bonding teeth. No tools or hardware needed.

**Grounding Lug**
A single Grounding Lug connects an entire row of PV modules to the grounding conductor.

**Bonded Attachments**
The bonding bolt attaches and bonds the L-foot to the rail. It is installed with the same socket as the rest of the system.

## System Diagram




Approved Enphase microinverters can provide equipment grounding of IronRidge systems, eliminating the need for grounding lugs and field installed equipment ground conductors (EGC). A minimum of two microinverters mounted to the same rail and connected to the same Engage cable is required. Refer to installation manuals for additional details.

## UL Certification

The IronRidge Flush Mount, Tilt Mount, and Ground Mount Systems have been listed to UL 2703 by Intertek Group plc.

UL 2703 is the standard for evaluating solar mounting systems. It ensures these devices will maintain strong electrical and mechanical connections over an extended period of time in extreme outdoor environments.

Go to IronRidge.com/UFO

**Cross-System Compatibility**

| Feature | Flush Mount | Tilt Mount | Ground Mount |
|---|---|---|---|
| XR Rails | ✔ | ✔ | XR1000 Only |
| UFO/Stopper | ✔ | ✔ | ✔ |
| BOSS™ Splice | ✔ | ✔ | N/A |
| Grounding Lugs | 1 per Row | 1 per Row | 1 per Array |
| Microinverters & Power Optimizers | Enphase - M250-72, M250-60, M215-60, C250-72<br>Darfon - MIG240, MIG300, G320, G640<br>SolarEdge - P300, P320, P400, P405, P600, P700, P730 | | |
| Fire Rating | Class A | Class A | N/A |
| Modules | Tested or Evaluated with over 400 Framed Modules<br>Refer to installation manuals for a detailed list. | | |





| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BRAD JORDAN | CONTRACTOR: | ENGINEER: | | DATE | BY | VER | DESCRIPTION | D6 |
| | LOTUS ENERGY & SOLAR | MOHAMED SAID MAHMOUD, PE | | 04.09.24 | RG | 1 | INITIAL DESIGN | |
| 42 BRITISH LANE CAMERON NORTH CAROLINA 28326 UNITED STATES | LOTUS ENERGY & SOLAR 220 W MAIN ST, TAVARES, FL 32778 | | | | | | | PAPER: ARCHB |
| | | | | | | | | SCALE: |
| PROJECT ID: 452024-42 | (407) 377-7437 | 8340 LAKE WILLOW WAY, ELK GROVE, CA 95758 | MOHAMED SAID MAHMOUD PE056354 | | | | | |

MOHAMED SAID MAHMOUD, PE

| Rail: XR10 | Gable Roof Flush Mount System Span Table (inches) - Portrait or Landscape Installation<br>Max Module Length: 80", Max Module SF: 24 SF<br>Exposure B | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wind Speed (mph) | Roof Slope (deg.) | Ground Snow: 0 psf | | | 10 psf | | | 20 psf | | | 30 psf | | | 40 psf | | | 50 psf | | | 60 psf | | | 70 psf* | | | 80 psf* | | | 90 psf* | | |
| | | Group 1 | Group 2 | Group 3 | Group 1 | Group 2 | Group 3 | Group 1 | Group 2 | Group 3 | Group 1 | Group 2 | Group 3 | Group 1 | Group 2 | Group 3 | Group 1 | Group 2 | Group 3 | Group 1 | Group 2 | Group 3 | Group 1 | Group 2 | Group 3 | Group 1 | Group 2 | Group 3 | Group 1 | Group 2 | Group 3 |
| 90 mph | 8-20 | 84 | 84 | 83 | 73 | 73 | 73 | 61 | 61 | 61 | 60 | 60 | 60 | 54 | 54 | 54 | 49 | 49 | 49 | 45 | 45 | 45 | 42 | 42 | 42 | 39 | 39 | 39 | 37 | 37 | 37 |
| | 21-27 | 84 | 84 | 84 | 72 | 72 | 72 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 50 | 50 | 50 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 | 39 | 39 | 39 |
| | 28-45 | 84 | 84 | 84 | 72 | 72 | 72 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 51 | 51 | 51 | 49 | 49 | 49 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 |
| 95 mph | 8-20 | 84 | 84 | 79 | 73 | 73 | 73 | 61 | 61 | 61 | 60 | 60 | 60 | 54 | 54 | 54 | 49 | 49 | 49 | 45 | 45 | 45 | 42 | 42 | 42 | 39 | 39 | 39 | 37 | 37 | 37 |
| | 21-27 | 84 | 84 | 84 | 72 | 72 | 72 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 50 | 50 | 50 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 | 39 | 39 | 39 |
| | 28-45 | 84 | 84 | 84 | 72 | 72 | 72 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 51 | 51 | 51 | 49 | 49 | 49 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 |
| 100 mph | 8-20 | 84 | 82 | 76 | 73 | 73 | 73 | 61 | 61 | 61 | 60 | 60 | 60 | 54 | 54 | 54 | 49 | 49 | 49 | 45 | 45 | 45 | 42 | 42 | 42 | 39 | 39 | 39 | 37 | 37 | 37 |
| | 21-27 | 84 | 84 | 83 | 72 | 72 | 72 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 50 | 50 | 50 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 | 39 | 39 | 39 |
| | 28-45 | 84 | 84 | 84 | 72 | 72 | 72 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 51 | 51 | 51 | 49 | 49 | 49 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 |
| 105 mph | 8-20 | 84 | 78 | 72 | 73 | 73 | 72 | 61 | 61 | 61 | 60 | 60 | 60 | 54 | 54 | 54 | 49 | 49 | 49 | 45 | 45 | 45 | 42 | 42 | 42 | 39 | 39 | 39 | 37 | 37 | 37 |
| | 21-27 | 84 | 84 | 80 | 72 | 72 | 72 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 50 | 50 | 50 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 | 39 | 39 | 39 |
| | 28-45 | 84 | 84 | 80 | 72 | 72 | 72 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 51 | 51 | 51 | 49 | 49 | 49 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 |
| 110 mph | 8-20 | 84 | 74 | 66 | 73 | 73 | 66 | 61 | 61 | 61 | 60 | 60 | 60 | 54 | 54 | 54 | 49 | 49 | 49 | 45 | 45 | 45 | 42 | 42 | 42 | 39 | 39 | 39 | 37 | 37 | 37 |
| | 21-27 | 84 | 81 | 76 | 72 | 72 | 72 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 50 | 50 | 50 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 | 39 | 39 | 39 |
| | 28-45 | 84 | 84 | 76 | 72 | 72 | 72 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 51 | 51 | 51 | 49 | 49 | 49 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 |
| 115 mph | 8-20 | 81 | 72 | 64 | 73 | 72 | 64 | 61 | 61 | 61 | 60 | 60 | 60 | 54 | 54 | 54 | 49 | 49 | 49 | 45 | 45 | 45 | 42 | 42 | 42 | 39 | 39 | 39 | 37 | 37 | 37 |
| | 21-27 | 84 | 77 | 72 | 72 | 72 | 72 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 50 | 50 | 50 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 | 39 | 39 | 39 |
| | 28-45 | 84 | 82 | 73 | 72 | 72 | 72 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 51 | 51 | 51 | 49 | 49 | 49 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 |
| 120 mph | 8-20 | 78 | 66 | 59 | 73 | 66 | 59 | 61 | 61 | 59 | 60 | 60 | 59 | 54 | 54 | 54 | 49 | 49 | 49 | 45 | 45 | 45 | 42 | 42 | 42 | 39 | 39 | 39 | 37 | 37 | 37 |
| | 21-27 | 84 | 73 | 67 | 72 | 72 | 67 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 50 | 50 | 50 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 | 39 | 39 | 39 |
| | 28-45 | 84 | 78 | 69 | 72 | 72 | 69 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 51 | 51 | 51 | 49 | 49 | 49 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 |
| 130 mph | 8-20 | 72 | 59 | 53 | 72 | 59 | 53 | 61 | 59 | 53 | 60 | 59 | 53 | 54 | 54 | 53 | 49 | 49 | 49 | 45 | 45 | 45 | 42 | 42 | 42 | 39 | 39 | 39 | 37 | 37 | 37 |
| | 21-27 | 82 | 66 | 60 | 72 | 66 | 60 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 50 | 50 | 50 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 | 39 | 39 | 39 |
| | 28-45 | 78 | 72 | 64 | 72 | 72 | 64 | 60 | 60 | 60 | 59 | 59 | 59 | 55 | 55 | 55 | 51 | 51 | 51 | 49 | 49 | 49 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 |
| 140 mph | 8-20 | 65 | 54 | 48 | 65 | 54 | 48 | 61 | 54 | 48 | 60 | 54 | 48 | 54 | 54 | 48 | 49 | 49 | 48 | 45 | 45 | 45 | 42 | 42 | 42 | 39 | 39 | 39 | 37 | 37 | 37 |
| | 21-27 | 76 | 60 | 55 | 72 | 60 | 55 | 60 | 60 | 55 | 59 | 59 | 55 | 55 | 55 | 55 | 50 | 50 | 50 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 | 39 | 39 | 39 |
| | 28-45 | 72 | 65 | 58 | 72 | 65 | 58 | 60 | 60 | 58 | 59 | 59 | 58 | 55 | 55 | 55 | 51 | 51 | 51 | 49 | 49 | 49 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 |
| 150 mph | 8-20 | 60 | 49 | 44 | 60 | 49 | 44 | 60 | 49 | 44 | 60 | 49 | 44 | 54 | 49 | 44 | 49 | 49 | 44 | 45 | 45 | 44 | 42 | 42 | 42 | 39 | 39 | 39 | 37 | 37 | 37 |
| | 21-27 | 72 | 55 | 49 | 72 | 55 | 49 | 60 | 55 | 49 | 59 | 55 | 49 | 55 | 55 | 49 | 50 | 50 | 49 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 | 39 | 39 | 39 |
| | 28-45 | 66 | 60 | 53 | 66 | 60 | 53 | 60 | 60 | 53 | 59 | 59 | 53 | 55 | 55 | 53 | 51 | 51 | 51 | 49 | 49 | 49 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 |
| 160 mph | 8-20 | 56 | 45 | 40 | 56 | 45 | 40 | 56 | 45 | 40 | 56 | 45 | 40 | 54 | 45 | 40 | 49 | 45 | 40 | 45 | 45 | 40 | 42 | 42 | 40 | 39 | 39 | 39 | 37 | 37 | 37 |
| | 21-27 | 65 | 51 | 45 | 65 | 51 | 45 | 60 | 51 | 45 | 59 | 51 | 45 | 55 | 51 | 45 | 50 | 50 | 45 | 48 | 48 | 45 | 43 | 43 | 43 | 41 | 41 | 41 | 39 | 39 | 39 |
| | 28-45 | 61 | 56 | 49 | 61 | 56 | 49 | 60 | 56 | 49 | 59 | 56 | 49 | 55 | 55 | 49 | 51 | 51 | 49 | 48 | 48 | 48 | 48 | 48 | 48 | 43 | 43 | 43 | 41 | 41 | 41 |
| 170 mph | 8-20 | 52 | 42 | 38 | 52 | 42 | 38 | 52 | 42 | 38 | 52 | 42 | 38 | 52 | 42 | 38 | 49 | 42 | 38 | 45 | 42 | 38 | 42 | 42 | 38 | 39 | 39 | 38 | 37 | 37 | 37 |
| | 21-27 | 61 | 48 | 42 | 61 | 48 | 42 | 60 | 48 | 42 | 59 | 48 | 42 | 55 | 48 | 42 | 50 | 48 | 42 | 48 | 48 | 42 | 43 | 43 | 42 | 41 | 41 | 41 | 39 | 39 | 39 |
| | 28-45 | 56 | 52 | 48 | 56 | 52 | 48 | 56 | 52 | 48 | 56 | 52 | 48 | 54 | 52 | 48 | 50 | 50 | 48 | 48 | 48 | 48 | 45 | 45 | 45 | 43 | 43 | 43 | 41 | 41 | 41 |
| 175 mph | 8-20 | 50 | 41 | 36 | 50 | 41 | 36 | 50 | 41 | 36 | 50 | 41 | 36 | 50 | 41 | 36 | 49 | 41 | 36 | 45 | 41 | 36 | 42 | 41 | 36 | 39 | 39 | 36 | 37 | 37 | 36 |
| | 21-27 | 59 | 45 | 41 | 59 | 45 | 41 | 59 | 45 | 41 | 59 | 45 | 41 | 55 | 45 | 41 | 50 | 45 | 41 | 48 | 45 | 41 | 43 | 43 | 41 | 41 | 41 | 41 | 39 | 39 | 39 |
| | 28-45 | 55 | 50 | 44 | 55 | 50 | 44 | 55 | 50 | 44 | 55 | 50 | 44 | 53 | 50 | 44 | 50 | 50 | 44 | 48 | 48 | 44 | 44 | 44 | 44 | 42 | 42 | 42 | 41 | 41 | 41 |
| 180 mph | 8-20 | 49 | 39 | 34 | 49 | 39 | 34 | 49 | 39 | 34 | 49 | 39 | 34 | 49 | 39 | 34 | 49 | 39 | 34 | 45 | 39 | 34 | 42 | 39 | 34 | 39 | 39 | 34 | 37 | 37 | 34 |
| | 21-27 | 57 | 43 | 40 | 57 | 43 | 40 | 57 | 43 | 40 | 57 | 43 | 40 | 55 | 43 | 40 | 50 | 43 | 40 | 48 | 43 | 40 | 43 | 43 | 40 | 41 | 41 | 40 | 39 | 39 | 39 |
| | 28-45 | 53 | 49 | 42 | 53 | 49 | 42 | 53 | 49 | 42 | 53 | 49 | 42 | 53 | 49 | 42 | 49 | 49 | 42 | 48 | 48 | 42 | 44 | 44 | 42 | 42 | 42 | 42 | 41 | 41 | 41 |

= min 72" span = min 64" span = min 48" span * = Note: additional installation requirement for CAMO modul

= Shaded cells indicate conditions in which UFO Mid Clamp connection capacity is exceeded. See Note 9 on page 2 for details.

| Grouping of ASCE 7-16 Roof Zones (Gable) | | | | | | |
|---|---|---|---|---|---|---|
| Roof Slope | 8° - 27° | | | 28° - 45° | | |
| Group | Group 1 | Group 2 | Group 3 | Group 1 | Group 2 | Group 3 |
| ASCE 7-16 Roof Zones | 1<br>2e | 2n<br>2r<br>3e | 3r | 1<br>2e<br>2r | 2n<br>3r | 3e |

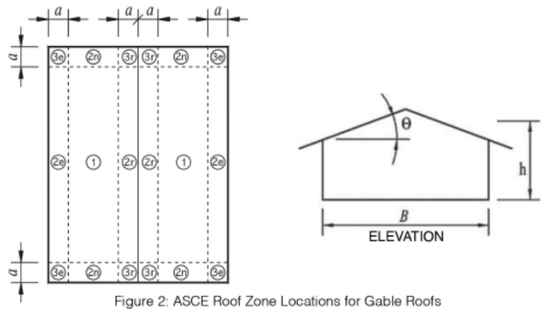



Figure 2: ASCE Roof Zone Locations for Gable Roofs

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| BRAD JORDAN | CONTRACTOR: | ENGINEER: | | DATE | BY | VER | DESCRIPTION |
| | LOTUS ENERGY & SOLAR | MOHAMED SAID MAHMOUD, PE | | 04.09.24 | RG | 1 | INITIAL DESIGN |
| 42 BRITISH LANE CAMERON NORTH CAROLINA 28326 UNITED STATES | 220 W MAIN ST, TAVARES, FL 32778 | | | | | | |
| | | | | | | | |
| | (407) 377-7437 | 8340 LAKE WILLOW WAY, ELK GROVE, CA 95758 | MOHAMED SAID MAHMOUD PE056354 | | | | |
| PROJECT ID: 452024-42 | | | | | | | |

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SCALE: