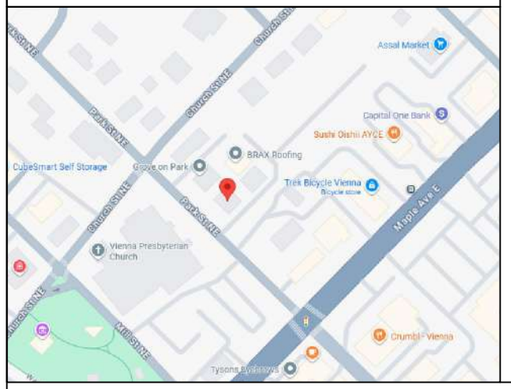
PAUL LEVIT - 10.560kW DC, 8.376kW AC

Attachment 03

VICINITY MAP



AERIAL MAP

SHEET CATALOG

SHEET	REVISION	DESCRIPTION
CS-01	B	COVER SHEET
CS-02	B	GENERAL NOTES
E-01	B	SITE PLAN
E-01.1	B	SATELLITE VIEW
S-01	B	MOUNTING DETAILS
S-02	B	STRUCTURAL DETAILS
E-02	B	SINGLE LINE DIAGRAM
E-03	B	ELECTRICAL CALCULATIONS
PL-01	B	PLACARDS
SS	B	SPEC SHEET(S)

ROOF AREA CALCULATION

TOTAL ARRAY AREA = 503.98 sq.ft
TOTAL ROOF AREA = 2178 sq.ft
% ARRAY AREA IN ROOF = 23.14 %

DESIGN CRITERIA

BASIC WIND SPEED = 130 MPH @ 3-SEC GUST
GROUND SNOW LOAD = 35 PSF
RISK CATEGORY- II

PROJECT WINDSPEED DETERMINED USING THE ASCE 7 STANDARD UNLESS DIRECTED OTHERWISE BY LOCAL JURISDICTION AMENDMENTS

SCOPE OF WORK

SYSTEM SIZE:
10560W DC, 8376W AC

MODULE:
(24)SILFAB SIL-440 QD (440W)

INVERTER:
(24)ENPHASE IQ8AC-72-M-US (240V)

BRANCH DETAILS:
1X8, 1X8, 1X8 ENPHASE BRANCHES

SCOTT WYSSLING

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ENGINEERING SCOPE OF WORK

1. ILLUMINE INTERNATIONAL INC. HAS ONLY PROVIDED DRAFTING SERVICES FOR THE PERMIT DRAWINGS. NO ACTUAL ENGINEERING WORK, ENGINEERING REVIEW OR ENGINEERING APPROVAL HAS BEEN CONDUCTED BY ILLUMINE INTERNATIONAL INC. UNLESS NOTED OTHERWISE.
2. WHEN A PROFESSIONAL ENGINEER APPROVES AND SEALS THE DESIGN FOR COMPONENTS OF THEIR RESPECTIVE DISCIPLINE (STRUCTURAL/ELECTRICAL) SHOWN ON THESE PERMIT DRAWINGS, THE PROFESSIONAL ENGINEER
   a. TAKES FULL DIRECT CONTROL OF THE ENGINEERED DESIGN
   b. IS GIVEN ACCESS TO PERSONALLY SUPERVISE AND RECTIFY ANY ASPECT OF THE ENGINEERED DESIGN
   c. HAS FULLY ACCEPTED RESPONSIBILITY FOR THE ENGINEERED DESIGN

GENERAL NOTES

1. MODULES ARE LISTED UNDER UL 1703 / 61730 AND CONFORM TO THE STANDARDS.
2. INVERTERS ARE LISTED UNDER UL 1741 AND CONFORM TO THE STANDARDS.
3. DRAWINGS ARE DIAGRAMMATIC, INDICATING GENERAL ARRANGEMENT OF THE PV SYSTEM AND THE ACTUAL SITE CONDITION MIGHT VARY.
4. WORKING CLEARANCES AROUND THE NEW PV ELECTRICAL EQUIPMENT WILL BE MAINTAINED IN ACCORDANCE WITH NEC 110.26.
5. ALL GROUND WIRING CONNECTED TO THE MAIN SERVICE GROUNDING IN MAIN SERVICE PANEL/ SERVICE EQUIPMENT.
6. ALL CONDUCTORS SHALL BE 600V, 90°C STANDARD COPPER UNLESS OTHERWISE NOTED.
7. WHEN REQUIRED, A LADDER SHALL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA REGULATIONS.
8. THE SYSTEM WILL NOT BE INTERCONNECTED BY THE CONTRACTOR UNTIL APPROVAL FROM THE LOCAL JURISDICTION AND/OR THE UTILITY.
9. ROOF ACCESS POINT SHALL BE LOCATED IN AREAS THAT DO NOT REQUIRE THE PLACEMENT OF GROUND LADDERS OVER OPENINGS SUCH AS WINDOWS OR DOORS, AND LOCATED AT STRONG POINTS OF BUILDING CONSTRUCTION WHERE THE ACCESS POINT DOES NOT CONFLICT WITH OVERHEAD OBSTRUCTIONS SUCH AS TREES, WIRES OR SIGNS.
10. PV ARRAY COMBINER/JUNCTION BOX PROVIDES TRANSITION FROM ARRAY WIRING TO CONDUIT WIRING.

Wyssling Consulting, PLLC
76 N. Meadowbrook Drive, Alpine UT
Virginia COA # 407008373
Signed 10/16/2025

APPLICABLE CODES

- ELECTRIC CODE: NEC 2020
- VIRGINIA STATEWIDE FIRE PREVENTION CODE: VSFPC 2021
- VIRGINIA CONSTRUCTION CODE: VCC 2021
- VIRGINIA RESIDENTIAL CODE: VRC 2021 WITH LOCAL AMENDMENTS

CUSTOMER INFORMATION

NAME: PAUL LEVIT
ADDRESS: 127A PARK STREET NORTHEAST, VIENNA, VA 22180

38.904273, -77.263505
APN: 0382710012
UTILITY: DOMINION ENERGY

AHJ: VA - FAIRFAX COUNTY

CONTRACTOR INFORMATION

CONVERT SOLAR
Benefits Beyond the Bottom Line

DRAWING INFORMATION

PRN NUMBER: COS-1017702 REV: B
DRAFTED BY: M.SRINI
QC'ED BY: KARTHI
SCALE: AS NOTED
PAPER SIZE: 17"X11"

ILLUMINE i

COVER SHEET
DATE: 10/10/2025
SHEET: CS-01

INSTALLATION NOTES:

1. STRUCTURAL ROOF MEMBER LOCATIONS ARE ESTIMATED AND SHOULD BE LOCATED AND VERIFIED BY THE CONTRACTOR WHEN LAG BOLT PENETRATION OR MECHANICAL ATTACHMENT TO THE STRUCTURE IS REQUIRED.
2. ROOFTOP PENETRATIONS FOR SOLAR RACKING WILL BE COMPLETED AND SEALED WITH APPROVED SEALANT PER CODE BY A LICENSED CONTRACTOR.
3. LAGS MUST HAVE A MINIMUM 2.5" THREAD EMBEDMENT INTO THE STRUCTURAL MEMBER.
4. ALL PV RACKING ATTACHMENTS SHALL BE STAGGERED BY ROW BETWEEN THE ROOF FRAMING MEMBERS AS NECESSARY.
5. ROOF MOUNTED STANDARD RAIL REQUIRES ONE THERMAL EXPANSION GAP FOR EVERY RUN OF RAIL GREATER THAN 40'.
6. ALL CONDUCTORS AND CONDUITS ON THE ROOF SHALL BE MINIMUM 7/8" ABOVE THE ROOF SURFACE (INCLUDING CABLES UNDERNEATH MODULES AND RACKING).
7. ALL SOLAR PANEL ARRAY COMPONENTS SHALL BE INSTALLED PER THE MANUFACTURER'S APPROVED INSTALLATION SPECIFICATIONS.
8. THE EXISTING BUILDINGS STRUCTURE SHALL BE VERIFIED AS PROPERLY CONSTRUCTED AND MAINTAINED IN GOOD CONDITION. NO ALLOWANCE HAS BEEN MADE IN THESE DRAWINGS FOR ANY EXISTING DEFICIENCY IN DESIGN, MATERIAL, CONSTRUCTION, OR LACK OF MAINTENANCE FOR THE EXISTING STRUCTURE OR PROPOSED EQUIPMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING EXISTING CONDITIONS, PROPER FIT, AND CLEARANCES IN THE FIELD.
9. WATERPROOFING AROUND THE ROOF PENETRATIONS IS THE RESPONSIBILITY OF CONTRACTOR/INSTALLER.
10. MISCELLANEOUS ITEMS NOT EXPLICITLY LISTED OR IDENTIFIED IN THESE DRAWINGS HAVE NOT BEEN DESIGNED. IT IS RECOMMENDED THAT MATERIAL OF SUITABLE SIZE STRENGTH TO BE OBTAINED FROM A REPUTABLE MANUFACTURER FOR MISCELLANEOUS ITEMS.
11. IF PROJECT IS STAMPED AND SEALED BY AN ILLUMINE-I STRUCTURAL ENGINEER, SEE ASSOCIATED ILLUMINE-I STRUCTURAL REPORT FOR FULL COMPREHENSIVE SCOPE OF STRUCTURAL ENGINEERING INVESTIGATION AND APPROVAL.
12. IF ANY CONDITION THROUGHOUT THE ASSOCIATED REPORT OR PERMIT DRAWINGS IS NOT ALSO REPRESENTED ON-SITE, CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD OF ANY DISCREPANCIES AND RECEIVE WRITTEN APPROVAL FROM THE ENGINEER OF RECORD BEFORE PROCEEDING WITH INSTALLATION.
13. CONTRACTOR TO PROVIDE MINIMUM 1/4" GAP BETWEEN ALL SOLAR PANELS.

ROOF ACCESS PATHWAYS AND SETBACKS:

1205.2.1 SOLAR PHOTOVOLTAIC SYSTEMS FOR GROUP R-3 BUILDINGS:

SOLAR PHOTOVOLTAIC SYSTEMS FOR GROUP R-3 BUILDINGS SHALL COMPLY WITH SECTIONS 1205.2.1.1 THROUGH 1205.2.1.3.

EXCEPTIONS:

1. THESE REQUIREMENTS SHALL NOT APPLY TO STRUCTURES DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE INTERNATIONAL RESIDENTIAL CODE.
2. THESE REQUIREMENTS SHALL NOT APPLY TO ROOFS WITH SLOPES OF 2 UNITS VERTICAL IN 12 UNITS HORIZONTAL (16.7-PERCENT) OR LESS.

1205.2.1.1 PATHWAYS TO RIDGE:

NOT FEWER THAN TWO 36-INCH-WIDE (914 MM) PATHWAYS ON SEPARATE ROOF PLANES,FROM LOWEST ROOF EDGE TO RIDGE, SHALL BE PROVIDED ON ALL BUILDINGS. NOT FEWER THAN ONE PATHWAY SHALL BE PROVIDED ON THE STREET OR DRIVEWAY SIDE OF THE ROOF. FOR EACH ROOF PLANE WITH A PHOTOVOLTAIC ARRAY, NOT FEWER THAN ONE 36-INCH-WIDE (914 MM) PATHWAY FROM LOWEST ROOF EDGE TO RIDGE SHALL BE PROVIDED ON THE SAME ROOF PLANE AS THE PHOTOVOLTAIC ARRAY, ON AN ADJACENT ROOF PLANE OR STRADDLING THE SAME AND ADJACENT ROOF PLANES

1205.2.1.2 SETBACKS AT RIDGE:

FOR PHOTOVOLTAIC ARRAYS OCCUPYING 33 PERCENT OR LESS OF THE PLAN VIEW TOTAL ROOF AREA,
A SETBACK OF NOT LESS THAN 18 INCHES (457 MM)WIDE IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE. FOR PHOTOVOLTAIC ARRAYS OCCUPYING MORE THAN 33 PERCENT OF THE PLAN VIEW TOTAL ROOF AREA, A SETBACK OF NOT LESS THAN 36 INCHES (457 MM) WIDE IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE.

1205.2.1.3 ALTERNATIVE SETBACKS AT RIDGE:

WHERE AN AUTOMATIC SPRINKLER SYSTEM IS INSTALLED WITHIN THE DWELLING IN ACCORDANCE WITH SECTION 903.3.1.3, SETBACKS AT THE RIDGE SHALL CONFORM TO ONE OF THE FOLLOWING:

1. FOR PHOTOVOLTAIC ARRAYS OCCUPYING 66 PERCENT OR LESS OF THE PLAN VIEW TOTAL ROOF AREA, A SETBACK OF NOT LESS THAN 18 INCHES (457 MM) WIDE IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE.
2. FOR PHOTOVOLTAIC ARRAYS OCCUPYING MORE THAN 66 PERCENT OF THE PLAN VIEW TOTAL ROOF AREA, A SETBACK OF NOT LESS THAN 36 INCHES (914 MM) WIDE IS REQUIRED ON BOTH SIDES OF A HORIZONTAL RIDGE.

1205.2.2 EMERGENCY ESCAPE AND RESCUE OPENINGS. PANELS AND MODULES INSTALLED ON GROUP R-3 BUILDINGS SHALL NOT BE PLACED ON THE PORTION OF A ROOF THAT IS BELOW AN EMERGENCY ESCAPE AND RESCUE OPENING. A PATHWAY OF NOT LESS THAN 36 INCHES (914 MM) WIDE SHALL BE PROVIDED TO THE EMERGENCY ESCAPE AND RESCUE OPENING.

SCOTT WYSSLING

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COMMONWEALTH OF VIRGINIA
SCOTT S. WYSSLING
Lic. No. 0402010600
PROFESSIONAL ENGINEER

Wyssling Consulting, PLLC
76 N. Meadowbrook Drive, Alpine UT
Virginia COA # 407008373
Signed 10/16/2025

CUSTOMER INFORMATION	CONTRACTOR INFORMATION
NAME: PAUL LEVIT ADDRESS: 127A PARK STREET NORTHEAST, VIENNA, VA 22180 38.904273, -77.263505 APN: 0382710012 UTILITY: DOMINION ENERGY AHJ: VA - FAIRFAX COUNTY	CONVERT SOLAR Benefits Beyond the Bottom Line

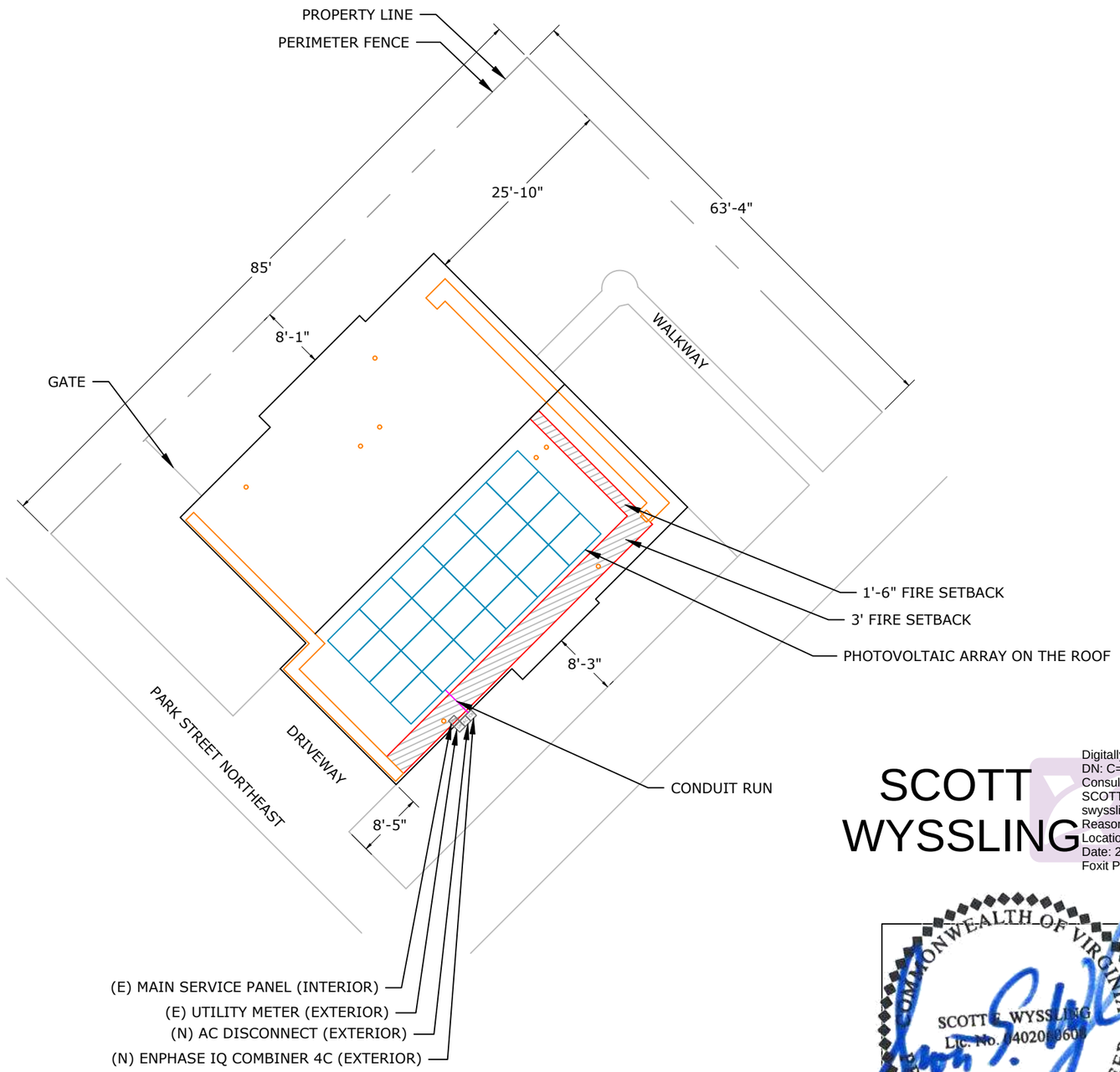
DRAWING INFORMATION

PRN NUMBER: COS-1017702 REV: B
DRAFTED BY: M.SRINI
QC'ED BY: KARTHI
SCALE: AS NOTED
PAPER SIZE: 17"X11"

ILLUMINE i

GENERAL NOTES
DATE: 10/10/2025 SHEET: CS-02

PAUL LEVIT - 10.560kW DC, 8.376kW AC



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ROOF AREA CALCULATION

TOTAL ARRAY AREA	= 503.98 sq.ft
TOTAL ROOF AREA	= 2178 sq.ft
% ARRAY AREA IN ROOF	= 23.14 %

COMMONWEALTH OF VIRGINIA
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38.904273, -77.263505
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CONTRACTOR INFORMATION

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SITE PLAN
DATE: 10/10/2025
SHEET: E-01

N

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

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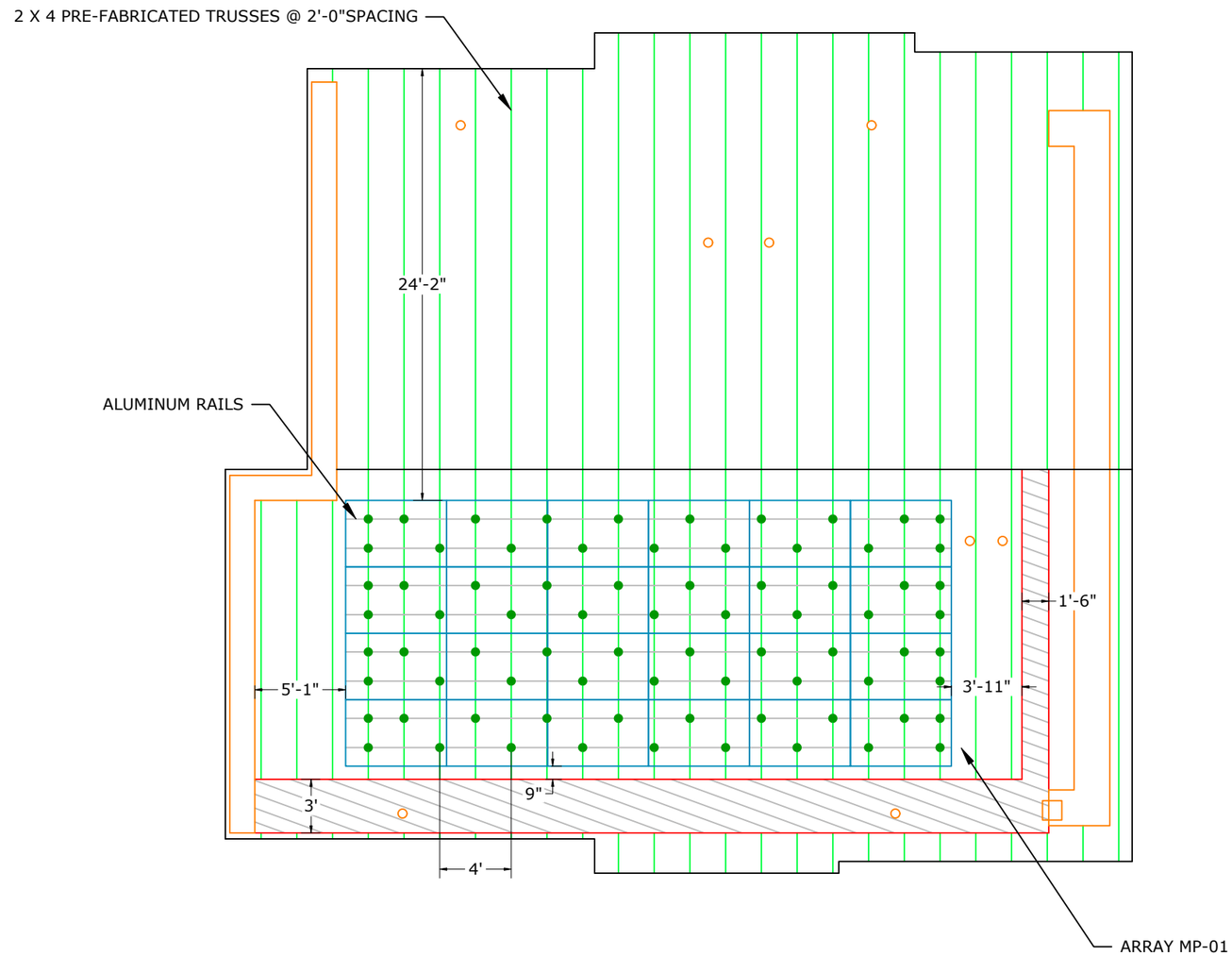
ILLUMINE i

SATELLITE VIEW
DATE: 10/10/2025 SHEET: E-01.1

NOTE: PENETRATIONS ARE STAGGERED



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

ROOF AREA CALCULATION

TOTAL ARRAY AREA	= 503.98 sq.ft
TOTAL ROOF AREA	= 2178 sq.ft
% ARRAY AREA IN ROOF	= 23.14 %

SITE INFORMATION

S.NO	AZIMUTH	PITCH	NO. OF MODULES	ARRAY AREA (SQ. FT.)	ROOF TYPE	ATTACHMENT	ROOF EXPOSURE	FRAME TYPE	FRAME SIZE	FRAME SPACING	MAX RAIL SPAN	OVER HANG
MP-01	314°	1°	24	503.98	EPDM MEMBRANE	QUICKMOUNT HALO ULTRAGRIP (FRAMING MOUNT)	ATTIC	PRE-FABRICATED TRUSSES	2 X 4	2'-0"	4'-0"	1'-6"

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MOUNTING DETAILS
DATE: 10/10/2025 SHEET: S-01

DEAD LOAD CALCULATIONS

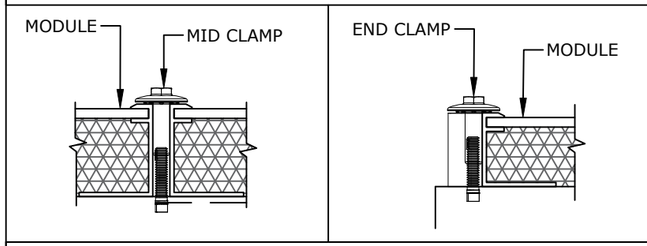
BOM	QUANTITY	LBS/UNIT	TOTAL WEIGHT (LBS)
MODULES	24	46.3	1111.2
MID-CLAMP	40	0.05	2
END-CLAMP	16	0.05	0.8
RAIL LENGTH	275	0.43	118.25
SPLICE BAR	16	0.36	5.76
QUICKMOUNT HALO ULTRAGRIP (FRAMING MOUNT)	76	0.57	43.32
MICROINVERTERS	24	2.43	58.32
TOTAL WEIGHT OF THE SYSTEM (LBS)			1339.65
TOTAL ARRAY AREA ON THE ROOF (SQ. FT.)			503.98
WEIGHT PER SQ. FT.(LBS)			2.66
WEIGHT PER PENETRATION (LBS)			17.63

MODULE DATA

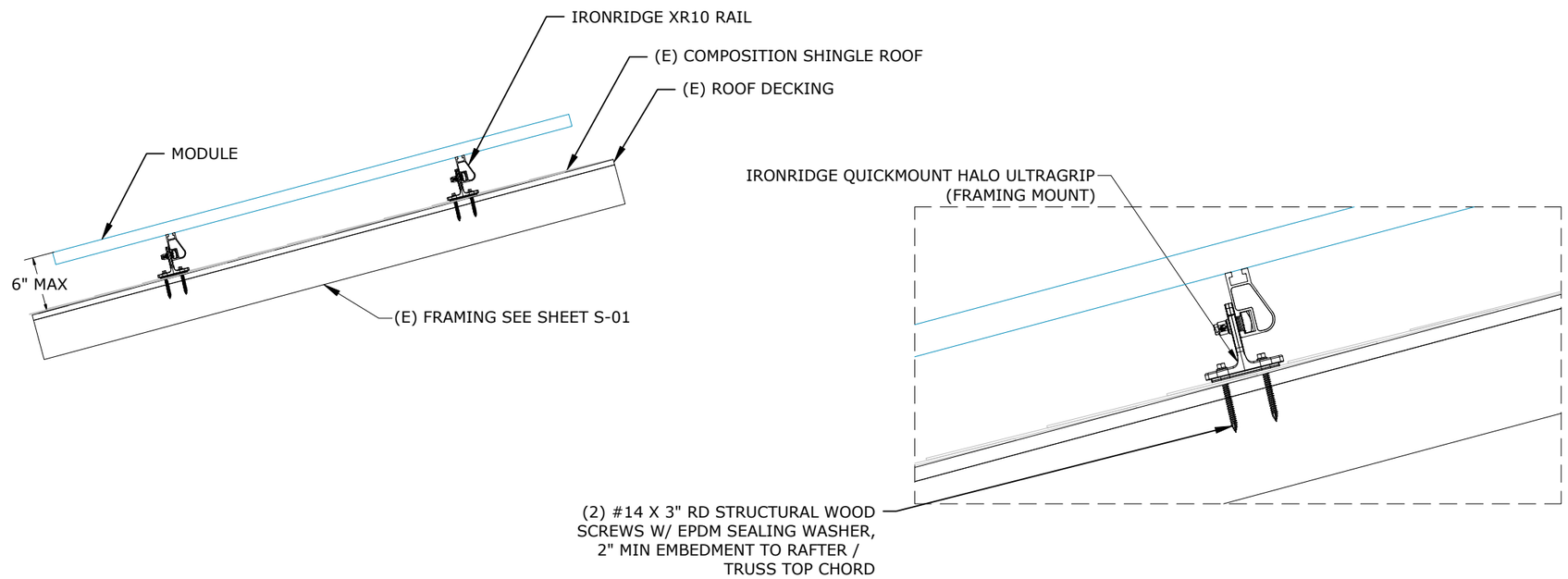
SILFAB SIL-440 QD (440W)

MODULE DIM	67.8"x44.6"x1.37"
WOOD SCREW	(2) #14 X 3" RD STRUCTURAL WOOD SCREWS W/ EPDM SEALING WASHER, 2" MIN EMBEDMENT TO RAFTER / TRUSS TOP CHORD

MID-CLAMP AND END-CLAMP ASSEMBLY



ATTACHMENT DETAIL- IRONRIDGE QUICKMOUNT HALO ULTRAGRIP (FRAMING MOUNT)



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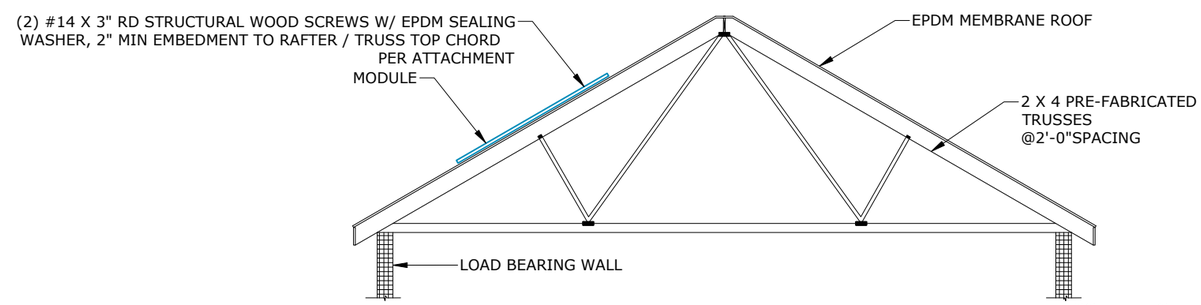
ROOF FRAMING DETAILS



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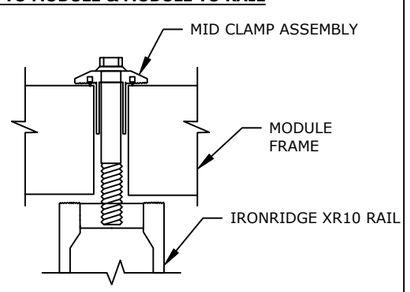
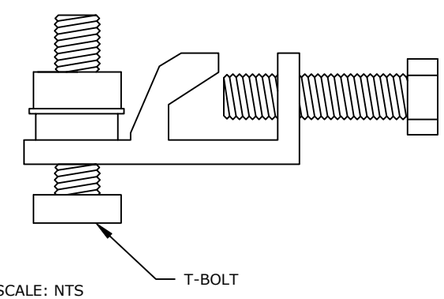
GROUNDING DETAILS

MODULE TO MODULE & MODULE TO RAIL



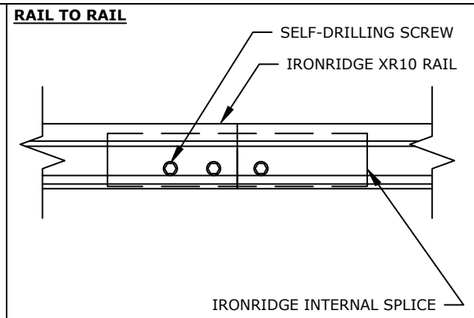
GROUNDING MID-CLAMP SCALE: NTS

GROUNDING LUG



SCALE: NTS

RAIL TO RAIL



SCALE: NTS

COMMONWEALTH OF VIRGINIA
SCOTT S. WYSSLING
Lic. No. 040201-0608
PROFESSIONAL ENGINEER

Wyssling Consulting, PLLC
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Virginia COA # 407008373
Signed 10/16/2025

CUSTOMER INFORMATION

NAME: PAUL LEVIT
ADDRESS: 127A PARK STREET
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UTILITY: DOMINION ENERGY

AHJ: VA - FAIRFAX COUNTY

CONTRACTOR INFORMATION

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Benefits Beyond the Bottom Line

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QC'ED BY: KARTHI
SCALE: AS NOTED
PAPER SIZE: 17"X11"

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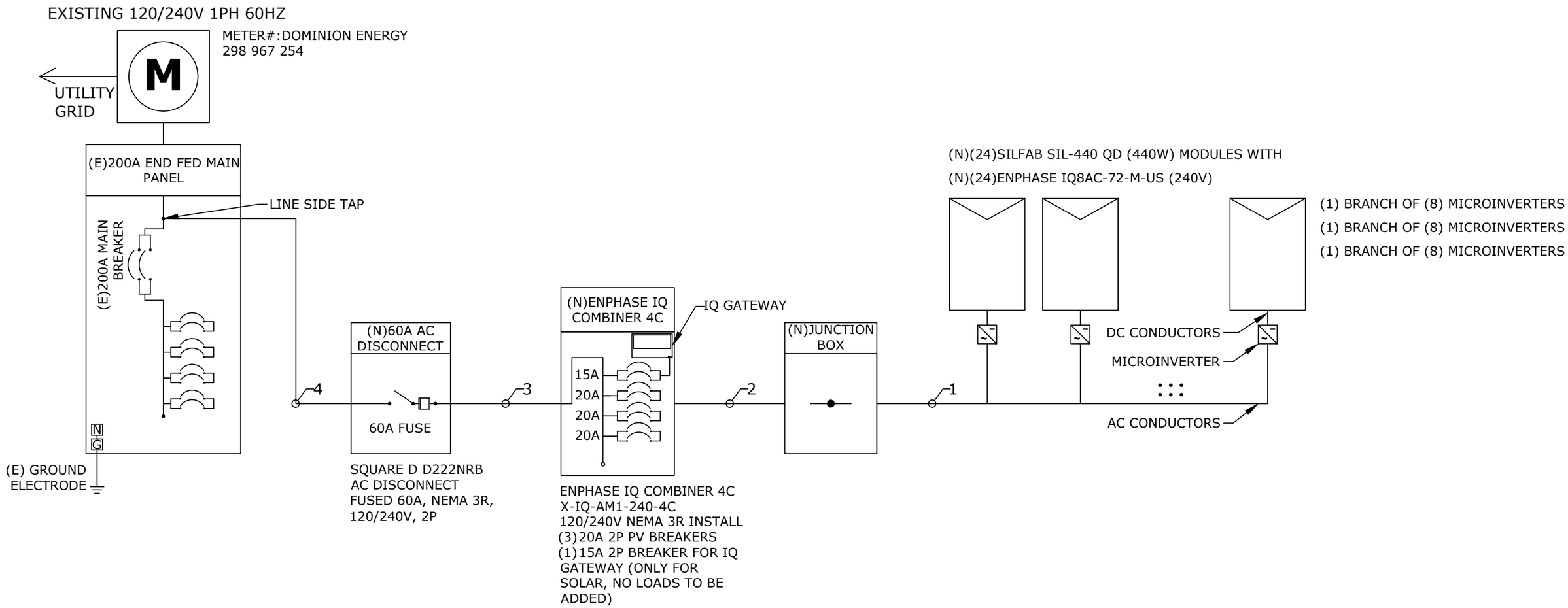
STRUCTURAL DETAILS
DATE: 10/10/2025 SHEET: S-02

DC SYSTEM SIZE- 10560W, AC SYSTEM SIZE - 8376W

NOTE:
EACH MICROINVERTER IS RAPID SHUTDOWN COMPLIANT



CONDUCTOR AND CONDUIT SCHEDULE

TAG ID	CONDUIT SIZE	CONDUCTOR	NEUTRAL	GROUND
1	NONE	(2) 12 AWG ENPHASE Q CABLE PER BRANCH CIRCUIT	NONE	(1) 6 AWG BARE COPPER
2	METALLIC CONDUIT	(6) 10 AWG THHN/THWN-2	NONE	(1) 8 AWG THHN/THWN-2
3	CONDUIT	(2) 6 AWG THHN/THWN-2	(1) 6 AWG THHN/THWN-2	(1) 8 AWG THHN/THWN-2
4	CONDUIT	(2) 6 AWG THHN/THWN-2	(1) 6 AWG THHN/THWN-2	(1) 6 AWG THHN/THWN-2

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ILLUMINE i

SINGLE LINE DIAGRAM
DATE: 10/10/2025 SHEET: E-02

DC SYSTEM SIZE- 10560W, AC SYSTEM SIZE - 8376W

MODULE SPECIFICATION

MODEL	SILFAB SIL-440 QD (440W)
MODULE POWER @ STC	440 W
OPEN CIRCUIT VOLTAGE:**Voc**	38.97 V
MAX POWER VOLTAGE:**Vmp**	33.41 V
SHORT CIRCUIT CURRENT:**Isc**	14.22 A
MAX POWER CURRENT:**Imp**	13.17 A

MICROINVERTER SPECIFICATIONS

MODEL	ENPHASE IQ8AC-72-M-US (240V)
POWER RATING	349W
MAX. CONTINUOUS OUTPUT CURRENT	1.45A
CEC WEIGHTED EFFICIENCY	97%
MAX NO OF MICROINVERTERS / BRANCH	11
MAX DC VOLTAGE	60V

WIRE SIZE CALCULATIONS

TAG 1: (AC)
REQUIRED CONDUCTOR AMPACITY (1.45 * 8 * 1.25) = 14.5 A
CORRECTED AMPACITY CALCULATION (0.96 * 1 * 30) = 28.8 A
14.5A < 28.8A

TAG 2: (AC)
REQUIRED CONDUCTOR AMPACITY (1.45 * 8 * 1.25) = 14.5 A
CORRECTED AMPACITY CALCULATION (0.96 * 0.8 * 40) = 30.72 A
14.5A < 30.72A

TAG 3: (AC)
REQUIRED CONDUCTOR AMPACITY (1.45 * 24 * 1.25) = 43.5 A
CORRECTED AMPACITY CALCULATION (0.96 * 1 * 75) = 72 A
43.5A < 72A

TAG 4: (AC)
REQUIRED CONDUCTOR AMPACITY (1.45 * 24 * 1.25) = 43.5 A
CORRECTED AMPACITY CALCULATION (0.96 * 1 * 75) = 72 A
43.5A < 72A

AC WIRE SIZING CALCULATIONS BASED ON FOLLOWING EQUATIONS

REQUIRED CONDUCTOR AMPACITY:
INVERTER OUTPUT CURRENT * #OF INVERTERS = MAX CURRENT PER 690.8(A)(1)(e) * 125%
= MAX CURRENT PER 690.8(B)(1)

CORRECTED AMPACITY CALCULATIONS:
DERATED CONDUCTOR AMPACITY PER 690.8(B)(2) = AMPACITY * TEMPERATURE DERATE FACTOR * CONDUIT FILL DERATE
DERATED CONDUCTOR AMPACITY CHECK: MAX CURRENT PER 690.8(B)(1) < DERATED CONDUCTOR AMPACITY

ELECTRICAL NOTES

1. CONDUCTORS EXPOSED TO WET LOCATIONS SHALL BE SUITABLE FOR USE IN WET LOCATIONS PER NEC 310.10(C).
2. CONDUCTORS EXPOSED TO SUNLIGHT SHALL BE LISTED AS SUNLIGHT RESISTANT PER NEC 310.10(D).
3. MAXIMUM DC/AC VOLTAGE DROP SHALL BE NO MORE THAN 2%.
4. ALL CONDUCTORS SHALL BE IN CONDUIT UNLESS OTHERWISE NOTED.
5. BREAKER/FUSES SIZED ACCORDING PER NEC ARTICLE 240.
6. AC GROUNDING ELECTRODE CONDUCTOR (GEC) SIZED PER NEC 250.66.
7. EQUIPMENT GROUNDING CONDUCTOR (EGC) SIZED PER NEC 250.122.
8. AMBIENT TEMPERATURE ADJUSTMENT FACTOR IS BASED ON TABLE NEC 310.15(B)(1).
9. CURRENT CARRYING CONDUCTOR ADJUSTMENT FACTOR IS BASED ON NEC 310.15(C)(1).
10. MAX. SYSTEM VOLTAGE CORRECTION IS PER NEC 690.7.
11. CONDUCTORS ARE SIZED PER NEC 310.16.

OCPD CALCULATION

ALLOWABLE BACKFEED:

MAIN PANEL RATING = 200 A
MAIN BREAKER RATING = 200 A
LINE SIDE TAP 100% OF ALLOWABLE BACKFEED = 200 A

INVERTER OVERCURRENT PROTECTION:

INVERTER OVERCURRENT PROTECTION = (MICROINVERTER O/P CURRENT * # OF MICROINVERTERS * CONTINUOUS LOAD(1.25))
= (1.45 * 24 *1.25)
= 43.5 A
PV BREAKER SIZE / FUSE SIZE = 60 A ⩾ 43.5 A

TOTAL REQUIRED PV BREAKER SIZE / FUSE SIZE = 60 A PV BREAKER / FUSE SIZE

CUSTOMER INFORMATION

NAME: PAUL LEVIT
ADDRESS: 127A PARK STREET
NORTHEAST, VIENNA, VA 22180

38.904273, -77.263505
APN: 0382710012
UTILITY: DOMINION ENERGY

AHJ: VA - FAIRFAX COUNTY

CONTRACTOR INFORMATION

CONVERT SOLAR
Benefits Beyond the Bottom Line

DRAWING INFORMATION

PRN NUMBER: COS-1017702 REV: B
DRAFTED BY: M.SRINI
QC'ED BY: KARTHI
SCALE: AS NOTED
PAPER SIZE: 17"X11"

ILLUMINE i

ELECTRICAL CALCULATIONS
DATE: 10/10/2025 SHEET: E-03

AC RACEWAYS
1

SW-1 DISCONNECT (SQUARE D D222NRB)
1 3

MSP - MAIN SERVICE PANEL
1 2

UTILITY METER
2

LABELING NOTES

1	ALL PLAQUES AND SIGNAGE REQUIRED BY 2020 NEC AND 2021 VSFPC WILL BE INSTALLED AS REQUIRED
2	LABELS, WARNING(S) AND MARKING SHALL COMPLY WITH ANSI Z535.4, WHICH REQUIRES THAT DANGER WARNING, AND CAUTION SIGNS USED THE STANDARD HEADER COLORS, HEADER TEXT AND SAFETY ALERT SYMBOL ON EACH LABEL. THE ANSI STANDARD REQUIRES A HEADING THAT IS AT LEAST 50% TALLER THAN THE BODY TEXT, IN ACCORDANCE WITH NEC 110.21(B).
3	A PERMANENT PLAQUE OR DIRECTORY SHALL BE INSTALLED PROVIDING THE LOCATION OF THE SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS IF NOT IN THE SAME LOCATION IN ACCORDANCE WITH NEC 690.56(B).
4	LABEL(S) WITH MARKING, "WARNING PHOTOVOLTAIC POWER SOURCE, "SHALL BE LOCATED AT EVERY 10 FEET OF EACH DC RACEWAY AND WITH IN ONE FOOT OF EVERY TURN OR BEND AND WITH IN ONE FOOT OF EVERY TURN OR BEND AND WITH IN ONE FOOT ABOVE AND BELOW ALL PENETRATIONS OF ROOF/CEILING ASSEMBLIES, WALLS AND BARRIERS. THE LABEL SHALL HAVE 3/8" TALL LETTERS AND BE REFLECTIVE WITH WHITE TEXT ON A RED BACKGROUND

1

WARNING:
PHOTOVOLTAIC POWER SOURCE

2

⚠ CAUTION

SOLAR ELECTRIC SYSTEM CONNECTED

3

SOLAR AC DISCONNECT

CUSTOMER INFORMATION	CONTRACTOR INFORMATION
NAME: PAUL LEVIT ADDRESS: 127A PARK STREET NORTHEAST, VIENNA, VA 22180 38.904273, -77.263505 APN: 0382710012 UTILITY: DOMINION ENERGY AHJ: VA - FAIRFAX COUNTY	CONVERT SOLAR Benefits Beyond the Bottom Line

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ILLUMINE i

PLACARDS
DATE: 10/10/2025
SHEET: PL-01

MODULE SPEC SHEET

SILFAB PRIME **NTC**

SIL-440 QD

SILFAB SOLAR®

NEXT-GENERATION N-TYPE CELL TECHNOLOGY

- Improved Shade Tolerance
- Improved Low-Light Performance
- Increased Performance in High Temperatures
- Enhanced Durability
- Reduced Degradation Rate
- 25-Year Product Warranty/ 30-Year Performance Warranty

SILFABSOLAR.COM

ELECTRICAL SPECIFICATIONS		440	
Test Conditions		STC	NOCT
Module Power (Pmax)	Wp	440	328.0
Maximum power voltage (Vpmax)	V	33.41	31.17
Maximum power current (Ipmax)	A	13.17	10.52
Open circuit voltage (Voc)	V	38.97	36.64
Short circuit current (Isc)	A	14.22	11.44
Module efficiency	%	22.6%	
Maximum system voltage (VDC)	V	1000	
Series fuse rating	A	25	
Power Tolerance	Wp	0 to +10	

Measurement conditions: STC 1000 W/m² • AM 1.5 • Temperature 25 °C • NOCT 800 W/m² • AM 1.5 • Measurement uncertainty ≤ 3%
Sun simulator calibration reference modules from Fraunhofer Institute. Electrical characteristics may vary by ±5% and power by 0 to +10 W.

MECHANICAL PROPERTIES / COMPONENTS	METRIC	IMPERIAL
Module weight	21 kg ± 0.2 kg	46.3 lbs ± 0.4 lbs
Dimensions (H x L x D)	1721 mm x 1133 mm x 35 mm	67.8 in x 44.6 in x 1.37 in
Maximum surface load (wind/snow)*	4000 Pa rear load / 5400 Pa front load	83.5 lb/ft² rear load / 112.8 lb/ft² front load
Hail impact resistance	ø 25 mm at 83 km/h	ø 1 in at 51.6 mph
Cells	108 Half cells - N-Type Silicon solar cell 182 mm x 91 mm	108 Half cells - N-Type Silicon solar cell 7.16 in x 3.58 in
Glass	3.2 mm high transmittance, tempered, antireflective coating	0.126 in high transmittance, tempered, antireflective coating
Cables and connectors (refer to installation manual)	1350 mm, ø 5.7 mm, MC4 from Staubli	53.1 in, ø 0.22 in (12 AWG), MC4 from Staubli
Backsheet	High durability, superior hydrolysis and UV resistance, multi-layer dielectric film, fluorine-free PV backsheet	
Frame	Anodized aluminum (Black)	
Junction Box	UL 3730 Certified, IEC 62790 Certified, IP68 rated, 3 diodes	

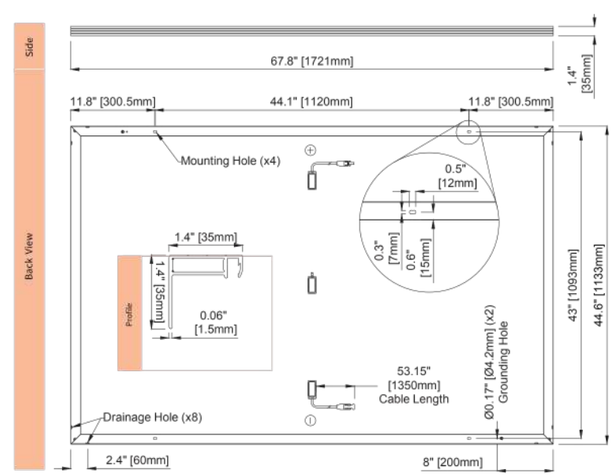
TEMPERATURE RATINGS	
Temperature Coefficient Isc	0.04 %/°C
Temperature Coefficient Voc	-0.24 %/°C
Temperature Coefficient Pmax	-0.29 %/°C
NOCT (± 2 °C)	45 °C
Operating temperature	-40/+85 °C

WARRANTIES	
Module product workmanship warranty	25 years**
Linear power performance guarantee	30 years
	≥ 98% end 1st yr ≥ 94.7% end 12th yr ≥ 90.8% end 25th yr ≥ 89.3% end 30th yr

CERTIFICATIONS	
Product	UL 61215, UL 61730, CSA C22.2#61730, IEC 61215, IEC 61730, IEC 61701 (Salt Mist Corrosion), IEC 62716 (Ammonia Corrosion), CEC Listed, UL Fire Rating: Type 2
Factory	ISO9001:2015

SHIPPING SPECS	
Modules Per Pallet:	26 or 26 (California)
Pallets Per Truck	32 or 30 (California)
Modules Per Truck	832 or 780 (California)

* ⚠ Warning. Read the Safety and Installation Manual for mounting specifications and before handling, installing and operating modules.
** 12 year extendable to 25 years subject to registration and conditions outlined under "Warranty" at silfabsolar.com.
PAN files generated from 3rd party performance data are available for download at: silfabsolar.com/downloads.



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Silfab - SIL-440-QD-20240829

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INVERTER SPEC SHEET

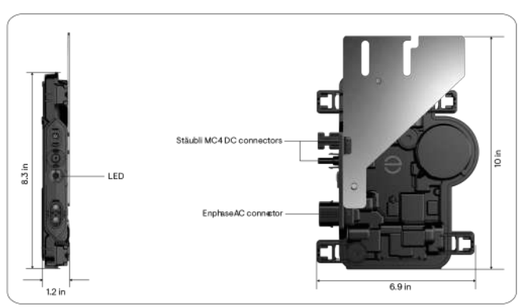
ENPHASE

NORTH AMERICA | DATA SHEET

IQ8AC Microinverter

Our newest IQ8 Series Microinverters[1, 2, 3] are the industry's first microgrid-forming[4], software-defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently.

Key specifications	IQ8AC-72-M-US @240 VAC	IQ8AC-72-M-US @208 VAC
Peak output power	366 VA	350 VA
Nominal grid voltage (L-L)	240 V split-phase (L-L), 180°	208 V single-phase (L-L), 120°
Nominal frequency	60 Hz	60 Hz
CEC weighted efficiency	97.0%	96.5%
Maximum input DC voltage	60 V	60 V
MPPT voltage range	28–45 V	28–45 V
Maximum module I_{sc}	20 A	20 A
Ambient temperature range	−40°C to 65°C (−40°F to 149°F)	



[1] IQ8 Series Microinverters can be added to existing IQ7 systems on the same IQ Gateway only in the following grid-tied configurations: Solar Only or Solar + Battery (IQ Battery 3T/10T and IQ Battery 5P) without backup.
[2] IQ7 Series Microinverters cannot be added to a site with existing IQ8 Series Microinverters on the same gateway. Mixed system of IQ7 and IQ8 will not support IQ8-specific PCS features and grid-forming capabilities.
[3] IQ Microinverters ship with default settings that meet North America's IEEE 1547 interconnection standard requirements. Region-specific adjustments may be requested by an Authority Having Jurisdiction (AHJ) or utility representative, according to the IEEE 1547 interconnection standard. Use an IQ Gateway to make these changes during installation.
[4] Meets UL 1741 only when installed with IQ System Controller 2 or 3.

Simple

- Lightweight and compact with plug-and-play connectors
- Power line communication (PLC) between components
- Faster installation with simple two-wire cabling

Reliable

- Produces power even when the grid is down[4]
- More than one million cumulative hours of testing
- Industry-leading limited warranty of up to 25 years
- Class II double-insulated enclosure
- Optimized for the latest high-powered PV modules

Microgrid-forming

- Complies with the latest advanced grid support
- Remote automatic updates for the latest grid requirements
- Configurable to support a wide range of grid profiles
- Meets CA Rule 21 (UL 1741-SA) and IEEE 1547:2018 (UL 1741-SB 3rd Ed.)

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Input data (DC)	Units	IQ8AC-72-M-US
Commonly used module pairings[5]	W	295–500
Module compatibility	–	To meet compatibility, PV modules must be within the following maximum input DC voltage and maximum module I_{sc}. Module compatibility can be checked at https://enphase.com/installers/microinverters/calculator.
MPPT voltage range	V	28–45
Operating range	V	18–58
Minimum/Maximum start voltage	V	22/58
Maximum input DC voltage	V	60
Maximum continuous input DC current	A	14
Maximum input DC short-circuit current	A	25
Maximum module I_{sc}	A	20
Overvoltage class DC port	–	II
DC port backfeed current	mA	0
PV array configuration	–	Ungrounded array; no additional DC side protection required; AC side protection requires a maximum of 20 A per branch circuit

Output data (AC)	Units	IQ8AC-72-M-US @240 VAC	IQ8AC-72-M-US @208 VAC
Peak output power	VA	366	350
Maximum continuous output power	VA	349	345
Nominal grid voltage (L-L)	V	240, split-phase (L-L), 180°	208,single-phase (L-L), 120°
Minimum and maximum grid voltage[6]	V	211–264	183-229
Maximum continuous output current	A	1.45	1.66
Nominal frequency	Hz	60	
Extended frequency range	Hz	47–68	
AC short-circuit fault current over three cycles	A_{rms}	2.70	
Maximum units per 20 A (L-L) branch circuit [7]	–	11	9
Total harmonic distortion	%	<5	
Overvoltage class AC port	–	III	
AC port backfeed current	mA	18	
Power factor setting	–	1.0	
Grid-tied power factor (adjustable)	–	0.85 leading ... 0.85 lagging	
Peak efficiency	%	97.3	97.2
CEC weighted efficiency	%	97.0	96.5
Nighttime power consumption	mW	30	22

Mechanical data	IQ8AC-72-M-US
Ambient temperature range	−40°C to 65°C (−40°F to 149°F)
Relative humidity range	4% to 100% (condensing)
DC connector type	Stäubli MC4

[5] No enforced DC/AC ratio.
[6] Nominal voltage range can be extended beyond nominal if required by the utility.
[7] Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

INVERTER SPEC SHEET

Mechanical data	IQ8AC-72-M-US
Dimensions (H × W × D); Weight	212 mm (8.3") × 175 mm (6.9") × 30.2 mm (1.2"); 1.1 kg (2.43 lb)
Cooling	Natural convection – no fans
Approved for wet locations; pollution degree	Yes; PD3
Enclosure	Class II double-insulated, corrosion-resistant polymeric enclosure
Environmental category; UV exposure rating	NEMA Type 6; Outdoor

Compliance	IQ8AC-72-M-US
Certifications	CA Rule 21 (UL 1741-SA), UL 62109-1, IEEE 1547:2018 (UL 1741-SB 3rd Ed.), FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA-C22.2 NO. 107.1-01. This product is UL Listed as PV rapid shutdown equipment and conforms with NEC 2014, NEC 2017, NEC 2020 and NEC 2023 section 690.12 and C22.1-2018 Rule 64-218 rapid shutdown of PV systems for AC and DC conductors when installed according to the manufacturer's instructions.

COMBINER SPEC SHEET

ENPHASE

DATA SHEET

X-IQ-AM1-240-4
X2-IQ-AM1-240-4
(IEEE 1547:2018)
X-IQ-AM1-240-4C
X2-IQ-AM1-240-4C
(IEEE 1547:2018)

IQ Combiner 4/4C

The Enphase IQ Combiner 4/4C with IQ Gateway and integrated LTE-M1 cell modem (included only with IQ Combiner 4C) consolidates interconnection equipment into a single enclosure and streamlines IQ Microinverters and storage installations by providing a consistent, pre-wired solution for residential applications. It offers up to four 2-pole input circuits and an Eaton BR series busbar assembly.

IQ Series Microinverters
The high-powered smart grid-ready IQ Series Microinverters (IQ6, IQ7, and IQ8 Series) dramatically simplify the installation process.

IQ System Controller 2
Provides microgrid interconnection device (MID) functionality by automatically detecting grid failures and seamlessly transitioning the home energy system from grid power to backup power.

IQ Battery
All-in-one AC coupled storage system that is reliable, smart, simple, and safe. It provides backup capability, and installers can quickly design the right system size to meet the needs of both new and retrofit solar customers.

IQ Load Controller
Helps prioritize essential appliances during a grid outage to optimize energy consumption and prolong battery life.

Enphase 5 year limited warranty

NOM

UL CERTIFIED SAFETY US+CA SÛRETÉ US+CA E341166

5-year limited warranty

Smart

- Includes IQ Gateway for communication and control
- Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), included only with IQ Combiner 4C
- Includes solar shield to match IQ Battery aesthetics and deflect heat
- Flexible networking supports Wi-Fi, Ethernet, or cellular
- Optional AC receptacle available for PLC bridge
- Provides production metering and consumption monitoring

Simple

- Centered mounting brackets support single stud mounting
- Supports bottom, back and side conduit entry
- Up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80 A total PV or storage branch circuits

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- Five-year limited warranty
- Two-years labor reimbursement program coverage included for both the IQ Combiner SKU's
- UL Listed
- X2-IQ-AM1-240-4 and X2-IQ-AM1-240-4C comply with IEEE 1547:2018 (UL 1741-SB, 3rd Ed.)

'Refer to the https://enphase.com/installers/resources/warranty page for country-specific warranty information.

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IQ Combiner 4/4C

MODEL NUMBER	UNITS	DESCRIPTION
IQ Combiner 4 (X-IQ-AM1-240-4, X2-IQ-AM1-240-4)	–	IQ Combiner 4 with an IQ Gateway printed circuit board for integrated revenue-grade PV production metering (ANSI C12.20 ±0.5%) and consumption monitoring (±2.5%). Includes a silver solar shield to match the IQ Battery and IQ System Controller 2 and to deflect heat.
IQ Combiner 4C (X-IQ-AM1-240-4C, X2-IQ-AM1-240-4C)	–	IQ Combiner 4C with an IQ Gateway printed circuit board for integrated revenue-grade PV production metering (ANSI C12.20 ±0.5%) and consumption monitoring (±2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05), a plug-and-play industrial-grade cell modem for systems up to 60 microinverters. (Available in the US, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area). Includes a silver solar shield to match the IQ Battery and IQ System Controller 2 and to deflect heat.
WHAT'S IN THE BOX	**UNITS**	
IQ Gateway printed circuit board	–	IQ Gateway is the platform for total energy management for comprehensive, remote maintenance, and management of the Enphase Energy System.
Busbar	–	80 A busbar with support for one IQ Gateway breaker and four 20 A breakers for installing IQ Series Microinverters and IQ Battery
IQ Gateway breaker	A	Circuit breaker, 2-pole, 10/15
Production CT	–	Pre-wired revenue-grade solid-core CT, accurate up to ±0.5%
Consumption CT	–	Two consumption metering split core or clamp-type CTs, shipped with the box, accurate up to ±2.5%
Emphase Mobile Connect (only with IQ Combiner 4C)	–	4G-based LTE-M1 cellular modem (CELLMODEM-M1-06-SP-05) with a five-year T-Mobile data plan
MICROINVERTERS, ACCESSORIES AND REPLACEMENT PARTS (not included; order separately)	**UNITS**	
Supported microinverters	–	IQ6, IQ7, and IQ8. Do not mix IQ6/IQ7 Microinverters with IQ8
Enphase Communications Kit COMMS-CELLMODEM-M1-06 CELLMODEM-M1-06-SP-05 CELLMODEM-M1-06-AT-05	–	- Includes COMMS-KIT-01 and CELLMODEM-M1-06-SP-05 with a 5-year T-Mobile data plan for Enphase sites - 4G-based LTE-M1 cellular modem with a five-year T-Mobile data plan - 4G-based LTE-M1 cellular modem with a five-year AT&T data plan
Circuit breakers (off-the-shelf)	–	Supports Eaton BR2xx, Siemens Q2xx and GE/ABB THQL21xx Series breakers (xx may be 10, 15, 20, 30, 40, 50, or 60). Supports Eaton BR220B, BR230B, and BR240B circuit breakers compatible with hold-down kit.
Circuit breakers (provided by Enphase)	–	BRK-10A-2-240V, BRK-15A-2-240V, BRK-20A-2P-240V, BRK-15A-2P-240V-B, and BRK-20A-2P-240V-B
XA-SOLARSHIELD-ES	–	Replacement solar shield for IQ Combiner 4/4C
XA-ENV2-PCBA-4	–	IQ Gateway replacement printed circuit board (PCB) for IQ Combiner 4/4C
XA-PLUG-120-3	–	Accessory receptacle for power line carrier in IQ Combiner 4/4C (required for EPLC-01)
X-IQ-NA-HD-125A	–	Hold-down kit for Eaton circuit breaker with screws
ELECTRICAL SPECIFICATIONS	**UNITS**	
Rating	A	80
System voltage and frequency	–	120/240 VAC, 120/208 VAC, 60 Hz
Busbar rating	A	125
Fault current rating	kAIC	10
Maximum continuous current rating (input from PV/storage)	A	64
Maximum fuse/Circuit rating (output)	A	90
Branch circuits (solar and storage)	–	Up to four 2-pole Eaton BR, Siemens Q, or GE/ABB THQL Series distributed generation (DG) breakers only (not included)
Maximum total branch circuit breaker rating (input)	A	80 A of distributed generation/95 A with IQ Gateway breaker included

To learn more about Enphase offerings, visit enphase.com.

ATTACHMENT SPEC SHEET

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).

Intertek

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

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.

Tech Brief

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.

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RACKING SPEC SHEET

Tech Brief

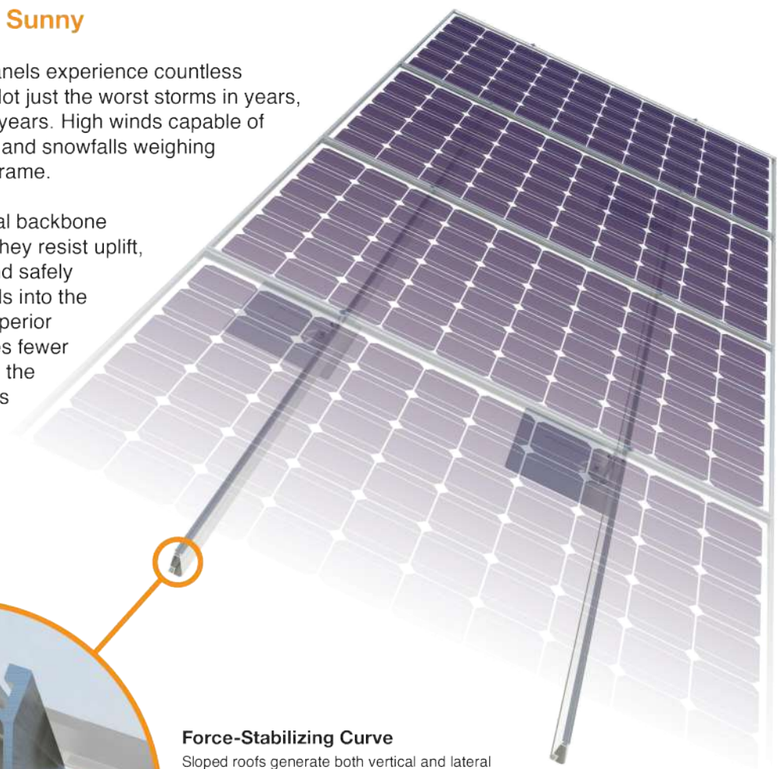
IRONRIDGE

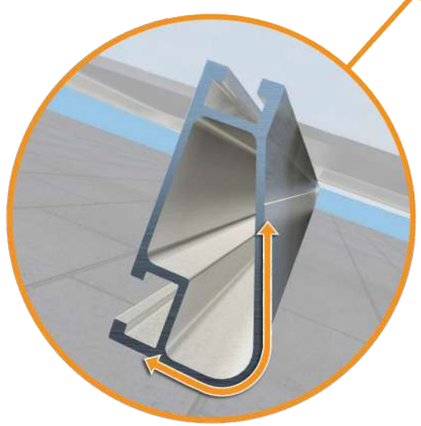
XR Rail® Family

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 6000-series aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

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
- Clear & black 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 10 feet.

- 10' 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 up to 12 feet for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear 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.

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October 16, 2025

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Re: Engineering Services
Levit Residence
127A Park Street Northeast, Vienna, VA
15.560 kW System

To Whom It May Concern:

We have received information regarding solar panel installation on the roof of the above referenced structure. Our evaluation of the structure is to verify the existing capacity of the roof system and its ability to support the additional loads imposed by the proposed solar system.

A. Site Assessment Information

1. Site visit documentation identifying attic information including size and spacing of framing for the existing roof structure.
2. Design drawings of the proposed system including a site plan, roof plan and connection details for the solar panels. This information will be utilized for approval and construction of the proposed system.

B. Description of Structure:

Roof Framing: Prefabricated wood trusses at 24" on center. All truss members are constructed of 2x4 dimensional lumber.
Roof Material: EPDM Membrane
Roof Slopes: 1 degrees
Attic Access: Accessible
Foundation: Permanent

C. Loading Criteria Used

- **Dead Load**
  - Existing Roofing and framing = 7 psf
  - New Solar Panels and Racking = 3 psf
  - TOTAL = 10 PSF
- **Live Load** = 20 psf (reducible) – 0 psf at locations of solar panels
- **Ground Snow Load** = 35 psf
- **Wind Load** based on ASCE 7-22
  - Ultimate Wind Speed = 130 mph (based on Risk Category II)
  - Exposure Category C

Analysis performed of the existing roof structure utilizing the above loading criteria is in accordance with the 2021 Virginia Residential Code. This analysis indicates that the existing framing will support the additional panel loading without damage, if installed correctly.

D. Solar Panel Anchorage

1. The solar panels shall be mounted in accordance with the most recent Ironridge installation manual. If during solar panel installation, the roof framing members appear unstable or deflect non-uniformly, our office should be notified before proceeding with the installation.
2. The maximum allowable withdrawal force for a #14 screw is 194 lbs per inch of penetration as identified in the National Design Standards (NDS) of timber construction specifications. Based on a minimum penetration depth of 2”, the allowable capacity per connection is greater than the design withdrawal force (demand). Considering the variable factors for the existing roof framing and installation tolerances, the connection using two #14 screws with a minimum of 2” embedment will be adequate and will include a sufficient factor of safety.
3. Considering the wind speed, roof slopes, size and spacing of framing members, and condition of the roof, the panel supports shall be placed no greater than 48” on center.

Based on the above evaluation, this office certifies that with the racking and mounting specified, the existing roof system will adequately support the additional loading imposed by the solar system. This evaluation is in conformance with the Virginia Residential Code, current industry standards and practice, and is based on information supplied to us at the time of this report.

Should you have any questions regarding the above or if you require further information do not hesitate to contact me.

Very truly yours,

Scott E. Wyssling, PE
Virginia License No. 0402060608
Virginia COA # 407008373

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Gravity Loads

Levit Residence
127A Park Street Northeast
Vienna, VA

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Existing

Roof Dead Load

2.0 psf	Membrane
1.6 psf	1/2" Plywood Sheathing
0.8 psf	2x4 Trusses @ 24 in. o.c.
1.0 psf	Ceiling, Mechanical, Electrical
1.6 psf	Miscellaneous
7.0 psf	**TOTAL**

Second Floor Dead Load

0 psf	Floor Finishes
0 psf	1 1/8" Subfloor Sheathing
0 psf	Joists @ 16' o.c.
0 psf	Partitions
0 psf	Ceiling, Mechanical, Electrical
0 psf	Miscellaneous
0 psf	TOTAL

Roof Live Load
20 psf

Floor Live Load
0 psf

Roof Snow Load

Ground Snow Load= 35 psf
pf = 0.7 Ce Ct pg = 25 psf $C_e = 1$, $C_t = 1.1$ Flat Roof Snow Load (ASCE 7-22 Eq. 7.3-1) Multiplied by 0.7 A
C_s = **1.00** Ct=1.2 ASCE 7-22 Figure 7.4-1

Additional

Roof Dead Load - New Solar Panels
3 psf

Roof Live Load at Solar Panels
0 psf

Roof Snow Load at Solar Panels
25 psf Sloped Roof Snow Load (ASCE 7-22 Eq. 7.4-1)

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Total

Total Existing Roof Load = (DL_{ROOF} + Max(LL_{ROOF} or S)) $Area_{ROOF}$
68607 lbs

Total New Roof Load = (DL_{ROOF} + DL_{ADD} + Max(LL_{ROOF} or S)) $Area_{ROOF}$
69870 lbs

Change in Demand = (Total New Roof Load - Existing Roof Load) / Existing Roof Load
1.84%

Total New Gravity Loads increase by less than 5%. OK

Existing structural elements supporting any additional gravity loads as a result of the alterations, including the effects of snow drift, comply with the International Building Code.