City of Huron
Agenda for the Planning Commission/DRB
Wednesday, August 20, 2025 5:00pm.

I. **Call to Order**

II. **Roll Call**

III. **Adoption of the Minutes (6-18-25 & 7-23-25)**

IV. **Audience Comments (3-minute time limit)** *Please step to the podium and state your name and address for the record.

V. **New Business**

207 Williams Street- PPN42-00497.000 Solar Roof Panel App

VI. **Staff Report**

Solar Chapter- Discussion- DRB requirement for roof panels.

Signage Code - Work Session Meeting Sept. 10 or 11th

Board/Commission Openings

VII. **Other Matters**

Next Regular Meeting: September 17, 2025

VIII. **Adjournment**

TO: Chairman Boyle and Members of the Planning Commission
FROM: Christine Gibboney, Planning & Zoning Manager
RE: 207 Williams- Roof Mounted Solar Panels
DATE: August 20, 2025

Address: 207 Williams **PPN 42-00497.000**

Zoning District: R-2 **Existing Land Use: Single Family Residential**

Traffic Considerations: N/A

Owner/Applicant: Robert & Nancy Smith, Owners
Ambia Energy, LLC

PROJECT DESCRIPTION
Applicant is proposing to install a 7.695 KW roof mounted residential solar panel system. The system consists of 3 arrays containing a total of nineteen (19) panels. Two arrays to be located on the home and one on the detached garage.

APPLICABLE CODE SECTIONS : 1126.18 Solar Structures (attached)

STAFF ANALYSIS/ RECOMMENDATION:
Pursuant to Code Section 1126.18 Solar Structures (d) (1), approval of the Design Review Board is required before the issuance of permits. The residence is a single-family home on Williams Street. The Residential Zoning application is complete and the plan review by Zoning has found the application to be compliant with Section 1126.18.

The proposed roof mounted solar panel system contains 19 panels, roof array area=403.75 sq. ft. to be installed on the pitched roofs of a single-story residential structure and the detached garage.

- The total roof area of the home and garage that are covered by the roof panels is approx. 19%.
- The panel attachment detail reflects a max 6" rise from the roof to the top side of the panel (18'' max per the code).
- The code requires that the system shall not be located within 12" of the edge of the roof, as proposed the system meets this requirement, reflecting panels being 3' from the roof edge.
- There is no known HOA in this neighborhood.

Upon approval from the DRB, the application will be submitted to the Building Department for the review and issuance of the Building Permit(s).

Attachments: Application & Plans

1126.18 SOLAR STRUCTURES.

(a) Purpose. It is the purpose of this chapter to regulate the construction, modification, operation and abandonment by discontinuation of use of solar energy systems in the City of Huron, subject to reasonable conditions that will protect the public health, safety, and welfare while preserving the enjoyment of private property, promoting orderly land use, and development; allowing the safe, effective, and efficient use of solar energy systems. Solar energy systems shall be considered a permitted use in any zoning district, subject to the requirements of any other applicable chapter of this Code.

(b) Definitions.

(1) "Abandonment" means choosing to give up or discontinue use of the solar energy generation system in whole or part.

(2) "Alternating-current (ac) module" means a complete, environmentally protected unit consisting of solar cells, optics, inverter, and other components, exclusive of tracker, designed to generate ac power when exposed to sunlight.

(3) "Applicant" means the person or entity filing an application under this Chapter.

(4) "Array" means a mechanically integrated assembly of modules or panels with a support structure and foundation, tracker, and other components, as required, to form a direct-current power producing unit.

(5) "Facility owner" means the entity or entities having equity interest in the solar energy facility, including their respective successors and assigns.

(6) "Ground mount" means a solar electrical system that is mounted directly to ground mounted structure instead of solely on a building wall or roof.

(7) "Operator" means the entity responsible for the day-to-day operation and maintenance of the solar energy system.

(8) "Solar cell" means the basic photovoltaic device that generates electricity when exposed to light.

(9) "Solar energy system (active or passive)" means the equipment, assembly or building construction and requisite hardware that provides and is used for collecting, transferring, converting, storing, or using incident solar energy for water heating, space heating, cooling, generating, electricity, or other applications that would otherwise require the use of a conventional source of energy such as petroleum products, natural gas, manufactured gas, or electricity produced from a nonrenewable resource. Such systems include Passive Solar Energy Systems that capture the Sun's energy in building design and construction components; Solar Thermal Energy Systems that convert sunlight to heat as in a hot water tank or swimming pool; and Photovoltaic Solar Energy Systems that convert sunlight to electricity.

(10) "Solar panel" means one of any type of assembly that produces energy, either electrical, heat or hot water for use or distribution include PV (Photovoltaic) an electrical device consisting of an array of connected solar cells, heat collectors and interstitial spaces including trombe panels, or hydronic panels for water heating systems.

(11) "Solar photovoltaic systems" means the total components and subsystems that, in combination convert solar energy into electrical energy suitable for connection to utilization load.

(c) Applicability.

(1) No person shall construct, erect, maintain, extend, or remove a solar system in any zoning district in the City without compliance with the provisions of this chapter and applicable related requirements of the entire ordinance.

(2) Solar energy systems constructed prior to the effective date of this chapter shall not be required to meet the requirements of this code; unless any physical condition or modification renders such system un-repairable or un-usable. If any pre-existing solar energy system is damaged or destroyed such an extent that is cannot be returned to original service, or any such damage or modification creates an unsafe condition it shall be replaced or removed in conformity to this chapter and pursuant to Section 1121.07.

(3) Like-kind replacements of panels shall require applicable electrical or general building permits.

(4) Like-kind replacements of entire ground-mount solar energy systems shall require proper zoning approval and applicable electrical/building permits. Existing installations shall provide emergency disconnect locations to the City of Huron Building Department.

(d) Contents of Application.

(1) Solar structures shall only be an accessory use in residential (R) and commercial (B) zoning districts. Ground-mounted solar panels are a conditional accessory use at any residential or non-residential building, excluding Industrial (I) zones, where they are permitted by right. In all districts, solar equipment including solar panels, may be located on the roof in compliance with all requirements of this Code including building height and screening, after approval by the Design Review Board. Nothing in this regulation shall preclude standalone systems for small accessory lighting, ventilation or battery storage systems either roof or ground-mounted not to exceed twelve (12) square feet.

(2) An application for a solar energy system shall be approved in compliance with the standards and criteria of this Chapter and shall include:

A. A narrative describing the proposed solar energy system including the approximate generating capacity of the project and the number, manufacturer, and model of the solar panels to be installed, their individual generating capacity and a description of ancillary systems.

B. A site plan to scale of the subject property showing the planned location of the solar panels, setback lines, proposed and existing ancillary equipment buildings, and structures. For systems with more than thirty-five percent (35%) of roof area facing the street, elevation(s) shall be provided to scale.

C. Certified approval from the Homeowners Association (HOA) and/or an approval letter from the HOA legal representative, if applicable.

(e) Design and Performance Standards.

(1) Lighting. Solar energy systems shall be lit only if required by an applicable authority. Lighting of other parts of the solar energy systems, such as appurtenant structures shall be limited to that required for safety and operational purposes, and shall be reasonably shielded from abutting structures.

(2) Appearance and Signage. The factory or original equipment manufacturer identification and/or logo are permitted. Required signage and emergency services disconnect placard shall be appropriate warning signs (Danger-High Voltage or Caution-Electrical Shock Hazard or any other recognized safety precaution signage) installed at the base of the solar array.

(3) Construction Codes. To extent applicable, the solar system shall comply with the Ohio Building Code and any other applicable building and fire codes.

(4) Electrical Codes. Permit applications for solar energy systems shall be accompanied by a line-drawing of the electrical components, as supplied by the manufacturer, in sufficient detail to allow for determination that the manner of installation conforms to all relevant and applicable local, state, and national codes, including the current national electric code NEC (NFPA 70). Solar energy systems interconnected to local utility shall have/ provide surge and lightning arrestors. All solar energy systems shall be grounded to reduce lightning strikes. All electrical lines and utility wires shall be buried underground.

(5) Utility Notification. Permits for solar energy systems shall not be issued until evidence has been provided that the utility company approves the customer's intent to install an interconnected customer-owned generator. Applicant shall supply the letter of approval from the utility company at the time of application.

(6) Completion. A solar energy system installation shall commence within six months of the issuance of the zoning permit and shall be completed and operational within one year from the date of commencement of installation. Commencement of installation shall be the date the solar panels are placed into position. If the solar energy system is not completed within the stated time period, the facility owner or operator or the landowner shall be required, at his or their expense, to complete decommissioning of the site within 180 days without exception.

(7) Solar Access Easements. Ohio R.C. 5301.63 sets forth the requirements for solar access, for the pwpose of ensuring adequate access of solar energy collection devices to sunlight, any person may grant a solar access easement. Such easements shall be in writing and subject to the same conveyance and recording requirements as other easements. Any instrument creating a solar easement shall be recorded in the Erie County Recorder's Office.

(8) Installation. Solar Panels must be installed in accordance with the manufacturer's design and operation standards, as well as all local county, state, and federal guidelines. Reasonable access for emergency response shall be provided to all solar systems and components including a twenty-four (24) inches clear area around all flat-roof or ground-mounted solar array(s).

(9) Roof-Mounted. Roof-mounted solar energy systems shall be permitted in all zoning districts provided the roof-mounted solar system meets all other requirements of the zoning and building regulations, including design review, and all applicable local and state fire and building codes. Pitched roof-mounted arrays shall be parallel to the roof. The distance between the roof and the uppermost portion of the solar panels shall not exceed eighteen (18) inches. Pitched-roof-mounted solar systems shall not be located within twelve (12) inches of the edge of the roof. Roof-mounted panels on a flat roof shall not project vertically more than five (5) feet from the surface of the roof and shall be buffered as prescribed by the Zoning Code.

(10) Ground-Mounted.

A. Ground-mounted solar panels located on the ground or attached to a framework located on the ground shall not exceed fifteen (15) feet in height above the adjacent grade.

B. All related mechanical equipment, other than the actual photoelectric panels shall be fully buffered from the adjacent properties by fencing and/or by evergreen plantings as prescribe by city ordinance and must be maintained and effective through the life of the system. Buffering shall permit work access to panel and shall conform to Chapter 1131.

C. Ground-mounted solar panel arrays shall not exceed thirty percent (30%) of the remaining rear yard area within the setbacks defined by other chapters of the Zoning Code.

D. Non-Residential. Ground-mounted solar energy systems shall be permitted by right in all Industrial (I) Zones. Any proposed ground-mounted solar energy system may be located within any yard subject to applicable setback requirements for accessory structures and front setback requirements for principal structures within the designated I District.

E. Residential. No ground installations are permitted by right. Any proposed ground-mounted solar panels are conditional uses based on full compliance with this Zoning Code and approval from the Board of Building and Zoning Appeals.

(i) If approved, ground-mounted solar energy systems shall not be permitted in the front or side yard of a residential property. It shall be permitted in the rear yard of a residence. Such equipment shall be subject to the applicable rear yard coverage regulations and setbacks for accessory structures in residential districts as set forth in Section 1121.06 or other prevailing chapters of the Zoning Code.

F. Commercial and Retail Business. No ground installations are permitted by right in Business (B) Zones. Any proposed ground-mounted solar panels are conditional uses based on full compliance with this Zoning Code and approval from the Board of Building and Zoning Appeals.

(i) If approved, ground-mounted solar energy systems shall not be permitted in the front or side yard of a residential property. It shall be permitted in the rear yard of a residence. Such equipment shall be subject to the applicable rear yard coverage regulations and setbacks for accessory structures in residential districts as set forth in Section 1121.06 and/or other prevailing chapters of the Zoning Code.

(f) Fees. See Chapter 1321 for the fee schedule pertaining to conditional use, accessory structures, and electrical fees.

(g) Abandonment.

(1) At such a time a solar energy system is scheduled to be abandoned or operation is to be discontinued, the applicant will notify the Building Official and Planning Department of the proposed date of abandonment or discontinuation of use. If applicant fails to notify either department, then in that event the provisions contained under subsection (g)(2) herein below shall apply.

(2) Upon abandonment or discontinuation of use, the owner shall physically remove the solar energy system within 180 days from the date of abandonment or discontinuation of use. This period may be extended sixty (60) days at the request of the owner but only upon the approval of the Building Official. "Physically remove" shall include, but not be limited to:

A. Removal of the solar energy system and related above grade structures.

B. Restoration of the location of the solar energy system to its natural condition, except that any landscaping, grading may remain in the after-conditions.

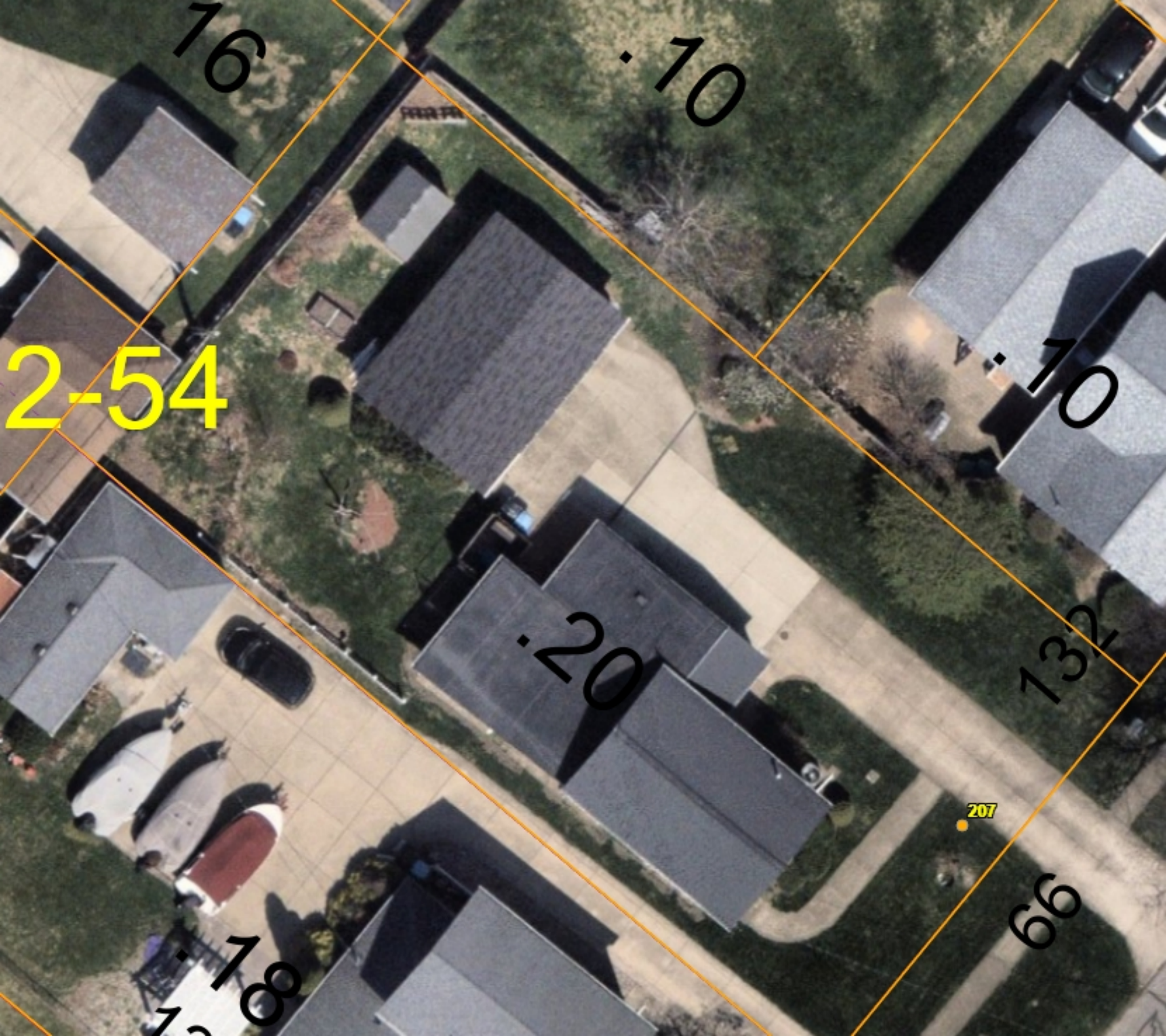
(3) In the event that an applicant fails to give such notice, the system shall be considered abandoned or discontinued if the system is out-of-service for a continuous six-month period. After the six-month period of inoperability, the Building Official shall issue a Notice of Abandonment to the owner and operator of the solar energy system and, if residential, the property owner. The owner shall have the right to respond to the Notice of Abandonment within thirty (30) days from Notice receipt time. The Building Official shall withdraw the Notice of Abandonment and notify the owner that the Notice has been withdrawn if the owner provides information that demonstrates the solar energy system has not been abandoned.

(4) If the owner fails to respond to the Notice of Abandonment or if after review by the Building Official it is determined that the solar energy system has been abandoned or use discontinued, the owner of the solar energy system shall remove the system at the owner's sole expense within sixty (60) days of receipt of the Notice of Abandonment. An extension may be granted to the applicant for just cause by the Building Official.

(h) Severability. Should any section, subdivision, clause, or phrase of this chapter be declared by the courts to be invalid, the validity of the chapter as a whole, or in part, shall not be affected other than the part invalidated.

(i) Penalty. See Section 1139.01 for Zoning Code violations.

(Ord. 2022-60. Passed 1-10-23.)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City of Huron
Planning and Zoning Dept.
417 Main St. Huron, Ohio 44839 P:
419-433-5000
F: 419-433-5120

Residential Zoning Permit Application- SOLAR Chapter 1126

Property Owner

Name: Robert Smith

Address, City, State, Zip: 207 Williams St Huron, OH 44839

Phone: (419) 433-0151

Email: r.b.smith@frontier.com

Contractor (must be registered with the City of Huron)

Name: Ambia Energy, LLC

Address, City, State, Zip: 335 South 560 West, Suite 100 | Lindon, Utah 84042

Phone: 877-412-7929

Email: permitting@ambiasolar.com

Location of Project

Address: 207 Williams St Huron, OH 44839 County Parcel Number: 42-00497.000 Lot #: _____

Zoning District & Flood Zone

Zoning District: R-2 (R-1 R-1A R-2 R-3 B-1 B-2 B-3 I-1 I-2 P-1 MU)

Flood Zone: _____ (A AE AO AH X-SHADED X)

PROJECT INFORMATION

Ground Mount ☐ Roof Mount: ☑

Description of proposed project: (include complete details, square footage)

7.695 kW residential solar system to be installed on roof

ESTIMATED VALUE OF PROPOSED PROJECT: $ $ 13,851.00

SETBACKS FROM PROPERTY LINES: (Not applicable for roof panels)

Front Yard Setback: N/A Can NOT be in the front yard Rear Yard Setback: _____ Height of Structure: _____

Side Yard Setbacks: (Left) _____ (Right) _____

Square footage: 403.75

Documents that must be included with this Zoning Application:

A. A narrative describing the proposed solar energy system including the approximate generating capacity of the project and the number, manufacturer, and model of the solar panels to be installed, their individual generating capacity and a description of ancillary systems.
B. A site plan to scale of the subject property showing the planned location of the solar panels, setback lines, proposed and existing ancillary equipment buildings, and structures. For systems with more than thirty-five percent (35%) of roof area facing the street, elevation(s) shall be provided to scale.
C. Certified approval from the Homeowners Association (HOA) and/or an approval letter from the HOA legal representative, if applicable supply the letter of approval from the utility company at the time of application
D. Utility Notification. Permits for solar energy systems shall not be issued until evidence has been provided that the utility company approves the customer's intent to install an interconnected customer-owned generator. Applicant shall supply the letter of approval from the utility company at the time of application.

Roof-Mounted. (REQUIRES APPROVAL THROUGH THE DESIGN REVIEW BOARD)

- Roof-mounted solar energy systems shall be permitted in all zoning districts provided the roof-mounted solar system meets all other requirements of the zoning and building regulations, including design review, and all applicable local and state fire and building codes.
- Pitched roof-mounted arrays shall be parallel to the roof.
- The distance between the roof and the upper most portion of the solar panels shall not exceed eighteen (18) inches. Pitched roof-mounted solar systems shall not be located within twelve (12) inches of the edge of the roof. Roof mounted panels on a flat roof shall not project vertically more than five (5) feet above the surface of the roof and shall be buffered as prescribed by the Zoning Code.

Ground-Mounted. (REQUIRES APPROVAL THROUGH THE BUILDING & ZONING APPEALS BOARD

- Ground-mounted solar panels located on the ground or attached to a framework located on the ground shall not exceed fifteen (15) feet in height above the adjacent grade.
- All related mechanical equipment, other than the actual photometric panels shall be fully buffered from the adjacent properties by fencing and/or by evergreen plantings as prescribed by city ordinance and must be maintained and refreshed through the life of the system. Buffering shall permit work access to panel and shall conform to Chapter 1131.
- Ground-mounted solar panel arrays shall not exceed thirty percent (30%) of the remaining rear yard area within the setbacks defined by other chapters of the Zoning Code.

BOARD/COMMISSION APPROVALS

UPON RECEIPT OF YOUR APPLICATION AND VERIFICATION OF COMPLIANCE, THE APPLICATION WILL BE PLACED ON THE NEXT APPLICABLE BOARD/COMMISSION AGENDA (Monthly Meetings) FOR APPROVAL BEFORE THE THE ZONING AND BUILDING PERMIT REVIEWS CAN BEGIN FOR PERMIT ISSUANCE.

City Code: Section 1126.18 Solar Structures available on our website at www.cityofhuron.org

VERIFICATION OF PROPERTY LINES:

It is the responsibility of the property owner to verify the location of property lines and reflect these on the required site plan. It is recommended owners refer to their survey map and/or have a survey performed to verify the property lines before applications are submitted.

CC
(Initials)

I hereby certify that I am the owner of record of the named property or that the proposed work is authorized by the owner of record and/or I have been authorized to make this application as an authorized agent, and we agree to conform to all applicable laws, regulations, and ordinances. All information contained within this application and supplemental materials is true and accurate to the best of my knowledge and belief.

Incomplete applications will not be accepted, please complete all applicable sections and include all specified plans as listed above.

Applicant Signature: Corben Cantrell - Permitting for Ambia Energy Date: 07/18/25

Owner Signature: Signed by: Robert Smith 097DCDC52BCB40A... Date: 7/19/2025

PLEASE NOTE, DO NOT APPLY FOR PERMITS UNLESS YOU ARE READY TO BEGIN YOUR PROJECT WITHIN 6 MONTHS.

PERMITS FEES ARE DUE AND PAYABLE AT THE TIME OF ISSUANCE AND ARE NON-REFUNDABLE. ZONING PERMITS EXPIRE 12 MONTHS FROM DATE OF ISSUANCE.

YOUR PROJECT ALSO REQUIRES A BUILDING PERMIT, SUBMIT THE BUILDING PERMIT APPLICATION AND REQUIRED PLANS WITH THIS APPLICATION.

For use by City of Huron Zoning Department:

Date of Submission: 7/21/25 Required Plans Included?: yes Building Permit included?: yes

Comments/Additional Information requested:_____

_____

Denial date and reason:_____

WYSSLING CONSULTING
CORPORATE EXPERIENCE WITH SMALL BUSINESS VALUE

Scott E. Wyssling, PE
Heath J. Harpster, PE, P.Eng
Gregory T. Elvestad, PE

76 North Meadowbrook Drive
Alpine, UT 84004
office (201) 874-3483
swyssling@wysslingconsulting.com

July 10, 2025

Ambia Energy
335 South 560 West, Suite 100
Lindon, Utah 84042

Re: Engineering Services
Smith Residence
207 Williams Street, Huron, OH
7.695 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 (Roof 1/3):	Assumed 2x6 dimensional lumber at 24” on center.
Roof Framing (Roof 2):	Prefabricated wood trusses with all truss members constructed of 2 x 4 dimensional lumber at 24” on center.
Roof Material:	Composite Asphalt Shingles
Roof Slope:	7, 23, & 27 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** = 20 psf
- **Wind Load** based on ASCE 7-16
  - Ultimate Wind Speed = 115 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 2019 Residential Code of Ohio (2018 IRC). This analysis indicates that the existing rafters 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 Pegasus Solar 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 system utilizes the Pegasus SkipRail racking system. Please reference the stamped plan set for rail and mounting locations.
3. The maximum allowable withdrawal force for a 5/16" lag screw is 229 lbs per inch of penetration as identified in the National Design Standards (NDS) of timber construction specifications. Based on a minimum penetration depth of 2½", 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 one 5/16" diameter lag screw with a minimum of 2½" embedment will be adequate and will include a sufficient factor of safety.
4. 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 (see report).

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 2019 Residential Code of Ohio (2018 IRC), current industry standards, 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
Ohio License No. 84884
COA# 06516

Wyssling Consulting, PLLC
76 N. Meadowbrook Drive, Alpine UT
Ohio COA # 06516
Signed 7/10/2025

DC SYSTEM SIZE: 7.695 KW

SCOPE OF WORK:

AMBIA ENERGY TO INSTALL THE PROPOSED GRID-TIED PHOTOVOLTAIC SYSTEM. AMBIA ENERGY WILL BE RESPONSIBLE FOR COLLECTING THE NEEDED SITE INFORMATION TO DESIGN AND INSTALL THE PROPOSED PHOTOVOLTAIC SYSTEM. INSTALL SHALL INCLUDE THE FOLLOWING:

- MODULES, INVERTER(S), MOUNTING, AND RACKING INSTALLATION
- AC/DC DISCONNECTS, AND PV LABELS (THAT ARE APPLICABLE TO PROJECT)
- GROUNDING AND PV GROUNDING ELECTRODE AND BONDING TO EXISTING GEC
- SYSTEM WIRING
- NET METERING (IF NEEDED)

THE PHOTOVOLTAIC SYSTEM INCLUDES:

(19) JA SOLAR – JAM54S31-405/MR (CS-1)
(19) ENPHASE – IQ8PLUS-72-2-US (CS-2)
(1) ENPHASE – X-IQ-AM1-240-5C (CS-3)

THE MODULES SHALL BE FLUSH MOUNTED USING

APPROX. (82) PEGASUS #PIF-RMDT MOUNTS
ON PEGASUS PSR-M84 RAIL

THE PHOTOVOLTAIC SYSTEM SHALL BE INTERCONNECTED BY PERFORMING A RATED BACK FED TAP INTO THE EXISTING 100 A MAIN SERVICE PANEL

CODE REFERENCES:

PROJECT TO COMPLY WITH THE FOLLOWING GOVERNING CODES

OBC	2017	OHIO BUILDING CODE
RCO	2019	RESIDENTIAL CODE OF OHIO
NEC	2023	NATIONAL ELECTRIC CODE

ASCE 7-16 WIND SPEED:	115 MPH, EXPOSURE CATEGORY C
GROUND SNOW LOAD:	20 PSF, EXPOSURE CATEGORY C

STAMPS (IF NEEDED)

STATE OF OHIO
SCOTT E. WYSSLING
PE-84884
REGISTERED
PROFESSIONAL ENGINEER

Wyssling Consulting, PLLC
76 N. Meadowbrook Drive, Alpine UT
Ohio COA # 06516
Signed 7/10/2025

SHEET INDEX

GENERAL NOTES

1. ALL COMPONENTS SHALL BE UL LISTED, AND CEC CERTIFIED WHERE APPLICABLE.
2. EACH MODULE TO BE GROUNDED USING THE SUPPLIED CONNECTION POINT PER MANUFACTURER'S REQUIREMENTS. ALL SOLAR MODULES, EQUIPMENT, AND METALLIC COMPONENTS ARE TO BE BONDED. IF THE EXISTING GROUNDING ELECTRODE SYSTEM CANNOT BE VERIFIED OR IS ONLY METALLIC WATER PIPING, IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL A SUPPLEMENTAL GROUNDING ELECTRODE.
3. ALL PLAQUES AND SIGNAGE REQUIRED BY THE ADOPTED NATIONAL ELECTRIC CODE SHALL BE METAL OR PLASTIC, ENGRAVED OR MACHINED IN A CONTRASTING COLOR TO THE PLAQUE/LABEL. ALL PLAQUES/LABELS SHALL BE UV & WEATHER RESISTANT (SEE E-2.1).
4. DC CONDUCTORS SHALL BE RUN IN EMT AND/OR MC (METAL CLAD CABLE) AND SHALL BE LABELED A MINIMUM OF EVERY 10' (SEE E2-E2.1)
5. EXPOSED NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH 250.134 OR 250.136(A).
6. CONFIRM LINE SIDE VOLTAGE AT ELECTRIC UTILITY SERVICE PRIOR TO CONNECTING INVERTER. VERIFY SERVICE VOLTAGE IS WITHIN INVERTER VOLTAGE OPERATIONAL RANGE.
7. ALL SIGNAGE MUST BE PERMANENTLY ATTACHED AND BE WEATHER/SUNLIGHT RESISTANT AND CANNOT BE HAND-WRITTEN(SEE E2-E2.1)
8. ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.
9. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE, AND FOR ROOF-MOUNTED SYSTEMS, WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF OF THE ROOF SURFACE. NEC 110.2 – 110.4 / 300.4
10. ALL PV METERS AND RAPID SHUTDOWNS TO BE WITHIN 5' OF ANOTHER. AC DISCONNECT TO BE WITHIN 10' OF UTILITY METER. PV METER CENTER OF GLASS TO BE AT 5'. ANY PV METERS TO BE INSTALLED CORRECTLY, SUPPLIED FROM TOP JAWS.
11. ALL ROOF PENETRATIONS MUST BE FLASHED. SIMPLY CAULKING WIILL NOT SUFFICE.
12. ALL DC CONDUCTORS RUN INSIDE OF THE STRUCTURE SHALL BE INSTALLED A MINIMUM OF 18" BELOW THE ROOF DECK.
13. EQUIPMENT MAY BE SUBSTITUTED FOR SIMILAR EQUIPMENT BASED ON AVAILABILITY. SUBSTITUTED EQUIPMENT SHALL COMPLY WITH DESIGN CRITERIA

V2.3.5

AMBIA

AMBIA ENERGY, LLC
ADDRESS: 335 SOUTH 560 WEST,
SUITE 100 | LINDON, UTAH 84042
PHONE: 877.412.7929

SYSTEM SIZE:	7.695 KW (E-1)
	(19) JA SOLAR – JAM54S31-405/MR (CS-1)
	(19) ENPHASE – IQ8PLUS-72-2-US (CS-2)
	(1) ENPHASE – X-IQ-AM1-240-5C (CS-3)
	ROOF TYPE: COMP SHINGLE (PV-2)
	INTERCONNECTION METHOD: RATED BACK FED TAP
CUSTOMER LAST NAME:	SMITH
ADDRESS:	207 WILLIAMS ST
CITY:	HURON
STATE:	OH
ZIP:	44839
JURISDICTION:	HURON
UTILITY COMPANY:	FIRST ENERGY

DESIGNED BY: SV

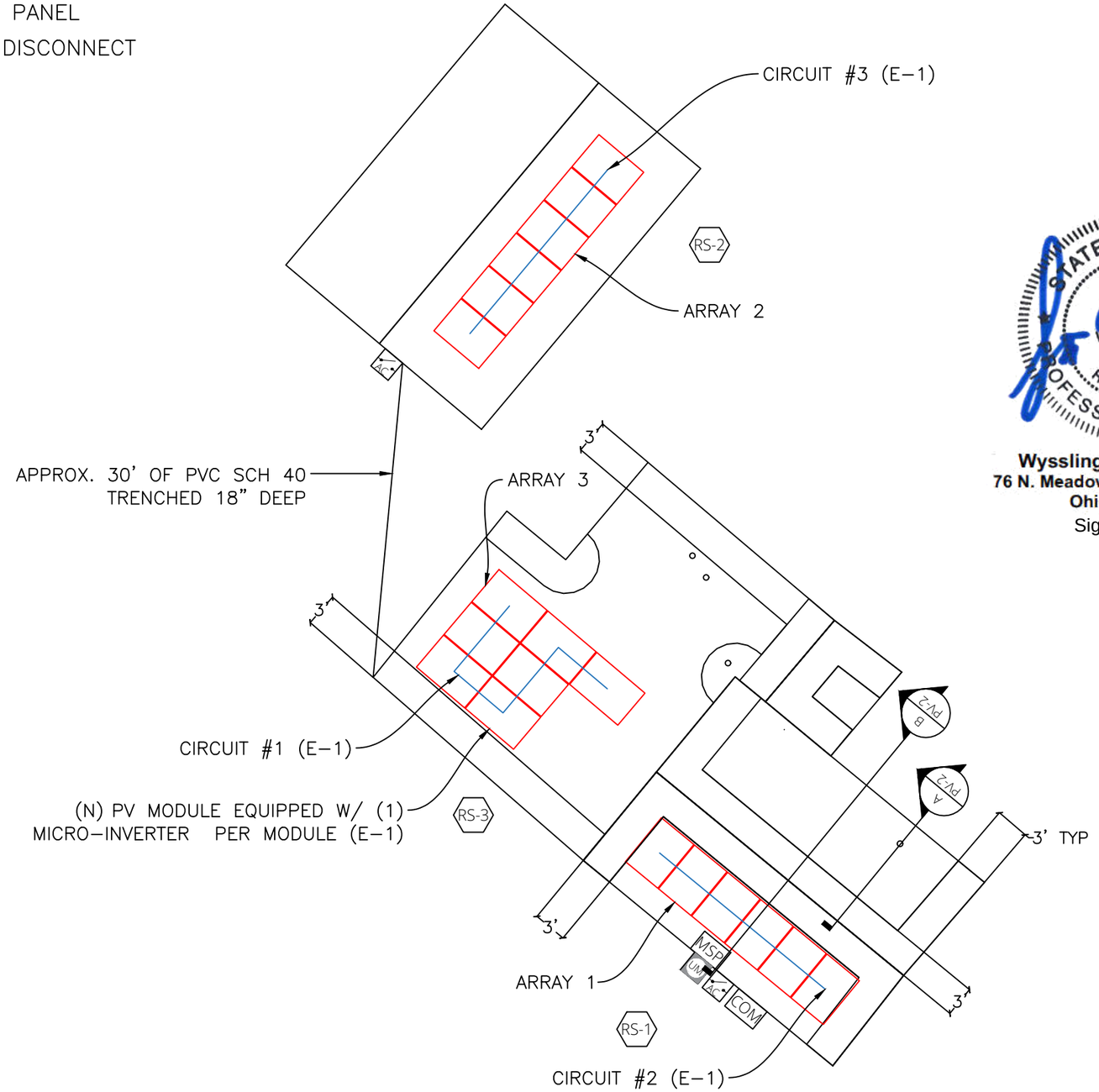
DESIGNED ON
7/8/2025

COVER PAGE

C-1

LEGEND:

- UM =UTILITY METER
- MSP =MAIN SERVICE PANEL
- AC =UTILITY PV AC DISCONNECT
- AC/DC =INVERTER



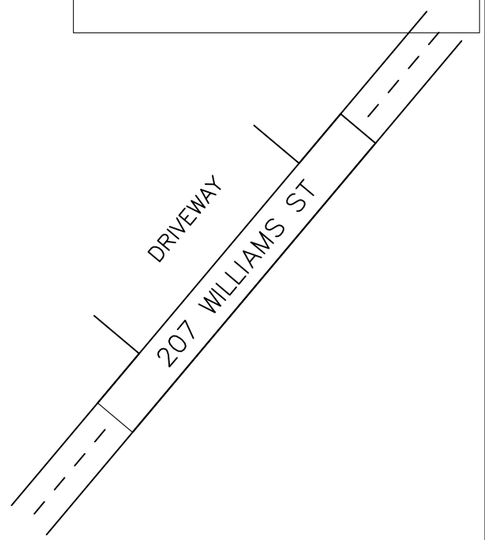
TRUE NORTH

	TILT	AZIMUTH
ROOF SECTION 1	27	219
ROOF SECTION 2	7	309
ROOF SECTION 3	23	129
ROOF SECTION 4	N/A	N/A
ROOF SECTION 5	N/A	N/A
ROOF SECTION 6	N/A	N/A

DESIGN ADDENDUMS TO STANDARD TEMPLATE BASED ON CITY, STATE, UTILITY, AHJ, OR PREVIOUS PLAN REVIEWER COMMENTS IF THERE ARE CONFLICTING NOTES, ADDENDUMS TAKE PRECEDENCE OVER STANDARD TEMPLATE NOTES

ADDENDUM #22 - OH: INVERTER WATTAGE= 5510W
ADDENDUM #23 - OH: MODULE WATTAGE= 405W
ADDENDUM #24 - OH: SYSTEM SIZE= 7.695kW
ADDENDUM #32 - 1: CALCULATION FOR OCPD TO THE AC OUTPUT INVERTER @125%: 1.21A(INVERTER MAXIMUM OUTPUT CURRENT) x 1.25 =1.5125A
ADDENDUM #33 - 2: CALCULATIONS FOR THE SUM OF THE MAIN OCPD AND THE INVERTER @120%: BUSBAR RATING x 120% - MAIN BREAKER RATING= 20A
ADDENDUM #34 - 3: CALCULATIONS FOR THE DERATING OF CONDUCTORS IN RACEWAY FOR ROOFTOP PV SYSTEMS: SEE EE-3 PAGE

Wyssling Consulting, PLLC
76 N. Meadowbrook Drive, Alpine UT
Ohio COA # 06516
Signed 7/10/2025



HATCHED AREA WILL PROVIDE A FIRECODE PATHWAY TO COMPLY WITH IFC 605.11.3.2.1

SITE PLAN NOTES:

- VERIFY ALL OBSTRUCTIONS AND DIMENSIONS IN THE FIELD.
- PROVIDE RAIL SPLICES AS REQUIRED BY MANUFACTURER'S GUIDELINES.
- NO SIGNIFICANT SHADING WILL RESULT FROM EXISTING ROOF OBSTRUCTIONS.
- PV MODULES CANNOT BE INSTALLED OVER OR BLOCK ATTIC VENTS, PLUMBING VENTS, FURNACE OR WATER HEATER VENTS ETC
- SCALE 3/32"=1'

V2.3.5

AMBIA

AMBIA ENERGY, LLC
ADDRESS: 335 SOUTH 560 WEST, SUITE 100 | LINDON, UTAH 84042
PHONE: 877.412.7929

SYSTEM SIZE: 7.695 KW (E-1)	
(19) JA SOLAR - JAM54S31-405/MR (CS-1)	
(19) ENPHASE - IQ8PLUS-72-2-US (CS-2)	
(1) ENPHASE - X-IQ-AM1-240-5C (CS-3)	
ROOF TYPE: COMP SHINGLE (PV-2)	
INTERCONNECTION METHOD: RATED BACK FED TAP	
CUSTOMER LAST NAME: SMITH	
ADDRESS: 207 WILLIAMS ST	
CITY: HURON	
STATE: OH	
ZIP: 44839	
JURISDICTION: HURON	
UTILITY COMPANY: FIRST ENERGY	

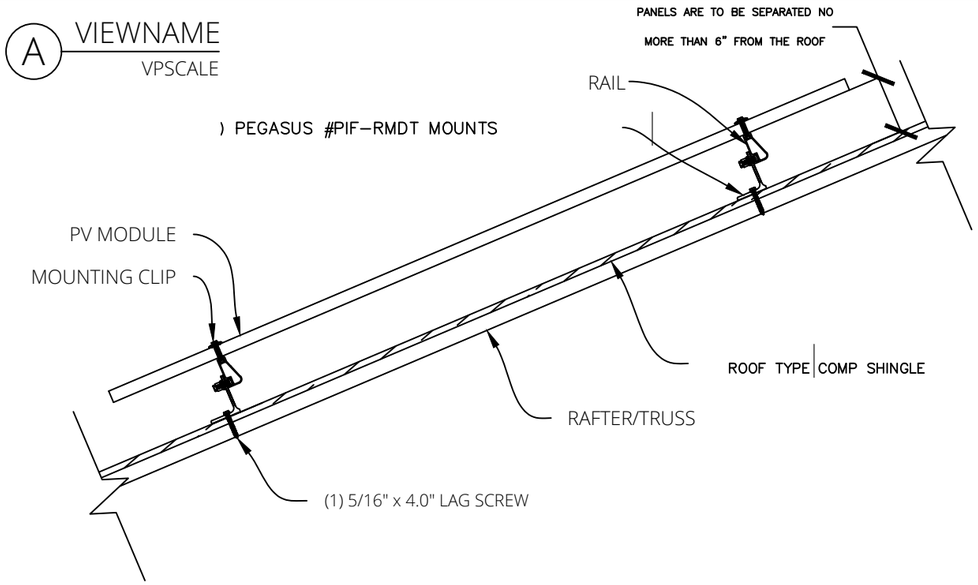
DESIGNED BY: SV

DESIGNED ON
7/8/2025

SITE PLAN

PV-1

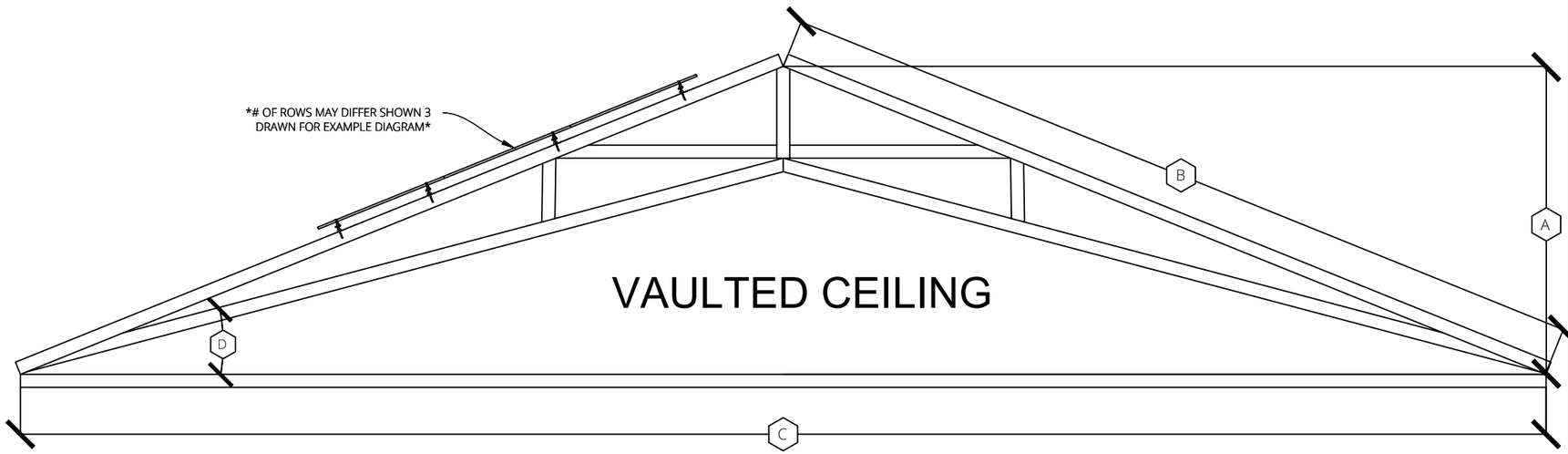
A VIEWNAME
VPSCALE

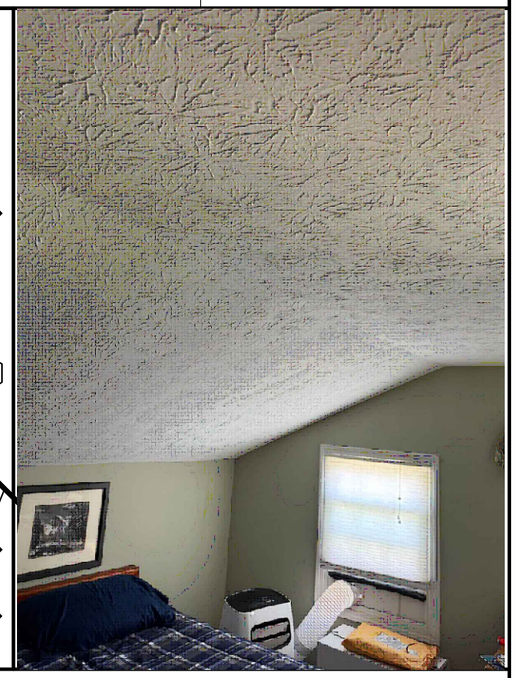


RAFTERS	SIZE:	2X6	SPACING:	24

ROOF INFO IN INCHES & DEGREES		TAG ID
ROOF HEIGHT:	64	A
ROOF FACE SPAN:	141	B
ROOF LENGTH:	252	C
ROOF TILT:	27	D

B ATTIC INFO
NOT TO SCALE





PV ARRAY STRUCTURAL INFO			
TOTAL PV MODULE COUNT:	(TOTAL NUMBER OF MODULES BEING INSTALLED)	19	MODULES
APPROX. ATTACHMENT POINTS:	(ROUND UP (TOTAL ROWS WIDTH) / (MOUNT SPACING)) +2	82	MOUNTS
INDIVIDUAL ARRAY AREA:	(MODULE LENGTH) X (MODULE WIDTH)	21.25	FT^2
TOTAL ARRAY AREA:	(INDIVIDUAL ARRAY AREA) X (TOTAL MODULE COUNT) = FT^2	403.75	FT^2
TOTAL ROOF AREA W/ MODULES:	(ROOF AREA TOTAL THAT HAS MODULES) = FT^2	1334	FT^2
% ARRAY/ T.R.A.W.M.:	(TOTAL ARRAY AREA)/(TOTAL ROOF AREA W/ MODULES:)= %	30.3	%
TOTAL ARRAY WEIGHT:	(TOTAL MODULE COUNT) X (MODULE WEIGHT) = LBS	902.5	LBS
TOTAL DISTRIBUTED LOAD ON ROOF:	(TOTAL ARRAY WEIGHT) / (ARRAY AREA) = LBS / FT^2	2.24	LBS / FT^2
LOAD ON EACH MOUNT	(TOTAL ARRAY WEIGHT) / (TOTAL NUMBER OF ATTACHMENTS)	11.01	LBS / ATTACH.
ASCE 7-16 WIND SPEED:	115 MPH, EXPOSURE CATEGORY C		
GROUND SNOW LOAD:	20 PSF, EXPOSURE CATEGORY C		
% OF ROOF AREA USED FOR SOLAR	TOTAL MODULE AREA / ENTIRE ROOF %	19%	

GENERAL STRUCTURAL NOTES:

THE FOLLOWING CALCULATIONS ARE INITIAL CALCULATIONS BASED OFF OF THE SITE SURVEY INFORMATION, AND THE EQUIPMENT CUT SHEETS. REFER TO STRUCTURAL LETTER FOR FINAL CALCULATIONS, SNOW AND WIND SPEEDS

V2.3.5

AMBIA

AMBIA ENERGY, LLC
ADDRESS: 335 SOUTH 560 WEST,
SUITE 100 | LINDON, UTAH 84042
PHONE: 877.412.7929

SYSTEM SIZE: 7.695 KW (E-1)
(19) JA SOLAR - JAM54S31-405/MR (CS-1)
(19) ENPHASE - IQ8PLUS-72-2-US (CS-2)
(1) ENPHASE - X-IQ-AM1-240-5C (CS-3)
ROOF TYPE: COMP SHINGLE (PV-2)
INTERCONNECTION METHOD: RATED BACK FED TAP

CUSTOMER LAST NAME: SMITH
ADDRESS: 207 WILLIAMS ST
CITY: HURON
STATE: OH
ZIP: 44839
JURISDICTION: HURON
UTILITY COMPANY: FIRST ENERGY

DESIGNED BY: SV
DESIGNED ON
7/8/2025

ROOF INFO

PV-2

Array 3

Attachment method: **SkipRail - rafter**
Panel size: **67.5" x 44.65" x 30mm**

Project dashboard:

Details

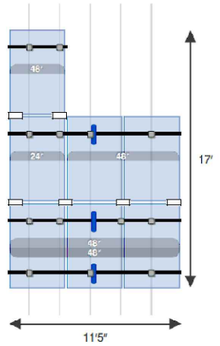
Roof: **7° Gable Comp** | Attachment: **Instaflash-2** | Rail: **6 x 7ft**
Rafter spacing: **24.0"** | Staggered attachments: **Yes** | Use scrap rail: **Yes**
SkipRail: **Yes** | Hidden end clamp: **No** | Extend rails across module gaps: **No**

Design notes

System weight: **371.5 lbs (approx.)**
Weight per attachment: **28.6 lbs**
Total area: **149 sqft**
Distributed load: **2.5 psf**

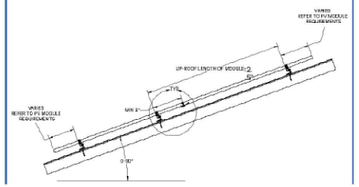
Legend

Rail splice | Module with rails | SkipRail clamp
Roof attachment | Thermal break | SkipRail clamp with kickstand
Spans: rafter | deck-plywood | deck-OSB | Zones

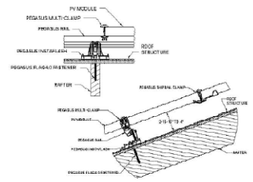


MOUNTS TO BE SPACED @48" O.C. MAXIMUM

ATTACHMENT SPACING - SIDE VIEW



INSTAFLASH DETAIL



MAXIMUM RAIL CANTILEVER

Attachment span	Max rail cantilever
72"	28"
64"	25"
48"	19"
32"	12"
24"	9"
Other	40% of attachment span

Produced by **Seth Velasquez** from Ambia on **07/08/25**

Array 1

Attachment method: **SkipRail - rafter**
Panel size: **67.5" x 44.65" x 30mm**

Project dashboard:

Details

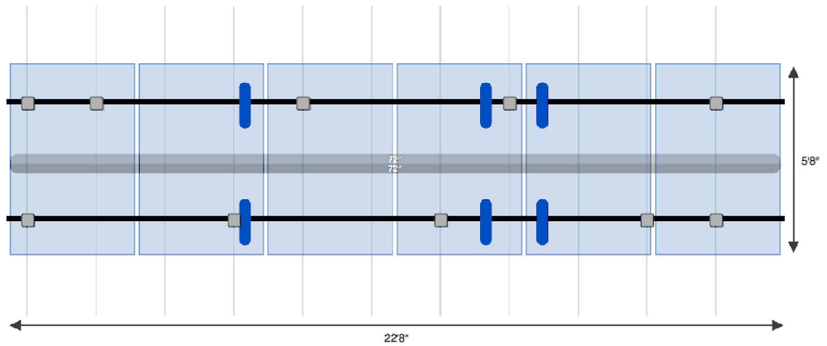
Roof: **23° Gable Comp** | Attachment: **Instaflash** | Rail: **7 x 7ft**
Rafter spacing: **24.0"** | Staggered attachments: **Yes** | Use scrap rail: **Yes**
SkipRail: **Yes** | Hidden end clamp: **No** | Extend rails across module gaps: **No**

Design notes

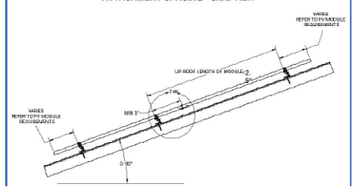
System weight: **318.7 lbs (approx.)**
Weight per attachment: **31.9 lbs**
Total area: **127 sqft**
Distributed load: **2.51 psf**

Legend

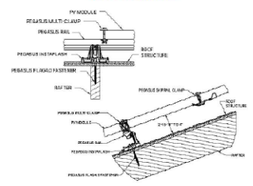
Rail splice | Module with rails | SkipRail clamp
Roof attachment | Thermal break | SkipRail clamp with kickstand
Spans: rafter | deck-plywood | deck-OSB | Zones



ATTACHMENT SPACING - SIDE VIEW



INSTAFLASH DETAIL



MAXIMUM RAIL CANTILEVER

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72"	28"
64"	25"
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32"	12"
24"	9"
Other	40% of attachment span

Produced by **Seth Velasquez** from Ambia on **07/08/25**

Array 2

Attachment method: **SkipRail - rafter**
Panel size: **67.5" x 44.65" x 30mm**

Project dashboard:

Details

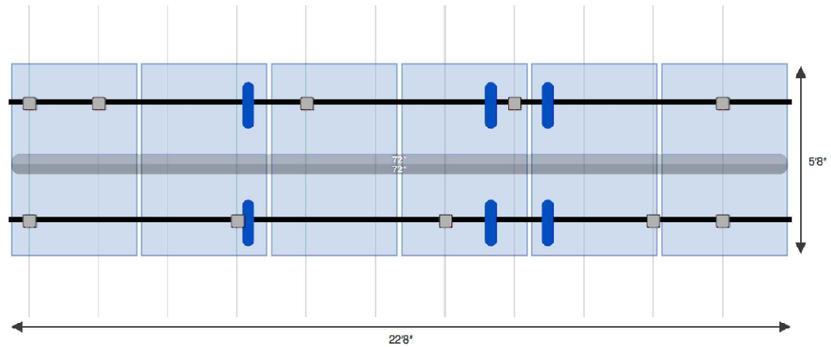
Roof: **27° Gable Comp** | Attachment: **Instaflash** | Rail: **7 x 7ft**
Rafter spacing: **24.0"** | Staggered attachments: **Yes** | Use scrap rail: **Yes**
SkipRail: **Yes** | Hidden end clamp: **No** | Extend rails across module gaps: **No**

Design notes

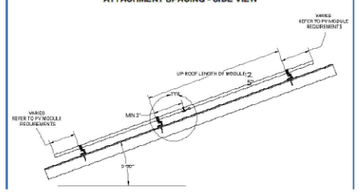
System weight: **318.7 lbs (approx.)**
Weight per attachment: **31.9 lbs**
Total area: **127 sqft**
Distributed load: **2.51 psf**

Legend

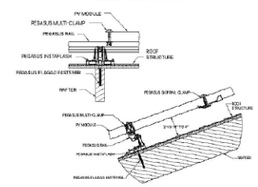
Rail splice | Module with rails | SkipRail clamp
Roof attachment | Thermal break | SkipRail clamp with kickstand
Spans: rafter | deck-plywood | deck-OSB | Zones



ATTACHMENT SPACING - SIDE VIEW



INSTAFLASH DETAIL



MAXIMUM RAIL CANTILEVER

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72"	28"
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Other	40% of attachment span

Produced by **Seth Velasquez** from Ambia on **07/08/25**

V2.3.5

AMBIA

AMBIA ENERGY, LLC
ADDRESS: 335 SOUTH 560 WEST,
SUITE 100 | LINDON, UTAH 84042
PHONE: 877.412.7929

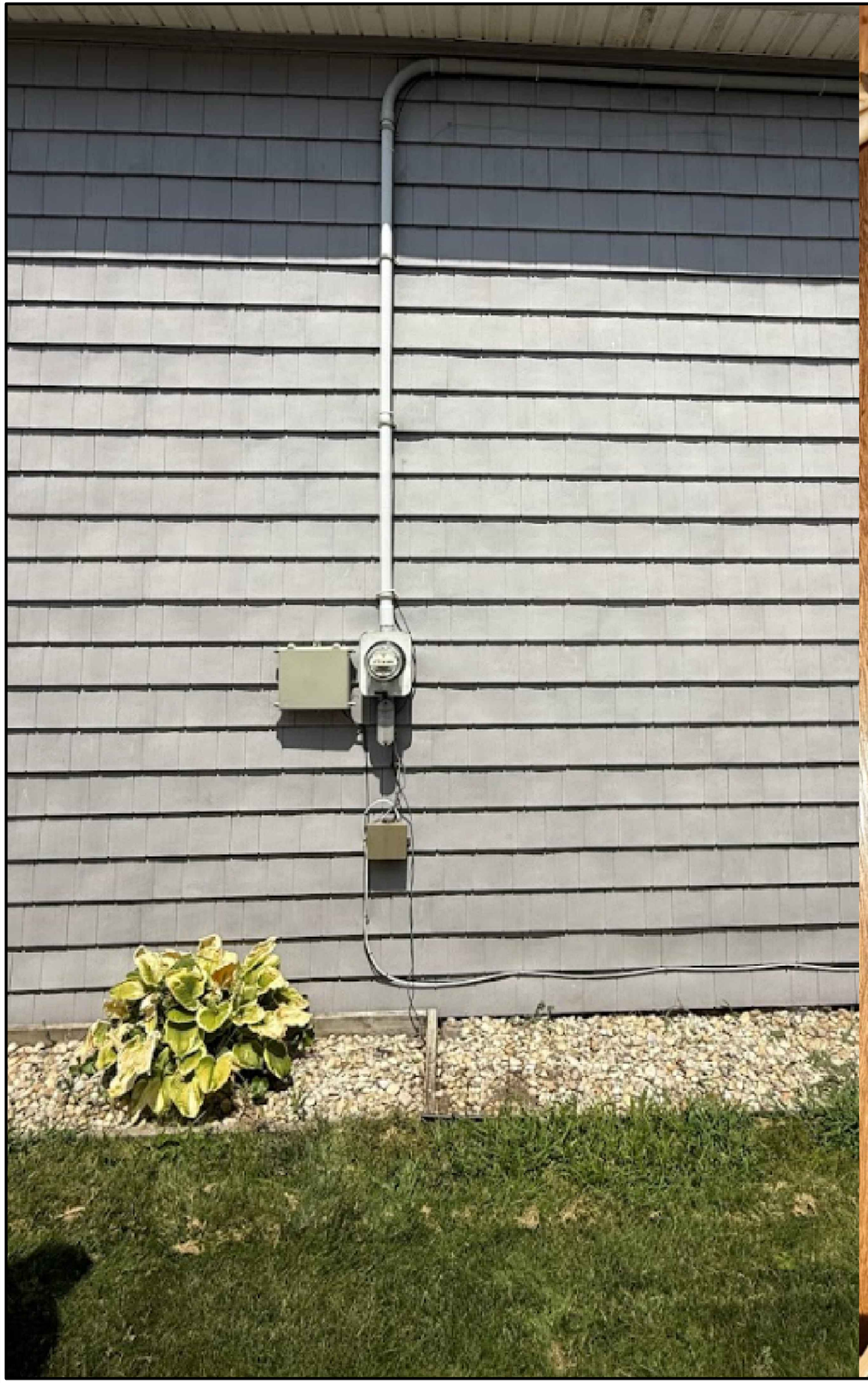
SYSTEM SIZE: 7.695 KW (E-1)
(19) JA SOLAR - JAM54S31-405/MR (CS-1)
(19) ENPHASE - IQ8PLUS-72-2-US (CS-2)
(1) ENPHASE - X-IQ-AM1-240-5C (CS-3)
ROOF TYPE: COMP SHINGLE (PV-2)
INTERCONNECTION METHOD: RATED BACK FED TAP

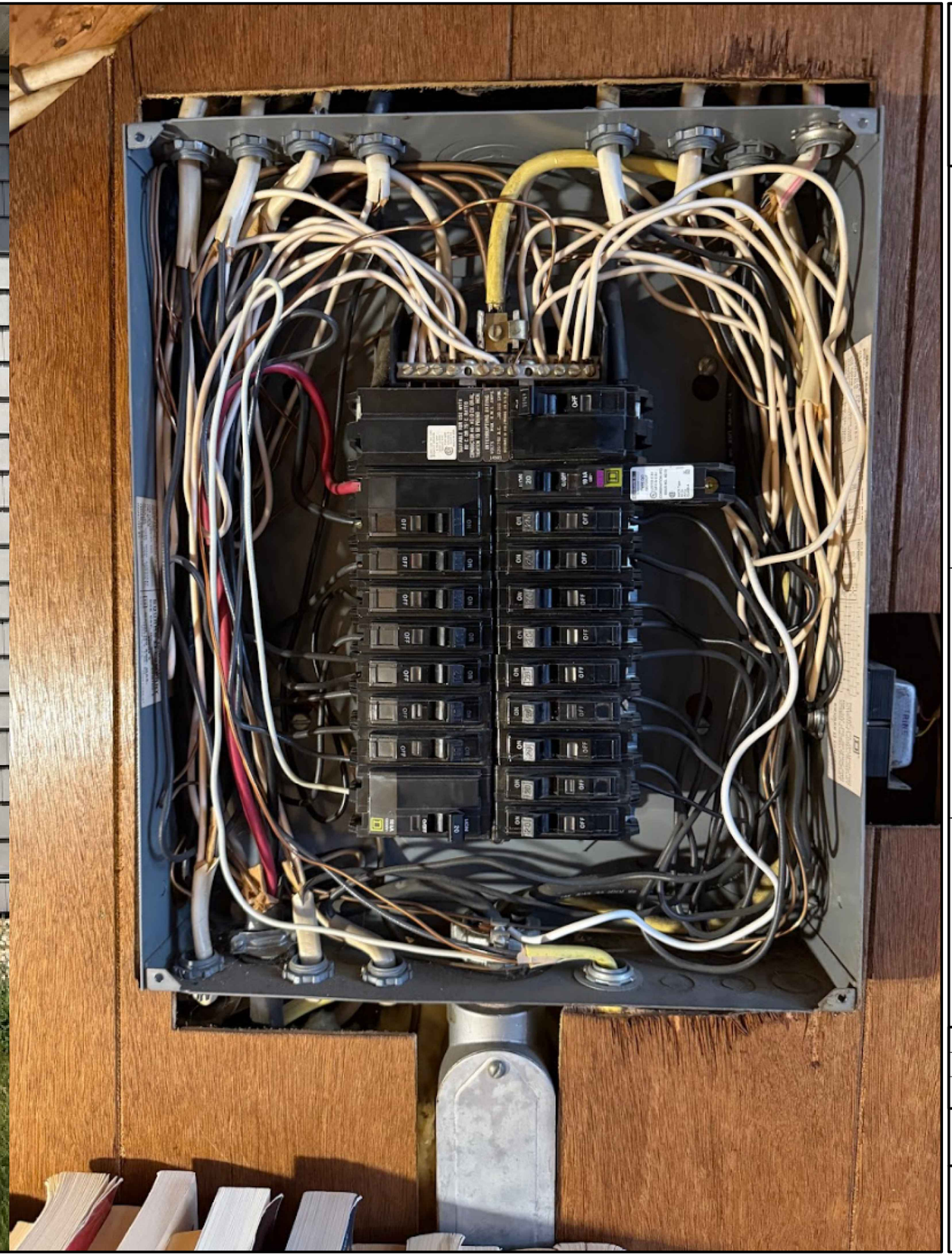
CUSTOMER LAST NAME: SMITH
ADDRESS: 207 WILLIAMS ST
CITY: HURON
STATE: OH
ZIP: 44839
JURISDICTION: HURON
UTILITY COMPANY: FIRST ENERGY

DESIGNED BY: SV
DESIGNED ON
7/8/2025

RACKING INFO

PV-2.2





V2.3.5

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CUSTOMER LAST NAME: SMITH	
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ZIP: 44839	
JURISDICTION: HURON	
UTILITY COMPANY: FIRST ENERGY	

DESIGNED BY: SV

DESIGNED ON

7/8/2025

SITE PHOTOS

PV-3

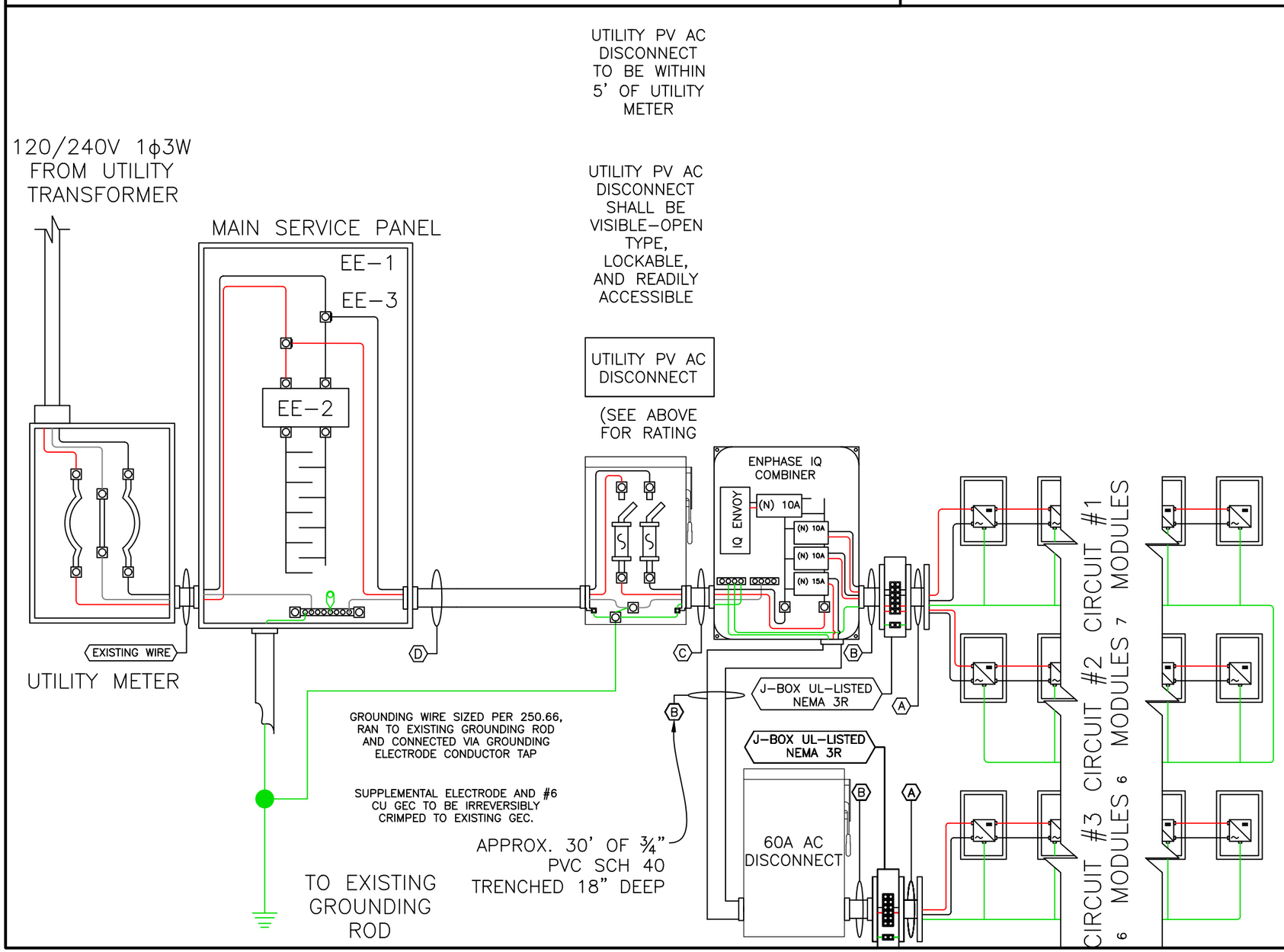
CONDUCTOR SCHEDULE

	CONDUCTORS				GROUND			CONDUIT
TAG ID	WIRES IN CONDUIT	WIRE AWG	TYPE, MATERIAL	WIRE 75°C (167°F) AMPERAGE RATING TABLE 310.15 (B)(16)	SIZE	RATING TABLE 250.122	TYPE, MATERIAL	EMT
A	7	#10 AWG	Q CABLE	30	#6 AWG	200	BARE, CU	3/4" CONDUIT
B	7	#10 AWG	THWN-2, CU	30	#10 AWG	60	THHW, CU	3/4" CONDUIT
C	4	#10 AWG	THWN-2, CU	30	#10 AWG	60	THHW, CU	3/4" CONDUIT
D	3	#6 AWG	THWN-2, CU	65	#8 AWG	100	THHW, CU	3/4" CONDUIT

* TAG D ONLY IF APPLICABLE *

AC DISCONNECT SIZE:	ENCLOSURE TYPE:	SPECIAL NOTES:
60A FUSED	NEMA 3R	30A FUSES

ELECTRICAL EQUIPMENT			
EE-1	EXISTING	100A	BUS BAR RATING
EE-2	EXISTING	100A	MAIN BREAKER RATING
EE-3	NEW	80A	RATED BACK FED TAP
EE-4			
EE-5			



PRODUCTION METER:

NO PM REQUIRED

DESIGN ADDENDUMS TO STANDARD TEMPLATE BASED ON CITY, STATE, UTILITY, AHJ, OR PREVIOUS PLAN REVIEWER COMMENTS IF THERE ARE CONFLICTING NOTES, ADDENDUMS TAKE PRECEDENCE OVER STANDARD TEMPLATE NOTES

ADDENDUM #22 - OH: INVERTER WATTAGE= 5510W
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ADDENDUM #24 - OH: SYSTEM SIZE= 7.695kW
ADDENDUM #32 - 1: CALCULATION FOR OCPD TO THE AC OUTPUT INVERTER @125%: 1.21A(INVERTER MAXIMUM OUTPUT CURRENT) x 1.25 =1.5125A
ADDENDUM #33 - 2: CALCULATIONS FOR THE SUM OF THE MAIN OCPD AND THE INVERTER @120%: BUSBAR RATING x 120% - MAIN BREAKER RATING= 20A
ADDENDUM #34 - 3: CALCULATIONS FOR THE DERATING OF CONDUCTORS IN RACEWAY FOR ROOFTOP PV SYSTEMS: SEE EE-3 PAGE
ADDENDUM #54 - : PER 2023 NEC VERIFICATION OR INSTALLATION OF A SURGE PROTECTER SHALL BE DETERMINED AT INSTALL. SITE SURVEY PHOTOS INDICATE A SURGE PROTECTOR BEING ON SITE (2023 NEC 215.18)
ADDENDUM #55 - : 2ND GROUND ROD TO BE INSTALLED NO MORE THAN 6 FEET AWAY IF NOT ALREADY PRESENT (PER 2023 NEC 250.53). NEEDS TO BE CONNECTED TO THE EXISTING GROUND ROD WITH AN IRREVERSIBLE CRIMP

INSTALLATION NOTES:

PERFORM TAP USING INSULATED TAP CONNECTERS ON THE LINE SIDE OF THE SERVICE WIRES

V2.3.5

AMBIA

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JURISDICTION: HURON
UTILITY COMPANY: FIRST ENERGY

DESIGNED BY: SV
DESIGNED ON
7/8/2025

3-LINE DIAGRAM

E-1

CAUTION
AUTHORIZED SOLAR PERSONNEL ONLY!

LABEL 1
LOCATION:
–AC DISCONNECT

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL 2
LOCATION: EVERY 10' ON CONDUIT AND ENCLOSURES
–EMT/CONDUIT RACEWAY
–SOLADECK/JUNCTION BOX

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

LABEL 3
LOCATION:
–AC DISCONNECT
–INVERTER
–MAIN SERVICE PANEL
–MAIN SERVICE DISCONNECT
–SUBPANEL

⚠ WARNING
DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL 4
LOCATION:
–PRODUCTION METER
–MAIN SERVICE PANEL
–UTILITY METER
–SUBPANEL

⚠ WARNING
TURN OFF PHOTOVOLTAIC AC DISCONNECT PRIOR TO WORKING INSIDE PANEL

LABEL 5
LOCATION:
–MAIN SERVICE PANEL
–MAIN SERVICE DISCONNECT
–SUBPANEL

⚠ CAUTION
PHOTOVOLTAIC SYSTEM CIRCUIT IS BACKFED

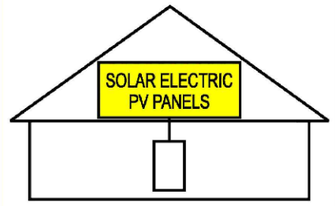
LABEL 6
LOCATION:
–MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK–FED)
–SUBPANEL(ONLY IF SOLAR IS BACK–FED)

⚠ WARNING
POWER SOURCE OUTPUT CONNECTION DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL 7
LOCATION:
–MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK–FED)
–SUBPANEL(ONLY IF SOLAR IS BACK–FED)

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



LABEL 8
LOCATION: AC DISCONNECT

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL 9
LOCATION: AC DISCONNECT

PHOTOVOLTAIC
AC DISCONNECT

LABEL 10
LOCATION: AC DISCONNECT

PHOTOVOLTAIC
DC DISCONNECT

LABEL 11
LOCATION: INVERTER/DC DISCONNECT

PHOTOVOLTAIC SYSTEM
⚠ AC DISCONNECT ⚠
OPERATING VOLTAGE: ____ VOLTS
OPERATING CURRENT: ____ AMPS

LABEL 12
LOCATION: –MAIN SERVICE PANEL –AC DISCONNECT
–SUB PANEL –INVERTER

MAXIMUM VOLTAGE ____
MAXIMUM CIRCUIT CURRENT ____
MAXIMUM RATED OUTPUT CURRENT OF THE CHARGE CONTROLLER OR DC-TO-DC CONVERTER (IF INSTALLED) ____

LABEL 13
LOCATION: INVERTER

MAIN PHOTOVOLTAIC SYSTEM DISCONNECT

LABEL 14
LOCATION: MAIN SERVICE DISCONNECT (ONLY IF PRESENT)

V2.3.5

AMBIA
AMBIA ENERGY, LLC
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STATE: OH
ZIP: 44839
JURISDICTION: HURON
UTILITY COMPANY: FIRST ENERGY

DESIGNED BY: SV
DESIGNED ON
7/8/2025

LABELS

E–2

SYSTEM SIZE

AC SYSTEM SIZE:	5.51 KW
DC SYSTEM SIZE:	7.695 KW

LABEL VALUES

AC OPERATING CURRENT =	22.99A
AC OPERATING VOLTAGE =	60V

INTERCONNECTION CALCULATIONS

ITEM	UNIT	PANEL
BUS RATING	AMPS	100A
MAIN OCPD	AMPS	100A
ALLOWED PV PER NEC	AMPS	80A

CONDUCTOR CALCULATIONS

TAG A ELECTRICAL CALCS (SEE E-1)
UNDER MODULES, NOT IN CONDUIT
#10 AWG MAX CURRENT= 30A
30A * .96= 28.8A
ENPHASE IQ8PLUS-72-2-USMAX CIRCUIT CURRENT
8.47A FOR STRING 1
7.26A FOR STRING 2
6A FOR STRING 3

TAG B ELECTRICAL CALCS (SEE E-1)
#10 AWG MAX CURRENT = 30A
30A * .96 = 28.8A (ASHRAE 2% AVERAGE HIGH =32° C)
28.8A PER CONDUCTOR
ENPHASE IQ8PLUS-72-2-USMAX CIRCUIT CURRENT
8.47A FOR STRING 1
7.26A FOR STRING 2
6A FOR STRING 3

TAG C ELECTRICAL CALCS (SEE E-1)
#10 AWG MAX CURRENT = 30A
30A * .96 = 28.8A (ASHRAE 2% AVG HIGH =32° C)
28.8A PER CONDUCTOR
ENPHASE IQ8PLUS-72-2-USMAX CIRCUIT CURRENT
8.47A FOR STRING 1
7.26A FOR STRING 2
6A FOR STRING 3

CONDUCTOR NOTES	J-BOX NOTE
TAG B = NM CABLE WILL RUN THROUGH ATTIC WHERE POSSIBLE AND MAY BE SUBSTITUTED WITH #12 AWG ROMXEX IF EACH CIRCUIT IS RAN WITH ITS OWN ROMEX	MULTIPLE J-BOXES MAY BE USED AND WILL BE DETERMINED AT INSTALL ONLY ONE SHOWN FOR CLARITY OF DESIGN

TAG D (IF APPLICABLE) ELECTRICAL CALCS (SEE E-1)
#6 AWG MAX CURRENT = 65A
65A * .96 = 62.4A (ASHRAE 2% AVG HIGH =32° C)
62.4A PER CONDUCTOR
ENPHASE IQ8PLUS-72-2-US MAX OUTPUT =22.99A
22.99A * 1.25 (SAFETY FACTOR) = 28.7375A
ENPHASE RECCOMENDED OCPD= 30A

DESIGN CRITERIA AND CALCULATIONS BASED UPON:
NEC TABLE CEC/NEC 310.15(B)(16) 75° C (167° F)
ASHRAE 2% AVERAGE HIGH =32° C
NEC TABLE 310.15(B)(2)(a) 90° C DERATE FACTOR = .96

EQUIPMENT INFO

MODULE

MANUFACTURER	JA SOLAR	
MODEL	JAM54S31-405/MR	
PMAX	405	W
VOC	37.23	V
VMP	31.21	V
IMP	12.98	A
ISC	13.87	A
TEMPERATURE COEFFICENT OF PMAX	-0.35	%/°C
TEMPERATURE COEFFICENT OF VOC	-0.275	%/°C

INVERTER / MICRO-INVERTER

# OF INVERTERS	19
MANUFACTURER	ENPHASE
MODEL	IQ8PLUS-72-2-US
MAX AC OUTPUT	1.21A
AC OUTPUT VOLTAGE	240V
MAX DC INPUT VOLTAGE	60V
NOMINAL DC INPUT VOLTAGE	27V - 45V
MAX INPUT CURRENT	20A
MAX OUTPUT CURRENT	1.21A
WEIGHTED CEC EFFICIENCY	97%
MIN AC CONDUCTOR SIZE	#10 AWG
MIN AC GROUND SIZE	#10 AWG
PV BREAKER	30A
INVERTER WATTAGE	5510W

OPTIMIZER / COMBINER PANEL

MANUFACTURER	ENPHASE	
MODEL	X-IQ-AM1-240-5C	
EATON BR215 BR220	BREAKERS	
BUSBAR RATING	125A	
SYSTEM VOLTAGE	240	V
MAX CONTINUOUS CURRENT RATING	64A	

BATTERY INFO (IF APPLICABLE)

BATTERY INFO	
MANUFACTURER	
PART NUMBER	NO BATTERY
TOTAL ENERGY (kWh)	
USABLE ENERGY (kWh)	
CAPACITY (Ah)	
NOMINAL VOLTAGE (V)	
VOLTAGE RANGE (V)	
MAX POWER (kW)	
WEIGHT	

V2.3.5

AMBIA

AMBIA ENERGY, LLC
ADDRESS: 335 SOUTH 560 WEST,
SUITE 100 | LINDON, UTAH 84042
PHONE: 877.412.7929

SYSTEM SIZE: 7.695 KW (E-1)
(19) JA SOLAR - JAM54S31-405/MR (CS-1)
(19) ENPHASE - IQ8PLUS-72-2-US (CS-2)
(1) ENPHASE - X-IQ-AM1-240-5C (CS-3)
ROOF TYPE: COMP SHINGLE (PV-2)
INTERCONNECTION METHOD: RATED BACK FED TAP

CUSTOMER LAST NAME: SMITH
ADDRESS: 207 WILLIAMS ST
CITY: HURON
STATE: OH
ZIP: 44839
JURISDICTION: HURON
UTILITY COMPANY: FIRST ENERGY

DESIGNED BY: SV

DESIGNED ON
7/8/2025

ELECTRICAL CALCS AND EQUIPMENT INFO

E-3

PEGASUS

INSTAFLASH™

Never Deal With Caulking Again!
Factory-installed, non-hardening sealant

Protective Cage
Prevents sealant from getting on hands or roof. Collapses upon lag installation.

Before **InstaFlash Installed:**
Sealant is contained above roof surface by a protective cage.

After **InstaFlash Installed:**
Sealant is compressed to fill all holes and voids.

Effortless Lifetime Roof Protection

The non-hardening sealant completely fills any missed pilot holes, shingle rips, voids, or other potential water ingress points under the entire footprint of the 4.6" wide base.

25-Year Warranty
Manufactured with advanced materials and coatings to outlast the roof itself

Code Compliant
Fully IBC/CBC Code Compliant
Exceeds ASCE 7-16 Standards
FL Cert of Approval FL41396
UL2703 Certified

Self-Healing
The proprietary non-hardening sealant will flex and reseal over years of thermal expansion and contraction

Larger Spans
The extra-large L-foot and proprietary lag screw result in larger spans between mounts

Pegasus Solar Inc | 506 West Ohio Avenue, Richmond, CA 94804 | **www.pegasussolar.com**

V2.3.5

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DESIGNED BY: SV
DESIGNED ON
7/8/2025

MOUNT

M-1

PEGASUS

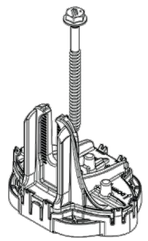
INSTAFLASH™

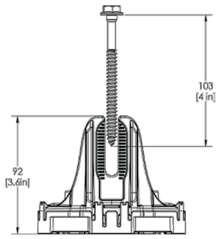
1
Drill pilot hole in the center of the rafter using a 7/32" bit.

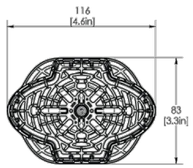
2
Place the InstaFlash over the pilot hole. **Note:** the direction of the InstaFlash Down arrows should point down the roof.

3
Insert the lag screw through the center hole into the pilot hole.

4
Drive the lag until the InstaFlash is fully seated to the roof.







SPECIFICATIONS	INSTAFLASH KITS				
	PIF-RB0	PIF-RBDT	PIF-RBSH	PIF-RM0	PIF-RMDT
Finish	Black			Mill	
Kit Contents	Black InstaFlash, 5/16" x 4.0" SS Lag	Black InstaFlash, 5/16" x 4.0" SS Lag, Dovetail T-bolt w/ Nut	Black InstaFlash, 5/16" x 4.0" SS Lag, M10 Hex Bolt w/ Nut	Mill Insta-Flash, 5/16" x 4.0" SS Lag	Mill InstaFlash, 5/16" x 4.0" SS Lag, Dovetail T-bolt w/ Nut
Attachment Type	Rafter Attached				
Roof Type	Sloped Roof: Composition Shingle, Rolled Asphalt | Flat roof: Modified Bitumen Roof, Built-Up Roof				
Sealant Application	Factory Installed				
Installation Temperature	0°F to 170° F				
Cure Time	Instantly Waterproof; Non-hardening				
Service Temperature	-40°F to 195° F				
Certifications	IBC, ASCE/SEI 7-16, FL Cert of Approval FL41396, TAS 100(A), UL2703				
Install Application	Most Railed Systems, Pegasus Tilt Leg Kit				
Kit Quantity	24				
Boxes per Pallet	36				

SCAN FOR INSTALLATION VIDEO

SCAN FOR FREE TRIAL

V2.3.5

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DESIGNED BY: SV
DESIGNED ON
7/8/2025

MOUNT CONT.

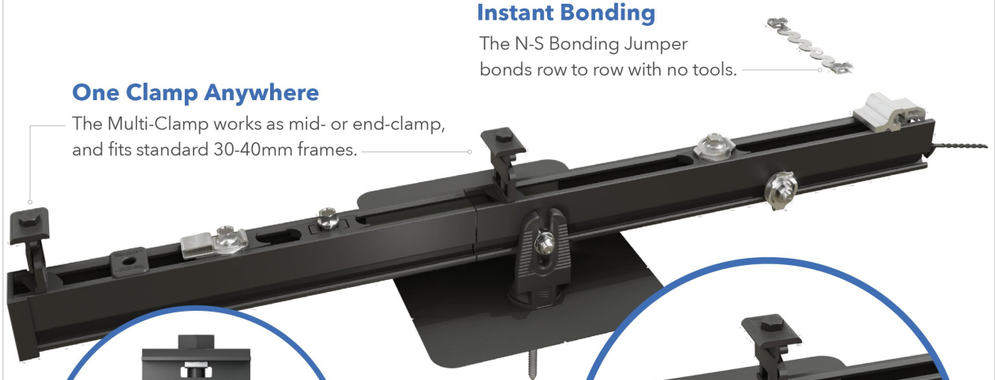
M-2

PEGASUS SOLAR™
A Better Day on the Job

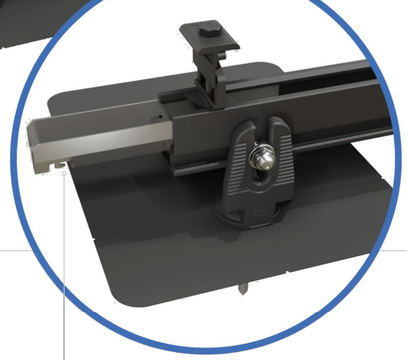
RAIL SYSTEM

Instant Bonding
The N-S Bonding Jumper bonds row to row with no tools.

One Clamp Anywhere
The Multi-Clamp works as mid- or end-clamp, and fits standard 30-40mm frames.



Lifetime Wire Management
Open rail channel holds and protects wires. Clamps won't pinch wires after tightening.



Bonding Structural Splice
Connect rails instantly, without tools, interference or limitations.

Next-Level Solar Mounting

A complete system for hassle-free rooftop installation, from watertight mounts to lifetime wire management.

Simplicity
1/2"socket for everything.
One clamp for mid or end.
No tool splicing and bonding.
Easy wire management.

Code Compliant
UL 2703 listed
LTR-AE-001-2012 listed
Class A fire rating for any slope
ASCE 7-16 PE Certified

Premium Aesthetics
The narrowest panel gap available. Optional Hidden End Clamps and End Caps provide a flush look on the edge of the array.

Watertight for Life
Secured on industry-leading Pegasus Mounts, for composite shingle and tile roofs.
Backed by a 25-year warranty.

Pegasus Solar Inc | 506 West Ohio Avenue, Richmond, CA 94804 | T: 510.210.3797 | **www.pegasussolar.com**

PEGASUS SOLAR™

RAIL SYSTEM

Pegasus Rail

Available in 14′ and 7′ lengths for easy layout and shipping.

Open-channel design holds MC4 connectors, PV wire and trunk cables.

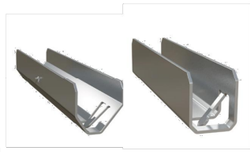
Black and Mill finish

Pegasus Max Rail

Maximum-strength design.

Meets specifications for high snow-load and hurricane zones.

Black and Mill finish



Splice and Max Splice

Installs by hand.

Works over mounts.

Structurally connects and bonds rails automatically; UL2703 listed as reusable.

Dovetail T-bolt

Dovetail shape for extra strength.

Uses ½" socket.

Multi-Clamp

Fits 30-40mm PV frames, as mid- or end-clamp.

Twist-locks into position; doesn't pinch wires in rail.

Bonds modules to rail; UL2703 listed as reusable

Hidden End Clamp

Offers premium edge appearance.

Preinstalled pull-tab grips rail edge, allowing easy, one-hand installation.

Tucks away for reuse.

Ground Lug

Holds 6 or 8 AWG wire.

Mounts on top or side of rail.

Assembled on MLPE Mount.

UL2703 listed as reusable.

N-S Bonding Jumper

Installs by hand, eliminates row-to-row copper wire.

UL2703 listed as reusable only with Pegasus Rail.

MLPE Mount

Secures and bonds most micro-inverters and optimizers to rail.

Connectors and wires easily route underneath after installation.

UL2703 listed as reusable.

Cable Grip

Secures four PV wires or two trunk cables.

Stainless-steel backing provides durable grip.

Eliminates sagging wires.

Wire Clip

Hand operable.

Holds wires in channel.

Won't slip.

End Cap and Max End Cap

Fits flush to PV module and hides raw or angled cuts.

Hidden drain quickly clears water from rail.

Certifications:
- UL 2703, Edition 1
- LTR-AE-001-2012
- ASCE 7-16 PE certified
- Class A fire rating for any slope roof

C SP® US

FREE
PEGASUS SOLAR
Design Tool

Quickly calculate the most efficient layout, spans and materials needed to suit your job. Visit the Pegasus Customer Portal. **pegasussolar.com/portal**

LOAD		SPAN			
SNOW (PSF)	WIND (MPH)	32″	4′	6′	8′
0	120				
	160				
	190				
15	140				
	160				
	190				
30	160				
	190				
45	190				
70	190				
110	190				

PEGASUS RAIL PEGASUS MAX RAIL

This summary span table is for snow and wind loading under ASCE 7-16, a Gable Roof, Exposure Category B, 7-20deg roof angle, 30ft mean roof height, with non-exposed modules. For complete span tables and PE certifications, visit www.pegasussolar.com/spans

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V2.3.5

AMBIA

AMBIA ENERGY, LLC
ADDRESS: 335 SOUTH 560 WEST,
SUITE 100 | LINDON, UTAH 84042
PHONE: 877.412.7929

SYSTEM SIZE: 7.695 KW (E-1)
(19) JA SOLAR - JAM54S31-405/MR (CS-1)
(19) ENPHASE - IQ8PLUS-72-2-US (CS-2)
(1) ENPHASE - X-IQ-AM1-240-5C (CS-3)
ROOF TYPE: COMP SHINGLE (PV-2)
INTERCONNECTION METHOD: RATED BACK FED TAP

CUSTOMER LAST NAME: SMITH
ADDRESS: 207 WILLIAMS ST
CITY: HURON
STATE: OH
ZIP: 44839
JURISDICTION: HURON
UTILITY COMPANY: FIRST ENERGY

DESIGNED BY: SV
DESIGNED ON 7/8/2025

EQUIPMENT

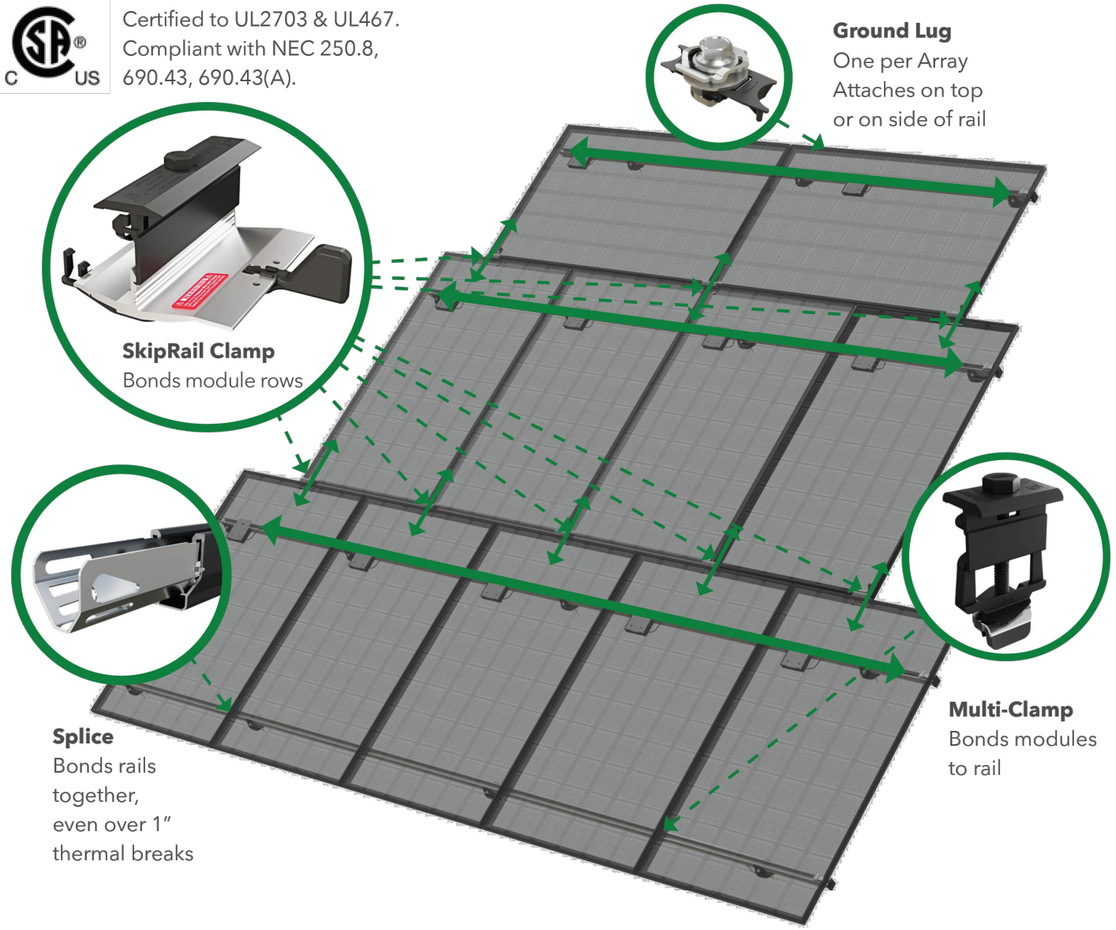
EQ-1

PEGASUS

TECH BRIEF

INTEGRATED BONDING

Certified to UL2703 & UL467.
Compliant with NEC 250.8, 690.43, 690.43(A).



Ground Lug
One per Array
Attaches on top or on side of rail

SkipRail Clamp
Bonds module rows

Splice
Bonds rails together, even over 1" thermal breaks

Multi-Clamp
Bonds modules to rail

Eliminating Rough Electrical Inspections

Code Compliant
System Certified to UL 2703 and LTR-AE-001-2012
Ground Lug certified to UL 467
25A Max OCPD Rating

Mesh Bonding
Redundant bond paths within module rows and redundant bond paths from row-to-row form a "mesh" bond connection.

Certified to Re-Use
All components are UL 2703 Certified for multiple use - even years later.

One Lug per Array
Only one ground lug is needed per array.

Pegasus Solar Inc | 506 West Ohio Avenue, Richmond, CA 94804 | **www.pegasussolar.com**

V2.3.5

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(1) ENPHASE - X-IQ-AM1-240-5C (CS-3)	
ROOF TYPE: COMP SHINGLE (PV-2)	
INTERCONNECTION METHOD: RATED BACK FED TAP	
CUSTOMER LAST NAME: SMITH	
ADDRESS: 207 WILLIAMS ST	
CITY: HURON	
STATE: OH	
ZIP: 44839	
JURISDICTION: HURON	
UTILITY COMPANY: FIRST ENERGY	

DESIGNED BY: SV

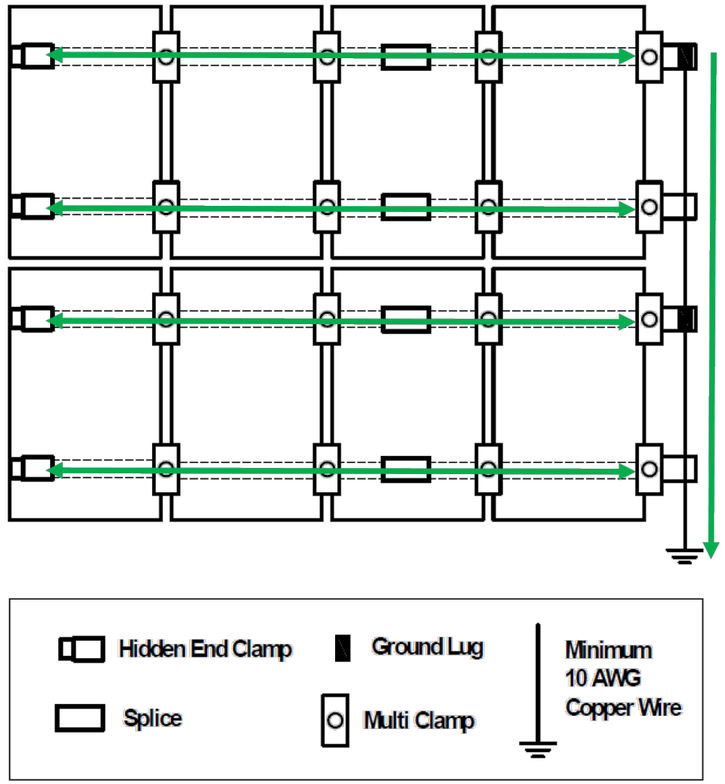
DESIGNED ON
7/8/2025

EQUIPMENT

EQ-2

Pegasus Rail System - Bond Path to Ground

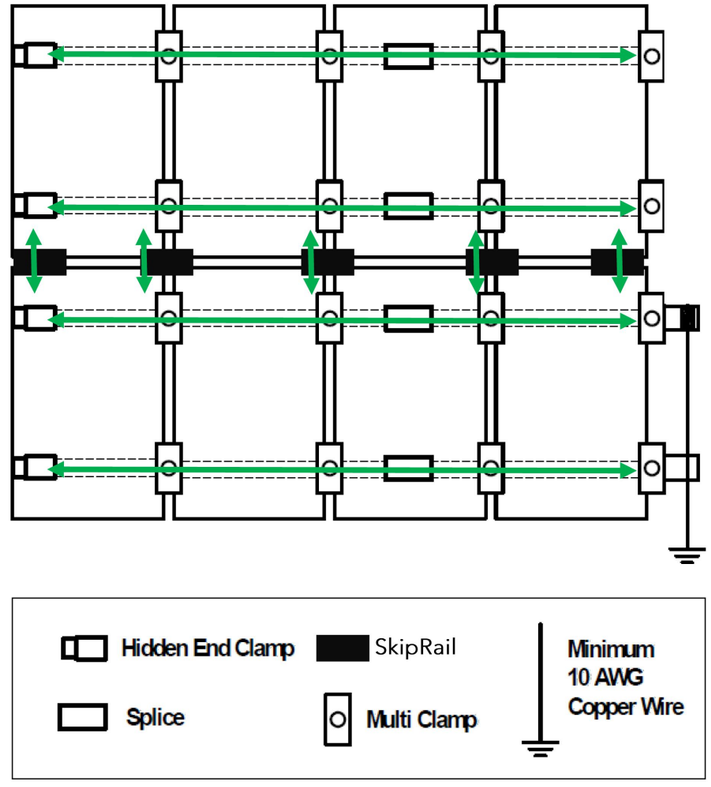
Ground Lug for each PV Module Row



Multi-Clamps bond adjacent PV modules to one another and to the Rail. The Splice provides a bond connection between two Rail sections, including when a 1" thermal gap is utilized. One Ground Lug is required per row of PV Modules, with a final earth ground connection at the terminal end of the ground wire. If a thermal break is left between two sections or Rail, the Multi-Clamps will provide a bond path across the two Rails through the PV module frame.

Pegasus Rail System - Bond Path to Ground

SkipRail System



Multi-Clamps bond adjacent PV modules to one another and to the Rail. The Splice provides a bond connection between two Rail sections, including when a 1" thermal gap is utilized. The SkipRail Splices will provide a bonding path between rows of PV modules, so that one Ground Lug per array is necessary for earth ground. If a thermal break is left between two sections or Rail, the Multi-Clamps will provide a bond path across the two Rails through the PV module frame.

V2.3.5

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ZIP: 44839	
JURISDICTION: HURON	
UTILITY COMPANY: FIRST ENERGY	

DESIGNED BY: SV

DESIGNED ON

7/8/2025

EQUIPMENT

EQ-3

Certificate of Compliance

Certificate: 80055489 **Master Contract:** 301405

Project: 80155839 **Date Issued:** 2023-04-07

Issued To: **Pegasus Solar Inc.**
506 W Ohio Avenue
Richmond, California, 94804
United States

Attention: Kai Stephan

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.

Issued by: Michael Hoffnagle
Michael Hoffnagle

PRODUCTS

CLASS - C531302 - POWER SUPPLIES - PHOTOVOLTAICS-PV Racking and clamping systems
CLASS - C531382 - POWER SUPPLIES - PHOTOVOLTAICS-PV Racking and clamping systems - Certified to US Standards

Models: PRS - Pegasus Rail System (PRS) is a racking system for bonding and grounding of photovoltaic modules.

The system listed is designed to provide bonding/grounding for PV modules mounted on the racking system. The modules are bonded to the racking system with anodization-piercing top-down clamps. Uses a certified grounding device for grounding system.

Racking system has been evaluated for bonding/grounding and fire ratings Type 1, 2, 29, and 30 for low and steep slope. System is not mechanical load rated.

The grounding of the system is intended to comply with the latest edition of the National Electrical Code, to include NEC 250 & 690 or in accordance with CSA C22.1, Safety Standard for Electrical Installations, Canadian Electrical Code, Part I. Local codes compliance is required, in addition to national codes. All grounding/bonding connections are to be torqued in accordance with the Installation Manual and the settings used during the certification testing for the current edition of the project report.

Conditions of Acceptability:

Installation is subject to acceptance of the local inspection authorities having jurisdiction. The certification of these products relates only to the methods of installation, bonding, and grounding as outlined in the Installation Manual for each product.

APPLICABLE REQUIREMENTS

UL 2703-1st Edition - Mounting Systems, Mounting Devices, Clamping/Retention Devices, and Ground Lugs for Use with Flat-Plate Photovoltaic Modules and Panels.
TIL No. A-40 - Technical Information Letter TIL No. A-40 Covering PV Module and Panel Rack Mounting Systems and Accessories

MARKINGS

The manufacturer is required to apply the following markings:

- Products shall be marked with the markings specified by the particular product standard.
- Products certified for Canada shall have all Caution and Warning markings in both English and French.

Additional bilingual markings not covered by the product standard(s) may be required by the Authorities Having Jurisdiction. It is the responsibility of the manufacturer to provide and apply these additional markings, where applicable, in accordance with the requirements of those authorities.

The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and U.S. Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only.

The following markings appear on the system on the Multi-Clamp only:

1. Submitter's name and/or CSA Master Contract number "301405";
2. Model designation;
3. Manufacturing date, year-quarter;
4. System fire class rating/designation of information location in Installation Manual

V2.3.5
AMBIA
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INTERCONNECTION METHOD: RATED BACK FED TAP

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ZIP: 44839
JURISDICTION: HURON
UTILITY COMPANY: FIRST ENERGY

DESIGNED BY: SV
DESIGNED ON
7/8/2025

EQUIPMENT

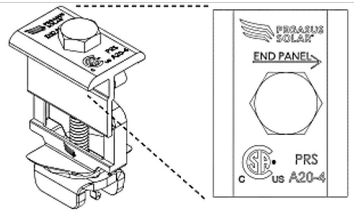
EQ-4

Certificate: 80055489
Project: 80155839

Master Contract: 301405
Date Issued: 2023-04-07

Product identification can be made by looking at the top of the Multi-Clamp:

- Pegasus Logo above bolt head
- Model Name: "PRS"
- Lot Code: e.g. "A20-4"
- UL 2703 listing: CSA Mark



Notes:

Products certified under Class C531302, C531382 have been certified under CSA's ISO/IEC 17065 accreditation with the Standards Council of Canada (SCC). www.scc.ca

Supplement to Certificate of Compliance

Certificate: 80055489 **Master Contract:** 301405

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
80155839	2023-04-07	Update report 80055489 to add modules to the PV list and add new Tile Leg design. Evaluation and testing are required.
80129682	2022-08-12	Update Report 80055489 to add fire rating Type 29 and 30, modules to PV list, add Gen 2 Rail splice, and add Tilt Leg bracket. Testing and evaluation are required.
80127536	2022-05-12	Update report 80055489 to add one Silfab model number to PV list Evaluation only, no testing
80122175	2022-04-27	Update report 80055489 to add modules to PV list; Add new Gen 2 N-S Bonding Jumper. Evaluation only, no testing Updating standard to TIL No. A-40
80106108	2021-11-17	Update report 80055489; Evaluation and Report update for PV list with new model numbers.
80055489	2021-03-15	Evaluation, Testing, and Certification of Pegasus Solar Rugged Rail System; Certification of Solar Photovoltaic Mounting System for rooftop applications for cCSAus Testing required.

V2.3.5

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(19) ENPHASE - IQ8PLUS-72-2-US (CS-2)
(1) ENPHASE - X-IQ-AM1-240-5C (CS-3)
ROOF TYPE: COMP SHINGLE (PV-2)
INTERCONNECTION METHOD: RATED BACK FED TAP

CUSTOMER LAST NAME: SMITH
ADDRESS: 207 WILLIAMS ST
CITY: HURON
STATE: OH
ZIP: 44839
JURISDICTION: HURON
UTILITY COMPANY: FIRST ENERGY

DESIGNED BY: SV
DESIGNED ON
7/8/2025

EQUIPMENT

EQ-5

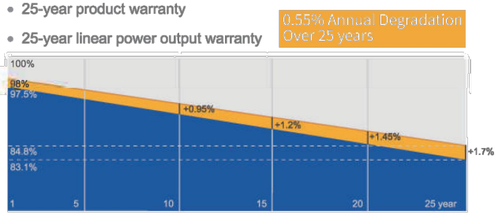
Introduction

Assembled with 11BB PERC cells, the half-cell configuration of the modules offers the advantages of higher power output, better temperature-dependent performance, reduced shading effect on the energy generation, lower risk of hot spot, as well as enhanced tolerance for mechanical loading.

- Higher output power
- Lower LCOE
- Less shading and lower resistive loss
- Better mechanical loading tolerance

Superior Warranty

- 25-year product warranty
- 25-year linear power output warranty



Comprehensive Certificates

- IEC 61215, IEC 61730,UL 61215, UL 61730
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- ISO 45001: 2018 Occupational health and safety management systems
- IEC TS 62941: 2016 Terrestrial photovoltaic (PV) modules – Guidelines for increased confidence in PV module design qualification and type approval

JA SOLAR

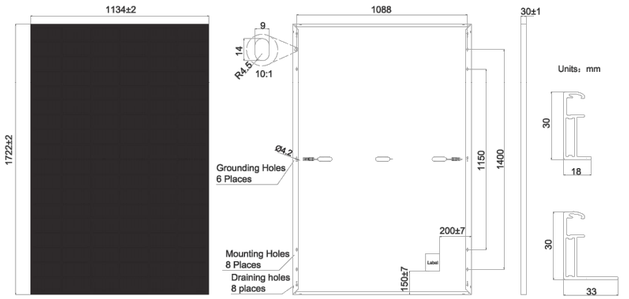
www.jasolar.com

Specifications subject to technical changes and tests.
JA Solar reserves the right of final interpretation.

JA SOLAR

JAM54S31 380-405/MR Series

MECHANICAL DIAGRAMS



Remark: customized frame color and cable length available upon request

SPECIFICATIONS

Cell	Mono
Weight	21.5kg±3%
Dimensions	1722±2mm×1134±2mm×30±1mm
Cable Cross Section Size	4mm² (IEC), 12 AWG(UL)
No. of cells	108(6x18)
Junction Box	IP68, 3 diodes
Connector	MC4-EVO2(1500V)
Cable Length (Including Connector)	Portrait: 300mm(+)/400mm(-); Landscape: 1200mm(+)/1200mm(-)
Packaging Configuration	36pcs/Pallet, 864pcs/40ft Container

ELECTRICAL PARAMETERS AT STC

TYPE	JAM54S31 -380/MR	JAM54S31 -385/MR	JAM54S31 -390/MR	JAM54S31 -395/MR	JAM54S31 -400/MR	JAM54S31 -405/MR
Rated Maximum Power(Pmax) [W]	380	385	390	395	400	405
Open Circuit Voltage(Voc) [V]	36.58	36.71	36.85	36.98	37.07	37.23
Maximum Power Voltage(Vmp) [V]	30.28	30.46	30.64	30.84	31.01	31.21
Short Circuit Current(Isc) [A]	13.44	13.52	13.61	13.70	13.79	13.87
Maximum Power Current(Imp) [A]	12.55	12.64	12.73	12.81	12.90	12.98
Module Efficiency [%]	19.5	19.7	20.0	20.2	20.5	20.7
Power Tolerance	±2%					
Temperature Coefficient of Isc(α_Isc)	+0.045%/℃					
Temperature Coefficient of Voc(β_Voc)	-0.275%/℃					
Temperature Coefficient of Pmax(γ_Pmp)	-0.350%/℃					
STC	Irradiance 1000W/m², cell temperature 25℃, AM1.5G					

Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer.They only serve for comparison among different module types.

ELECTRICAL PARAMETERS AT NOCT

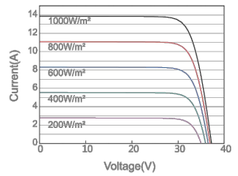
TYPE	JAM54S31 -380/MR	JAM54S31 -385/MR	JAM54S31 -390/MR	JAM54S31 -395/MR	JAM54S31 -400/MR	JAM54S31 -405/MR
Rated Max Power(Pmax) [W]	286	290	294	298	302	306
Open Circuit Voltage(Voc) [V]	34.36	34.49	34.62	34.75	34.88	35.12
Max Power Voltage(Vmp) [V]	28.51	28.68	28.87	29.08	29.26	29.47
Short Circuit Current(Isc) [A]	10.75	10.82	10.89	10.96	11.03	11.10
Max Power Current(Imp) [A]	10.03	10.11	10.18	10.25	10.32	10.38
NOCT	Irradiance 800W/m², ambient temperature 20°C,wind speed 1m/s, AM1.5G					

OPERATING CONDITIONS

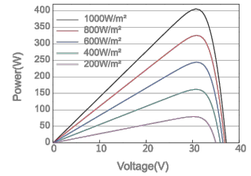
Maximum System Voltage	1000V/1500V DC
Operating Temperature	-40℃~+85℃
Maximum Series Fuse Rating	25A
Maximum Static Load,Front* Maximum Static Load,Back*	5400Pa(112lb/ft²) 2400Pa(50lb/ft²)
NOCT	45±2℃
Safety Class	Class Ⅱ
Fire Performance	UL Type 1

CHARACTERISTICS

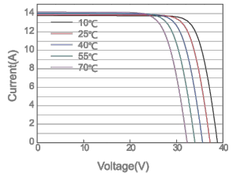
Current-Voltage Curve JAM54S31-405/MR



Power-Voltage Curve JAM54S31-405/MR



Current-Voltage Curve JAM54S31-405/MR



Premium Cells, Premium Modules

Version No. : Global_EN_20231130A

V2.3.5

AMBIA

AMBIA ENERGY, LLC
ADDRESS: 335 SOUTH 560 WEST, SUITE 100 | LINDON, UTAH 84042
PHONE: 877.412.7929

SYSTEM SIZE: 7.695 KW (E-1)
(19) JA SOLAR - JAM54S31-405/MR (CS-1)
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(1) ENPHASE - X-IQ-AM1-240-5C (CS-3)
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DESIGNED BY: SV
DESIGNED ON 7/8/2025

MODULE

CS-1

ENPHASE.

DATA SHEET

IQ8 and IQ8+ Microinverters

Our newest IQ8 Microinverters are the industry's first microgrid-forming, software defined microinverters with split-phase power conversion capability to convert DC power to AC power efficiently. The brain of the semiconductor-based microinverter is our proprietary application specific integrated circuit (ASIC) which enables the microinverter to operate in grid-tied or off-grid modes. This chip is built in advanced 55nm technology with high speed digital logic and has superfast response times to changing loads and grid events, alleviating constraints on battery sizing for home energy systems.

Part of the Enphase Energy System, IQ8 Series Microinverters integrate with the IQ Battery, IQ Gateway, and the Enphase App monitoring and analysis software.

Enphase 25 year limited warranty

IQ8 Series Microinverters redefine reliability standards with more than one million cumulative hours of power-on testing, enabling an industry-leading limited warranty of up to 25 years.

Connect PV modules quickly and easily to IQ8 Series Microinverters using the included Q-DCC-2 adapter cable with plug-n-play MC4 connectors.

CERTIFIED SAFETY

IQ8 Series Microinverters are UL listed as PV Rapid Shutdown Equipment and conform with various regulations, when installed according to manufacturer's instructions.

Easy to install

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

High productivity and reliability

- Produce power even when the grid is down*
- More than one million cumulative hours of testing
- 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.)

Note:

IQ8 Microinverters cannot be mixed together with previous generations of Enphase microinverters (IQ7 Series, IQ6 Series, etc) in the same system.

*Only when installed with IQ System Controller 2, meets UL 1741.
**IQ8 and IQ8Plus support split-phase, 240V installations only.

IQ8 and IQ8+ Microinverters

INPUT DATA (DC)		IQ8-60-2-US	IQ8PLUS-72-2-US
Commonly used module pairings[1]	W	235 – 350	235 – 440
Module compatibility		60-cell / 120 half-cell	54-cell / 108 half-cell, 60-cell / 120 half-cell, 66-cell / 132 half-cell and 72-cell / 144 half-cell
MPPT voltage range	V	27 – 37	27 – 45
Operating range	V	16 – 48	16 – 58
Min. / Max. start voltage	V	22 / 48	22 / 58
Max. input DC voltage	V	50	60
Max. continuous input DC current	A	10	12
Max. input DC short-circuit current	A	25	
Max. module I_{sc}	A	20	
Overvoltage class DC port		II	
DC port backfeed current	mA	0	
PV array configuration		1 x 1 Ungrounded array; No additional DC side protection required; AC side protection requires max 20A per branch circuit	
OUTPUT DATA (AC)		**IQ8-60-2-US**	**IQ8PLUS-72-2-US**
Peak output power	VA	245	300
Max. continuous output power	VA	240	290
Nominal (L-L) voltage / range[2]	V	240 / 211 – 264	
Max. continuous output current	A	1.0	1.21
Nominal frequency	Hz	60	
Extended frequency range	Hz	47 – 68	
AC short circuit fault current over 3 cycles	Arms	2	
Max. units per 20 A (L-L) branch circuit[3]		16	13
Total harmonic distortion		<5%	
Overvoltage class AC port		III	
AC port backfeed current	mA	30	
Power factor setting		1.0	
Grid-tied power factor (adjustable)		0.85 leading – 0.85 lagging	
Peak efficiency	%	97.7	
CEC weighted efficiency	%	97	
Night-time power consumption	mW	60	
MECHANICAL DATA			
Ambient temperature range		-40°C to +60°C (-40°F to +140°F)	
Relative humidity range		4% to 100% (condensing)	
DC Connector type		MC4	
Dimensions (H x W x D)		212 mm (8.3") x 175 mm (6.9") x 30.2 mm (1.2")	
Weight		1.08 kg (2.38 lbs)	
Cooling		Natural convection – no fans	
Approved for wet locations		Yes	
Pollution degree		PD3	
Enclosure		Class II double-insulated, corrosion resistant polymeric enclosure	
Environ. category / UV exposure rating		NEMA Type 6 / outdoor	
COMPLIANCE			
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, and NEC 2020 section 690.12 and C22.1-2018 Rule 64-218 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.	

(1) Pairing PV modules with wattage above the limit may result in additional clipping losses. See the compatibility calculator at https://link.enphase.com/module-compatibility.
(2) Nominal voltage range can be extended beyond nominal if required by the utility. (3) Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

V2.3.5

AMBIA

AMBIA ENERGY, LLC
ADDRESS: 335 SOUTH 560 WEST, SUITE 100 | LINDON, UTAH 84042
PHONE: 877.412.7929

SYSTEM SIZE: 7.695 KW (E-1)
(19) JA SOLAR – JAM54S31-405/MR (CS-1)
(19) ENPHASE – IQ8PLUS-72-2-US (CS-2)
(1) ENPHASE – X-IQ-AM1-240-5C (CS-3)
ROOF TYPE: COMP SHINGLE (PV-2)
INTERCONNECTION METHOD: RATED BACK FED TAP

CUSTOMER LAST NAME: SMITH
ADDRESS: 207 WILLIAMS ST
CITY: HURON
STATE: OH
ZIP: 44839
JURISDICTION: HURON
UTILITY COMPANY: FIRST ENERGY

DESIGNED BY: SV
DESIGNED ON
7/8/2025

INVERTER

CS – 2

ENPHASE

DATA SHEET

X-IQ-AM1-240-5-HDK
X-IQ-AM1-240-5C-HDK
X-IQ-AM1-240-5
X-IQ-AM1-240-5C

IQ Combiner 5/5C

The IQ Combiner 5/5C consolidates interconnection equipment into a single enclosure and streamlines IQ Series Microinverters and IQ Gateway installation by providing a consistent, pre-wired solution for residential applications. IQ Combiner 5/5C uses wired control communication and is compatible with IQ System Controller 3/3G and IQ Battery 5P.

The IQ Combiner 5/5C, IQ Series Microinverters, IQ System Controller 3/3G, and IQ Battery 5P provide a complete grid-agnostic Enphase Energy System.

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

IQ System Controller 3/3G
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 5P
Fully integrated AC battery system. Includes six field-replaceable IQ8D-BAT Microinverters.

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 (CELLMODEM-M1-06-SP-05), only with IQ Combiner 5C
- Supports flexible networking: Wi-Fi, Ethernet, or cellular
- Provides production metering (revenue grade) and consumption monitoring

Easy to install

- Mounts to one stud with centered brackets
- Supports bottom, back, and side conduit entries
- Supports up to four 2-pole branch circuits for 240 VAC plug-in breakers (not included)
- 80 A total PV branch circuits
- Factory installed hold-down kit
- Bluetooth-based Wi-Fi provisioning for easy Wi-Fi setup

Reliable

- Durable NRTL-certified NEMA type 3R enclosure
- 5-year limited warranty
- 2-year labor reimbursement program coverage included for IQ Combiner SKUs*
- UL1741 Listed

*For country-specific warranty information, see the https://enphase.com/installers/resources/warranty page.

IQ Combiner 5/5C

MODEL NUMBER	
IQ Combiner 5 (X-IQ-AM1-240-5/ X-IQ-AM1-240-5-HDK)	IQ Combiner 5 with IQ Gateway printed circuit board for integrated revenue-grade PV production metering (ANSI C12.20 ±0.5%), consumption monitoring (±2.5%), and IQ Battery monitoring (±2.5%). Includes a silver solar shield to deflect heat. IQ-AM1-240-5-HDK includes a factory installed hold-down kit compatible with all the circuit breakers mentioned in the **Accessories and Replacement Parts** section.
IQ Combiner 5C (X-IQ-AM1-240-5C / X-IQ-AM1-240-5C-HDK)	IQ Combiner 5C with IQ Gateway printed circuit board for integrated revenue-grade PV production metering (ANSI C12.20 ±0.5%), consumption monitoring (±2.5%), and IQ Battery monitoring (±2.5%). Includes Enphase Mobile Connect cellular modem (CELLMODEM-M1-06-SP-05)[1]. Includes a silver solar shield to deflect heat. IQ-AM1-240-5C-HDK includes a factory installed hold-down kit compatible with all the circuit breakers mentioned in the **Accessories and Replacement Parts** section.
WHAT'S IN THE BOX	
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 5P
IQ Gateway breaker	Circuit breaker, 2-pole, 10 A/15 A
Production CT	Pre-wired revenue-grade solid-core CT, accurate up to ±0.5%
Consumption CT	Two consumption metering clamp CTs, shipped with the box, accurate up to ±2.5%
IQ Battery CT	One battery metering clamp CT, shipped with the box, accurate up to ±2.5%
CTRL board	Control board for wired communication with IQ System Controller 3/3G and the IQ Battery 5P
Enphase Mobile Connect (only with IQ Combiner 5C)	4G-based LTE-M1 cellular modem (CELLMODEM-M1-06-SP-05) with a 5-year T-Mobile data plan
Accessories kit	Spare control headers for the COMMS-KIT-2 board
ACCESSORIES AND REPLACEMENT PARTS (NOT INCLUDED, ORDER SEPARATELY)	
CELLMODEM-M1-06-SP-05	4G-based LTE-M1 cellular modem with a 5-year T-Mobile data plan
CELLMODEM-M1-06-AT-05	4G-based LTE-M1 cellular modem with a 5-year AT&T data plan
Circuit breakers (off-the-shelf)	Supports Eaton BR2XX, Siemens Q2XX, and GE/ABB THQL21XX Series circuit breakers (XX represents 10, 15, 20, 30, 40, 50, or 60). Also supports Eaton BR220B, BR230B, and BR240B circuit breakers compatible with the 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 (more details in the "Accessories" section)
XA-SOLARSHIELD-ES	Replacement solar shield for IQ Combiner 5/5C
XA-ENV2-PCBA-5	IQ Gateway replacement printed circuit board (PCB) for IQ Combiner 5/5C
X-IQ-NA-HD-125A	Hold-down kit compatible with Eaton BR-B Series circuit breakers (with screws). Not required for X-IQ-AM1-240-5-HDK/X-IQ-AM1-240-5C-HDK.
XA-COMMS2-PCBA-5	Replacement COMMS-KIT-2 printed circuit board (PCB) for IQ Combiner 5/5C
ELECTRICAL SPECIFICATIONS	
Rating	80 A
System voltage and frequency	120/240 VAC or 120/208 VAC, 60 Hz
Busbar rating	125 A
Fault current rating	10 kAIC
Maximum continuous current rating (input from PV/ storage)	64 A
Branch circuits (solar and/or 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)	80 A of distributed generation/95 A with IQ Gateway breaker included
IQ Gateway breaker	10 A or 15 A rating GE/Siemens/Eaton included
Production metering CT	200 A solid core pre-installed and wired to IQ Gateway

[1] A plug-and-play industrial-grade cell modem for systems of up to 60 microinverters. Available in the United States, Canada, Mexico, Puerto Rico, and the US Virgin Islands, where there is adequate cellular service in the installation area.

IQC-5-5C-DSH-00007-6.0-EN-US-2024-09-30

V2.3.5

AMBIA

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ADDRESS: 335 SOUTH 560 WEST,
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JURISDICTION: HURON
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DESIGNED BY: SV
DESIGNED ON
7/8/2025

OPTIMIZER

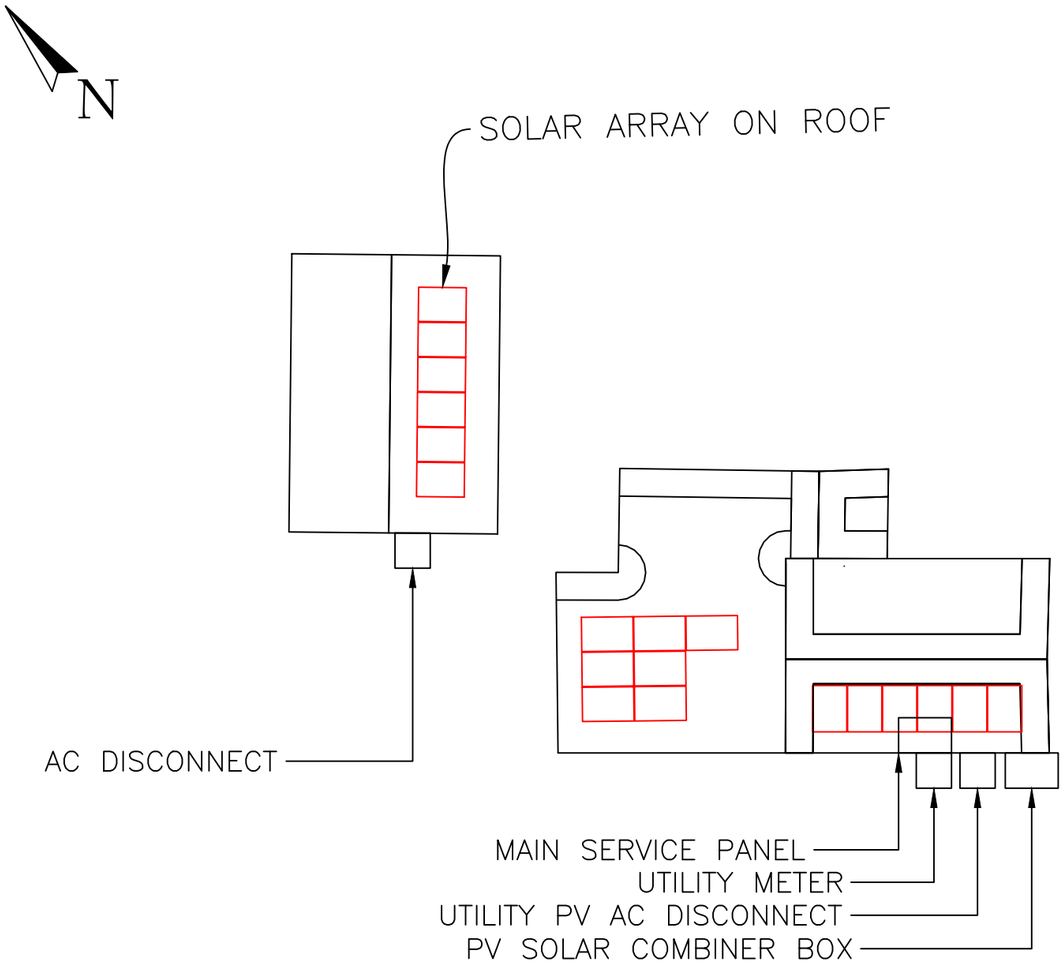
CS-3

CAUTION

MULTIPLE SOURCES OF POWER

SITE SPECIFIC PLACARD REQUIRED

REASON: MULTIPLE STRUCTURES WITH MODULES MOUNTED TO ROOF



CITY:	HURON

V2.3.5

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UTILITY COMPANY: FIRST ENERGY	

DESIGNED BY: SV

DESIGNED ON

7/8/2025

PLACARD

PL-1

Project information

Installer	-	Project name	**207 Williams St Design**
Project address	**207 Williams Street, Huron, OH 44839 USA**	AHJ/ASCE	**City of Huron / 7-16**
Project number	-	Wind / Exp. Cat. / Snow	**108.0mph / C / 20 psf**

Equipment type

Module	**JA Solar JAM54S31 405/MR (1500V)**
Inverter	-
Battery	--

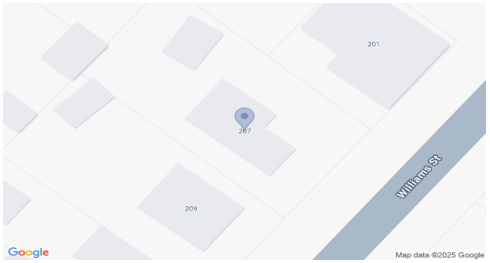
Summary

Total modules	**19**
Total watts	**7695 W**
Total attachments	**33**

Arrays

Array 1		Roof: **23° Gable Comp** SkipRail: **Yes**
Array 2		Roof: **27° Gable Comp** SkipRail: **Yes**
Array 3		Roof: **7° Gable Comp** SkipRail: **Yes**

Location preview



Notes

pegasussolar.com | sales@pegasussolar.com

Bill of materials

Part Info	Array 1	Array 2	Array 3	Spares	Total QTY
PSR-M84 | Pegasus Rail - Mill 84"	7	7	6	2	22
PSR-SPLS | Pegasus - Bonded Structural Splice	6	6	3	2	17
PSR-MCZ | Pegasus - Multi-Clamp - Mid/End 30-40mm - Black Ano	14	14	14	-	42
PSR-SRC | Pegasus - SkipRail Clamp	-	-	6	-	6
PSR-MLP | Pegasus - MLPE Mount	6	6	7	-	19
PSR-LUG | Pegasus - Ground Lug	1	1	1	-	3
PSR-WMC | Pegasus - Wire Management Clip	15	15	18	-	48
PSR-CBG | Pegasus - Cable Grip	1	1	2	-	4
PSR-CAP | Pegasus - End Cap	4	4	8	-	16
PIF2-MDT | InstaFlash2 - Deck or Rafter Attach - with Dovetail T-bolt	-	-	13	-	13
PIF-RMDT | Pegasus InstaFlash - Mill - Dovetail T-bolt	10	10	-	-	20
PF-DRW85 | Pegasus Fastener - Deck-Rafter 85mm	-	-	39	-	39

BOS section

	MFG	P/N	DESCRIPTION	QTY	QTY w/ SPARES
PV MOD	JA Solar	JAM54S31 405/MR (1500V)		19	19

APPLICATION FOR SOLAR PROJECTS

Submit one application per building or structure.

Type of Project:

_☑_ Roof Top Units
_____ Ground Units
_____ Hot Water Heating System
_____ Building Integrated Photovoltaics - materials that are integrated in to the outer surface or structure of a building and serve as the outer protective surface of that building
_____ Off-Grid. Not using or depending on public utilities.
_____ Other
*Electrical Production and Distribution Networks please contact the office beforehand.

Building/Project Location

Owner's Name Robert Smith
Address 207 Williams Street
City/State Huron, OH
Zip Code 44839
Phone Number (419) 433-0151
Email r.b.smith@frontier.com
* Has the proper application from the electric utility been obtained and approved ☑ Yes ____ No
* Has this project received zoning approval ☑ Yes _____ No
* Is this project located with your local flood plain? _____ Yes ☑ No

Brief Description of the scope of the work covered under this application:

7.695 kW residential solar system to be installed on roof

Contractor Information

Name Ambia Energy, LLC
Address 335 S 560 W, Ste 100
City/State Lindon, UT 84042
Phone 877-412-7929
Email permitting@ambiasolar.com

Required Submittal with this application:

*Building permit application for a solar energy system or systems shall be accompanied by standard construction documents of the solar panel and related frame work, including but not limited to: the mounting hardware and attachment to the dwelling, building or structure, base and/or footings, etc. An engineering analysis showing compliance with the current adopted Ohio Builing Code, NEC, and Fire Code shall be prepared by a registered design professional and shall be submitted at the time of application. This analysis may be prepared by the manufacturer of the solar panel provided that he/she is a registered design professional in the State of Ohio. This analysis and construction documents shall be sealed according to the State of Ohio Seal Law.