

**LEAVENWORTH PRESERVATION COMMISSION  
COMMISSION CHAMBERS, CITY HALL  
100 N. 5<sup>th</sup> Street  
Leavenworth, KS 66048**

**REGULAR SESSION  
Wednesday, January 3, 2024  
6:00 p.m.**

**AGENDA**

CALL TO ORDER:

- 1. Roll Call/Establish Quorum**
- 2. Approval of Minutes: June 7, 2023**

OLD BUSINESS:

**None**

NEW BUSINESS:

**1. ELECTION OF OFFICERS**

**2. 2024-02 LPC – 1128 3<sup>RD</sup> AVE**

A State Law review (KSA 75-2724) for proposed modifications to property located at 1128 3<sup>rd</sup> Avenue, a property located in the Third Avenue Historic District, under the Secretary of the Interior's Standards for Rehabilitation.

OTHER BUSINESS/CORRESPONDENCE:

**1. MINOR STATE LAW REVIEW AND/OR MINOR CERTIFICATE OF APPROPRIATENESS (24) –  
No action required.**

- 223 S 5<sup>th</sup> St – temporary banner
- 424 Delaware – electric off for 1 year
- 400 Shawnee – wall sign
- 600 Cherokee – temporary feather flag
- 100 N 5<sup>th</sup> Street – replace rooftop HVAC unit
- 422 Delaware – projecting sign
- 1021 3<sup>rd</sup> Avenue – replace asphalt roof with ice barrier
- 220 Arch Street – replace asphalt roof
- 519 Marshall Street – private sewer repair
- 905 Cherokee – replace roof
- 101 N 5<sup>th</sup> Street – Interior renovations

- 422 Delaware – sign attached to canopy
- 426 Delaware – minor interior renovations
- 1036 3<sup>rd</sup> Avenue – replace asphalt roof
- 424 Delaware – install water heater
- 317 N Esplanade – replace roof
- 320 S 7<sup>th</sup> St – install chain link fence
- 223 S 5<sup>th</sup> St – temporary banner
- 411 N Broadway St – replace roof
- 420-426 Delaware – roof replacement
- 418 Cherokee – update existing rooftop HVAC
- 1029 3<sup>rd</sup> Avenue – replace roof
- 307 N Broadway St – replace roof on house and garage
- 600 Shawnee – install roof mounted solar panels

ADJOURN



**LEAVENWORTH PRESERVATION COMMISSION MINUTES**  
**COMMISSION CHAMBERS, CITY HALL**  
100 N 5<sup>th</sup> Street, Leavenworth, Kansas 66048  
**WEDNESDAY, June 7, 2023, 6:00 PM**

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**CALL TO ORDER:**

**Board Members Present**

Rik Jackson  
Ed Otto  
Ken Bateman  
Dick Gibson  
Sherry Hines Whitson

**Board Member(s) Absent**

**City Staff Present**

Michelle Baragary  
Bethany Falvey

Chairman Jackson called the meeting to order at 6:00 p.m. and noted a quorum was present.

**APPROVAL OF MINUTES: April 5, 2023**

Chairman Jackson asked for comments, changes or a motion on the April 5, 2023 minutes presented for approval. Commissioner Bateman moved to approve the minutes as presented, seconded by Commissioner Gibson and approved by a vote of 5-0.

**OLD BUSINESS:**

None

**NEW BUSINESS:**

**1. 2023-12 LPC – 222 PINE STREET**

A State Law review (K.S.A. 75-2724) for proposed modifications to the property located at 222 Pine Street, a contributing property located in the Arch Street Historic District, to determine if the project meets the Standards for Rehabilitation as set forth by the Secretary of the Interior.

Chairman Jackson called for the staff report.

City Planner Bethany Falvey stated this is a State Law review (KSA 75-2724) for the proposed modifications to the property located at 222 Pine Street, a contributing property located in the Arch Street Historic District, under the Secretary of the Interior's Standards for Rehabilitation. The scope of work includes replacement of 11 windows.

The subject property is located in the Arch Street Historic District, which was listed in the Register of Historic Kansas Places and National Register of Historic Places in 2002. The wood framed building is a two-story National Folk style single-family house. The property is a Contributing structure to the district. The nomination notes that the front addition was a modification at some time, but retains original 4/2 wood windows.

The project scope of work includes replacement of 11 windows; 4 in the kitchen, 5 in the upstairs bedroom, and 2 in the basement with Renewal by Andersen Fibrex composite replacement windows.

**REQUIRED REVIEWS:**

The proposed project shall be reviewed utilizing the Standards for Rehabilitation as set forth by the Secretary of the Interior:

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

*No such change is proposed.*

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

*Eleven of the original windows are proposed to be removed and replaced with Renewal by Andersen Fibrex windows on all elevations except the south (front) façade.*

3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

*Proposed windows 202 and 203 on the north (rear) side are changing pairs of double-hung windows with little to no lite divisions to Gliding windows that "will simulate pair double hungs". The muntin pattern on the top sash will mimic 204, 101, and 102, and will be the Colonial 3w x 2h with full divided lights.*

*Proposed window 204 on the east (side) façade is currently a four-over-four, and the proposed window is a double hung window with four-over-one with the grille pattern in-between the glass.*

*Proposed windows 101 and 102 are eight-over-one windows, and 201 is a two-over-two window. The proposed replacement windows are the Colonial grille pattern 3w x 2h.*

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

*No such change is proposed.*

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.

*No such change is proposed.*

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities, and where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

*The proposed replacement windows replace historic wood windows, except windows 103 and 104 that are already replacement one-over-one windows. The replacement windows differ in configuration, but do fit the historic window size. The proposed replacement windows are all secondary elevations.*

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

*No such change is proposed.*

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

*No ground disturbing work is proposed.*

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

*The proposed exterior alterations are all on secondary elevations, and do not characterize the property.*

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

*No such work is proposed.*

#### **ACTION /OPTIONS:**

- Motion, to determine that the proposed changes to 222 Pine Street do not damage or destroy the Arch Street Historic District.
- Motion, to determine that the proposed changes to 222 Pine Street does damage or destroy Arch Street Historic District.
- Motion, to Table item until the next meeting for the purpose of gathering additional information.
- Motion, to forward to the SHPO for review.

Chairman Jackson called for questions about the staff report.

Commissioner Whitson asked the property owners what their expected timeframe is.

Joann Soderlund, property owner 222 Pine Street, responded installation should be in September.

Chairman Jackson asked if the windows will have any tint.

Mark Soderlund, property owner 222 Pine Street, stated the windows will have the standard tinting that comes with Andersen windows, and the windows will go from single pane to double pane.

With no further questions, Chairman Jackson opened the public hearing. With no one wishing to speak, Chairman Jackson closed the public hearing and called for a motion. Commissioner Bateman moved that the proposed changes to 222 Pine Street do not damage or destroy the Arch Street Historic District, seconded by Commissioner Whitson, and approved by a roll call vote 5-0.

## **2. 2023-13 LPC – 404 SHAWNEE**

A State Law review (K.S.A. 75-2724) for proposed modifications to the property located at 404 Shawnee, a non-contributing property located in the Downtown Historic District, to determine if the project meets the Standards for Rehabilitation as set forth by the Secretary of the Interior.

Chairman Jackson called for the staff report.

City Planner Bethany Falvey stated this is a State Law review (KSA 75-2724) for the proposed modifications to the property located at 404 Shawnee, a non-contributing property located in the Downtown Historic District, under the Secretary of the Interior's Standards for Rehabilitation. The scope of work includes replacement of 3 windows in the front and installation of 2 windows in the back.

The subject property is located in the Downtown Historic District, which was listed in the Register of Historic Kansas Places and National Register of Historic Places in 2002. The brick building is a two-story commercial style building. The property is a non-contributing structure to the district. When reviewing requests for work to a non-contributing structure, the review is based on the impact to the surrounding contributing historic structures and environment and not as it relates to the building itself. The nomination that the "building has suffered irreversible alterations to its storefront and through the application of synthetic stucco...the only element that appears unaltered is the double-hung sash windows with two-over-two lights".

The project scope of work includes replacement of 3 windows in the front and installation of 2 windows in the back with Window World vinyl windows. The two rear windows will be one-over-one double hung windows, and the front will be a four-over-four double hung window with a half round four lite window on top of the double hung window.

#### **REQUIRED REVIEWS:**

The proposed project shall be reviewed utilizing the Standards for Rehabilitation as set forth by the Secretary of the Interior:

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

*No such change is proposed.*

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

*Three of the original four-over-four double-hung wood windows are proposed to be replaced with four-over-four double hung vinyl windows with a half round four light window. One window in the rear is reopening a blocked-in window and an additional new window, one-over-one double hung, in the rear.*

3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

*The addition of a new window opening in the rear is a secondary elevation. The proposed front window replacement changes the configuration of the windows.*

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

*No such change is proposed.*

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.

*The front four-over-four windows are the only remaining historic materials.*

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color,

texture, and other visual qualities, and where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

*The proposed replacement windows replace historic wood windows on the primary elevation with Window World vinyl windows with a different configuration that exists.*

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

*No such change is proposed.*

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

*No ground disturbing work is proposed.*

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

*The proposed exterior alterations are on the front primary and rear secondary elevation. The new work is differentiated but not compatible.*

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

*No such work is proposed.*

#### **ACTION /OPTIONS:**

- Motion, to determine that the proposed changes to 404 Shawnee do not damage or destroy the Downtown Historic District.
- Motion, to determine that the proposed changes to 404 Shawnee Street does damage or destroy Downtown Historic District.
- Motion, to Table item until the next meeting for the purpose of gathering additional information.
- Motion, to forward to the SHPO for review.

Chairman Jackson called for questions about the staff report.

Chairman Jackson asked the property owner if an additional window is being added.

Marshall Blount, property owner PO Box 9219 Kansas City, MO, responded an additional window is not being added. Referring to window #8 in the policy report, Mr. Blount stated that was the existing original window. Prior to his ownership of the building, cinder blocks were installed within a framed-in area around the inside of the window and stucco was installed on the outside covering the bottom half of the window. The proposed changes to that window are to cut the stucco from the outside and remove the cinder blocks from within the framed-in area on the inside so the entire length of the original window is exposed, and a double hung window will be installed. Window #7 will be identical to window #8, with dimensions of 34.25" x 77.25".

With no further questions about the staff report, Chairman Jackson opened the public meeting.

Commissioner Bateman asked if the current proposals are in addition to the changes that were brought before this board in October 2022.

Mr. Blount responded that while working on the project, it occurred to them that they needed to start the approval process for the rear facing windows.

With no further questions or discussion, Chairman Jackson closed the public hearing, and called for a motion. Commissioner Whitson moved to determine that the proposed changes to 404 Shawnee do not damage or destroy the Downtown Historic District, seconded by Commissioner Bateman, and approved by a roll call vote of 5-0.

### **OTHER BUSINESS/CORRESPONDENCE**

**1. MINOR STATE LAW REVIEW AND/OR MINOR CERTIFICATE OF APPROPRIATENESS**

Ms. Falvey noted there are nine minor state law review included in the agenda packet, which does not require action from the commission.

**2. DOWNTOWN SURVEY**

Presentation by Brenda Spencer with Spencer Preservation. The survey area includes the Downtown Historic District and Industrial Historic District.

Ms. Falvey stated there are not items on the agenda for July.

With no further discussion, Chairman Jackson called for a motion to adjourn. Commissioner Gibson moved to adjourn, seconded by Commissioner Otto and approved by a vote of 5-0.

Meeting adjourned at 6:49 p.m.

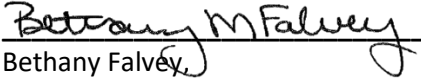
Minutes taken by Planning Assistant Michelle Baragary.



**LEAVENWORTH PRESERVATION COMMISSION**

**State Law Review  
KSA 75-2724  
1128 3<sup>rd</sup> Avenue  
January 3, 2024**

**PREPARED BY:**

  
Bethany Falvey  
City Planner

**APPROVED BY:**

\_\_\_\_\_  
Paul Kramer,  
City Manager

**APPLICANT/OWNER:**

Fritz Schultes

**SUBJECT:**

A State Law review (KSA 75-2724) for proposed modifications to the property located at 1128 3<sup>rd</sup> Avenue, a property located in the Third Avenue Historic District, under the Secretary of the Interior's Standards for Rehabilitation. The scope of work includes the installation of 31 roof-mounted solar panels.

**STAFF ANALYSIS:**

The property is located in the 3<sup>rd</sup> Avenue Historic District, which was listed in the Register of Historic Kansas Places and National Register of Historic Places in 2002. The wood frame house is a two-story Queen Anne style house. The property is a Contributing structure to the district. The nomination notes the attached garage was added in c. 1970.

The proposed 31 roof-mounted solar panels are proposed on three sides of the primary house hipped roof (east, south, and west side), including the front facing roof and on both sides of the gabled roof attached garage.

**REQUIRED REVIEWS:**

The proposed project shall be reviewed utilizing the Standards for Rehabilitation as set forth by the Secretary of the Interior:

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.  
*No such change is proposed.*
2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.  
*The proposed roof mounted solar panels on the front (East) side will be highly visible from the street, altering the historic character.*

3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.  
*No such change is proposed.*
4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.  
*No such change is proposed.*
5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.  
*No such change is proposed.*
6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.  
*No such change is proposed.*
7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.  
*No such change is proposed.*
8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.  
*No ground disturbing work is proposed.*
9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.  
*The proposed solar panels will be differentiated but not compatible on the front side.*
10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.  
*No such work is proposed.*

**ACTION/OPTIONS:**

- Motion, to determine that the proposed changes to 1128 3<sup>rd</sup> Avenue do not damage or destroy the Third Avenue Historic District.
- Motion, to determine that the proposed changes to 1128 3<sup>rd</sup> Avenue do not damage or destroy the Third Avenue Historic District.
- Motion, to Table item until the next meeting for the purpose of gathering additional information.
- Motion, to forward to the SHPO for review.



Application No. 14728  
Filing Date 11/30/2023

### HISTORICAL IMPACT DETERMINATION

Property Address: 1128 3rd Ave Leavenworth, KS 66048

Print Name of Property Owner: Fritz Schultes

Address of Property Owner:

Phone: 914-486-3970 Email: Fritzschultes@gmail.com

Applicant Name (if different from property owner): \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Description of work:

Installing 31 roof mounted solar panels with 31 microinverters.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*(Attach detailed written description of proposed project, along with plans, renderings, manufacturer's specifications, details of materials to be used, photos, and any other necessary supporting documentation to fully describe scope of work)*

Historical or Architectural significance:

- National Register
- Kansas Register
- Leavenworth Landmarks Register

Historic District (if applicable)

Name of District: 3rd Ave HD

#### For Office Use:

Required Review

- Major State Law Review
- Major Certificate of Appropriateness

Project No. 2024-02 LPC

Fee (non-refundable) \$200.00

Fee Paid/Received By: Clerk's

Date of LPC Hearing: 1/3/2024  
 Date of Notice of Public Hearing published 12/13/23  
 Date Notice sent to property owners within historic district, as appropriate: 12/13/23  
 Date of request for appeal to City Commission, if appropriate: \_\_\_\_\_  
 Date scheduled for City Commission review and action, if appropriate: \_\_\_\_\_

Final Action:

Deny as proposed [ ] Approve as proposed [ ] Approve with modifications [ ]

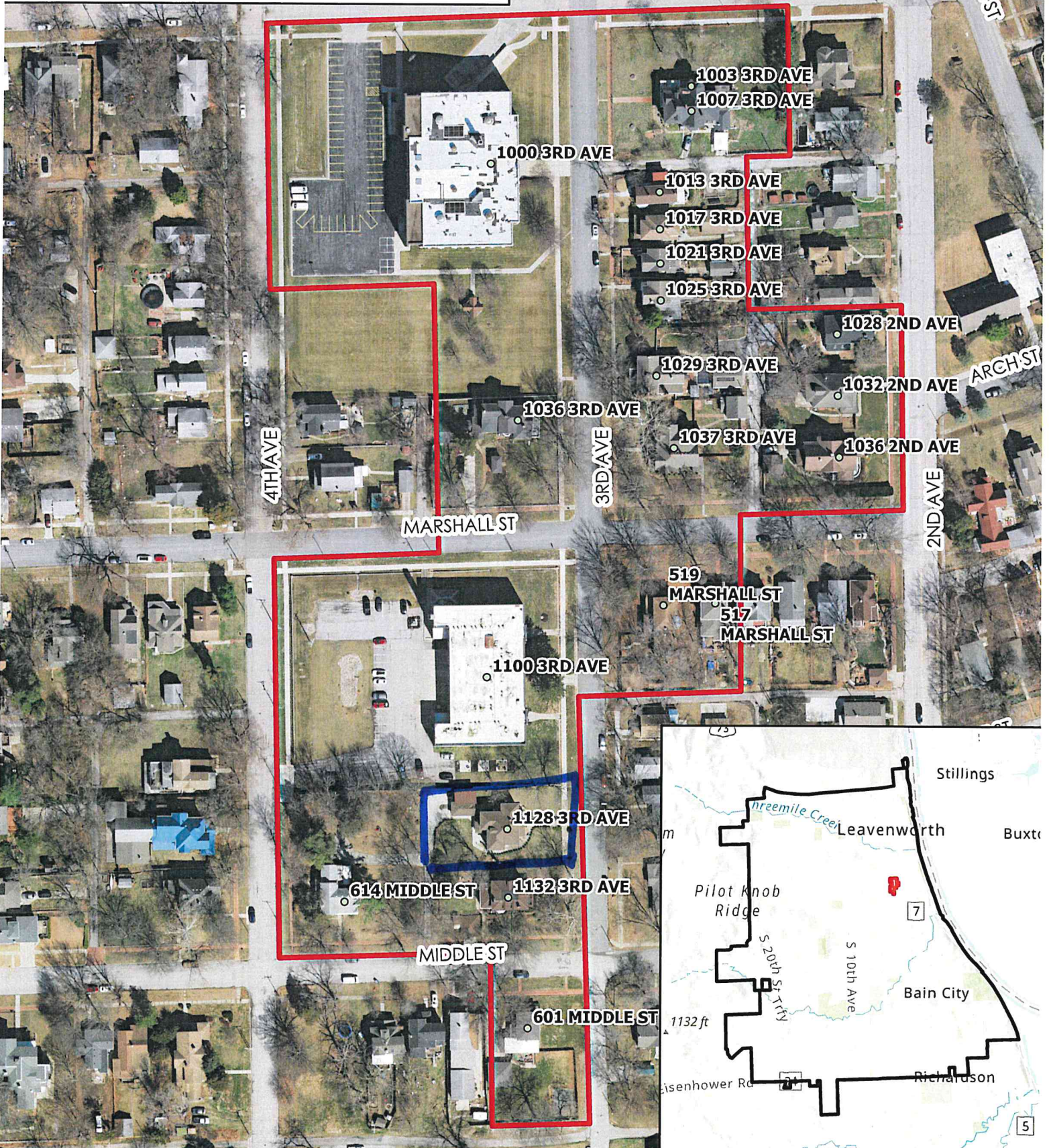
Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

# 3rd Ave Historic District



0 120 240 480 Feet

Map prepared by LV GIS 12/13/22



**NEW PHOTOVOLTAIC SYSTEM 12.400kW DC / 8.990kW AC**  
**1128 3RD AVENUE, LEAVENWORTH, KS 66048**

**AHJ**

KS-CITY OF LEAVENWORTH

**UTILITY**

EVERGY KANSAS CENTRAL ( FORMERLY WESTAR ENERGY INC )

**CODES AND STANDARDS**

ELECTRIC CODE: NEC 2017  
 FIRE CODE: IFC 2018  
 BUILDING CODE: IBC 2018  
 RESIDENTIAL CODE: IRC 2018  
 WIND SPEED: 115 MPH  
 SNOW LOAD: 20 PSF

**SCOPE OF WORK**

(N) 12.400kW DC / 8.990kW AC ROOF MOUNT PV SYSTEM  
 (31) SILFAB SIL-400HC+ (400W) MODULES  
 (31) ENPHASE IQ8PLUS-72-2-US (240V) MICROINVERTERS  
 (1) ENPHASE IQ COMBINER 4

**VICINITY MAP**



**CONTRACTOR INFORMATION**



**BRADY LUNSFORD**  
 ADDRESS: 32152 215 STREET,  
 EASTON, KS  
 PHONE NUMBER: (913) 547-0610  
 LICENSE NUMBER: 5994  
 LICENSE NUMBER: ELECTRICAL  
 CONTRACTOR

**CUSTOMER INFORMATION**

**NAME: FRITZ SCHULTES**  
 ADDRESS: 1128 3RD AVENUE,  
 LEAVENWORTH, KS 66048  
 COORDINATES: 39.306812, -94.915252  
 APN: 0520773603020004000  
 12.400kW DC / 8.990kW AC ROOF  
 MOUNT PV SYSTEM

**GENERAL NOTES**

1. MODULES ARE LISTED UNDER UL 1703 / UL 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. ACTUAL SITE CONDITIONS MAY VARY.  
 4. WORKING CLEARANCES AROUND THE NEW PV ELECTRICAL EQUIPMENT SHALL 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 UTILITY IS RECEIVED.  
 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.

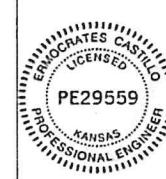
10. PV ARRAY COMBINER / JUNCTION BOX PROVIDES TRANSITION FROM ARRAY WIRING TO CONDUIT WIRING.  
 11. RACKING SYSTEM SHALL BE LISTED TO UL 2703.  
 12. FIRE RATING OF EXISTING ROOF ASSEMBLY SHALL BE MAINTAINED WITH ADDITIONAL OF PHOTOVOLTAIC SYSTEM.

**SHEET CATALOG**

- PV-1 COVER SHEET
- PV-2 SITE PLAN
- PV-3 MOUNTING DETAILS-1
- PV-3.1 MOUNTING DETAILS-2
- PV-3.2 STRUCTURAL DETAILS-1
- PV-3.3 STRUCTURAL DETAILS-2
- PV-4 SINGLE LINE DIAGRAM
- PV-4.1 ELECTRICAL CALCULATIONS
- PV-5 PLACARDS
- SS SPEC SHEETS

METER NUMBER: 40 605 589

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 Castillo**  
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PROJECT ID	AUR-87853
DATE	10/25/2023
CREATED BY	GP
SIGNATURE	
COVER SHEET PV-1	

WIND SPEED: 115 MPH AND SNOW LOAD: 20 PSF

S.NO	AZIMUTH	PITCH	NO. OF MODULES	ARRAY AREA (SQ.FT)	ROOF TYPE	ATTACHMENT	ATTACHMENT QUANTITY	ROOF EXPOSURE	SEAM SPACING	MAX ATTACHMENT SPACING	MAX OVER HANG		
MP-01	360°	5°	10	213.35	METAL ROOF	S-5I PROTEABRACKET	22	EXPOSED	1'-0"	4'-0"	1'-6"		
S.NO	AZIMUTH	PITCH	NO. OF MODULES	ARRAY AREA (SQ.FT)	ROOF TYPE	ATTACHMENT	ATTACHMENT QUANTITY	ROOF EXPOSURE	FRAME TYPE	FRAME SIZE	FRAME SPACING	MAX ATTACHMENT SPACING	MAX OVER HANG
MP-02	180°	19°	6	128.01	COMPOSITION SHINGLE	UNIRAC FLASHLOC (004085D)	22	ATTIC	RAFTERS	2" X 6"	24" O.C.	4'-0"	1'-6"
MP-03	181°	33°	4	85.34	COMPOSITION SHINGLE	UNIRAC FLASHLOC (004085D)	16	ATTIC	RAFTERS	2" X 6"	24" O.C.	4'-0"	1'-6"
MP-04	91°	33°	6	128.01	COMPOSITION SHINGLE	UNIRAC FLASHLOC (004085D)	17	ATTIC	RAFTERS	2" X 6"	24" O.C.	4'-0"	1'-6"
MP-05	271°	32°	1	21.33	COMPOSITION SHINGLE	UNIRAC FLASHLOC (004085D)	4	ATTIC	RAFTERS	2" X 6"	24" O.C.	4'-0"	1'-6"
MP-06	271°	32°	2	42.67	COMPOSITION SHINGLE	UNIRAC FLASHLOC (004085D)	6	ATTIC	RAFTERS	2" X 6"	24" O.C.	4'-0"	1'-6"
MP-07	181°	33°	2	42.67	COMPOSITION SHINGLE	UNIRAC FLASHLOC (004085D)	4	ATTIC	RAFTERS	2" X 6"	24" O.C.	4'-0"	1'-6"

**CONTRACTOR INFORMATION**



BRADY LUNSFORD

ADDRESS: 32152 215 STREET, EASTON, KS

PHONE NUMBER: (913) 547-0610  
 LICENSE NUMBER: 5994  
 LICENSE NUMBER: ELECTRICAL CONTRACTOR

**CUSTOMER INFORMATION**

NAME: FRITZ SCHULTES

ADDRESS: 1128 3RD AVENUE, LEAVENWORTH, KS 66048

COORDINATES: 39.306812, -94.915252

APN: 0520773603020004000  
 12.400kW DC / 8.990kW AC ROOF MOUNT PV SYSTEM

PROJECT ID AUR-87853

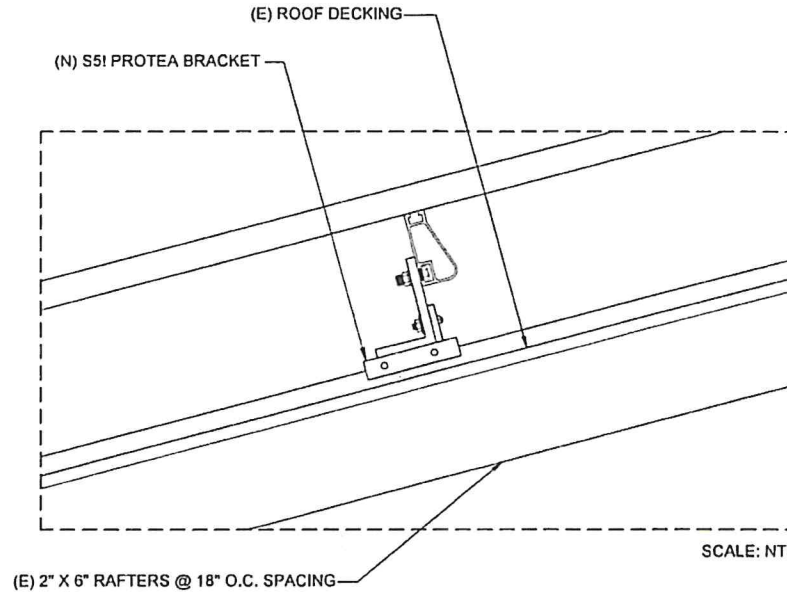
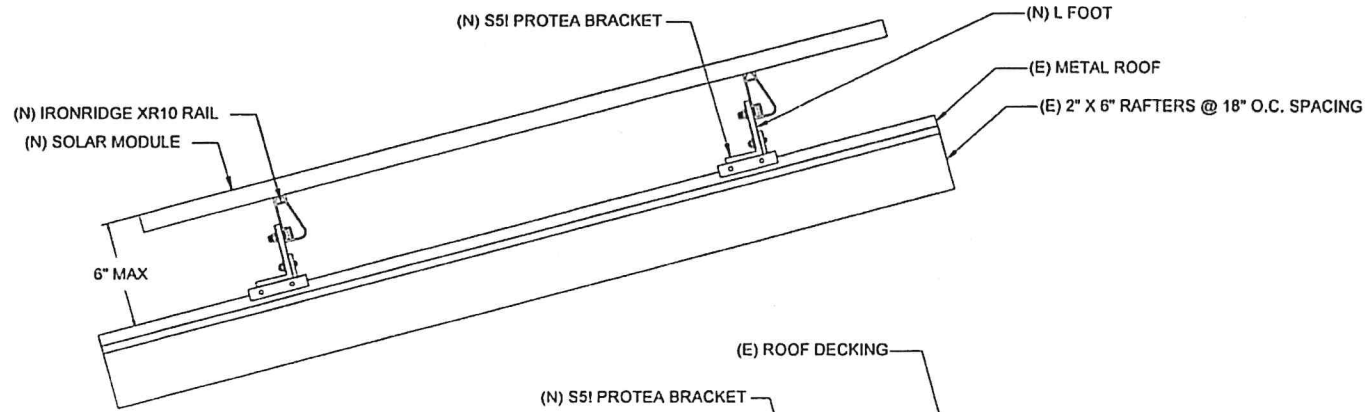
DATE 10/25/2023

CREATED BY GP

SIGNATURE

MOUNTING DETAILS-1  
 PV-3

FOR MP- 01



DEAD LOAD CALCULATIONS			
BOM	QUANTITY	LBS/UNIT	TOTAL WEIGHT (LBS)
MODULES	31	47	1457
MID-CLAMP	34	0.05	1.7
END-CLAMP	56	0.05	2.8
RAIL LENGTH	283	0.43	121.69
SPLICE BAR	8	0.36	2.88
S-5I PROTEABRACKET	22	0.53	11.66
UNIRACFLASHLOC (004085D)	69	0.55	37.95
MICROINVERTER	31	2.38	73.78
TOTAL WEIGHT OF THE SYSTEM (LBS)			1709.46
TOTAL ARRAY AREA ON THE ROOF (SQ. FT.)			661.38
WEIGHT PER SQ. FT.(LBS)			2.58
WEIGHT PER PENETRATION (LBS)			18.78

CONTRACTOR INFORMATION



BRADY LUNSFORD  
 ADDRESS: 32152 215 STREET,  
 EASTON, KS  
 PHONE NUMBER: (913) 547-0610  
 LICENSE NUMBER: 5994  
 LICENSE NUMBER: ELECTRICAL  
 CONTRACTOR

CUSTOMER INFORMATION

NAME: FRITZ SCHULTES  
 ADDRESS: 1128 3RD AVENUE,  
 LEAVENWORTH, KS 66048  
 COORDINATES: 39.306812, -94.915252  
 APN: 0520773603020004000  
 12.400kW DC / 8.990kW AC ROOF  
 MOUNT PV SYSTEM

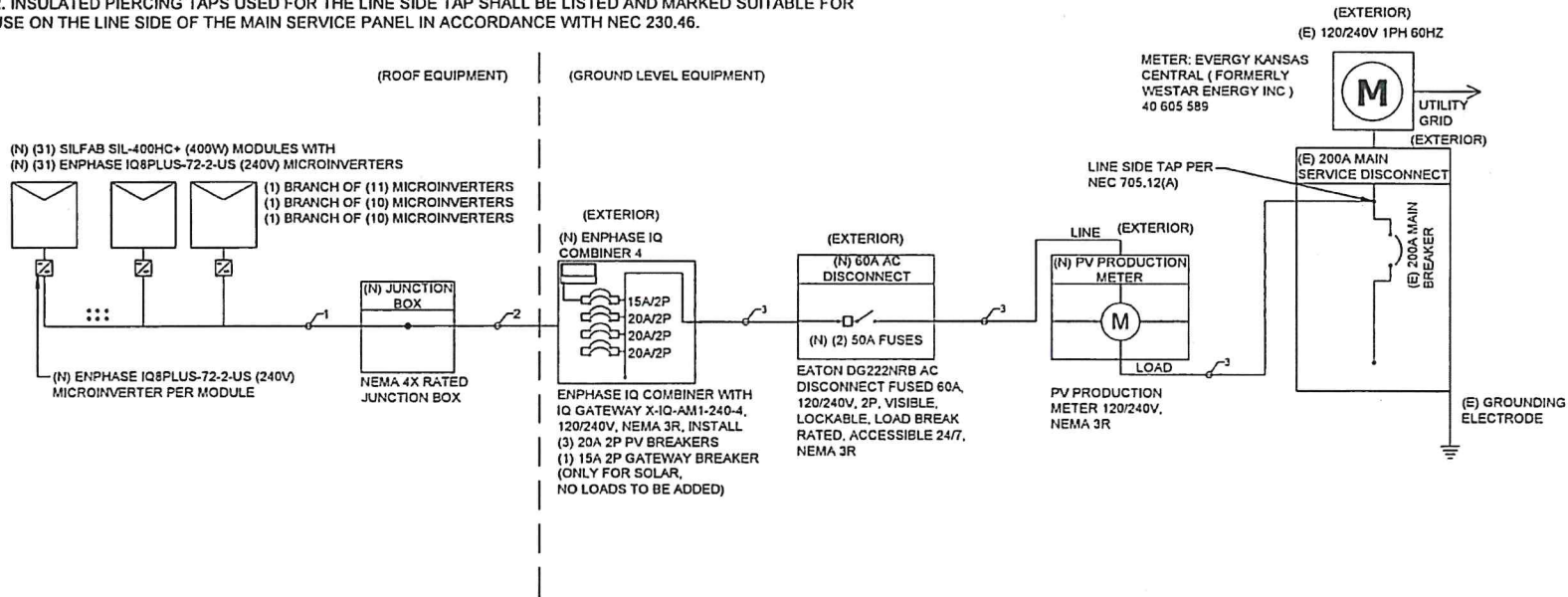
PROJECT ID	AUR-87853
DATE	10/25/2023
CREATED BY	GP
SIGNATURE	

STRUCTURAL DETAILS-1  
 PV-3.2

MODULE SPECIFICATIONS	
MODEL	SILFAB SIL-400HC+ (400W)
MODULE POWER @ STC	400W
OPEN CIRCUIT VOLTAGE:Voc	43.02V
MAX POWER VOLTAGE:Vmp	36.05V
SHORT CIRCUIT CURRENT:Isc	11.58A
MAX POWER CURRENT:Imp	11.1A
TEMPERATURE COEFFICIENT:Voc	-0.28%/°C
MODULE DIMENSIONS: L x W x H	75.3" x 40.8" x 1.37"

MICROINVERTER SPECIFICATIONS	
MODEL	ENPHASE IQ8PLUS-72-2-US (240V)
POWER RATING	290W
MAX OUTPUT CURRENT	1.21A
CEC WEIGHTED EFFICIENCY	97%
MAX NO OF MICRO INVERTERS/BRANCH	13
MAX DC VOLTAGE	60V

NOTE:  
 1. MICROINVERTERS ARE RAPID SHUTDOWN COMPLIANT AS PER NEC 690.12.  
 2. INSULATED PIERCING TAPS USED FOR THE LINE SIDE TAP SHALL BE LISTED AND MARKED SUITABLE FOR USE ON THE LINE SIDE OF THE MAIN SERVICE PANEL IN ACCORDANCE WITH NEC 230.46.



CONDUCTOR 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, EGC
2	3/4" EMT	(6) 10 AWG THHN/THWN-2, Cu	NONE	(1) 10 AWG THHN/THWN-2, EGC
3	3/4" EMT	(2) 6 AWG THHN/THWN-2, Cu	(1) 6 AWG THHN/THWN-2, Cu	(1) 10 AWG THHN/THWN-2, EGC

CONTRACTOR INFORMATION



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 MOUNT PV SYSTEM

Digitally signed by Ermocrates E Castillo  
 Date: 2023.10.31 09:03:18 -04'00'

PROJECT ID	AUR-87853
DATE	10/25/2023
CREATED BY	GP
SIGNATURE	
SINGLE LINE DIAGRAM PV-4	



**WARNING**

**ELECTRIC SHOCK HAZARD**

TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

DC VOLTAGE IS ALWAYS PRESENT WHEN SOLAR MODULES ARE EXPOSED TO SUNLIGHT

**LABEL LOCATION**  
AC DISCONNECT, POINT OF INTERCONNECTION  
PER CODE: NEC 690.13

**WARNING: PHOTOVOLTAIC POWER SOURCE**

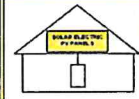
**LABEL LOCATION**  
CONDUIT, PV COMBINER BOX  
PER CODE: NEC 690.31(G)(3)

**PHOTOVOLTAIC AC DISCONNECT**

**LABEL LOCATION**  
AC DISCONNECT, POINT OF INTERCONNECTION  
PER CODE: NEC 690.13(B)

**SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN**

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



**LABEL LOCATION**  
AC DISCONNECT, POINT OF INTERCONNECTION  
PER CODE: NEC 690.56(C)(1)(a)

**RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM**

**LABEL LOCATION**  
AC DISCONNECT, PV COMBINER BOX  
PER CODE: NEC 690.56(C)(3)

**PHOTOVOLTAIC SYSTEM AC DISCONNECT SWITCH**

RATED AC OPERATING CURRENT 37.51 AMPS AC  
AC NOMINAL OPERATING VOLTAGE 240 VAC

**LABEL LOCATION**  
AC DISCONNECT, POINT OF INTERCONNECTION  
PER CODE: NEC 690.54

**WARNING**

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

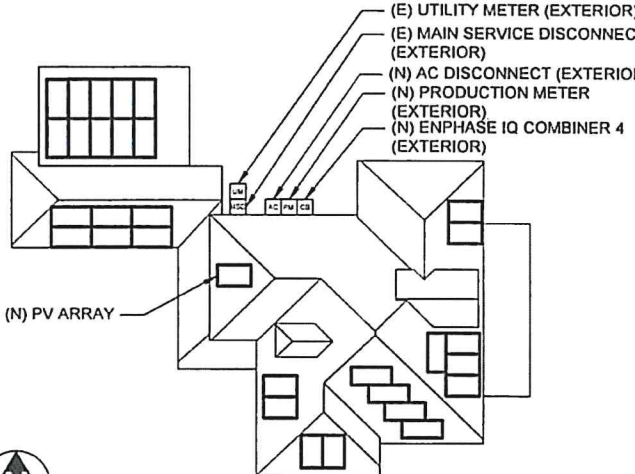
**LABEL LOCATION**  
POINT OF INTERCONNECTION  
PER CODE: NEC 705.12(B)(3)

**PHOTOVOLTAIC SYSTEM METER**

**LABEL LOCATION:**  
DEDICATED kWh METER  
PER CODE: NEC 690.4(B) UTILITY

**CAUTION: MULTIPLE SOURCES OF POWER**

**POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN**





1128 3RD AVENUE, LEAVENWORTH, KS 66048

SYSTEM UTILIZES MICROINVERTERS LOCATED UNDER EACH SOLAR MODULE

- NOTES**
1. PLACARDS SHALL MEET THE REQUIREMENTS OF ARTICLES 690 AND 705, UNLESS OTHERWISE SPECIFIED PER LOCAL AHJ REQUIREMENTS.
  2. PLACARDS SHALL MEET THE REQUIREMENTS OF SECTION 110.21(B) AS REQUIRED AND SHALL COMPLY WITH ANSI Z535.4-2011, PRODUCT SAFETY SIGNS AND LABELS.
  3. PLACARDS SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD.
  4. PLACARDS SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED AND SHALL BE HANDWRITTEN.
  5. PLACARDS SHALL NOT COVER EXISTING MANUFACTURER LABELS.
  6. WARNING SIGNAGE TEXT SHALL BE MINIMUM 3/8" TALL.

**LABEL LOCATION**  
SERVICE PANEL  
PER CODE: NEC 705.10

CONTRACTOR INFORMATION	
	
<b>BRADY LUNSFORD</b> ADDRESS: 32152 215 STREET, EASTON, KS PHONE NUMBER: (913) 547-0610 LICENSE NUMBER: 5994 LICENSE NUMBER: ELECTRICAL CONTRACTOR	
CUSTOMER INFORMATION	
<b>NAME: FRITZ SCHULTES</b> ADDRESS: 1128 3RD AVENUE, LEAVENWORTH, KS 66048 COORDINATES: 39.306812, -94.915252 APN: 0520773603020004000 12.400kW DC / 8.990kW AC ROOF MOUNT PV SYSTEM	
Digitally signed by Ermocrates E Castillo Date: 2023.10.31 09:03:46 -04'00' 	
PROJECT ID	AUR-87853
DATE	10/25/2023
CREATED BY	GP
SIGNATURE	
<b>PLACARDS PV-5</b>	



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.



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-in-play MC4 connectors.



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-in-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-S1) and IEEE 1547-2019 (UL 1741-SB 3\*\* E2)

### Note:

\*\*25 Year warranty is based on power-on testing. Power-on testing is based on the number of hours the microinverter is powered on. Power-on testing is based on the number of hours the microinverter is powered on.

\*5% when installed with IQ System Controller 2, meets UL 1741

\*\*25 and 30 year warranty is for split phase 240V installation only.

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IQ8P-14-01-0001-03-EN-09-2022-10-21

## IQ8 and IQ8+ Microinverters

INPUT DATA (DC)	IQ8-60-2-03	IQ8PLUS-75-2-03
Commonly used module pairings	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
MPPV voltage range	V 27 - 37	27 - 45
Operating range	V 16 - 48	10 - 58
Min. / Max. start voltage	V 22 / 4.8	22 / 5.8
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 <sub>sc</sub>	A 20	
Overvoltage class AC port	1	
DC port backfeed current	A 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)	IQ8-60-2-03	IQ8PLUS-75-2-03
Peak output power	W 245	300
Max. continuous output power	W 240	290
Nominal (L-L) voltage / range	V 240 / 210 - 254	
Max. continuous output current	A 10	121
Nominal frequency	Hz 60	
Extended frequency range	Hz 47 - 63	
AC short circuit fault current over 3 cycles	Amps 2	
Max. units per 20 A (L-L) branch circuit <sup>1</sup>	N/A	13
Total harmonic distortion	% <0.5	
Overvoltage class AC port	1	
AC port backfeed current	A 30	
Power factor setting	1.0	
Grid-tied power factor (adjustable)	0.95 leading - 0.95 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	108 kg (238 lbs)
Cooling	Natural convection - no fans
Approved for wet locations	Yes
Pollution degree	FD3
Enclosure	Class II double-insulated, corrosion resistant polymeric enclosure
Emison category / UV exposure rating	NEMA Type 6 / outdoor

COMPLIANCE	
CE Marking	CA Rule 21 (UL 1741-S1), UL 62709-1, IEEE 1547-2019 (UL 1741-SB 3** E2), FCC Part 15 Class B, IEC 603 Class B, CAN / CSA C22.2 NO. 1071-01
Certifications	This product is UL Listed as PV Rapid Shutdown Equipment and conforms with NEC 2014, NEC 2017, and NEC 2020 section 690.12 and 690.12-1 2019 Rule 64-218 Rapid Shutdown of PV System, for AC and DC conductors, when installed according to manufacturer's instructions.

Offering Microinverters with split phase 240V installation capability. See the complete product literature for more information on this product. © 2022 Enphase Energy, Inc. All rights reserved. Enphase, the Enphase logo, IQ8 Microinverters, and other names are trademarks of Enphase Energy, Inc. Data subject to change.

IQ8P-14-01-0001-03-EN-09-2022-10-21

## CONTRACTOR INFORMATION



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ADDRESS: 32152 215 STREET,  
EASTON, KS  
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COORDINATES: 39.306812, -94.915252  
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12.400kW DC / 8.990kW AC ROOF  
MOUNT PV SYSTEM

PROJECT ID AUR-87853

DATE 10/25/2023

CREATED BY GP

SIGNATURE

MICROINVERTER SPEC SHEET  
SS

# S-5!®

## The Right Way!™

**NEW**

**NOW AVAILABLE  
IN ALUMINUM**

ProteaBracket™

### ProteaBracket™

A versatile bracket for mounting solar PV to trapezoidal roof profiles

ProteaBracket™ is now made in aluminum. Still the most versatile trapezoidal metal roof attachment solution on the market, the S-5! ProteaBracket just got better!

The bracket features an adjustable attachment base and module attachment options to accommodate different roof profile dimensions and mounting options.

Our pre-applied EPDM gasket with peel and stick adhesive makes installation a snap, ensuring accurate and secure placement the first time.

With no messy sealants, faster installation, and a weather-proof fit, ProteaBracket offers you the most versatile solar attachment solution available.

ProteaBracket® can be used for rail mounting or "direct-attach" with S-5! PVKIT™

### Features and Benefits

- 34% lighter - saves on shipping
- Stronger L-Foot™
- Load-tested for engineered application
- Corrosion-resistant materials
- Adjustable - Fits rib profiles up to 3"
- Peel-and-Stick prevents accidental shifting during installation
- Fully pro-assembled
- 25-year warranty\*

888-825-3432 | www.S-5.com

The right way to attach solar PV to trapezoidal roof profiles!

\*When ProteaBracket is used in conjunction with the S-5! PVKIT, an additional rail is required during installation.

\*See www.S-5.com for details.

# S-5!®

The Right Way!™

ProteaBracket™ is the perfect solar attachment solution for most trapezoidal rib, exposed-fastened metal roof profiles!

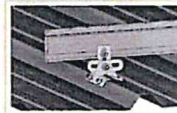
ProteaBracket™ is compatible with common metal roofing materials and comes with a pre-applied EPDM gasket on the base.

Note: All four pre-punched holes must be used to achieve tested strength. Fasteners are provided.

For design assistance, ask your distributor, or visit [www.S-5.com](http://www.S-5.com) for the independent lab test data that can be used for load-critical designs and applications. Also, please visit our website for more information including metallurgical compatibilities and specifications.

S-5!® holding strength is unmatched in the industry.

### Multiple Attachment Options:



Side  
Mount Rail

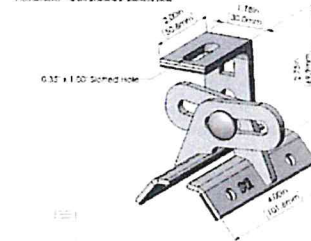


Bottom  
Mount Rail



w/ S-5!  
PVKIT™  
(rail-less)

### ProteaBracket™



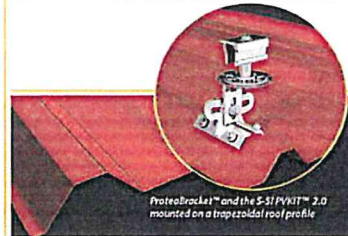
0.37 x 1.00 (Sched. Hole)



ProteaBracket fits profiles up to 3 inches

INSTALLATION:

- No surface preparation needed. (1) Peel away excess oil and debris. (2) Peel off adhesive release paper. (3) Align and mount bracket directly onto surface of panel. (4) Secure ProteaBracket through pre-punched holes, using pre-drilled S-5! screws.



ProteaBracket™ and the S-5! PVKIT™ 2.0 mounted on a trapezoidal roof profile

S-5!® Warning! Please use this product responsibly!

Product use prohibited by multiple U.S. and foreign patents. For published data regarding holding strength, wind uplift, gusting, and installation, visit [www.S-5.com](http://www.S-5.com) or call 888-825-3432. © 2023 S-5! Solar. All rights reserved. S-5! Solar is a registered trademark of S-5! Solar. All other trademarks are the property of their respective owners.

Distributed by

### CONTRACTOR INFORMATION



BRADY LUNSFORD  
ADDRESS: 32152 215 STREET,  
EASTON, KS  
PHONE NUMBER: (913) 547-0610  
LICENSE NUMBER: 5994  
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CONTRACTOR

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12.400kW DC / 8.990kW AC ROOF  
MOUNT PV SYSTEM

PROJECT ID AUR-87853

DATE 10/25/2023

CREATED BY GP

SIGNATURE

MOUNT SPEC SHEET  
SS



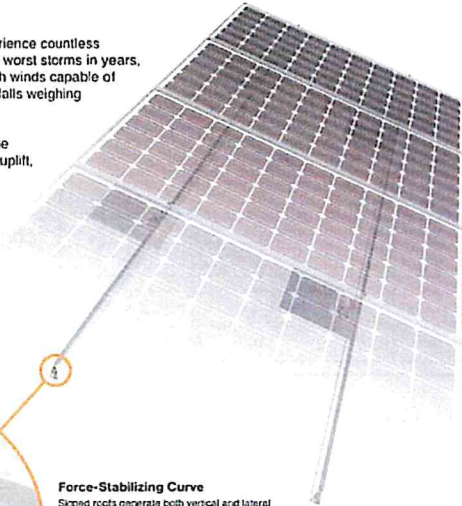
## XR Rail® Family

Tech Brief

### 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 tie 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.



## 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.

Tech Brief



**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](http://IronRidge.com) for detailed certification letters.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 0"	6'	8'	10'	12'
None	90						
	120						
	140	XR10		XR100		XR1000	
	160						
20	90						
	120						
	140						
	160						
30	90						
	160						
40	90						
	160						
80	160						
	160						
120	160						
	160						

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

## CONTRACTOR INFORMATION



BRADY LUNSFORD

ADDRESS: 32152 215 STREET,  
EASTON, KS

PHONE NUMBER: (913) 547-0610  
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12,400kW DC / 8,990kW AC ROOF  
MOUNT PV SYSTEM

PROJECT ID AUR-87853

DATE 10/25/2023

CREATED BY GP

SIGNATURE

RAIL SPEC SHEET  
SS

Monday, October 30, 2023

Contractor  
Invictus Solar  
32152 215 Street ,  
Easton , KS 67037

RE: Roof mounted PV system  
Schultes Fritz Residence  
1128 3rd Avenue , Leavenworth , Kansas, 66048, USA

To Whom It May Concern,



CASTILLO ENGINEERING SERVICES, LLC  
407-289-2575  
WWW.CASTILLOPE.COM  
1060 MAILLAND CENTER COMMONS, SUITE 270  
MAILLAND, FL 32751

### ***Structural Engineering Certification***

Upon reviewing the as-built conditions provided by the contractor, I, Ermocrates castillo PE# 29559 an engineer licensed pursuant to Title 73, Chapter 13, certify that the installation of the modules is in compliance with IRC 2018, Chapter 3 and that the building structure will safely accommodate wind, lateral and uplift forces, and equipment dead loads. The member forces in the area of the solar panels are not increased by more than 5%; thus, the stresses of the structural elements are not increased by more than 5%. Therefore, the requirements of Section 806.2 of 2018 IEBC are met and the structure is permitted to remain unaltered. The solar array will be flush-mounted and parallel to the roof surface. Thus, it is concluded that any additional wind loading on the structure related to the addition of the proposed solar array is negligible. The attached calculations verify the capacity of the connections of the solar array to the existing roof against wind (uplift), the governing load case."&" Because the increase in lateral forces is less than 10%, this addition meets the requirements of the exception in Section 806.3 of 2018 IBC-EB. Thus the existing lateral force resisting system is permitted to remain unaltered.

### ***A. Site Visit & Documentation***

A site visit was performed by the contractor to identify the size and spacing of the existing roof's framing structure. The roof is evaluated for a module count of 21 modules

### ***B. Existing Structure***

Roof Style	Gable
Roof Type	Asphalt Shingle
Roof Height	25 ft
Rafter Type	Spruce-Pine-Fir
Rafter Size	2x6
Rafter Spacing	24 in O.C.
Roof Slope	8/12 (33.7 deg)

### ***C. Governing Codes***

2018 INTERNATIONAL RESIDENTIAL CODE  
2018 INTERNATIONAL BUILDING CODE  
2018 INTERNATIONAL EXISTING BUILDING CODE  
2018 INTERNATIONAL FIRE CODE  
ALL LOCAL CITY AND COUNTY ORDINANCES,  
NATIONAL ELECTRICAL CODE, 2017 (NEC)  
ASCE 7-16

**Subject: Wind Pressure Calculations**

<b>Site Information</b>	
IRC VERSION	2018
MEAN ROOF HEIGHT (ft)	25
ROOF LENGTH (ft)	80
ROOF WIDTH (ft)	50
PARAPET HEIGHT (ft)	0
MODULE AREA (sq. ft.)	21.335
COMPONENT AMPLIFICATION ( $\alpha_p$ )	1
COMPONENT OPERATING WEIGHT	47
TOTAL MODULES IN THE ARRAY	21
GROUND SNOW LOAD (psf)	20
DEAD LOAD (psf)	3
SLOPED ROOF SNOW LOAD (psf)	7.820600841
EFFECTIVE WIND AREA (ft <sup>2</sup> )	18
GROUND ELEVATION (ft)	871
HVHZ	NO

<b>Site Information</b>	
RISK CATEGORY	II
EXPOSURE CATEGORY	B
ROOF SLOPE	8 /12
ROOF SLOPE (°)	33.69
ROOF TYPE	Gable
ULTIMATE WIND SPEED	115.00 mph
NOMINAL WIND SPEED	89.08 mph
EXPOSURE FACTOR ( $C_e$ )	1.00
TEMPERATURE FACTOR ( $C_t$ )	1.00
COMPONENT RESPONSE FACTOR	1.50
SPECTRAL ACCELERATION ( $S_{DS}$ )	0.10
IMPORTANCE FACTOR ( $I_s$ )	1.00
SLOPE FACTOR ( $C_s$ )	0.56
$K_D$	0.85
$K_{ZT}$	1.00
$K_e$	0.97
$K_z$	0.67
HEIGHT B/W MODULE AND ROOF	0.50

<b>DESIGN CALCULATIONS</b>					
VELOCITY PRESSURE ( $q$ ) =	$.00256 * KEK_z K_{ZT} K_D V^2$				
VELOCITY PRESSURE(ASD)	11.1		psf		
WIDTH OF PRESSURE COEFFICIENT	50' * 10%	=	5'	ZONE WIDTH A	4 FT
	25' * 40%	=	10'	ZONE 2 WIDTH	N/A (FOR (°) < 7°)
				ZONE 3 WIDTH	N/A (FOR (°) < 7°)

**Subject: Connection Calculations**

<b>ATTACHMENT STRENGTH, NDS 2018 ALLOWABLE DESIGN STRENGTH</b>					
2"x6"	SUPPORT MEMBER			SPECIFIC GRAVITY	0.42
1/4"	WOOD SCREW	NO OF SCREWS:	1	LENGTH OF SCREW	3.75 in
0.3125	TIP LENGTH	SIDE MEMBER THICKNESS	1.5 in	ADJUSTMENT	1
		MAIN MEMBER THICKNESS	4 in		
	NDS REFERENCE WITHDRAWAL PER SCREW		476.00 LBS/IN		PER 12.2
	NDS REFERENCE WITHDRAWAL PER SCREW		476.00 LBS/IN		PER 12.2A
	ALLOWABLE DESIGN LOAD		476.00 LBS/IN		
	ATTACHMENT MODEL		Lag Bolts- Shingle		
	ATTACHMENT STRENGTH		476 lbs		FoS=1.5

Monday, October 30, 2023

Contractor  
Invictus Solar  
32152 215 Street ,  
Easton , KS 67037

RE: Roof mounted PV system  
Schultes Fritz Residence  
1128 3rd Avenue , Leavenworth , Kansas, 66048, USA

To Whom It May Concern,

***Structural Engineering Certification***

Upon reviewing the as-built conditions provided by the contractor, I, Ermocrates castillo PE# 29559 an engineer licensed pursuant to Title 73, Chapter 13, certify that the installation of the modules is in compliance with IRC 2018, Chapter 3 and that the building structure will safely accommodate wind, lateral and uplift forces, and equipment dead loads. The member forces in the area of the solar panels are not increased by more than 5%; thus, the stresses of the structural elements are not increased by more than 5%. Therefore, the requirements of Section 806.2 of 2018 IEBC are met and the structure is permitted to remain unaltered. The solar array will be flush-mounted and parallel to the roof surface. Thus, it is concluded that any additional wind loading on the structure related to the addition of the proposed solar array is negligible. The attached calculations verify the capacity of the connections of the solar array to the existing roof against wind (uplift), the governing load case."&" Because the increase in lateral forces is less than 10%, this addition meets the requirements of the exception in Section 806.3 of 2018 IBC-EB. Thus the existing lateral force resisting system is permitted to remain unaltered.

***A. Site Visit & Documentation***

A site visit was performed by the contractor to identify the size and spacing of the existing roof's framing structure. The roof is evaluated for a module count of 10 modules

***B. Existing Structure***

Roof Style	Gable
Roof Type	Metal Seam Roof
Roof Height	25 ft
Rafter Type	Spruce-Pine-Fir
Rafter Size	2x6
Rafter Spacing	12 in O.C.
Roof Slope	4/12 (18.44 deg)

***C. Governing Codes***

2018 INTERNATIONAL RESIDENTIAL CODE  
2018 INTERNATIONAL BUILDING CODE  
2018 INTERNATIONAL EXISTING BUILDING CODE  
2018 INTERNATIONAL FIRE CODE  
ALL LOCAL CITY AND COUNTY ORDINANCES,  
NATIONAL ELECTRICAL CODE, 2017 (NEC)  
ASCE 7-16



**Castillo  
Engineering**

CASTILLO ENGINEERING SERVICES, LLC  
407-289-2575  
WWW.CASTILLOPE.COM  
1060 MAITLAND CENTER COMMONS, SUITE 270  
MAITLAND, FL 32751

**Subject: Wind Pressure Calculations**

<b>Site Information</b>	
IRC VERSION	2018
MEAN ROOF HEIGHT (ft)	25
ROOF LENGTH (ft)	80
ROOF WIDTH (ft)	50
PARAPET HEIGHT (ft)	0
MODULE AREA (sq. ft.)	21.335
COMPONENT AMPLIFICATION ( $\alpha_p$ )	1
COMPONENT OPERATING WEIGHT	47
TOTAL MODULES IN THE ARRAY	10
GROUND SNOW LOAD (psf)	20
DEAD LOAD (psf)	3
SLOPED ROOF SNOW LOAD (psf)	11.10631872
EFFECTIVE WIND AREA (ft <sup>2</sup> )	18
GROUND ELEVATION (ft)	871
HVHZ	NO

<b>Site Information</b>	
RISK CATEGORY	II
EXPOSURE CATEGORY	B
ROOF SLOPE	4 /12
ROOF SLOPE (°)	18.43
ROOF TYPE	Gable
ULTIMATE WIND SPEED	115.00 mph
NOMINAL WIND SPEED	89.08 mph
EXPOSURE FACTOR ( $C_e$ )	1.00
TEMPERATURE FACTOR ( $C_t$ )	1.00
COMPONENT RESPONSE FACTOR	1.50
SPECTRAL ACCELERATION ( $S_{DS}$ )	0.10
IMPORTANCE FACTOR ( $I_s$ )	1.00
SLOPE FACTOR ( $C_s$ )	0.79
$K_D$	0.85
$K_{ZT}$	1.00
$K_e$	0.97
$K_z$	0.67
HEIGHT B/W MODULE AND ROOF	0.50

<b>DESIGN CALCULATIONS</b>					
VELOCITY PRESSURE (q) =	$.00256 * K_e K_z K_{ZT} K_D V^2$				
VELOCITY PRESSURE(ASD)	11.1		psf		
WIDTH OF PRESSURE COEFFICIENT	50' * 10%	=	5'	ZONE WIDTH A	4 FT
	25' * 40%	=	10'	ZONE 2 WIDTH	N/A (FOR (°) < 7°)
				ZONE 3 WIDTH	N/A (FOR (°) < 7°)

**Subject: Connection Calculations**

<b>ATTACHMENT STRENGTH, NDS 2018 ALLOWABLE DESIGN STRENGTH</b>					
2"x6"	SUPPORT MEMBER			SPECIFIC GRAVITY	0.42
1/4"	WOOD SCREW	NO OF SCREWS:	4	LENGTH OF SCREW	2 in
0.3125	TIP LENGTH	SIDE MEMBER THICKNESS	1.5 in	ADJUSTMENT	0.84
		MAIN MEMBER THICKNESS	4 in		
	NDS REFERENCE WITHDRAWAL PER SCREW		422.00 LBS/IN		PER 12.2
	NDS REFERENCE WITHDRAWAL PER SCREW		422.00 LBS/IN		PER 12.2A
	ALLOWABLE DESIGN LOAD		422.00 LBS/IN		
	ATTACHMENT MODEL		S-5 protea		
	ATTACHMENT STRENGTH		422 lbs		FoS=1.5