

#### **Historic Preservation Services**

Community Development & Neighborhood Services 281 North College Avenue P.O. Box 580 Fort Collins, CO 80522.0580

970.416.4250 preservation@fcgov.com fcgov.com/historicpreservation

#### CERTIFICATE OF APPROPRIATENESS ISSUED: November 9, 2020 EXPIRATION: November 9, 2021

David W. Fanning & Carol Seemueller 1645 Sheely Drive Fort Collins, CO 80526

Dear Mr. Fanning & Ms. Seemueller:

This letter provides you with confirmation that the proposed changes to your designated Fort Collins landmark property, the Shawver House at 1645 Sheely Drive have been approved by the City's Historic Preservation Division because the proposed work meets the criteria and standards in Chapter 14, <u>Article IV</u> of the Fort Collins Municipal Code.

1) Rooftop solar installation on rear (south) roof slope

Notice of the approved application has been provided to building and zoning staff to facilitate the processing of any permits that are needed for the work.

Please note that all ensuing work must conform to the approved plans. Any non-conforming alterations are subject to stop-work orders, denial of Certificate of Occupancy, and restoration requirements and penalties.

If the approved work is not completed prior to the expiration date noted above, you may apply for an extension by contacting staff at least 30 days prior to expiration. Extensions may be granted for up to 12 additional months, based on a satisfactory staff review of the extension request.

Property owners can appeal staff design review decisions by filing a written notice of appeal to the Director of Community Development & Neighborhood Services within fourteen (14) days of this decision. If you have any questions regarding this approval, or if I may be of any assistance, please do not hesitate to contact me. I may be reached at <u>jbertolini@fcgov.com</u>, or 970-416-4250.

Sincerely,

Jim Bertolini Historic Preservation Planner

Applicable	Summary of Code Requirement and Analysis (Rehabilitation)	Standard
Code Standard		Met (V/N)
Sol #1	A property will be used as it was historically or be given a new use	(1/N) V
501 #1	that requires minimal change to its distinctive materials, features,	1
	spaces, and spatial relationships;	
SOI #3	The property will remain in residential use.	<b>X</b> 7
SOI #2	The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features	Y
	spaces, and spatial relationships that characterize a property will be	
	avoided.	
	The property is a 1955 Panch-style dwelling in the Sheely Drive	
	Landmark District. The property is defined by its low-slung.	
	side-gabled roof with intersecting front gable entry projection,	
	combination of stone veneer, vertical board, and Masonite	
	siding, and large stone chimney on the west elevation. The	
	a garage under the main house.	
	0 0	
	The solar panels are due for installation on the rear/south slope	
	of the roof, clustered on the west side. They are not expected to alter or disrupt any character defining features	
SOI #3	Each property will be recognized as a physical record of its time.	Y
~ ~	place, and use. Changes that create a false sense of historical	_
	development, such as adding conjectural features or elements from	
	other historic properties, will not be undertaken.	
	The solar panels will be easily distinguishable as new features of	
	the historic building.	
SOI #4	Changes to a property that have acquired historic significance in	N/A
SOI #5	their own right will be retained and preserved.	N7
501 #5	or examples of craftsmanship that characterize a property will be	ľ
	preserved.	
	Due to the location of the solar installation, it is not expected to discuss damage or obscure any distinctive materials features	
	or finishes of the property.	
SOI #6	Deteriorated historic features will be repaired rather than replaced.	N/A
	Where the severity of deterioration requires replacement of a	
	distinctive feature, the new feature will match the old in design,	
	color, lexture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical	
	evidence.	

SOI #7	Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.	N/A
SOI #8	Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.	N/A
SOI #9	<ul> <li>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.</li> <li>The new solar panels are not expected to damage or destroy any character-defining features of the building due to their location on the rear roof slope. Solar panels are a modern feature distinguishable from the 1955 design elements and materials of the building.</li> </ul>	Y
SOI #10	New additions and adjacent or related new construction will 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.	N/A







#### Planning, Development & Transportation Services



Community Development & Neighborhood Services 281 North College Avenue P.O. Box 580 Fort Collins, CO 80522.0580

**970.416.2740** 970.224.6134- fax *fcgov.com* 

#### **Roof Mounted Photovoltaic Systems Residential Installation Standards**

#### Roof Access, Walking Pathways, and Spacing Criteria

#### Roof access points.

- Shall be located in areas that do not require the placement of ground ladders over openings such as windows or doors,
- Located at strong points of building construction locations
- Where the access point does not conflict with overhead obstructions such as tree limbs, wires or signs.

#### Hip roof layouts.

- Panels and modules shall be located in a manner that provides a clear access pathway not less than 3 feet (914 mm) in width from the eave to the ridge on each roof slope where panels and modules are located.
- 18" of access pathway required at the top of ridge/hip where someone can stand on opposite roof plane.
- The access pathway shall be located at a structurally strong location on the building capable of supporting the live load of fire fighters accessing the roof.

#### Single ridge roofs.

- Panels and modules shall be located in a manner that provides two, 3-foot-wide (914 mm) access pathways from the eave to the ridge on each roof slope where panels or modules are located.
- A single shed roof must provide 36" access pathway along the top of the roof.

#### Roofs with hips and valleys.

- Panels and modules shall not be located less than 18 inches (457 mm) from a hip or valley where panels or modules are to be placed on both sides of a hip or valley.
- Where panels are to be located on one side only of a hip or valley that is of equal length, the 18-inch (457 mm) clearance does not apply.

#### Exceptions

- Detached, non-habitable Group U Occupancies
- Roof Structures with a slope of less than 2:12
- Panels may be placed adjacent to the roof ridge if an alternate fire-fighting smoke ventilation method is approved by the Building Official.

Russ Hovland CBO 11/2017



VSE Project Number: U2673.0866.900

October 20th, 2020

Sofdesk Inc. 642 de Courcelle, Suite PH4 Montreal, QC, Canada, H4C 3C5

#### **REFERENCE:** 1645 Sheely Dr Fort Collins CO 80526 Solar Array Installation

To Whom It May Concern:

Per your request, we have reviewed the existing structure at the above referenced site. The purpose of our review was to determine the adequacy of the existing structure to support the proposed installation of solar panels on the roof as shown on the panel layout plan.

Based upon our review, we conclude that the existing structure is adequate to support the proposed solar panel installation.

#### **Design Parameters**

Code: International Building Code, 2018 Edition

Risk Category: II Design wind speed: 140 mph (3-sec gust) per ASCE 7-16 Wind exposure category: C Ground snow load: 45 psf Design snow load on roof: 31 psf (non-reducible)

#### **Existing Roof Structure**

Roof structure: 2x4 manufactured trusses @ 24" O.C. Roofing material: asphalt shingles Roof slope: 27°

#### **Connection to Roof**

Mounting connection: (1) 5/16" lag screw w/ min. 2.5" embedment into framing at max. 48" o.c. This installation uses a rail-less system

#### **Conclusions**

Based upon our review, we conclude that the existing structure is adequate to support the proposed solar panel installation. The gravity loads, and thus the stresses of the structural elements, in the area of the solar array are either decreased or increased by no more than 5%. Therefore, the requirements of Section 806.2 of the 2018 IEBC are met and the structure is permitted to remain unaltered.



The solar array will be flush-mounted (no more than 6" above the roof surface) and parallel to the roof surface. Thus, we conclude 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 the 2018 IEBC. Thus the existing lateral force resisting system is permitted to remain unaltered.

#### **Limitations**

Installation of the solar panels must be performed in accordance with manufacturer recommendations. All work performed must be in accordance with accepted industry-wide methods and applicable safety standards. The contractor must notify Vector Structural Engineering, LLC should any damage, deterioration or discrepancies between the as-built condition of the structure and the condition described in this letter be found. Connections to existing roof framing must be staggered, except at array ends, so as not to overload any existing structural member. The use of solar panel support span tables provided by others is allowed only where the building type, site conditions, site-specific design parameters, and solar panel configuration match the description of the span tables. The design of the solar panel racking (mounts, rails, etc.), and electrical engineering is the responsibility of others. Waterproofing around the roof penetrations is the responsibility of others. Vector Structural Engineering assumes no responsibility for improper installation of the solar array.

VECTOR STRUCTURAL ENGINEERING, LLC



Kelly Springer, P.E. CO License: 56677 - Expires: 10/31/2021 Project Engineer

Enclosures

KGS/anr



#### Components and Cladding Wind Calculations

Label:

Solar Panel Array

Note: Calculations per ASCE 7-16

#### SITE-SPECIFIC WIND PARAMETERS:

Basic Wind Speed [mph]: 140 Exposure Category: C Risk Category: II



#### **ADDITIONAL INPUT & CALCULATIONS:**

Height of Roof, h [ft]:	25	(Approximate)
Comp/Cladding Location:	Gable Roof	$fs 20^\circ < \theta \le 27^\circ$
Enclosure Classification:	Enclosed B	uildings
Zone 1, 2e GCp:	1.5	Figure 30.3-2C (enter negative pressure coefficients)
Zone 2n, 2r, 3e GCp:	2.5	
Zone 3r GCp:	3.6	
α:	9.5	Table 26.11-1
z <sub>g</sub> [ft]:	900	Table 26.11-1
K <sub>h</sub> :	0.95	Table 26.10-1
K <sub>e</sub> :	0.83	Table 26.9-1
K <sub>zt</sub> :	1	Equation 26.8-1
K <sub>d</sub> :	0.85	Table 26.6-1
Velocity Pressure, q <sub>h</sub> [psf]:	33.5	Equation 26.10-1

**PRESSURES:**  $p = qh (GCp)(\gamma E)(\gamma a)$  Equation 29.4-5

Zone 1, 2e, p [psf]:	60.2	psf (1.0 W)
Zone 2n, 2r, 3e, p [psf]:	100.4	psf (1.0 W)
Zone 3r, p [psf]:	144.6	psf (1.0 W)

(a = 3 ft)



#### Calculate Uplift Forces on Connection

	Pressure (0.6 Wind) (psf)	Max Connection Spacing <sup>1</sup> (ft)	Max Trib. Area <sup>2</sup> (ft <sup>2</sup> )	Max Uplift Force (Ibs)
Zone 1, 2e	36.1	4.0	13.0	470
Zone 2n, 2r, 3e	60.2	4.0	6.5	391
Zone 3r	86.7	4.0	6.5	564

#### **Calculate Connection Capacity**

Lag Screw Size [in]:	5/16	
C <sub>d</sub> :	1.6	NDS Table 2.3.2
Embedment <sup>3</sup> [in]:	2.5	
Grade:	SPF (G = 0.42)	
Nominal Capacity [lbs/in]:	205	NDS Table 12.2A
Number of Screws:	1	
Prying Coefficient:	1.4	
Total Capacity [lbs]:	586	

#### **Determine Result**

Maximum Demand [lbs]:	564	
Lag Screw Capacity [lbs]:	586	
Result:	Capacity > Dema	and, Connection is adequate.

#### <u>Notes</u>

1. 'Max Connection Spacing' is the spacing between connections along the panel seams.

 'Max Trib Area' is the product of the 'Max Connection Spacing' and the panel width/height perpendicular to the direction of the connection spacing. Tributary area on connections at array edges are reduced by 50% as
 Embedment is measured from the top of the framing member to the beginning of the tapered tip of the lag screw. Embedment in sheathing or other material is not effective. The length of the tapered tip is not part of the embedment length.



#### CALCULATE ESTIMATED GRAVITY LOADS

			Incr	ease due to	Original	
ROOF DEAD LOAD (D)				pitch	loading	
Roof Pitch/12		6.1				
Asphalt Shingles		2.2		1.12	2.0	psf
1/2" Plywood		1.1		1.12	1.0	psf
Framing		3.0	psf			
Insulation		0.5	psf			
1/2" Gypsum Clg.		2.0	psf			
M, E & Misc		1.5	psf			
	DL	10	psf			
PV Ar	ray DL	3	psf			
ROOF LIVE LOAD (Lr)						
Evipting Design Deef Live Load Inef		20		7 40 Table 4	4	
Existing Design Root Live Load [psi]		20	ASCE	17-16, Table 4	-1	
Root Live Load White V Array [psi]		0	2010	IDC, Section I	007.13.5	
			w/ \$	Solar Panel		
SNOW LOAD (S):	Existin	g		Array		
Roof Slope [x:12]:		6.1		6.1		
Roof Slope [°]:		27		27		
Snow Ground Load, p <sub>g</sub> [psf]:		45		45	ASCE 7-16	, Section 7.2
Terrain Category:		С		С	ASCE 7-16	, Table 7-2
Exposure of Roof:	Fully	/ Exposed	Ful	ly Exposed	ASCE 7-16	, Table 7-2
Exposure Factor, C <sub>e</sub> :		0.9		0.9	ASCE 7-16	, Table 7-2
Thermal Factor, C <sub>t</sub> :		1.1		1.1	ASCE 7-16	, Table 7-3
Risk Category:		II		II	ASCE 7-16	, Table 1-1
Importance Factor, I <sub>s</sub> :		1.0		1.0	ASCE 7-16	, Table 7-4
Flat Roof Snow Load, p <sub>f</sub> [psf]:		31		31	ASCE 7-16	, Equation 7-1
Minimum Roof Snow Load, p <sub>m</sub> [psf]:		30		30	ASCE 7-16	, Section 7.3.4
Unobstructed Slippery Surface?		No		No	ASCE 7-16	, Section 7.4
Slope Factor Figure:	Fig	ure 7-2b	Fi	gure 7-2b	ASCE 7-16	, Section 7.4
Roof Slope Factor, C <sub>s</sub> :		1.00		1.00	ASCE 7-16	, Figure 7-2
Sloped Roof Snow Load, p <sub>s</sub> [psf]:		31		31	ASCE 7-16	, Equation 7-2
Design Snow Load S [nsfl:		31		31	]	



## Array 1

Summary of Loads

	Existing	With PV Array
D [psf]	10	13
Lr [psf]	20	0
S [psf]	31	31

Maximum Gravity Loads:

	Existing	With PV Array	_
(D + Lr) / Cd [psf]	24	15	ASCE 7-16, Section 2.4.1
(D + S) / Cd [psf]	36	39	ASCE 7-16, Section 2.4.1
/Cd - Load Duration Factor - 0	Ofer D 1 15 for 6 and 1	25 for Lr)	

(Cd = Load Duration Factor = 0.9 for D, 1.15 for S, and 1.25 for Lr)

Maximum Gravity Load [psf]: 36 39

Maximum Member Forces:

GEOMETRY

Span(ft)	24.3	(Approximate)
Solar Panel Array Start, a (ft)	0.0	(Approximate)
Solar Panel Array Length, b (ft)	11.9	(Approximate)
Framing Spacing (ft)	2.0	

MEMBER FORCES

	Existing	With PV Array	Ratio	_
Vertical Reaction, $V_1$ (lbs)	876	920	105%	ок
Vertical Reaction, $V_2$ (lbs)	876	890	102%	ок
	Existing	With PV Array	Ratio	-
Moment @ Center, M (lbs-ft)	5312	5485	103%	ок

The gravity loads and; thus, the stresses of the structural elements, in the area of the solar array are either decreased or increased by no more than 5%. Therefore, the requirements of Section 806.2 of the 2018 IEBC are met and the structure is permitted to remain unaltered.



## Array 2

Summary of Loads

	Existing	With PV Array
D [psf]	10	13
Lr [psf]	20	0
S [psf]	31	31

Maximum Gravity Loads:

	Existing	With PV Array	_
(D + Lr) / Cd [psf]	24	15	ASCE 7-16, Section 2.4.1
(D + S) / Cd [psf]	36	39	ASCE 7-16, Section 2.4.1
(Cd = Load Duration Easter = 0	Ofer D 1 1E for S and 1	2E for Lr)	•

(Cd = Load Duration Factor = 0.9 for D, 1.15 for S, and 1.25 for Lr)

Maximum Gravity Load [psf]: 36 39

Maximum Member Forces:

GEOMETRY

Span(ft)	17.8	(Approximate)
Solar Panel Array Start, a (ft)	0.3	(Approximate)
Solar Panel Array Length, b (ft)	6.5	(Approximate)
Framing Spacing (ft)	2.0	

MEMBER FORCES

	Existing	With PV Array	Ratio	_
Vertical Reaction, $V_1$ (lbs)	644	672	104%	ок
Vertical Reaction, $V_2$ (lbs)	644	651	101%	ок
	Existing	With PV Array	Ratio	-
Moment @ Center, M (lbs-ft)	2873	2932	102%	ок

The gravity loads and; thus, the stresses of the structural elements, in the area of the solar array are either decreased or increased by no more than 5%. Therefore, the requirements of Section 806.2 of the 2018 IEBC are met and the structure is permitted to remain unaltered.

## **GENERAL NOTES**

#### 1.1.1 PROJECT NOTES:

- 1.1.2 THIS PHOTOVOLTAIC (PV) SYSTEM SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC) ARTICLE 690. ALL MANUFACTURERS'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES. 1.1.3 THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND
- PV SYSTEM INSPECTED PRIOR TO PARALLEL OPERATION
- 1.1.4 ALL PV SYSTEM COMPONENTS; MODULES, UTILITY-INTERACTIVE INVERTERS, AND SOURCE CIRCUIT COMBINER BOXES ARE IDENTIFIED AND LISTED FOR USE IN PHOTOVOLTAIC SYSTEMS AS REQUIRED BY NEC 690.4 PV MODULES: UL1703, IEC61730, AND IEC61215, AND NFPA 70 CLASS C FIRE INVERTERS: UL 1741 CERTIFIED, IEEE 1547, 929, 519 COMBINER BOX(ES) UL 1703 OR UL 1741 ACCESSORY
- 1.1.5 MAX DC VOLTAGE CALCULATED USING MANUFACTURER PROVIDED TEMP COEFFICIENT FOR VOC. IF UNAVAILABLE, MAX DC VOLTAGE CALCULATED ACCORDING TO NEC 690.7.
- 1.1.6 ALL INVERTERS, PHOTOVOLTAIC MODULES, PHOTOVOLTAIC PANELS, AND SOURCE CIRCUIT COMBINERS INTENDED FOR USE IN A PHOTOVOLTAIC POWER SYSTEM WILL BE IDENTIFIED AND LISTED FOR THE APPLICATION PER 690.4 (D). SHALL BE INSTALLED ACCORDING TO ANY INSTRUCTIONS FROM LISTING OR LABELING [NEC 110.3].
- 1.1.7 ALL SIGNAGE TO BE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT. ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ.

#### 1.2.1 SCOPE OF WORK:

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

#### 1.3.1 WORK INCLUDES:

- 1.3.2 PV ROOF ATTACHMENTS UNIRAC SUNFRAME MICRORAIL FLASHKIT
- 1.3.3 PV RACKING SYSTEM INSTALLATION UNIRAC SUNFRAME MICRORAIL
- 1.3.4 PV MODULE AND INVERTER INSTALLATION LG ELECTRONICS LG350N1C-V5 / SOLAR EDGE SE7600H-US ENERGY HUB INVERTER WITH PRISM TECHNOLOGY (240V)
- 1.3.5 PV EQUIPMENT GROUNDING
- 1.3.6 PV SYSTEM WIRING TO A ROOF-MOUNTED JUNCTION BOX
- 1.3.7 PV LOAD CENTERS (IF INCLUDED)
- 1.3.8 PV METERING/MONITORING (IF INCLUDED)
- 1.3.9 PV DISCONNECTS
- 1.3.10 PV FINAL COMMISSIONING
- 1.3.11 (E) ELECTRICAL EQUIPMENT RETROFIT FOR PV
- 1.3.12 SIGNAGE PLACED IN ACCORDANCE WITH LOCAL BUILDING CODE

SCOPE OF WORK: SYSTEM SIZE: STC: 19 x 350W = 6.650kW PTC: 19 x 325.8W= 6.190kW DC (19) LG ELECTRONICS LG350N1C-V5 (1) SOLAR EDGE SE7600H-US ENERGY HUB INVERTER WITH PRISM TECHNOLOGY (240V) UNIRAC SUNFRAME MICRORAIL FLASHKIT ATTACHMENT TYPE: MSP UPGRADE: NO

# NEW PV SYSTEM: 6.650 kWp **SEEMUELLER & FANNING RESIDENCE**

1645 SHEELY DR FORT COLLINS, CO 80526 ASSESSOR'S #: 9723205006





	SHEET LIST
SHEET NUMBER	SHEET TITLE
T-001	COVER PAGE
G-001	NOTES
A-101	SITE PLAN
A-102	ELECTRICAL PLAN
A-103	SOLAR ATTACHMENT PLAN
E-601	LINE DIAGRAM
E-602	DESIGN TABLES
E-603	PLACARDS
S-501	ASSEMBLY DETAILS
R-001	RESOURCE DOCUMENT
R-002	RESOURCE DOCUMENT
R-003	RESOURCE DOCUMENT
R-004	RESOURCE DOCUMENT

OWNER NAME

PROJECT MANAGER NAME: PHONE:

CONTRACTOR NAME: PHONE:

AUTHORITIES HAVING JURISDICTION BUILDING: ZONING: UTILITY:

OCCUPANCY: CONSTRUCTION: ZONING: GROUND SNOW LOAD: 30 PSF WIND EXPOSURE: WIND SPEED:

**APPLICABLE CODES & STANDARDS** BUILDING: ELECTRICAL: FIRE:

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## **PROJECT INFORMATION**

**CAROL SEEMUELLER & DAVID FANNING** 

REENERGIZECO 3032271000

CITY OF FORT COLLINS CITY OF FORT COLLINS FORT COLLINS UTILITIES **RESIDENTIAL - TIME-OF-DAY** 

#### TIONS

SINGLE-FAMILY RESIDENTIAL

В 140 MPH

IRC 2018, IBC 2018 NEC 2017 IFC 2018



#### CONTRACTOR

**RFFNFRGIZECO** 

PHONE: 3032271000 ADDRESS: 1805 E 58TH AVE UNIT K **DENVER, CO 80216** 

LIC. NO.: LIC-0010070-09 HIC. NO .:

ELE. NO .:

UNAUTHORIZED USE OF THIS DRAWING SET WITHOUT WRITTEN PERMISSION FROM CONTRACTOR IS IN VIOLATION OF U.S. COPYRIGHT LAWS AND WILL BE SUBJECT TO CIVIL DAMAGES AND PROSECUTIONS.

NEW PV SYSTEM: 6.650 kWp

## **SEEMUELLER & FANNING** RESIDENCE

1645 SHEELY DR FORT COLLINS, CO 80526 APN: 9723205006

#### ENGINEER OF RECORD

PAPER SIZE: 11" x 17" (ANSI B)

#### **COVER PAGE**

DATE: 09.16.2020

DESIGN BY: V.T

CHECKED BY:

REVISIONS

T-001.00 (SHEET 1

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	2.1.1	SITE NOTES:	2.4.9	THE GROUNDING ELECTRODE SYSTEM COMPLIES WITH NEC 690.47 AND NEC 250.50
	2.1.2	A LADDER WILL BE IN PLACE FOR INSPECTION IN COMPLIANCE WITH OSHA		THROUGH 250.106. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, A
		REGULATIONS.		GROUNDING ELECTRODE SYSTEM PROVIDED ACCORDING TO NEC 250, NEC 690.47
1	2.1.3	THE PV MODULES ARE CONSIDERED NON-COMBUSTIBLE AND THIS SYSTEM IS A		AND AHJ.
'	-	UTILITY INTERACTIVE SYSTEM WITH NO STORAGE BATTERIES	2 4 10	DC PV ARRAYS SHALL BE PROVIDED WITH DC GROUND-FAULT PROTECTION MEETING
	211		2.4.10	
	2.1.4	THE SOLAR PV INSTALLATION WILL NOT OBSTRUCT ANT PLOWIDING, WECHANICAL, OR		THE REQUIREMENTS OF 090.41(D)(T) AND (2) TO REDUCE FIRE HAZARDS
_	0.4.5	DUILDING ROUF VENTS.	/	
	2.1.5	PROPER ACCESS AND WORKING CLEARANCE AROUND EXISTING AND PROPOSED	2.5.1	INTERCONNECTION NOTES:
		ELECTRICAL EQUIPMENT WILL BE PROVIDED AS PER SECTION NEC 110.26.	2.5.2	LOAD-SIDE INTERCONNECTION SHALL BE IN ACCORDANCE WITH [NEC 705.12
	2.1.6	ROOF COVERINGS SHALL BE DESIGNED, INSTALLED, AND MAINTAINED IN		(B)]
		ACCORDANCE WITH THIS CODE AND THE APPROVED MANUFACTURER'S	2.5.3	THE SUM OF THE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY
		INSTRUCTIONS SUCH THAT THE ROOF COVERING SERVES TO PROTECT THE		NOT EXCEED 120% OF BUSBAR RATING INFC 705 12(B)(2)(3)]
		BUILDING OR STRUCTURE.	254	
•			2.3.4	THE SUM OF 125 PERCENT OF THE POWER SOURCE(3) OUTFUT CIRCUIT
2	2.2.1	EQUIPMENT LOCATIONS		CURRENT AND THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE
	2.2.2	ALL EQUIPMENT SHALL MEET MINIMUM SETBACKS AS REQUIRED BY NEC 110.26.		BUSBAR SHALL NOT EXCEED 120 PERCENT OF THE AMPACITY OF THE
	2.2.3	WIRING SYSTEMS INSTALLED IN DIRECT SUNLIGHT MUST BE RATED FOR EXPECTED		BUSBAR, PV DEDICATED BACKFEED BREAKERS MUST BE LOCATED OPPOSITE
		OPERATING TEMPERATURE AS SPECIFIED BY NEC 690 31 (A) (C) AND NEC TABLES		END OF THE BUS FROM THE UTILITY SOURCE OCPD [NEC 705.12(B)(2)(3)].
		310 15 (B)(2)(A) AND 310 15 (B)(3)(C)	2.5.5	AT MULTIPLE ELECTRIC POWER SOURCES OUTPUT COMBINER PANEL. TOTAL
	2.2.2			RATING OF ALL OVERCLIRRENT DEVICES SHALL NOT EXCEED AMPACITY OF
	2.2.3	JUNCTION AND FULL BOXES FERMITTED INSTALLED UNDER FV WIDDULES		
		ACCURDING TO NEU 690.34.		BUSDAR. HUWEVER, THE COMMINED OVERCORRENT DEVICE MAY BE
	2.2.4	ADDITIONAL AC DISCONNECT(S) SHALL BE PROVIDED WHERE THE INVERTER IS NOT		EXCLUDED ACCORDING TO NEC 705.12 (B)(2)(3)(C).
		WITHIN SIGHT OF THE AC SERVICING DISCONNECT.	2.5.6	FEEDER TAP INTERCONECTION (LOAD SIDE) ACCORDING TO NEC 705.12
	2.2.5	ALL EQUIPMENT SHALL BE INSTALLED ACCESSIBLE TO QUALIFIED PERSONNEL		(B)(2)(1)
		ACCORDING TO NEC APPLICABLE CODES.	2.5.7	SUPPLY SIDE TAP INTERCONNECTION ACCORDING TO NEC 705 12 (A) WITH
	2.2.6	ALL COMPONENTS ARE LISTED FOR THEIR PURPOSE AND RATED FOR OUTDOOR		SERVICE ENTRANCE CONDUCTORS IN ACCORDANCE WITH NEC 230.42
		USAGE WHEN APPROPRIATE.	250	
3			2.3.0	DAUNFEEDING DREAKER FOR ELECTRIC POWER SOURCES OUTPUT IS EXEMPT
0	231	STRUCTURAL NOTES:		FROM ADDITIONAL FASTENING [NEC 705.12 (B)(5)].
	2.0.1			
	2.3.2	CODE COMPLIANT INSTALLATION MANUAL TOD CLAMPS DECLIDE A	2.6.1	DISCONNECTION AND OVER-CURRENT PROTECTION NOTES:
		CODE-COMPLIANT INSTALLATION MANUAL. TOP CLAMPS REQUIRE A	2.6.2	DISCONNECTING SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH
		DESIGNATED SPACE BETWEEN MODULES, AND RAILS MUST ALSO EXTEND A		IS OPENED THE CONDUCTORS REMAINING ENERGIZED ARE CONNECTED TO
		MINIMUM DISTANCE BEYOND EITHER EDGE OF THE ARRAY/SUBARRAY,		
		ACCORDING TO RAIL MANUFACTURER'S INSTRUCTIONS.		THE TERMINALS WARKED LINE SIDE (TTFICALLET THE OFFEN TERMINALS).
	233	JUNCTION BOX WILL BE INSTALLED PER MANUFACTURERS' SPECIFICATIONS	2.6.3	DISCONNECTS TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL, BE
		IF ROOF-PENETRATING TYPE IT SHALL BE FLASHED & SEALED PER LOCAL		LOCKABLE, AND BE A VISIBLE-BREAK SWITCH.
		DECUREMENTS	2.6.4	BOTH POSITIVE AND NEGATIVE PV CONDUCTORS ARE UNGROUNDED.
				THEREFORE BOTH MUST OPEN WHERE A DISCONNECT IS REQUIRED,
	2.3.4	ROOFTOP PENETRATIONS FOR PV RACEWAY WILL BE COMPLETED AND		ACCORDING TO NEC 690 13
		SEALED W/ APPROVED CHEMICAL SEALANT PER CODE BY A LICENSED	265	ISOLATING DEVICES OR EQUIDMENT DISCONNECTING MEANS SHALL BE
		CONTRACTOR.	2.0.0	
4	2.3.5	ALL PV RELATED ROOF ATTACHMENTS TO BE SPACED NO GREATER THAN THE		INSTALLED IN CIRCUITS CONNECTED TO EQUIPINENT AT A LOCATION WITHIN
		SPAN DISTANCE SPECIFIED BY THE RACKING MANUFACTURER		THE EQUIPMENT, OR WITHIN SIGHT AND WITHIN 10 FT OF THE EQUIPMENT. AN
	236	WHEN POSSIBLE ALL BY RELATED RACKING ATTACHMENTS WILL BE		EQUIPMENT DISCONNECTING MEANS SHALL BE PERMITTED TO BE REMOTE
	2.0.0			FROM THE EQUIPMENT WHERE THE EQUIPMENT DISCONNECTING MEANS CAN
		STAGGERED AMONGST THE ROOF FRAMING MEMBERS.		BE REMOTELY OPERATED FROM WITHIN 10 FT OF THE EQUIPMENT.
				ACCORDING TO NEC 690 15 (A)
	2.4.1	GROUNDING NOTES:	266	DV SVSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A
_	2.4.2	GROUNDING SYSTEM COMPONENTS SHALL BE LISTED FOR THEIR PURPOSE, AND	2.0.0	
		GROUNDING DEVISES EXPOSED TO THE ELEMENTS SHALL BE RATED FOR SUCH		
		USE.		RESPONDERS IN ACCORDANCE WITH 690.12(A) THROUGH (D)
	2.4.3	PV SYSTEMS REQUIRE AN EQUIPMENT GROUNDING CONDUCTOR. ALL METAL	2.6.7	ALL OCPD RATINGS AND TYPES SPECIFIED ACCORDING TO NEC 690.8, 690.9,
		ELECTRICAL EQUIPMENT AND STRUCTURAL COMPONENTS BONDED TO GROUND. IN		AND 240.
		ACCORDANCE WITH 250.134 OR 250.136(A). ONLY THE DC CONDUCTORS ARE	2.6.8	BOTH POSITIVE AND NEGATIVE PV CONDUCTORS ARE UNGROUNDED.
		UNGROUNDED.	-	THEREFORE BOTH REQUIRE OVER-CURRENT PROTECTION ACCORDING TO
-	244	PV EQUIPMENT SHALL BE GROUNDED ACCORDING TO NEC 600 43 AND MINIMUM		
5	<b>-</b>	NEC TABLE 250 122	260	
	215		2.0.9	IF REQUIRED DT ANJ, STOTEM WILL INCLUDE AKC-FAULT CIKCUTT PKUTECTION
	2.4.0	IVILIAL FANTS OF IVIDULE FRAIVIES, IVIDULE RAUNING, AND ENGLUSURE		ACCORDING TO NEC 690.11 AND UL1699B.
	040			
	2.4.0	EAGT MODULE WILL BE GROUNDED USING WEEK GROUNDING CLIPS AS SHOWN IN	2.7.1	WIRING & CONDUIT NOTES:
		MANUFACTURER DOCUMENTATION AND APPROVED BY THE AHJ. IF WEEBS ARE	2.7.2	ALL CONDUIT AND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE.
		NOT USED, MODULE GROUNDING LUGS MUST BE INSTALLED AT THE SPECIFIED		CONDUIT AND WIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE
		GROUNDING LUG HOLES PER THE MANUFACTURERS' INSTALLATION		
		REQUIREMENTS.	070	
	2.4.7	THE GROUNDING CONNECTION TO A MODULE SHALL BE ARRANGED SUCH THAT	2.1.3	ALL CONDUCTORS SIZED ACCORDING TO NEC 690.8, NEC 690.7.
		THE REMOVAL OF A MODULE DOES NOT INTERRUPT A GROUNDING CONDUCTOR TO	2.7.4	EXPOSED PV SOURCE CIRCUITS AND OUTPUT CIRCUITS SHALL USE WIRE
6		ANOTHER MODULE.		LISTED AND IDENTIFIED AS PHOTOVOLTAIC (PV) WIRE [690.31 (C)]. PV
Ŭ	2.4.8	GROUNDING AND BONDING CONDUCTORS. IF INSULATED. SHALL BE COLORED		MODULES WIRE LEADS SHALL BE LISTED FOR USE ON PV ARRAYS,
		GREEN OR MARKED GREEN IF #4 AWG OR I ARGER INFC 250 1191		ACCORDING TO NEC 690.31 (A).

G ELECTRODE SYSTEM COMPLIES WITH NEC 690.47 AND NEC 250.50	2.7.5	PV WIRE BLACK WIRE MAY BE FIELD-
06. IF EXISTING SYSTEM IS INACCESSIBLE, OR INADEQUATE, A	2.7.6	MODULE WIRING SHALL BE LOCATED
ECTRODE SYSTEM PROVIDED ACCORDING TO NEC 250, NEC 690.47	2.7.7	ACCORDING TO NEC 200.7, UNG
		COLORED OR MARKED AS FOLLOWS:
SHALL BE PROVIDED WITH DC GROUND-FAULT PROTECTION MEETING		DC POSITIVE- RED, OR OTHER
ENTS OF 690.41(B)(1) AND (2) TO REDUCE FIRE HAZARDS		GREEN
		DC NEGATIVE- BLACK, OR OTHER
TION NOTES:		AND GREEN
ERCONNECTION SHALL BE IN ACCORDANCE WITH [NEC 705.12	2.7.8	AC CONDUCTORS COLORED OR MAR
		PHASE A OR L1- BLACK
HE UTILITY OCPD AND INVERTER CONTINUOUS OUTPUT MAY		PHASE B OR L2- RED. OR OTHER (
20% OF BUSBAR RATING [NEC 705.12(B)(2)(3)].		PHASE C OR L3- BILLE YELLOW C
125 PERCENT OF THE POWER SOURCE(S) OUTPUT CIRCUIT		NEUTRAL - WHITE OR GREY
THE RATING OF THE OVERCURRENT DEVICE PROTECTING THE		NEOTICE WHITE ON ONET
L NOT EXCEED 120 PERCENT OF THE AMPACITY OF THE		

TO BE MARKED ORANGE [NEC 110.15].

- NAND OVER-CURRENT PROTECTION NOTES: G SWITCHES SHALL BE WIRED SUCH THAT WHEN THE SWITCH
- CONDUCTORS REMAINING ENERGIZED ARE CONNECTED TO MARKED "LINE SIDE" (TYPICALLY THE UPPER TERMINALS).
- TO BE ACCESSIBLE TO QUALIFIED UTILITY PERSONNEL. BE BE A VISIBLE-BREAK SWITCH.
- AND NEGATIVE PV CONDUCTORS ARE UNGROUNDED. OTH MUST OPEN WHERE A DISCONNECT IS REQUIRED, NEC 690.13.
- VICES OR EQUIPMENT DISCONNECTING MEANS SHALL BE CIRCUITS CONNECTED TO EQUIPMENT AT A LOCATION WITHIN , OR WITHIN SIGHT AND WITHIN 10 FT OF THE EQUIPMENT. AN SCONNECTING MEANS SHALL BE PERMITTED TO BE REMOTE IPMENT WHERE THE EQUIPMENT DISCONNECTING MEANS CAN OPERATED FROM WITHIN 10 FT OF THE EQUIPMENT, NEC 690.15 (A).
- CUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A WN FUNCTION TO REDUCE SHOCK HAZARD FOR EMERGENCY ACCORDANCE WITH 690.12(A) THROUGH (D)
- NGS AND TYPES SPECIFIED ACCORDING TO NEC 690.8, 690.9,
- AND NEGATIVE PV CONDUCTORS ARE UNGROUNDED, OTH REQUIRE OVER-CURRENT PROTECTION. ACCORDING TO EXCEPTION IN NEC 690.9)
- (AHJ, SYSTEM WILL INCLUDE ARC-FAULT CIRCUIT PROTECTION NEC 690.11 AND UL1699B.

#### DUIT NOTES:

- ND WIRE WILL BE LISTED AND APPROVED FOR THEIR PURPOSE. VIRE SPECIFICATIONS ARE BASED ON MINIMUM CODE AND ARE NOT MEANT TO LIMIT UP-SIZING.
- RS SIZED ACCORDING TO NEC 690.8, NEC 690.7.
- DURCE CIRCUITS AND OUTPUT CIRCUITS SHALL USE WIRE NTIFIED AS PHOTOVOLTAIC (PV) WIRE [690.31 (C)]. PV LEADS SHALL BE LISTED FOR USE ON PV ARRAYS, NEC 690.31 (A).

F

WIRE BLACK WIRE MAY BE FIELD-MARKED WHITE [NEC 200.6 (A)(6)]. DULE WIRING SHALL BE LOCATED AND SECURED UNDER THE ARRAY. CORDING TO NEC 200.7, UNGROUNDED SYSTEMS DC CONDUCTORS

DC POSITIVE- RED. OR OTHER COLOR EXCLUDING WHITE. GREY AND

DC NEGATIVE- BLACK, OR OTHER COLOR EXCLUDING WHITE, GREY

CONDUCTORS COLORED OR MARKED AS FOLLOWS:

PHASE B OR L2- RED, OR OTHER CONVENTION IF THREE PHASE PHASE C OR L3- BLUE, YELLOW, ORANGE\*, OR OTHER CONVENTION

\* IN 4-WIRE DELTA CONNECTED SYSTEMS THE PHASE WITH HIGHER VOLTAGE



#### CONTRACTOR

REENERGIZECO

**PHONE:** 3032271000 ADDRESS: 1805 E 58TH AVE UNIT K

**DENVER, CO 80216** 

LIC. NO.: LIC-0010070-09 HIC. NO .:

ELE. NO.:

UNAUTHORIZED USE OF THIS DRAWING SET WITHOUT WRITTEN PERMISSION FROM CONTRACTOR IS IN VIOLATION OF U.S. COPYRIGHT LAWS AND WILL BE SUBJECT TO CIVIL DAMAGES AND PROSECUTIONS.

NEW PV SYSTEM: 6.650 kWp

## **SEEMUELLER &** FANNING RESIDENCE

1645 SHEELY DR FORT COLLINS, CO 80526 APN: 9723205006

ENGINEER OF RECORD

PAPER SIZE: 11" x 17" (ANSI B)

#### NOTES

DATE: 09.16.2020

DESIGN BY: V.T.

CHECKED BY:

REVISIONS

G-001.00 (SHEET 2



## GENERAL NOTES

#### 1. FIELD VERIFY ALL MEASUREMENTS

2. ITEMS BELOW MAY NOT BE ON THIS PAGE

---- PROPERTY LINE



#### CONTRACTOR

REENERGIZECO

PHONE: 3032271000

ADDRESS: 1805 E 58TH AVE UNIT K DENVER, CO 80216

LIC. NO.: LIC-0010070- 09 HIC. NO.:

ELE. NO.:

UNAUTHORIZED USE OF THIS DRAWING SET WITHOUT WRITTEN PERMISSION FROM CONTRACTOR IS IN VIOLATION OF U.S. COPYRIGHT LAWS AND WILL BE SUBJECT TO CIVIL DAMAGES AND PROSECUTIONS.

NEW PV SYSTEM: 6.650 kWp

## SEEMUELLER & FANNING RESIDENCE

1645 SHEELY DR FORT COLLINS, CO 80526 APN: 9723205006

#### ENGINEER OF RECORD

PAPER SIZE: 11" x 17" (ANSI B)

#### SITE PLAN

DATE: 09.16.2020

DESIGN BY: V.T.

CHECKED BY:

REVISIONS

A-101.00









D	TERM. TEMP. RATING	AMP. @ TERMINAL		
	75°C 75°C	50A 35A		
	76 0	50/T		REenergizeCO
	75 0	50A		
	750	50A		
				REENERGIZECO
				<b>PHONE:</b> 3032271000
	GRID (UG)			ADDRESS: 1805 E 58TH AVE UNIT K DENVER, CO 80216
	$\uparrow$ $\uparrow$ $\uparrow$		Þ	LIC. NO.: LIC-0010070- 09 HIC. NO.:
.2—				ELE. NO.: UNAUTHORIZED USE OF THIS DRAWING SET WITHOUT WRITTEN
1—				PERMISSION FROM CONTRACTOR IS IN VIOLATION OF U.S. COPYRIGHT LAWS AND WILL BE SUBJECT TO CIVIL
				NEW PV SYSTEM: 6.650 kWp
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<u> </u>	·•  ·			1645 SHEELY DR FORT COLLINS_CO 80526
	(E) GRO	UNDING		APN: 9723205006
	ELECI	RODE		ENGINEER OF RECORD
<u>ا</u> ۔	► TO (E)			
ا ا				
				PAPER SIZE: 11" x 17" (ANSI B)
	J			LINE DIAGRAM
M	AIN SERVICE P	ANEL		DATE: 09.16.2020
24 M/	10/120 v 10, 3W AIN BUSS: 200/	4	þ	DESIGN BY: V.T.
				REVISIONS

E-601.00

Norme         Norme <th< th=""><th></th><th>SYSTEM SUMMARY</th><th></th><th></th><th></th><th></th><th></th><th>МС</th><th>DULES</th><th></th><th></th><th></th><th></th><th></th><th></th></th<>		SYSTEM SUMMARY						МС	DULES						
Image: control of the signed of the		INVERTER	3 #1	REF. QTY.		MAKE AND I	MODEL	PMA	X PTC	ISC IMP	VOC	VMP TEN	MP. COEFF. OI	F VOC FUSE RATING	
CORR WA CONST         LIA IN INFORMATION CONST         LIA INFORMATION CONST <thl< th=""><th></th><th>STRING #1</th><th>STRING #2 P</th><th>M1-19 19</th><th>LG</th><th>ELECTRONICS</th><th>LG350N1C-V5</th><th>350W</th><th>V 325.8W</th><th>10.61A 9.92A</th><th>41.3V</th><th>35.3V -0.1</th><th>112V/°C (-0.27</th><th>%/°C) 20A</th><th>DEoporaizo</th></thl<>		STRING #1	STRING #2 P	M1-19 19	LG	ELECTRONICS	LG350N1C-V5	350W	V 325.8W	10.61A 9.92A	41.3V	35.3V -0.1	112V/°C (-0.27	%/°C) 20A	DEoporaizo
UBBLN BRIGES         13         3         CONTRACTOR           STRAND GL TACC         0.00<	ERBOX MAX OUTPUT CURRENT	15A	15A	· ·										·	
STREE VIEW         BOOK         OUTER OF INJURIES         MAXIMUT ISC MAX 200,0000         WORTER OF INJURIES         SOURCE OF INJURIES	MIZERS IN SERIES	10	9												
CPECKTM         CIX         TXA	INAL STRING VOLTAGE	400V	400V												-
Bit Private         Low         Unit         Out         Out         Out         Out         Dist         Dist           Control         LikeWith         LikeWith <td>AY OPERATING CURRENT</td> <td>8.75A</td> <td>7.88A</td> <td>REF. QTT.</td> <td></td> <td></td> <td>RATED</td> <td>370W</td> <td>MAX UUTPUT</td> <td>CURRENT MAX</td> <td>11A</td> <td></td> <td>TAGE V</td> <td></td> <td>CONTRACTOR</td>	AY OPERATING CURRENT	8.75A	7.88A	REF. QTT.			RATED	370W	MAX UUTPUT	CURRENT MAX	11A		TAGE V		CONTRACTOR
Un produit         Linkw         Linkw <thlinkw< th="">         Linkw         Linkw</thlinkw<>	AY STC POWER	6,650W		01-19 19	SOLA	REDGE F3/0		57000	IJA		TIA	000		30.076	
Current         Statu         INVENTIES         INVE	AY PTC POWER	6,190W													REENERGIZECO
CAUCHA         LABIN           DECESTAR POWER         0.550V           DECESTAR POWER         0.50V           DECESTAR POWER	AC CURRENT	32A						INV	ERTERS				-		
United with Weight Ar Provents         Database         Database <th< td=""><td></td><td>7,60000</td><td></td><td>REF. QTY.</td><td>n</td><td>MAKE AND MOD</td><td>EL</td><td>AC</td><td></td><td>CPD RATED</td><td>MAX OUTPU</td><td></td><td></td><td>IT CEC WEIGHTED</td><td></td></th<>		7,60000		REF. QTY.	n	MAKE AND MOD	EL	AC		CPD RATED	MAX OUTPU			IT CEC WEIGHTED	
I         I	ATED (CEC) AC POWER	0,05577				7600H-US ENER		VOLTAGE	K	ATING POWER	CURRENT		VOLTAGE		PHONE: 3032271000
Image: constraint of the					WITH PF	RISM TECHNOLC	OGY (240V)	240V FI	LOATING	40A 7600W	32A	20A	480V	99.0%	
List         Discolucity         Rete         OCCPDS         Ret         Ret															
Ref         OTV         MARK AND MODEL         RATED QUIRENT         Max Ratio Quirent         Max VQLTAGE         ULX NOT         Max VQLTAGE         Max VQLTAGE						DISCO	NNECTS					OCI	PDS		DERVER, CO 80210
Styl         1         Source Dozzne Bo Rzouw.         60/k         2 40/AC         Friz         2         46/k         20/AC         Here:           ASHRAE EXTING         277 C F68 FF; SOURCE FORT COLLINS (MODS) (4.67'; 105')				REF. QTY.	MAK	E AND MODEL	RATE	D CURRENT M	IAX RATED VO	LTAGE REF	. QTY.	RATED CURF	RENT	MAX VOLTAGE	LIC. NO.: LIC-0010070- 09
Ashrae Extreme Low27°C (146 PF), SOURCE: FORT COLLINS (AVIOS) (42.45°165°)Manuel Colspan="2">Manuel Colspan="2">Manuel Colspan="2">Manuel Colspan="2">Manuel Colspan="2">Manuel Colspan="2">Manuel Colspan="2">Manuel Colspan="2"Ashrae Zin High35.3°C (95.5°), SOURCE: FORT COLLINS (AVIOS) (40.45°165°)Manuel Colspan="2">Manuel Colspan="2"Manuel Colspan="2"Manuel Colspan="2"CALEGORYMarke Zin HighManuel Colspan="2"Manuel Colspan="2"CALEGORYMarke Zin HighManuel Colspan="2"Manuel Colspan="2"Manuel Colspan="2"Manuel Colspan="2"Manuel Colspan="2"Manuel Colspan="2"Manuel Colspan="2"Manuel Colspan="2"Manuel Colspan="2"Manuel Colspan="2" <th< td=""><td></td><td></td><td></td><td>SW1 1</td><td>SQUARE D</td><td>D222NRB OR EC</td><td>QUIV.</td><td>60A</td><td>240VAC</td><td> F1-2</td><td>2</td><td>40A</td><td></td><td>240VAC</td><td></td></th<>				SW1 1	SQUARE D	D222NRB OR EC	QUIV.	60A	240VAC	F1-2	2	40A		240VAC	
LAHMAE EXTERNE (DW       -27°C (* 0.87F) SOURCE FORT COLLINE (AVR05) (40.45°195°)         ABHAE 2X; HIGH       36 3°C (95 9°L), SOURCE FORT COLLINE (AVR05) (40.45°195°)         MODEL       SABHAE 2X; HIGH       36 3°C (95 9°L), SOURCE FORT COLLINE (AVR05) (40.45°195°)         MODEL       LO ELCTRONICS       BELLO F MATERIALS         MODEL       LO ELECTRONICS       BELLO FMATERIALS         NODULE       SOLAR EDGE       PP11-19       19       PIECES       1       SOLAR EDGE STRONICAS (ANDICONS ON INVERTIER       SECRPTION         NODULE OF MATERIALS       DESCRPTION       DESCRPTION       DESCRPTION       SOLAR EDGE       PP11-19       19       PIECES       1       SOLAR EDGE STRONICAS (ANDICONS ON INVERTIER       SOLAR EDGE       SOLAR EDGE       SOLAR EDGE       SOLAR EDGE       P01-19       19       PIECES       1       SOLAR EDGE STRONICAS (ANDICONS ON INVERTIER       SOLAR EDGE STRONICAS DEVERTIER WITH PRISM TECHNOLOGY (AND) 78000 INVERTIER       SOLAR EDGE STRONICAS DEVERTIER WITH PRISM TECHNOLOGY (AND) 78000 INVERTIER       SOLAR EDGE STRONICAS DESCRIPTION       SOLAR EDGE STRONICAS DEVERTIER WITH PRISM TECHNOLOGY (AND) 78000 INVERTIER       SOLAR EDGE STRONICAS DESCRIPTION       SOLAR EDGE STRONICAS DESCRIPTION PRISMETED DC ARCHITECTURE)       SOLAR EDGE STRONICAS DESCRIPTION PRISMETED DC ARCHITECTURE)       SOLAR EDGE STRONICAS DESCRIPTION PRISMETED DC ARCHITECTURE)       SOLAR EDGE STRONICAS DESCRIPTION AND CONTRACTURES STRONICED CONTRUES DEV															
ASHRAE 2% HIGH         35.3°C (95.5°F), SOURCE FORT COLLINS (AV05) (40.4°T.105°T)         Personant control to a submit of the control to a su			A	SHRAE EXTREME LOW	-	-27°C (-16.6°F), S	SOURCE: FORT COLI	INS (AWOS) (40.45	5°; -105°)						DRAWING SET WITHOUT WRITTEN
CATEGORY         MAKE         MODEL NUMBER         REF         OTY         UNIT         OTY/UNIT         DESCRIPTION         DESCRIPTION <th< td=""><td></td><td></td><td></td><td>ASHRAE 2% HIGH</td><td>3</td><td>35.3°C (95.5°F), S</td><td>SOURCE: FORT COL</td><td>INS (AWOS) (40.45</td><td>5°; -105°)</td><td></td><td></td><td></td><td></td><td></td><td>PERMISSION FROM CONTRACTOR IS IN</td></th<>				ASHRAE 2% HIGH	3	35.3°C (95.5°F), S	SOURCE: FORT COL	INS (AWOS) (40.45	5°; -105°)						PERMISSION FROM CONTRACTOR IS IN
DAMAGE         DESCRIPTION         DESCRIPTION <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>AND WILL BE SUBJECT TO CIVIL</td></t<>															AND WILL BE SUBJECT TO CIVIL
Disconsect         Solar Edge         P370         P01-19         19         PIECEs         1         LG ELECTRONICS         Solar Edge         PARAME         Solar Edge         P370         P01-19         19         PIECEs         1         Solar Edge Strong															DAMAGES AND PROSECUTIONS.
BILL OF MATE         BILL OF MATE         Solar East         Description         Description <thdescription< th=""> <thdescription< th=""></thdescription<></thdescription<>															NEW PV SYSTEM: 6.65
CATEGORY         MAKE         MODEL NUMBER         REF         OTY         UNIT         OTY/UNIT         DESCRIPTION           MODULE         LIG ELECTRONICS         LG3SMIC/VS         PMI-19         19         PIECES         1         LG ELECTRONICS ISSMIC/VS 3000 60 CELLS, MONOCRYSTALLINE SILICON           INVERTER         SOLAR EDGE         SE700H/US ENERGY HUB NURFITEW INTH         1         1         PIECES         1         SOLAR EDGE SE700H/US ENERGY HUB NURFITEW INTH         II         1         PIECES         1         SOLAR EDGE SE700H/US ENERGY HUB NURFITEW INTH         III         1         PIECES         1         SOLAR EDGE SE700H/US ENERGY HUB NURFITEW INTH         III         1         PIECES         1         SOLAR EDGE SE700H/US ENERGY HUB NURFITEW INTH         SOLAR EDGE SE700H/US ENERGY HUB NUERTER WITH PRISM TECHNOLOGY (2407) 7600W INVERTER         MIVERTER WITH PRISM TECHNOLOGY (2407) 7600W INV															
Control         Image         <	CATEGORY	MAKE		DEE											
module         Local Laboration         Control Laboration         Contredition         Control Laboration	MODULE			PM1-19	19	PIECES		ELECTRONICS LG3	350N1C-V5 350N		RYSTALLINE S				
MODULE OPTIMIZERSOLAR EDGEP10000 (EXT)P11919P1ECES1SOLAR EDGE 9370 OPTIMIZER (REQUIRED PART OF INVERTER'S DISTRIBUTED DC ARCHITECTURE)DISCONNECTSQUARE DD222NRBSW11P1ECE1SQUARE D 2022NRB, 2-POLE, 60A, 240VAC OR EGUIVALENTWIRINGGEN-10-AWG-FV-WIRE-CUWR1180FEET110 AWG PV WIRE, COPPER (POSITIVE AND NEGATIVE)1645 SHEELY DRWIRINGGEN-10-AWG-FV-WIRE-CUWR190FEET110 AWG THWN-2, COPPER (ROUND)1645 SHEELY DRWIRINGGEN-10-AWG-THWN-2-CU-RDWR240FEET110 AWG THWN-2, COPPER, BLACK (NEGATIVE)APN 19723205000WIRINGGEN-10-AWG-THWN-2-CU-RDWR220FEET110 AWG THWN-2, COPPER, GROUND)APN: 9723205000WIRINGGEN-10-AWG-THWN-2-CU-RDWR3420FEET18 AWG THWN-2, COPPER, BLACK (NE GATUNE)APN: 9723205000WIRINGGEN-8-AWG-THWN-2-CU-RDWR3420FEET18 AWG THWN-2, COPPER, BLACK (LINE 2)ENGINEER OF RECCWIRINGGEN-8-AWG-THWN-2-CU-RDWR3420FEET18 AWG THWN-2, COPPER, BLACK (LINE 2)ENGINEER OF RECCWIRINGGEN-8-AWG-THWN-2-CU-RGWR3420FEET18 AWG THWN-2, COPPER, GREEN (GROUND)ENGINEER OF RECCWIRINGGEN-8-AWG-THWN-2-CU-RGWR3420FEET18 AWG THWN-2, COPPER, GREEN (LINE 1)ENGINEER OF RECCWIRINGGEN-8-AWG-THWN-2-CU-RGWR3420FEET18 AWG THWN-2,	INVERTER	SOLAR EDGE	SE7600H-US ENERGY HUB INVERTER PRISM TECHNOLOGY (240V)	WITH I1	1	PIECE	1 SOI	AR EDGE SE7600H	H-US ENERGY I	HUB INVERTER WIT	H PRISM TECH	NOLOGY (240V)	7600W INVER	TER	
DISCONNECTSQUARE DD222NRBSW11PIECE1SQUARE DSQUARE DD22NRBSW11PIECE1SQUARE DSQUARE DCONTRALContractCo	MODULE OPTIMIZER	SOLAR EDGE	P370	PO1-19	19	PIECES	1 SOI	AR EDGE P370 OP	TIMIZER (REQ	UIRED PART OF INV	ERTER'S DISTR	RIBUTED DC ARC	CHITECTURE)		1 RESIDENC!
WIRINGGEN-10-AWG-PV-WIRE-CUWR1180FEET110 AWG PV WIRE, COPPER (POSITIVE AND NEGATIVE)1645 SHEELY DRWIRINGGEN-6-AWG-BARE-CUWR190FEET16 AWG BARE, COPPER (GROUND)FEET10 AWG THWN-2, COPPER, GREU POSITIVE)FEET10 AWG THWN-2, COPPER, GREU POSITIVE)FEET10 AWG THWN-2, COPPER, BLACK (NEGATIVE)FEET10 AWG THWN-2, COPPER, BLACK (NEGATIVE)FEET10 AWG THWN-2, COPPER, BLACK (NEGATIVE)FEET10 AWG THWN-2, COPPER, GREEN (GROUND)APN: 9723205006APN: 9723205006WIRINGGEN-10-AWG-THWN-2-CU-BIKWR220FEET110 AWG THWN-2, COPPER, RED (LINE 1)APN: 9723205006APN: 9723205006WIRINGGEN-8-AWG-THWN-2-CU-BIKWR3-420FEET18 AWG THWN-2, COPPER, RED (LINE 1)APN: 9723205006WIRINGGEN-8-AWG-THWN-2-CU-BIKWR3-420FEET18 AWG THWN-2, COPPER, RED (LINE 2)APN: 9723205006WIRINGGEN-8-AWG-THWN-2-CU-BIKWR3-420FEET18 AWG THWN-2, COPPER, RED (LINE 2)APN: 9723205006WIRINGGEN-8-AWG-THWN-2-CU-BIKWR3-420FEET18 AWG THWN-2, COPPER, RED (LINE 2)APN: 9723205006WIRINGGEN-8-AWG-THWN-2-CU-BIKWR3-420FEET18 AWG THWN-2, COPPER, RED (GROUND)WIRINGGEN-8-AWG-THWN-2-CU-GRWR3-420FEET18 AWG THWN-2, COPPER, REEN (GROUND)WIRINGGEN-8-AWG-THWN-2-CU-GRWR3-420FEET18 AWG THWN-2, COPPER, REEN (GROUND) <td>DISCONNECT</td> <td>SQUARE D</td> <td>D222NRB</td> <td>SW1</td> <td>1</td> <td>PIECE</td> <td>1 SQI</td> <td>JARE D D222NRB, 2</td> <td>2-POLE, 60A, 24</td> <td>40VAC OR EQUIVAL</td> <td>ENT</td> <td></td> <td> /</td> <td></td> <td></td>	DISCONNECT	SQUARE D	D222NRB	SW1	1	PIECE	1 SQI	JARE D D222NRB, 2	2-POLE, 60A, 24	40VAC OR EQUIVAL	ENT		/		
WIRINGGEN-6AWG-BARE-CUWR190FEET16 AWG BARE, COPPER (GROUND)FEET16 AWG BARE, COPPER (GROUND)FEET16 AWG THWN-2, COPPER, RED (POSITIVE)FEET110 AWG THWN-2, COPPER, RED (CROUND)AWG THWN-2, COPPER, RED (CROUND)AWG THWN-2, COPPER, RED (LINE 1)FEET111 </td <td>WIRING</td> <td></td> <td>GEN-10-AWG-PV-WIRE-CU</td> <td>WR1</td> <td>180</td> <td>FEET</td> <td>1 10 Å</td> <td>WG PV WIRE, COP</td> <td>PPER (POSITIVI</td> <td>E AND NEGATIVE)</td> <td></td> <td></td> <td></td> <td></td> <td>1645 SHEELY DR</td>	WIRING		GEN-10-AWG-PV-WIRE-CU	WR1	180	FEET	1 10 Å	WG PV WIRE, COP	PPER (POSITIVI	E AND NEGATIVE)					1645 SHEELY DR
WIRINGGEN-10-AWG-THWN-2-CU-RDWR240FEET110 AWG THWN-2, COPPER, RED (POSITIVE)APN: 9723205000WIRINGGEN-10-AWG-THWN-2-CU-GRWR240FEET110 AWG THWN-2, COPPER, RED (INCOLDAPN: 9723205000WIRINGGEN-10-AWG-THWN-2-CU-GRWR220FEET110 AWG THWN-2, COPPER, RED (INCOLDAPN: 9723205000WIRINGGEN-8-AWG-THWN-2-CU-RDWR3-420FEET18 AWG THWN-2, COPPER, RED (LINE 1)BAWG THWN-2, COPPER, RED (LINE 2)WIRINGGEN-8-AWG-THWN-2-CU-BLKWR3-420FEET18 AWG THWN-2, COPPER, RED (LINE 2)WIRINGGEN-8-AWG-THWN-2-CU-BLKWR3-420FEET18 AWG THWN-2, COPPER, RED (LINE 2)WIRINGGEN-8-AWG-THWN-2-CU-GRWR3-420FEET18 AWG THWN-2, COPPER, RED (GROUND)WIRINGGEN-8-AWG-THWN-2-CU-GRWR3-420FEET18 AWG THWN-2, COPPER, RED (INE 2)WIRINGGEN-8-AWG-THWN-2-CU-GRWR3-420FEET18 AWG THWN-2, COPPER, RED (GROUND)WIRINGGEN-8-AWG-THWN-2-CU-GRWR3-420FEET18 AWG THWN-2, COPPER, GREEN (GROUND)OCPD	WIRING		GEN-6-AWG-BARE-CU	WR1	90	FEET	1 6 A	VG BARE, COPPER	R (GROUND)						FORT COLLINS CO 8
WIRINGGEN-10-AWG-THWN-2-CU-BLKWR240FEET110 AWG THWN-2, COPPER, BLACK (NEGATIVE)APPR. 200 (RPP. 20	WIRING		GEN-10-AWG-THWN-2-CU-RD	WR2	40	FEET	1 10 /	WG THWN-2, COPI	PER, RED (POS	SITIVE)					
WIRINGGEN-10-AWG-THWN-2-CU-GRWR220FEET110 AWG THWN-2, COPPER, GREEN (GROUND)FEET1FEET110 AWG THWN-2, COPPER, RED (LINE 1)WIRINGGEN-8-AWG-THWN-2-CU-BLKWR3-420FEET18 AWG THWN-2, COPPER, BLACK (LINE 2)FEET18 AWG THWN-2, COPPER, BLACK (LINE 2)WIRINGGEN-8-AWG-THWN-2-CU-WHWR3-420FEET18 AWG THWN-2, COPPER, WHITE (NEUTRAL)FEET18 AWG THWN-2, COPPER, WHITE (NEUTRAL)WIRINGGEN-8-AWG-THWN-2-CU-GRWR3-420FEET18 AWG THWN-2, COPPER, GREEN (GROUND)FEET18 AWG THWN-2, COPPER, GREEN (GROUND)WIREWAYGEN-8-AWG-THWN-2-CU-GRWR3-420FEET18 AWG THWN-2, COPPER, GREEN (GROUND)FEET18 AWG THWN-2, COPPER, GREEN (GROUND)OCPDGENERIC MANUFACTURERGEN-FU-40A-240VACF1-22PIECES1ENT CONDUIT, 0.75" DIATRANSITION BOXGENERIC MANUFACTURERGEN-AWB-TB-44XJB11PIECE1TRANSITION/PASS-THROUGH BOX, WITH 4 TERMINAL BLOCKS			GEN-10-AWG-THWN-2-CU-BLK	WR2	40	FEET	1 10 /	WG THWN-2, COPP	PER, BLACK (N	EGATIVE)					APN. 9723203000
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WIRINGGEN-8-AWG-THWN-2-CU-BLKWR3-420FEET18 AWG THWN-2, COPPER, BLACK (LINE 2)WIRINGGEN-8-AWG-THWN-2-CU-WHWR3-420FEET18 AWG THWN-2, COPPER, WHITE (NEUTRAL)WIRINGGEN-8-AWG-THWN-2-CU-GRWR3-420FEET18 AWG THWN-2, COPPER, GREEN (GROUND)WIREWAYGEN-EMT-0.75" DIAWW2-440FEET1EMT CONDUIT, 0.75" DIAOCPDGENERIC MANUFACTURERGEN-FU-40A-240VACF1-22PIECES1FUSE, 40A, 240VACTRANSITION BOXGENERIC MANUFACTURERGEN-AWB-TB-4-4XJB11PIECE1TRANSITION/PASS-THROUGH BOX, WITH 4 TERMINAL BLOCKS	WIRING WIRING		GEIN-10-AVIG-THWIN-2-CO-GR		20	FEET	1 8 A	VG THWN-2, COPP	PER, RED (LINE	1)					
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WIRINGGEN-8-AWG-THWN-2-CU-GRWR3-420FEET18 AWG THWN-2, COPPER, GREEN (GROUND)WIREWAYGEN-EMT-0.75" DIAWW2-440FEET1EMT CONDUIT, 0.75" DIAOCPDGENERIC MANUFACTURERGEN-FU-40A-240VACF1-22PIECES1FUSE, 40A, 240VACTRANSITION BOXGENERIC MANUFACTURERGEN-AWB-TB-4-4XJB11PIECE1TRANSITION/PASS-THROUGH BOX, WITH 4 TERMINAL BLOCKS	WIRING WIRING WIRING WIRING		GEN-8-AWG-THWN-2-CU-BLK	WR3-4 WR3-4	20				PER WHITE (NE						<u>_L</u>
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OCPD     GENERIC MANUFACTURER     GEN-FU-4UA-240VAC     F1-2     2     PIECES     1     F0SE, 40A, 240VAC       TRANSITION BOX     GENERIC MANUFACTURER     GEN-AWB-TB-4-4X     JB1     1     PIECES     1     F0SE, 40A, 240VAC	WIRING WIRING WIRING WIRING WIRING		GEN-8-AWG-THWN-2-CU-GR GEN-8-AWG-THWN-2-CU-BLK GEN-8-AWG-THWN-2-CU-BLK GEN-8-AWG-THWN-2-CU-WH GEN-8-AWG-THWN-2-CU-GR	WR3-4 WR3-4 WR3-4 WR3-4	20 20 20	FEET FEET FEET	1 8 A' 1 8 A'	VG THWN-2, COPP	PER, GREEN (G	ROUND)					- <b>F</b>
TRANSITION BOX GENERIC MANUFACTORER GEN-AWB-TB-4-4X JBT I PIECE I TRANSITION/PASS-THROUGH BOX, WITH 4 TERMINAL BLOCKS	WIRING WIRING WIRING WIRING WIRING WIREWAY		GEN-10-AWG-THWN-2-CU-GR GEN-8-AWG-THWN-2-CU-RD GEN-8-AWG-THWN-2-CU-BLK GEN-8-AWG-THWN-2-CU-WH GEN-8-AWG-THWN-2-CU-GR GEN-EMT-0.75" DIA	WR3-4 WR3-4 WR3-4 WR3-4 WW2-4	20 20 20 40	FEET FEET FEET	1 8 A 1 8 A 1 EM	VG THWN-2, COPP VG THWN-2, COPP CONDUIT, 0.75" D	PER, GREEN (G DIA	ROUND)					-
	WIRING WIRING WIRING WIRING WIRING WIREWAY OCPD	GENERIC MANUFACTURER	GEN-10-AWG-THWN-2-CU-GR GEN-8-AWG-THWN-2-CU-RD GEN-8-AWG-THWN-2-CU-BLK GEN-8-AWG-THWN-2-CU-WH GEN-8-AWG-THWN-2-CU-GR GEN-EMT-0.75" DIA GEN-FU-40A-240VAC	WR3-4 WR3-4 WR3-4 WR3-4 WR3-4 WW2-4 F1-2	20 20 20 40 2	FEET FEET FEET PIECES	1 8 A 1 8 A 1 EM 1 EM	VG THWN-2, COPP VG THWN-2, COPP CONDUIT, 0.75" D E, 40A, 240VAC	PER, GREEN (G	ROUND)	00//0				-
	WIRING WIRING WIRING WIRING WIRING WIREWAY OCPD TRANSITION BOX	GENERIC MANUFACTURER GENERIC MANUFACTURER	GEN-IU-AWG-THWN-2-CU-GR GEN-8-AWG-THWN-2-CU-RD GEN-8-AWG-THWN-2-CU-BLK GEN-8-AWG-THWN-2-CU-WH GEN-8-AWG-THWN-2-CU-GR GEN-EMT-0.75" DIA GEN-FU-40A-240VAC GEN-AWB-TB-4-4X	WR3-4           WR3-4           WR3-4           WR3-4           WR2-4           F1-2           JB1	20 20 20 40 2 1	FEET FEET FEET PIECES PIECE	1 8 A 1 8 A 1 EM 1 FUS 1 TR/	VG THWN-2, COPP VG THWN-2, COPP CONDUIT, 0.75" D E, 40A, 240VAC INSITION/PASS-THI	PER, GREEN (G DIA ROUGH BOX, V	NITH 4 TERMINAL B	.OCKS				
PAPER SIZE: 11" x 17" (ANSI B)	WIRING WIRING WIRING WIRING WIRING WIREWAY OCPD TRANSITION BOX	GENERIC MANUFACTURER GENERIC MANUFACTURER	GEN-10-AWG-THWN-2-CU-GR GEN-8-AWG-THWN-2-CU-RD GEN-8-AWG-THWN-2-CU-BLK GEN-8-AWG-THWN-2-CU-WH GEN-8-AWG-THWN-2-CU-GR GEN-8-AWG-THWN-2-CU-GR GEN-FU-40A-240VAC GEN-FU-40A-240VAC GEN-AWB-TB-4-4X	WR3-4 WR3-4 WR3-4 WR3-4 WW2-4 F1-2 JB1	20 20 20 40 2 1	FEET FEET FEET PIECES PIECE	1 8 A 1 8 A 1 EM 1 FUS 1 TR/	VG THWN-2, COPP VG THWN-2, COPP CONDUIT, 0.75" D E, 40A, 240VAC INSITION/PASS-THI	ROUGH BOX, V	NITH 4 TERMINAL B	OCKS				PAPER SIZE: 11" x 17" (ANSI B)
PAPER SIZE: 11" x 17" (ANSI B)	WIRING WIRING WIRING WIRING WIRING WIREWAY OCPD TRANSITION BOX	GENERIC MANUFACTURER GENERIC MANUFACTURER	GEN-10-AWG-THWN-2-CU-GR GEN-8-AWG-THWN-2-CU-RD GEN-8-AWG-THWN-2-CU-BLK GEN-8-AWG-THWN-2-CU-WH GEN-8-AWG-THWN-2-CU-GR GEN-8-AWG-THWN-2-CU-GR GEN-FU-40A-240VAC GEN-FU-40A-240VAC GEN-AWB-TB-4-4X	WR3-4 WR3-4 WR3-4 WR3-4 WW2-4 F1-2 JB1	20 20 20 40 2 1	FEET FEET FEET PIECES PIECE	1 8 A 1 8 A 1 EM 1 FUS 1 TR/	VG THWN-2, COPP VG THWN-2, COPP CONDUIT, 0.75" D E, 40A, 240VAC NSITION/PASS-THI	ROUGH BOX, V	NITH 4 TERMINAL B	.OCKS				PAPER SIZE: 11" x 17" (ANSI B)
PAPER SIZE: 11" x 17" (ANSI B) DESIGN TABLES	WIRING WIRING WIRING WIRING WIRING WIREWAY OCPD TRANSITION BOX	GENERIC MANUFACTURER GENERIC MANUFACTURER	GEN-IU-AWG-THWN-2-CU-GR GEN-8-AWG-THWN-2-CU-BLK GEN-8-AWG-THWN-2-CU-BLK GEN-8-AWG-THWN-2-CU-WH GEN-8-AWG-THWN-2-CU-GR GEN-EMT-0.75" DIA GEN-FU-40A-240VAC GEN-FU-40A-240VAC	WR3-4 WR3-4 WR3-4 WR3-4 WW2-4 F1-2 JB1	20 20 20 40 2 1	FEET FEET FEET PIECES PIECE	1 8 A 1 8 A 1 EM 1 FUS 1 TR/	VG THWN-2, COPP VG THWN-2, COPP CONDUIT, 0.75" D E, 40A, 240VAC INSITION/PASS-THI	ROUGH BOX, V	NITH 4 TERMINAL B	OCKS				PAPER SIZE: 11" x 17" (ANSI B) DESIGN TABLES
PAPER SIZE: 11" x 17" (ANSI B) DESIGN TABLES	WIRING WIRING WIRING WIRING WIRING WIREWAY OCPD TRANSITION BOX	GENERIC MANUFACTURER GENERIC MANUFACTURER	GEN-8-AWG-THWN-2-CU-BLK GEN-8-AWG-THWN-2-CU-BLK GEN-8-AWG-THWN-2-CU-WH GEN-8-AWG-THWN-2-CU-WH GEN-8-AWG-THWN-2-CU-GR GEN-EMT-0.75" DIA GEN-FU-40A-240VAC GEN-FU-40A-240VAC	WR3-4 WR3-4 WR3-4 WR3-4 WW2-4 F1-2 JB1	20 20 20 40 2 1	FEET FEET FEET PIECES PIECE	1 8 A 1 8 A 1 EM 1 FUS 1 TR/	VG THWN-2, COPP VG THWN-2, COPP CONDUIT, 0.75" D E, 40A, 240VAC NSITION/PASS-THI	ROUGH BOX, V	NITH 4 TERMINAL B	OCKS				PAPER SIZE: 11" x 17" (ANSI B) DESIGN TABLES DATE: 09.16.2020
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FIELD VERIFY ALL MEASUREMENTS 2. ITEMS BELOW MAY NOT BE ON THIS PAGE

## SHEET KEYNOTES

ROOF MATERIAL: ASPHALT SHINGLE ROOF STRUCTURE: TRUSS ATTACHMENT TYPE: UNIRAC SUNFRAME MICRORAIL

MODULE MANUFACTURER: LG ELECTRONICS MODULE MODEL: LG350N1C-V5 MODULE LENGTH: 66.4 IN. MODULE WEIGHT: 37.7 LBS. SEE SHEET A-103 FOR DIMENSION(S) MIN. FIRE OFFSET: 36" FROM RIDGE/RAKE, 18" FROM TRUSS SPACING: 24 IN. O.C. LAG BOLT DIAMETER: BOLT/SCREW SUPPLIED WITH LAG BOLT EMBEDMENT: PER RACKING MFG

TOTAL # OF ATTACHMENTS: 39 TOTAL AREA: 350.44 SQ. FT. TOTAL WEIGHT: 742.9 LBS. WEIGHT PER ATTACHMENT: 19.05 LBS. DISTRIBUTED LOAD: 2.12 PSF MAX. HORIZONTAL STANDOFF: 48 IN. MAX. VERTICAL STANDOFF: LANDSCAPE: 41 IN., PORTRAIT: 67 IN. STANDOFF STAGGERING: NO MODULE CLEARANCE: 3 IN. MIN., 6 IN. MAX.



#### CONTRACTOR

REENERGIZECO

**PHONE:** 3032271000 ADDRESS: 1805 E 58TH AVE UNIT K **DENVER, CO 80216** 

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NEW PV SYSTEM: 6.650 kWp

## **SEEMUELLER &** FANNING RESIDENCE

1645 SHEELY DR FORT COLLINS, CO 80526 APN: 9723205006

#### ENGINEER OF RECORD

PAPER SIZE: 11" x 17" (ANSI B)

#### ASSEMBLY DETAILS

DATE: 09.16.2020

DESIGN BY: V.T.

CHECKED BY:

REVISIONS

S-501.00

# LG NeON<sup>®</sup>2

#### LG350N1C-V5

### 350W

The LG NeON® 2 is LG's best selling solar module, and is one of the most powerful and versatile modules on the market today. Featuring LG's Cello Technology, the LG NeON<sup>®</sup> 2 increases power output. New updates include an extended performance warranty from 86% to 90.08% to give customers higher performance and reliability.







#### Features

-11	
	nimin -
	25w

#### Enhanced Performance Warranty

LG NeON<sup>®</sup> 2 has an enhanced performance warranty. After 25 years, LG NeON® 2 is guaranteed at least 90.08% of initial performance.



#### Enhanced Product Warranty

LG has extended the warranty of the NeON<sup>®</sup> 2 to 25 years including labor, which is top level in the industry.



#### Better Performance on a Sunny Day

LG NeON<sup>®</sup> 2 now performs better on sunny days, thanks to its improved temperature coefficient.

## 

**Roof Aesthetics** 

LG NeON<sup>®</sup> 2 has been designed with aesthetics in mind using thinner wires that appear all black at a distance. The LG NeON® 2 can increase the aesthetic value of your home with a more modern design.

#### When you go solar, ask for the brand you can trust: LG Solar

#### About LG Electronics

LG Electronics is a global leader in electronic products in the clean energy markets by offering solar PV panels and energy storage systems. The company first embarked on a solar energy source research program in 1985, supported by LG Group's vast experience in the semi-conductor, LCD, chemistry and materials industries. In 2010, LG Solar successfully released its first MonoX<sup>®</sup> series to the market, which is now available in 32 countries. The NeON<sup>®</sup> (previous MonoX<sup>®</sup> NeON), NeON<sup>®</sup>2, NeON<sup>®</sup>2, BiFacial won the "Intersolar MURDE". DOI: 10.1007/DE 10. AWARD" in 2013, 2015 and 2016, which demonstrates LG's leadership and innovation in the solar industry

LG Solar



# LG NeON<sup>®</sup>2

Monocrystalline/N-type

60 Cells (6 x 10)

12EA

,686mm x 1,016mm x 40 mm

17.1 kg

Tempered Glass with AR Coatin

White

Anodized Aluminiun

IP 68 with 3 Bypass Diode

1,000mm x 2EA

MC 4/MC

IEC 61215-1/-1-1/2:2016. IEC 61730-1/2:2016

ISO 9001, ISO 14001, ISO 50001

OHSAS 18001

IEC 61701:2012 Severity

IEC 62716:2013

Class C (UL 790)

25 Years

Linear Warranty\*

42 ± 3

-0.36

-0.27

0.03

LG350N1C-V5

261

33.0

7.91

38.80

8.53

#### Electrical Properties (S

Model		LG350N1C-V5
Maximum Power (Pmax)	[VV]	350
MPP Voltage (Vmpp)	[V]	35.3
MPP Current (Impp)	[A]	9.92
Open Circuit Voltage (Voc, 5%)	[V]	41.3
Short Circuit Current (Isc, _ 5%)	[A]	10.61
Module Efficiency	[%]	20.4
Power Tolerance	[%]	0~+3
*STC (Standard Test Condition): Irradia	ance 1000 \	W/m², cell temperature 25 °C, AM 1.5, Measure Tolerance: ±3%
Operating Conditions		

#### Operating Temperature

Maximum System Voltage Maximum Series Fuse Rating Mechanical Test Load\* (Front) Mechanical Test Load\* (Rear) \*Mechanical Test Loads 5.400 Pa Factor (1.5))

#### Packaging Configuration Number of Modules per Pallet Number of Modules per 40ft

Packaging Box Dimensions (L Packaging Box Gross Weight

#### Dimensions (mm/inch)

# 16-8.0+3.0/0.3 Drain Holes B-Ø4.3/0.2 Grounding Holes 8-8.5+12.0/0.3+0. Mounting Holes



LG350N1C-V5\_AUS.pdf

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LG350N1C-V5

Cell Properties (Material/Type

Module Dimensions (L  $\times$  W  $\times$  H)

Junction Box (Protection Degree

Certifications and Warranty

General Data

Number of Bushars

Glass (Material)

Backsheet (Color)

Frame (Material)

Cables (Length)

Certifications

Fire Rating

NMOT\*

Model

Connector (Type/Maker

Salt Mist Corrosion Test

Ammonia Corrosion Test

Solar Module Product Warr

Solar Module Output Warranty

**Temperature Characteristics** 

Wind speed 1 m/s Spectrum AM 1.5

Electrical Properties (NMOT)

[V]

[A]

Maximum Power (Pmax) [W]

Open Circuit Voltage (Voc) [V]

Short Circuit Current (Isc) [A]

MPP Voltage (Vmpp)

MPP Current (Impp)

I-V Curves

6.0

4.0

Improved: 1st year 98%, from 2-24th year: 0.33%/year down, after 25th year: 90.08%

[°C]

[%/°C]

[%/°C]

[%/°C]

\*NMOT (Nominal Module Operating Temperature): Irradiance 800 W/m2, Ambient temperature 20 °C.

Cell Maker Cell Configuration

Weight

60

6/27/19 1:02 PM LG350N1C-V5.indd 2

LG350N1C-V5.indd

20.0

olar Business Divi

30.0

40.0

Voltage (V

E	





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R-001.00 (SHEET 10)

#### Preliminary

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	[°C]	-40 ~+90
	[V]	1000(IEC)
	[A]	20
	[Pa/psi <sup>-</sup> ]	5,400/113
	[Pa/psi <sup>-</sup> ]	4,000/84
1.0	00 Pa based on IEC 611	215-2 · 2016 (Test Load - Design Load x Safety

	[EA]	25
IQ Container	[EA]	650
W×H)	[mm]	1,750 x 1,120 x 1,221
	[kg]	464



## **Single Phase Energy Hub Inverter with Prism Technology**

#### for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US



#### Optimized battery storage with HD-Wave technology

- / Record-breaking 99% weighted efficiency with 200% DC oversizing
- Small, lightweight, and easy to install
- Modular design, future ready with optional upgrades to:
- I DC-coupled storage for full or partial home backup
- Built-in consumption monitoring
- / Direct connection to the SolarEdge smart EV charger

- Multi-inverter, scalable StorEdge<sup>®</sup> solution
- / Integrated arc fault protection and rapid shutdown for NEC 2014 and 2017, per article 690.11 and 690.12
- Embedded revenue grade production data, ANSI C12.20 Class 0.5



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## **/** Single Phase Energy Hub Inverter with Prism Technology

for North America

SE3000H-US / SE3800H-US / SE5000H-US / SE6000H-US / SE7600H-US<sup>(1)</sup>

	SE3000H-US	SE3800H-US	SE5000H-US	SE6000H-US	SE7600H-US	UNIT
OUTPUT - AC ON GRID						
Rated AC Power	3000	3800	5000	6000	7600	W
Maximum AC Power Output	3000	3800	5000	6000	7600	W
AC Output Voltage Range		1	211-264	1		Vac
AC Frequency Range (min - nom - max)			59.3 - 60 - 60.5(2)			Hz
Maximum Continuous Output Current	12.5	16	21	25	32	A
GFDI Threshold		1	1	1		A
Total Harmonic Distortion (THD)			<3			%
Power Factor		1,	adjustable -0.85 to 0.	85		
Utility Monitoring, Islanding Protection, Country Configurable Thresholds			Yes			
Charge Battery from AC (if Allowed)			Yes			
Typical Nighttime Power Consumption			<2.5			W
OUTPUT - AC BACKUP <sup>(3)</sup>						
Rated AC Power in Backup Operation	2400	3050	4000	4800	6100	W
Peak AC Power (<10 sec) in Backup Operation	2700	3400	4500	5400	6900	W
AC L-L Output Voltage Range in Backup			211-264			Vac
AC L-N Output Voltage Range in Backup			105-132			Vac
AC Frequency Range in Backup (min - nom - max)			55 - 60 - 65			Hz
Maximum Continuous Output Current in Backup Operation	10	12.7	16.6	20	25.5	A
Peak AC Current (<10sec) in Backup Operation	11.25	14.2	18.75	22.5	30	A
GFDI			1			A
THD			<5			%
OUTPUT - SMART EV CHARGER AC						
Rated AC Power			9,600			W
AC Output Voltage Range			211-264			Vac
AC Frequency Range (min - nom - max)			59.3-60-60.5			Hz
Maximum Continuous Output Current @240V (grid, PV and battery)	40			Aac		
INPUT - DC (PV AND BATTERY)						
Transformer-less, Ungrounded			Yes			
Max Input Voltage			480			Vdc
Nom DC Input Voltage		3	80		400	Vdc
Reverse-Polarity Protection			Yes			
Ground-Fault Isolation Detection			600kΩ Sensitivity			
INPUT - DC (PV)						
Maximum DC Power	6000	7600	10000	12000	15600	W
Maximum Input Current <sup>'4)</sup>	8.5	10.5	13.5	16.5	20	Adc
Max. Input Short Circuit Current			45			Adc
Maximum Inverter Efficiency			99.2			%
CEC Weighted Efficiency			99			%
2-pole Disconnection			Yes			
INPUT - DC (BATTERY)						
Supported Battery Types			LG Chem RESU10H			
Number of Batteries per Inverter			1 or 2(5)			
Maximum Battery Capacity per Inverter			19.6			kWh
Continuous Power Per Inverter			5000			W
Peak Power	6900				W	
Max Input Current @240V	18				Adc	
2-pole Disconnection			Yes			

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NEW PV SYSTEM: 6.650 kWp

## **SEEMUELLER &** FANNING RESIDENCE

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REVISIONS

R-002.00 (SHEET 11)

# **Power Optimizer**

For North America P320 / P340 / P370 / P400 / P405 / P505



# POWER **OPTIMIZ**

#### PV power optimization at the module-level

- Specifically designed to work with SolarEdge inverters
- / Up to 25% more energy
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch losses, from manufacturing tolerance to partial shading
- Flexible system design for maximum space utilization

- Fast installation with a single bolt
- I Next generation maintenance with modulelevel monitoring
- Meets NEC requirements for arc fault protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS)
- Module-level voltage shutdown for installer and firefighter safety



P320 / P340 / P370 / P400 / P405 / P505

Optimizer model (typical module compatibility)	P320 (for 60-cell modules)	P340 (for high- power 60-cell modules)	P370 (for higher- power 60 and 72-cell modules)	P400 (for 72 & 96- cell modules)	P405 (for thin film modules)	P505 (for higher current modules)	
INPUT							
Rated Input DC Power <sup>(1)</sup>	320	340	370	400	405	505	W
Absolute Maximum Input Voltage (Voc at lowest temperature)	2	18	60	80	125(2)	83(2)	Vdc
MPPT Operating Range	8 -	48	8 - 60	8 - 80	12.5 - 105	12.5 - 83	Vdc
Maximum Short Circuit Current (Isc)		11		1	).1	14	Adc
Maximum DC Input Current		13.75		12	.63	17.5	Adc
Maximum Efficiency			99	9.5			%
Weighted Efficiency			98.8			98.6	%
Overvoltage Category				1			
OUTPUT DURING OPER	RATION (POWE	R OPTIMIZER C	ONNECTED TO	OPERATING SO	LAREDGE INVE	RTER)	
Maximum Output Current			1	5			Adc
Maximum Output Voltage		60 85					Vdc
INVERTER OFF) Safety Output Voltage per Power Optimizer						Vdc	
STANDARD COMPLIAN	ICE						1
FMC		FC	C Part15 Class B. IEC6	51000-6-2. JEC 61000-6	5-3		
Safety			IEC62109-1 (class	s II safetv), UL1741			
RoHS			Y	es			
INSTALLATION SPECIFI	CATIONS						1
Maximum Allowed System Voltage	1000			Vdc			
Compatible inverters		All Sc	olarEdge Single Phase	and Three Phase inv	erters		
Dimensions (W x L x H)	129 x 153 x 27.5 / 5.1 x 6 x 1.1 129 x 153 x 27.5 / 5.1 x 6 x 1.1 5.1 x 6 x 1.3 5.1 x 6 x 1.3		129 x 159 x 49.5 / 5.1 x 6.3 x 1.9	129 x 162 x 59 / 5.1 x 6.4 x 2.3	mm / in		
Weight (including cables)		630 / 1.4		750 / 1.7	845 / 1.9	1064 / 2.3	gr / lb
Input Connector			MC	24 <sup>(3)</sup>			
Output Wire Type / Connector			Double Inst	ulated; MC4			
Output Wire Length	0.95	/ 3.0		1.2	/ 3.9		m / ft
Input Wire Length			0.16 ,	/ 0.52			m / ft
Operating Temperature Range			-40 - +85 /	/ -40 - +185			°C / °F
Protection Rating			IP68 / N	NEMA6P			
Relative Humidity	0 - 100			%			

 $^{(1)}$  Rated STC power of the module. Module d up to +5% power tolerance allowed  $^{(2)}$  NEC 2017 requires max input voltage be not more than 80V  $^{(3)}$  For other connector types please contact SolarEdge

PV System Design Using a SolarEdge Inverter <sup>(4(5)</sup>		Single Phase HD-Wave Single phase		Three Phase 208V Three Phase 480		
Minimum String Length	P320, P340, P370, P400	8		10	18	
(Power Optimizers) P405 / P505		6		8	14	
Maximum String Length 25		5	25	50(6)		
Maximum Power per String		5700 (6000 with SE7600-US - SE11400- US)	5250	6000(7)	12750(8)	W
Parallel Strings of Different Lengths			Y	/es		

For detailed string sizing information refer to: http://www.solaredge.com/sites/default/files/string\_sizing\_na.pdf
 It is not allowed to mix P405/P505 with P320/P340/P370/P400 in one string
 A string with more than 30 optimizers does not meet NEC rapid shutdown requirements; safety voltage will be above the 30V requirement
 For SE14.4KUS/SE43.2KUS: It is allowed to install up to 6,500W per string when 3 strings are conneced to the inverter (3 strings per unit for SE43.2KUS) and when

For SE30KUS/SE33.3KUS/SE66.6KUS/SE100KUS: It is allowed to install up to 15,000W per string when 3 strings are connected to the inverter (3 strings per unt for SE66.6KUS/SE100KUS) and when the maximum power difference between the strings is up to 2,000W

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REVISIONS

R-003.00 (SHEET 12)

CE RoHS

# **SUNFRAME** MICRORAIL **#UNIRAC**

**SUNFRAME MICRORAIL™ (SFM)** is a hybrid racking system including a structural front Trimrail<sup>™</sup> for fastest array alignment and superior aesthetics. Minimize total labor with pre-assembled parts, integrated bonding hardware and one tool installation. Compact packaging with few SKUs lowers logistics costs from the warehouse to the roof. Patented mounting components provide post-install height adjustment and allow for removal of individual panels for maintenance. **INDUSTRY LEADING FEATURES** STRUCTURAL FRONT TRIMRAIL FASTEST ARRAY ALIGNMENT & SUPERIOR AESTHETICS POST-INSTALL HEIGHT ADJUSTMENT LEVEL MODULES ANYTIME DURING INSTALLATION

SINGLE MODULE ACCESS REMOVE SINGLE PANELS FOR ARRAY MAINTENANCE

SINGLE TOOL INSTALLATION **QUICK & EASY ARRAY ALIGNMENT** TRIMRAIL WITH SEAMLESS MODULE MOUNTING MIXED ARRAYS - PORTRAIT & LANDSCAPE ORIENTATION AVAILABLE MLPE MOUNT WITH CABLE MANAGEMENT LOGISTICS OPTIMIZED - COMPACT PACKAGING FEW SKUS SIMPLIFIES INSTALLATION ENHANCED U-BUILDER DESIGN / LAYOUT TOOL **ON-SITE PRODUCT TRAINING** 

# SUNFRAME MICRORAIL **UNIRAC**

#### LESS RAIL, MORE PERFORMANCE **SOLAR SHOULD BE SIMPLE**

No unique module type or frame required for installation Accommodates the most common frame heights: 32mm, 35mm, 40mm & 46mm

Design around the roof, not the racking; Portrait, Landscape or Mixed module orientation Maximize power on the roof, install up to 25% more with modules in landscape orientation

UL2703 Listed. Accommodate the most stringent AHJ requirements Stagger roof attachments & use attached splice for extra strength and flexibility Lose All the Copper and Lugs. Bonding and grounding thru Enphase M215 & M250 Microinverte

Full wire management solution allows pre-management of wires before module installation Engage Wire Management Clip, MLPE Mount & Hevco Dual PV wire trunk cable clips

Small components, Compact packaging & Pre-assembled parts A third less volume than traditional racking. Fit several jobs-worth of racking on a single truck





## **COLLABORATION WITH INDUSTRY LEADING INSTALLERS - FIELD TESTED & VERIFIED**

#### WORLD CLASS U-BUILDER FOR QUICK & EFFICIENT DESIGN / LAYOUT WITHIN MINUTES

#### FAST AND EASY PERMIT APPROVAL

PRODUCT TRAINING WITH PROJECT MANAGEMENT SERVICES TO MINIMIZE INSTALLATION LEARNING CURVE

UNIRAC CUSTOMER SERVICE MEANS THE HIGHEST LEVEL OF PRODUCT SUPPORT IN THE RACKING INDUSTRY

# **LESS RAIL**, MORE PERFORMANCE





#### CONTRACTOR

**RFFNFRGIZECO** 

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