



**DEPARTMENT OF PLANNING AND ZONING
PLANNER'S REPORT**

DATE: June 5, 2019
TO: Tonya Hutson
FROM: Lynn Patterson
RE: **Design Review – 3341 North Whitney Avenue**

BACKGROUND

The City of Hapeville has received a Design Review Application from Tia Muse and Brooke Fortenberry for the addition of solar panels to the roof of the existing building at 3341 North Whitney Avenue.

The property is zoned R-1, One-Family Detached, and is subject to the Neighborhood Conservation Area of the Architectural Design Standards.

CODE

(e) *Roof and chimney standards.*

1. Principal building roofs for one-family detached dwellings shall have a minimum usable life of thirty (30) years, per manufacturer's warranty.
2. Roof shingles shall be slate, cedar, or asphalt.
3. Roof tiles shall be clay, terra cotta or concrete.
4. Metal roofs are:
 - a. Permitted on one-family and two-family detached dwellings if approved by the design review committee; and
 - b. Permitted on multifamily and townhouse dwellings only when screened from the adjacent street by a parapet wall.
5. Gutters shall be copper, aluminum or galvanized steel.
6. Downspouts shall match gutters in material and finish.
7. Roof forms shall be based on architectural style.
8. All roofs, excluding dormers, shall overhang a minimum of 12 inches beyond the facade.
9. Dormers are permitted on all style homes (unless specified), but shall not be taller than the main roof to which they are attached.
10. Chimneys exposed to the public view may not be faced in wood or cement based siding and may not be of an exposed metal or ceramic pipe. All chimneys shall be wrapped in a brick, stone or suitable masonry finish material.
11. Chimneys on exterior building walls shall begin at grade.
12. Chimneys shall begin at grade and be faced with brick or stacked stone; extend chimneys between three and six feet above the roof line.

FINDINGS

The Architectural Design Standards do not provide guidance for the installation of roof-mounted solar panels. As solar panels are not directly allowed by the code, a Design Exception would be required.

CITY OF HAPEVILLE

DESIGN REVIEW APPLICATION

SUBMITTAL DATE: May 15, 2019

NOTE: All applications must be typed or neatly printed. Applications or an authorized representative is required to personally appear at the Design Review Meeting to answer questions.

The Design Review Committee meets the third Wednesday of each month. Every attempt will be made to place your application for review on the next month's agenda following the submittal of a completed application with supporting documents; however, that may not always be possible. The City reserves the right to schedule applications as deemed necessary.

Applicant: Tia Muse / Brooke Fortenberry Contact Number: 770-485-7438

Applicants Address: 2931 Lewis St Ste 300 Kennesaw GA 30144

E-Mail Address: tia.muse@creative.solar.usa.com Zoning Classification: _____

Address of Proposed Work: 3341 N Whitney Ave Hapeville GA 30354

Parcel ID# (INFORMATION MUST BE PROVIDED): 14009800150122

Property Owner: Marcus Fellingham Contact Number: [REDACTED]

Project Description (including occupancy type): Installing 5.90 KW
of solar panels to rooftop

Contractors Name: Alan Carrier Contact Number: 678-779-6248

Contact Person: Tia Muse Contact Number: 770-485-7438

I hereby make application to the City of Hapeville, to the Design Review Committee for the above referenced property. I do hereby swear or affirm that the information provided here and above is true, complete and accurate, and I understand that any inaccuracies may be considered just cause for invalidation of this application and any action taken on this application. I understand that the City of Hapeville, Georgia, reserves that right to enforce any and all ordinances regardless of any action or approval on this application. I further understand that it is my/our responsibility to conform with all of City of Hapeville's Ordinances in full. I hereby acknowledge that all requirements of the City of Hapeville shall be adhered to. I can read and write the English language and/or this document has been read and explained to me and I have full and voluntarily completed this application. I understand that it is a felony to make false statements or writings to the City of Hapeville, Georgia pursuant to O.C.G.A. 16-10-20 and I may be prosecuted for violation thereof.

Tia Muse
Applicants Signature

5-6-19
Date

Project Class (check one):

☒ Residential ☐ Commercial ☐ Mixed-Use Development

Project Type:

☐ New Commercial Construction ☐ Addition to Existing Commercial Building
☐ Addition to Existing Residential Structure ☐ Accessory Structure
☐ Site Plan, Grading & Landscaping ☐ New Single Family Residential Construction
☒ Other Solar Panels

Total Square Footage of proposed New Construction: _____

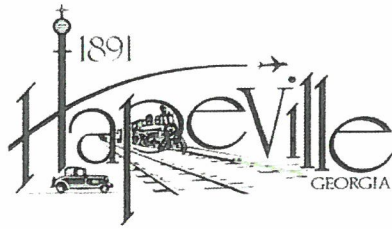
Total Square Footage of existing building: _____

Estimated Cost of Construction: \$15,250

List/Describe Building Materials on the exterior of the **existing** structure: _____

List/Describe Building Materials **proposed** for the exterior facade of the new structure: _____

(20) Hanwha Q-Cells solar panels (data sheet provided)
(20) Enphase IQ-7-60-2-US micro inverters (data sheet provided)
(1) sola deck
Iron ridge mounting system (data sheet provided)



DEPARTMENT OF PLANNING AND ZONING

DESIGN REVIEW APPLICATION INSTRUCTIONS AND ACKNOWLEDGEMENT

I, the undersigned, agree that with my signature and submission to the City of Hapeville, I have done the following:

- ☒ Read the City of Hapeville's Architectural Design Guidelines and relevant Code sections for my proposed project. The Architectural Design Guidelines may be found here:
https://library.municode.com/ga/hapeville/codes/code_of_ordinances?nodeId=PTIICOOR_CH81ARDEST
- ☒ Ensured that my proposed project meets all of the required criteria per the City of Hapeville Code of Ordinances.
- ☒ Submitted my application materials in full by the published deadline for review by Staff prior to the Design Review Committee meeting.
- ☒ Identified and explained all deficiencies or components of the proposed project that do not meet with the requirements set forth in the Code. This explanation should be submitted as a separate document in the application.
- ☒ Understood that any deficiencies in the application must be resolved at least 10 days prior to the Design Review Committee meeting or the application may not be presented to the DRC for review.
- ☒ Submitted architectural drawings and details for all projects unless allowed in writing by the Community Services or Planning & Zoning Department.
- ☒ Agreed to submit any required revisions by the Design Review Committee with updated drawings to the Community Services Department for review prior to requesting any permits.

<u>Tia Muse</u>	<u>Tia Muse</u>	<u>5-6-19</u>
Printed Name	Signature	Date

Should you have any questions, please do not hesitate to contact the Community Services Department at 404-669-2120.

Thank you for interest and investment in the City of Hapeville.

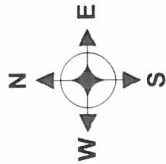
Google Maps 3341 N Whitney Ave



Image capture: Sep 2018 © 2019 Google

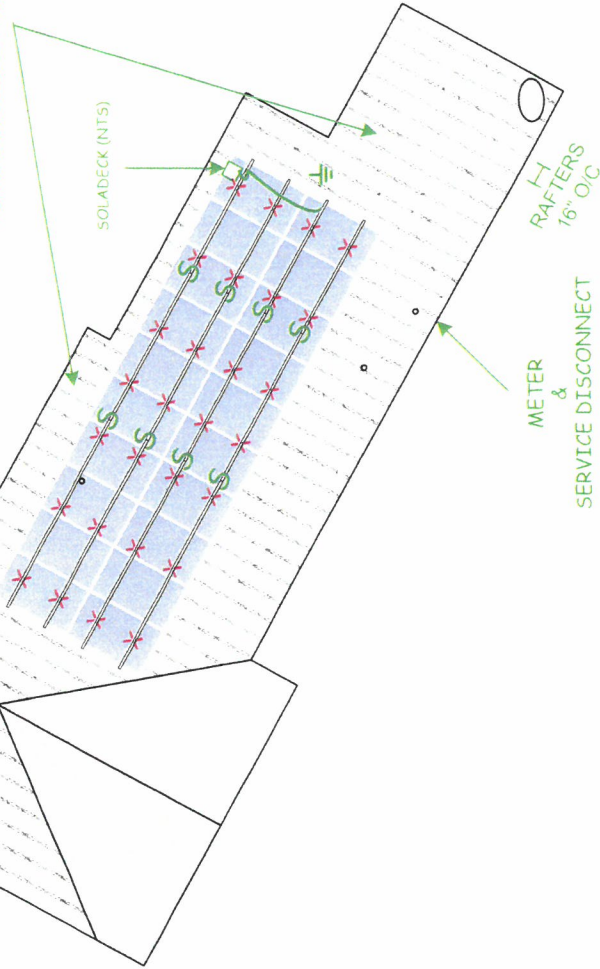
Hapeville, Georgia
Google
Street View - Sep 2018

5.9 KW ROOF-MOUNT SOLAR PV ARRAY



RAIL PAIRS:
14' + 11' + 8' 6"

3-FT MAIN RIDGE SETBACK AND 3-FT ACCESS PATHS
PER IFC 605.11.3.2 AND NFPA 1: 11.12.2.2.2



NOTES:

1. SHINGLE ROOF DECKING IS 2X6 PLANK. 2X6 RAFTERS 16" O/C. CONVENTIONAL FRAMING; PITCH IS 7:12. PRE-MEASURE ALL AREAS TO CLEAR OBSTACLES AND ENSURE PROPER FIT, LEAVING SUFFICIENT ROOM FOR SETBACKS AND ACCESS PATHS.
2. MARK AND ATTACH MOUNTS & RAILS ACCORDING TO LAYOUT & MOUNT AND RAIL PATTERNS. RAIL SPACING IS 33". MOUNTS ARE AT VARYING INTERVALS. MAXIMUM DISTANCE BETWEEN MOUNT AND RAIL-EDGE OR SPLICE IS 24". (MAX MOUNTING SPAN 7') (INNER 50% OF PANEL SHOULD BE BETWEEN RAILS.) LEAVE ROOM FOR FUTURE PANELS.
3. MOUNT ENPHASE Q, TRUNK CABLE AND IQ7 MICROINVERTERS, NOTING STRING CONFIGURATION AND RECORDING MICROINVERTER S/N'S. INSTALL TERMINATORS AND UNUSED CONNECTOR CAPS. RUN ALL GROUND. USE LFGC AND 600V PV WIRE.
4. INSTALL SOLADECKS. VERIFYING POSITION IN ATTIC BEFORE PENETRATING ROOF, AND WIRE HOME RUNS. RUNS ARE 600V.
5. MOUNT & CONNECT PANELS CENTERED OVER RAILS. RECORDING PANEL S/N'S. RAIL OVERHANGS ARE APPROX. 2-3" PAST PANELS. CONNECT ALL JUMPERS. MANAGE WIRES. SEPARATION DISTANCE BETWEEN ADJACENT PANELS $\frac{1}{4}$ - $\frac{1}{2}$ "

REVISIONS			
DATE	DESCRIPTION	BY	CK'D
03/16/19	PROPOSAL v1	REG	



Richard Gale
NABCEP Certified Solar PV Installer™
Certification No. PV 032611-117

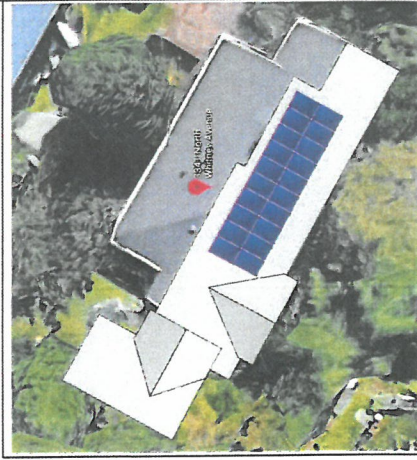


A	A	A	A	A	A	A	A	A	A
1	2	3	4	5	6	7	8	9	10
B	B	B	B	B	B	B	B	B	B
1	2	3	4	5	6	7	8	9	10

STRING CONFIGURATION
(NTS)

RATED WITH THE FOLLOWING MINIMUMS MET:

- *BUILDING MEAN ROOF HEIGHT $\leq$ 30 FT
- *RAFTER SPACING 24" MAX
- *RISK CATEGORY II
- *WIND EXPOSURE B
- *WIND SPEED $\leq$ 110 MPH
- *GROUND SNOW LOAD $\leq$ 15 PSF
- *ARRAY DISTRIBUTED WEIGHT $\leq$ 4.0 PSF AND $\leq$ 35 LBS. PER ATTACHMENT
- *MAX GAP BENEATH MODULE FRAME $\leq$ 7"
- *UPLIFT, DOWN FORCE, AND SHEAR FORCE OF 167 LB, 258 LB, AND 135 LB RESPECTIVELY



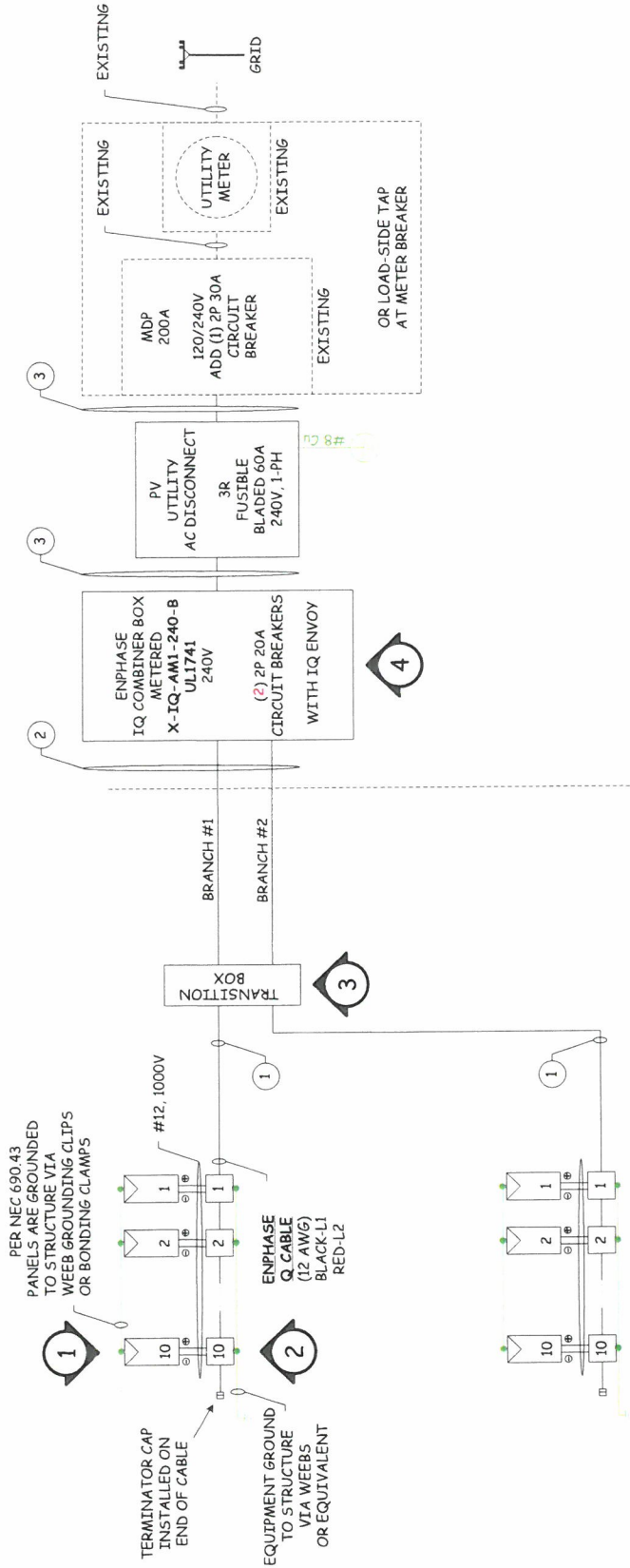
OVERHEAD MOCK-UP (NTS)

Creative Solar USA, Inc.

2931 Lewis Street
Kennesaw, Ga 30144
Russell Seifert: 770-378-9668
www.creativesolarusa.com

TITLE:	5.9 KW ROOF-MOUNT SOLAR PV ARRAY
CUSTOMER:	JOE & MARCUS FELLINGHAM
ADDRESS:	3341 N WHITNEY AVE, HAPEVILLE, GA 30354
SCALE:	1" = 12' (OUTPUT: 8.5 X 11 LANDSCAPE)
PAGE:	1 OF 1
DATE:	03-05-2019
ENG/DRA:	REG

5.9 KW DC PV ARRAY - SINGLE-LINE ELECTRICAL



CONDUIT AND WIRE SCHEDULE	
# OF RUN	CONDUIT DESCRIPTION
1	N/A #12 Q CABLE (ENPHASE)
2	IMC (4) - #10 XHHW (1) - #8 XHHW GND
3	IMC #8 4-WIRE

4. COMBINER BOX
COMBINED
MAX CONTINUOUS AC
OUTPUT CURRENT AT
240V OF 20A.

3. TRANSITION BOX
(1) AC BRANCH CIRCUIT
JUNCTION BOX
/ SOLADECK

1. PV ARRAY SOURCE CIRCUIT
(20) HANWHA Q-CELLS
Q-ANTUM SOLAR MODULE
Q-PEAK BLK-64.1 295, 295W PV PANELS
60-CELL POLYCRYSTALLINE
ROOF-MOUNTED.
SHORT CIRCUIT CURRENT 9.7A.
EACH WIRED TO INDIVIDUAL INVERTERS.
5,900 WATTS TOTAL
UL1703

2. INVERTERS
(20) ENPHASE IQ7-60-2-US
MICROINVERTERS.
ROOF-MOUNTED, UNDER EACH PANEL.
MAX CONTINUOUS AC OUTPUT POWER 240VA
NOMINAL AC OUTPUT CURRENT
AT 240V SINGLE PHASE OF 1.0A.
(2) BRANCHES AT (10) INVERTERS PER STRING,
CONNECTED IN SERIES.
(MAX 16 UNITS PER 20A BRANCH, 240VAC),
(2) STRINGS IN PARALLEL.
MAX CONT AC OUTPUT POWER 4,800 VA TOTAL.
MAX CONTINUOUS AC OUTPUT CURRENT AT 240V OF
10A PER 10-INVERTER BRANCH,
EACH PROTECTED AT 20A.
NEC 2014 & 2017 SECTION 690.12 COMPLIANT
UL1741/IEEE1547

REVISIONS		
DATE	DESCRIPTION	BY CKD
03/16/19	PROPOSAL v1	REG

TITLE: 5.9 KW DC PV ARRAY - SINGLE-LINE ELECTRICAL	
CUSTOMER: JOE & MARCUS FELLINGHAM	
ADDRESS: 3341 N WHITNEY AVE, HAPEVILLE, GA 30354	
SCALE: NONE	
PAGE: 1 OF 1	DATE: 03-16-2019
	ENG/DRA: REG

Creative Solar USA, Inc.

2931 Lewis Street
Kennesaw, Ga 30144
Russell Seifert: 770-378-9668
www.creativesolarusa.com

powered by
Q.ANTUM

Q.PEAK BLK-G4.1 290-300

Q.ANTUM SOLAR MODULE

With its top performance and completely black design the new **Q.PEAK BLK-G4.1** is the ideal solution for all residential rooftop applications thanks to its innovative cell technology **Q.ANTUM**. The world-record cell design was developed to achieve the best performance under real conditions – even with low radiation intensity and on clear, hot summer days.



LOW ELECTRICITY GENERATION COSTS

Higher yield per surface area and lower BOS costs thanks to higher power classes and an efficiency rate of up to 18.3%.



INNOVATIVE ALL-WEATHER TECHNOLOGY

Optimal yields, whatever the weather with excellent low-light and temperature behavior.



ENDURING HIGH PERFORMANCE

Long-term yield security with Anti-PID Technology¹, Hot-Spot-Protect and Traceable Quality Track™.



EXTREME WEATHER RATING

High tech aluminum alloy frame, certified for high snow (5400 Pa) and wind loads (4000 Pa) regarding IEC.



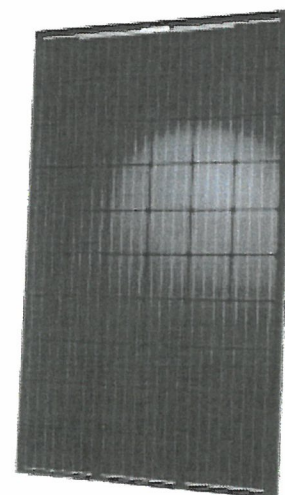
MAXIMUM COST REDUCTIONS

Up to 10% lower logistics costs due to higher module capacity per box.



A RELIABLE INVESTMENT

Inclusive 12-year product warranty and 20-year linear performance guarantee².



THE IDEAL SOLUTION FOR:



Residential buildings
residential buildings

Engineered in **Germany**

Anti-PID Technology (APIT) is a 100% requirement, with maximum voltage for increased module surface (2500V, 1000V).
See data sheet on page 10 for further information.

Q CELLS

MECHANICAL SPECIFICATION

Format	65.7in x 39.4in x 1.26in (including frame) (1670mm x 1000mm x 32mm)
Weight	41.4kN (1189kg)
Front Cover	0.16in (4.2mm) thermally tempered glass with anti-reflection technology
Back Cover	Composite film
Frame	Black anodized aluminum
Cell	6 x 16 monocrystalline Q CELLS solar cells
Junction box	1.6in x 0.4in x 4.7in (41mm x 10mm x 119mm) 15.19cm ² Protection class IP67, with bypass diodes
Cable	1mm Solar cable 14/39.57in (1000mm) 14/39.57in (1000mm)
Connector	Multi-Contact MCA or MCA interchangeable, IP68

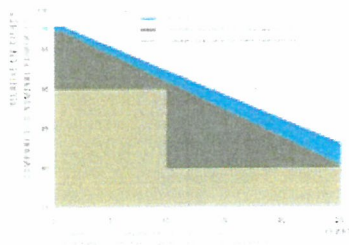


ELECTRICAL CHARACTERISTICS

POWER CLASS			290	295	300
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS (STC) (POWER TOLERANCE $\pm 5\%$ / $\pm 0.5\%$)					
Minimum	Power at MPP*	P_{MPP} (W)	290	295	300
	Short Circuit Current*	I_{sc} (A)	9.62	9.70	9.77
	Open Circuit Voltage*	V_{oc} (V)	39.19	39.48	39.76
	Current at MPP*	I_{MPP} (A)	9.07	9.12	9.20
	Voltage at MPP*	V_{MPP} (V)	31.95	32.39	32.81
	Efficiency*	η (%)	17.4	17.7	18.0
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS (NOCT)					
Minimum	Power at MPP*	P_{MPP} (W)	214.4	218.1	221.8
	Short Circuit Current*	I_{sc} (A)	7.22	7.30	7.38
	Open Circuit Voltage*	V_{oc} (V)	36.60	36.92	37.19
	Current at MPP*	I_{MPP} (A)	7.12	7.20	7.27
	Voltage at MPP*	V_{MPP} (V)	30.12	30.30	30.49

1000 W/m², 25 °C, spectrum AM 1.5D, 1 m, Maximum air mass (AM) 1.5, 10% relative humidity, 1000 W/m², NOCT: 45 °C, 1 m, 10% relative humidity

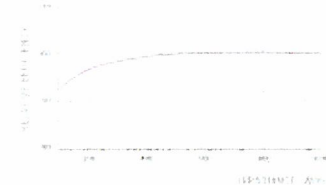
Q CELLS PERFORMANCE WARRANTY



At least 80% of nominal power during first year.
The weather over 200% distribution per year.
At least 80% of nominal power up to 10 years.
At least 80% of nominal power up to 25 years.

All data within measurement tolerance.
Full warranty is accordance with the warranty.
Terms of the Q CELLS modules registration of your respective country.

PERFORMANCE AT LOW IRRADIANCE



Typical module performance at low irradiance conditions.
Temperature: 25 °C, humidity: 10%, 1000 W/m²

TEMPERATURE COEFFICIENTS

Temperature Coefficient of I_{sc}	α	(%/K)	-0.16	Temperature Coefficient of V_{oc}	β	(%/K)	-0.78
Temperature Coefficient of P_{MPP}	γ	(%/K)	-0.39	Normal Operating Cell Temperature	NOCT	(°F)	113 $\pm$ 5, (45 $\pm$ 3 °C)

PROPERTIES FOR SYSTEM DESIGN

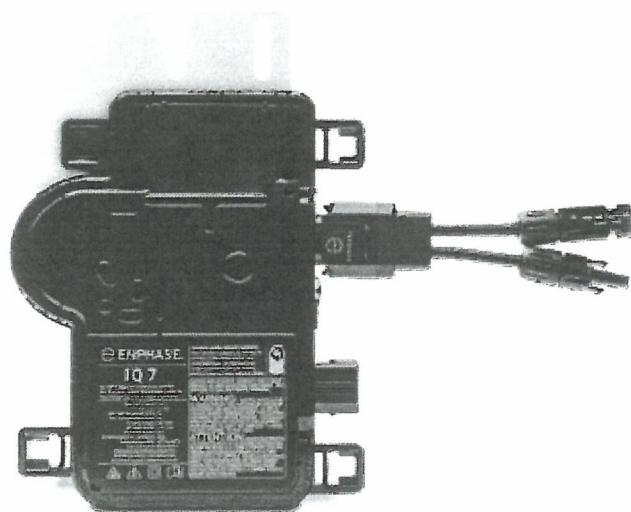
Maximum System Voltage V_{sys}	(V)	1000 (IEC) / 1000 (UL)	Safety Class	I
Maximum Series Fuse Rating	(A DC)	20	Fire Rating	UL 954 TYPE 1 (UL)
Design load, push (UL)	(lbs./ft ²)	25 (3400 Pa)	Permitted module temperature on continuous duty	-40 °C up to +45 °C 40 °C up to +65 °C
Design load, pull (UL)	(lbs./ft ²)	25 (3400 Pa)	See installation manual	

QUALIFICATIONS AND CERTIFICATES

IEC 61215, IEC 61701, IEC 61851, IEC 61853, IEC 61854, IEC 61855, IEC 61856, IEC 61857, IEC 61858, IEC 61859, IEC 61860, IEC 61861, IEC 61862, IEC 61863, IEC 61864, IEC 61865, IEC 61866, IEC 61867, IEC 61868, IEC 61869, IEC 61870, IEC 61871, IEC 61872, IEC 61873, IEC 61874, IEC 61875, IEC 61876, IEC 61877, IEC 61878, IEC 61879, IEC 61880, IEC 61881, IEC 61882, IEC 61883, IEC 61884, IEC 61885, IEC 61886, IEC 61887, IEC 61888, IEC 61889, IEC 61890, IEC 61891, IEC 61892, IEC 61893, IEC 61894, IEC 61895, IEC 61896, IEC 61897, IEC 61898, IEC 61899, IEC 61900, IEC 61901, IEC 61902, IEC 61903, IEC 61904, IEC 61905, IEC 61906, IEC 61907, IEC 61908, IEC 61909, IEC 61910, IEC 61911, IEC 61912, IEC 61913, IEC 61914, IEC 61915, IEC 61916, IEC 61917, IEC 61918, IEC 61919, IEC 61920, IEC 61921, IEC 61922, IEC 61923, IEC 61924, IEC 61925, IEC 61926, IEC 61927, IEC 61928, IEC 61929, IEC 61930, IEC 61931, IEC 61932, IEC 61933, IEC 61934, IEC 61935, IEC 61936, IEC 61937, IEC 61938, IEC 61939, IEC 61940, 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IQ 7 and IQ 7+ Microinverters

Enphase IQ 7 and IQ 7+ Microinverters



The high-powered smart grid-ready **Enphase IQ 7 Micro™** and **Enphase IQ 7+ Micro™** dramatically simplify the installation process while achieving the highest system efficiency.

Part of the Enphase IQ System, the IQ 7 and IQ 7+ Microinverters integrate with the Enphase IQ Envoy™, Enphase IQ Battery™, and the Enphase Enlighten™ monitoring and analysis software.

IQ Series Microinverters extend the reliability standards set forth by previous generations and undergo over a million hours of power on testing, enabling Enphase to provide an industry-leading warranty of up to 25 years.

Easy to Install

- Lightweight and simple
- Faster installation with integrated lighter two-wire conduit
- Built-in rapid shutdown compliant (NEC 2014 & 2017)

Productive and Reliable

- Optimized for high-powered 60-colt and 48-volt modules
- More than a million hours of testing
- Class II double-insulated enclosure
- UL-listed

Smart Grid Ready

- Complies with advanced grid export, voltage and frequency ride-through requirements
- Remotely updates to respond to changing grid requirements
- Configurable for various grid profiles
- Meets CA Rule 21 (UL 1741-341)

- The IQ 7+ Microinverter also supports third-party inverters



To learn more about Enphase offerings, visit enphase.com



Enphase IQ 7 and IQ 7+ Microinverters

INPUT DATA (DC)		IQ7-60-2-US / IQ7-60-B-US		IQ7PLUS-72-2-US / IQ7PLUS-72-B-US	
Commonly used module pairings ¹		235 W - 350 W +		235 W - 440 W +	
Module compatibility		60-cell PV modules only		60-cell and 72-cell PV modules	
Maximum input DC voltage		48 V		60 V	
Peak power tracking voltage		22 V - 37 V		22 V - 45 V	
Operating range		15 V - 48 V		15 V - 60 V	
Min-Max start voltage		22 V - 48 V		22 V / 60 V	
Max DC short circuit current (module Isc)		15 A		15 A	
Overvoltage class DC port		II		II	
DC port backfeed current		0 A		0 A	
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)		IQ 7 Microinverter		IQ 7+ Microinverter	
Peak output power		250 VA		295 VA	
Maximum continuous output power		240 VA		290 VA	
Nominal (L-L) voltage/range ²		240 V / 211-264 V	208 V / 183-229 V	240 V / 211-264 V	208 V / 183-229 V
Maximum continuous output current		1.0 A (240 V)	1.15 A (208 V)	1.21 A (240 V)	1.39 A (208 V)
Nominal frequency		60 Hz		60 Hz	
Extended frequency range		47 - 68 Hz		47 - 68 Hz	
AC short circuit fault current over 3 cycles		5.8 Arms		5.8 Arms	
Maximum units per 20 A (1-l) branch circuit		16 (240 VAC)	13 (208 VAC)	13 (240 VAC)	11 (208 VAC)
Overvoltage class AC port		III		III	
AC port backfeed current		0 A		0 A	
Power factor setting		1.0		1.0	
Power factor (adjustable)		0.85 leading - 0.85 lagging		0.85 leading - 0.85 lagging	
EFFICIENCY		@240 V	@208 V	@240 V	@208 V
Peak efficiency		97.6 %	97.6 %	97.5 %	97.3 %
CEC weighted efficiency		97.0 %	97.0 %	97.0 %	97.0 %
MECHANICAL DATA					
Ambient temperature range		-40°C to +65°C			
Relative humidity range		45% to 100% (condensing)			
Connector type (IQ7-60-2-US & IQ7PLUS-72-2-US)		MC4 for Amphenol H4 UT-X with additional Q-DCC-5 adapter			
Connector type (IQ7-60-B-US & IQ7PLUS-72-B-US)		Friends PV2 (MC4 interchangeable) Adapters for modules with MC4 or UT-X connectors: - PV2 to MC4: order ECA-S20-S27 - PV2 to UT-X: order LCA-S20-S25			
Dimensions (WxHxD)		212 mm x 175 mm x 30.2 mm (without bracket)			
Weight		1.08 kg (2.38 lbs)			
Cooling		Natural convection - No fans			
Approved for wet locations		Yes			
Pollution degree		PD3			
Enclosure		Class II double-insulated, corrosion resistant polymer enclosure			
Environmental category / UV exposure rating		NEMA Type 6 / outdoor			
FEATURES					
Communication		Power Line Communication (PLC)			
Monitoring		Enlighten Manager and MyEnlighten monitoring options. Both options require installation of an Enphase IQ Envoy.			
Disconnecting means		The AC and DC connectors have been evaluated and approved by UL for use as the load-break disconnect required by NEC 690.			
Compliance		CA Rule 21 (UL 1741-SA) UL 62109-1, UL 1741/IEEE1547, FCC Part 15 Class B, ICES-0003 Class B, CAN/CSA C22.2 NO. 1071-01 This product is UL Listed as PV Rapid Shut-Down Equipment and conforms with NEC-2014 and NEC 2017 section 690.12 and C22.1 2015 Rule 64-216 Rapid Shutdown of PV Systems, for AC and DC conductors, when installed according to manufacturer's instructions.			

¹ No enforced DC:AC ratio. See the compatibility calculator at <https://enphase.com/en-us/support/module-compatibility>

² Terminal voltage range can be extended beyond nominal if required by the utility.

³ Limits may vary. Refer to local requirements to define the number of microinverters per branch in your area.

To learn more about Enphase offerings, visit enphase.com



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Roof Mount System



Built for solar's toughest roofs.

IronRidge builds the strongest roof mounting system in solar. Every component has been tested to the limit and proven in extreme environments.

Our rigorous approach has led to unique structural features, such as curved rails and reinforced flashings, and is also why our products are fully certified, code compliant and backed by a 20-year warranty.



Strength Tested

All components evaluated for superior structural performance.



PE Certified

Pre-stamped engineering letters available in most states.



Class A Fire Rating

Certified to maintain the fire resistance rating of the existing roof.



Design Software

Online tool generates a complete bill of materials in minutes.



Integrated Grounding

UL 2703 system eliminates separate module grounding components.



20 Year Warranty

Twice the protection offered by competitors.

XR Rails

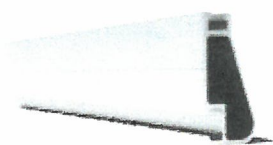
XR10 Rail



A low-profile mounting rail for regions with light snow.

- 6' spanning capability
- Moderate load capability
- Clear & black anod. finish

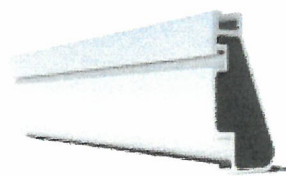
XR100 Rail



The ultimate residential solar mounting rail.

- 8' spanning capability
- Heavy load capability
- Clear & black anod. finish

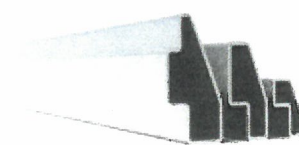
XR1000 Rail



A heavyweight mounting rail for commercial projects.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish

Internal Splices

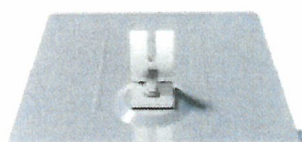


All rails use internal splices for seamless connections.

- Self-tapping screws
- Varying versions for rails
- Grounding Straps offered

Attachments

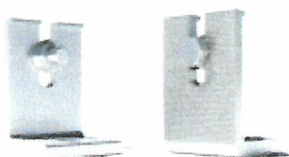
FlashFoot



Anchor, flash, and mount with all-in-one attachments.

- Ships with all hardware
- IBC & IRC compliant
- Certified with XR Rails

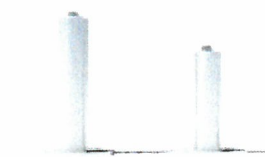
Slotted L-Feet



Drop-in design for rapid rail attachment.

- High-friction serrated face
- Heavy-duty profile shape
- Clear & black anod. finish

Standoffs



Raise flush or tilted systems to various heights.

- Works with vent flashing
- Ships pre-assembled
- 4" and 7" Lengths

Tilt Legs

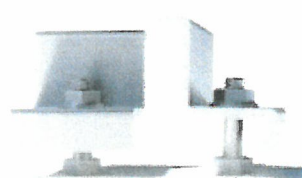


Tilt assembly to desired angle, up to 45 degrees.

- Attaches directly to rail
- Ships with all hardware
- Fixed and adjustable

Clamps & Grounding

End Clamps



Slide in clamps and secure modules at ends of rails.

- Mill finish & black anod.
- Sizes from 1.22" to 2.3"
- Optional Under Clamps

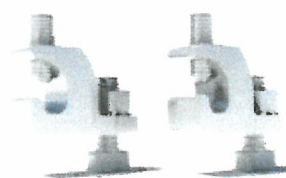
Grounding Mid Clamps



Attach and ground modules in the middle of the rail.

- Parallel bonding T-bolt
- Reusable up to 10 times
- Mill & black stainless

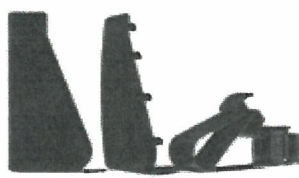
T-Bolt Grounding Lugs



Ground system using the rail's top slot.

- Easy top-slot mounting
- Eliminates pre-drilling
- Swivels in any direction

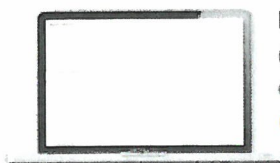
Accessories



Provide a finished and organized look for rails.

- Snap-in Wire Clips
- Perfected End Caps
- UV-protected polymer

Free Resources



Design Assistant

Go from rough layout to fully engineered system. For free.

Go to IronRidge.com/rm



NABCEP Certified Training

Earn free continuing education credits while learning more about our systems.

Go to IronRidge.com/training