

STAFF REPORT: 10/13/2021 MEEETING

PREPARED BY: J. ROSS

ADDRESS: 12746 BROADSTREET

HISTORIC DISTRICT: RUSSELL WOODS-SULLIVAN

APPLICATION: #21-7520

APPLICANT: NOAH SCHNEIDER

OWNER: CALVIN JUDE

DATE OF PROVISIONALLY COMPLETE APPLICATION: 9/20/2021

DATE OF STAFF SITE VISIT 10/4/2021

SCOPE: INSTALL NEW SOLAR PANELS AT ROOFTOP

EXISTING CONDITIONS

Erected ca. 1935, the building located at 12746 Broadstreet is a two-story, Colonial Revival style home which is located in the Russell Woods-Sullivan Historic District. The home features a side-gabled central mass with lower, projecting gabled-roof wings at the rear elevation. Brown asphalt shingles cover the building's roof. The building's exterior walls are primarily clad with red brick with a small area of vinyl siding located at the rear elevation second-story gable end. Windows are vinyl with muntins/grids between the glass. A black vinyl awning with fabric panels shelters the primary entrance, which is located at the front/west elevation.



12746 Broadstreet, staff photo dating from 10/4/2021

PROPOSAL

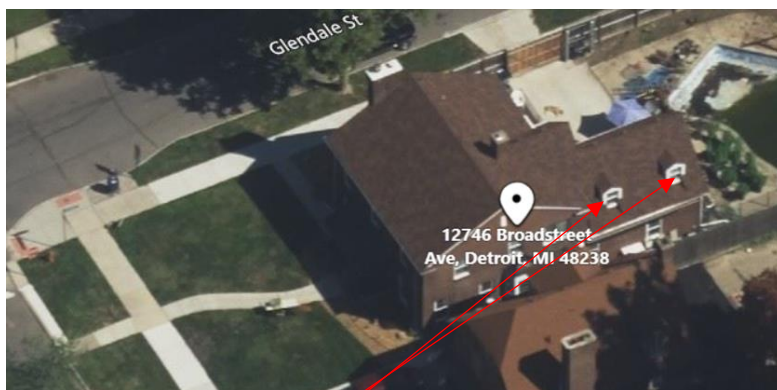
As outlined in the submitted proposal, the applicant is seeking to install new solar panels at the building's roof per the following:

- At northeast/rear roof surface, install a 7- panel array which measures 18'x8'-11"
- At southeast/rear roof surface, install a 3-panel array which measures 6'x8'-11"
- At rear garage roof, southern face, install 5-panel array which measures 16'-6"x72.13"

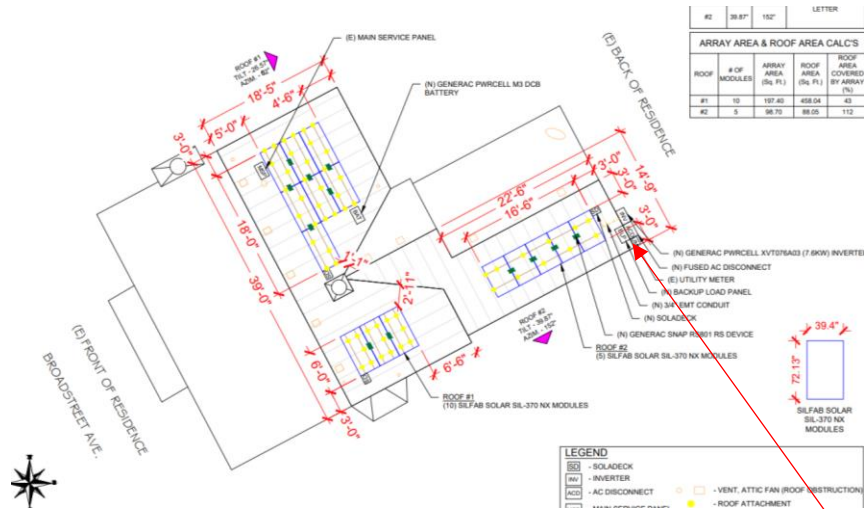
Staff requested that the applicant provide the height of the L-brackets upon which the panels will be mounted. However, the applicant has not provided the requested information as of the date of this report's completion. The solar panels will be a glossy black color. The service panels will be located at the roof surface per the submitted plans.

STAFF OBSERVATIONS AND RESEARCH

- The 3-panel, 6'x8'-11" array proposed for installation at southeast/rear roof surface will not be visible when viewing the home from Broadstreet/from the home's primary elevation
- The application proposes to install a 5-panel, 16'-6"x72.13" array at the southern roof surface of the rear garage wing. See the below images which indicate that this portion of the roof includes two dormers. It appears to staff that the current proposal has not taken those dormers into account. However, an installation of flat solar panels at this location, between the two dormers, would be minimally visible from Broadstreet and would not detract from the home's historic appearance in staff's opinion.
- Staff noted that the following exterior work items have been undertaken without Historic District Commission approval and/or permit. A review of Google Streetview and the property's HDC file revealed that the following items were completed in 2019:
 - Replace all existing wood windows with new vinyl windows. The new/existing windows have grids/muntins between the glass.
 - Install a vinyl awning at the front elevation, first story, above the primary entrance
- A 6'-0" tall, wood dog-eared fence was also installed at the rear/side yards without HDC approval sometime between 2013 and 2016. The current fence replaced an older 6'-0"-high wood fence which existed at the same location and appeared to be in poor condition in 2013.



12746 Broadstreet, note dormers at rear garage roof



12746 Broadstreet, note location of proposed panels at rear, garage roof. It appears that the proposed placement does not take the existing dormers into account as there is only 3'-0" clearance from the array and the rear edge of the roof .

- The only array that will be visible from the public right-of-way on Glendale Street is the 7-panel, 18'x8'-11" array proposed for installation at the northeast/rear roof surface
- The building's rear elevation lacks the distinctive detailing found at the front and north/side elevations. The rear elevation also displays a number of inappropriate alterations which detract from the building's historic character. It is therefore staff's opinion that the rear elevation is of secondary importance to the main and north/side elevations. However, the rear elevation and the rear/east roof surface are highly visible from the public right-of-way due to the home's prominent location at an intersection. It is staff's opinion that the location of the proposed 7-panel, 18'x8'-11" array at the northeast/rear roof surface would introduce an additional incompatible element to the highly-visible rear elevation and would further diminish the building's historic appearance when the home is viewed from Glendale Street.



Rear elevation. Note the number of incompatible alterations to include the rear one-story enclosed porch, vinyl windows, and vinyl siding. The new panels represent an additional non-compatible element, in staff's opinion

ISSUES

- As noted above, it appears that the applicant has not taken the two existing dormers into consideration when they proposed to install the 5-panel, 16'-6"x72.13" at the southern roof surface of the rear garage wing.
- It is staff's opinion that the location of the proposed 7-panel, 18'x8'-11" array at the northeast/rear roof surface would introduce an additional incompatible element to the highly-visible rear elevation and would further diminish the building's historic appearance when the home is viewed from Glendale Street.

RECOMMENDATION

Section 21-2-78. Determinations of the Historic District Commission

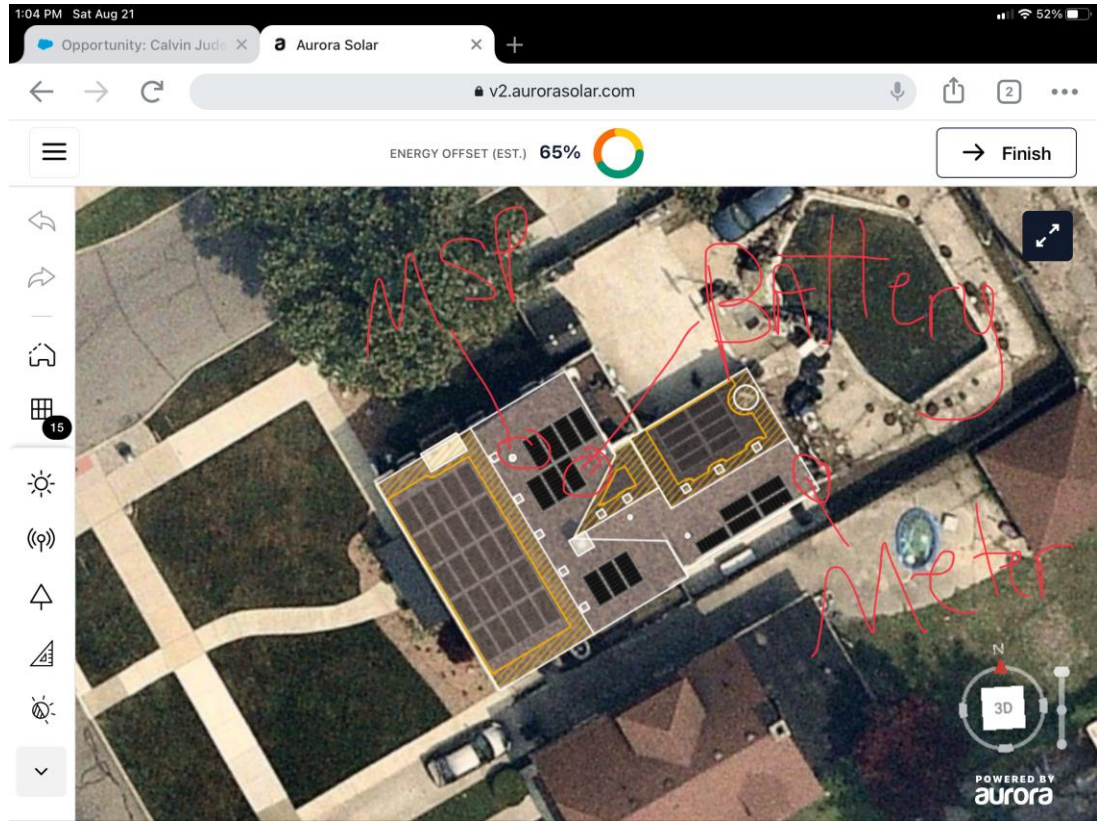
Staff recommends that the Commission issue a Certificate of Appropriateness (COA) for the project because conforms to the district's Elements of Design and meets the Secretary of the Interior (SOI) Standards for Rehabilitation. However, staff does recommend that the Commission issue this COA with the following conditions:

- The 7-panel, 18'x8'-11" array at the northeast/rear roof surface shall be removed from the proposal. Solar panels shall not be installed at the home's northeast/rear roof surface
- HDC staff shall be afforded the opportunity to review and approve a revised proposal for the panels proposed for installation at the southern roof surface of the rear garage wing. Should staff determine that the installation does not meet the SOI Standards, they shall forward the proposal to the Commission for review at a regular meeting.
- The applicant shall provide staff with the height of the L-brackets upon which the panels will be mounted prior to the issuance of the COA. Should staff determine that the dimensions not meet the SOI Standards, they shall forward the proposal to the Commission for review at a regular meeting.









HISTORIC DISTRICT COMMISSION PROJECT REVIEW REQUEST

CITY OF DETROIT
PLANNING & DEVELOPMENT DEPARTMENT
2 WOODWARD AVENUE, ROOM 808, DETROIT, MI 48226

DATE: _____

PROPERTY INFORMATION

ADDRESS: _____ AKA: _____

HISTORIC DISTRICT: _____

SCOPE OF WORK: Windows/Doors Roof/Gutters/Chimney Porch/Deck Landscape/Fence/Tree/Park General Rehab
(Check ALL that apply) New Construction Demolition Addition Other: _____

APPLICANT IDENTIFICATION

Property Owner/Homeowner Contractor Tenant or Business Occupant Architect/Engineer/Consultant

NAME: _____ COMPANY NAME: _____

ADDRESS: _____ CITY: _____ STATE: _____ ZIP: _____

PHONE: _____ MOBILE: _____ EMAIL: _____

PROJECT REVIEW REQUEST CHECKLIST

Please attach the following documentation to your request:

PLEASE KEEP FILE SIZE OF ENTIRE SUBMISSION UNDER 30MB

- Completed Building Permit Application** (highlighted portions only)
- ePLANS Permit Number** (only applicable if you've already applied for permits through ePLANS)
- Photographs** of ALL sides of existing building or site
- Detailed photographs** of location of proposed work (photographs to show existing condition(s), design, color, & material)
- Description of existing conditions** (including materials and design)
- Description of project** (if replacing any existing material(s), include an explanation as to why replacement--rather than repair--of existing and/or construction of new is required)
- Detailed scope of work** (formatted as bulleted list)
- Brochure/cut sheets** for proposed replacement material(s) and/or product(s), as applicable

NOTE:

Based on the scope of work, additional documentation may be required.

See www.detroitmi.gov/hdc for scope-specific requirements.

Upon receipt of this documentation, staff will review and inform you of the next steps toward obtaining your building permit from the Buildings, Safety Engineering and Environmental Department (BSEED) to perform the work.

SUBMIT COMPLETED REQUESTS TO HDC@DETROITMI.GOV

P2 - BUILDING PERMIT APPLICATION

Date: _____

PROPERTY INFORMATION

Address: _____ Floor: _____ Suite#: _____ Stories: _____

AKA: _____ Lot(s): _____ Subdivision: _____

Parcel ID#(s): _____ Total Acres: _____ Lot Width: _____ Lot Depth: _____

Current Legal Use of Property: _____ Proposed Use: _____

Are there any existing buildings or structures on this parcel? Yes No

PROJECT INFORMATION

Permit Type: New Alteration Addition Demolition Correct Violations

Foundation Only Change of Use Temporary Use Other: _____

Revision to Original Permit #: _____ (Original permit has been issued and is active)

Description of Work (Describe in detail proposed work and use of property, attach work list)

MBC use change No MBC use change

Included Improvements (Check all applicable; these trade areas require separate permit applications)

HVAC/Mechanical Electrical Plumbing Fire Sprinkler System Fire Alarm

Structure Type

New Building Existing Structure Tenant Space Garage/Accessory Building

Other: _____ Size of Structure to be Demolished (LxWxH) _____ cubic ft.

Construction involves changes to the floor plan? Yes No

(e.g. interior demolition or construction to new walls)

Use Group: _____ Type of Construction (per current MI Bldg Code Table 601) _____

Estimated Cost of Construction \$ _____ By Contractor \$ _____ By Department

Structure Use

Residential-Number of Units: _____ Office-Gross Floor Area _____ Industrial-Gross Floor Area _____

Commercial-Gross Floor Area: _____ Institutional-Gross Floor Area _____ Other-Gross Floor Area _____

Proposed No. of Employees: _____ List materials to be stored in the building: _____

PLOT PLAN SHALL BE submitted on separate sheets and shall show all easements and measurements (must be correct and in detail). SHOW ALL streets abutting lot, indicate front of lot, show all buildings, existing and proposed distances to lot lines. (Building Permit Application Continues on Next Page)

For Building Department Use Only

Intake By: _____ Date: _____ Fees Due: _____ DngBld? No

Permit Description: _____

Permit #: _____ Current Legal Land Use: _____ Proposed Use: _____

Permit#: _____ Date Permit Issued: _____ Permit Cost: \$ _____

Zoning District: _____ Zoning Grant(s): _____

Lots Combined? Yes No (attach zoning clearance)

Revised Cost (revised permit applications only) Old \$ _____ New \$ _____

Structural: _____ Date: _____ Notes: _____

Zoning: _____ Date: _____ Notes: _____

Other: _____ Date: _____ Notes: _____



IDENTIFICATION (All Fields Required)

Property Owner/Homeowner Property Owner/Homeowner is Permit Applicant

Name: _____ Company Name: _____

Address: _____ City: _____ State: _____ Zip: _____

Phone: _____ Mobile: _____

Driver's License #: _____ Email: _____

Contractor Contractor is Permit Applicant

Representative Name: _____ Company Name: _____

Address: _____ City: _____ State: _____ Zip: _____

Phone: _____ Mobile: _____ Email: _____

City of Detroit License #: _____

TENANT OR BUSINESS OCCUPANT Tenant is Permit Applicant

Name: _____ Phone: _____ Email: _____

ARCHITECT/ENGINEER/CONSULTANT Architect/Engineer/Consultant is Permit Applicant

Name: _____ State Registration#: _____ Expiration Date: _____

Address: _____ City: _____ State: _____ Zip: _____

Phone: _____ Mobile: _____ Email: _____

HOMEOWNER AFFIDAVIT (Only required for residential permits obtained by homeowner.)

I hereby certify that I am the legal owner and occupant of the subject property and the work described on this permit application shall be completed by me. I am familiar with the applicable codes and requirements of the City of Detroit and take full responsibility for all code compliance, fees and inspections related to the installation/work herein described. I shall neither hire nor sub-contract to any other person, firm or corporation any portion of the work covered by this building permit.

Print Name: _____ Signature: _____ Date: _____
(Homeowner)

Subscribed and sworn to before me this _____ day of _____ 20 ____ A.D. _____ County, Michigan

Signature: _____ My Commission Expires: _____
(Notary Public)

PERMIT APPLICANT SIGNATURE

I hereby certify that the information on this application is true and correct. I have reviewed all deed restrictions that may apply to this construction and am aware of my responsibility thereunder. I certify that the proposed work is authorized by the owner of the record and I have been authorized to make this application as the property owner(s) authorized agent. Further I agree to conform to all applicable laws and ordinances of jurisdiction. **I am aware that a permit will expire when no inspections are requested and conducted within 180 days of the date of issuance or the date of the previous inspection and that expired permits cannot be**

Print Name: _____ Signature: *POW* _____ Date: _____
(Permit Applicant)

Driver's License #: _____ Expiration: _____

Subscribed and sworn to before me this _____ day of _____ 20 ____ A.D. _____ County, Michigan

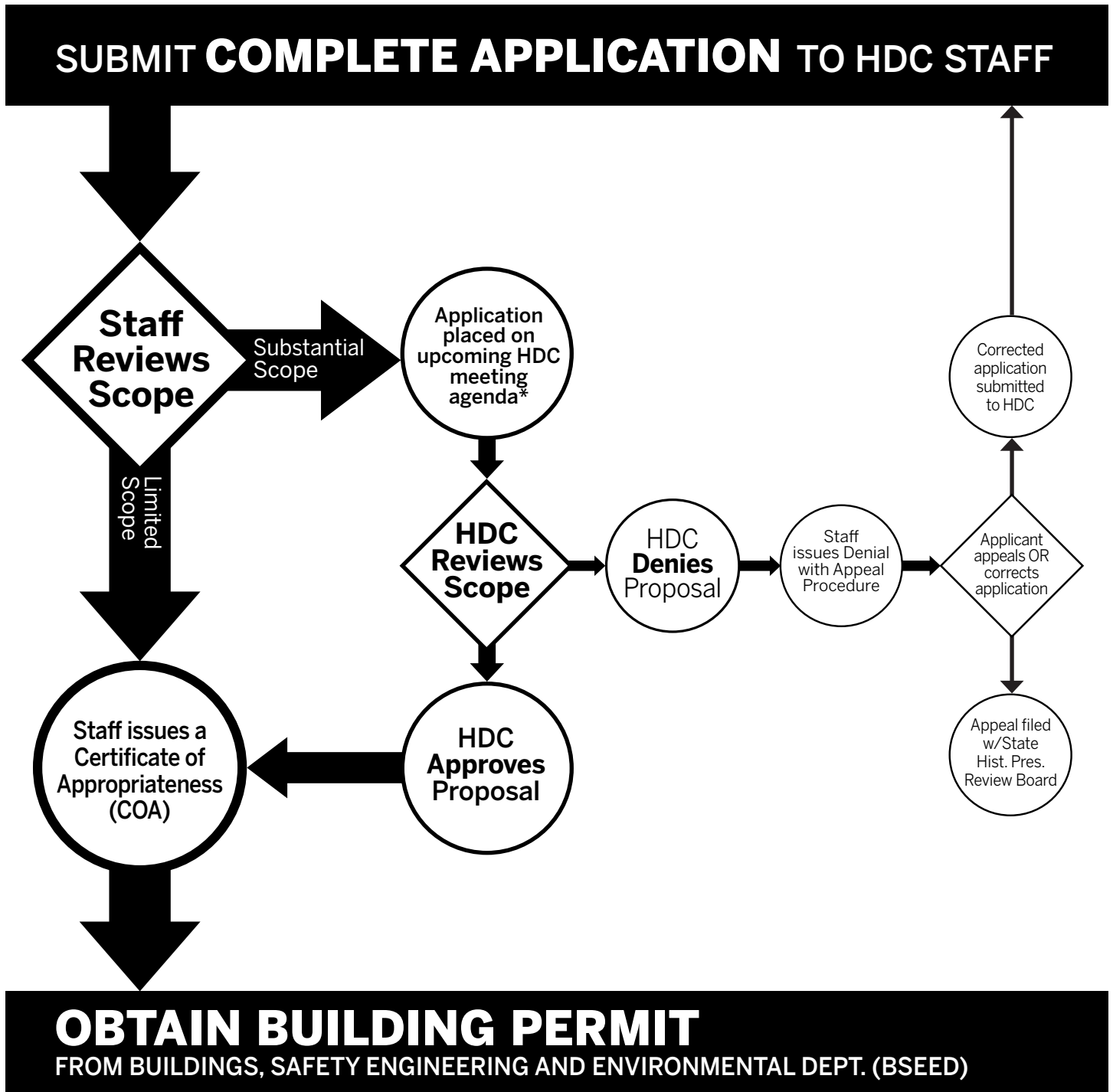
Signature: _____ My Commission Expires: _____
(Notary Public)

Section 23a of the state construction code act of 1972, 1972PA230, MCL 125.1523A, prohibits a person from conspiring to circumvent the licensing requirements of this state relating to persons who are to perform work on a residential building or a residential structure. Visitors of Section 23a are subject to civil fines.

This application can also be completed online. Visit detroitmi.gov/bseed/elaps for more information.



HISTORIC DISTRICT COMMISSION REVIEW & PERMIT PROCESS



* THE COMMISSION MEETS REGULARLY AT LEAST ONCE PER MONTH, TYPICALLY ON THE SECOND WEDNESDAY OF THE MONTH. (SEE WEBSITE FOR MEETING SCHEDULE/AGENDAS)

FIND OUT MORE AT www.detroitmi.gov/hdc

Job at 12746 Broadstreet Ave – Calvin Jude

Description of existing conditions: Installation on asphalt shingles. The existing roof structure will adequately support with the following: Racking and attachment mounting connection: (1) 5/16” lag screw w/ min. 2.5” embedment into framing at max 48” o/c along rails (2) rails per row of panels, evenly spaced; panel length perpendicular to the rails not to exceed 67 in. Solar module mounting hardware design is by the manufacturer.

- Ground snow (Pg): 20psf
- Wind Speed (V): 115 mph

Description of project: Installing 15 solar panels, 5.55kw grid tied, onto existing structure.

Detailed scope of proposed work for approval:

- Installing 15 roof-mounted solar modules
- Modules are 5.55 kw and grid tied
- Modules are to be installed on an existing residence
- Battery installation is also to be performed.

L-Mount | QMLM / QMLM-ST

Elevated Water Seal Technology®

ITEM NO.	DESCRIPTION	QTY.
1	FLASHING, ROUNDED CORNERS, 9" X 12" X .040", .438" HOLE, 5052, MILL	1
2	L-FOOT, 2" X 3.30" FOR .438" O.D. FASTENER, 2-1/16" SLOT, 6061-T6/6005A-T61, MILL	1
3	WASHER, SEALING, 5/16" ID X 3/4" OD, EPDM BONDED SS	1
4	LAG SCREW, HEX HEAD, 5/16" X 4", 18-8 SS	1
*5	STRUCTURAL SCREW, GMPV, T-30 HEX WASHER HEAD, 5/16" X 4-1/2", 18-8SS	1

Quick Mount PV®
 TITLE: QMLM & QMLM-ST: L-MOUNT, 2-1/16" SLOT
 UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES; TOLERANCES: FRACTIONAL ± 1/8; TWO PLACE DECIMAL ± .01; THREE PLACE DECIMAL ± .004
 SIZE: A DRAWN BY: AAP DATE: 4/4/2019 REV: 11
 SCALE: 1:4 WEIGHT: 0.7566 SHEET 1 OF 1

L-Mount Installation Instructions

Installation Tools Required: tape measure, roofing bar, chalk line, stud finder, caulking gun, sealant compatible with roofing materials, drill with 7/32" or 1/8" bit, drill or impact gun with 1/2" socket.

WARNING: Quick Mount PV products are NOT designed for and should NOT be used to anchor fall protection equipment.

1 Locate, choose, and mark centers of rafters to be mounted. Select the courses of shingles where mounts will be placed.

2 Carefully lift composition roof shingle with roofing bar, just above placement of mount. Remove nails as required and backfill holes with approved sealant. See "Proper Flashing Placement" on next page.

3 Insert flashing between 1st and 2nd course. Slide up so top edge of flashing is at least 3/4" higher than the butt-edge of the 3rd course and lower flashing edge is above the butt-edge of 1st course. Mark center for drilling.

4 If attaching with lag bolt use a 7/32" bit (Lag). Use a 1/8" bit (ST) for attaching with the structural screw. Drill pilot hole into roof and rafter, taking care to drill square to the roof. Do not use mount as a drill guide. Drill a 2" deep hole into rafter.

5 Clean off any sawdust, and fill hole with sealant compatible with roofing materials.

6 Place L-foot onto elevated flute and rotate L-foot to desired orientation.

7 Prepare lag bolt or structural screw with sealing washer. Using a 1/2-inch socket on an impact gun, drive prepared lag bolt through L-foot until L-foot can no longer easily rotate. **DO NOT over-torque.** NOTE: Structural screw can be driven with T-30 hex head bit.

8 You are now ready for the rack of your choice. Follow all the directions of the rack manufacturer as well as the module manufacturer. NOTE: Make sure top of L-Foot makes solid contact with racking.

All roofing manufacturers' written instructions must also be followed by anyone modifying a roof system. Consult the roof manufacturer's specs and instructions prior to working on the roof.

BI 7.2.3-44

Apr-2019 Rev 6



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 "POWER YOUR FUTURE"
 919 N. MAIN ST.
 MOORESVILLE, NC 28115
 Phone: 704-800-6591 (OFFICE)
 Email: info@powerhome.com
 Web: www.powerhome.com

REVISIONS		
DESCRIPTION	DATE	REV

Signature with Seal

DATE: 8/25/2021

PROJECT NAME & ADDRESS

CALVIN JUDE
 RESIDENCE
 12746 BROADSTREET AVE.,
 DETROIT, MI 48238

SHEET NAME
 EQUIPMENT SPECIFICATION

SHEET SIZE
 ANSI B
 11" X 17"

SHEET NUMBER
 PV-12

T-Bolt



Item Code	Part Number	Description	Finish
QMR-TB A 300	880	T-Bolt w/ Nut, 300 Pack	stainless steel

Grounding Lug



Item Code	Part Number	Description	Finish
QMR-GL A 50	890	WEEB Lug w/ T-Bolt, 50 Pack	n/a

Wire Clip



Works with both PV and Trunk Cabling

Item Code	Part Number	Description	Finish
QMR-WCA 300	892	Trunk/PV Cable, 300 Pack	stainless steel

WEEB BMC



Item Code	Part Number	Description	Finish
QMR-ECWA 50	891	WEEB BMC, 50 Pack	stainless steel



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SHEET SIZE

ANSI B
 11" X 17"

SHEET NUMBER

PV-11C

Universal End Clamp with QClick™ Technology



Black

Mill

Item Code	Part Number	Description	Finish
QMR-UEC3045 A 20	860	Universal End Clamp, 30-45mm, 20 Pack	Mill
QMR-UEC3850 A 20	861	Universal End Clamp, 38-50mm, 20 Pack	Mill
QMR-UEC3045 B 20	865	Universal End Clamp, 30-45mm, 20 Pack	Black
QMR-UEC3850 B 20	866	Universal End Clamp, 38-50mm, 20 Pack	Black
QMR-UEC3045BP A 20	862	Universal End Clamp, 30-45mm, w/ Bonding, 20 Pack	Mill
QMR-UEC3850BP A 20	863	Universal End Clamp, 38-50mm, w/ Bonding, 20 Pack	Mill
QMR-UEC3045BP B 20	867	Universal End Clamp, 30-45mm, w/ Bonding, 20 Pack	Black
QMR-UEC3850BP B 20	868	Universal End Clamp, 38-50mm, w/ Bonding, 20 Pack	Black

Mid Clamp with QClick™ Technology



Black

Mill

Item Code	Part Number	Description	Finish
QMR-UMC3045BP 1.2 A 20	872	Universal Mid Clamp, 30-45mm, w/ Bonding, 20 Pack	Mill
QMR-UMC3850BP 1.2 A 20	873	Universal Mid Clamp, 38-50mm, w/ Bonding, 20 Pack	Mill
QMR-UMC3045BP 1.2 B 20	877	Universal Mid Clamp, 30-45mm, w/ Bonding, 20 Pack	Black
QMR-UMC3850BP 1.2 B 20	878	Universal Mid Clamp, 38-50mm, w/ Bonding, 20 Pack	Black

Single-Slot L-Foot



Item Code	Part Number	Description	Finish
QMC-LF A 12	692	Single-slot L-foot, 12 Pack	Mill
QMC-LF B 12	693	Single-slot L-foot, 12 Pack	Black

End Caps



Heavy

Standard

Light

Item Code	Part Number	Description	Finish
QMR-CPL B 50	885	End Cap Light, 50 Pack	Black
QMR-CPS B 50	886	End Cap Standard, 50 Pack	Black
QMR-CPH B 50	887	End Cap Heavy, 50 Pack	Black



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QRail™ Configurations



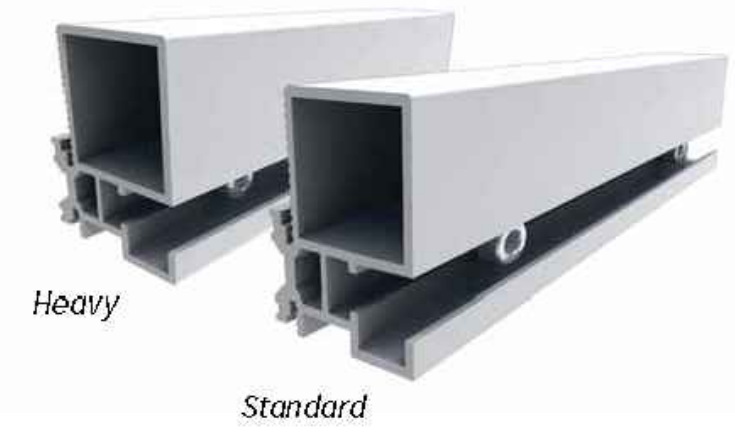
Item Code	Part Number	Description	Finish
QMR-RL14 A 60	800	QRail Light, 14 ft., 60 Pack	Mill
QMR-RL17.3 A 60	801	QRail Light, 17.3 ft., 60 Pack	Mill
QMR-RL14 B 60	805	QRail Light, 14 ft., 60 Pack	Black
QMR-RL17.3 B 60	806	QRail Light, 17.3 ft., 60 Pack	Black
QMR-RS14 A 60	810	QRail Standard, 14 ft., 60 Pack	Mill
QMR-RS17.3 A 60	811	QRail Standard, 17.3 ft., 60 Pack	Mill
QMR-RS14 B 60	815	QRail Standard, 14 ft., 60 Pack	Black
QMR-RS17.3 B 60	816	QRail Standard, 17.3 ft., 60 Pack	Black
QMR-RH14 A 60	820	QRail Heavy, 14 ft., 60 Pack	Mill
QMR-RH17.3 A 60	821	QRail Heavy, 17.3 ft., 60 Pack	Mill
QMR-RH14 B 60	825	QRail Heavy, 14 ft., 60 Pack	Black
QMR-RH17.3 B 60	826	QRail Heavy, 17.3 ft., 60 Pack	Black

QSplice™ Internal Structural Splice



Item Code	Part Number	Description	Finish
QMR-ISL A 15	830	QSplice Internal, Light, 15 Pack	Mill
QMR-ISS A 15	831	QSplice Internal, Standard, 15 Pack	Mill
QMR-ISH A 15	832	QSplice Internal, Heavy, 15 Pack	Mill

QSplice™ External Structural Splice



Item Code	Part Number	Description	Finish
QMR-ESS A 15	834	QSplice External, Standard, 15 Pack	Mill
QMR-ESH A 15	835	QSplice External, Heavy, 15 Pack	Mill

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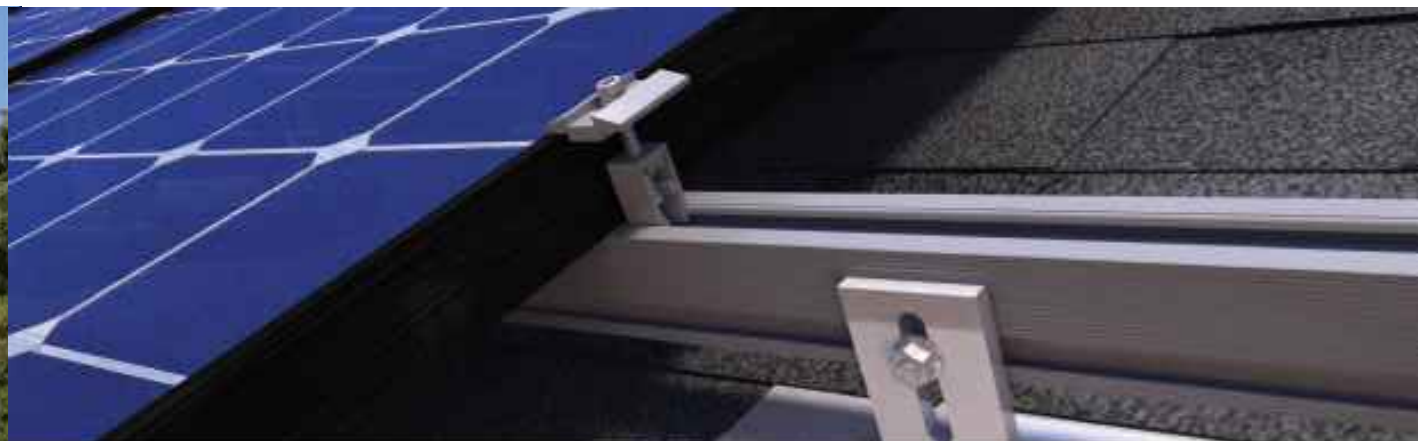
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SHEET SIZE
**ANSI B
 11" X 17"**

SHEET NUMBER
PV-11A



QRail™ — Fully Integrated Mounting and Racking System

The QRail Series is a strong and versatile solar array mounting system that provides unrivaled benefits to solar designers and installers. Combined with Quick Mount PV's industry-leading waterproof mounts, QRail offers a complete racking solution for mounting solar modules on any roof.



Easily design array configurations with the QDesign software application. Generate complete engineering reports and calculate a precise bill of materials for all the mounting, racking and accessories needed for a complete solar array.

Comprehensive, One-Source Solution

QRail, together with Quick Mount PV's waterproof mounting products, provides the benefit of a single-sourced, seamlessly integrated rooftop installation that works with all roof types — composition/asphalt shingles, flat or curved tile, metal shingle, shake, slate and low slope roofs. The QRail system also works with any roof attachment system for maximum flexibility.

Superior Strength and Versatility

QRail is engineered for optimal structural performance. The system is certified to UL 2703, fully code compliant and backed by a 25-year warranty. QRail is available in Light, Standard and Heavy versions to match all geographic locations. QRail is compatible with virtually all modules and works on a wide range of pitched roof surfaces. Modules can be mounted in portrait or landscape orientation in standard or shared-rail configurations.

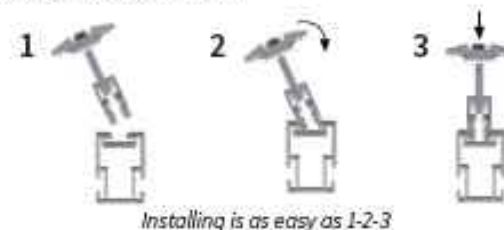


QRails come in two lengths — 168 inches (14 ft) and 208 inches (17.3 ft)
Mill and Black Finish

Fast, Simple Installation: It Just Clicks

QClick Technology™

The universal mid and end clamps use QClick technology to simply "click" into the rail channel and remain upright, ready to accept the module. The pre-assembled clamps fit virtually all module frames and require no extra hardware, eliminating pre-loading and reducing installation time.



Installing is as easy as 1-2-3



UNIVERSAL END CLAMP
2 clamps for modules from 30-45mm or 38-50mm thick



UNIVERSAL BONDED MID CLAMP
2 clamps for modules from 30-45mm or 38-50mm thick

QSplice™ Technology

QRail's innovative internal QSplice installs in seconds, requiring no tools or screws. Simply insert QSplice into the rail and slide the other rail on to create a fully structural, bonded splice. An external splice is also available.



Installs in seconds — no tools or hardware required

Fully Integrated Electrical Bonding

The QRail system provides an integrated electrical bonding path, ensuring that all exposed metal parts and the solar module frames are electrically connected. All electrical bonds are created when the components are installed and tightened down.



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SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-11

GENERAC

PV Link™

2500W MPPT Substring Optimizer
Model #: S2502 (Ordering SKU: APKE00010)

PV Link is the simple solar optimizer for quick installation and long-lasting performance. Connect PV modules to each PV Link to overcome shading and challenging roof lines.

FEATURES & BENEFITS

- Fast, simple installation
- Lower failure risk than module-level optimizers
- 2017/2020 NEC rapid shutdown compliant with SnapRS™
- Quick connections with MC4 connectors
- Exports up to 2500W
- Compatible with PWRcell™ Inverters
- Cost-effective solution for high-performance PV
- Ground-fault protection

SINGLE-STRING PV ARRAY WITH SnapRS DEVICES

Where PV module-level rapid shutdown is required (NEC 690.12), a SnapRS device (RS) is installed to negative (-) lead of each PV module.

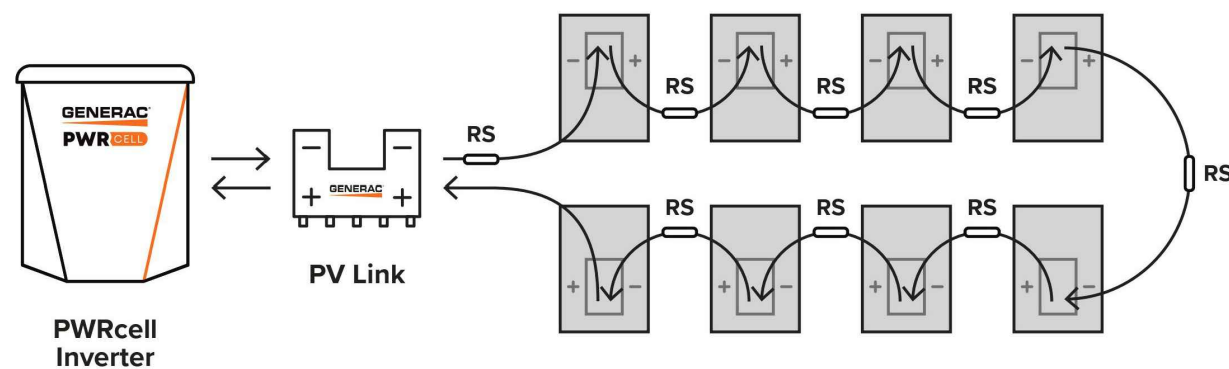


Diagram is applicable for most 60 cell PV modules. Modules with higher cell count may require a different arrangement. Contact Generac for more details.



Specifications

PV Link™ (APKE00010)	
RATED POWER*:	2500W
PEAK EFFICIENCY:	99%
MPPT VOLTAGE RANGE:	60-360 VMP
MAX INPUT VOLTAGE:	420 VOC; max when cold
MAX OUTPUT:	420 VOC
NOMINAL OUTPUT (REbus™):	380 VDC
MAX OUTPUT CURRENT (CONTINUOUS):	8 A
MAX OUTPUT CURRENT (FAULT):	10 A
MAX INPUT CURRENT (CONTINUOUS):	13 A @ 50°C, 10 A @ 70°C
MAX INPUT SHORT CIRCUIT CURRENT (ISC):	18 A
STANDBY POWER:	< 1 W
PROTECTIONS:	Ground-fault, Arc-fault (Arc-fault Type 1 AFCI, Integrated), PVRSE
MAX OPERATING TEMP: FAHRENHEIT (CELSIUS):	158 °F (70 °C)
SYSTEM MONITORING:	PWRview™ Web Portal and Mobile App
ENCLOSURE:	Type 4X
WEIGHT - LB (KG):	7.3 lb (3.3 kg)
DIMENSIONS, L x W x H - IN (MM):	15.4" x 2" x 9.6" (391.2 x 50.8 x 243.8)
COMPLIANCE:	UL 1741, CSA 22.2
WARRANTY:	25 Years

*PV Link can tolerate higher than rated power at its input if Max Input Voltage and Short Circuit Current specifications are not exceeded



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MOORESVILLE, NC 28115
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Email: info@powerhome.com
Web: www.powerhome.com

REVISIONS

DESCRIPTION	DATE	REV

Signature with Seal

DATE: 8/25/2021

PROJECT NAME & ADDRESS

CALVIN JUDE
RESIDENCE
12746 BROADSTREET AVE.,
DETROIT, MI 48238

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-10

GENERAC

PWRCELL

3.0kWh DCB BATTERY MODULE

3.0kWh PWRcell DCB Battery Module
Model #: BJ-DCB05ZKBG (Ordering SKU: G0080040)



Build a better backup system with the Generac DCB Battery Module for PWRcell™. Add capacity and backup power with as few as three or as many as six modules. Upgrade a PWRcell Battery post-installation with the addition of more DCB modules for more power and capacity.

FEATURES & BENEFITS

- Suitable for indoor and outdoor cabinets
- Modular: Stack the right number of battery modules for the application
- Upgradeable: Add more modules later when consumer needs change
- Easy to install: At just 55lbs, installers won't need special equipment to move and install these batteries

SPECIFICATIONS

NOMINAL VOLTAGE:	46.8 VDC
USABLE CAPACITY @ TYPICAL VOLTAGE:	3.00 kWh
MAXIMUM AMBIENT OPERATING TEMPERATURE:	14 to 122 °F (-10 to 50 °C)
OPTIMAL AMBIENT OPERATING TEMPERATURE:	41 to 104 °F (5 to 40 °C)
STORAGE TEMPERATURE RANGE:	68 °F (20 °C)
SCALABILITY:	3-6 pcs in series
DIMENSIONS, L x W x H - IN (MM):	17.3" x 17.7" x 3.3" (440 x 450 x 84)
WEIGHT - LB (KG):	55 (25)
BATTERY CHEMISTRY:	Lithium Nickel Manganese Cobalt (NMC)
WARRANTY:	10 years or 7.56MWh Throughput (per module)

Note: Charge/discharge rate may be reduced at temperature extremes

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Overview of technical specifications

PWRcell™ BATTERY CONFIGURATIONS

BATTERY MODULE SERIES:	3.0 kWh DCB / 3.0 kWh EX			
BATTERY MODULES:	3	4	5	6
USABLE ENERGY:	9 kWh	12 kWh	15 kWh	18 kWh
NOMINAL CONT. AC POWER ¹ :	3.4 kW	4.5 kW	5.6 kW	6.7 kW
MAX. CONT. AC POWER ² :	4.5 kW	6 kW	7.5 kW	9 kW
MAX. CONT. DC CURRENT (CHARGE/DISCHARGE) - A:	13.8	18.4	23.0	27.5
PEAK MOTOR STARTING CURRENT (2 SEC) - A, RMS:	25	33	42	50
REbus™ VOLTAGE - INPUT/OUTPUT:	360-420 VDC			
NOMINAL VOLTAGE:	380 VDC			
DC-DC ROUND-TRIP EFFICIENCY:	96.5%			
MAXIMUM AMBIENT OPERATING TEMPERATURE:	14 to 122 °F (-10 to 50 °C)			
RECOMMENDED AMBIENT OPERATING TEMPERATURE:	41 to 104 °F (5 to 40 °C)			
MAXIMUM INSTALLATION ALTITUDE - FT (M):	9834 (3000)			
DIMENSIONS, L x W x H - IN (MM):	22" X 10" X 68" (559 X 254 X 1727)			
WEIGHT, ENCLOSURE - LB (KG):	111 (50)			
WEIGHT, INSTALLED W/ DCB MODULES- LB (KG):	276 (125)	331 (150)	386 (175)	441 (200)
WEIGHT, INSTALLED W/ EX MODULES - LB (KG):	282 (128)	340 (154)	397 (180)	454 (206)
ENCLOSURE TYPE:	Type 1			
WARRANTY - LI-ION MODULES:	10 Years, (7.56MWh)			
WARRANTY - ELECTRONICS AND ENCLOSURE:	10 Years			
COMMUNICATION PROTOCOL:	REbus™ DC Nanogrid™			
SEISMIC RATING:	IEEE 693-2018 (HIGH)			
COMPLIANCE:	UL 9540, UL 1973, UL 1642, CSA 22.2 #107.1			



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DATE: 8/25/2021

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CALVIN JUDE
RESIDENCE
12746 BROADSTREET AVE.,
DETROIT, MI 48238

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-9

GENERAC[®] PWRCELL[™] OUTDOOR RATED BATTERY

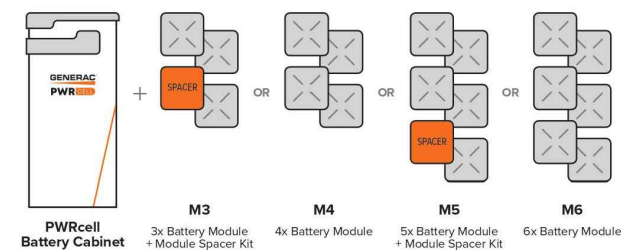
PWRcell Outdoor Rated Battery Cabinet (Ordering SKU: APKE00028)
 3.0kWh PWRcell DCB Battery Module
 Model #: BJ-DCB05ZKBG (Ordering SKU: G0080040)
 3.0kWh PWRcell EX Battery Module
 Model #: G0080001

The PWRcell™ Outdoor Rated (OR) Battery Cabinet is a Type 3R smart battery enclosure that allows for a range of configurations to suit any need, small or large, indoor or outdoor. No other smart battery offers the power and flexibility of PWRcell.

PWRcell BATTERY CABINET DESIGN

The PWRcell Battery Cabinet allows system owners the flexibility to scale from an economical 9kWh to a massive 18kWh by installing additional battery modules to the PWRcell Battery Cabinet. An existing PWRcell Battery Cabinet can be upgraded with additional modules. Use the graphic below and the chart on the back of this sheet to understand what components you need for your chosen PWRcell configuration.

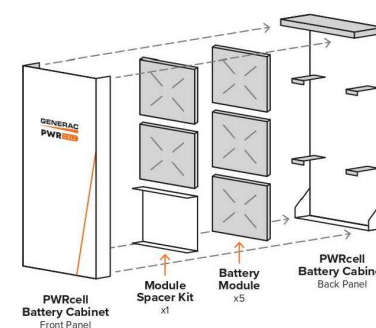
BATTERY CONFIGURATION GUIDE



FEATURES & BENEFITS

- Connect 2 PWRcell Battery Cabinets to a single PWRcell Inverter for up to 36kWh of storage
- Best-in-class battery backup power
- Plug-and-play with PWRcell Inverter and PV Link™
- Time-of-use (TOU) and zero-export ready
- Residential and commercial application ready.
- 3R-rated cabinet allows for outdoor or indoor installation
- Additional mounting hardware for outdoor installations comes standard to provide additional ground clearance and support

BATTERY CABINET ASSEMBLY



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 DETROIT, MI 48238

SHEET NAME
**EQUIPMENT
 SPECIFICATION**

SHEET SIZE
**ANSI B
 11" X 17"**

SHEET NUMBER
PV-9A

GENERAC

SnapRS™

Inline Disconnect Switch
Model #: RS801 (Ordering SKU: APKE00011)



Generac SnapRS are a simple way to satisfy rapid shutdown compliance for solar + storage systems. Generac SnapRS are 2017/2020 NEC 690.12 compliant, don't require any extra hardware to mount, and need no pairing or fussy digital communications.

FEATURES & BENEFITS

- Fast, easy, and simple to install
- One SnapRS device per PV module
- Achieves PVRSS Compliance
- Low cost, high efficiency solution

SYSTEM DESIGN

Snap a Generac SnapRS disconnect device (RS) to the negative lead (-) of each module in the solar array for simple module-level rapid shutdown compliance. SnapRS devices isolate array voltage when a rapid shutdown is initiated at a PWRcell™ Inverter. When rapid shutdown is initiated, SnapRS units isolate each PV module in the array, reducing array voltage to <80V in seconds.

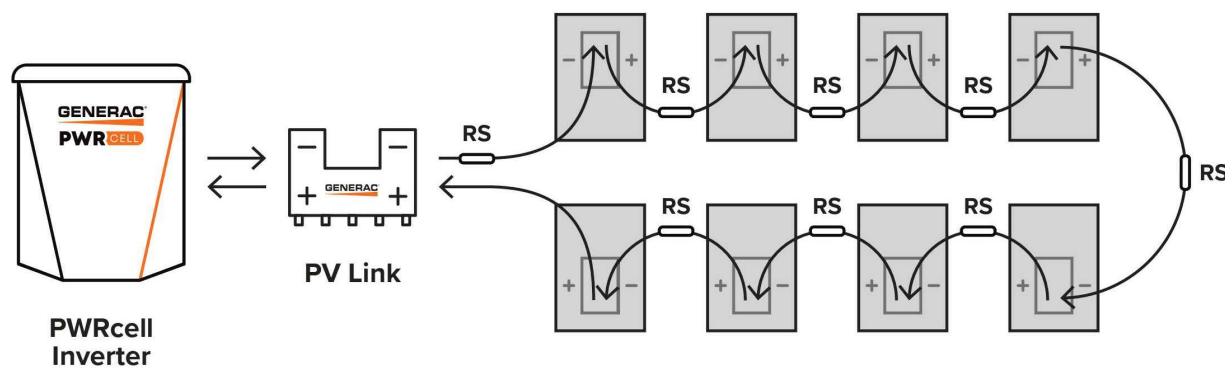


Diagram is applicable for most 60 cell PV modules. Modules with higher cell count may require a different arrangement. Contact Generac for more details.

Specifications

SnapRS™ (APKE00011)

PV MODULE MAX VOC:	75 V
EFFICIENCY:	99.8%*
MAX INPUT CURRENT:	13 A
MAX TOTAL QTY IN SUBSTRING:	10
SHUTDOWN TIME:	< 10 Seconds
ENCLOSURE RATING:	NEMA 6P
OPERATING TEMPERATURE - FAHRENHEIT (CELSIUS):	-40 to 158 °F (-40 to 70 °C)
CERTIFICATIONS:	UL1741
PROTECTIONS:	PVRSE
WEIGHT - LB (KG):	0.17 (0.08)
DIMENSIONS, L x W x H - IN (MM):	7" x 1" x 1" (177.8 x 25.4 x 25.4)
WARRANTY:	25 Years

*When used with a 50V panel

Connect one SnapRS device to the negative lead of each PV module in the PV Link controlled array for complete PV Rapid shutdown performance



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SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-8

GENERAC

PWRCELL

7.6kW 1Ø PWRcell Inverter with CTs
Model #: XVT076A03

11.4 kW 3Ø PWRcell Inverter with CTs
Model #: X11402 (Ordering SKU: APKE00013)



Solar + storage is simple with the Generac PWRcell™ Inverter. This bi-directional, REbus™-powered inverter offers a simple, efficient design for integrating smart batteries with solar. Ideal for self-supply, backup power, zero-export and energy cost management, the PWRcell Inverter is the industry's most feature-rich line of inverters, available in single-phase and three-phase models.

FEATURES & BENEFITS

- Single inverter for grid-tied solar with smart battery integration
- Simplified system design: No autotransformer or battery inverter needed
- User-selectable modes for backup power, self-supply, time-of-use, zero-import and export limiting
- Free system monitoring included via PWRview™ Web Portal and Mobile App

AC OUTPUT/GRID-TIE	MODEL XVT076A03	MODEL X11402
CONT. GRID-TIED AC POWER @ 50°C (122°F):	7600 W	11400 W
AC OUTPUT VOLTAGE:	120/240, 1Ø VAC	120/208, 3Ø VAC
AC FREQUENCY:	60 Hz	
MAXIMUM CONTINUOUS OUTPUT CURRENT:	32 A, RMS	
GROUND-FAULT ISOLATION DETECTION:	Included	
CHARGE BATTERY FROM AC:	Yes	
THD (CURRENT):	< 2%	
TYPICAL NIGHTTIME POWER CONSUMPTION ¹ :	< 7 W	

DC INPUT	MODEL XVT076A03	MODEL X11402
DC INPUT VOLTAGE RANGE:	360-420 VDC	
NOMINAL DC BUS VOLTAGE:	380 VDC	
DC DISTRIBUTION INPUT BREAKERS:	4 x 2P30 A	
MAX INPUT CURRENT PER DC INPUT:	30 A	
REVERSE-POLARITY PROTECTION:	Yes	
TRANSFORMERLESS, UNGROUNDED:	Yes	
DC BUS EXPORT FUSES (+/-):	40 A	
2-POLE DISCONNECTION:	Yes	

AC OUTPUT/ISLAND MODE	MODEL XVT076A03	MODEL X11402
MAX. CONT. AC POWER WHILE IN ISLAND MODE WITHOUT AN EXTERNAL TRANSFER SWITCH ² :	7600 W	
MAX. CONT. AC POWER WHILE IN ISLAND MODE W/ EXTERNAL TRANSFER SWITCH AND SINGLE 6 MODULE BATTERY CABINET ³ :	9000 W	
MAX. CONT. AC POWER WHILE IN ISLAND MODE W/ EXTERNAL TRANSFER SWITCH AND 2 BATTERY CABINETS (8 MODULES MINIMUM) ³ :	11000 W	9600 W-11000 W*
PEAK MOTOR STARTING CURRENT (2 SEC):	50 A, RMS	
AC BACKUP OUTPUT VOLTAGE:	120/240, 1Ø VAC	120/208, 1Ø VAC
AC FREQUENCY:	60 Hz	
THD (VOLTAGE):	< 2%	
ALLOWABLE SPLIT PHASE IMBALANCE:	Up to 30%	

EFFICIENCY	MODEL XVT076A03	MODEL X11402
PEAK EFFICIENCY:	97.3%	97.7%
CEC WEIGHTED EFFICIENCY:	96.5%	97.5%

¹Nighttime power consumption depends on the system mode
²In Island Mode, continuous power output is restricted to 7.6kW unless backup power is routed through an external transfer switch in a whole home backup application.
³Peak performance, values provided for 40°C (104°F).
 *In Island mode X11402 protected loads only supply 2 phases 120 VAC L-N, 208 L-L which results in lower power than in a grid tied 3 phase state. The low value of the range is for full L-L loading while high value of the range is full L-N loading

Specifications

FEATURES AND MODES

ISLAND MODE ⁴ :	Yes
GRID SELL:	Yes
SELF CONSUMPTION:	Yes
PRIORITIZED CHARGING FROM RENEWABLES:	Yes
GRID SUPPORT - ZERO EXPORT:	Yes
ESS PCS OPERATION MODES (IMPORT ONLY, EXPORT ONLY):	Yes

ADDITIONAL FEATURES

SUPPORTED COMMUNICATION INTERFACES:	REbus™, CANbus, Ethernet
SYSTEM MONITORING:	PWRview™ Web Portal and Mobile App
BACKUP LOADS DISCONNECT ⁴ :	Yes, 50 A Circuit Breaker
INVERTER BYPASS SWITCH:	Automatic
WARRANTY:	10 Years

STANDARDS COMPLIANCE

SAFETY:	UL 1741 SA, CSA 22.2 #107.1, UL 1998
GRID CONNECTION STANDARDS:	IEEE 1547, Rule 21, Rule 14H (HECO V1.1), CSIP, UL 1741 PCS CRD (Import Only, Export Only)
EMISSIONS:	FCC Part 15 Class B

DIMENSIONS AND INSTALLATION SPECIFICATIONS

ENCLOSURE KNOCKOUTS - QTY, SIZE - IN (MM):	6 x Combo 3/4" x 1" (19 x 25.4) 7 x Combo 1/2" x 3/4" (12.7 x 19)	1 x 0.575" exclusively for optional LTE antenna mounting
DIMENSIONS L x W x H - IN (MM):	24.5" x 19.25" x 8" (622.3 x 488.9 x 203.2)	
WEIGHT - LB (KG):	62.7 (28.4)	
COOLING:	Forced convection	
AUDIBLE NOISE:	< 40 dBA	
OPERATING TEMPERATURE:	-4 to 122 °F (-20 to 50 °C) ⁵	
ENCLOSURE TYPE:	Type 3R	

INSTALLATION GUIDELINES

BATTERY TYPES SUPPORTED:	PWRcell™ Battery
MODULE SUBSTRING SIZE PER PV LINK OPTIMIZER:	Varies, refer to PV Link Installation Manual
MAXIMUM RECOMMENDED DC POWER FROM PV ⁶ :	10 kW (1Ø), 15 kW (3Ø)

⁴3Ø inverters offer backup for [single phase] 208 V loads.
⁵Includes ambient temperature rising from inverter operation. Reduced power at extreme temperatures.
⁶Values provided for PV-only or small storage systems. Additional PV power is permissible if sufficient battery storage capacity is installed.

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DATE: 8/25/2021

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CALVIN JUDE
 RESIDENCE
 12746 BROADSTREET AVE.,
 DETROIT, MI 48238

SHEET NAME
**EQUIPMENT
 SPECIFICATION**

SHEET SIZE

**ANSI B
 11" X 17"**

SHEET NUMBER

PV-7

Electrical Specifications		SIL-370 NX mono PERC	
Test Conditions		STC	NOCT
Module Power (Pmax)	Wp	370	266
Maximum power voltage (Vpmax)	V	37.2	33.7
Maximum power current (Ipmax)	A	10.0	7.9
Open circuit voltage (Voc)	V	44.8	40.7
Short circuit current (Isc)	A	10.6	8.3
Module efficiency	%	20.2	18.2
Maximum system voltage (VDC)	V		1000
Series fuse rating	A		20
Power Tolerance	Wp		±3%
Measurement conditions: STC 1000 W/m ² • AM 1.5 • Temperature 25 °C • NOCT 800 W/m ² • AM 1.5 • Measurement uncertainty ≤ 3% • Sun simulator calibration reference modules from Fraunhofer Institute. Electrical characteristics may vary by ±5% and power by ±3%.			
Temperature Ratings		SIL-370 NX mono PERC	
Temperature Coefficient Isc		+0.064 %/°C	
Temperature Coefficient Voc		-0.28 %/°C	
Temperature Coefficient Pmax		-0.36 %/°C	
NOCT (± 2°C)		46 °C	
Operating temperature		-40/+85 °C	
Mechanical Properties and Components		SIL-370 NX mono PERC	
		Metric	Imperial
Module weight		20±0.2 kg	44±0.4 lbs
Dimensions (H x L x D)		1832 mm x 1000 mm x 38 mm	72.13 in x 39.4 in x 1.5 in
Maximum surface load (wind/snow)*		4000 Pa rear load / 5400 Pa front load	83.5/112.8 lb/ft ²
Hail impact resistance		Ø 25 mm at 83 km/h	Ø 1 in at 51.6 mph
Cells		66 - Si mono-PERC - 5 busbar 158.75 x 158.75 mm	66 - Si mono-PERC - 5 busbar 62.25 x 62.25 in
Glass		3.2 mm high transmittance, tempered, DSM anti-reflective coating	0.126 in high transmittance, tempered, DSM anti-reflective coating
Cables and connectors (refer to installation manual)		1200 mm Ø 5.7 mm, MC4 from Staubli	47.2 in, Ø 0.22 (12AWG), MC4 from Staubli
Backsheet		High durability, superior hydrolysis and UV resistance, multi-layer dielectric film, fluorine-free PV backsheet	
Frame		Anodized Aluminum (Black)	
Bypass diodes		3 diodes-30SQ045T (45V max DC blocking voltage, 30A max forward rectified current)	
Junction Box		UL 3730 Certified, IEC 62790 Certified, IP67 rated	
Warranties		SIL-370 NX mono PERC	
Module product workmanship warranty		25 years**	
Linear power performance guarantee		30 years	
		≥ 97.1% end 1 st year ≥ 91.6% end 12 th year ≥ 85.1% end 25 th year ≥ 82.6% end 30 th year	
Certifications		SIL-370 NX mono PERC	
Product		ULC ORD C1703, UL1703, CEC listed***, UL 61215-1/-1-1/-2, UL 61730-1/-2, IEC 61215-1/-1-1/-2***, IEC 61730-1/-2***, CSA C22.2#61730-1-2, IEC 62716 Ammonia Corrosion; IEC61701:2011 Salt Mist Corrosion Certified, UL Fire Rating: Type 2	
Factory		ISO9001:2015	

All states except California California
 ■ Modules Per Pallet: 26 ■ Modules Per Pallet: 26
 ■ Pallets Per Truck: 34 ■ Pallets Per Truck: 32
 ■ Modules Per Truck: 884 ■ Modules Per Truck: 832

*▲ Warning. Read the Safety and Installation Manual for mounting specifications and before handling, installing and operating modules.

**12 year extendable to 25 years subject to registration and conditions outlined under "Warranty" at www.silfabsolar.com.

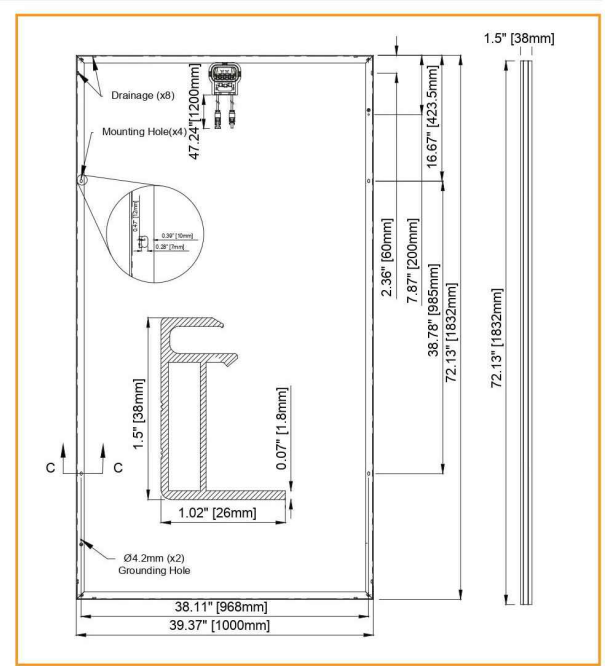
***Certification and CEC listing in progress.

PAN files generated from 3rd party performance data are available for download at: www.silfabsolar.com/downloads.



Silfab Solar Inc.
 240 Courtneypark Drive East
 Mississauga ON L5T 2Y3 Canada
 Tel +1 905-255-2501 | Fax +1 905-696-0267
 info@silfabsolar.com | www.silfabsolar.com

Silfab Solar Inc.
 800 Cornwall Ave
 Bellingham WA 98225 USA
 Tel +1 360-569-4733



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 "POWER YOUR FUTURE"
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SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
**ANSI B
 11" X 17"**

SHEET NUMBER
PV-6

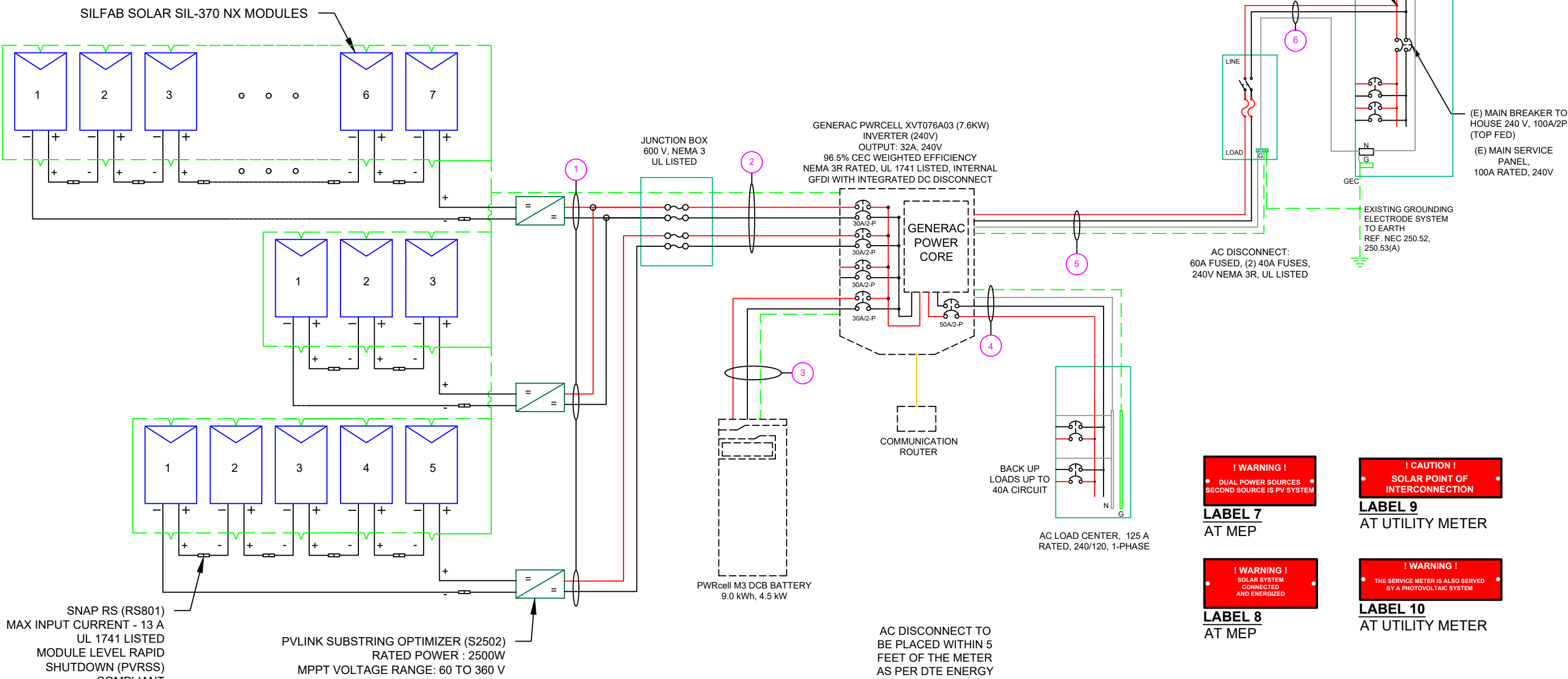
(15) SILFAB SOLAR SIL-370 NX MODULES
 (1) PV LINK OF 7 MODULES &
 (1) PV LINK OF 3 MODULES &
 (1) PV LINK OF 5 MODULES CONNECTED IN SERIES

SERVICE INFO

UTILITY PROVIDER: DTE ENERGY
 MAIN SERVICE VOLTAGE: 240V
 MAIN PANEL BRAND: N/A
 MAIN SERVICE PANEL: 100A
 MAIN CIRCUIT BREAKER RATING: 100A
 MAIN SERVICE LOCATION: NORTH-EAST
 SERVICE FEED SOURCE: OVERHEAD

WIRE LEGEND

- PV ARRAY +VE CONDUCTOR AND L1
- PV ARRAY -VE CONDUCTOR AND L2
- NEUTRAL CONDUCTOR
- EGC AND GEC
- SINGLE TWISTED PAIR, CAT 5 WIRE



SNAP RS (RS801)
 MAX INPUT CURRENT - 13 A
 UL 1741 LISTED
 MODULE LEVEL RAPID
 SHUTDOWN (PVRSS)
 COMPLIANT
 NEMA 6P RATED

PV LINK SUBSTRING OPTIMIZER (S2502)
 RATED POWER : 2500W
 MPPT VOLTAGE RANGE: 60 TO 360 V
 MAX OUTPUT VOLTAGE: 420V
 MAX OUTPUT CURRENT: 8A
 RAPID SHUTDOWN COMPLIANT
 GROUND-FAULT PROTECTION COMPLIANT

GENERAC PWRCELL XVT076A03 (7.6kW)
 INVERTER (240V)
 OUTPUT: 32A, 240V
 96.5% CEC WEIGHTED EFFICIENCY
 NEMA 3R RATED, UL 1741 LISTED, INTERNAL
 GFDI WITH INTEGRATED DC DISCONNECT

AC DISCONNECT:
 60A FUSED, (2) 40A FUSES,
 240V NEMA 3R, UL LISTED

(E) MAIN BREAKER TO
 HOUSE 240 V, 100A/2P
 (TOP FED)
 (E) MAIN SERVICE
 PANEL,
 100A RATED, 240V

! WARNING !
 DUAL POWER SOURCES
 SECOND SOURCE IS PV SYSTEM

! CAUTION !
 SOLAR POINT OF
 INTERCONNECTION

LABEL 7
 AT MEP

LABEL 9
 AT UTILITY METER

! WARNING !
 SOLAR SYSTEM
 CONNECTED
 AND ENERGIZED

! WARNING !
 THE SERVICE METER IS ALSO SERVED
 BY A PHOTOVOLTAIC SYSTEM

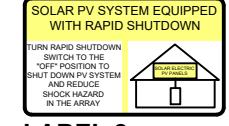
LABEL 8
 AT MEP

LABEL 10
 AT UTILITY METER

AC DISCONNECT TO
 BE PLACED WITHIN 5
 FEET OF THE METER
 AS PER DTE ENERGY

! WARNING !
 PHOTOVOLTAIC
 POWER SOURCE

LABEL 1
 ON ALL CONDUITS
 SPACED AT MAX 10FT



LABEL 2
 AT INVERTER

! CAUTION !
 SOLAR ELECTRIC
 SYSTEM CONNECTED
 AND ENERGIZED

LABEL 3
 AT INVERTER

**PHOTOVOLTAIC
 DC DISCONNECT**

LABEL 4
 AT EACH DC
 DISCONNECT

! WARNING !
 ELECTRIC SHOCK HAZARD
 DO NOT TOUCH TERMINALS.
 TERMINALS ON BOTH LINE AND LOAD SIDES
 MAY BE ENERGIZED IN THE OPEN POSITION

LABEL 5
 AT EACH AC
 DISCONNECT

**PHOTOVOLTAIC
 AC DISCONNECT**

LABEL 6
 AT EACH AC
 DISCONNECT

QTY	CONDUCTOR INFORMATION	CONDUIT TYPE	CONDUIT SIZE
(6)	#10AWG - PV WIRE/USE-2	N/A	N/A
(1)	#6AWG - BARE COPPER IN FREE AIR		
(4)	#10AWG - THWN-2	EMT OR FLEX IN ATTIC	3/4"
(1)	#6AWG - THWN-2 GND		
(2)	#6AWG - THWN-2	EMT OR FLEX	3/4"
(1)	#6AWG - THWN-2 GND		
(3)	#6AWG - THWN-2	EMT OR FLEX	3/4"
(1)	#6AWG - THWN-2 GND		
(3)	#6AWG - THWN-2	EMT OR FLEX	3/4"
(1)	#6AWG - THWN-2 GND		
(3)	#6AWG - THWN-2	EMT OR FLEX	3/4"

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 MOORESVILLE, NC 28115
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 Email: info@powerhome.com
 Web: www.powerhome.com

REVISIONS

DESCRIPTION	DATE	REV

Signature with Seal
 DATE: 8/25/2021

PROJECT NAME & ADDRESS
 CALVIN JUDE
 RESIDENCE
 12746 BROADSTREET AVE.,
 DETROIT, MI 48238

SHEET NAME
**ELECTRICAL LINE
 DIAGRAM**

SHEET SIZE
**ANSI B
 11" X 17"**

SHEET NUMBER
PV-4

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	SILFAB SOLAR SIL-370 NX
VMP	37.2V
IMP	10.0A
VOC	44.8V
ISC	10.6A
TEMP. COEFF. VOC	-0.28%/°C
PTC RATING	342.21W
MODULE DIMENSION	72.13"L x 39.4"W x 1.50"D (In Inch)

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	GENERAC PWRCELL XVT076A03 (7.6KW)
AC POWER OUTPUT (LOADS/GRID)	7600VA
AC POWER OUTPUT (BACKUP)	8000VA
NOMINAL OUTPUT VOLTAGE	240 VAC
MAX OUTPUT CURRENT @240V (LOADS/GRID)	32A
MAX OUTPUT CURRENT @240V (BACKUP)	50A
NOMINAL DC INPUT VOLTAGE	380Vdc
MAX DC INPUT VOLTAGE	420Vdc
CEC WEIGHTED EFFICIENCY	96.5%
MAX DC POWER (PV)	10000W
MAX INPUT CURRENT (PV)	20Adc
CONT. PEAK POWER (BATTERY)	8000W

SERIES SUB STRING OPTIMIZER SPECIFICATIONS	
MANUFACTURER / MODEL #	PV LINK S2502
RATED POWER	2500W
MPPT VOLTAGE RANGE	60-360 Vmp
MAXIMUM INPUT VOLTAGE	420Voc
MAXIMUM OUTPUT	420 Adc
NOMINAL OUTPUT	380 Vdc
MAXIMUM OUTPUT CURRENT	8 A
MAXIMUM SHORT CIRCUIT CURRENT	18 A

BATTERY SPECIFICATIONS	
MANUFACTURER / MODEL #	GENERAC PWRCELL M3 DCB BATTERY
USABLE ENERGY	9.0kWH
NOMINAL CONTINUOUS AC POWER	3.4kW
MAX. CONTINUOUS AC POWER	4.5kW
PEAK MOTOR STARTING CURRENT (2 SEC)	25A
REBUS VOLTAGE: INPUT/ OUTPUT	360-420Vdc
MODULE VOLTAGE	46.8Vdc
ROUND-TRIP EFFICIENCY	96.5%

ELECTRICAL NOTES

- 1.) ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- 2.) ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
- 3.) WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- 4.) WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- 5.) DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- 6.) WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- 7.) ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- 8.) MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
- 9.) MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
- 10.) THE POLARITY OF THE GROUNDED CONDUCTORS IS NEGATIVE

AMBIENT TEMPERATURE SPECS	
RECORD LOW TEMP	-19°
AMBIENT TEMP (HIGH TEMP 2%)	34°
CONDUIT HEIGHT	0.5"
ROOF TOP TEMP	56°

DC CONDUCTOR AMPACITY CALCULATIONS: PV LINK OPTIMIZER TO JUNCTION BOX:

EXPECTED WIRE TEMP (In Celsius)	56°
TEMP. CORRECTION PER NEC TABLE 310.15 (B)(2)(a)	0.71
NO. OF CURRENT CARRYING CONDUCTORS	6
CONDUIT FILL CORRECTION PER NEC TABLE 310.15(B)(3)(a)	0.8
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY PER NEC TABLE 310.15(B)(16)	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	10A
1.25 X I _{max}	
DERATED AMPACITY OF CIRCUIT CONDUCTOR	22.72A
TEMP. CORRECTION PER TABLE 310.15 (B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY 310.15 (B)(16)	
Result should be greater than (10A) otherwise less the entry for circuit conductor size and ampacity	

FROM JUNCTION BOX TO INVERTER:

EXPECTED WIRE TEMP (In Celsius)	56°
TEMP. CORRECTION PER NEC TABLE 310.15 (B)(2)(a)	0.71
NO. OF CURRENT CARRYING CONDUCTORS	4
CONDUIT FILL CORRECTION PER NEC TABLE 310.15(B)(3)(a)	0.8
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY PER NEC TABLE 310.15(B)(16)	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	20A
1.25 X I _{max} X # of PV LINKS	
DERATED AMPACITY OF CIRCUIT CONDUCTOR	22.72A
TEMP. CORRECTION PER TABLE 310.15 (B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY 310.15 (B)(16)	
Result should be greater than (20A) otherwise less the entry for circuit conductor size and ampacity	

FROM BATTERY TO INVERTER:

EXPECTED WIRE TEMP (In Celsius)	34°
TEMP. CORRECTION PER NEC TABLE 310.15 (B)(2)(a)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	2
CONDUIT FILL CORRECTION PER NEC TABLE 310.15(B)(3)(a)	1
CIRCUIT CONDUCTOR SIZE	10 AWG
CIRCUIT CONDUCTOR AMPACITY PER NEC TABLE 310.15(B)(16)	40A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	31.25A
1.25 X I _{max} (= 25A)	
DERATED AMPACITY OF CIRCUIT CONDUCTOR	38.40A
TEMP. CORRECTION PER TABLE 310.15 (B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY 310.15 (B)(16)	
Result should be greater than (31.25A) otherwise less the entry for circuit conductor size and ampacity	

AC CONDUCTOR AMPACITY CALCULATIONS: FROM INVERTER TO BACK-UP PANEL:

No. OF INVERTER	1
EXPECTED WIRE TEMP (In Celsius)	34°
TEMP. CORRECTION PER NEC TABLE 310.15(B)(2)(a)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	3
CONDUIT FILL CORRECTION PER NEC TABLE 310.15(B)(3)(a)	1
CIRCUIT CONDUCTOR SIZE	6 AWG
CIRCUIT CONDUCTOR AMPACITY PER NEC TABLE 310.15(B)(16)	75A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	42.5A
1.25 X INVERTER OUTPUT CURRENT (BACKUP POWER)	
DERATED AMPACITY OF CIRCUIT CONDUCTOR	72A
TEMP. CORRECTION PER TABLE 310.15 (B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY 310.15 (B)(16)	
Result should be greater than (42.5A) otherwise less the entry for circuit conductor size and ampacity	

AC CONDUCTOR AMPACITY CALCULATIONS: FROM INVERTER TO MEP:

No. OF INVERTER	1
EXPECTED WIRE TEMP (In Celsius)	34°
TEMP. CORRECTION PER NEC TABLE 310.15(B)(2)(a)	0.96
NO. OF CURRENT CARRYING CONDUCTORS	3
CONDUIT FILL CORRECTION PER NEC TABLE 310.15(B)(3)(a)	1
CIRCUIT CONDUCTOR SIZE	6 AWG
CIRCUIT CONDUCTOR AMPACITY PER NEC TABLE 310.15(B)(16)	75A

REQUIRED CIRCUIT CONDUCTOR AMPACITY PER NEC 690.8(A&B)	40A
1.25 X MAX INVERTER OUTPUT CURRENT (LOADS/GRID)	
DERATED AMPACITY OF CIRCUIT CONDUCTOR	72A
TEMP. CORRECTION PER TABLE 310.15 (B)(2)(a) X CONDUIT FILL CORRECTION PER NEC 310.15(B)(3)(a) X CIRCUIT CONDUCTOR AMPACITY 310.15 (B)(16)	
Result should be greater than (40A) otherwise less the entry for circuit conductor size and ampacity	



REVISIONS

DESCRIPTION	DATE	REV

Signature with Seal

DATE: 8/25/2021

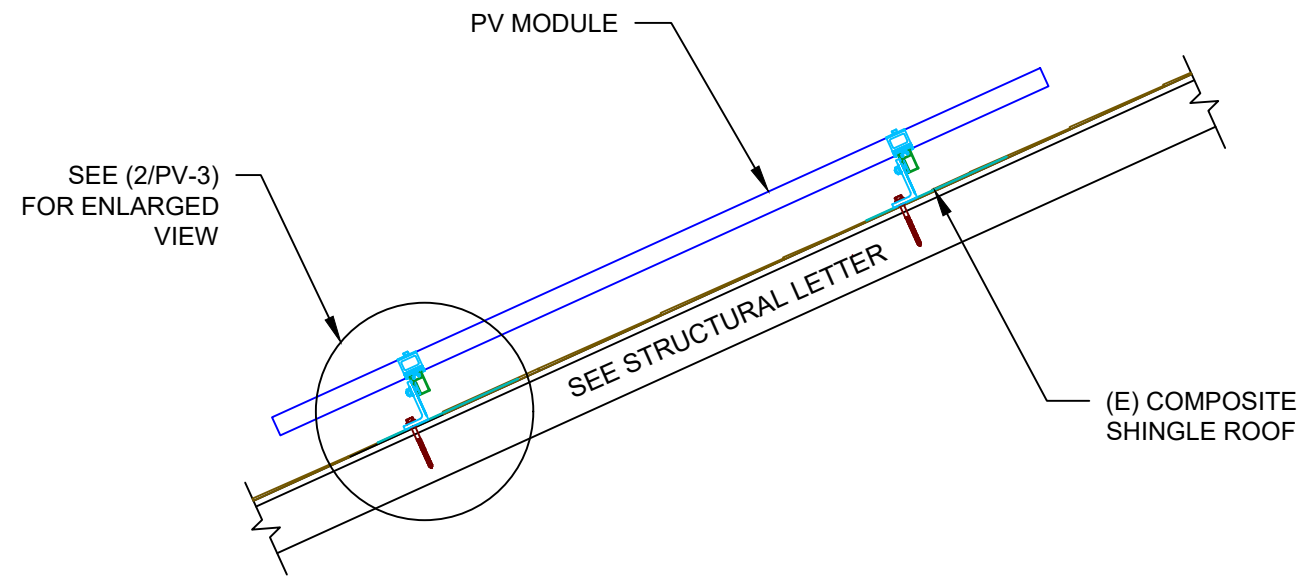
PROJECT NAME & ADDRESS

CALVIN JUDE
RESIDENCE
12746 BROADSTREET AVE.,
DETROIT, MI 48238

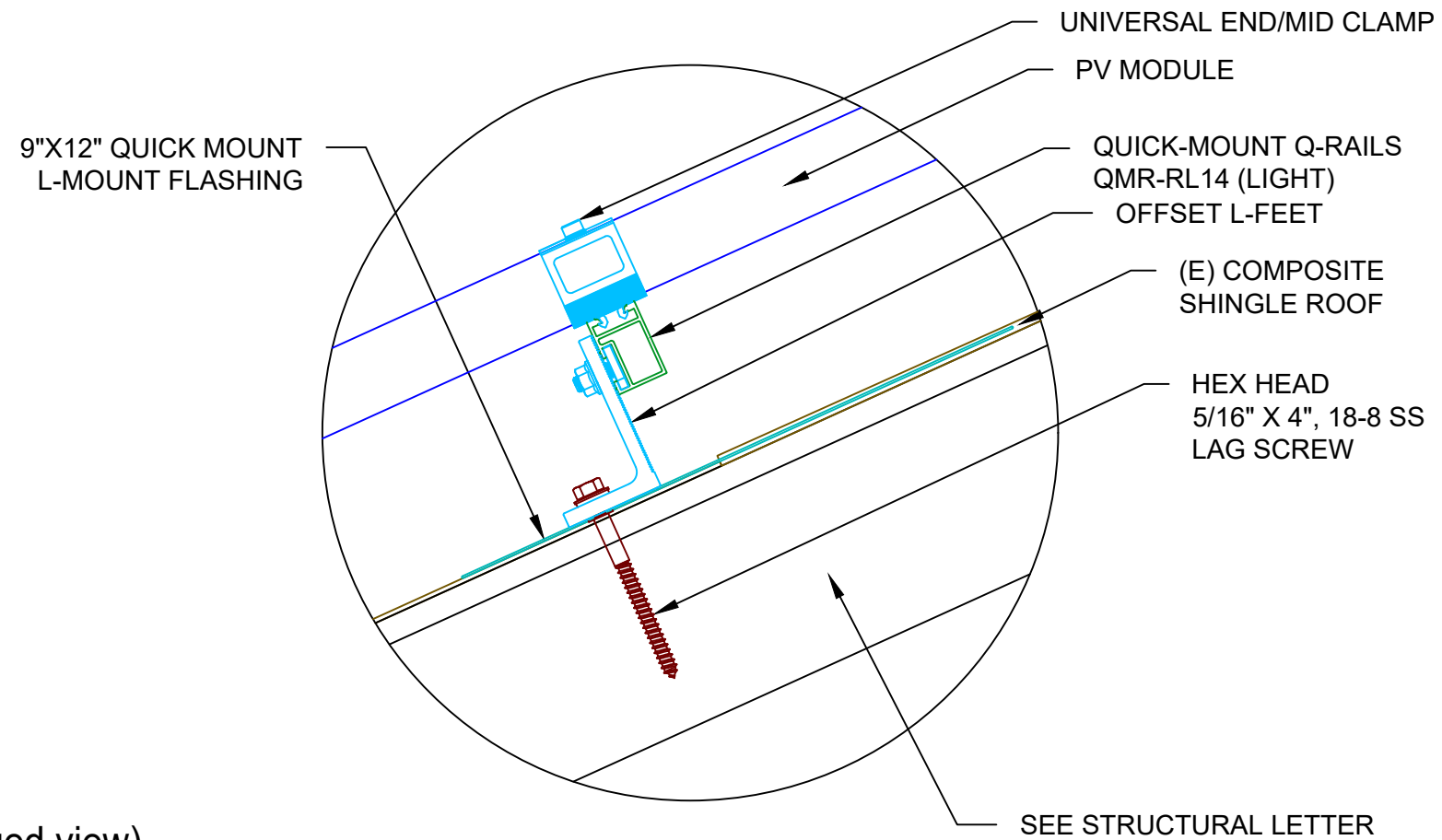
SHEET NAME
WIRING
CALCULATIONS

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-5



1 | ATTACHMENT DETAIL
 PV-3 | SCALE: 1" = 1'-0"



2 | ATTACHMENT DETAIL (enlarged view)
 PV-3 | SCALE: NTS

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DESCRIPTION	DATE	REV

Signature with Seal

 DATE: 8/25/2021

PROJECT NAME & ADDRESS

**CALVIN JUDE
 RESIDENCE**
 12746 BROADSTREET AVE.,
 DETROIT, MI 48238

SHEET NAME
**ATTACHMENT
 DETAIL**

SHEET SIZE
**ANSI B
 11" X 17"**

SHEET NUMBER
PV-3

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 15 MODULES
 MODULE TYPE = SILFAB SOLAR SIL-370 NX MODULES
 MODULE WEIGHT = 44.0 LBS / 20.0 KG.
 MODULE DIMENSIONS = 72.13"x 39.4" = 19.74 SF
 UNIT WEIGHT OF ARRAY = 2.23 PSF

ROOF DESCRIPTION				
ROOF TYPE			COMPOSITION SHINGLE	
ROOF	ROOF TILT	AZIMUTH	FRAMING SIZE	FRAMING SPACING
#1	26.57°	62°	SEE STRUCTURAL LETTER	
#2	39.87°	152°		

ARRAY AREA & ROOF AREA CALC'S				
ROOF	# OF MODULES	ARRAY AREA (Sq. Ft.)	ROOF AREA (Sq. Ft.)	ROOF AREA COVERED BY ARRAY (%)
#1	10	197.40	458.04	43
#2	5	98.70	88.05	112

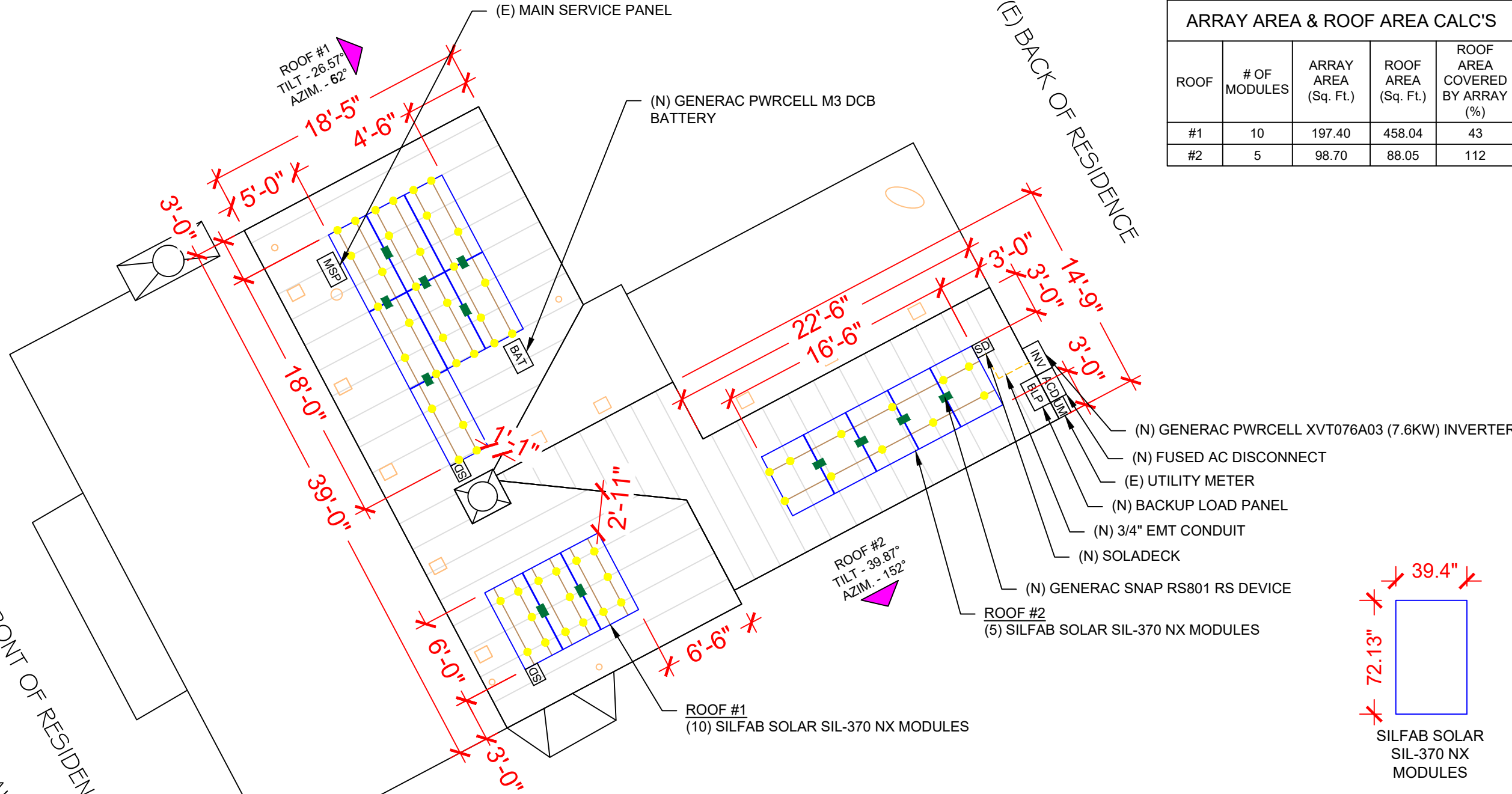
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 "POWER YOUR FUTURE"
 919 N. MAIN ST.
 MOORESVILLE, NC 28115
 Phone: 704-800-6591 (OFFICE)
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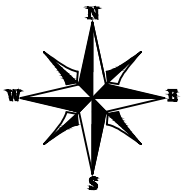
PROJECT NAME & ADDRESS
CALVIN JUDE RESIDENCE
 12746 BROADSTREET AVE.,
 DETROIT, MI 48238

SHEET NAME
ROOF PLAN & MODULES
 SHEET SIZE
ANSI B 11" X 17"
 SHEET NUMBER
PV-2



BROADSTREET AVE.
 (E) FRONT OF RESIDENCE

(E) BACK OF RESIDENCE



1 ROOF PLAN & MODULES

PV-2 SCALE: 1/8" = 1'-0"

ON- SITE CUSTOMER APPROVAL: _____

LEGEND	
[SD]	- SOLADECK
[INV]	- INVERTER
[ACD]	- AC DISCONNECT
[MSP]	- MAIN SERVICE PANEL
[BLP]	- BACKUP LOAD PANEL
[BAT]	- BATTERY
[OP]	- PV LINK OPTIMIZER
○	- VENT, ATTIC FAN (ROOF OBSTRUCTION)
●	- ROOF ATTACHMENT
---	- RAFTERS
---	- CONDUIT
■	- RAPID SHUTDOWN

PROJECT DESCRIPTION:

15 X 370 SILFAB SOLAR SIL-370 NX MODULES
 ROOF MOUNTED SOLAR PHOTOVOLTAIC MODULES

SYSTEM SIZE: 5.55 kW DC STC
 ARRAY AREA: ROOF#1 - 197.40 SQ FT
 ARRAY AREA: ROOF#2 - 98.70 SQ FT

EQUIPMENT SUMMARY

15 SILFAB SOLAR SIL-370 NX MODULES
 03 GENERAC PV LINK S2502 POWER OPTIMIZERS
 01 GENERAC PWRCELL XVT076A03 (7.6KW) INVERTER

APPLICABLE CODES & STANDARDS

MICHIGAN RESIDENTIAL CODE 2015
 NEC 2017

AUTHORITIES HAVING JURISDICTION

BUILDING : WAYNE COUNTY
 ZONING : WAYNE COUNTY
 UTILITY : DTE ENERGY

DESIGN SPECIFICATIONS

OCCUPANCY : II
 CONSTRUCTION : SINGLE-FAMILY
 ZONING : RESIDENTIAL
 GROUND SNOW LOAD : SEE STRUCTURAL LETTER
 WIND EXPOSURE : SEE STRUCTURAL LETTER
 WIND SPEED : SEE STRUCTURAL LETTER



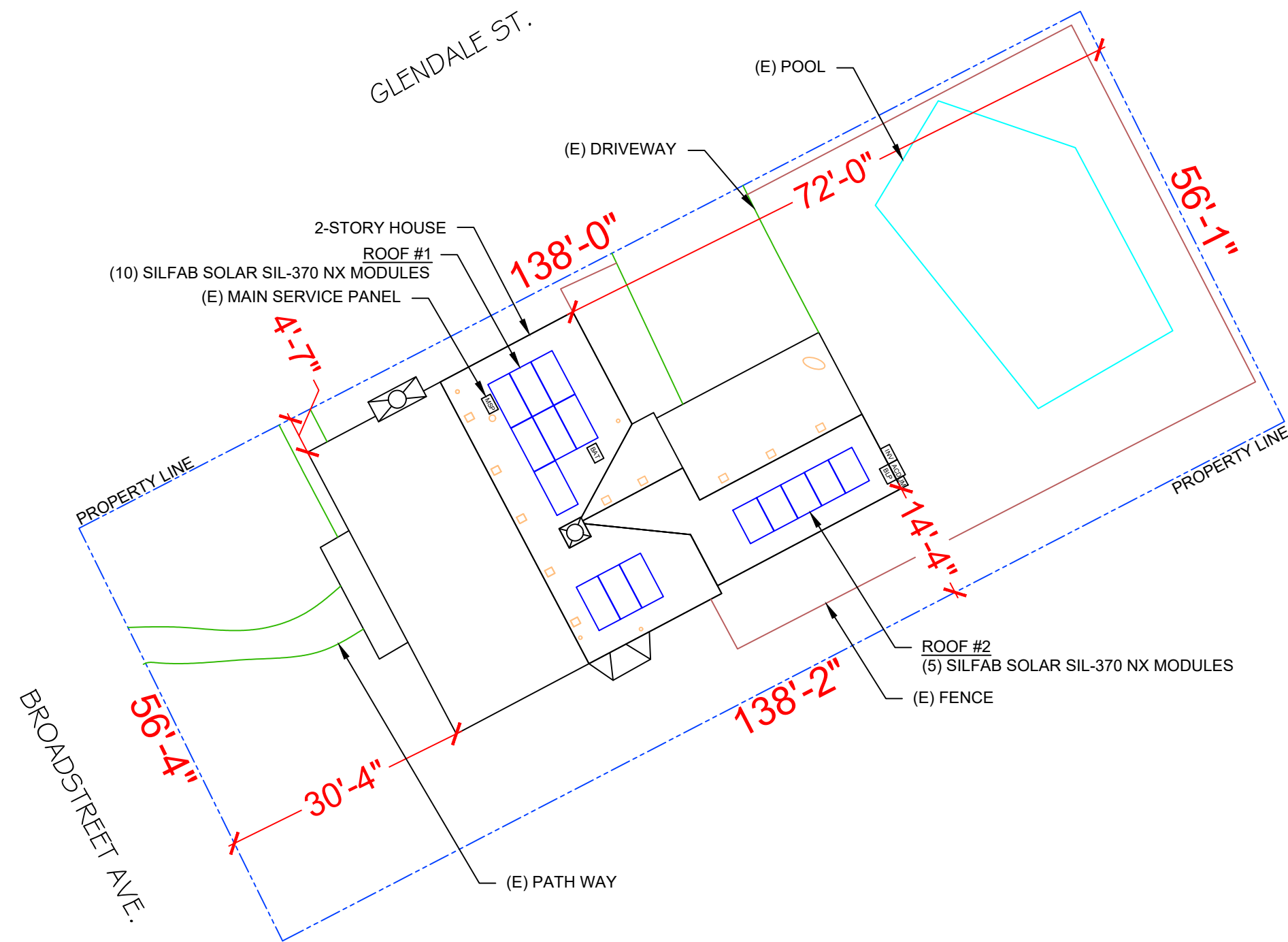
2 HOUSE PHOTO
 PV-1 | SCALE: NTS



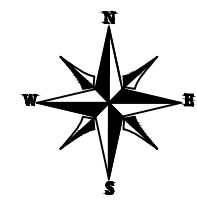
3 VICINITY MAP
 PV-1 | SCALE: NTS

SHEET INDEX

PV-1	PLOT PLAN & VICINITY MAP
PV-2	ROOF PLAN & MODULES
PV-2A	STRING LAYOUT
PV-3	ATTACHMENT DETAIL
PV-4	ELECTRICAL LINE DIAGRAM
PV-5	WIRING CALCULATIONS
PV-6 to 12	EQUIPMENT SPECIFICATIONS



1 PLOT PLAN & VICINITY MAP
 PV-1 | SCALE: 1/16" = 1'-0"



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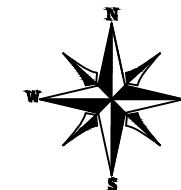
Signature with Seal
 DATE: 8/25/2021

PROJECT NAME & ADDRESS
 CALVIN JUDE
 RESIDENCE
 12746 BROADSTREET AVE.,
 DETROIT, MI 48238

SHEET NAME
 PLOT PLAN & VICINITY MAP

SHEET SIZE
 ANSI B
 11" X 17"

SHEET NUMBER
 PV-1



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 POWER HOME SOLAR, LLC
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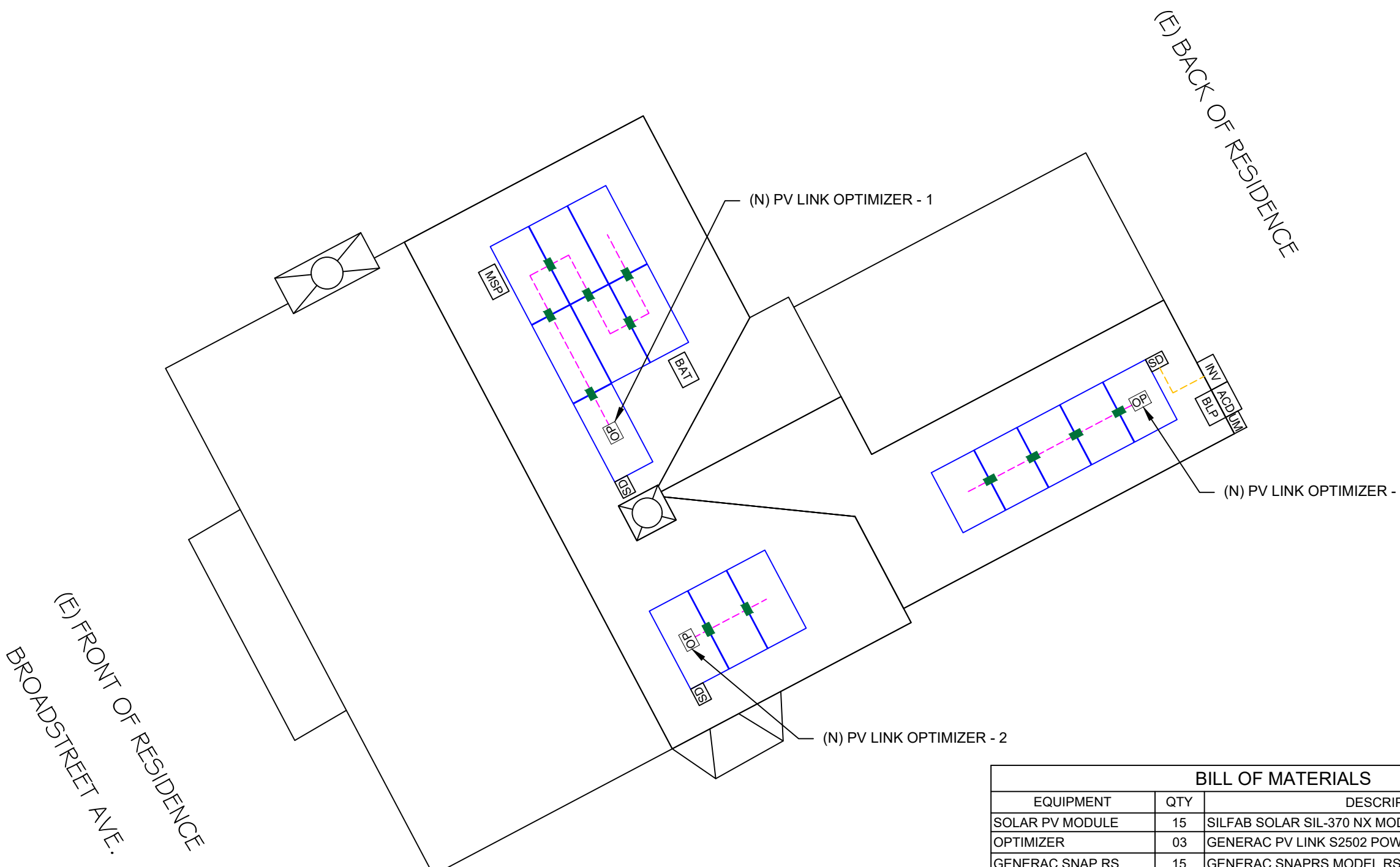
PROJECT NAME & ADDRESS

**CALVIN JUDE
 RESIDENCE**
 12746 BROADSTREET AVE.,
 DETROIT, MI 48238

SHEET NAME
**STRING
 LAYOUT**

SHEET SIZE
**ANSI B
 11" X 17"**

SHEET NUMBER
PV-2A



BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULE	15	SILFAB SOLAR SIL-370 NX MODULES
OPTIMIZER	03	GENERAC PV LINK S2502 POWER OPTIMIZERS
GENERAC SNAP RS	15	GENERAC SNAPRS MODEL RS801
INVERTER	01	GENERAC PWRCELL XVT076A03 (7.6KW) INVERTER
AC DISCONNECT	1	60A FUSED, (2) 40A FUSES, 240V, NEMA 3R, UL LISTED
SOLADECK	3	SOLADECKS 600 V, NEMA 3R, UL LISTED
BATTERY	1	GENERAC PWRCELL IR M3 DCB BATTERY
BACKUP PANEL	1	125A, BACKUP PANEL, 240V
RAILS	13	QRAIL LIGHT 14 FT. BLACK
SPLICE KIT	4	QSPLICE INTERNAL LIGHT
WEEB BMC	12	WEEB BMC MILL
MODULE CLAMPS	16	UNIVERSAL MID CLAMP
GROUNDING LUG	7	WEEB LUG W/ T-BOLT
END CLAMPS	28	UNIVERSAL END CLAMPS
ATTACHMENT	55	L-MOUNT ATTACHMENT (QUICKMOUNT)
T-BOLT	58	T-BOLT W/ NUT M8 X 20MM