

APPLICATION FOR BUILDING PERMIT

The Village of Irvington | 85 Main St | Irvington NY 10533

Application Number:	992	Date:	12/19/2022
Job Location:	65 N BROADWAY	Parcel ID:	2.50-17-8.3
Property Owner:	HARSCAR, C.J. & K. 50% & GEISMAR M.S. & E.A. 50%	Property Class:	1 FAMILY RES
Occupancy:	One/ Two Family	Zoning:	
Common Name:			

Applicant	Contractor
Stacie Varian	Stacie Varian
Tesla Energy Operations	Tesla Energy Operations
1073 Rt 94 Unit 4New Windsor NY 12553	1073 Rt 94 Unit 4 New Windsor NY 12553
845-275-6011	845-275-6011

Description of Work

Type of Work:	Solar Panels	Applicant is:	Contractor
Work Requested by:	The Owner	In association with:	
Cost of Work (Est.):	37615.00	Property Class:	1 FAMILY RES

Description of Work

New 19.2 kw solar PV array consisting of 48 panels plus 27 kWh Energy Storage System.

Please Note: Completing the application does not constitute a permit to commence construction. To obtain your permit follow the instructions on the instruction page provided on page 3.

Job Location: 65 N BROADWAY

Parcel Id: 2.50-17-8.3

AFFIDAVIT OF APPLICANT

I **Stacie Varian** being duly sworn, depose and says: That s/he does business as: **Tesla Energy Operations** with offices at: **1073 Rt 94 Unit 4 New Windsor NY 12553** and that s/he is:

- ☐ The owner of the property described herein.
- ☐ The _____ of the New York Corporation _____ with offices at: _____ duly authorized by resolution of the Board of Directors, and that said corporation is duly authorized by the owner to make this application.
- ☐ A general partner of _____ with offices _____ and that said Partnership is duly authorized by the Owner to make this application.
- ☐ The Lessee of the premises, duly authorized by the owner to make this application.
- ☐ The Architect of Engineer duly authorized by the owner to make this application.
- ☐ The contractor authorized by the owner to make this application.

That the information contained in this application and on the accompanying drawings is true to the best of his knowledge and belief. The undersigned hereby agrees to comply with all the requirements of the New York State Uniform Fire Prevention and Building Code, the Village of Irvington Building Code, Zoning Ordinance and all other laws pertaining to same, in the construction applied for, whether or not shown on plans or specify in this application.

Sworn to before me this _____ day of _____ of _____

Notary Public / Commission of Deeds

Applicant's Signature

OWNER'S AUTHORIZATION

I **HARSCAR, C.J. & K. 50% & GEISMAR M.S. & E.A. 50%** as the owner of the subject premises and have authorized the contractor named above to perform the work under the subject application.

Owner phone number _____ Owner email address _____

- ☐ _____ I hereby acknowledge that it is my responsibility as the **property owner** to ensure that if the permit (if issued) receives a Final Certificate of Approval from the Building Department and further that if a Final Certificate of Approval is not obtained upon completion of the construction, a property violation may be placed on the property for which this permit is being requested.

Sworn to before me this _____ day of _____ of _____

Notary Public / Commission of Deeds

Applicant's Signature

INSTRUCTIONS

REQUIREMENTS FOR OBTAINING A PERMIT:

The following items must be submitted in order to obtain a Building Permit:

1. One (1) Building Permit application signed by the owner or a notarized Agent Letter.
2. One (1) property survey (signed and sealed), reflecting existing conditions.
3. Two (2) sets of construction drawings and specifications, including existing and proposed conditions, state design criteria, structural and architectural details, plans, and cross sections, mechanical, electrical, and plumbing drawings (signed and sealed by a likened professional).
4. One USB with all plans (with Licensed Professionals certification/stamp) and specifications in PDF (file size must be less than 25MB).
5. Copy of approved site plan from the Irvington Planning Board when applicable (required on all increases of FAR, footprint, coverage, driveways and increases of cubic content under a roof).
6. Approval by the Architectural Review Board (ARB) when applicable. An additional five (5) sets of construction drawings and specifications (please see ARB requirements (available on the village web site www.irvingtonny.gov) prior to submission).
7. Visit the Village of Irvington website www.irvingtonny.gov for additional check list for solar panels, generators, underground propane tanks, signs and awnings(found in forms and documents in the Building & Planning General Information folder).
8. Village Zoning Code is available on the Village website: www.irvingtonny.gov.
9. Provide evidence that the application meets the NYS Energy code as described by www.dos.state.ny.us/code/energycode/overview.htm

Contractor Requirements in order to obtain a Building Permit:

10. Contractor's Certificate of Liability listing the Village of Irvington as the Certificate Holder with no disclaimer in the description other than certificate holder is named additional insured (any additional comments will not be accepted).
11. Contractor's Workers Compensation C-105 form (or equivalent) listing the Village of Irvington as Certificate Holder.
12. Copy of Contractor's Westchester County Home Improvement License.
13. All information above uploaded into permit application with the contractor's contact information, including mailing address, phone number, and email address.
14. Contractor's signature on Affidavit of Contractor (required prior to issuance of the permit).

Please Note:

-State Law requires that the contractor submits a copy of Workman's Compensation as required by the New York State Disability Insurance naming the Department of Buildings, Village of Irvington as certificate holder and showing coverage for general contracting and the locations covered by such insurance. If structure is to be demolished a copy of Liability Insurance must also be submitted.

- Please be advised under State and Municipal Laws, the Workman's Compensation and Disability benefits insurance must be submitted on separate state approved forms. The "Acord Form" is no longer acceptable as proof of Workman's Compensation coverage. Further information or questions may be answered by calling the NYS Bureau of Compliance at (518) 486-6307 or by visiting their website or by contacting your insurance provider.

FEES ASSOCIATED WITH BUILDING PERMIT APPLICATION (All fees must be paid at time of application):

Fee schedule

Building Permit (Non-Refundable)

* Application fee \$85

* Permit fee \$17 per thousand dollars (\$1000) of estimated cost of construction, or fraction thereof

85

• Inspection Fees (as applicable)

- | | |
|--|--|
| • Insulation: \$50 | • Footing: \$50 |
| • Solid Fuel: \$50 | • Preparation for concrete slabs and walls: \$50 |
| • Foundation and footing drain: \$50 | • Framing: \$50 |
| • Energy Code Compliance: \$50 | • Building systems, including underground and rough-in: \$50 |
| • Sediment and erosion control: \$50 | • Fire resistant construction and penetrations: \$50 |
| • Footing: \$50 | • Final Inspection for C.O.: \$50 |
| • Preparation for concrete slabs and walls: \$50 | • State and local laws (per re-inspection): \$50 |

Total Inspections _____

* Certificate of Occupancy Fees: One dollar (\$1.00) per thousand dollars of estimated cost. Minimum Fee \$25.00

* Permit Revisions or Amendment: \$50.00 (plus \$17 per thousand (\$1000), of the estimated cost of construction and any additional inspections fees).

* Re-inspection fee for work not ready at time of inspection or not in compliance: \$50

* Applications for Undocumented Work/ Legalizing: Applications to legalize work done prior to applying for and receiving a building permit shall pay double all applicable fees and inspections, including the cost of construction based on the cost of all proposed work being legalized at the time of application. Minimum fee \$500.00.

(To be collected at time of submission of application)Total _____

**(Note: pursuant to 224-54A all permits are valid for one (1) year from date on permit
Any permit that expires will be subject to additional fees.)**

NOTICE OF APPLICATION AND HEARING

Board of Architectural Review

Clerk's Office

Village of Irvington

Westchester County, New York

CERTIFIED MAIL

Date of Mailing 1/3/22

NOTICE:

Pursuant to 9-12 of the code of the Village of Irvington notice to adjacent neighbors (as defined below) is required 10 days prior a meeting where an application for Solar Panels to the Village of Irvington Architectural Board is asking to be heard.

Date of Meeting: January 23, 2023
Time of Meeting: Meeting starts at 8pm
Location of Meeting: Trustees Meeting Room
85 Main St. Irvington, NY 10533

Applicant Name	<u>Stacie Varian of Tesla Energy Operations</u>	Owners Name	<u>Judd & Kathy Harcsar</u>
Applicant Mailing Address	<u>1073 Rt 94 Unit 4</u>	Owner Mailing Address	<u>65 N Broadway</u>
	<u>New Windsor, NY 12553</u>		<u>Irvington, NY 10533</u>
Applicant Phone Number	<u>845-275-6011</u>	Owners Phone Number	<u>347-451-1412</u>
Applicant Email Address	<u>svarian@tesla.com</u>	Owners Email Address	<u>judd@harcsar.com</u>

Address of Proposed Solar Panels:

Street Address 65 N Broadway Irvington, NY 10533

To Adjacent Neighbors of: Judd & Kathy Harcsar
65 N Broadway Irvington, NY 10533

Please take notice that the applicant named above is requesting the Board of Architectural Review of the Village of Irvington to grant a permit for the installation of **Solar Energy Equipment** to the address listed above.

Plans of the proposed work are available in the office of the Irvington Building Department for public inspection during regular business hours 5 days prior to the scheduled meeting.

9-12. Solar Energy Equipment.

For any application for a building permit for solar energy equipment, written notice of the application and the date, time and place of the meeting at which it will be considered must be given to all adjacent property owners not less than 10 days prior to the meeting date. Notice shall be by a method of mail or a delivery service company providing proof of mailing or delivery or by personal service of such notice on the property owners, evidenced by their signature as acknowledgment of receipt of such notice on a form supplied or similar to one supplied by the Village Clerk. Proof of service of the notice shall be filed prior to or at the meeting at which the application is considered.*

("Adjacent property" refers to any neighbor that shares a property line with the subject property as well as neighbors across any street from the subject property.)

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Irvington, NY 10533

Certified Mail Fee \$4.00
\$
Extra Services & Fees (check box, add fee as appropriate)
☐ Return Receipt (hardcopy) \$0.00
☐ Return Receipt (electronic) \$0.00
☐ Certified Mail Restricted Delivery \$0.00
☐ Adult Signature Required \$0.00
☐ Adult Signature Restricted Delivery \$0.00

Postage \$0.60

Total Postage and Fees \$4.60

Sent To

Grady's Barreca
Street and Apt. No., or PO Box No. 72 N Broadway
City, State, ZIP+4® Irvington, NY 10533

PS Form 3800, April 2015 PSN 7530-02-000-9047

See Reverse for Instructions

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Irvington, NY 10533

Certified Mail Fee \$4.00
\$
Extra Services & Fees (check box, add fee as appropriate)
☐ Return Receipt (hardcopy) \$0.00
☐ Return Receipt (electronic) \$0.00
☐ Certified Mail Restricted Delivery \$0.00
☐ Adult Signature Required \$0.00
☐ Adult Signature Restricted Delivery \$0.00

Postage \$0.60

Total Postage and Fees \$4.60

Sent To

Richard Marzantoni
Street and Apt. No., or PO Box No. 66 N Broadway
City, State, ZIP+4® Irvington, NY 10533

PS Form 3800, April 2015 PSN 7530-02-000-9047

See Reverse for Instructions

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Dobbs, NY 10522

Certified Mail Fee \$4.00
\$
Extra Services & Fees (check box, add fee as appropriate)
☐ Return Receipt (hardcopy) \$0.00
☐ Return Receipt (electronic) \$0.00
☐ Certified Mail Restricted Delivery \$0.00
☐ Adult Signature Required \$0.00
☐ Adult Signature Restricted Delivery \$0.00

Postage \$0.60

Total Postage and Fees \$4.60

Sent To

Taconic State Park
Street and Apt. No., or PO Box No. 15 Walnut St.
City, State, ZIP+4® Irvington, NY 10533

PS Form 3800, April 2015 PSN 7530-02-000-9047

See Reverse for Instructions

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Irvington, NY 10533

Certified Mail Fee \$4.00
\$
Extra Services & Fees (check box, add fee as appropriate)
☐ Return Receipt (hardcopy) \$0.00
☐ Return Receipt (electronic) \$0.00
☐ Certified Mail Restricted Delivery \$0.00
☐ Adult Signature Required \$0.00
☐ Adult Signature Restricted Delivery \$0.00

Postage \$0.60

Total Postage and Fees \$4.60

Sent To

Sciviteri Notecam
Street and Apt. No., or PO Box No. 62 N Broadway
City, State, ZIP+4® Irvington, NY 10533

PS Form 3800, April 2015 PSN 7530-02-000-9047

See Reverse for Instructions

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Irvington, NY 10533

Certified Mail Fee \$4.00
\$
Extra Services & Fees (check box, add fee as appropriate)
☐ Return Receipt (hardcopy) \$0.00
☐ Return Receipt (electronic) \$0.00
☐ Certified Mail Restricted Delivery \$0.00
☐ Adult Signature Required \$0.00
☐ Adult Signature Restricted Delivery \$0.00

Postage \$0.60

Total Postage and Fees \$4.60

Sent To

Lewardo Villa LLC
Street and Apt. No., or PO Box No. 67 N Broadway
City, State, ZIP+4® Irvington, NY 10533

PS Form 3800, April 2015 PSN 7530-02-000-9047

See Reverse for Instructions

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only

For delivery information, visit our website at www.usps.com®.

Irvington, NY 10533

Certified Mail Fee \$4.00
\$
Extra Services & Fees (check box, add fee as appropriate)
☐ Return Receipt (hardcopy) \$0.00
☐ Return Receipt (electronic) \$0.00
☐ Certified Mail Restricted Delivery \$0.00
☐ Adult Signature Required \$0.00
☐ Adult Signature Restricted Delivery \$0.00

Postage \$0.60

Total Postage and Fees \$4.60

Sent To

Frank Raganelli
Street and Apt. No., or PO Box No. 51 N Broadway
City, State, ZIP+4® Irvington, NY 10533

PS Form 3800, April 2015 PSN 7530-02-000-9047

See Reverse for Instructions

VILLAGE OF IRVINGTON

BUILDING DEPARTMENT

85 MAIN STREET

IRVINGTON, NEW YORK 10533

TEL: (914) 591-8335 • FAX: (914) 591-5870



PHOTOVOLTAIC (PV SOLAR) RESIDENTIAL SYSTEMS

PERMIT APPLICATION CHECK LIST

Revised June 7, 2017

It is suggested that all applicants applying for a permit read and understand the manufacture installation instructions prior to applying for a building permit and attached ARB guide lines and Village code for Solar Energy Equipment.

REQUIREMENTS TO APPLY FOR A PHOTOVOLTAIC (PV SOLAR) SYSTEM PERMIT

- ☒ 1) Apply on line at www.irvingtonny.gov for a mechanical permit, under building permits and along with your application, submit to the building department the following;
- ☒ 2) Owners phone number and email address entered in the online permit application
- ☒ 3) Evidence of Workers Compensation Insurance (on a C-105 or equivalent)
- ☒ 4) Evidence of Liability Insurance naming the Village of Irvington additional insured
- ☒ 5) A copy of the contractors Westchester County Department of Consumer Protection License
- ☒ 6) Pursuant to 9-12-A. provide evidence of notice to adjacent properties owners not less than 10 days prior to the meeting (see attached code section for more details)
- ☒ 7) Submit permit fee: **(all fees must be paid at time of submission)**
 - ☒ \$85 application fee
 - ☐ \$200 for systems up to 5 kilowatts
 - ☐ \$450 for systems above 5 kilowatts and less than 10 kilowatts
 - ☒ \$700 for systems above 10 kilowatts and less than 20 kilowatts
 - ☐ \$700 plus \$250 per additional 10 kilowatts above 20 for systems above 20 kilowatts
 - ☒ \$75 Certificate of Completion inspection and fee
- ☒ 8) An affidavit from a NYS licensed professional detailing and certifying that the existing structure meets or exceeds the minimum load requirement's as per TABLE R301.2(1) for wind and load before and after installation of the proposed equipment or the proposed upgrades to the existing structure to accomplish the aforesaid.
- ☒ 9) Drawings (signed and sealed by a NYS licensed professional) of the roof plan showing the following criteria;
 - a. ☒ Showing all proposed PV panels on all proposed roof surfaces.
 - b. ☒ Showing all equipment on all elevations including
 - c. ☒ Show / list all roof connectors and flashing details
 - d. ☒ Show compliance with section R902.4 (fire classification in accordance with UL1703 and 3' from any lot line)
 - e. ☒ Show compliance with sections R324.3.1 through R324.7.2.5 and NFPA 70 (installation)
 - f. ☒ Show compliance with section R324.7 (access and pathways) (see attachment)
 - g. ☒ Show compliance with section R324.7.2.1-6. (roof access points) (see attachment)
 - h. ☒ Show compliance with section R324.7.3 (ground access areas) (see attachment)
 - i. ☒ Show compliance with section R324.7.4 (single ridge roofs *when applicable*) (see attachment)
 - j. ☒ Show compliance with section R324.7.5 (hip roofs *when applicable*) (see attachment)
 - k. ☒ Show compliance with section R324.7.6 (roof with valleys *when applicable*) (see attachment)
 - l. ☒ Show compliance with section R324.7.7 (allowance for smoke ventilation operations) (see attachment)
 - m. ☒ Show a Fire Department AC disconnect, located outside by the Utility meter on all systems.
- ☒ 10) Provide a drawing or manufactures cut sheets of array mounting hardware and interconnection diagram and specifications.
- ☒ 11) Provide a drawing or manufactures cut sheets of the unit mount and roof penetration's flashing system.
- ☒ 12) 3 wire diagram showing all proposed equipment as governed by the National Electrical Code (NEC)
- ☒ 13) Provide a diagram showing all proposed labels and labeling locations including; Solar AC Disconnect, Inverter Output, Connection Warning, Dual Power Source Warning, Solar AC Combiner Panel, Solar PV Circuits Only, Solar Production meter. (see attachment)
- ☒ 14) Provide snow guards on panels were snow has the potential of sliding of the panel into a neighbor's property
- ☒ 15) Pictures of dwelling showing photo shopped arrays on the structure.
- ☒ 16) Provide a drawing or photo shop picture of all proposed equipment on all effected elevations (including FD emergency disconnect switch)
- ☒ 17) A Fire Department AC disconnect, located outside by the Utility meter on all systems.

VILLAGE OF IRVINGTON

BUILDING DEPARTMENT

85 MAIN STREET

IRVINGTON, NEW YORK 10533

TEL: (914) 591-8335 • FAX: (914) 591-5870



- ☒ 18) Separate Electrical Permit application by a Westchester County Department of Licensing, licensed Electrician with required insurances and the appropriate fee (must be filed by the licensed contractor, see village application for further details).
- ☒ 19) Submit signed check list with submission and appropriate building permit fee.
- ☒ 20) Applicant has provided seven copies of the entire submittal for Architectural Review Board approval.

Applicant Affidavit:

Applicants Name: Stacie Varian of Tesla Energy Operations

Applicants Address: 1073 Rt 94 Unit 4
New Windsor, NY 12553

Applicants Phone # 845-275-6011

Applicants Email svarian@tesla.com

Applicant Name: Stacie Varian of Tesla Energy Operations **Signature:** Stacie Varian **Date:** 12/19/22 **By signing this affidavit I attest to have read the attached Solar Energy Equipment Code and the Solar Equipment Guidelines manufactures installation instructions and that all information asked for above has been submitted and that the submitted information is correct.**

General Contractor Affidavit:

Contractors Name: Tesla Energy Operations

Contractors Address: 1073 Rt 94 Unit 4
New Windsor, NY 12553

Contractors Phone # 845-275-6011

Contractors Email svarian@tesla.com

General Contractor Name: Tesla Energy Operations **Signature:** Stacie Varian **Date:** 12/19/22 **By signing this affidavit I attest to being the general contractor of record for this application and will be responsible for oversite and direct supervision of same, and will maintain a valid Westchester County Department of Consumer Protection License, a valid for Workers Compensation Policy and a General Liability Policy listing the Village of Irvington as Certificate Holder and additional insured with no conditions until such time I apply for and receive a Certificate of Completion.**

Electrical Contractor Affidavit:

Electrical Contractors Name: Frank Saladino of Tesla Energy Operations

Electrical Contractors Address: 1073 Rt 94 Unit 4
New Windsor, NY 12553

Electrical Contractors Phone # 845-275-6011

Electrical Contractors Email svarian@tesla.com

Electrical Contractor Name: Frank Saladino of Tesla Energy Operations **Signature:** Stacie Varian **Date:** 12/19/22 **By signing this affidavit I attest to being the electrical contractor of record for this application and will be responsible for oversite and direct supervision of same, and will maintain a valid Westchester County Electrical License, a valid for Workers Compensation Policy and a General Liability Policy listing the Village of Irvington as Certificate Holder and additional insured with no conditions until such time I apply for and receive a Certificate of Completion.**

Note: Applications for all exterior elevation changes including photovoltaic solar systems are required to apply for, make a presentation in front of, and receive approval from the Village of Irvington Architectural Review Board (ARB) prior to issuance of a building permit. The ARB meetings are the second and fourth Mondays of the month, with a deadline for submissions one week prior to the meetings (see village web site for confirmation of meetings). Seven sets of copies of the entire application are required to be submitted at the deadline with appropriate fee at the time of submission.

Note: The following list above is given to assist in the application process. It is not intended to be a replacement for the Building or Zoning Code, County or State Regulations, or Consolidate Edison Requirements. Unique and Special projects may require additional information.

***Hours of Construction: Monday-Friday 7AM-7PM; Saturday 9AM-5PM; Sunday and holiday's construction is prohibited**
***Only completed applications will be accepted with attached insurance certificates and County license**



LICENSED PROFESSIONAL AFFIDAVIT for RESIDENTIAL SOLAR SYSTEMS

TO BE SUBMITTED AS PART OF THE PERMIT APPLICATION

AFFIDAVIT OF ARCHITECT OR ENGINEER

State of New York }
County of Westchester } ss.:

I the undersigned, under penalty of perjury, do hereby affirm:

1. I am an the (architect)(engineer) duly licensed in the State of New York
2. I am the NYS licensed design professional named in the Application for which a Building Permit for a residential solar system located at _____, Irvington, New York 10533.
3. I have inspected the existing building and structure and find that the existing structure with the proposed solar panel installation and connections to the existing roof meet the minimum criteria set forth in;
Applicable Codes: 2015 Residential Code of New York State
Design Roof Load: 30 psf live load, 115 psf dead load, 45 psf total load
Design Wind Load: 120 mph, 35psf
OR have proposed additional measures to insure compliance with above.
4. I have reviewed the following submitted drawings and/or manufacture specifications as part of the submission
List applicable plans with revision dates: _____ (rev date) _____
_____ (rev date) _____
_____ (rev date) _____
_____ (rev date) _____
_____ (rev date) _____
5. The plans, drawings and specifications which the Building Permit is requested and listed above, as submitted (a)-were prepared by me or under my supervision, and (b)-to the best of my knowledge comply with the requirements of the Residential Building Code of New York State as adopted by the Village of Irvington, applicable design loads and all other applicable laws, rules and regulations governing building construction.

Signature

(Architect) (Engineer)

Sworn to before me this
____ day of _____, 20____.

Notary Public

NOTICE OF APPLICATION AND HEARING

Board of Architectural Review

Clerk's Office

Village of Irvington

Westchester County, New York

CERTIFIED MAIL

Date of Mailing 1/3/22

NOTICE:

Pursuant to 9-12 of the code of the Village of Irvington notice to adjacent neighbors (as defined below) is required 10 days prior a meeting where an application for Solar Panels to the Village of Irvington Architectural Board is asking to be heard.

Date of Meeting: January 23, 2023
Time of Meeting: Meeting starts at 8pm
Location of Meeting: Trustees Meeting Room
85 Main St. Irvington, NY 10533

Applicant Name	Stacie Varian of Tesla Energy Operations	Owners Name	Judd & Kathy Harcsar
Applicant Mailing Address	1073 Rt 94 Unit 4 New Windsor, NY 12553	Owner Mailing Address	65 N Broadway Irvington, NY 10533
Applicant Phone Number	845-275-6011	Owners Phone Number	347-451-1412
Applicant Email Address	svarian@tesla.com	Owners Email Address	judd@harcscar.com

Address of Proposed Solar Panels:

Street Address 65 N Broadway Irvington, NY 10533

To Adjacent Neighbors of: Judd & Kathy Harcsar
65 N Broadway Irvington, NY 10533

Please take notice that the applicant named above is requesting the Board of Architectural Review of the Village of Irvington to grant a permit for the installation of **Solar Energy Equipment** to the address listed above.

Plans of the proposed work are available in the office of the Irvington Building Department for public inspection during regular business hours 5 days prior to the scheduled meeting.

9-12. Solar Energy Equipment.

For any application for a building permit for solar energy equipment, written notice of the application and the date, time and place of the meeting at which it will be considered must be given to all adjacent property owners not less than 10 days prior to the meeting date. Notice shall be by a method of mail or a delivery service company providing proof of mailing or delivery or by personal service of such notice on the property owners, evidenced by their signature as acknowledgment of receipt of such notice on a form supplied or similar to one supplied by the Village Clerk. Proof of service of the notice shall be filed prior to or at the meeting at which the application is considered.*

("Adjacent property" refers to any neighbor that shares a property line with the subject property as well as neighbors across any street from the subject property.)

August 1, 2022

Certification Letter

Project/Job # 1055414

Project Address:

Harcstar Residence
65 N Broadway
Irvington, NY 10533

AHJ
SC Office

Irvington Village
New Windsor

Design Criteria:

- Applicable Codes = 2020 RCNYS/BCNYS/EBCNYS with 2020 NYSUCS, ASCE 7-16, and 2018 NDS
- Risk Category = II
- Wind Speed = 115 mph (3-s Gust - Vult), Exposure Category C, Partially/Fully Enclosed Method
- Ground Snow Load = 30 psf
- MP1: 2x10 Stick Frame @ 16" OC, Comp Roof, Roof DL = 11 psf, Roof LL/SL = 19.2 psf (Non-PV), Roof LL/SL = 10.4 psf (PV)
- MP3: 2x10 Stick Frame @ 16" OC, Comp Roof, Roof DL = 11 psf, Roof LL/SL = 19.2 psf (Non-PV), Roof LL/SL = 10.4 psf (PV)
- MP4: 2x10 Stick Frame @ 16" OC, Comp Roof, Roof DL = 11 psf, Roof LL/SL = 19.2 psf (Non-PV), Roof LL/SL = 10.4 psf (PV)

Note: Per IBC 1613.1; Seismic check is not required because $S_s = 0.295 < 0.4g$ and Seismic Design Category (SDC) = B < D

To Whom It May Concern,

A jobsite survey of the existing framing system of the address indicated above was performed by a site survey team from Tesla. Structural evaluation was based on site observations and the design criteria listed above.

Based on this evaluation, I certify that the alteration to the existing structure by installation of the PV system meets the prescriptive compliance requirements of the applicable existing building and/or new building provisions adopted/referenced above.

Additionally, I certify that the PV module assembly including all standoffs supporting it have been reviewed to be in accordance with the manufacturer's specifications and to meet and/or exceed all requirements set forth by the referenced codes for loading.

The PV assembly hardware specifications are contained in the plans/docs submitted for approval.



NY

By Yuri at 6:29:18 PM, 8/1/2022

HARDWARE DESIGN AND STRUCTURAL ANALYSIS RESULTS SUMMARY TABLES

Landscape Hardware	Hardware - Landscape Modules' Standoff Specifications					
	X-X Spacing	X-X Cantilever	Y-Y Spacing	Y-Y Cantilever	Configuration	Uplift DCR
MP1	64"	24"	41"	NA	Staggered	49.8%
MP3	64"	24"	41"	NA	Staggered	49.8%
MP4	64"	24"	41"	NA	Staggered	49.8%

Portrait Hardware	Hardware - Portrait Modules' Standoff Specifications					
	X-X Spacing	X-X Cantilever	Y-Y Spacing	Y-Y Cantilever	Configuration	Uplift DCR
MP1	64"	21"	74"	NA	Staggered	90.0%
MP3	64"	21"	74"	NA	Staggered	90.0%
MP4	64"	21"	74"	NA	Staggered	90.0%

Mounting Plane	Structure Information			Qualification Results
	Type	Pitch	Spacing	Member Evaluation Results
MP1	Stick Frame	40°	16" O.C.	Member Impact Check OK
MP3	Stick Frame	40°	16" O.C.	Member Impact Check OK
MP4	Stick Frame	40°	16" O.C.	Member Impact Check OK

STRUCTURE ANALYSIS - LOADING SUMMARY AND MEMBER CHECK - MP1

Member Properties Summary					
MP1		Horizontal Member Spans		Rafter Properties	
		Overhang	1.20 ft	Actual W	1.50"
Roof System Properties		Span 1	16.14 ft	Actual D	9.25"
Number of Spans (w/o Overhang)	1	Span 2		Nominal	Yes
Roofing Material	Comp Roof	Span 3		A (in^2)	13.88
Re-Roof	No	Span 4		Sx (in.^3)	21.39
Plywood Sheathing	Yes	Span 5		Ix (in^4)	98.93
Board Sheathing	None	Total Rake Span	22.63 ft	TL Defl'n Limit	120
Vaulted Ceiling	No	PV 1 Start	2.58 ft	Wood Species	SPF
Ceiling Finish	1/2" Gypsum Board	PV 1 End	16.00 ft	Wood Grade	#2
Rafter Slope	40°	PV 2 Start		Fb (psi)	875
Rafter Spacing	16" O.C.	PV 2 End		Fv (psi)	135
Top Lat Bracing	Full	PV 3 Start		E (psi)	1,400,000
Bot Lat Bracing	At Supports	PV 3 End		E-min (psi)	510,000

Member Loading Summary					
Roof Pitch	10/12	Initial	Pitch Adjust	Non-PV Areas	PV Areas
Roof Dead Load	DL	11.0 psf	x 1.31	14.4 psf	14.4 psf
PV Dead Load	PV-DL	3.0 psf	x 1.31		3.9 psf
Roof Live Load	RLL	20.0 psf	x 0.70	14.0 psf	
Snow Load	SL ^{1,2}	30.0 psf	x 0.64 x 0.35	19.2 psf	10.4 psf
Total Load (Governing LC)	TL			33.6 psf	28.7 psf

Notes: 1. ps = Cs*pf; Cs -roof, Cs -pv per ASCE 7 [Figure 7.4-1]; 2. pf = 0.7 (Ce) (Ct) (Is) pg ; Ce=0.9, Ct=1.1, Is=1.0;

Member Analysis Results Summary					
Governing Analysis	Pre-PV	Load (psf)	Post-PV	Net Impact	Result
Gravity Loading Check	33.6		28.7	-15%	Pass

LOAD ITEMIZATION - MP1

Net PV System Load		
PV Module Weight		2.5 psf
Hardware Assembly Weight (psf)		0.5 psf
Net PV System Weight		3.0 psf

Roof Dead Load	Non-PV Areas	Material	PV Areas
Roof Category Description		MP1	
Original/Existing Roofing Material	5.0 psf	Comp Roof (2 Layers)	5.0 psf
Re-Roof (Under PV Assembly)		No	
Underlayment	0.5 psf	Roofing Paper	0.5 psf
Plywood Sheathing	1.5 psf	Yes	1.5 psf
Board Sheathing		None	
Rafter Size and Spacing	2.9 psf	2 x 10 @ 16 in. O.C.	2.9 psf
Vaulted Ceiling		No	
Miscellaneous	1.1 psf	Miscellaneous Items	1.1 psf
Total Roof Dead Load	11.0 psf	(MP1)	11.0 psf

Reduced Roof LL	Non-PV Areas	Value	ASCE 7-16
Roof Live Load	L_o	20.0 psf	Table 4.3-1
Member Tributary Area	A_t	≤ 200 sf	
Roof Slope		10/12	
Tributary Area Reduction	R_1	1	Section 4.8
Sloped Roof Reduction	R_2	0.7	Section 4.8
Reduced Roof Live Load	L_r	$L_r = L_o (R_1) (R_2)$	Equation 4.8-1
Reduced Roof Live Load	L_r	14 psf (MP1)	14.0 psf

Reduced Ground/Roof Live/Snow Loads			Code
Ground Snow Load	p_g	30.0 psf	Table 7-1
Snow Load Reductions Allowed?		Yes	
Snow Guards to be Installed?		No	
Effective Roof Slope		40°	
Horiz. Distance from Eve to Ridge	W	17.3 ft	
Snow Importance Factor	I_s	1.0	Table 1.5-2
Snow Exposure Factor	C_e	Fully Exposed 0.9	Table 7-2
Snow Thermal Factor	C_t	Structures kept just above freezing 1.1	Table 7-3
Minimum Flat Roof Snow Load (w/ Rain-on-Snow Surcharge)	p_{f-min}	20.8 psf	7.3.4 & 7.10
Flat Roof Snow Load	p_f	$p_f = 0.7 (C_e) (C_t) (I) p_g$; $p_f \geq p_{f-min}$ 20.8 psf	Eq: 7.3-1 69%

ASCE Design Sloped Roof Snow Load Over Surrounding Roof			
Surface Condition of Surrounding Roof	C_{s-roof}	All Other Surfaces 0.9	Figure 7-2
Design Roof Snow Load Over Surrounding Roof	p_{s-roof}	$p_{s-roof} = (C_{s-roof}) p_f$	ASCE Eq: 7.4-1
		19.2 psf	64%

ASCE Design Sloped Roof Snow Load Over PV Modules			
Surface Condition of PV Modules	C_{s-pv}	Unobstructed Slippery Surfaces 0.5	Figure 7-2
Design Snow Load Over PV Modules	p_{s-pv}	$p_{s-pv} = (C_{s-pv}) p_f$	ASCE Eq: 7.4-1
		10.4 psf	35%

ZEP HARDWARE DESIGN CALCULATIONS - MP1

Mounting Plane Information

Roofing Material		Comp Roof	
Roof Slope		40°	
Framing Type / Direction		Y-Y Rafters	
PV System Type		SolarCity SleekMount™	
Zep System Type		ZS Comp	
Standoff (Attachment Hardware)		ZS Comp V4 with Flashing Insert	
Spanning Vents		No	

Wind Design Criteria

Design Standard		ASCE 7-16	
Wind Design Method		Partially/Fully Enclosed Method	
Ultimate Wind Speed	V-Ult	115 mph	Fig. 26.5-1B
Exposure Category		C	Section 26.7
Roof Style		Hip Roof	Fig. 30.3-2A/B/C/D/E/G/H-5A/B
Mean Roof Height	h	25 ft	Section 26.2

Notes: 1. Risk Category = II

Wind Pressure Calculation Coefficients

Wind Pressure Exposure	K_z	0.95	Table 26.10-1
Topographic Factor	K_{zt}	1.00	Section 26.8
Wind Directionality Factor	K_d	0.85	Section 26.6-1
Ground Elevation Factor	K_e	1.00	Table 26.9-1
Velocity Pressure	q_h	$q_h = 0.00256 (K_z) (K_{zt}) (K_d) (K_e) (V^2)$ 27.2 psf	Equation 26.10-1

Wind Pressure			
Ext. Pressure Coefficient (Up)	$G C_p$ (Up)	-1.22	Fig. 30.3-2A/B/C/D/E/G/H-5A/B
Ext. Pressure Coefficient (Down)	$G C_p$ (Down)	0.56	Fig. 30.3-2A/B/C/D/E/G/H-5A/B
Design Wind Pressure	p	$p = q_h (y_E) (y_a) (G C_p)$; $y_E = 1.15$, $y_A = 0.60$	Equation 29.4-7
Wind Pressure Up (Design Ult)	$p_{(up)}$	-13.8 -23 psf	
Wind Pressure Down (Design Ult)	$p_{(down)}$	9.6 16 psf	

Notes: 1. Wind Zone Perimeter Width (a) = 8.4 ft.; Effective Wind Area (A) = 21.3 sf

2. y_E = Array Edge Factor and y_A = Solar Panel Pressure Equalization Factor per SEAoC PV2-2017

ALLOWABLE STANDOFF SPACINGS

		X-Direction	Y-Direction
Max Allowable Standoff Spacing	Landscape	64"	41"
Max Allowable Cantilever	Landscape	24"	NA
Standoff Configuration	Landscape	Staggered	
Max Standoff Tributary Area (Interior)	Trib	18 sf	
PV Assembly Dead Load	W-PV	3.0 psf	
Net Wind Uplift at Standoff (Interior)	T-actual	-227 lbs	
Uplift Capacity of Standoff	T-allow	456 lbs	
Standoff Demand/Capacity (Interior)	DCR	49.8%	

		X-Direction	Y-Direction
Max Allowable Standoff Spacing	Portrait	64"	74"
Max Allowable Cantilever	Portrait	21"	NA
Standoff Configuration	Portrait	Staggered	
Max Standoff Tributary Area (Interior)	Trib	33 sf	
PV Assembly Dead Load	W-PV	3.0 psf	
Net Wind Uplift at Standoff (Interior)	T-actual	-410 lbs	
Uplift Capacity of Standoff	T-allow	456 lbs	
Standoff Demand/Capacity (Interior)	DCR	90.0%	

STRUCTURE ANALYSIS - LOADING SUMMARY AND MEMBER CHECK - MP3

Member Properties Summary					
MP3		Horizontal Member Spans		Rafter Properties	
		Overhang	1.20 ft	Actual W	1.50"
Roof System Properties		Span 1	18.12 ft	Actual D	9.25"
Number of Spans (w/o Overhang)	1	Span 2		Nominal	Yes
Roofing Material	Comp Roof	Span 3		A (in^2)	13.88
Re-Roof	No	Span 4		Sx (in.^3)	21.39
Plywood Sheathing	Yes	Span 5		Ix (in^4)	98.93
Board Sheathing	None	Total Rake Span	25.22 ft	TL Defl'n Limit	120
Vaulted Ceiling	No	PV 1 Start	2.08 ft	Wood Species	SPF
Ceiling Finish	1/2" Gypsum Board	PV 1 End	18.25 ft	Wood Grade	#2
Rafter Slope	40°	PV 2 Start		Fb (psi)	875
Rafter Spacing	16" O.C.	PV 2 End		Fv (psi)	135
Top Lat Bracing	Full	PV 3 Start		E (psi)	1,400,000
Bot Lat Bracing	At Supports	PV 3 End		E-min (psi)	510,000

Member Loading Summary					
Roof Pitch	10/12	Initial	Pitch Adjust	Non-PV Areas	PV Areas
Roof Dead Load	DL	11.0 psf	x 1.31	14.4 psf	14.4 psf
PV Dead Load	PV-DL	3.0 psf	x 1.31		3.9 psf
Roof Live Load	RLL	20.0 psf	x 0.70	14.0 psf	
Snow Load	SL ^{1,2}	30.0 psf	x 0.64 x 0.35	19.2 psf	10.4 psf
Total Load (Governing LC)	TL			33.6 psf	28.7 psf

Notes: 1. ps = Cs*pf; Cs -roof, Cs -pv per ASCE 7 [Figure 7.4-1]; 2. pf = 0.7 (Ce) (Ct) (Is) pg ; Ce=0.9, Ct=1.1, Is=1.0;

Member Analysis Results Summary					
Governing Analysis	Pre-PV	Load (psf)	Post-PV	Net Impact	Result
Gravity Loading Check	33.6		28.7	-15%	Pass

LOAD ITEMIZATION - MP3

Net PV System Load		
PV Module Weight		2.5 psf
Hardware Assembly Weight (psf)		0.5 psf
Net PV System Weight		3.0 psf

Roof Dead Load	Non-PV Areas	Material	PV Areas
Roof Category Description		MP3	
Original/Existing Roofing Material	5.0 psf	Comp Roof (2 Layers)	5.0 psf
Re-Roof (Under PV Assembly)		No	
Underlayment	0.5 psf	Roofing Paper	0.5 psf
Plywood Sheathing	1.5 psf	Yes	1.5 psf
Board Sheathing		None	
Rafter Size and Spacing	2.9 psf	2 x 10 @ 16 in. O.C.	2.9 psf
Vaulted Ceiling		No	
Miscellaneous	1.1 psf	Miscellaneous Items	1.1 psf
Total Roof Dead Load	11.0 psf	(MP3)	11.0 psf

Reduced Roof LL	Non-PV Areas	Value	ASCE 7-16
Roof Live Load	L_o	20.0 psf	Table 4.3-1
Member Tributary Area	A_t	≤ 200 sf	
Roof Slope		10/12	
Tributary Area Reduction	R_1	1	Section 4.8
Sloped Roof Reduction	R_2	0.7	Section 4.8
Reduced Roof Live Load	L_r	$L_r = L_o (R_1) (R_2)$	Equation 4.8-1
Reduced Roof Live Load	L_r	14 psf (MP3)	14.0 psf

Reduced Ground/Roof Live/Snow Loads			Code
Ground Snow Load	p_g	30.0 psf	Table 7-1
Snow Load Reductions Allowed?		Yes	
Snow Guards to be Installed?		No	
Effective Roof Slope		40°	
Horiz. Distance from Eve to Ridge	W	19.3 ft	
Snow Importance Factor	I_s	1.0	Table 1.5-2
Snow Exposure Factor	C_e	Fully Exposed 0.9	Table 7-2
Snow Thermal Factor	C_t	Structures kept just above freezing 1.1	Table 7-3
Minimum Flat Roof Snow Load (w/ Rain-on-Snow Surcharge)	p_{f-min}	20.8 psf	7.3.4 & 7.10
Flat Roof Snow Load	p_f	$p_f = 0.7 (C_e) (C_t) (I) p_g$; $p_f \geq p_{f-min}$ 20.8 psf	Eq: 7.3-1 69%

ASCE Design Sloped Roof Snow Load Over Surrounding Roof			
Surface Condition of Surrounding Roof	C_{s-roof}	All Other Surfaces 0.9	Figure 7-2
Design Roof Snow Load Over Surrounding Roof	p_{s-roof}	$p_{s-roof} = (C_{s-roof}) p_f$	ASCE Eq: 7.4-1
		19.2 psf	64%

ASCE Design Sloped Roof Snow Load Over PV Modules			
Surface Condition of PV Modules	C_{s-pv}	Unobstructed Slippery Surfaces 0.5	Figure 7-2
Design Snow Load Over PV Modules	p_{s-pv}	$p_{s-pv} = (C_{s-pv}) p_f$	ASCE Eq: 7.4-1
		10.4 psf	35%

ZEP HARDWARE DESIGN CALCULATIONS - MP3

Mounting Plane Information

Roofing Material		Comp Roof	
Roof Slope		40°	
Framing Type / Direction		Y-Y Rafters	
PV System Type		SolarCity SleekMount™	
Zep System Type		ZS Comp	
Standoff (Attachment Hardware)		ZS Comp V4 with Flashing Insert	
Spanning Vents		No	

Wind Design Criteria

Design Standard		ASCE 7-16	
Wind Design Method		Partially/Fully Enclosed Method	
Ultimate Wind Speed	V-Ult	115 mph	Fig. 26.5-1B
Exposure Category		C	Section 26.7
Roof Style		Hip Roof	Fig. 30.3-2A/B/C/D/E/G/H-5A/B
Mean Roof Height	h	25 ft	Section 26.2

Notes: 1. Risk Category = II

Wind Pressure Calculation Coefficients

Wind Pressure Exposure	K_z	0.95	Table 26.10-1
Topographic Factor	K_{zt}	1.00	Section 26.8
Wind Directionality Factor	K_d	0.85	Section 26.6-1
Ground Elevation Factor	K_e	1.00	Table 26.9-1
Velocity Pressure	q_h	$q_h = 0.00256 (K_z) (K_{zt}) (K_d) (K_e) (V^2)$ 27.2 psf	Equation 26.10-1

Wind Pressure			
Ext. Pressure Coefficient (Up)	$G C_p$ (Up)	-1.22	Fig. 30.3-2A/B/C/D/E/G/H-5A/B
Ext. Pressure Coefficient (Down)	$G C_p$ (Down)	0.56	Fig. 30.3-2A/B/C/D/E/G/H-5A/B
Design Wind Pressure	p	$p = q_h (y_E) (y_a) (G C_p)$; $y_E = 1.15$, $y_A = 0.60$	Equation 29.4-7
Wind Pressure Up (Design Ult)	$p_{(up)}$	-13.8 -23 psf	
Wind Pressure Down (Design Ult)	$p_{(down)}$	9.6 16 psf	

Notes: 1. Wind Zone Perimeter Width (a) = 8.4 ft.; Effective Wind Area (A) = 21.3 sf

2. y_E = Array Edge Factor and y_A = Solar Panel Pressure Equalization Factor per SEAOc PV2-2017

ALLOWABLE STANDOFF SPACINGS

		X-Direction	Y-Direction
Max Allowable Standoff Spacing	Landscape	64"	41"
Max Allowable Cantilever	Landscape	24"	NA
Standoff Configuration	Landscape	Staggered	
Max Standoff Tributary Area (Interior)	Trib	18 sf	
PV Assembly Dead Load	W-PV	3.0 psf	
Net Wind Uplift at Standoff (Interior)	T-actual	-227 lbs	
Uplift Capacity of Standoff	T-allow	456 lbs	
Standoff Demand/Capacity (Interior)	DCR	49.8%	

		X-Direction	Y-Direction
Max Allowable Standoff Spacing	Portrait	64"	74"
Max Allowable Cantilever	Portrait	21"	NA
Standoff Configuration	Portrait	Staggered	
Max Standoff Tributary Area (Interior)	Trib	33 sf	
PV Assembly Dead Load	W-PV	3.0 psf	
Net Wind Uplift at Standoff (Interior)	T-actual	-410 lbs	
Uplift Capacity of Standoff	T-allow	456 lbs	
Standoff Demand/Capacity (Interior)	DCR	90.0%	

STRUCTURE ANALYSIS - LOADING SUMMARY AND MEMBER CHECK - MP4

Member Properties Summary					
MP4		Horizontal Member Spans		Rafter Properties	
		Overhang	1.20 ft	Actual W	1.50"
Roof System Properties		Span 1	13.32 ft	Actual D	9.25"
Number of Spans (w/o Overhang)	1	Span 2		Nominal	Yes
Roofing Material	Comp Roof	Span 3		A (in^2)	13.88
Re-Roof	No	Span 4		Sx (in.^3)	21.39
Plywood Sheathing	Yes	Span 5		Ix (in^4)	98.93
Board Sheathing	None	Total Rake Span	18.96 ft	TL Defl'n Limit	120
Vaulted Ceiling	No	PV 1 Start	3.67 ft	Wood Species	SPF
Ceiling Finish	1/2" Gypsum Board	PV 1 End	13.33 ft	Wood Grade	#2
Rafter Slope	40°	PV 2 Start		Fb (psi)	875
Rafter Spacing	16" O.C.	PV 2 End		Fv (psi)	135
Top Lat Bracing	Full	PV 3 Start		E (psi)	1,400,000
Bot Lat Bracing	At Supports	PV 3 End		E-min (psi)	510,000

Member Loading Summary					
Roof Pitch	10/12	Initial	Pitch Adjust	Non-PV Areas	PV Areas
Roof Dead Load	DL	11.0 psf	x 1.31	14.4 psf	14.4 psf
PV Dead Load	PV-DL	3.0 psf	x 1.31		3.9 psf
Roof Live Load	RLL	20.0 psf	x 0.70	14.0 psf	
Snow Load	SL ^{1,2}	30.0 psf	x 0.64 x 0.35	19.2 psf	10.4 psf
Total Load (Governing LC)	TL			33.6 psf	28.7 psf

Notes: 1. ps = Cs*pf; Cs -roof, Cs -pv per ASCE 7 [Figure 7.4-1]; 2. pf = 0.7 (Ce) (Ct) (Is) pg ; Ce=0.9, Ct=1.1, Is=1.0;

Member Analysis Results Summary					
Governing Analysis	Pre-PV	Load (psf)	Post-PV	Net Impact	Result
Gravity Loading Check	33.6		28.7	-15%	Pass

LOAD ITEMIZATION - MP4

Net PV System Load		
PV Module Weight		2.5 psf
Hardware Assembly Weight (psf)		0.5 psf
Net PV System Weight		3.0 psf

Roof Dead Load	Non-PV Areas	Material	PV Areas
Roof Category Description		MP4	
Original/Existing Roofing Material	5.0 psf	Comp Roof (2 Layers)	5.0 psf
Re-Roof (Under PV Assembly)		No	
Underlayment	0.5 psf	Roofing Paper	0.5 psf
Plywood Sheathing	1.5 psf	Yes	1.5 psf
Board Sheathing		None	
Rafter Size and Spacing	2.9 psf	2 x 10 @ 16 in. O.C.	2.9 psf
Vaulted Ceiling		No	
Miscellaneous	1.1 psf	Miscellaneous Items	1.1 psf
Total Roof Dead Load	11.0 psf	(MP4)	11.0 psf

Reduced Roof LL	Non-PV Areas	Value	ASCE 7-16
Roof Live Load	L_o	20.0 psf	Table 4.3-1
Member Tributary Area	A_t	≤ 200 sf	
Roof Slope		10/12	
Tributary Area Reduction	R_1	1	Section 4.8
Sloped Roof Reduction	R_2	0.7	Section 4.8
Reduced Roof Live Load	L_r	$L_r = L_o (R_1) (R_2)$	Equation 4.8-1
Reduced Roof Live Load	L_r	14 psf (MP4)	14.0 psf

Reduced Ground/Roof Live/Snow Loads			Code
Ground Snow Load	p_g	30.0 psf	Table 7-1
Snow Load Reductions Allowed?		Yes	
Snow Guards to be Installed?		No	
Effective Roof Slope		40°	
Horiz. Distance from Eve to Ridge	W	14.5 ft	
Snow Importance Factor	I_s	1.0	Table 1.5-2
Snow Exposure Factor	C_e	Fully Exposed 0.9	Table 7-2
Snow Thermal Factor	C_t	Structures kept just above freezing 1.1	Table 7-3
Minimum Flat Roof Snow Load (w/ Rain-on-Snow Surcharge)	p_{f-min}	20.8 psf	7.3.4 & 7.10
Flat Roof Snow Load	p_f	$p_f = 0.7 (C_e) (C_t) (I) p_g$; $p_f \geq p_{f-min}$ 20.8 psf	Eq: 7.3-1 69%

ASCE Design Sloped Roof Snow Load Over Surrounding Roof			
Surface Condition of Surrounding Roof	C_{s-roof}	All Other Surfaces 0.9	Figure 7-2
Design Roof Snow Load Over Surrounding Roof	p_{s-roof}	$p_{s-roof} = (C_{s-roof}) p_f$	ASCE Eq: 7.4-1
		19.2 psf	64%

ASCE Design Sloped Roof Snow Load Over PV Modules			
Surface Condition of PV Modules	C_{s-pv}	Unobstructed Slippery Surfaces 0.5	Figure 7-2
Design Snow Load Over PV Modules	p_{s-pv}	$p_{s-pv} = (C_{s-pv}) p_f$	ASCE Eq: 7.4-1
		10.4 psf	35%

ZEP HARDWARE DESIGN CALCULATIONS - MP4

Mounting Plane Information

Roofing Material		Comp Roof	
Roof Slope		40°	
Framing Type / Direction		Y-Y Rafters	
PV System Type		SolarCity SleekMount™	
Zep System Type		ZS Comp	
Standoff (Attachment Hardware)		ZS Comp V4 with Flashing Insert	
Spanning Vents		No	

Wind Design Criteria

Design Standard		ASCE 7-16	
Wind Design Method		Partially/Fully Enclosed Method	
Ultimate Wind Speed	V-Ult	115 mph	Fig. 26.5-1B
Exposure Category		C	Section 26.7
Roof Style		Hip Roof	Fig. 30.3-2A/B/C/D/E/G/H-5A/B
Mean Roof Height	h	25 ft	Section 26.2

Notes: 1. Risk Category = II

Wind Pressure Calculation Coefficients

Wind Pressure Exposure	K_z	0.95	Table 26.10-1
Topographic Factor	K_{zt}	1.00	Section 26.8
Wind Directionality Factor	K_d	0.85	Section 26.6-1
Ground Elevation Factor	K_e	1.00	Table 26.9-1
Velocity Pressure	q_h	$q_h = 0.00256 (K_z) (K_{zt}) (K_d) (K_e) (V^2)$ 27.2 psf	Equation 26.10-1

Wind Pressure			
Ext. Pressure Coefficient (Up)	$G C_p$ (Up)	-1.22	Fig. 30.3-2A/B/C/D/E/G/H-5A/B
Ext. Pressure Coefficient (Down)	$G C_p$ (Down)	0.56	Fig. 30.3-2A/B/C/D/E/G/H-5A/B
Design Wind Pressure	p	$p = q_h (y_E) (y_a) (G C_p)$; $y_E = 1.15$, $y_A = 0.60$	Equation 29.4-7
Wind Pressure Up (Design Ult)	$p_{(up)}$	-13.8 -23 psf	
Wind Pressure Down (Design Ult)	$p_{(down)}$	9.6 16 psf	

Notes: 1. Wind Zone Perimeter Width (a) = 8.4 ft.; Effective Wind Area (A) = 21.3 sf

2. y_E = Array Edge Factor and y_A = Solar Panel Pressure Equalization Factor per SEAoC PV2-2017

ALLOWABLE STANDOFF SPACINGS

		X-Direction	Y-Direction
Max Allowable Standoff Spacing	Landscape	64"	41"
Max Allowable Cantilever	Landscape	24"	NA
Standoff Configuration	Landscape	Staggered	
Max Standoff Tributary Area (Interior)	Trib	18 sf	
PV Assembly Dead Load	W-PV	3.0 psf	
Net Wind Uplift at Standoff (Interior)	T-actual	-227 lbs	
Uplift Capacity of Standoff	T-allow	456 lbs	
Standoff Demand/Capacity (Interior)	DCR	49.8%	

		X-Direction	Y-Direction
Max Allowable Standoff Spacing	Portrait	64"	74"
Max Allowable Cantilever	Portrait	21"	NA
Standoff Configuration	Portrait	Staggered	
Max Standoff Tributary Area (Interior)	Trib	33 sf	
PV Assembly Dead Load	W-PV	3.0 psf	
Net Wind Uplift at Standoff (Interior)	T-actual	-410 lbs	
Uplift Capacity of Standoff	T-allow	456 lbs	
Standoff Demand/Capacity (Interior)	DCR	90.0%	

APPLICATION FOR ELECTRICAL PERMIT

The Village of Irvington | 85 Main St | Irvington NY 10533

This application is hereby made by the undersigned a licensed electrician, representing the owner, to do electrical work subject to all rules and regulation of New York State, the New York Board of Fire Underwriters and the Board of Trustees of the Village of Irvington.

Application No.: 993

Date: 12/19/2022

Job Location: 65 N BROADWAY

Parcel ID: 2.50-17-8.3

Common Name:

Property Class: 1 FAMILY RES

Occupancy:

Zoning:

Applicant	Property owner
Frank Saladino	HARSCAR, C.J. & K. 50% & GEISMAR M.S. & E.A. 50%
1073 Rt 94 Unit 4 New Windsor NY 12553	65 NO BROADWAY IRVINGTON NY 10533
svarian@tesla.com	judd@harcscar.com
8452756011	
License No. 1814 Expires:	

Description of Work: New 19.2 kw solar PV array consisting of 48 panels plus 27 kWh Energy Storage System.

	Outlets		Fixtures		Motors		Heaters	
Location	Sidewall	Switch	INCADE	FLUORE	No.	H.P.Each	No.	Watts
Outside								
Basement								
1st Floor								
2nd Floor								
3rd Floor								
Other								

Associated Building Permit Number:

Electrical Inspection Agency: State Wide Inspections

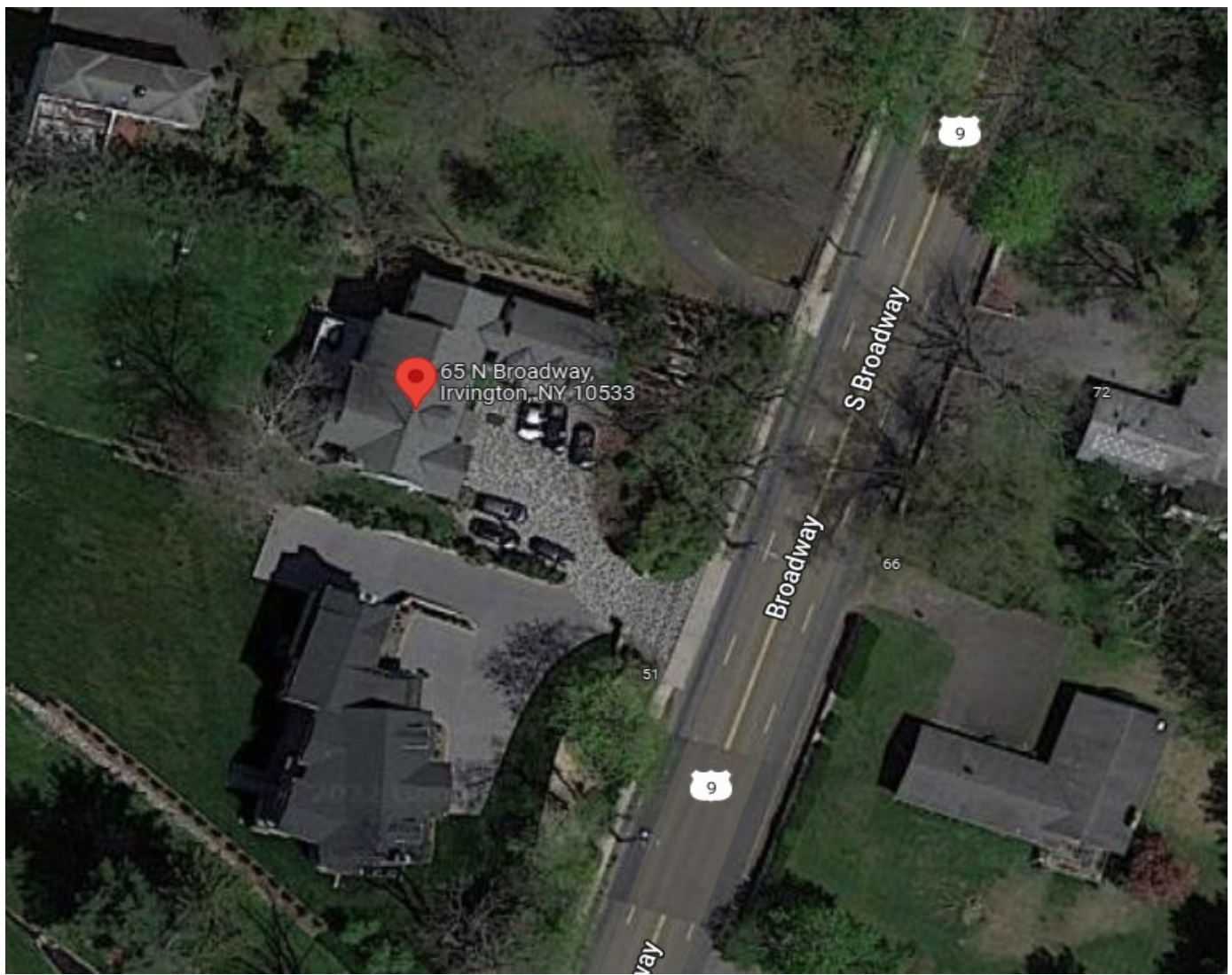
Frank Saladino _____ being duly sworn, deposes and says:

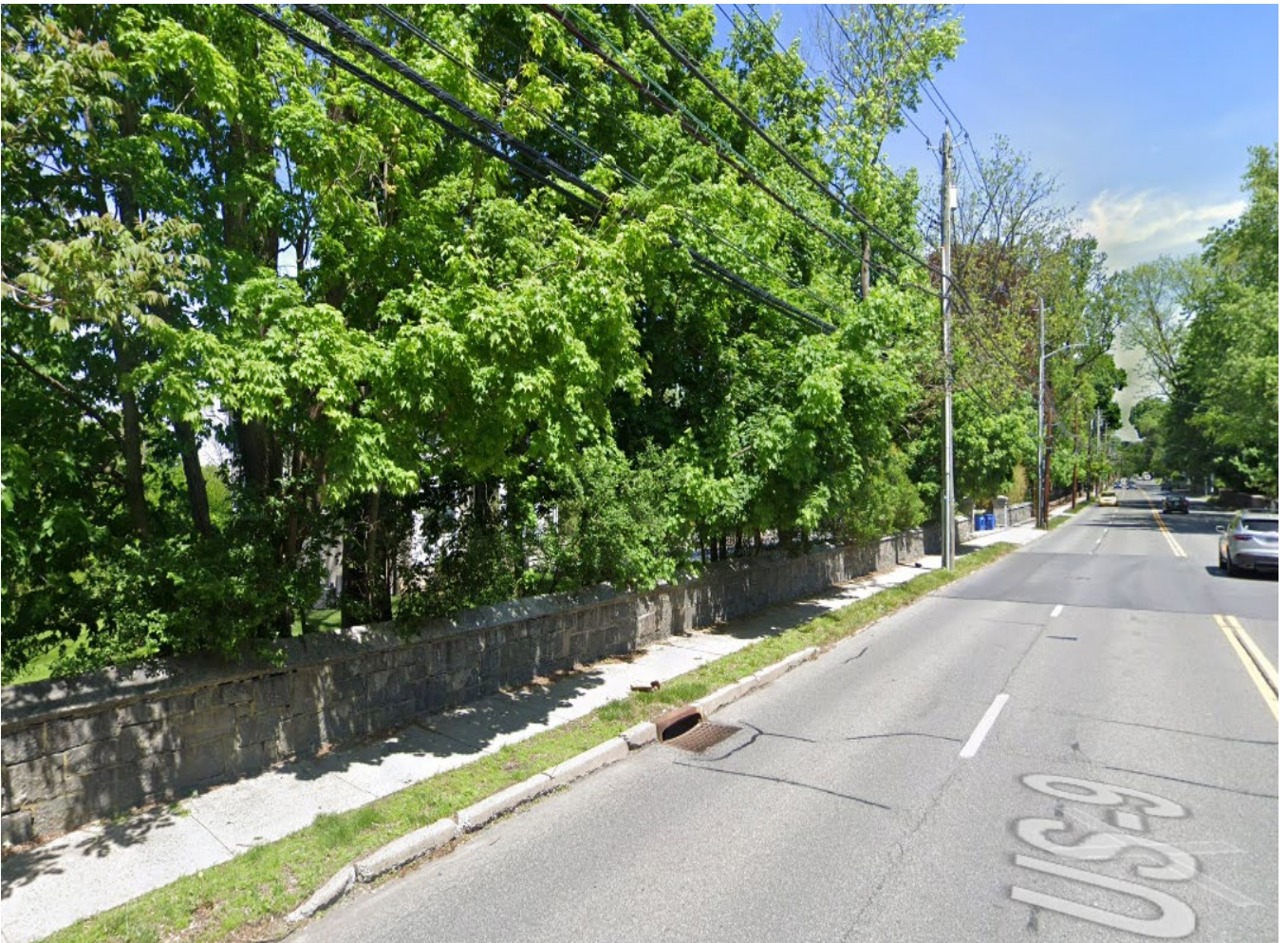
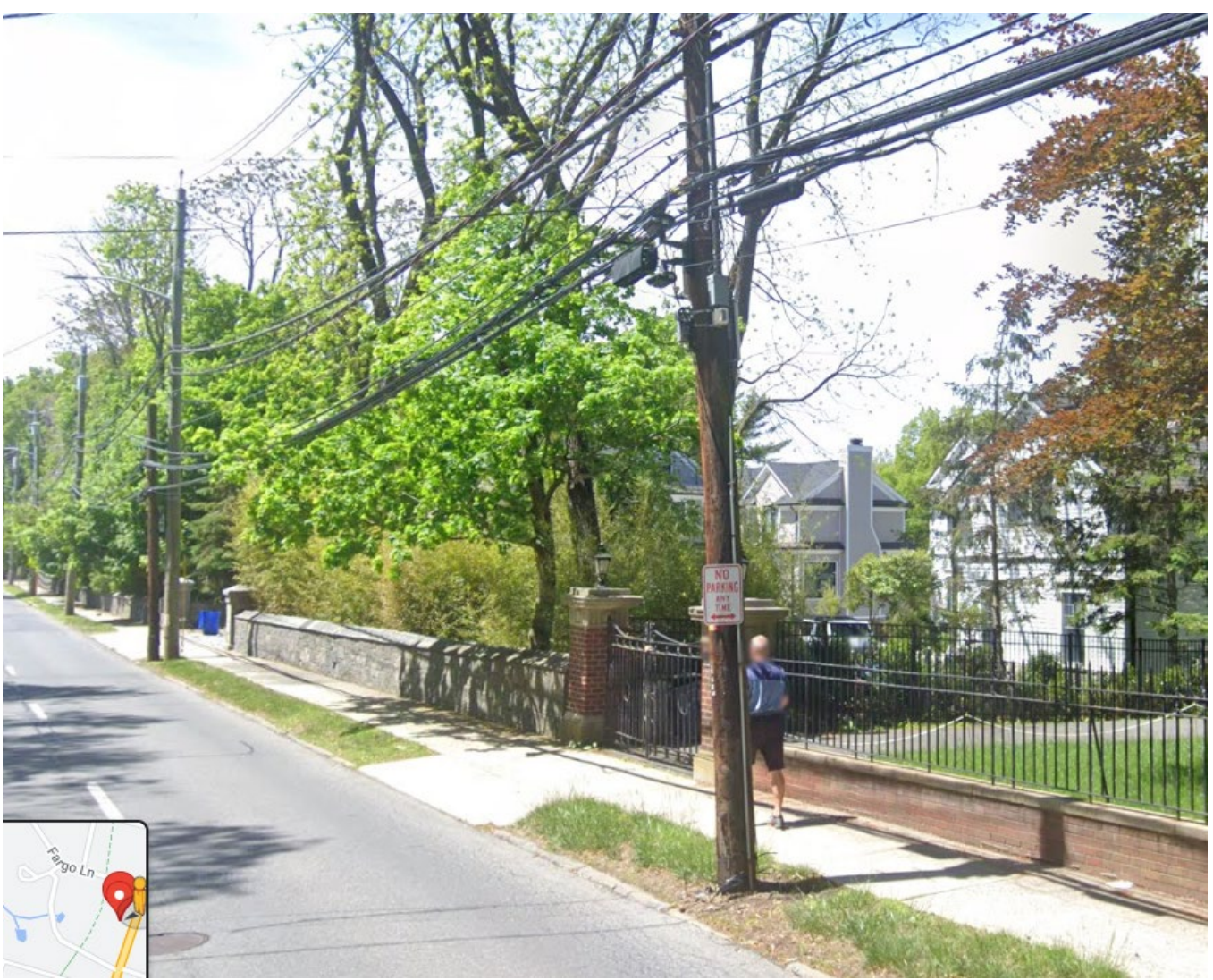
That (s) he is a duly authorized agent of the owner of the premises mentioned in this application, including the accompanying plans, drawings, and statements (if any) are true, and that this application is true and complete statement, an accordance with the laws and regulations of all proposed work to be done on this property. I further swear that I will abide by all the rules and regulations of all proposed work to be done on this property. I further swear that I will abide by all rules and regulations of the Building Inspector whether specifically stated herein or on the plans or not. I will hold the Village of Irvington and their officials harmless from any liability of any injury or damage to persons or property for the issuance of any license or permits.

A copy of the following information is required with every application:

- A valid Westchester County Electrician's License
- General Liability Insurance (listing the Village of Irvington as Additional Insured)
- Workers Compensation Policy
- Fee of \$85

Signature of Licensed Electrician _____

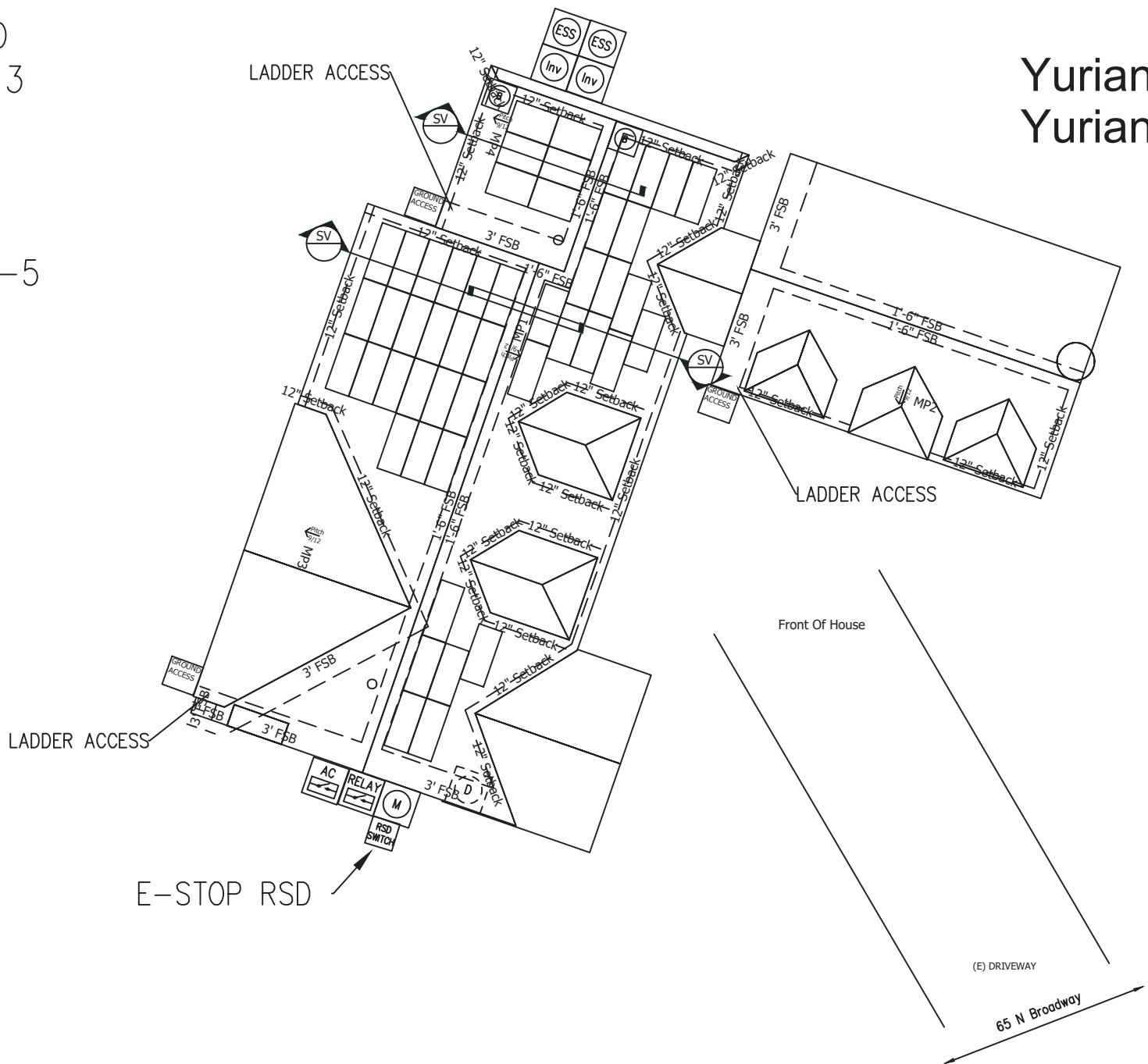




ABBREVIATIONS A AMPERE AC ALTERNATING CURRENT BLDG BUILDING CONC CONCRETE DC DIRECT CURRENT EGC EQUIPMENT GROUNDING CONDUCTOR (E) EXISTING EMT ELECTRICAL METALLIC TUBING FSB FIRE SET-BACK GALV GALVANIZED GEC GROUNDING ELECTRODE CONDUCTOR GND GROUND HDG HOT DIPPED GALVANIZED I CURRENT Imp CURRENT AT MAX POWER Isc SHORT CIRCUIT CURRENT kVA KILOVOLT AMPERE kW KILOWATT LBW LOAD BEARING WALL MIN MINIMUM (N) NEW NEUT NEUTRAL NTS NOT TO SCALE OC ON CENTER PL PROPERTY LINE POI POINT OF INTERCONNECTION PV PHOTOVOLTAIC SCH SCHEDULE S STAINLESS STEEL STC STANDARD TESTING CONDITIONS TYP TYPICAL UPS UNINTERRUPTIBLE POWER SUPPLY V VOLT Vmp VOLTAGE AT MAX POWER Voc VOLTAGE AT OPEN CIRCUIT W WATT 3R NEMA 3R, RAIN TIGHT		ELECTRICAL NOTES 1. THIS SYSTEM IS GRID-INTERTIED VIA A UL-LISTED POWER-CONDITIONING INVERTER. 2. A NATIONALLY – RECOGNIZED TESTING LABORATORY SHALL LIST ALL EQUIPMENT IN COMPLIANCE WITH ART. 110.3. 3. WHERE ALL TERMINALS OF THE DISCONNECTING MEANS MAY BE ENERGIZED IN THE OPEN POSITION, A SIGN WILL BE PROVIDED WARNING OF THE HAZARDS PER ART. 690.17. 4. EACH UNGROUNDED CONDUCTOR OF THE MULTIWIRED BRANCH CIRCUIT WILL BE IDENTIFIED BY PHASE AND SYSTEM PER ART. 210.5. 5. CIRCUITS OVER 250V TO GROUND SHALL COMPLY WITH ART. 250.97, 250.92(B). 6. DC CONDUCTORS EITHER DO NOT ENTER BUILDING OR ARE RUN IN METALLIC RACEWAYS OR ENCLOSURES TO THE FIRST ACCESSIBLE DC DISCONNECTING MEANS PER ART. 690.31(E). 7. ALL WIRES SHALL BE PROVIDED WITH STRAIN RELIEF AT ALL ENTRY INTO BOXES AS REQUIRED BY UL LISTING. 8. MODULE FRAMES SHALL BE GROUNDED AT THE UL – LISTED LOCATION PROVIDED BY THE MANUFACTURER USING UL LISTED GROUNDING HARDWARE. 9. MODULE FRAMES, RAIL, AND POSTS SHALL BE BONDED WITH EQUIPMENT GROUND CONDUCTORS.		JURISDICTION NOTES ALL WORK TO COMPLY WITH SECTION R327 OF THE 2020 RESIDENTIAL CODE OF NYS.																													
LICENSE		GENERAL NOTES 1. ALL WORK SHALL COMPLY WITH THE 2020 NYS UNIFORM CODE. 2. ALL ELECTRICAL WORK SHALL COMPLY WITH THE 2017 NATIONAL ELECTRIC CODE. 3. ALL WORK SHALL COMPLY WITH THE 2020 NYS FIRE CODE. 4. ALL WORK SHALL COMPLY WITH THE 2020 BUILDING CODE OF NYS. 5. ALL WORK SHALL COMPLY WITH THE 2020 RESIDENTIAL CODE OF NYS. 6. ALL WORK SHALL COMPLY WITH THE 2020 EXISTING BUILDING CODE OF NYS.		VICINITY MAP 			INDEX Sheet 1COVER SHEET Sheet 2SITE PLAN Sheet 3STRUCTURAL VIEWS Sheet 4UPLIFT CALCULATIONS Sheet 5THREE LINE DIAGRAM Sheet 6THREE LINE DIAGRAM CONT. Sheet 7AERIAL RENDER Sheet 8STREET RENDER Sheet 9OUTSIDE EQUIPMENT Sheet 10ESS LOCATION Cutsheets Attached <table><tr><th>REV</th><th>BY</th><th>DATE</th><th>COMMENTS</th></tr><tr><td>REV A</td><td>JV</td><td>5/20/2022</td><td>ESS MOVED INSIDE AND AHJ UPDATED</td></tr><tr><td>REV B</td><td>JV</td><td>7/28/2022</td><td>CLEARER SETBACKS AND RENDERS ADDED</td></tr><tr><td>REV C</td><td>JV</td><td>9/1/2022</td><td>ESS MOVED BACK OUTSIDE</td></tr><tr><td>*</td><td>*</td><td>*</td><td>*</td></tr><tr><td>*</td><td>*</td><td>*</td><td>*</td></tr></table>			REV	BY	DATE	COMMENTS	REV A	JV	5/20/2022	ESS MOVED INSIDE AND AHJ UPDATED	REV B	JV	7/28/2022	CLEARER SETBACKS AND RENDERS ADDED	REV C	JV	9/1/2022	ESS MOVED BACK OUTSIDE	*	*	*	*	*	*	*	*
REV	BY	DATE	COMMENTS																														
REV A	JV	5/20/2022	ESS MOVED INSIDE AND AHJ UPDATED																														
REV B	JV	7/28/2022	CLEARER SETBACKS AND RENDERS ADDED																														
REV C	JV	9/1/2022	ESS MOVED BACK OUTSIDE																														
*	*	*	*																														
*	*	*	*																														
CONFIDENTIAL – THE INFORMATION HEREIN CONTAINED SHALL NOT BE USED FOR THE BENEFIT OF ANYONE EXCEPT TESLA INC., NOR SHALL IT BE DISCLOSED IN WHOLE OR IN PART TO OTHERS OUTSIDE THE RECIPIENT'S ORGANIZATION, EXCEPT IN CONNECTION WITH THE SALE AND USE OF THE RESPECTIVE TESLA EQUIPMENT, WITHOUT THE WRITTEN PERMISSION OF TESLA INC.		JOB NUMBER: JB-1055414 00 MOUNTING SYSTEM: ZS Comp V4 w Flashing-Insert MODULES: (48) Tesla # T400H INVERTER: Powerwall+ [240V] #1850000-00-C / PVI Assy. 1538000-35-F		CUSTOMER: Judd&Kathy Harcsar 65 N Broadway Irvington, NY 10533 3474511412		DESCRIPTION: 19.2 KW PV ARRAY 27 KWH ENERGY STORAGE SYSTEM PAGE NAME: COVER SHEET		DESIGN: Justin Very SHEET: 1REV: CDATE: 9/1/2022		TESLA																							

PV CIRCUIT BREAKER OR SWITCH
MUST BE
LABELED '89L' OR 'GENERATOR
DISCONNECT SWITCH'
ESS TO BE MOUNTED
ON EXTERIOR WALL, 3
FT. FROM ALL
DOORS/WINDOWS.

ACCOUNT NUMBER:
51-1702-5621-0003-5



Yurianto
Yurianto

Digitally signed by Yurianto Yurianto
DN: cn=Yurianto Yurianto, o=US, ou=A01410D0000017507CB, email=F250000A7A2, c=US
Reason: I am the author of this document
Location:
Date: 2022-09-01 19:17-05:00
By Yuri at 7:17:04 PM, 9/1/2022

STATE OF NEW YORK
YURIANTO YURIANTO
101980
LICENSED PROFESSIONAL ENGINEER

NY

MP1	PITCH: 36° (9:12) ARRAY PITCH: 36° (9:12) AZIMUTH: 109 ARRAY AZIMUTH: 109 MATERIAL: Comp Shingle STORY: 2 Stories
MP3	PITCH: 36° (9:12) ARRAY PITCH: 36° (9:12) AZIMUTH: 289 ARRAY AZIMUTH: 289 MATERIAL: Comp Shingle STORY: 2 Stories
MP4	PITCH: 36° (9:12) ARRAY PITCH: 36° (9:12) AZIMUTH: 289 ARRAY AZIMUTH: 289 MATERIAL: Comp Shingle STORY: 2 Stories

LEGEND

- (M)

(E) UTILITY METER & WARNING LABEL
- (Inv)

INVERTER W/ INTEGRATED DC DISCO
& WARNING LABELS
- RELAY

AUTOMATIC RELAY
- DC

DC DISCONNECT & WARNING LABELS
- AC

AC DISCONNECT & WARNING LABELS
- (B)

DC JUNCTION/COMBINER BOX & LABELS
- (ESS)

ENERGY STORAGE SYSTEM FOR STAND
ALONE OPERATION
- (D)

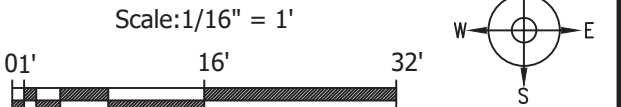
DISTRIBUTION PANEL & LABELS
- (LC)

LOAD CENTER & WARNING LABELS
- (M)

DEDICATED PV SYSTEM METER
- (RSD)

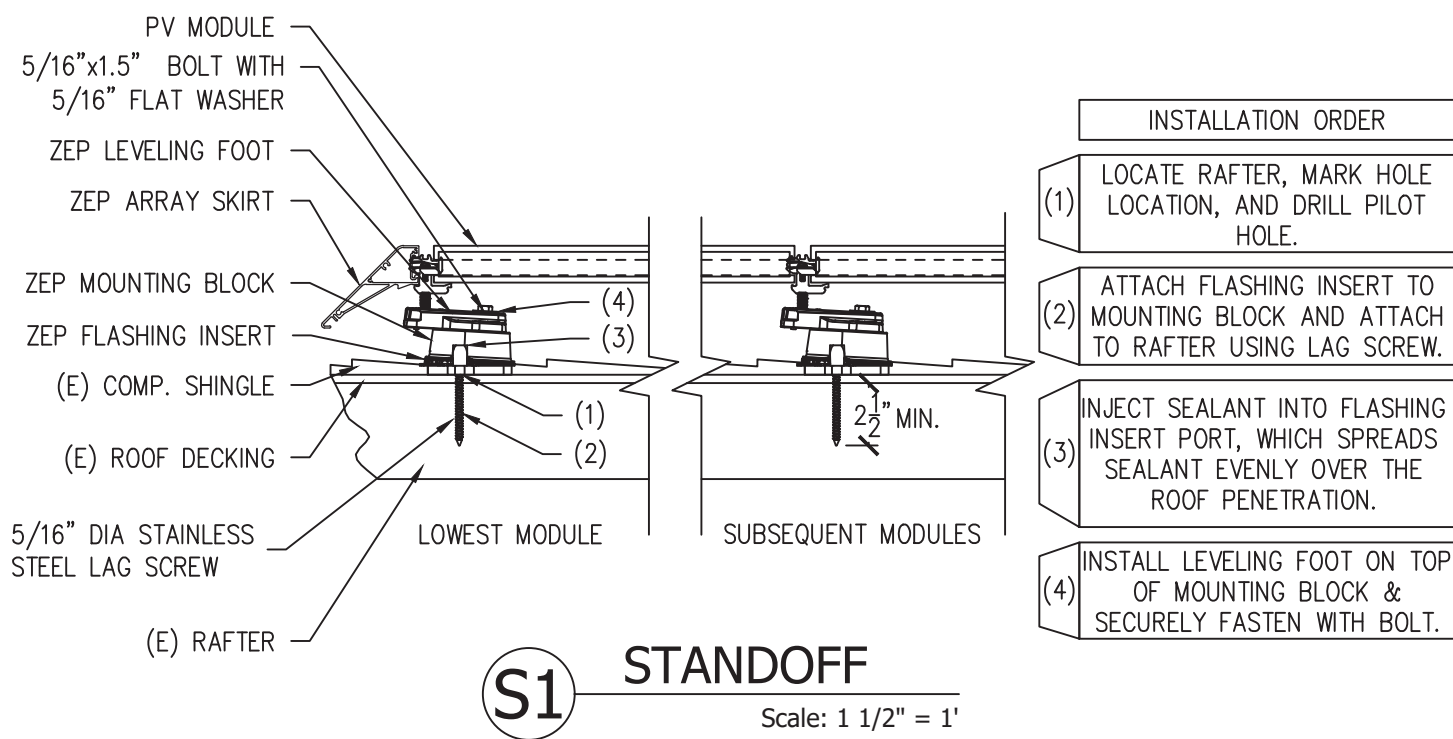
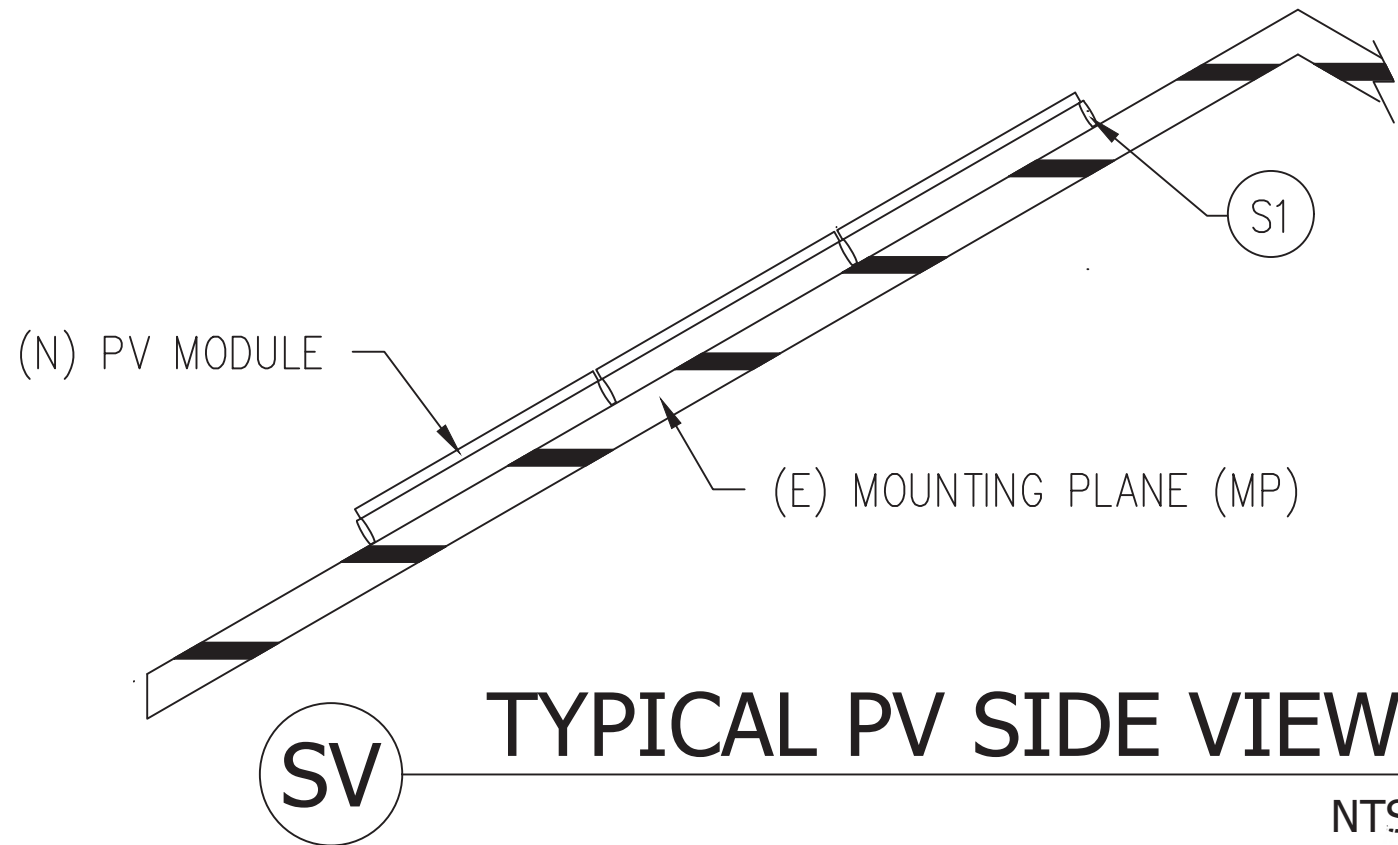
RAPID SHUTDOWN
- STANDOFF LOCATIONS
- CONDUIT RUN ON EXTERIOR
- CONDUIT RUN ON INTERIOR
- GATE/FENCE
- HEAT PRODUCING VENTS ARE RED
- INTERIOR EQUIPMENT IS DASHED

SITE PLAN



TOTAL ARRAY AREA (SF): 1041
TOTAL ROOF AREA (SF): 4940
TOTAL ARRAY AREA IS ≈ 21.07
PERCENT OF TOTAL ROOF AREA

CONFIDENTIAL – THE INFORMATION HEREIN CONTAINED SHALL NOT BE USED FOR THE BENEFIT OF ANYONE EXCEPT TESLA INC., NOR SHALL IT BE DISCLOSED IN WHOLE OR IN PART TO OTHERS OUTSIDE THE RECIPIENT'S ORGANIZATION, EXCEPT IN CONNECTION WITH THE SALE AND USE OF THE RESPECTIVE TESLA EQUIPMENT, WITHOUT THE WRITTEN PERMISSION OF TESLA INC.	JOB NUMBER: JB-1055414 00	CUSTOMER: Judd&Kathy Harcsar 65 N Broadway Irvington, NY 10533 3474511412	DESCRIPTION: 19.2 KW PV ARRAY 27 KWH ENERGY STORAGE SYSTEM PAGE NAME: SITE PLAN	DESIGN: Justin Very SHEET: 2 REV: C DATE: 9/1/2022	TESLA
	MOUNTING SYSTEM: ZS Comp V4 w Flashing-Insert				
	MODULES: (48) Tesla # T400H				
	INVERTER: Powerwall+ [240V] #1850000-00-C / PVI Assy. 1538000-35-F				



CONFIDENTIAL – THE INFORMATION HEREIN CONTAINED SHALL NOT BE USED FOR THE BENEFIT OF ANYONE EXCEPT TESLA INC., NOR SHALL IT BE DISCLOSED IN WHOLE OR IN PART TO OTHERS OUTSIDE THE RECIPIENT'S ORGANIZATION, EXCEPT IN CONNECTION WITH THE SALE AND USE OF THE RESPECTIVE TESLA EQUIPMENT, WITHOUT THE WRITTEN PERMISSION OF TESLA INC.	JOB NUMBER: JB-1055414 00	CUSTOMER: Judd&Kathy Harcsar 65 N Broadway Irvington, NY 10533 3474511412	DESCRIPTION: 19.2 KW PV ARRAY 27 KWH ENERGY STORAGE SYSTEM PAGE NAME: STRUCTURAL VIEWS	DESIGN: Justin Very SHEET: 3 REV: C DATE: 9/1/2022	
	MOUNTING SYSTEM: ZS Comp V4 w Flashing-Insert				
	MODULES: (48) Tesla # T400H				
	INVERTER: Powerwall+ [240V] #1850000-00-C / PVI Assy. 1538000-35-F				

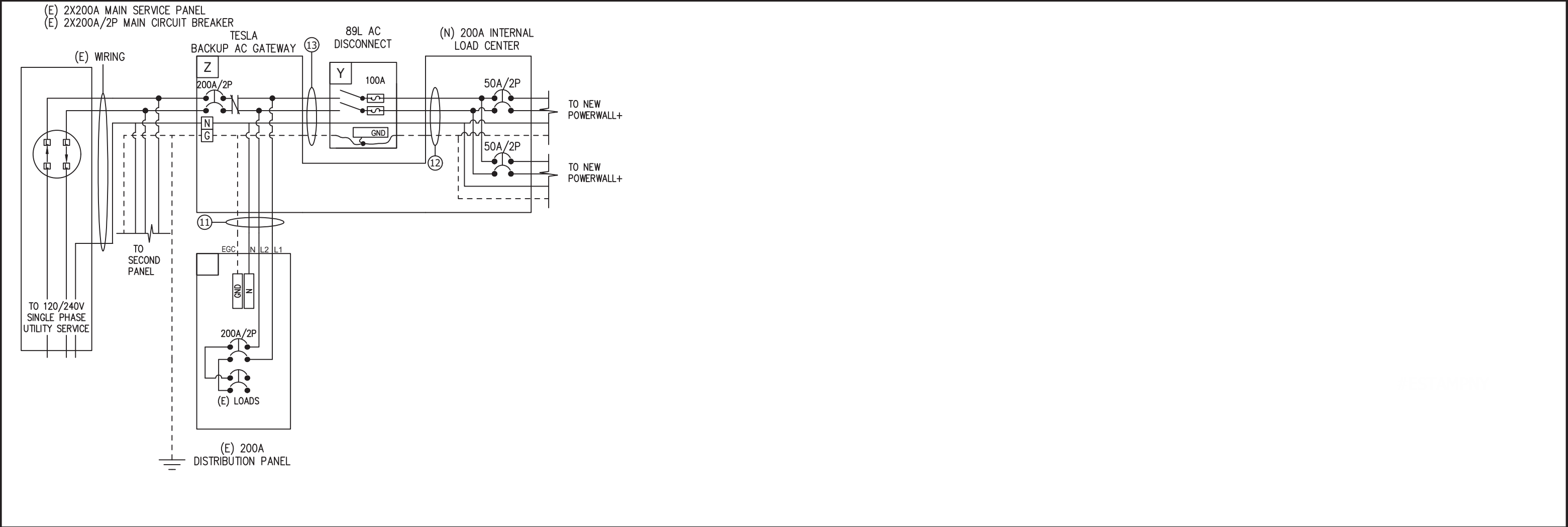


Jobsite Specific Design Criteria			
Design Code		ASCE 7-16	
Risk Category		II	Table 1.5-1
Ultimate Wind Speed	V-Ult	115	Fig. 1609A
Exposure Category		C	Section 26.7
Ground Snow Load	pg	30	Table 7-1
Edge Zone Width	a	8.4 ft	Fig. 30.3-2A to I

MP Specific Design Information			
MP Name	MP1	MP3	MP4
Roofing	Comp Shingle	Comp Shingle	Comp Shingle
Standoff	ZS Comp V4 w Flashing-Insert	ZS Comp V4 w Flashing-Insert	ZS Comp V4 w Flashing-Insert
Pitch	36	36	36
SL/RLL: PV	11.8	11.8	11.8
SL/RLL: Non-PV	20.8	20.8	20.8

Standoff Spacing and Layout			
MP Name	MP1	MP3	MP4
Landscape X-Spacing	64	64	64
Landscape X-Cantilever	24	24	24
Landscape Y-Spacing	41	41	41
Landscape Y-Cantilever	-	-	-
Portrait X-Spacing	48	48	48
Portrait X-Cantilever	19	19	19
Portrait Y-Spacing	74	74	74
Portrait Y-Cantilever	-	-	-
Layout	Staggered	Staggered	Staggered
X and Y are maximums that are always relative to the structure framing that supports the PV. X is across rafters and Y is along rafters.			

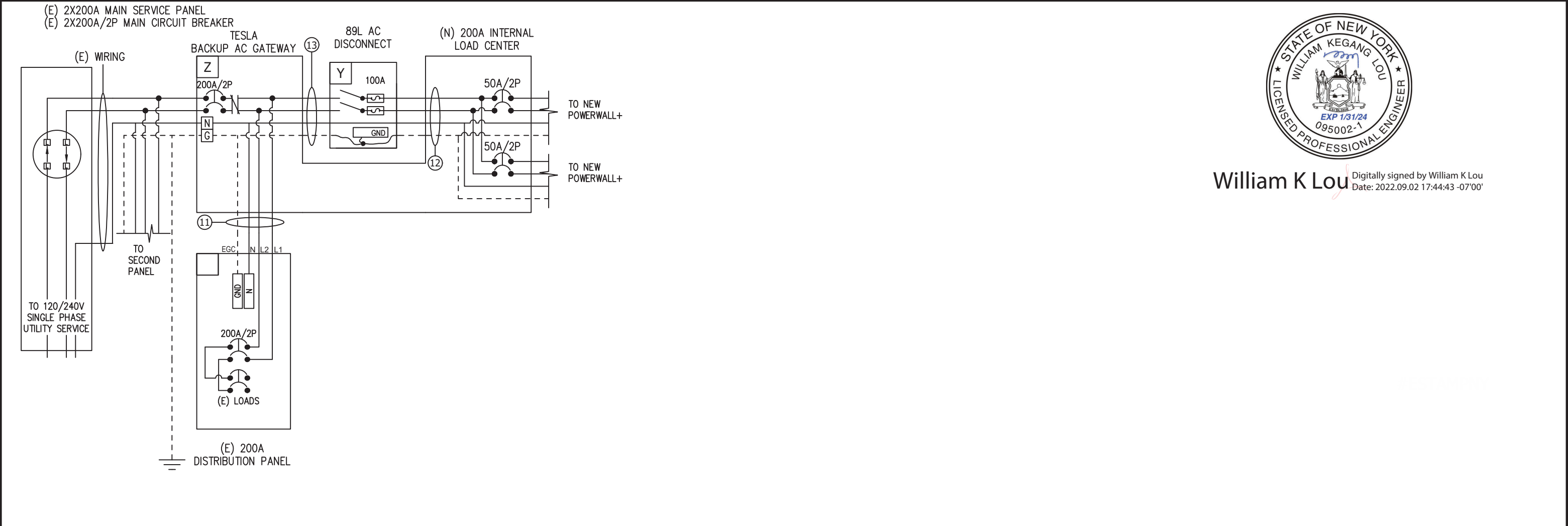
	MAIN PANEL SPECS	GENERAL NOTES			LICENSE
	Panel Number: NoMatch Meter Number: 011006066 Underground Service Entrance ACCOUNT NUMBER: 51-1702-5621-0003-5	*			



POI	(1) Ground Rod 5/8" x 8', Copper	(11) 2ft (3) AWG #2/0, THWN-2, Black (1) AWG #6, THWN-2, Green (1) Conduit 2" PVC; Schedule 80	AC
Z	(1) Tesla # 1232100-00-G Back-up Gateway 2.0 NA for AC PW 2.0 (1) Eaton # CSR2200N 200A MB ONLY; 2-Pole, 120V/240V, 25kAIC, Bolt On (2) CUTLER-HAMMER # BR250 Breaker; 50A/2P, 2 Spaces (1) Panelboard Accessory Kit for GW 2.0 NA 200A, 6sp/12cir, 120/240V, 1PH	(12) 2ft (1) AWG #1, THWN-2, White (1) AWG #1, THWN-2, Red (1) AWG #1, THWN-2, Black (1) AWG #6, THWN-2, Green (1) Conduit Kit; 1-1/4" EMT	
Y	(2) FERRAZ SHAWMUT # TR100R Fuse; 100A, 250V, Class RK5 (1) CUTLER-HAMMER # DG100NB Ground/Neutral Kit; 60-100A, General Duty (DG) (1) CUTLER-HAMMER # DG223NRB Disconnect; 100A, 240V, Fusible, NEMA 3R	(13) 10ft (1) AWG #3, THWN-2, White (1) AWG #3, THWN-2, Red (1) AWG #3, THWN-2, Black (1) AWG #8, THWN-2, Green (1) Conduit Kit; 1" EMT	

CONFIDENTIAL - THE INFORMATION HEREIN CONTAINED SHALL NOT BE USED FOR THE BENEFIT OF ANYONE EXCEPT TESLA INC., NOR SHALL IT BE DISCLOSED IN WHOLE OR IN PART TO OTHERS OUTSIDE THE RECIPIENT'S ORGANIZATION, EXCEPT IN CONNECTION WITH THE SALE AND USE OF THE RESPECTIVE TESLA EQUIPMENT, WITHOUT THE WRITTEN PERMISSION OF TESLA INC.	JOB NUMBER: JB-1055414 00 MOUNTING SYSTEM: ZS Comp V4 w Flashing-Insert MODULES: (48) Tesla # T400H INVERTER: Powerwall+ [240V] #1850000-00-C / PVI Assy. 1538000-35-F	CUSTOMER: Judd&Kathy Harcsar 65 N Broadway Irvington, NY 10533 3474511412	DESCRIPTION: 19.2 KW PV ARRAY 27 KWH ENERGY STORAGE SYSTEM PAGE NAME: THREE LINE DIAGRAM	DESIGN: Justin Very SHEET: 5 REV: C DATE: 9/1/2022	TESLA
---	--	---	--	--	-------

	MAIN PANEL SPECS	GENERAL NOTES			LICENSE
	Panel Number: NoMatch Meter Number: 011006066 Underground Service Entrance ACCOUNT NUMBER: 51-1702-5621-0003-5	*			



William K Lou
Digitally signed by William K Lou
Date: 2022.09.02 17:44:43 -07'00'

POI	(1) Ground Rod 5/8" x 8', Copper	(11) 2ft (3) AWG #2/0, THWN-2, Black (1) AWG #6, THWN-2, Green (1) Conduit 2" PVC; Schedule 80	AC
Z	(1) Tesla # 1232100-00-G Back-up Gateway 2.0 NA for AC PW 2.0 (1) Eaton # CSR2200N 200A MB ONLY; 2-Pole, 120V/240V, 25kAIC, Bolt On (2) CUTLER-HAMMER # BR250 Breaker; 50A/2P, 2 Spaces (1) Panelboard Accessory Kit for GW 2.0 NA 200A, 6sp/12cir, 120/240V, 1PH	(12) 2ft (1) AWG #1, THWN-2, White (1) AWG #1, THWN-2, Red (1) AWG #1, THWN-2, Black (1) AWG #6, THWN-2, Green (1) AWG #3, THWN-2, White (1) AWG #3, THWN-2, Red (1) AWG #3, THWN-2, Black (1) AWG #8, THWN-2, Green	(1) Conduit Kit; 1-1/4" EMT (1) Conduit Kit; 1" EMT
Y	(2) FERRAZ SHAWMUT # TR100R Fuse; 100A, 250V, Class RK5 (1) CUTLER-HAMMER # DG100NB Ground/Neutral Kit; 60-100A, General Duty (DG) (1) CUTLER-HAMMER # DG223NRB Disconnect; 100A, 240Vac, Fusible, NEMA 3R		

CONFIDENTIAL - THE INFORMATION HEREIN CONTAINED SHALL NOT BE USED FOR THE BENEFIT OF ANYONE EXCEPT TESLA INC., NOR SHALL IT BE DISCLOSED IN WHOLE OR IN PART TO OTHERS OUTSIDE THE RECIPIENT'S ORGANIZATION, EXCEPT IN CONNECTION WITH THE SALE AND USE OF THE RESPECTIVE TESLA EQUIPMENT, WITHOUT THE WRITTEN PERMISSION OF TESLA INC.	JOB NUMBER: JB-1055414 00	CUSTOMER: Judd&Kathy Harcsar 65 N Broadway Irvington, NY 10533	DESCRIPTION: 19.2 KW PV ARRAY 27 KWH ENERGY STORAGE SYSTEM	DESIGN: Justin Very	TESLA
	MOUNTING SYSTEM: ZS Comp V4 w Flashing-Insert				
	MODULES: (48) Tesla # T400H				
	INVERTER: Powerwall+ [240V] #1850000-00-C / PVI Assy. 1538000-35-F	3474511412	PAGE NAME: THREE LINE DIAGRAM	SHEET: 5 REV: C DATE: 9/1/2022	

	MAIN PANEL SPECS	GENERAL NOTES	PRODUCT SPECS		MODULE SPECS	LICENSE
	Panel Number: Meter Number: ACCOUNT NUMBER: 51-1702-5621-0003-5	Inv 1: DC Ungrounded Inv 2: DC Ungrounded	1	- (1) Powerwall+ [240V] #1850000-00-C / PVI Assy. 1538000-35-F	- (48) Tesla # T400H PV Module, 400W, 371.5 PTC, 40MM, Black Frame, MC4/MC4-EV02, ZEP, 1000V Voc: 45.3 Vpmax: 37.13 Isc AND Imp ARE SHOWN IN THE DC STRINGS IDENTIFIER	
			2	- (1) Powerwall+ [240V] #1850000-00-C / PVI Assy. 1538000-35-F		
			3			

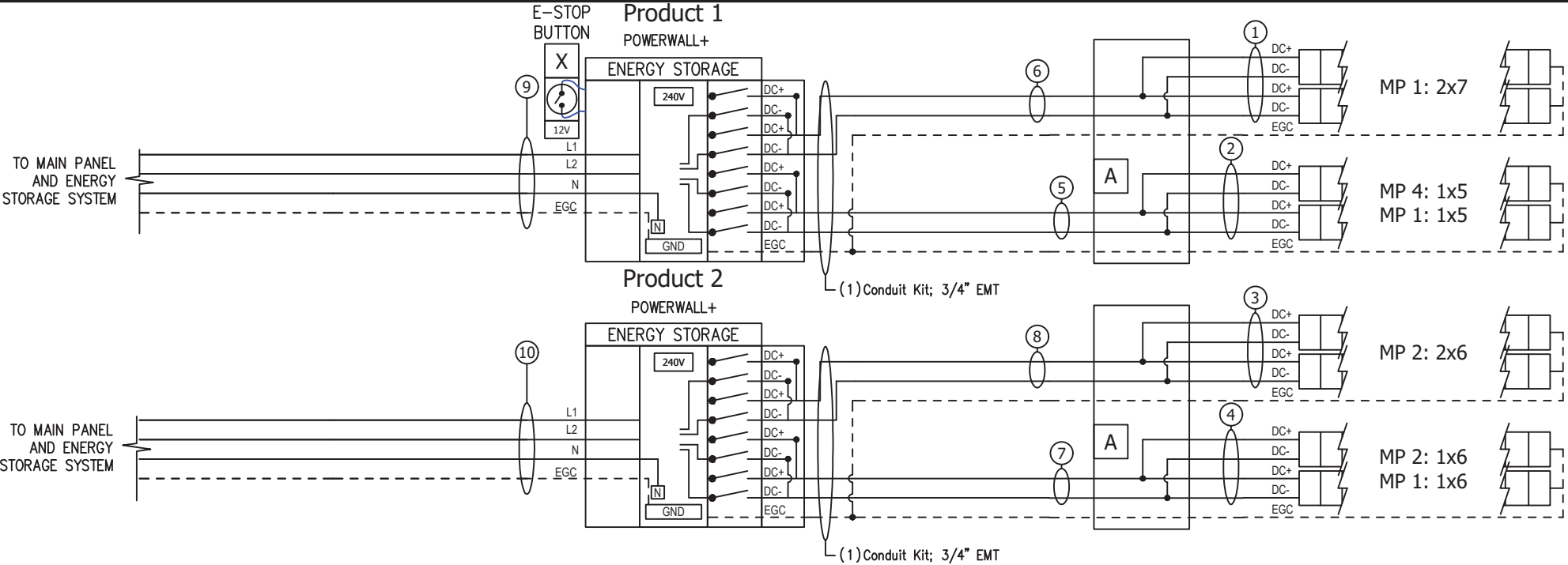
EGC ON ROOF TO BE ROUTED WHERE NOT SUBJECT TO PHYSICAL DAMAGE. WHEN ROUTED SUBJECT TO PHYSICAL DAMAGE THE SIZE MUST BE INCREASED TO #6 SOLID BARE COPPER.

THE GATEWAY WILL REMAIN OPEN WHEN THE SYSTEM LOSES CONTACT WITH THE UTILITY GRID

AC POWERWALL HAS A BUILT IN INVERTER TESTED TO UL 1741 STANDARDS

MAIN SERVICE PANEL ENERGIZED FROM UTILITY AND BATTERY STORAGE

POWERWALL MODES OF OPERATION ARE TIME BASED CONTROL OR BACK UP ONLY.

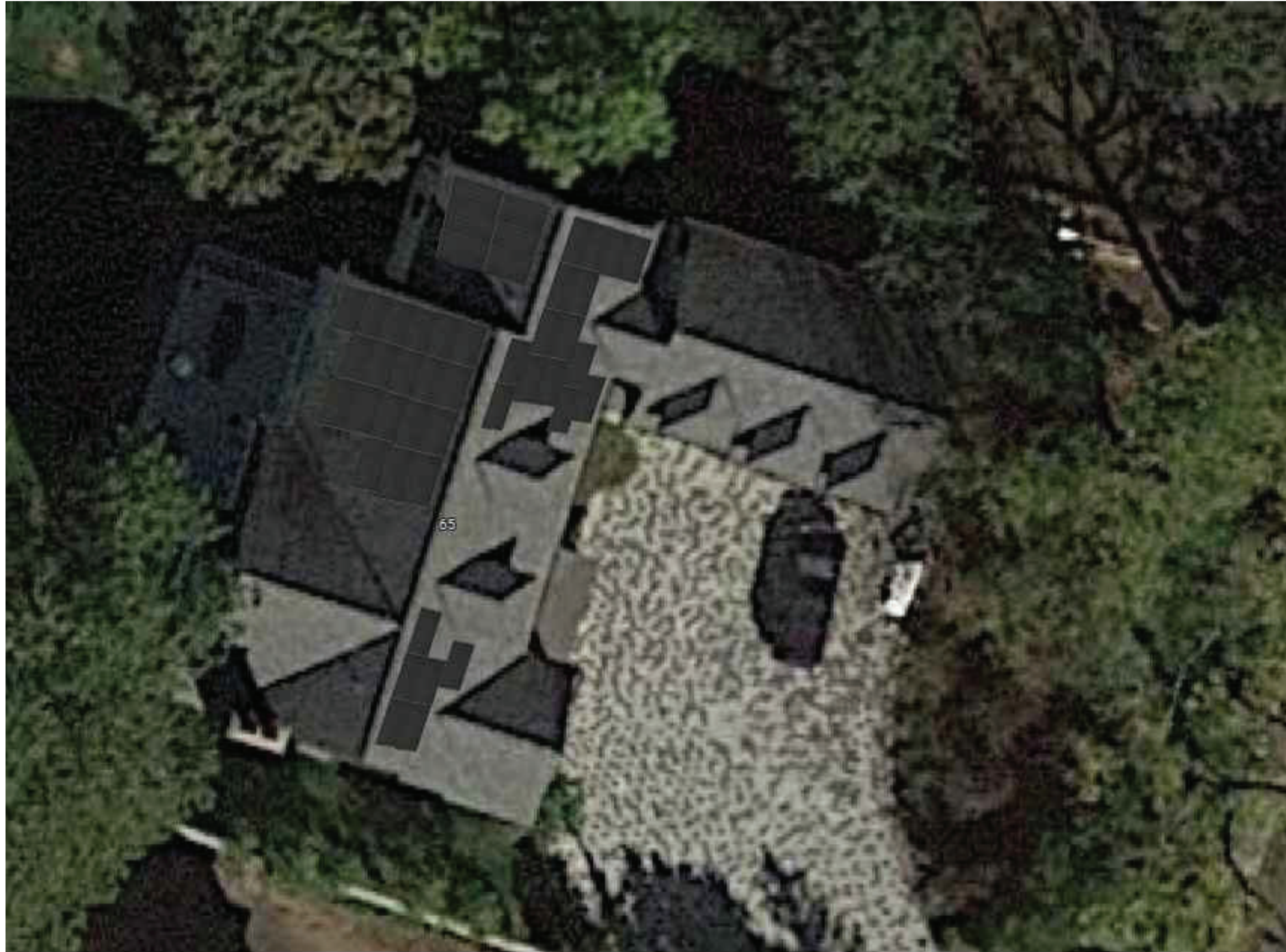


Up to (3) Powerwall+ units can be wired to the emergency stop button (e-stop) for rapid shutdown initiation. Low voltage wiring of connection(s) to additional units is not shown.

Voc* = MAX VOC AT MIN TEMP

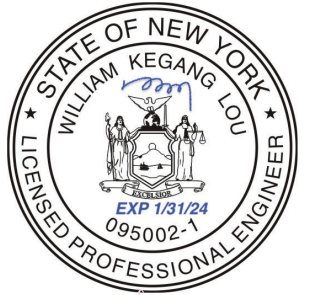
	X	(1)UL 508 Emergency Stop Device – NEMA 4X	AC	095002-1 ED PROFESSIONAL EN William K Lou Digitally signed by William K Lou Date: 2022.09.02 17:45:00 -07'00'	A	(2) Tesla 4J 4–String Combiner Box UNFUSED, GROUNDED, Black, Diag DIN Rail with Bracket/ Cord Grip	DC											
	PV					(18) Tesla MCI, 650V, 12A												
	9	(1)AWG #8, THWN–2, Black (1)AWG #8, THWN–2, Red (1)AWG #8, THWN–2, Green – (1)Conduit Kit; 3/4" EMT	– (1)AWG #8, THWN–2, White EGC Vmp = 240 VAC Imp= 32 AAC	5	(1)AWG #8, THWN–2, Black (1)AWG #8, THWN–2, Red (1)AWG #10, THHN/THWN–2, Green (1)AWG #8, THWN–2, Black (1)AWG #8, THWN–2, Red (1)AWG #10, THHN/THWN–2, Green (1)AWG #8, THWN–2, Black (1)AWG #8, THWN–2, Red (1)AWG #10, THHN/THWN–2, Green (1)AWG #8, THWN–2, Black (1)AWG #8, THWN–2, Red (1)AWG #10, THHN/THWN–2, Green (1)AWG #8, THWN–2, Black (1)AWG #8, THWN–2, Red (1)AWG #10, THHN/THWN–2, Green – (1)Conduit Kit; 3/4" EMT	Voc* = 263.19 VDC Isc = 22.28 ADC Vmp = 185.65 VDC Imp= 21.54 ADC – (1)Conduit Kit; 3/4" EMT Voc* = 368.47VDC Isc = 22.28 ADC Vmp = 259.91 VDC Imp= 21.54 ADC – (1)Conduit Kit; 3/4" EMT Voc* = 315.83 VDC Isc = 22.28 ADC Vmp = 222.78VDC Imp= 21.54 ADC – (1)Conduit Kit; 3/4" EMT Voc* = 315.83 VDC Isc = 22.28 ADC Vmp = 222.78VDC Imp= 21.54 ADC – (1)Conduit Kit; 3/4" EMT	1	(4)PV Wire, AWG 10 (1)AWG #6, Solid Bare Copper EGC	Voc* = 368.47VDC Isc = 11.14 ADC Vmp = 259.91 VDC Imp= 10.77 ADC	2	(4)PV Wire, AWG 10 (1)AWG #6, Solid Bare Copper EGC	Voc* = 263.19 VDC Isc = 11.14 ADC Vmp = 185.65 VDC Imp= 10.77 ADC	3	(4)PV Wire, AWG 10 (1)AWG #6, Solid Bare Copper EGC	Voc* = 315.83 VDC Isc = 11.14 ADC Vmp = 222.78 VDC Imp= 10.77 ADC	4	(4)PV Wire, AWG 10 (1)AWG #6, Solid Bare Copper EGC	Voc* = 315.83 VDC Isc = 11.14 ADC Vmp = 222.78VDC Imp= 10.77 ADC
	10	(1)AWG #8, THWN–2, Red (1)AWG #8, THWN–2, Green – (1)Conduit Kit; 3/4" EMT	– (1)AWG #8, THWN–2, White EGC Vmp = 240 VAC Imp= 32 AAC	6														

CONFIDENTIAL - THE INFORMATION HEREIN CONTAINED SHALL NOT BE USED FOR THE BENEFIT OF ANYONE EXCEPT TESLA INC., NOR SHALL IT BE DISCLOSED IN WHOLE OR IN PART TO OTHERS OUTSIDE THE RECIPIENT'S ORGANIZATION, EXCEPT IN CONNECTION WITH THE SALE AND USE OF THE RESPECTIVE TESLA EQUIPMENT, WITHOUT THE WRITTEN PERMISSION OF TESLA INC.	JOB NUMBER: JB-1055414 00	CUSTOMER: Judd&Kathy Harcsar 65 N Broadway Irvington, NY 10533 3474511412	DESCRIPTION: 19.2 KW PV ARRAY 27 KWH ENERGY STORAGE SYSTEM PAGE NAME: THREE LINE DIAGRAM CONT.	DESIGN: Justin Very SHEET: 6 REV: C DATE: 9/1/2022	
	MOUNTING SYSTEM: ZS Comp V4 w Flashing-Insert				
	MODULES: (48) Tesla # T400H INVERTER: Powerwall+ [240V] #1850000-00-C / PVI Assy. 1538000-35-F				



William K Lou Digitally signed by William K Lou
Date: 2022.09.02 17:45:13 -07'00'

CONFIDENTIAL – THE INFORMATION HEREIN CONTAINED SHALL NOT BE USED FOR THE BENEFIT OF ANYONE EXCEPT TESLA INC., NOR SHALL IT BE DISCLOSED IN WHOLE OR IN PART TO OTHERS OUTSIDE THE RECIPIENT'S ORGANIZATION, EXCEPT IN CONNECTION WITH THE SALE AND USE OF THE RESPECTIVE TESLA EQUIPMENT, WITHOUT THE WRITTEN PERMISSION OF TESLA INC.	JOB NUMBER: JB-1055414 00	CUSTOMER: Judd&Kathy Harcsar 65 N Broadway Irvington, NY 10533 3474511412	DESCRIPTION: 19.2 KW PV ARRAY 27 KWH ENERGY STORAGE SYSTEM PAGE NAME: AERIAL RENDER	DESIGN: Justin Very SHEET: 7 REV: C DATE: 9/1/2022	TESLA
	MOUNTING SYSTEM: ZS Comp V4 w Flashing-Insert				
	MODULES: (48) Tesla # T400H				
	INVERTER: Powerwall+ [240V] #1850000-00-C / PVI Assy. 1538000-35-F				



William K Lou Digitally signed by William K Lou
Date: 2022.09.02 17:45:28 -07'00'

CONFIDENTIAL – THE INFORMATION HEREIN CONTAINED SHALL NOT BE USED FOR THE BENEFIT OF ANYONE EXCEPT TESLA INC., NOR SHALL IT BE DISCLOSED IN WHOLE OR IN PART TO OTHERS OUTSIDE THE RECIPIENT'S ORGANIZATION, EXCEPT IN CONNECTION WITH THE SALE AND USE OF THE RESPECTIVE TESLA EQUIPMENT, WITHOUT THE WRITTEN PERMISSION OF TESLA INC.	JOB NUMBER: JB-1055414 00	CUSTOMER: Judd&Kathy Harcsar 65 N Broadway Irvington, NY 10533 3474511412	DESCRIPTION: 19.2 KW PV ARRAY 27 KWH ENERGY STORAGE SYSTEM PAGE NAME: STREET RENDER	DESIGN: Justin Very SHEET: 8 REV: C DATE: 9/1/2022	
	MOUNTING SYSTEM: ZS Comp V4 w Flashing-Insert				
	MODULES: (48) Tesla # T400H				
	INVERTER: Powerwall+ [240V] #1850000-00-C / PVI Assy. 1538000-35-F				



William K Lou
Digitally signed by William K Lou
Date: 2022.09.02 17:45:42 -07'00'

CONFIDENTIAL – THE INFORMATION HEREIN CONTAINED SHALL NOT BE USED FOR THE BENEFIT OF ANYONE EXCEPT TESLA INC., NOR SHALL IT BE DISCLOSED IN WHOLE OR IN PART TO OTHERS OUTSIDE THE RECIPIENT'S ORGANIZATION, EXCEPT IN CONNECTION WITH THE SALE AND USE OF THE RESPECTIVE TESLA EQUIPMENT, WITHOUT THE WRITTEN PERMISSION OF TESLA INC.

JOB NUMBER:	JB-1055414 00
MOUNTING SYSTEM:	ZS Comp V4 w Flashing-Insert
MODULES:	(48) Tesla # T400H
INVERTER:	Powerwall+ [240V] #1850000-00-C / PVI Assy. 1538000-35-F

CUSTOMER:
Judd&Kathy Harcsar
65 N Broadway
Irvington, NY 10533
3474511412

DESCRIPTION:
19.2 KW PV ARRAY
27 KWH ENERGY STORAGE SYSTEM

PAGE NAME:
OUTSIDE EQUIPMENT

DESIGN:
Justin Very

SHEET: 9
REV: C
DATE: 9/1/2022



ESS TO BE MOUNTED ON EXTERIOR WALL, 3 FT. FROM ALL DOORS/WINDOWS.



ESS LOCATION



William K Lou Digitally signed by William K Lou
Date: 2022.09.02 17:45:57 -07'00'

CONFIDENTIAL – THE INFORMATION HEREIN CONTAINED SHALL NOT BE USED FOR THE BENEFIT OF ANYONE EXCEPT TESLA INC., NOR SHALL IT BE DISCLOSED IN WHOLE OR IN PART TO OTHERS OUTSIDE THE RECIPIENT'S ORGANIZATION, EXCEPT IN CONNECTION WITH THE SALE AND USE OF THE RESPECTIVE TESLA EQUIPMENT, WITHOUT THE WRITTEN PERMISSION OF TESLA INC.	JOB NUMBER: JB-1055414 00	CUSTOMER: Judd&Kathy Harcsar 65 N Broadway Irvington, NY 10533 3474511412	DESCRIPTION: 19.2 KW PV ARRAY 27 KWH ENERGY STORAGE SYSTEM PAGE NAME: ESS LOCATION	DESIGN: Justin Very SHEET: 10 REV: C DATE: 9/1/2022	
	MOUNTING SYSTEM: ZS Comp V4 w Flashing-Insert				
	MODULES: (48) Tesla # T400H				
	INVERTER: Powerwall+ [240V] #1850000-00-C / PVI Assy. 1538000-35-F				

WARNING: PHOTOVOLTAIC POWER SOURCE

Label Location:
(C)(CB)(JB)
Per Code:
NEC 690.31.G.3

PHOTOVOLTAIC DC
DISCONNECT

Label Location:
(DC) (INV)
Per Code:
NEC 690.13.B

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

Label Location:
(DC) (INV)
Per Code:
NEC 690.53

WARNING

ELECTRIC SHOCK HAZARD
IF A GROUND FAULT IS INDICATED
NORMALLY GROUNDED
CONDUCTORS MAY BE
UNGROUNDDED AND ENERGIZED

Label Location:
(DC) (INV)
Per Code:
690.41.B

PHOTOVOLTAIC AC
DISCONNECT

Label Location:
(AC) (POI)
Per Code:
NEC 690.13.B

MAXIMUM AC A
OPERATING CURRENT
MAXIMUM AC V
OPERATING VOLTAGE

Label Location:
(AC) (POI)
Per Code:
NEC 690.54

WARNING

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

Label Location:
(AC)(POI)
Per Code:
NEC 690.13.B

PHOTOVOLTAIC SYSTEM
EQUIPPED WITH RAPID
SHUTDOWN

Label Location:
(INV)
Per Code:
NEC 690.56.C.3

CAUTION
DUAL POWER SOURCE
SECOND SOURCE IS
PHOTOVOLTAIC SYSTEM

Label Location:
(POI)
Per Code:
NEC 705.12.B.3

WARNING

INVERTER OUTPUT
CONNECTION
DO NOT RELOCATE
THIS OVERCURRENT
DEVICE

Label Location:
(POI)
Per Code:
NEC 705.12.B.2.3.b

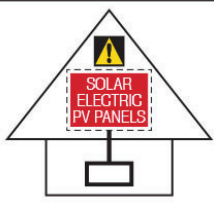
WARNING

ELECTRIC SHOCK HAZARD
THE DC CONDUCTORS OF THIS
PHOTOVOLTAIC SYSTEM ARE
UNGROUNDDED AND
MAY BE ENERGIZED

Label Location:
(DC) (INV)

SOLAR PV SYSTEM
EQUIPPED WITH RAPID
SHUTDOWN

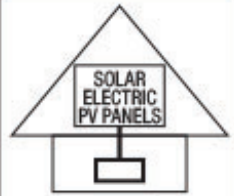
TURN RAPID
SHUTDOWN SWITCH
TO THE "OFF"
POSITION TO SHUT
DOWN CONDUCTORS
OUTSIDE THE ARRAY.
CONDUCTORS WITHIN
THE ARRAY REMAIN
ENERGIZED IN SUNLIGHT



Label Location:
ABB/Delta Solivia Inverter
Per Code:
690.56(C)(1)(b)

SOLAR PV SYSTEM
EQUIPPED WITH RAPID
SHUTDOWN

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



Label Location:
SolarEdge and,Delta M-Series and,Telsa Inverter
Per Code:
690.56(C)(1)(a)



William K Lou Digitally signed by William K Lou
Date: 2022.09.02 17:46:12 -07'00'

(AC): AC Disconnect
(C): Conduit
(CB): Combiner Box
(D): Distribution Panel
(DC): DC Disconnect
(IC): Interior Run Conduit
(INV): Inverter With Integrated DC Disconnect
(LC): Load Center
(M): Utility Meter
(POI): Point of Interconnection

BACKUP LOAD CENTER

Label Location:
(BLC)
Per Code:
NEC 408.4

CAUTION
DO NOT ADD NEW LOADS

Label Location:
(BLC)
Per Code:
NEC 220

CAUTION
THIS PANEL HAS SPLICED FEED-
THROUGH CONDUCTORS.
LOCATION OF DISCONNECT AT ENERGY
STORAGE BACKUP LOAD PANEL

Label Location:
(MSP)
Per Code:
NEC 312.8.A(3)

CAUTION
DUAL POWER SOURCE
SECOND SOURCE IS
ENERGY STORAGE SYSTEM

Label Location:
(MSP)
Per Code:
NEC 705.12(B)(3)

ENERGY STORAGE SYSTEM ON SITE
LOCATED WITHIN LINE OF SIGHT

Label Location:
(MSP)
Per Code:

ENERGY STORAGE SYSTEM ON SITE
LOCATED ON ADJACENT WALL

Label Location:
(MSP)
Per Code:

ENERGY STORAGE SYSTEM ON SITE
LOCATED ON OPPOSITE WALL

Label Location:
(MSP)
Per Code:

ENERGY STORAGE SYSTEM ON SITE
LOCATED INSIDE

Label Location:
(MSP)
Per Code:

CAUTION
TRI POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM
THIRD SOURCE IS ENERGY STORAGE SYSTEM

Label Location:
(MSP)
Per Code:
NEC 705.12(B)(3)

WARNING
THIS EQUIPMENT FED BY
MULTIPLE SOURCES. TOTAL
RATING OF ALL OVER CURRENT
DEVICES, EXCLUDING MAIN
SUPPLY OVERCURRENT DEVICE,
SHALL NOT EXCEED AMPACITY
OF BUSBAR.

Label Location:
(MSP)
Per Code:
NEC 705.12.B.2.3.c

NOMINAL ESS VOLTAGE: 120/240V
MAX AVAILABLE SHORT-
CIRCUIT FROM ESS: 32A
ARC FAULT CLEARING
TIME FROM ESS: 67ms
DATE OF
CALCULATION:

Label Location:
(MSP)
Per Code:
Per 706.7(D) label to be marked in field



William K Lou
Digitally signed by William K Lou
Date: 2022.09.02 17:46:26 -07'00'

(AC): AC Disconnect
(BLC): Backup Load Center
(MSP): Main Service Panel

POWERWALL

Backup Gateway 2

The Backup Gateway 2 for Tesla Powerwall provides energy management and monitoring for solar self-consumption, time-based control, and backup.

The Backup Gateway 2 controls connection to the grid, automatically detecting outages and providing a seamless transition to backup power. When equipped with a main circuit breaker, the Backup Gateway 2 can be installed at the service entrance. When the optional internal panelboard is installed, the Backup Gateway 2 can also function as a load center.

The Backup Gateway 2 communicates directly with Powerwall, allowing you to monitor energy use and manage backup energy reserves from any mobile device with the Tesla app.



PERFORMANCE SPECIFICATIONS

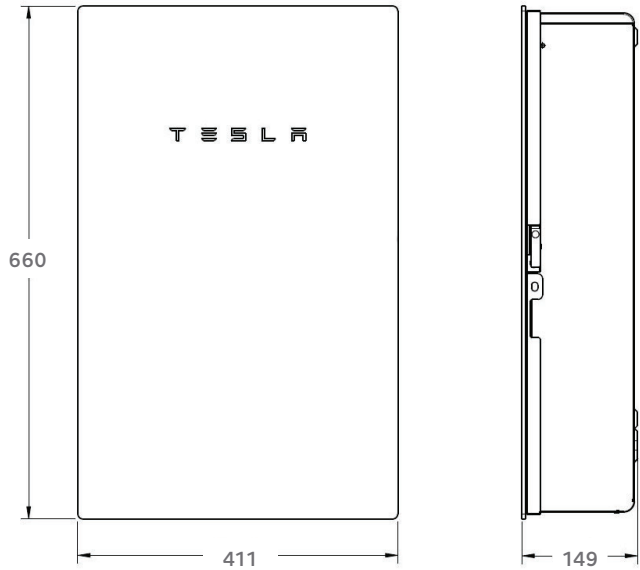
Model Number	1232100-xx-y
AC Voltage (Nominal)	120/240V
Feed-In Type	Split Phase
Grid Frequency	60 Hz
Current Rating	200 A
Maximum Input Short Circuit Current	10 kA ¹
Overcurrent Protection Device	100-200A; Service Entrance Rated ¹
Overvoltage Category	Category IV
AC Meter	Revenue accurate (+/- 0.2 %)
Primary Connectivity	Ethernet, Wi-Fi
Secondary Connectivity	Cellular (3G, LTE/4G) ²
User Interface	Tesla App
Operating Modes	Support for solar self-consumption, time-based control, and backup
Backup Transition	Automatic disconnect for seamless backup
Modularity	Supports up to 10 AC-coupled Powerwalls
Optional Internal Panelboard	200A 6-space / 12 circuit Eaton BR Circuit Breakers
Warranty	10 years

¹ When protected by Class J fuses, Backup Gateway 2 is suitable for use in circuits capable of delivering not more than 22kA symmetrical amperes.

² The customer is expected to provide internet connectivity for Backup Gateway 2; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.

MECHANICAL SPECIFICATIONS

Dimensions	660 mm x 411 mm x 149 mm (26 in x 16 in x 6 in)
Weight	20.4 kg (45 lb)
Mounting options	Wall mount, Semi-flush mount



COMPLIANCE INFORMATION

Certifications	UL 67, UL 869A, UL 916, UL 1741 PCS CSA 22.2 0.19, CSA 22.2 205
Emissions	FCC Part 15, ICES 003

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Operating Humidity (RH)	Up to 100%, condensing
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R

MCI WIRING DETAIL

GENERAL NOTES

- DRAWING OF STANDARD MCI WIRING DETAIL FOR ANY GIVEN STRING LENGTH
- IF INITIATED, RAPID SHUTDOWN OCCURS WITHIN 30 SECONDS OF ACTIVATION AND LIMITS VOLTAGE ON THE ROOF TO NO GREATER THAN 165V (690.12.B.2.1)
- MID CIRCUIT INTERRUPTER (MCI) IS A UL 1741 PVRSE CERTIFIED RAPID SHUTDOWN DEVICE (RSD)

RETROFIT PV MODULES

- MCIS ARE LOCATED AT ROOF LEVEL, JUST UNDER THE PV MODULES IN ACCORDANCE WITH 690.12 REQUIREMENTS
- THE QUANTITY OF MCIS PER STRING IS DETERMINED BY STRING LENGTH
 - NUMBER OF MODULES BETWEEN MCI UNITS = 0–3
 - MAXIMUM NUMBER OF MODULES PER MCI UNIT = 3
 - MINIMUM NUMBER MCI UNITS = MODULE COUNT/3

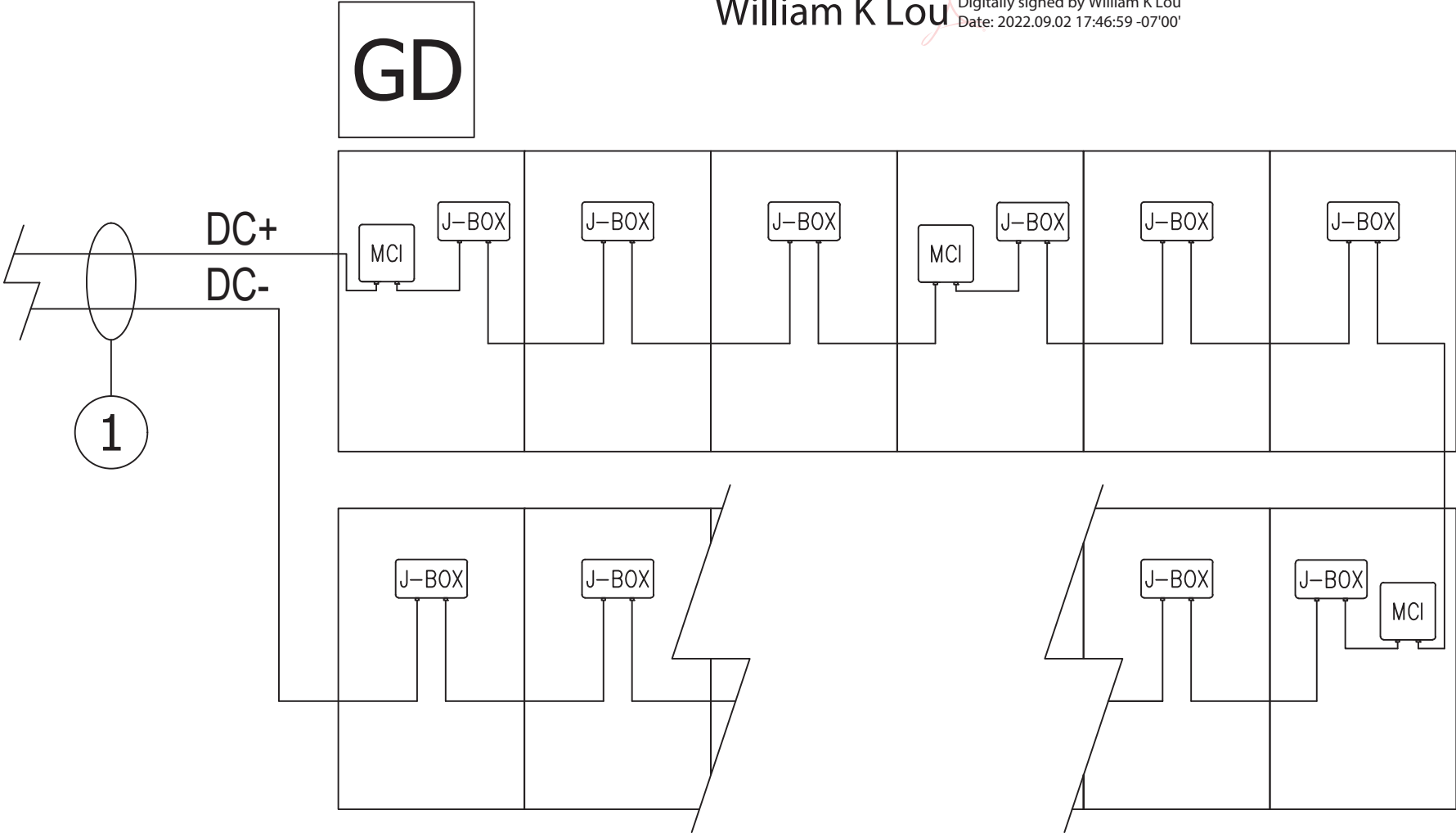
*Exception: Tesla (Longi) modules installed in locations where the max Voc for 3 modules at low design temperature exceeds 165V shall be limited to 2 modules between MCIs.

PLEASE REFER TO MCI CUTSHEET AND PVRSA INSERT FOR MORE INFORMATION



William K Lou Digitally signed by William K Lou
Date: 2022.09.02 17:46:59 -07'00'

TESLA



① (2) AWG, PV Wire, 600V, Black

DC

MCI WIRING DETAIL

GENERAL NOTES

- DRAWING OF STANDARD MCI WIRING DETAIL FOR ANY GIVEN STRING LENGTH
- IF INITIATED, RAPID SHUTDOWN OCCURS WITHIN 30 SECONDS OF ACTIVATION AND LIMITS VOLTAGE ON THE ROOF TO NO GREATER THAN 165V (690.12.B.2.1)
- MID CIRCUIT INTERRUPTER (MCI) IS A UL 1741 PVRSE CERTIFIED RAPID SHUTDOWN DEVICE (RSD)

SOLAR ROOF TILES

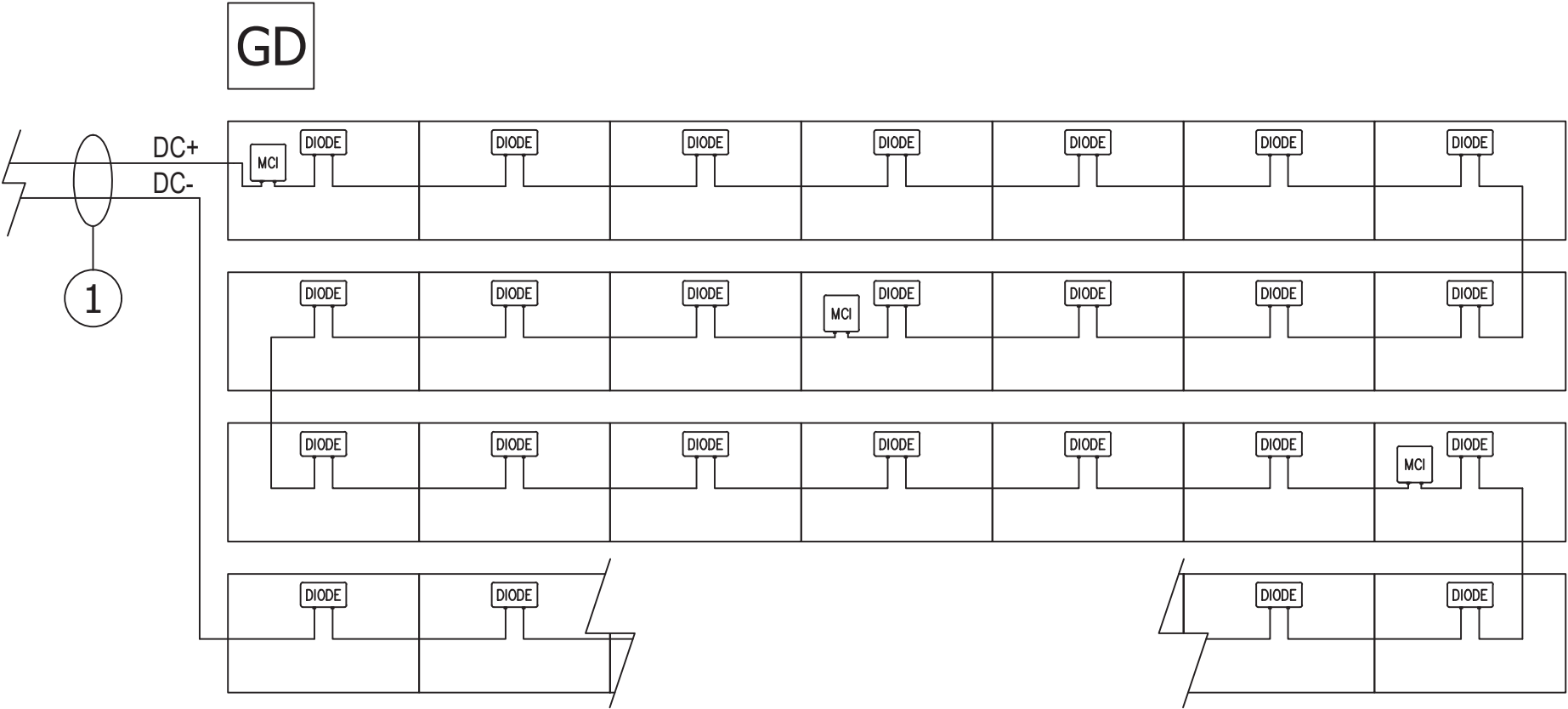
- MCIS ARE LOCATED AT DECK LEVEL, JUST UNDER THE TILES IN ACCORDANCE WITH 690.12 REQUIREMENTS
- THE QUANTITY OF MCIS PER STRING IS DETERMINED BY STRING LENGTH
 - NUMBER OF TILES BETWEEN MCI UNITS = 0–10
 - MAXIMUM NUMBER OF TILES PER MCI UNIT = 10
 - MINIMUM NUMBER MCI UNITS = TILE COUNT/10

PLEASE REFER TO MCI CUTSHEET AND PVRSA INSERT FOR MORE INFORMATION



TESLA

William K Lou Digitally signed by William K Lou
Date: 2022.09.02 17:46:43 -07'00'



① (2) AWG, PV Wire, 600V, Black

DC



TESLA

POWERWALL+

Powerwall+ is an integrated solar battery system that stores energy from solar production. Powerwall+ has two separate inverters, one for battery and one for solar, that are optimized to work together. Its integrated design and streamlined installation allow for simple connection to any home, and improved surge power capability brings whole home backup in a smaller package. Smart system controls enable owners to customize system behavior to suit their renewable energy needs.

KEY FEATURES

- Integrated battery, inverter, and system controller for a more compact install
- A suite of application modes, including self-powered, time-based control, and backup modes
- Wi-Fi, Ethernet, and LTE connectivity with easy over-the-air updates

POWERWALL+

PHOTOVOLTAIC (PV) AND BATTERY ENERGY STORAGE SYSTEM (BESS) SPECIFICATIONS

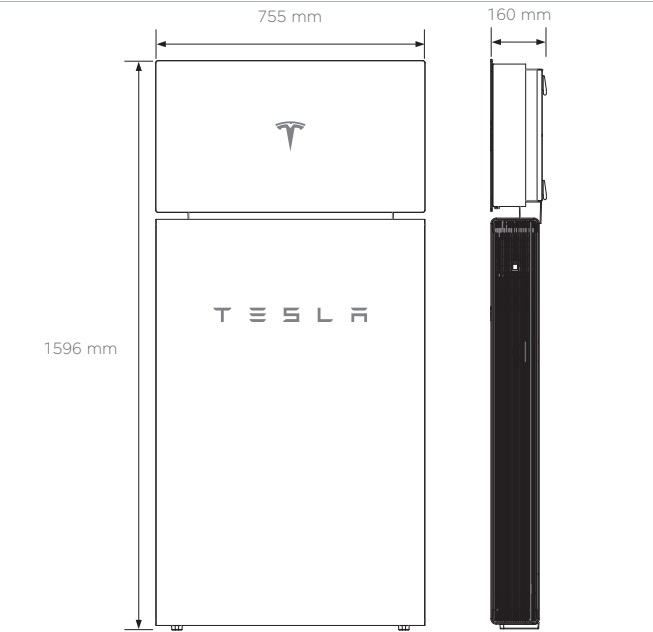
Powerwall+ Model Number	1850000-xx-y
Solar Assembly Model Number	1538000-xx-y
Nominal Battery Energy	13.5 kWh
Nominal Grid Voltage (Input / Output)	120/240 VAC
Grid Voltage Range	211.2 - 264 VAC
Frequency	60 Hz
Phase	240 VAC: 2W+N+GND
Maximum Continuous Power On-Grid	7.6 kVA full sun / 5.8 kVA no sun ¹
Maximum Continuous Power Off-Grid	9.6 kW full sun / 7 kW no sun ¹
Peak Off-Grid Power (10 s)	22 kW full sun / 10 kW no sun ¹
Maximum Continuous Current On-Grid	32 A output
Maximum Continuous Current Off-Grid	40 A output
Load Start Capability	98 - 118 A LRA ²
PV Maximum Input Voltage	600 VDC
PV DC Input Voltage Range	60 - 550 VDC
PV DC MPPT Voltage Range	60 - 480 VDC
MPPTs	4
Input Connectors per MPPT	1-2-1-2
Maximum Current per MPPT (I _{mp})	13 A ³
Maximum Short Circuit Current per MPPT (I _{sc})	17 A ³
Allowable DC/AC Ratio	1.7
Overcurrent Protection Device	50 A breaker
Maximum Supply Fault Current	10 kA
Output Power Factor Rating	+/- 0.9 to 1 ⁴
Round Trip Efficiency	90% ⁵
Solar Generation CEC Efficiency	97.5% at 208 V 98.0% at 240 V
Customer Interface	Tesla Mobile App
Internet Connectivity	Wi-Fi, Ethernet, Cellular LTE/4G ⁶
PV AC Metering	Revenue grade (+/-0.5%)
Protections	Integrated arc fault circuit interrupter (AFCI), PV Rapid Shutdown
Warranty	10 years

COMPLIANCE INFORMATION

PV Certifications	UL 1699B, UL 1741, UL 3741, UL 1741 SA, UL 1998 (US), IEEE 1547, IEEE 1547.1
Battery Energy Storage System Certifications	UL 1642, UL 1741, UL 1741 PCS, UL 1741 SA, UL 1973, UL 9540, IEEE 1547, IEEE 1547.1, UN 38.3
Grid Connection	United States
Emissions	FCC Part 15 Class B
Environmental	RoHS Directive 2011/65/EU
Seismic	AC156, IEEE 693-2005 (high)

MECHANICAL SPECIFICATIONS

Dimensions	1596 x 755 x 160 mm (62.8 x 29.7 x 6.3 in)
Total Weight	140 kg (310 lb) ⁷
Battery Assembly	118 kg (261 lb)
Solar Assembly	22 kg (49 lb)
Mounting options	Floor or wall mount



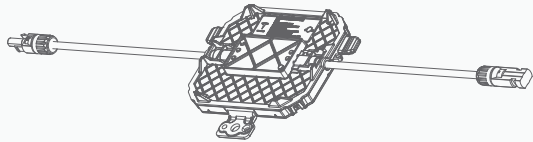
ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-20°C to 50°C (-4°F to 122°F) ⁸
Recommended Temperature	0°C to 30°C (32°F to 86°F)
Operating Humidity (RH)	Up to 100%, condensing
Storage Conditions	-20°C to 30°C (-4°F to 86°F) Up to 95% RH, non-condensing State of Energy (SoE): 25% initial
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	Type 3R
Solar Assembly Ingress Rating	IP55 (Wiring Compartment)
Battery Assembly Ingress Rating	IP56 (Wiring Compartment) IP67 (Battery & Power Electronics)
Noise Level @ 1 m	< 40 db(A) optimal, < 50 db(A) maximum

¹Values provided for 25°C (77°F).
²Load start capability may vary.
³Where the DC input current exceeds an MPPT rating, jumpers can be used to allow a single MPPT to intake additional DC current up to 26 A I_{mp} / 34 A I_{sc}.
⁴Power factor rating at max real power.
⁵AC to battery to AC, at beginning of life.
⁶Cellular connectivity subject to network service coverage and signal strength.
⁷The total weight does not include the Powerwall+ bracket, which weighs an additional 9 kg (20 lb).
⁸Performance may be de-rated at operating temperatures below 10°C (50°F) or greater than 43°C (109°F).

SOLAR SHUTDOWN DEVICE

The Tesla Solar Shutdown Device is a Mid-Circuit Interrupter (MCI) and is part of the PV system rapid shutdown (RSD) function in accordance with Article 690 of the applicable NEC. When paired with Powerwall+, solar array shutdown is initiated by pushing the System Shutdown Switch if one is present.



ELECTRICAL SPECIFICATIONS

Model Number	MCI-1
Nominal Input DC Current Rating (I_{MP})	12 A
Maximum Input Short Circuit Current (I_{SC})	15 A
Maximum System Voltage	600 V DC

RSD MODULE PERFORMANCE

Maximum Number of Devices per String	5
Control	Power Line Excitation
Passive State	Normally open
Maximum Power Consumption	7 W
Warranty	25 years

COMPLIANCE INFORMATION

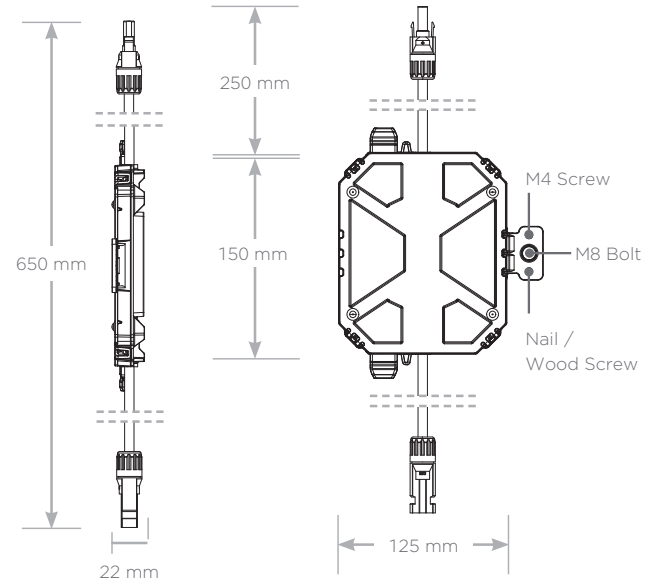
Certifications	UL 1741 PVRSE, UL 3741, PVRSA (Photovoltaic Rapid Shutdown Array)
RSD Initiation Method	External System Shutdown Switch
Compatible Equipment	See Compatibility Table below

ENVIRONMENTAL SPECIFICATIONS

Ambient Temperature	-40°C to 50°C (-40°F to 122°F)
Storage Temperature	-30°C to 60°C (-22°F to 140°F)
Enclosure Rating	NEMA 4 / IP65

MECHANICAL SPECIFICATIONS

Electrical Connections	MC4 Connector
Housing	Plastic
Dimensions	125 mm x 150 mm x 22 mm (5 in x 6 in x 1 in)
Weight	350 g (0.77 lb)
Mounting Options	ZEP Home Run Clip M4 Screw (#10) M8 Bolt (5/16") Nail / Wood screw



UL 3741 PV HAZARD CONTROL (AND PVRSA) COMPATIBILITY

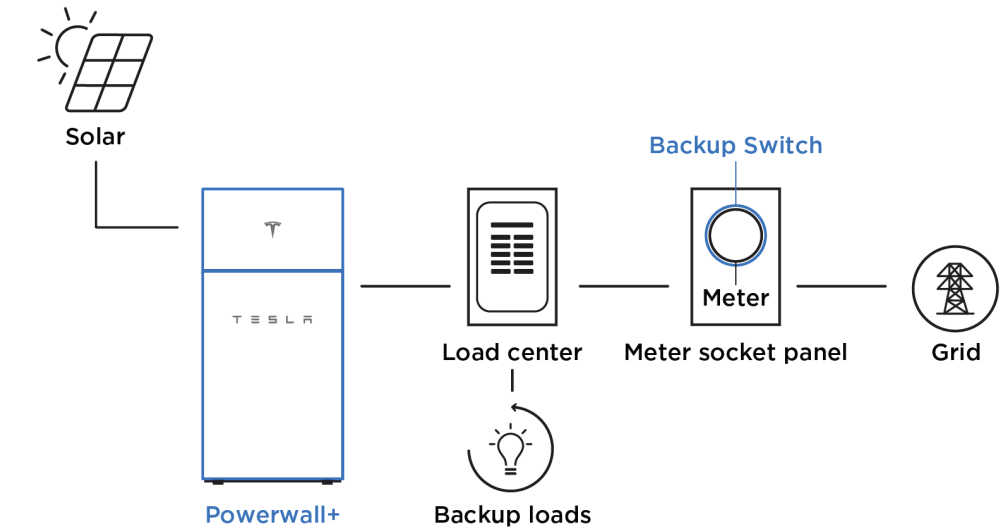
Tesla Solar Roof and Tesla/Zep ZS Arrays using the following modules are certified to UL 3741 and UL 1741 PVRSA when installed with the Powerwall+ and Solar Shutdown Devices. See the Powerwall+ Installation Manual for detailed instructions and for guidance on installing Powerwall+ and Solar Shutdown Devices with other modules.

Brand	Model	Required Solar Shutdown Devices
Tesla	Solar Roof V3	1 Solar Shutdown Device per 10 modules
Tesla	Tesla TxxxS (where xxx = 405 to 450 W, increments of 5)	1 Solar Shutdown Device per 3 modules ¹
Tesla	Tesla TxxxH (where xxx = 395 to 415 W, increments of 5)	1 Solar Shutdown Device per 3 modules
Hanwha	Q.PEAK DUO BLK-G5	1 Solar Shutdown Device per 3 modules
Hanwha	Q.PEAK DUO BLK-G6+	1 Solar Shutdown Device per 3 modules

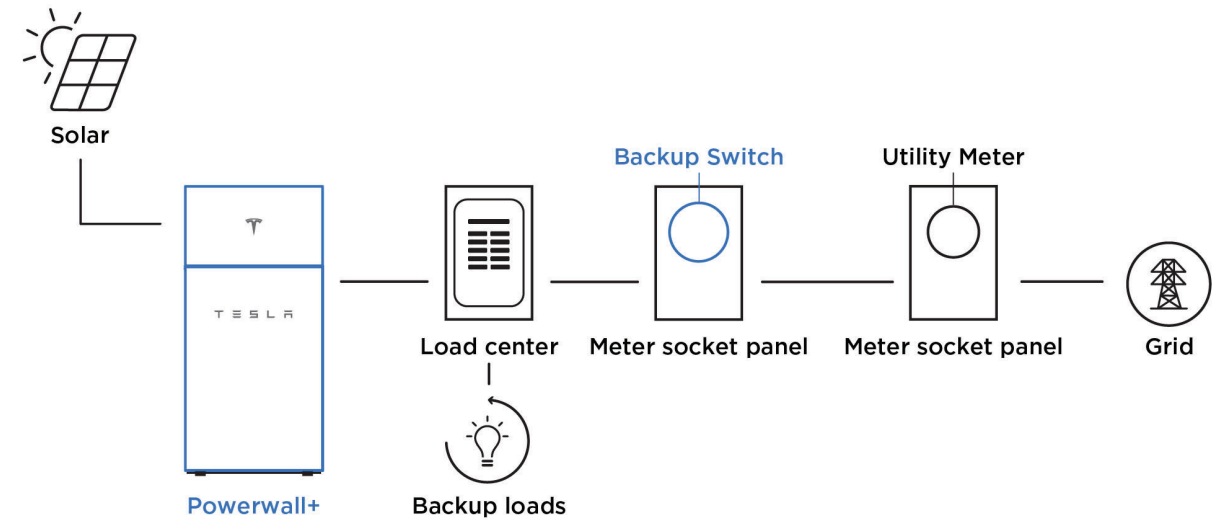
¹**Exception:** Tesla solar modules installed in locations where the max Voc for three modules at low design temperatures exceeds 165 V shall be limited to two modules between Solar Shutdown Devices.

SYSTEM LAYOUTS

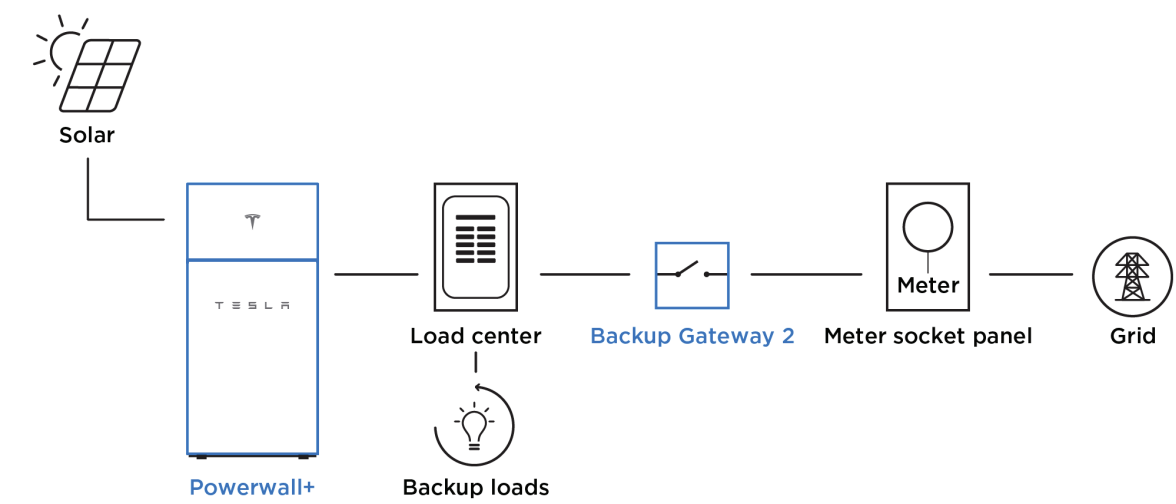
Powerwall+ with Backup Switch Installed Behind Utility Meter



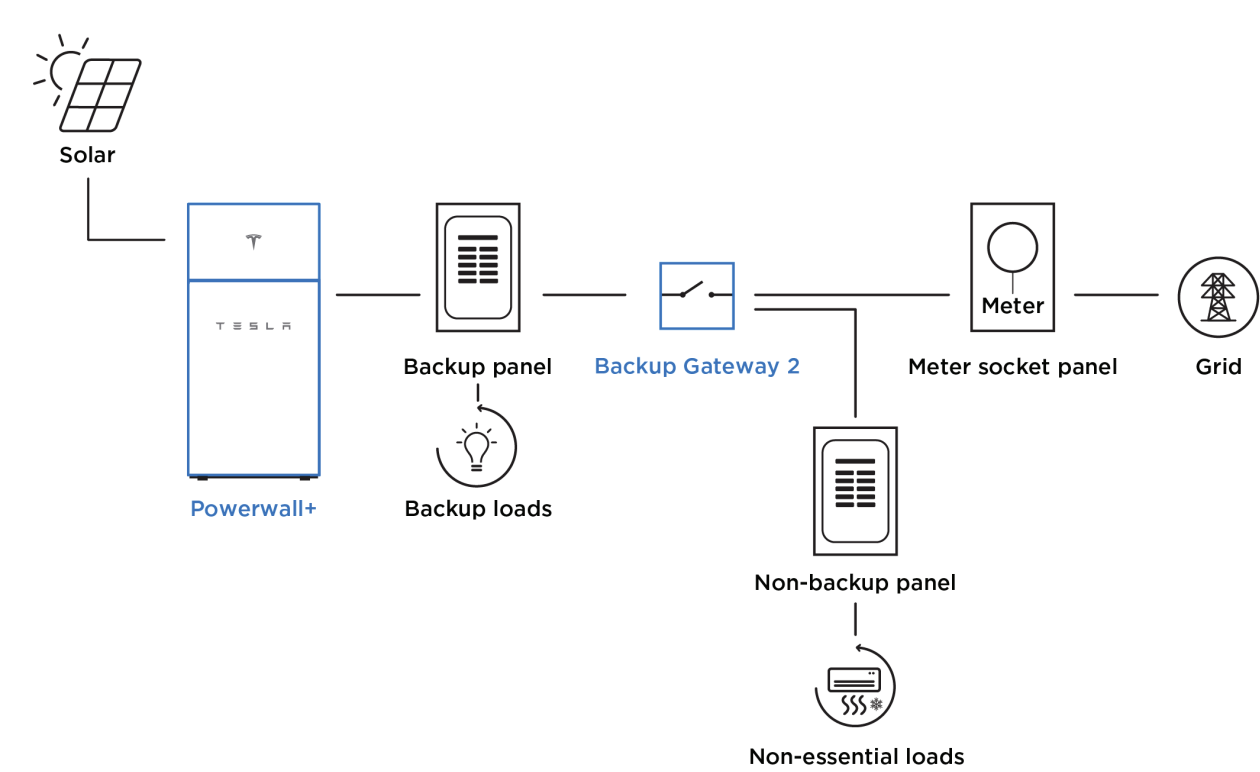
Powerwall+ with Backup Switch Installed Downstream of Utility Meter



Powerwall+ with Backup Gateway 2 for Whole Home Backup



Powerwall+ with Backup Gateway 2 for Partial Home Backup



Tesla Photovoltaic Module

T395H, T400H, and T405H

The Tesla module is one of the most powerful residential photovoltaic modules available and exceeds industry engineering and quality standards. Featuring our proprietary Zep Groove design, the all-black module mounts close to your roof for a minimalist aesthetic. Modules are certified to IEC / UL 61730 - 1, IEC / UL 61730 - 2 and IEC 61215.



Module Specifications

40 mm / 1.575 in

35 mm / 1.378 in

Electrical Characteristics						
Power Class	T395H		T400H		T405H	
Test Method	STC	NMOT	STC	NMOT	STC	NMOT
Max Power, P _{MAX} (W)	395	296.3	400	300.1	405	303.8
Open Circuit Voltage, V _{OC} (V)	45.27	42.69	45.30	42.72	45.34	42.76
Short Circuit Current, I _{SC} (A)	11.10	8.95	11.14	8.97	11.17	9.00
Max Power Voltage, V _{MP} (V)	36.88	35.03	37.13	35.25	37.39	35.46
Max Power Current, I _{MP} (A)	10.71	8.46	10.77	8.51	10.83	8.57
Module Efficiency (%)	≥ 20.1		≥ 20.4		≥ 20.6	
STC	1000 W/m², 25°C, AM1.5					
NOCT	800 W/m², 20°C, AM1.5, wind speed 1 m/s					

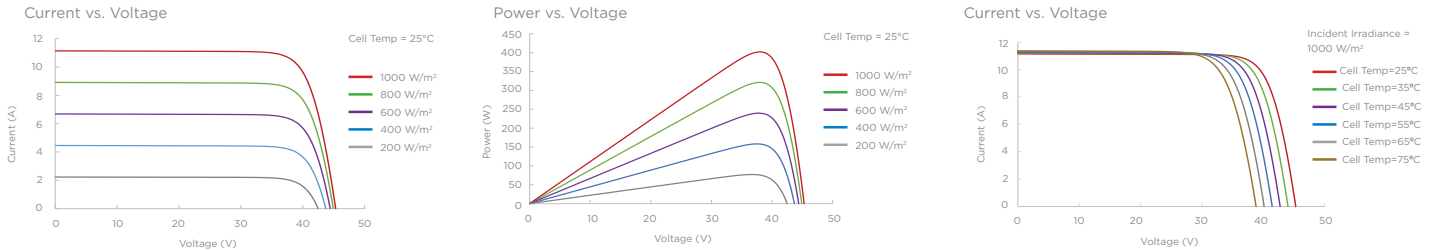
Mechanical Loading			Temperature Rating (STC)	
Front Side Test Load	6120 Pa 128 lb/ ft²	Refer to module and system installation manuals for allowable design loads, foot spacings, and cantilever specifications.	Temperature Coefficient of I _{sc}	+0.04% / °C
Rear Side Test Load	6120 Pa 128 lb/ ft²		Temperature Coefficient of V _{OC}	-0.27% / °C
Front Side Design Load	4080 Pa 85 lb/ft²		Temperature Coefficient of P _{MAX} (W)	-0.34% / °C
Rear Side Design Load	4080 Pa 85 lb/ft²			
Hail Test	35 mm at 27.2 m/s			
Mechanical Parameters				
Cell Orientation	132 (6 x 22)			
Junction Box	IP68, 3 diodes			
Cable	4 mm² 12 AWG, 1325 mm 47.2 in. Length			
Connector	Staubli MC4			
Front Cover	0.13 in (3.2 mm) thermally pre-stressed glass			
Frame	Black Anodized Aluminum Alloy			
Weight	23.5 kg 51.8 lb			
Dimension	1890 mm x 1046 mm x 40 mm 74.4 in x 41.2 in x 1.57 in			
Operation Parameters				
Operational Temperature	-40°C up to +85°C			
Power Output Tolerance	-0 /+5 W			
V _{OC} & I _{SC} Tolerance	+/- 5%			
Max System Voltage	DC 1000 V (IEC/UL)			
Max Series Fuse Rating	20 A			
NOCT	45.7 +/- 3 °C			
Safety Class	Class II			
Fire Rating	UL 61730 Type 2			

Linear Power Warranty	
Materials and Processing	25 years
Extra Linear Power Output	25 years

At least 98% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 93.5% of nominal power up to 10 years. At least 86% of nominal power up to 25 years.



IV Curves



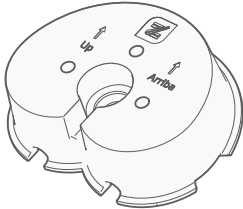
ROOFING SYSTEM SPECIFICATIONS



DESCRIPTION	PV mounting solution for composition shingle roofs.
	Works with all Zep Compatible Modules.
	Auto bonding UL-listed hardware creates structural and electrical bond.
SPECIFICATIONS	Designed for pitched roofs.
	Installs in portrait and landscape orientations.
	Engineered for spans up to 72” and cantilevers up to 24”.
	ZS Comp has a UL 1703 Class “A” Fire Rating when installed using modules from any manufacturer certified as “Type 1” or “Type 2”.
	Attachment method UL listed to UL 2582 for Wind Driven Rain.
	ZS Comp supports 50 psf (2400 Pa) front and up to 72 psf (3450 Pa) rear side design load rating for Portrait module orientation per UL 2703.
	ZS Comp supports 50 psf (2400 Pa) front side and up to 72 psf (3450 Pa) rear side design load rating for Landscape module orientation.
	Engineered for compliance with ASCE 7-05, 7-10, and 7-16 wind load requirements.
Zep wire management products listed to UL 1565 for wire positioning devices.	
ZS Comp grounding products are listed to UL 2703 and UL 467.	
ZS Comp bonding products are listed to UL 2703.	

MOUNTING BLOCK

Listed to UL 2703
Part #850-1633



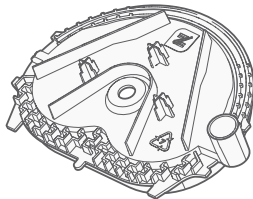
CAPTURED WASHER LAG

Part #850-1631-002 and #850-1631-004



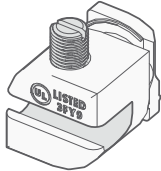
FLASHING INSERT

Listed to UL 2703 and UL 2582 for Wind Driven Rain
Part #850-1628



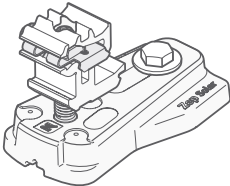
GROUND ZEP

Listed to UL 2703
Part #850-1511



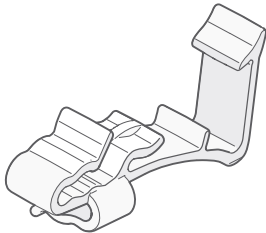
LEVELING FOOT

Listed to UL 2703
Part #850-1397



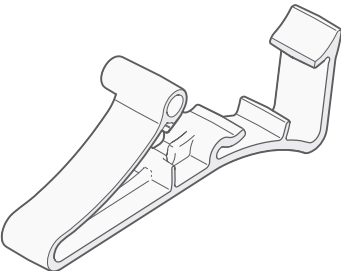
DC WIRE CLIP

Listed to UL 1565
Part #850-1509



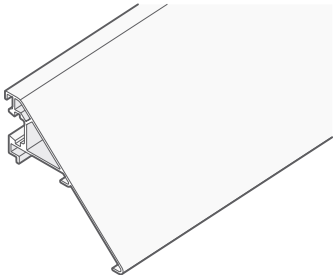
HOME RUN CLIP

Listed to UL 1565
Part #850-1510



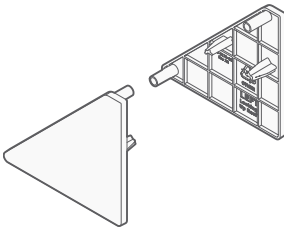
ARRAY SKIRT

Listed to UL 2703
Part #850-1608



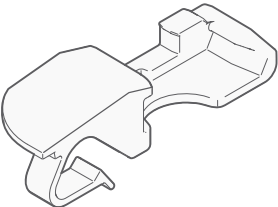
END CAP

Listed to UL 2703
Part #850-1586 (Left)
Part #850-1588 (Right)



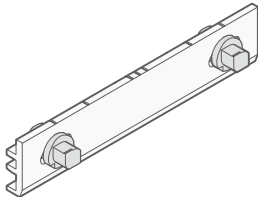
SKIRT GRIP

Listed to UL 2703
Part #850-1606



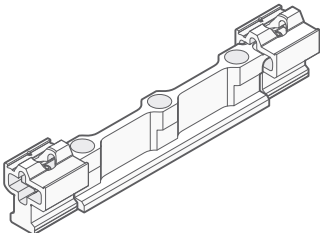
INTERLOCK

Listed to UL 2703
Part #850-1613



HYBRID INTERLOCK

Listed to UL 2703
Part #850-1281



PV HAZARD CONTROL SYSTEM | ZS PVHCS

UL 3741 REPORT DATE 10-20-21 (APPLICABLE TO ZS COMP, ZS SPAN, ZS RAMP, AND ZS SEAM)
PV RAPID SHUTDOWN ARRAY, UL 1741 CATEGORY QIJR

WARNING: To reduce the risk of injury, read all instructions.

PV HAZARD CONTROL EQUIPMENT AND COMPONENTS

Function	Manufacturer	Model No.	Firmware Versions and Checksums	Certification Standard
PVRSE Mid Circuit Interrupter (MCI)	Tesla	MCI-1	N/A	UL 1741 PVRSE
Inverter or Powerwall+	Tesla	7.6 kW: 1538000 ¹ 3.8 kW: 1534000 ¹ 7.6 kW: 1850000 ¹	V4, CEA4F802 V4, FF7BE4E1 V4, CEA4F802	UL 1741, 1998 PVRSS/PVRSE
PV Module	Hanwha/ Q-CELLS Tesla	Q.PEAK DUO BLK-G5/SC310-320 Q.PEAK DUO BLK G6+/SC330-345 Tesla TxxxS (xxx = 405 to 450) Tesla TxxxH (xxx = 395 to 415)	N/A	UL 1703 UL 61730
PVHCS Initiator (PV Inverter)	Dedicated PV system AC circuit breaker or AC disconnect switch, labeled per NEC 690.12 requirements.			N/A
PVHCS Initiator (Powerwall+)	Emergency stop device (NISD)- Listed "Emergency Stop Button" or "Emergency Stop Device" or "Emergency Stop Unit".			UL 508 or UL 60947 Parts 1, 5-1 and 5-5

¹ Applies to variations of this part number with suffix of two numbers and one letter.

Note: PVHCS installation requirements may reduce the effective equipment and component ratings below the individual equipment and component PVRSE ratings in order to achieve PVHCS shock hazard reduction requirements.

PVHCS INSTALLATION REQUIREMENTS

Max System Voltage	600 Vdc
PVHCS Maximum Circuit Voltage (Array Internal Voltage After Actuation)	165 Vdc (cold weather open circuit)
Max Series-Connected Modules Between MCIs: *Exception: Tesla S-Series (TxxxS) modules installed in locations where the max VOC for 3 modules at low design temperature exceeds 165V shall be limited to 2 modules between MCIs.	3*

OTHER INSTALLATION INSTRUCTIONS

1. An MCI must be connected to one end of each series string or mounting plane sub-array string.
2. Verification that MCIs are installed with 3 or fewer modules between MCIs shall be documented for inspection, by voltage measurement logs and/or as-built string layout diagrams.
3. For PV Inverter: The PVHCS initiator (AC breaker or switch) shall be sized and installed in accordance with NEC requirements. The specific part shall be identified on the as-built system drawings.
4. For Powerwall+: The PVHCS emergency stop initiator shall have the following minimum ratings: Outdoor (Type 3R or higher), 12V, 1A, and shall be installed in accordance with NEC requirements. The specific part shall be identified on the as-built system drawings. Refer to the Powerwall+ installation manual for further details.



CERTIFIED
SAFETY US
E515336

Certification Mark of UL on the installation instructions is the only method provided by UL to identify products manufactured under its Certification and Follow-Up Service. The Certification Mark for these products includes the UL symbol, the words "CERTIFIED" and "SAFETY," the geographic identifier(s), and a file number.

PV HAZARD CONTROL SYSTEM PVHCS | CERTIFICATION

UL 3741 REPORT DATE 8-12-21
PV RAPID SHUTDOWN ARRAY, UL 1741 CATEGORY QIJR, REPORT DATE: 2021-06-11 (REV 8-10-21)

WARNING: To reduce the risk of injury, read all instructions.

PV HAZARD CONTROL EQUIPMENT AND COMPONENTS

Function	Manufacturer	Model No.	Firmware Versions and Checksums	Certification Standard
PVRSE Mid Circuit Interrupter (MCI)	Tesla	MCI-1 1550379 ¹	N/A	UL 1741 PVRSE
Inverter or Powerwall+	Tesla	7.6 kW: 1538000 ¹ 3.8 kW: 1534000 ¹ 7.6 kW: 1850000 ¹	V4, CEA4F802 V4, FF7BE4E1 V4, CEA4F802	UL 1741, 1998 PVRSS/PVRSE
PV Module	Tesla	SR60T1, SR72T1 SR72T2	N/A	UL 61730
Diode Harness (Not applicable to SR72T2)	Tesla	SRDTH	N/A	UL 9703
PV Wire Jumper(s)	Tesla	SR-BJ2X, SR-BJ3X, SR-BJ4X, SR-BJMini	N/A	UL 9703
Pass-Through Box	Tesla	SRPTB-4	N/A	UL 1741
PVHCS Initiator : (PV Inverter)	Dedicated PV system AC circuit breaker or AC disconnect switch, labeled per NEC 690.12 requirements.			N/A
PVHCS Initiator : (Powerwall+)	Emergency stop device (NISD)- Listed "Emergency Stop Button" or "Emergency Stop Device" or "Emergency Stop Unit"			UL 508 or UL 60947 Parts 1, 5-1 and 5-5

¹ Applies to variations of this part number with suffix of two numbers and one letter.

Note: PVHCS installation requirements may reduce the effective equipment and component ratings below the individual equipment and component PVRSE ratings in order to achieve PVHCS shock hazard reduction requirements.

PVHCS INSTALLATION REQUIREMENTS

Max System Voltage	600 Vdc
PVHCS Maximum Circuit Voltage (Array Internal Voltage After Actuation)	165 Vdc (cold weather open circuit)
Max Series-Connected Panels between MCIs	10

OTHER INSTALLATION INSTRUCTIONS

1. An MCI must be connected to one end of each series string or mounting plane sub-array string.
2. Verification that MCIs are installed with 10 or fewer modules between MCIs shall be documented for inspection, by voltage measurement logs and/or as-built string layout diagrams.
3. For PV Inverter: The PVHCS initiator (AC breaker or switch) shall be sized and installed in accordance with NEC requirements. The specific part shall be identified on the as-built system drawings.
4. For Powerwall+: The PVHCS emergency stop initiator shall have the following minimum ratings: Outdoor (Type 3R or higher), 12V, 1A, and shall be installed in accordance with NEC requirements. The specific part shall be identified on the as-built system drawings. Refer to the Powerwall+ installation manual for further details.



CERTIFIED
SAFETY US
E515336

Certification Mark of UL on the installation instructions is the only method provided by UL to identify products manufactured under its Certification and Follow-Up Service. The Certification Mark for these products includes the UL symbol, the words "CERTIFIED" and "SAFETY," the geographic identifier(s), and a file number.