

Valley County Planning and Zoning Department
219 North Main
Cascade, ID 83611

06/25/26

Please find the below outline for a proposed solar ground mount project at the Nokes residence at 34 Ilka Lane, McCall ID 83638. This outline is for the purpose of approval for a conditional use permit.

Below is our detailed project description:

Array Details:

- Installation of a ground mount PV array to be 11.04 kW DC / 11.50 kW AC consisting of 24 REC Solar REC460AA Pure-RX (460W) modules in a 4-row by 6-column configuration
- Array's front edge clearance from ground will be 6' while the top height from the ground shall not exceed approximately 18.23' — height of array is intended to sit above snow cover in winter
- The array's dimensions will be approximately 34' 6" long (E/W) x 15' 11" deep (N/S) at a tilt of 50 degrees
- PV system will operate in conjunction with Idaho Power's electrical grid and follow Idaho Power Customer Generation Guidelines for operation
- All equipment to be installed is UL listed and compliant to NEC and IFC regulations
- Array installed on homeowner's private property
- System includes (1) Tesla Powerwall 3 inverter/battery (11.5 kW / 13.5 kWh), (1) Tesla Powerwall 3 expansion battery, (1) Tesla Backup Gateway 3, and (12) Tesla MCI-2 rapid shutdowns

Construction/Installation Details:

- Two concrete footings, each 48"x48" square, at 6' 6" in depth (78 inches below grade per structural engineer's evaluation based on 96 mph wind speed, Exposure C, and 120 PSF ground snow load)
- Pole supports: (2) 8-inch Schedule 40 steel pipe, 12' 1" above grade, spaced 17' 0" apart
- One DC conduit trench from the array to the house, approximately 200' long, minimum 18" deep, PVC burial
- Estimated installation time frame is one week
- Installation to be overseen by Idaho licensed Journeyman Electrician under RevoluSun's licenses both ELC 039193 and RCE 48299. Installed per manufacturer guidelines and jurisdictional requirements to meet NEC and IFC code requirements
- Structural engineering certification provided by Scott E. Wyssling, PE — Idaho License No. 18974 (COA #4347), Wyssling Consulting, LLC — confirming footing design conforms to the 2018 International Building Code
- Dust, noise, and disruption is minimal and will occur during normal working hours

Project Purpose:

- Generate solar power to power homeowner's electrical and storage system
- Solar generation to offset utility use and provide power during any electrical outages

Please find supporting documentation:

- PV System Plan Set to include: plot plan, site plan, assembly detail, and equipment specifications
- Structural Engineering Report — Wyssling Consulting, LLC (dated 06/25/2026)
- SkyCiv AutoDesigner Structural Analysis Report
- Documentation requested but not applicable to our installation
 - Landscaping plan - no landscaping to occur
 - Lighting plan - no lighting to occur
 - Site grading - no grading or excavation to occur
 - No irrigation changes - does not irrigate

Project Purpose from property owner:

Although the existing property has suitable open land for either a roof-mount or ground-mount solar system, the homeowner is requesting approval for a ground-mount solar system for the following reasons:

1. The 11.04 kW DC system size (24 modules) is designed to fully offset the home's electrical load and support whole-home battery backup. A ground-mount configuration allows optimal south-facing orientation at a 50-degree tilt, maximizing annual energy production in McCall's high-latitude, high-snow-load environment.
2. Installation of a large roof-mounted array of this size would require significant structural evaluation and potential reinforcement of the existing roof structure. A ground-mount system eliminates roof penetrations entirely, preserving the building envelope and reducing the risk of water intrusion, ice damming, and damage to roofing materials.
3. The ground-mount system can be independently maintained and serviced without coordinating around roof access or future roofing work. Should the roof require replacement at any point, the solar array will not need to be removed and reinstalled, saving significant future cost and disruption.
4. The elevated ground-mount design (6' front clearance, 18+ ft peak height) is specifically engineered to remain above typical winter snow accumulation in McCall, ID — an area with a 120 PSF ground snow load — ensuring consistent year-round energy production without panel shading or structural overloading from snow accumulation on the array.

Valley County Planning and Zoning

PO Box 1350 • 700 South Main Street
Cascade, ID 83611-1350



Phone: 208-382-7115
Email: cherrick@valleycountyid.gov

DISCLAIMER

Pre-application meetings with Valley County Staff are required prior to submitting an application.

Please note that information provided in a pre-application meeting or over the phone does not guarantee approval by either the Planning and Zoning Commission nor the Valley County Board of Commissioners. Planning and Zoning staff cannot give you legal advice. You should seek the advice of an attorney if you have specific legal questions regarding the sufficiency of your application.

Sincerely,

A handwritten signature in black ink, appearing to read "Cynda Herrick".

Cynda Herrick, AICP, CFM
Planning and Zoning Director

Valley County Code:

9-5H-1: PREAPPLICATION CONFERENCE:

A. Conference Required: Prior to the formal filing of an application, the applicant shall confer with the administrator or staff to obtain proper forms, information, and guidance.

B. Familiarity With Standards, Goals And Objectives: The applicant shall familiarize himself with the standards of this title, the goals and objectives of the comprehensive plan, and review procedure and submittal requirements, which will affect the proposal.

C. Meeting At Site Or Other Investigations: The preapplication conference may include a meeting at the proposed site and other investigations deemed necessary by the administrator or staff.

Conditional Use Permit Process

- ☐ **Pre-Application Conference with PZ Director Required – 208-382-7115.**
- ☐ **Contact Road & Bridge Director for pre-application appointment – 208-382-7195.**
- ☐ **Submit Application**
 - **Deadline is 45 days prior to a PZ Commission meeting.**
 - **Proposals within an impact area must be submitted 60 days prior to a public hearing date to meet requirements in VCC Title 7**
 - **Public Hearings are typically held on the 2nd Thursday of every month, starting at 6:00 p.m.**
- ☐ **Staff will review, place on agenda, and notice.**
- ☐ **PZ Staff prepares a Staff Report.**
- ☐ **Public Hearing:**
 - Staff Report to Commissioners, Exhibits, and Questions for Staff
 - Presentation by Applicant
 - Testimony of Proponents.
 - Testimony of Undecided
 - Testimony of Opponents
 - Rebuttal by the Applicant
 - If new information is provided, must reopen for other testimony.
 - The public hearing is closed for Commissioner deliberation
 - Commissions approve a motion or table to a future date for more information.
 - There is a 10-day appeal period to the Board of County Commissioners in accordance with Valley County Code 9-5H-12.

Valley County Planning and Zoning Department

700 S. Main ST | PO Box 1350
 Cascade, ID 83611
www.co.valley.id.us
cherrick@valleycountyid.gov
 208-382-7115



Conditional Use Permit Application

TO BE COMPLETED BY THE PLANNING AND ZONING DEPARTMENT		☐ Check # _____ or ☐ Cash or ☐ Card
FILE #	CUP 26-020	FEE \$ 250.00
ACCEPTED BY	Hannah Smith	DEPOSIT _____
CROSS REFERENCE FILE(S):	_____	DATE 06/29/2026
PROPOSED USE:	Solar Panels	_____

When an application has been submitted, it will be reviewed in order to determine compliance with application requirements.
 A hearing date will be scheduled only after an application has been accepted as complete or if applicant requests the hearing in writing.

Applicant's Signature: Signed by: Barbara Nokes-Kwader Date: 6/29/2026
 By signing, you are agreeing to allow County staff to inspect the property identified in the application.

The following must be completed and submitted with the conditional use permit application:

- ☐ A **detailed project description** disclosing the purpose, strategy, and time frame of construction. Include a phasing plan if appropriate. Address fire mitigation, utilities, fencing, access, emissions, dust, noise, and outside storage.
- ☐ A **plot plan**, drawn to scale, showing the boundaries, dimensions, area of lot, existing and proposed utilities, streets, easements, parking, setbacks, and buildings.
- ☐ A **landscaping plan**, drawn to scale, showing elements such as trees, shrubs, ground covers, and vines. Include a plant list indicating the size, quantity, location and name (both botanical and common) of all plant material to be used.
- ☐ A **site grading plan** clearly showing the existing site topography and detailing the best management practices for surface water management, siltation, sedimentation, and blowing of dirt and debris caused by grading, excavation, open cuts, side slopes, and other site preparation and development.
- ☐ A **lighting plan**.
- ☐ **Names and addresses of property owners within 300 feet of the property lines**. Information can be obtained through the GIS Portal at www.co.valley.id.us. Only one copy of this list is required. Staff may notice more than 300 feet based on adjacent ownership and potential for impacts.
- ☐ **Three (3) copies** of the application, project description, plot plan, landscaping plan, grading plan, and impact report are required.
- ☐ **A Development Agreement may be required**. Possible road mitigation should be discussed with the Valley County Road and Bridge Director, 208-382-7195.

**We recommend you review the Valley County Code online at www.co.valley.id.us
 or at the Planning & Zoning Office at 219 North Main Street, Cascade, Idaho**

Date of Pre-Application Meeting with Staff: 6/26/26

Staff Name(s): Hannah Smith

CONTACT INFORMATION

APPLICANT Barbara Kwader-Nokes PHONE [REDACTED]

Owner ☐ Purchaser ☐ Lessee ☐ Renter ☐

MAILING ADDRESS 34 Ilka Ln, McCall, ID ZIP 83638

EMAIL [REDACTED]

PROPERTY OWNER KWADER JOHN P & KWADER BARBARA SUE

MAILING ADDRESS 34 ILKA LN, MCCALL ID 83638 USA ZIP 83638

EMAIL [REDACTED]

AGENT / REPRESENTATIVE RevoluSun Mountain States PHONE 208-661-2297

MAILING ADDRESS 457 Steelhead Way, Boise ID ZIP 83704

EMAIL idahopermits@revolusun.com **Please use this email address**

CONTACT PERSON (if different from above) Claire Cameron

MAILING ADDRESS same as above ZIP

EMAIL claire.alivia@revolusun.com PHONE

PROPERTY INFORMATION

ADDRESS OF SUBJECT PROPERTY 34 ILKA LN, MCCALL ID 83638 USA

PROPERTY DESCRIPTION (either lot, block & subdivision name or attach a recorded deed with a metes and bounds description.)

100000 Lakefork Area Rural Investment

TAX PARCEL NUMBER(S) RP 18N03E273605

Quarter Section 27 Township 18N Range 3E

1. PROPOSED USE: Residential ☒ Civic or Community ☐ Commercial ☐ Industrial ☐

2. SIZE OF PROPERTY 5 Acres ☒ or Square Feet ☐

3. EXISTING LAND USES AND STRUCTURES ON THE PROPERTY ARE AS FOLLOWS:

Residential Home

4. ARE THERE ANY KNOWN HAZARDS ON OR NEAR THE PROPERTY (such as canals, hazardous material spills, and/or soil or water contamination)? If so, describe and give location: None

5. ADJACENT PROPERTIES HAVE THE FOLLOWING BUILDING TYPES AND/OR USES:

North Residential

South Residential

East Residential

West Residential

APPLICATION DETAILS

6. MAXIMUM PROPOSED STRUCTURE HEIGHT: 18 ft

7. NON-RESIDENTIAL STRUCTURES OR ADDITIONS (If applicable):

Number of Proposed Structures: 1

Number of Existing Structures: _____

Proposed Gross Square Feet

Existing Gross Square Feet

1st Floor _____

1st Floor _____

2nd Floor _____

2nd Floor _____

Total 551

Total _____

8a. TYPE OF RESIDENTIAL USE (If applicable): Single family residence ☒ Multiple residences on one parcel ☐

8b. TYPE OF STRUCTURE: Stick-built ☐ Manufacture Home ☐ Mobile Home ☐ Tiny Home ☐ Other ☒ Solar Ground Mount

8c. SQUARE FOOTAGE OF PROPOSED RESIDENTIAL STRUCTURES (If applicable): N/A

SQUARE FOOTAGE OF EXISTING RESIDENTIAL STRUCTURES: N/A

8d. DENSITY OF DWELLING UNITS PER ACRE: N/A

9. SITE DESIGN:

Percentage of site devoted to building coverage: N/A

Percentage of site devoted to landscaping: N/A

Percentage of site devoted to roads or driveways: N/A

Percentage of site devoted to other uses: .25%, describe: Solar Ground Mount Installation

Total: 100%

10. PARKING (If applicable): N/A

Office Use Only

a. Handicapped spaces proposed: _____

Handicapped spaces required: _____

b. Parking spaces proposed: _____

Parking spaces required: _____

c. Number of compact spaces proposed: _____

Number of compact spaces allowed: _____

d. Restricted parking spaces proposed: _____

e. Are you proposing off-site parking: _____

11. SETBACKS:

BUILDING

Office Use Only

PARKING

Office Use Only

Proposed

Required

Proposed

Required

Front N 91'-2"

Rear E 545' -10"

Side S 142' -2"

Side Street W132' -2"

12. NUMBER OF EXISTING ROADS: N/A Width: _____

Existing roads will be: Publicly maintained? ☐ Privately Maintained? ☐ or Combination of both? ☐

Existing road construction: Gravel ☐ Paved ☐ or Combination of both? ☐

13. NUMBER OF PROPOSED ROADS: N/A Proposed width: _____

Proposed roads: Publicly maintained? ☐ Privately Maintained? ☐ or Combination of both? ☐

Proposed road construction: Gravel ☐ Paved ☐ or Combination of both? ☐

Anticipated Trip Generation [Refer to ITE – Trip Generation Manual within Roads Policy Manual] _____

Primarily heavy truck traffic? Yes ☐ No ☐ Combination ☐

14. ARE SHARED DRIVEWAYS PROPOSED? If so, please explain why. Yes ☐ No ☒

N/A

15. EXISTING UTILITIES ON THE PROPERTY ARE AS FOLLOWS:

Electrical

16. PROPOSED UTILITIES: None.

Proposed utility easement widths N/A

Locations N/A

17. SEWAGE WASTE DISPOSAL METHOD: Septic ☒ Central Sewage Treatment Facility ☐

Name: _____

18. POTABLE WATER SOURCE: Public ☐ Water Association ☐ Individual Well: ☒

If individual, has a test well been drilled? _____ Depth _____ Flow _____ Purity Verified? _____

Nearest adjacent well _____ Depth _____ Flow _____

19. DRAINAGE (Proposed method of on-site retention): N/A

Any special drains? _____ (Please attach map)

Soil type(s): McCall complex, 5 to 50 percent slopes

(Information can be obtained from the Natural Resource Conservation Service: websoilsurvey.nrcs.usda.gov)

Stormwater Prevention Management Plan will need approval from Valley County Engineer.

20. IS ANY PORTION OF THE PROPERTY LOCATED IN A FLOODWAY OR 100-YR FLOODPLAIN?

(Information can be obtained from the Planning & Zoning Office) Yes ☐ No ☒

21. DOES ANY PORTION OF THIS PARCEL HAVE SLOPES IN EXCESS OF 15%? Yes ☒ No ☐

22. ARE THERE WETLANDS LOCATED ON ANY PORTION OF THE PROPERTY? Yes ☐ No ☒

23. IS ANY PORTION LOCATED WITHIN 150-FT OF ANY LAKE, POND, RIVER, OR YEAR-ROUND FLOWING CREEK OR STREAM? THIS IS A RIPARIAN AREA AS DEFINED BY VCC 9-6-6.

Yes ☐ No ☒

24. IS THERE ANY SITE GRADING OR PREPARATION PROPOSED? Yes ☐ No ☒

If yes, explain:

N/A

25a. ARE THERE ANY EXISTING IRRIGATION SYSTEMS? Yes ☒ No ☐

Are you proposing any alterations, improvements, extensions or new construction? Yes ☐ No ☒

If yes, explain: Lake Irrigation System

25b. COMPLETE ATTACHED PLAN FOR IRRIGATION if you have water rights and are in an irrigation district. Submit letter from Irrigation District, if applicable.

26. COMPLETE ATTACHED WEED CONTROL AGREEMENT

27. COMPLETE ATTACHED IMPACT REPORT

Irrigation Plan

(Idaho Code 31-3805)

This land: ☐ Has water rights available to it
☒ Is dry and has no water rights available to it.

Idaho Code 31-3805 states that when all or part of a subdivision is “located within the boundaries of an existing irrigation district or canal company, ditch association, or like irrigation water deliver entity ... **no subdivision plat or amendment to a subdivision plat or any other plat or map recognized by the city or county for the division of land will be accepted, approved, and recorded unless:**”

- A. The appropriate water rights and assessment of those water rights have been transferred from said lands or excluded from an irrigation entity by the owner; or
- B. The owner filing the subdivision plat or amendment to a subdivision plat or map has provided for the division of land of underground tile or conduit for lots of one acre or less or a suitable system for lots of more than one acre which will deliver water to those landowners within the subdivision who are also within the irrigation entity with the appropriate approvals:
 1. For proposed subdivisions located within an area of city impact, both city and county zoning authorities must approve such irrigation system.
 2. For proposed subdivisions outside of negotiated areas of city impact, the delivery system must be approved by the Planning and Zoning Commission and the Board of County Commissioners with the advice of the irrigation entity charged with the delivery of water to said lands (e.g., irrigation district).

To better understand your irrigation request, we need to ask you a few questions. Additional pages can be added. A list of the map requirements follows the short questionnaire. **Any missing information may result in the delay of your request before the Planning and Zoning Commission and ultimately the approval of your irrigation plan by the Board of County Commissioners as part of final plat approval.**

1. Are you within an area of negotiated City Impact? ☐ Yes ☒ N/A No
2. What is the name of the irrigation district/company and drainage entities servicing the property?
 Irrigation: N/A
 Drainage: N/A
3. How many acres is the property being subdivided? N/A
4. What percentage of this property has water? N/A
5. How many inches of water are available to the property? N/A
6. How is the land currently irrigated? ☐ surface ☐ sprinkler ☐ irrigation well
☐ above ground pipe ☐ underground pipe
7. How is the land to be irrigated after it is subdivided? ☐ surface ☐ sprinkler ☐ irrigation well
☐ above ground pipe ☐ underground pipe
8. Describe how the head gate/pump connects to the canal and irrigated land and where ditches &/or pipes go.
N/A
9. Is there an irrigation easement(s) on the property? ☐ Yes ☐ No

10. How do you plan to retain storm and excess water on each lot? N/A

11. How do you plan to process this storm water and/or excess irrigation water prior to it entering the established drainage system? (i.e. oil, grease, contaminated aggregates)

N/A

Irrigation Plan Map Requirements

The irrigation plan **must be on a scalable map** and show all of the irrigation system including all supply and drainage structures and easements. Please include the following information on your map:

- ☐ All canals, ditches, and laterals with their respective names.
- ☐ Head gate location and/or point of delivery of water to the property by the irrigation entity.
- ☐ Pipe location and sizes, if any
- ☐ Rise locations and types, if any.
- ☐ Easements of all private ditches that supply adjacent properties (i.e. supply ditches and drainage ways).
- ☐ Slope of the property in various locations.
- ☐ Direction of water flow (use short arrows on your map to indicate water flow direction →).
- ☐ Direction of wastewater flow (use long arrows on your map to indicate wastewater direction —→).
- ☐ Location of drainage ponds or swales, if any where wastewater will be retained on property
- ☒ Other information: N/A

Also, provide the following documentation: N/A

- ☐ Legal description of the property.
- ☐ Proof of ownership.
- ☐ A written response from the irrigation entity and/or proof of agency notification.
- ☐ Copy of any water users' association agreement which shows water schedules and maintenance responsibilities.
- ☐ Copy of all new easements ready for recording (irrigation supply and drainage).
- ☐ If you are in a city area of impact, please include a copy of the approvals by the city planning and zoning commission and city council of your irrigation plan.

=====Applicant Acknowledgement=====

I, the undersigned, agree that prior to the Planning and Zoning Department accepting this application, I am responsible to have all the required information and site plans.

I further acknowledge that the irrigation system, as approved by the Planning and Zoning Commission and ultimately the Board of County Commissioners, must be bonded and/or installed prior to the recording of the plat or building permit.

Signed: Signed by:
Barbara Nokes-Kwader
8542820202079405
Applicant

Date: / /
 6/29/2026



VALLEY COUNTY

WEED CONTROL AGREEMENT

It shall be the duty and responsibility of all landowners to control noxious weeds on their land and property, in accordance with Idaho Statute 22-2407.

The purpose of this agreement is to establish a cooperative relationship between Valley County and the undersigned Cooperator to protect the natural and economic values in the Upper Payette River watershed from damages related to the invasion and expansion of infestations of noxious weeds and invasive plants. This is a cooperative effort to prevent, eradicate, contain and control noxious weeds and invasive plants on public and private lands in this area. Factors related to the spread of weeds are not related to ownership nor controllable at agency boundaries. This agreement formalizes the cooperative strategy for management of these weeds addressed in Valley County's Integrated Weed Management Plan.

In this continuing effort to control Noxious Weeds, Valley County Weed Control will consult with the undersigned Cooperator and outline weed identification techniques, present optional control methods and recommend proper land management practices.

The undersigned Cooperator acknowledges that he/she is aware of any potential or real noxious weed problems on his/her private property and agrees to control said weeds in a timely manner using proper land management principles.

Valley County Weed Department can be contacted at 208-382-7199.

Signed by:
By: Barbara Nobles-Kwader
Applicant

By: Valley County Weed Supervisor

Date: 6/29/2026

IMPACT REPORT (from Valley County Code 9-5-3-D)

You may add information to the blanks below or attach additional sheets.

❖ **An impact report shall be required for all proposed Conditional Uses.**

❖ **Thoroughly answer all questions. Mark N/A if the question is not applicable to your application.**

❖ **The impact report shall address potential environmental, economic, and social impacts and how these impacts are to be minimized as follows:**

1. Traffic volume, character, and patterns including adequacy of existing or proposed street width, surfacing, alignment, gradient, and traffic control features or devices, and maintenance. Contrast existing with the changes the proposal will bring during construction and after completion, build-out, or full occupancy of the proposed development. Include pedestrian, bicycle, auto, and truck traffic.

N/A

2. Provision for the mitigation of impacts on housing affordability.

N/A

3. Noise and vibration levels that exist and compare to those that will be added during construction, normal activities, and special activities. Include indoor and outdoor, day and night variations.

Construction related noise only. Daytime construction for one week. Noise primarily resulting from crews digging trenches and concrete piles for ground mount solar array. No noise or vibration increase after installation.

4. Heat and glare that exist and that might be introduced from all possible sources such as autos in parking areas, outdoor lights, water or glass surfaces, buildings or outdoor activities.

Glare from solar modules. Minimal impact. Glare and visibility of the array will be reduced/screened by surrounding vegetation, and fully blocked from the road by the existing home.

5. Particulate emissions to the air including smoke, dust, chemicals, gasses, or fumes, etc., both existing and what may be added by the proposed uses.

Minimal dust production possible during installation. No increase in any of the above factors after completion of installation.

6. Water demand, discharge, supply source, and disposal method for potable uses, domestic uses, and fire protection. Identify existing surface water drainage, wetlands, flood prone areas and potential changes. Identify existing ground water and surface water quality and potential changes due to this proposal.

N/A

7. Fire, explosion, and other hazards existing and proposed. Identify how activities on neighboring property may affect the proposed use.

Equipment installed to comply with NEC and IFC standards. No affect from or on neighboring properties.

8. Removal of existing vegetation or effects thereon including disturbance of wetlands, general stability of soils, slopes, and embankments and the potential for sedimentation of disturbed soils.

Minimal removal of existing vegetation, no wetland disturbance, no impact on stability of disturbed soils. One 180 ft, 24 in deep trench extending from the ground mount array to the home.

9. Include practices that will be used to stabilize soils and restore or replace vegetation.

N/A

10. Soil characteristics and potential problems in regard to slope stability, embankments, building foundation, utility and road construction. Include suitability for supporting proposed landscaping.

N/A

11. Site grading or improvements including cuts and fills, drainage courses and impoundments, sound and sight buffers, landscaping, fencing, utilities, and open areas.

N/A

12. Visibility from public roads, adjoining property, and buildings. Include what will be done to reduce visibility of all parts of the proposal but especially cuts and fills and buildings. Include the impacts of shadows from new features on neighboring property.

No shading on neighboring property. Cuts and fills not visible. Visibility from the road to be obstructed by surrounding vegetation and the existing home. Visibility to neighboring properties to be obstructed by surrounding vegetation. See planset for site plan, landscaping plan, and full array dimensions.

13. Reasons for selecting the particular location including topographic, geographic and similar features, historic, adjoining land ownership or use, access to public lands, recreation, utilities, streets, etc., in order to illustrate compatibility with and opportunities presented by existing land uses or character.

N/A

14. Approximation of increased revenue from change in property tax assessment, new jobs available to local residents, and increased local expenditures.

N/A

15. Approximation of costs for additional public services, facilities, and other economic impacts.

N/A

16. State how the proposed development will impact existing developments providing the same or similar products or services.

N/A

17. State what natural resources or materials are available at or near the site that will be used in a process to produce a product and the impacts resulting from the depletion of the resource. Describe the process in detail and describe the impacts of each part.

N/A

18. What will be the impacts of a project abandoned at partial completion?

N/A

19. Number of residential dwelling units, other buildings and building sites, and square footage or gross non-residential floor space to be available.

N/A

20. Stages of development in geographic terms and proposed construction time schedule.

Construction time of one week- occurring within the 2026 building season

21. Anticipated range of sale, lease or rental prices for dwelling units, building or other site, or non-residential floor space in order to insure compatibility with adjacent land use and development.

N/A

Property Tax Exemption

New and expanding business **may** qualify for a property tax exemption for up to 5 years by meeting the qualifications in accordance with Idaho Code§ 63-602NN

Application must be filed with the Valley County Assessor's office before construction begins.

Protocols for qualifying property exemption in Valley County, Idaho:

- Application must be received prior to the start of construction (ex. Building Permits, excavation)
- Term of exemption, not to exceed 5 years, will be up to the discretion of the Valley County Board of Commissioners
- Retail sales business do not qualify
- Multi use may qualify excluding retail sale area
- Housing
 - Multi-family housing must have 5 units or more per structure.
 - Multi-Family housing units may qualify if more than one structure is built totaling 5 or more units
 - For local housing only (workforce)
 - Short term rentals not allowed
 - Units cannot be individually sold (e.g., no condominiums)
- Remodel and/or additions to existing businesses
 - Only the area of remodel/addition may qualify for exemption
 - Retail sales additions/remodel will not qualify

For further information regarding the 63-602NN application process and instructions, please contact the Valley County Assessor's office at 208-382-7126.

June 25, 2026

Greenlancer Energy Inc.
500 Woodward Avenue, Suite 2125
Detroit, MI 48226

Re: Engineering Services
Nokes Residence
34 Ilka Lane, McCall, ID
11.500 kW System

To Whom It May Concern:

Pursuant to your request, we have reviewed the following information regarding ground mount solar panel installation at the above referenced location:

1. Structural drawings prepared by SkyCiv identifying specific site requirements for the proposed ground mount system.
2. Design drawings of the proposed system including a site plan, and details for the solar panels. This information will be utilized for approval and construction of the proposed system.

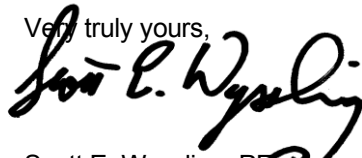
Based on our review of the Photovoltaic Array, installed at 4 modules high and 6 modules wide, the PV array shall have a maximum pier spacing of 17'-0" east/west. Based on a wind speed of 96 mph, Exposure C, and a ground snow load of 120 PSF, it was determined that the minimum required footing depth is 78 inches below grade with a 48" diameter concrete footing. The footing size based upon the worst case loading due to horizontal and vertical wind loading.

Based on the above evaluation, it is the opinion of this office that with appropriate construction the footing and post assembly will adequately support the additional loading imposed by the solar panels. This evaluation is in conformance with the 2018 International Building Code, current industry and standards, and based on information supplied to us at the time of this report.

This certification is specific to the footing design for the solar system and does not include the racking system. Racking system and components designed and specified by the manufacturer (SkyCiv).

Should you have any questions regarding the above or if you require further information do not hesitate to contact me.

Very truly yours,



Scott E. Wyssling, PE
Idaho License No. 18974
COA # 4347



Wyssling Consulting, PLLC
76 N. Meadowbrook Drive, Alpine UT
Idaho COA # 4347

Signed 6/25/2026

Project Details



Project Name: Nokes, Barbara 4x6 C

Date: Wed Jun 24 2026

Location: 34 Ilka Ln, McCall, ID 83638, USA

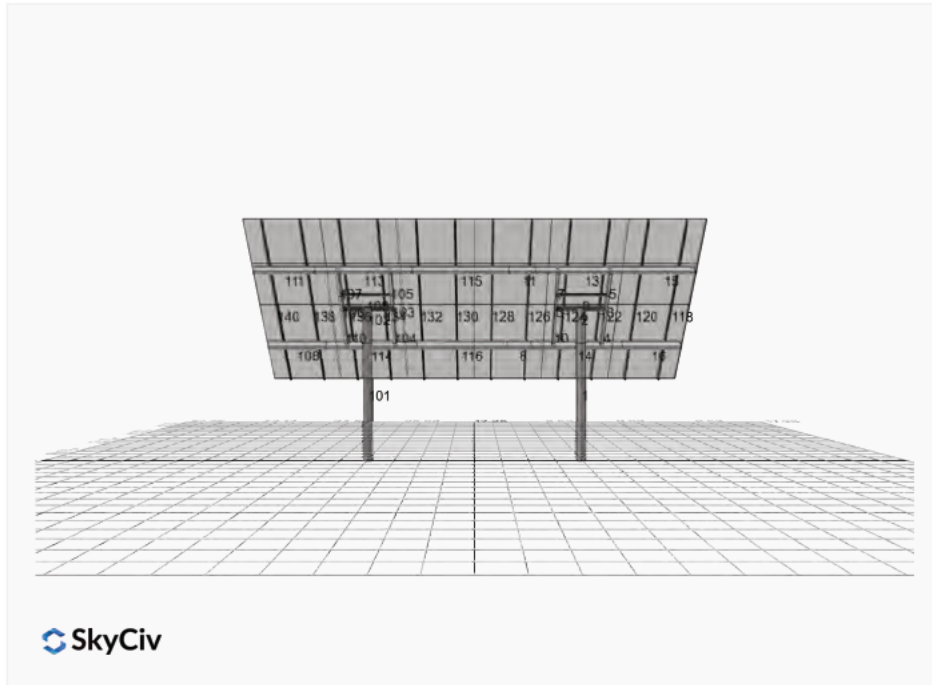
Number of Modules: 24

Unique ID: 2P-17-8TOP-HD-57-L-4Hx6W-F847

Number of Poles: 2

Dealer: _____

Date Sold: _____



Array Dimensions N/S	15.97 ft
Array Dimensions E/W	34.50 ft
Winter Tilt Angle (Degrees)	50
Front Edge Clearance	6

MT Solar Bill of Materials (2P-17-8TOP-HD-57-L-4Hx6W-F847)

Part	Short Description	BOM Qty
MTS-PC-8	8IN Pole Cap Assembly	2
MTS-HF-HD	H-Frame Assembly-HD	2
MTS-HD-Wing-57	57IN HD Wing	4
MTS-HD-Splice-57	57IN HD Splice	4
MTS-CLAMP-HOOK-4PK	Hook Clamp	6

Rail Bill of Materials

Part	Qty
Rails (196in Long)	12x
Rail Attachment	24x
Module Mid Clamp	36x
Module End Clamp	24x
Ground Lug	6x

Site Details:



Site Address: 34 Ilka Ln, McCall, ID 83638, USA

Array Specifications

Duty Classification:	HD
Module Width:	47.40 in
Module Length:	68.00 in
Number of Rows:	4
Number of Columns:	6
Total Number of Modules:	24
Winter Tilt Angle:	50
Front Edge Clearance:	6
Total Array Height at Tilt:	18.23 ft
Total Frame Length:	34.00 ft
Module Info/Notes:	
Array Dimensions N/S:	15.97 ft
Array Dimensions E/W:	34.50 ft
Rail Length:	196.00 in
Rail Spacing:	2.88 ft

Support Specifications

Pole Size:	8in Pipe Sch 40
Pole Length above Grade:	12.12 ft
Number of Poles:	2
Pole Spacing:	17 ft

Foundation Specifications

Foundation Type:	rectangular
Foundation Dimensions:	48x48 in
Foundation Depth (below grade):	6.5 ft
Foundation Volume:	104.00 ft ³

Site Info

Risk Category:	I
Exposure:	C
Soil Classification:	sand
Site Location:	34 Ilka Ln, McCall, ID 83638, USA
Wind Speed:	100 mph

Design Disclaimer

This software should be used for preliminary designs and should not be used as a final design unless reviewed, verified and designed by a qualified structural engineer.



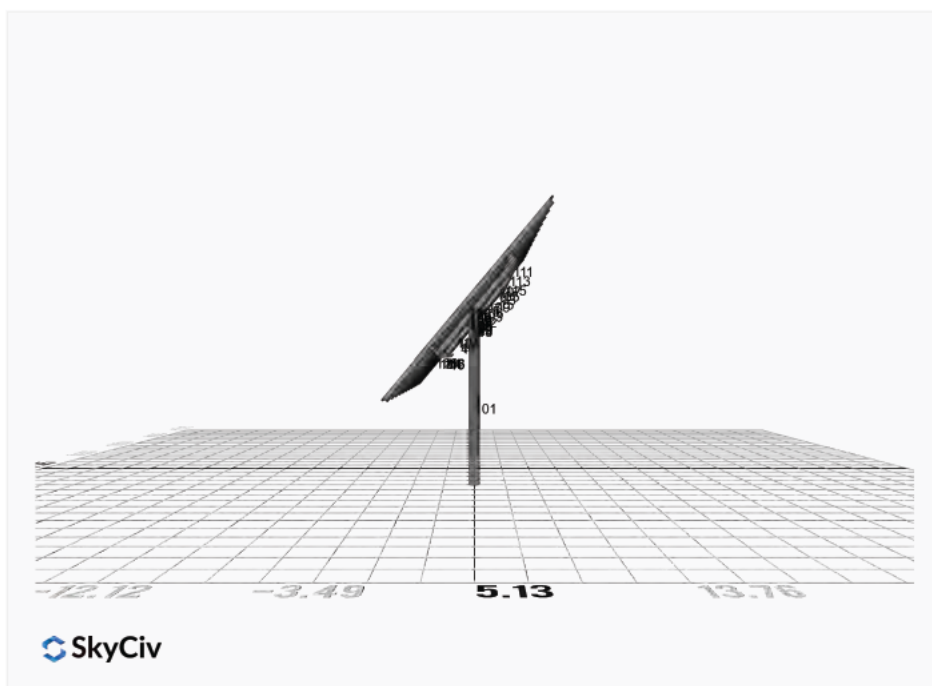
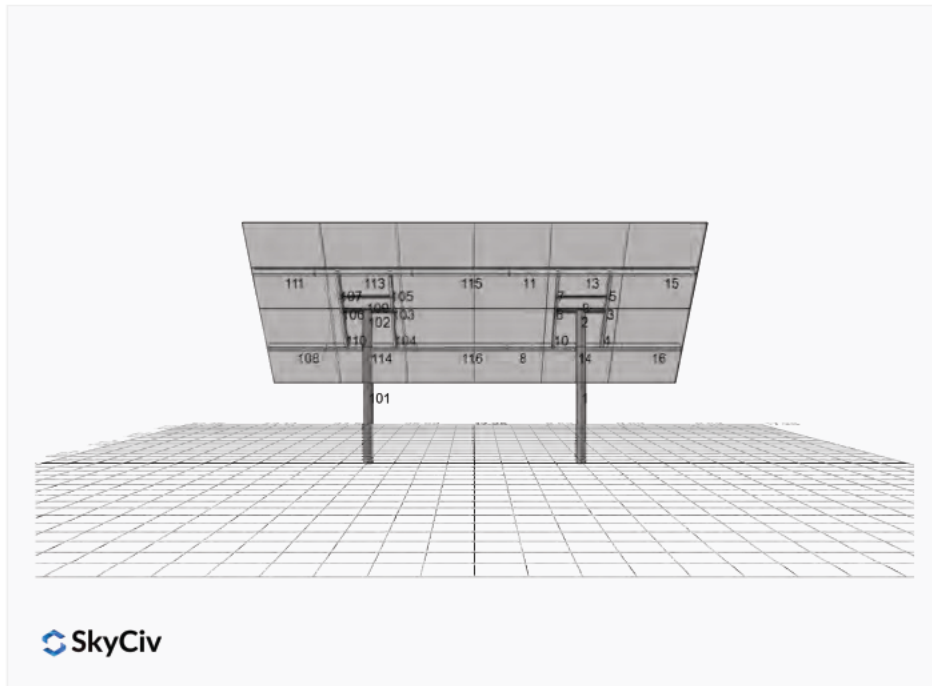
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76 N. Meadowbrook Drive, Alpine UT
Idaho COA # 4347
Signed 6/25/2026

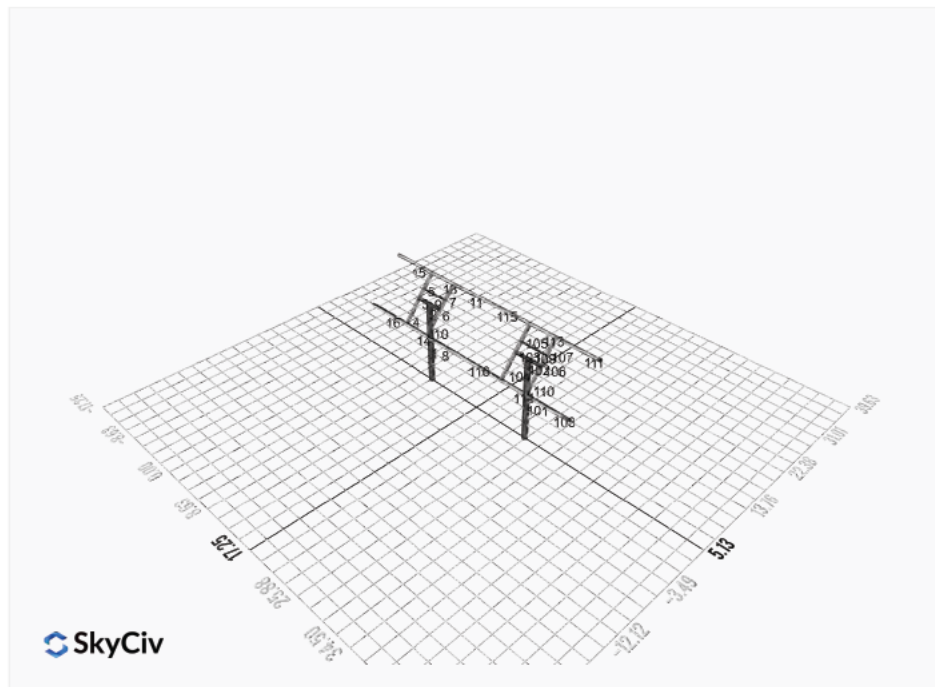
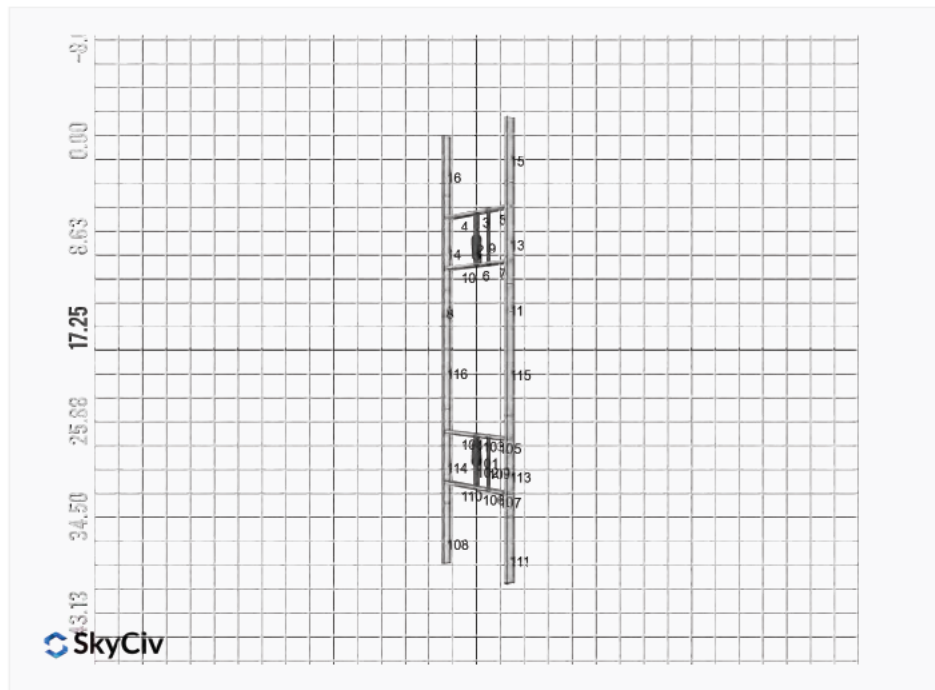
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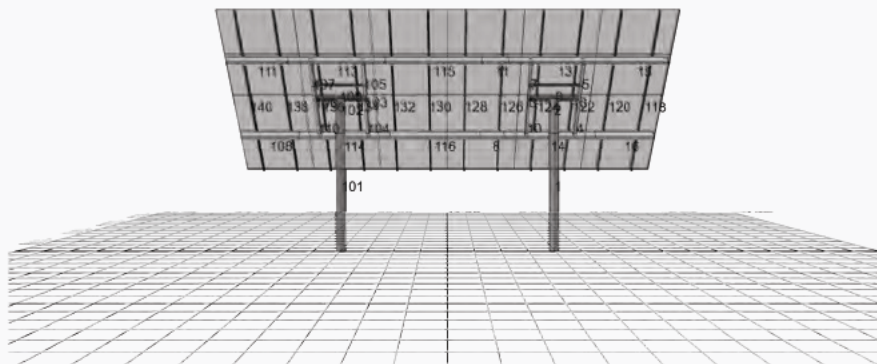
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Design Notes:

- Deflection checks are set to L/1 due to manufacturer structural design intent
- Foundation Soil Parameters used in this Autodesigned are all estimates, proper geotechnical reports are required to confirm soil profiles
- Wind speeds, snow loads and other site specific results are based on ASCE 7-16
- Steel frame design checks are based on AISC 360-16 LRFD
- Design / analysis of fixings and connections are not carried out by this module.
- Impacts of eccentrically applied, partial or pattern loading are not considered by this module.
- Foundation Design and Sizing is approximate only



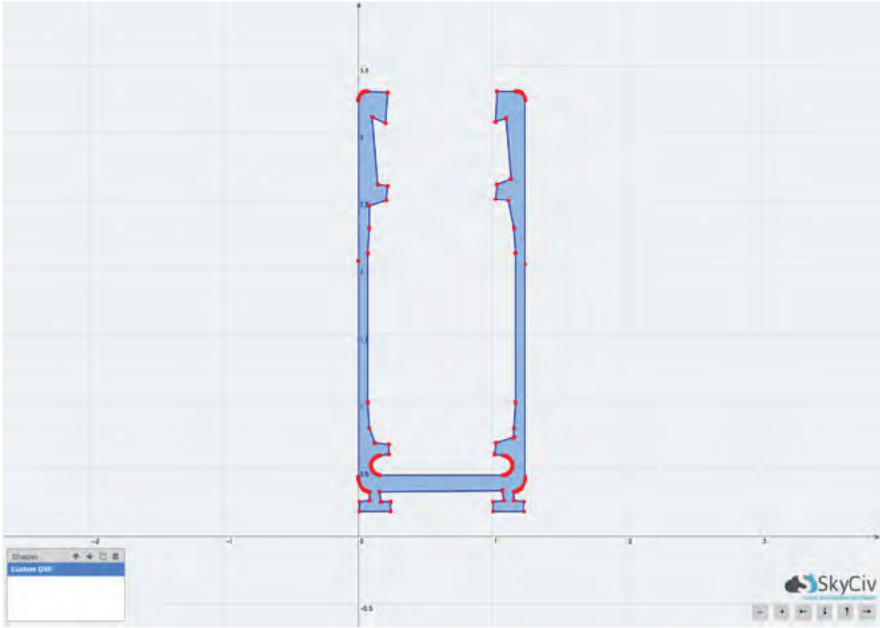




Rail Design Check

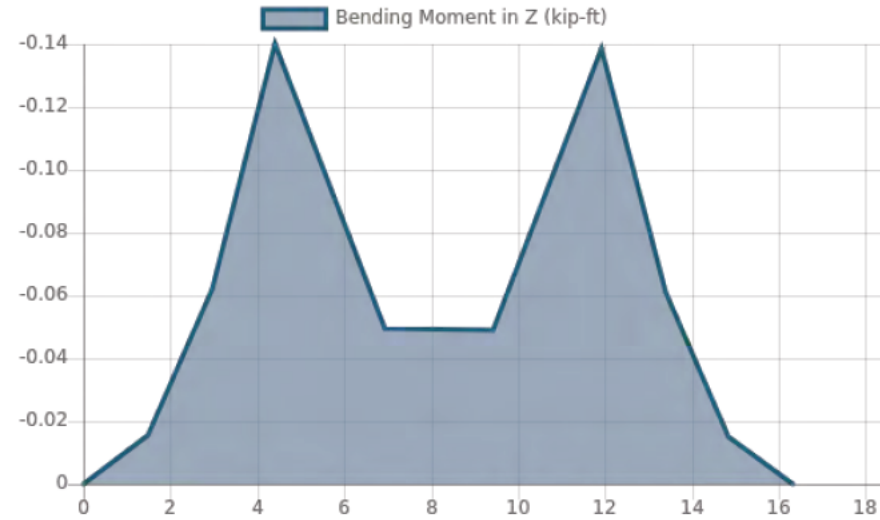
Rail Length: 16.33 ft
Additional Restraints Required: None
Tributary Width: 2.88 ft
Material: Aluminium
Density: 169.00 lb/ft³
Elastic Modulus: 10000.00 ksi
Fy: 34.50 ksi
Fu: 37.00 ksi

Rail Distributed Loading:
Note, gravity loading is resolved into member local X and Y axes.
Snow (X): 0.0488 kip/ft
Snow (Y): -0.0581 kip/ft
Wind uplift Case A (X): 0.0000 kip/ft
Wind uplift Case A (Y): 0.0525 kip/ft
Wind downforce Case A (X): 0.0000 kip/ft
Wind downforce Case A (Y): -0.0525 kip/ft
Dead (Panel load) (X): 0.0086 kip/ft
Dead (Panel load) (Y): -0.0102 kip/ft

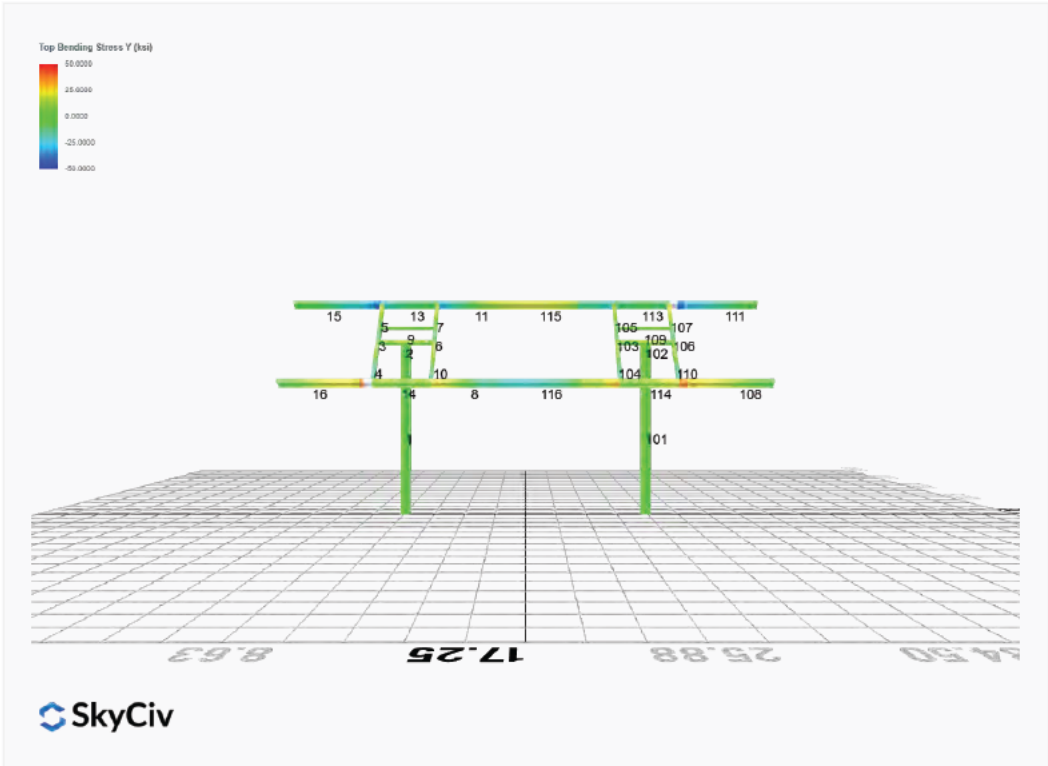
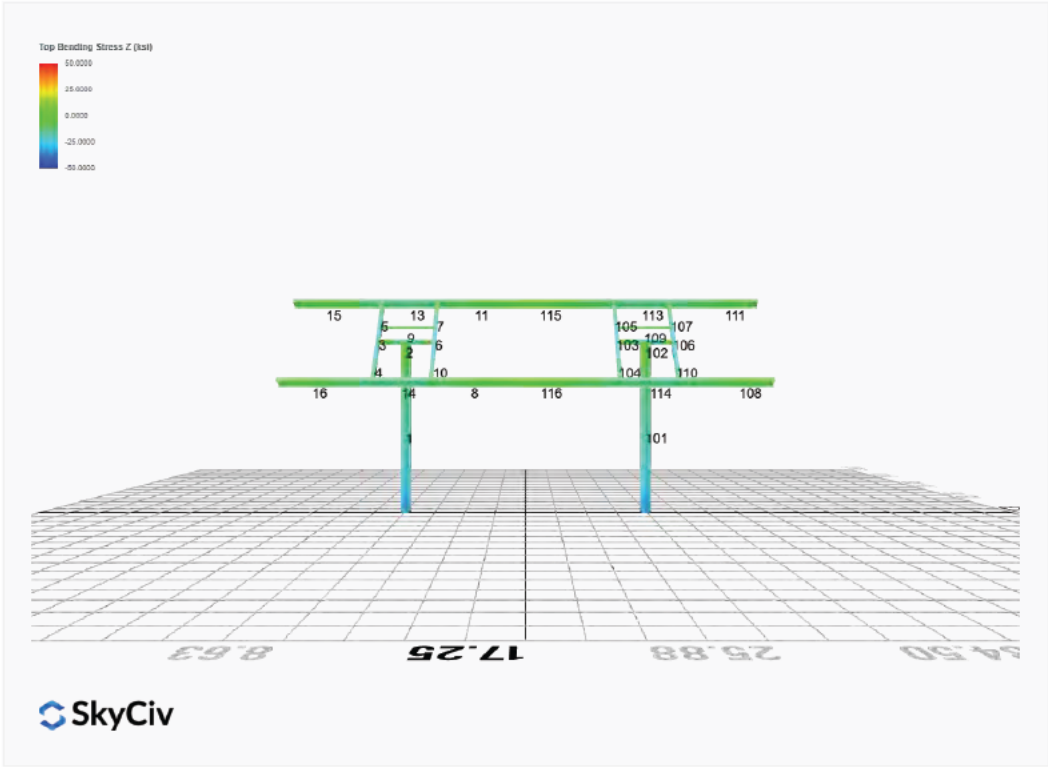


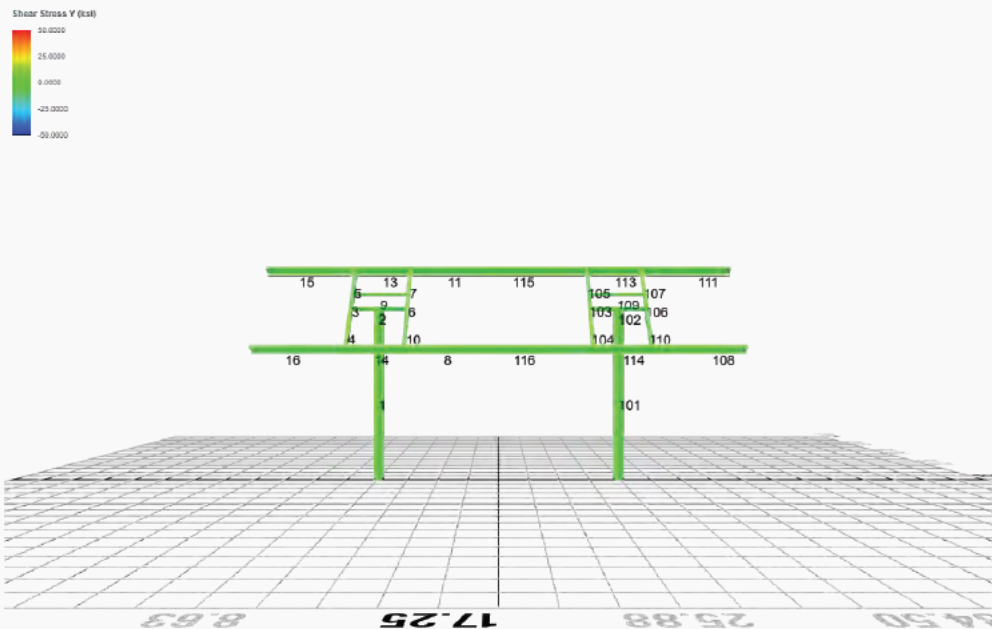
Result Check	Max Limit	Max Value	Utility	Status
Custom Stress Limit	34.50	28.13	0.815	PASS
Material Yield	34.50	28.13	0.815	PASS
Material Strength	37.00	28.13	0.760	PASS

Member 1, ULS: 1. 1.4D

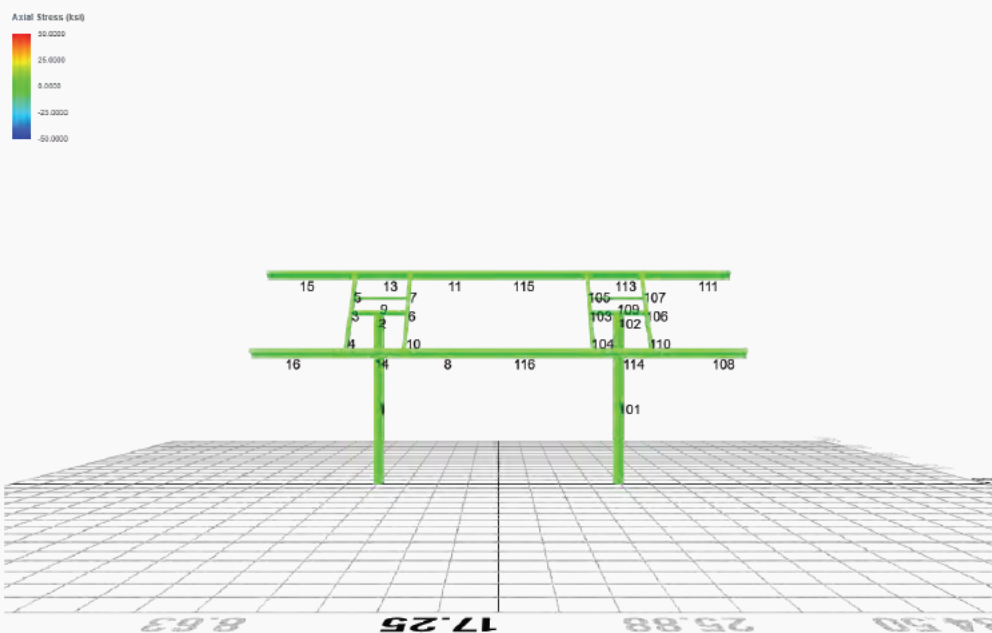


FEM Results (Envelope Worst Case)

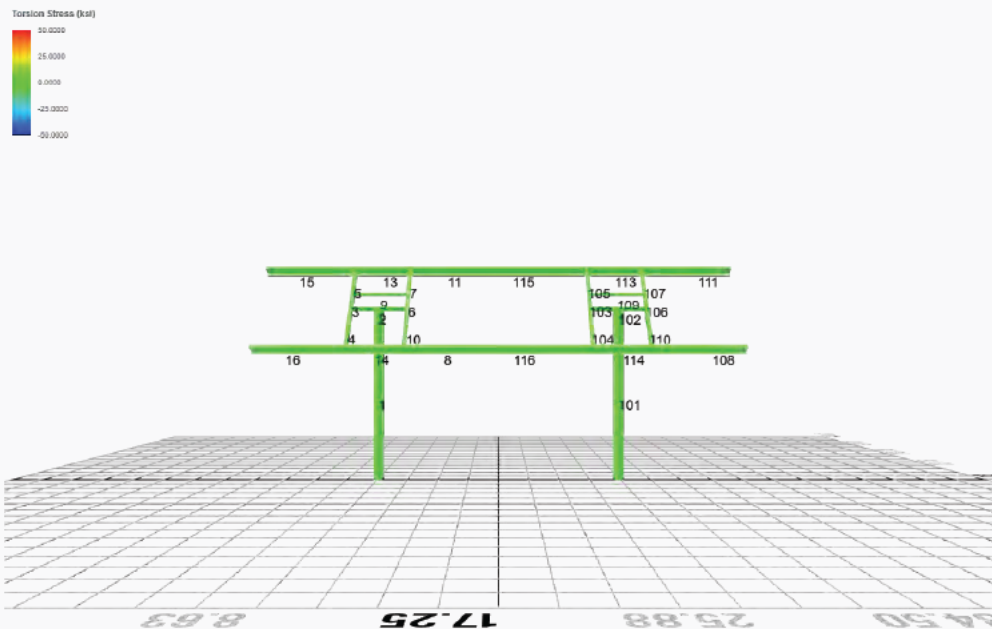




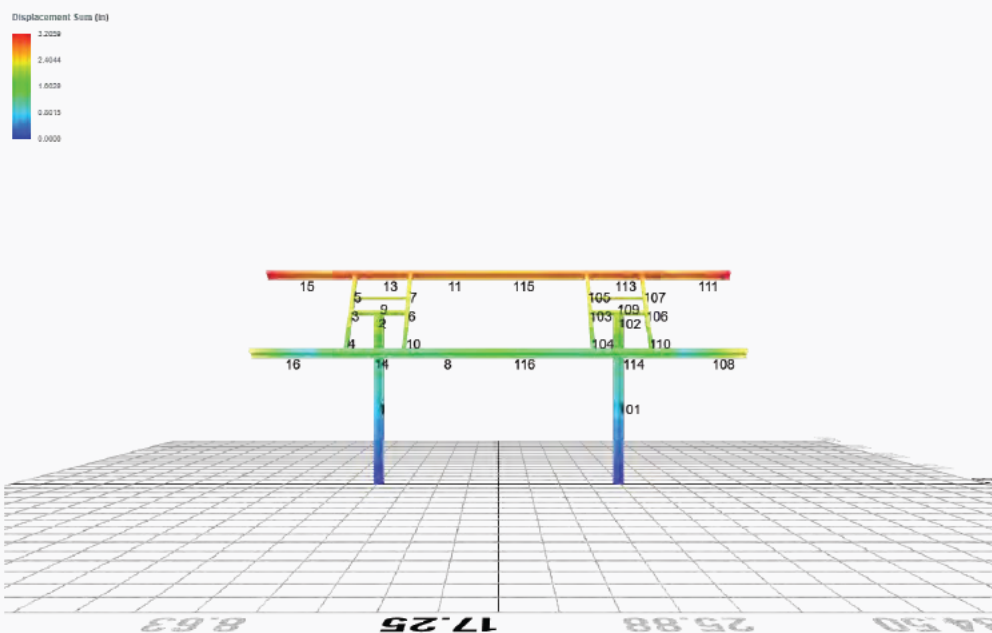
SkyCiv



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Reaction Forces for Foundation 1 (Node ID#1), (kip, kip-ft)

LRFD Load Combination Results

Name	Fx	Fy	Fz	Mx	My	Mz
ULS: 1. 1.4D	0.0000	3.0551	-0.0436	-0.1579	0.1422	0.0332
ULS: 2. 1.2D + 1.6L + 0.5(S or Lr or R)	0.0000	4.9548	-0.0820	-0.2974	0.2672	0.0472
ULS: 2. 1.2D + 1.6L + 0.5(S or Lr or R)	0.0000	2.6187	-0.0373	-0.1353	0.1219	0.0275
ULS: 3. 1.2D + 1.6(S or Lr or R) + L	0.0000	10.0943	-0.1807	-0.6567	0.5869	0.1438
ULS: 5. 1.2D + E + L + 0.2S	0.0000	3.5531	-0.0552	-0.2000	0.1800	0.0336
ULS: 7. 0.9D + 1.0E	0.0000	1.9640	-0.0280	-0.1014	0.0914	0.0196
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind downforce Case A only	-3.8505	8.1857	-0.2048	-0.7312	0.8640	48.0683
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind downforce Case B only	0.0000	4.9548	-0.0820	-0.2974	0.2672	0.0472
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind uplift Case A only	3.8505	1.7239	0.0407	0.1355	-0.3304	-46.9201
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind uplift Case B only	0.0000	4.9548	-0.0820	-0.2974	0.2672	0.0472
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind downforce Case A only	-3.8505	5.8496	-0.1602	-0.5690	0.7195	47.6365
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind downforce Case B only	0.0000	2.6187	-0.0373	-0.1353	0.1219	0.0275
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind uplift Case A only	3.8505	-0.6123	0.0854	0.2974	-0.4765	-46.5484
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind uplift Case B only	0.0000	2.6187	-0.0373	-0.1353	0.1219	0.0275
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind downforce Case A only	-1.9252	11.7098	-0.2420	-0.8736	0.8844	24.4828
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind downforce Case B only	0.0000	10.0943	-0.1807	-0.6567	0.5869	0.1438
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind uplift Case A only	1.9252	8.4789	-0.1194	-0.4400	0.2892	-23.9199
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind uplift Case B only	0.0000	10.0943	-0.1807	-0.6567	0.5869	0.1438
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind downforce Case A only	-1.9252	4.2341	-0.0988	-0.3520	0.4208	23.7003
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind downforce Case B only	0.0000	2.6187	-0.0373	-0.1353	0.1219	0.0275
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind uplift Case A only	1.9252	1.0032	0.0241	0.0812	-0.1772	-23.3871
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind uplift Case B only	0.0000	2.6187	-0.0373	-0.1353	0.1219	0.0275
ULS: 6. 0.9D + 1.0W_Wind downforce Case A only	-3.8505	5.1949	-0.1509	-0.5350	0.6893	47.5160
ULS: 6. 0.9D + 1.0W_Wind downforce Case B only	0.0000	1.9640	-0.0280	-0.1014	0.0914	0.0196
ULS: 6. 0.9D + 1.0W_Wind uplift Case A only	3.8505	-1.2669	0.0948	0.3312	-0.5072	-46.4494
ULS: 6. 0.9D + 1.0W_Wind uplift Case B only	0.0000	1.9640	-0.0280	-0.1014	0.0914	0.0196

ASD Load Combination Results

Name	Fx	Fy	Fz	Mx	My	Mz
ULS: 1. D	0.0000	2.1822	-0.0311	-0.1127	0.1015	0.0221
ULS: 2. D + L	0.0000	2.1822	-0.0311	-0.1127	0.1015	0.0221
ULS: 3. D + (S or Lr or R)	0.0000	6.8545	-0.1205	-0.4374	0.3922	0.0721
ULS: 3. D + (S or Lr or R)	0.0000	2.1822	-0.0311	-0.1127	0.1015	0.0221
ULS: 4. D + 0.75L + 0.75(S or Lr or R)	0.0000	5.6864	-0.0981	-0.3560	0.3195	0.0540
ULS: 4. D + 0.75L + 0.75(S or Lr or R)	0.0000	2.1822	-0.0311	-0.1127	0.1015	0.0221
ULS: 5b. D + 0.7E	0.0000	2.1822	-0.0311	-0.1127	0.1015	0.0221
ULS: 6b. D + 0.75L + 0.75(0.7)E + 0.75S	0.0000	5.6864	-0.0981	-0.3560	0.3195	0.0540
ULS: 8. 0.6D + 0.7E	0.0000	1.3093	-0.0187	-0.0676	0.0609	0.0124
ULS: 5a. D + 0.6W_Wind downforce Case A only	-2.3103	4.1208	-0.1048	-0.3728	0.4603	28.4163
ULS: 5a. D + 0.6W_Wind downforce Case B only	0.0000	2.1822	-0.0311	-0.1127	0.1015	0.0221
ULS: 5a. D + 0.6W_Wind uplift Case A only	2.3103	0.2437	0.0426	0.1470	-0.2575	-28.0015
ULS: 5a. D + 0.6W_Wind uplift Case B only	0.0000	2.1822	-0.0311	-0.1127	0.1015	0.0221
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind downforce Case A only	-1.7327	7.1404	-0.1534	-0.5511	0.5881	21.5891
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind downforce Case B only	0.0000	5.6864	-0.0981	-0.3560	0.3195	0.0540
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind uplift Case A only	1.7327	4.2325	-0.0429	-0.1610	0.0508	-21.2663
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind uplift Case B only	0.0000	5.6864	-0.0981	-0.3560	0.3195	0.0540

Name	Fx	Fy	Fz	Mx	My	Mz
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind downforce Case A only	-1.7327	3.6361	-0.0864	-0.3077	0.3706	21.2826
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind downforce Case B only	0.0000	2.1822	-0.0311	-0.1127	0.1015	0.0221
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind uplift Case A only	1.7327	0.7283	0.0242	0.0821	-0.1677	-21.0299
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind uplift Case B only	0.0000	2.1822	-0.0311	-0.1127	0.1015	0.0221
ULS: 7. 0.6D + 0.6W_Wind downforce Case A only	-2.3103	3.2479	-0.0924	-0.3276	0.4199	28.3179
ULS: 7. 0.6D + 0.6W_Wind downforce Case B only	0.0000	1.3093	-0.0187	-0.0676	0.0609	0.0124
ULS: 7. 0.6D + 0.6W_Wind uplift Case A only	2.3103	-0.6292	0.0550	0.1921	-0.2983	-27.9253
ULS: 7. 0.6D + 0.6W_Wind uplift Case B only	0.0000	1.3093	-0.0187	-0.0676	0.0609	0.0124

Worst Case Reactions (LRFD)

Note: Downforce / downwind wind load cases are assumed to govern.

Result	Value (kip, kip-ft)
Axial	11.7098
Shear X	-3.8505
Shear Z	-0.2420
Moment X	-0.8736
Moment Y (Twist)	0.8844
Moment Z	48.0683

Worst Case Reactions (ASD)

Note: Downforce / downwind wind load cases are assumed to govern.

Result	Value (kip, kip-ft)
Axial	7.1404
Shear X	-2.3103
Shear Z	-0.1534
Moment X	-0.5511
Moment Y (Twist)	0.5881
Moment Z	28.4163

Reaction Forces for Foundation 2 (Node ID#101), (kip, kip-ft)

LRFD Load Combination Results

Name	Fx	Fy	Fz	Mx	My	Mz
ULS: 1. 1.4D	-0.0000	3.0551	0.0436	0.1579	-0.1421	0.0332
ULS: 2. 1.2D + 1.6L + 0.5(S or Lr or R)	-0.0000	4.9548	0.0820	0.2975	-0.2671	0.0473
ULS: 2. 1.2D + 1.6L + 0.5(S or Lr or R)	-0.0000	2.6187	0.0373	0.1353	-0.1218	0.0275
ULS: 3. 1.2D + 1.6(S or Lr or R) + L	-0.0000	10.0944	0.1807	0.6570	-0.5868	0.1438
ULS: 5. 1.2D + E + L + 0.2S	-0.0000	3.5531	0.0552	0.2001	-0.1799	0.0337
ULS: 7. 0.9D + 1.0E	-0.0000	1.9640	0.0280	0.1014	-0.0914	0.0196
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind downforce Case A only	-3.8505	8.1857	0.2048	0.7313	-0.8642	48.0690
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind downforce Case B only	-0.0000	4.9548	0.0820	0.2975	-0.2671	0.0473
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind uplift Case A only	3.8504	1.7239	-0.0407	-0.1353	0.3307	-46.9206
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind uplift Case B only	-0.0000	4.9548	0.0820	0.2975	-0.2671	0.0473
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind downforce Case A only	-3.8505	5.8496	0.1602	0.5689	-0.7198	47.6372
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind downforce Case B only	-0.0000	2.6187	0.0373	0.1353	-0.1218	0.0275
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind uplift Case A only	3.8504	-0.6123	-0.0854	-0.2973	0.4768	-46.5490
ULS: 4. 1.2D + W + L + 0.5(S or Lr or R)_Wind uplift Case B only	-0.0000	2.6187	0.0373	0.1353	-0.1218	0.0275
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind downforce Case A only	-1.9252	11.7098	0.2420	0.8739	-0.8845	24.4832
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind downforce Case B only	-0.0000	10.0944	0.1807	0.6570	-0.5868	0.1438
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind uplift Case A only	1.9252	8.4789	0.1194	0.4403	-0.2889	-23.9202
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind uplift Case B only	-0.0000	10.0944	0.1807	0.6570	-0.5868	0.1438
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind downforce Case A only	-1.9252	4.2341	0.0988	0.3520	-0.4209	23.7006
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind downforce Case B only	-0.0000	2.6187	0.0373	0.1353	-0.1218	0.0275
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind uplift Case A only	1.9252	1.0032	-0.0241	-0.0811	0.1774	-23.3873
ULS: 3. 1.2D + 1.6(S or Lr or R) + 0.5W_Wind uplift Case B only	-0.0000	2.6187	0.0373	0.1353	-0.1218	0.0275
ULS: 6. 0.9D + 1.0W_Wind downforce Case A only	-3.8505	5.1949	0.1509	0.5350	-0.6895	47.5165
ULS: 6. 0.9D + 1.0W_Wind downforce Case B only	-0.0000	1.9640	0.0280	0.1014	-0.0914	0.0196
ULS: 6. 0.9D + 1.0W_Wind uplift Case A only	3.8505	-1.2669	-0.0948	-0.3311	0.5074	-46.4499
ULS: 6. 0.9D + 1.0W_Wind uplift Case B only	-0.0000	1.9640	0.0280	0.1014	-0.0914	0.0196

ASD Load Combination Results

Name	Fx	Fy	Fz	Mx	My	Mz
ULS: 1. D	-0.0000	2.1822	0.0311	0.1127	-0.1015	0.0222
ULS: 2. D + L	-0.0000	2.1822	0.0311	0.1127	-0.1015	0.0222
ULS: 3. D + (S or Lr or R)	-0.0000	6.8545	0.1205	0.4376	-0.3921	0.0721
ULS: 3. D + (S or Lr or R)	-0.0000	2.1822	0.0311	0.1127	-0.1015	0.0222
ULS: 4. D + 0.75L + 0.75(S or Lr or R)	-0.0000	5.6864	0.0981	0.3561	-0.3195	0.0540
ULS: 4. D + 0.75L + 0.75(S or Lr or R)	-0.0000	2.1822	0.0311	0.1127	-0.1015	0.0222
ULS: 5b. D + 0.7E	-0.0000	2.1822	0.0311	0.1127	-0.1015	0.0222
ULS: 6b. D + 0.75L + 0.75(0.7)E + 0.75S	-0.0000	5.6864	0.0981	0.3561	-0.3195	0.0540
ULS: 8. 0.6D + 0.7E	-0.0000	1.3093	0.0187	0.0676	-0.0609	0.0124
ULS: 5a. D + 0.6W_Wind downforce Case A only	-2.3103	4.1208	0.1048	0.3727	-0.4604	28.4167
ULS: 5a. D + 0.6W_Wind downforce Case B only	-0.0000	2.1822	0.0311	0.1127	-0.1015	0.0222
ULS: 5a. D + 0.6W_Wind uplift Case A only	2.3103	0.2437	-0.0426	-0.1469	0.2576	-28.0018
ULS: 5a. D + 0.6W_Wind uplift Case B only	-0.0000	2.1822	0.0311	0.1127	-0.1015	0.0222
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind downforce Case A only	-1.7327	7.1404	0.1534	0.5512	-0.5881	21.5893
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind downforce Case B only	-0.0000	5.6864	0.0981	0.3561	-0.3195	0.0540
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind uplift Case A only	1.7327	4.2325	0.0429	0.1612	-0.0507	-21.2665
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind uplift Case B only	-0.0000	5.6864	0.0981	0.3561	-0.3195	0.0540
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind downforce Case A only	-1.7327	3.6361	0.0864	0.3077	-0.3707	21.2828
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind downforce Case B only	-0.0000	2.1822	0.0311	0.1127	-0.1015	0.0222
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind uplift Case A only	1.7327	0.7283	-0.0242	-0.0821	0.1678	-21.0301
ULS: 6a. D + 0.75L + 0.75(0.6)W + 0.75(S or Lr or R)_Wind uplift Case B only	-0.0000	2.1822	0.0311	0.1127	-0.1015	0.0222
ULS: 7. 0.6D + 0.6W_Wind downforce Case A only	-2.3103	3.2479	0.0924	0.3276	-0.4199	28.3181
ULS: 7. 0.6D + 0.6W_Wind downforce Case B only	-0.0000	1.3093	0.0187	0.0676	-0.0609	0.0124
ULS: 7. 0.6D + 0.6W_Wind uplift Case A only	2.3103	-0.6292	-0.0550	-0.1920	0.2983	-27.9255
ULS: 7. 0.6D + 0.6W_Wind uplift Case B only	-0.0000	1.3093	0.0187	0.0676	-0.0609	0.0124

Worst Case Reactions (LRFD)

Note: Downforce / downwind wind load cases are assumed to govern.

Result	Value (kip, kip-ft)
Axial	11.7098
Shear X	-3.8505
Shear Z	0.2420
Moment X	0.8739
Moment Y (Twist)	0.8845
Moment Z	48.0690

Worst Case Reactions (ASD)

Note: Downforce / downwind wind load cases are assumed to govern.

Result	Value (kip, kip-ft)
Axial	7.1404
Shear X	-2.3103
Shear Z	0.1534
Moment X	0.5512
Moment Y (Twist)	0.5881
Moment Z	28.4167

Project Details

Design Code: AISC 360-16 LRFD
Provision: LRFD
Country: United States

User Name: sales@mtsolar.us
Project Name: Nokes, Barbara 4x6 C
Unit System: imperial



Design Input Information

Design Factors			
Φ_t	Φ_c	Φ_b	Φ_v
0.9	0.9	0.9	0.9

Design Materials			
ID	E (ksi)	F _y (ksi)	F _u (ksi)
1	29000	50	65
2	29000	46	62
4	29000	50	62

Section Dimensions								
ID	Name	d (in)	t _w (in)					
2	2in Pipe Sch 80	2.38	0.22					
5	4in Pipe Sch 80	4.50	0.34					
9	8in Pipe Sch 40	8.63	0.32					
ID	Name	d (in)	b (in)	t _w (in)	t _b (in)	r (in)		
16	HSS5x3x3/16	5.00	3.00	0.17	0.17	0.17		
ID	Name	d (in)	t _w (in)	b _t (in)	b _b (in)	t _t (in)	t _b (in)	r (in)
19	W8x10	7.89	0.17	3.94	3.94	0.20	0.20	0.30

[illegible]

Member ID	$\Phi_t P_n$ (kip)	$\Phi_c P_n$ (kip)	$\Phi_b M_{zn}$ (k-ft)	$\Phi_b M_{yn}$ (k-ft)	$\Phi_v V_{yn}$ (kip)	$\Phi_v V_{zn}$ (kip)
1	347.73	324.35	76.62	76.62	104.32	104.32
2	182.47	177.07	20.19	20.19	54.74	54.74
3	116.10	115.41	15.79	11.10	42.08	23.28
4	116.10	111.33	15.79	11.10	42.08	23.28
5	116.10	114.23	15.79	11.10	42.08	23.28
6	116.10	115.41	15.79	11.10	42.08	23.28
7	116.10	114.23	15.79	11.10	42.08	23.28
8	133.20	123.95	32.87	6.12	40.24	43.62
9	61.16	54.71	3.51	3.51	18.35	18.35
10	116.10	111.33	15.79	11.10	42.08	23.28
11	133.20	123.95	32.87	6.12	40.24	43.62
13	133.20	85.85	24.84	6.12	40.24	43.62
14	133.20	85.85	24.82	6.12	40.24	43.62
15	133.20	32.95	32.87	6.12	40.24	43.62
16	133.20	32.95	32.87	6.12	40.24	43.62
101	347.73	324.35	76.62	76.62	104.32	104.32
102	182.47	177.07	20.19	20.19	54.74	54.74
103	116.10	115.41	15.79	11.10	42.08	23.28
104	116.10	111.33	15.79	11.10	42.08	23.28
105	116.10	114.23	15.79	11.10	42.08	23.28
106	116.10	115.41	15.79	11.10	42.08	23.28
107	116.10	114.23	15.79	11.10	42.08	23.28
108	133.20	32.95	32.87	6.12	40.24	43.62
109	61.16	54.71	3.51	3.51	18.35	18.35

110	116.10	111.33	15.79	11.10	42.08	23.28
111	133.20	32.95	32.87	6.12	40.24	43.62
113	133.20	85.85	24.83	6.12	40.24	43.62
114	133.20	85.85	24.83	6.12	40.24	43.62
115	133.20	86.20	32.87	6.12	40.24	43.62
116	133.20	86.20	32.87	6.12	40.24	43.62

Design Ratio

Member ID	P	M _z	M _y	V _y	V _z	(P,M _z ,M _y)	Worst LC	KL/r	δ	Status
1	0.036	0.627	0.027	0.037	0.002	0.649	#13	0.161	Not Required	Pass
2	0.006	0.469	0.225	0.113	0.038	0.648	#21	0.070	Not Required	Pass
3	0.017	0.563	0.119	0.057	0.024	0.691	#21	0.045	Not Required	Pass
4	0.018	0.557	0.287	0.056	0.059	0.735	#21	0.080	Not Required	Pass
5	0.017	0.349	0.300	0.055	0.073	0.417	#21	0.074	Not Required	Pass
6	0.015	0.477	0.075	0.047	0.005	0.557	#21	0.045	Not Required	Pass
7	0.015	0.297	0.212	0.047	0.055	0.362	#21	0.074	Not Required	Pass
8	0.002	0.056	0.143	0.030	0.023	0.181	#21	0.095	Not Required	Pass
9	0.021	0.040	0.083	0.002	0.002	0.123	#21	0.204	Not Required	Pass
10	0.014	0.471	0.219	0.047	0.049	0.644	#21	0.080	Not Required	Pass
11	0.003	0.056	0.140	0.030	0.023	0.181	#21	0.063	Not Required	Pass
13	0.013	0.219	0.733	0.041	0.032	0.946	#21	0.190	Not Required	Pass
14	0.016	0.223	0.733	0.041	0.032	0.947	#21	0.190	Not Required	Pass
15	0.000	0.087	0.391	0.030	0.023	0.478	#21	Not Required	Not Required	Pass
16	0.000	0.087	0.391	0.030	0.023	0.478	#21	Not Required	Not Required	Pass
101	0.036	0.627	0.027	0.037	0.002	0.650	#13	0.161	Not Required	Pass
102	0.006	0.469	0.225	0.113	0.038	0.648	#21	0.070	Not Required	Pass
103	0.015	0.477	0.075	0.047	0.005	0.557	#21	0.045	Not Required	Pass
104	0.014	0.471	0.219	0.047	0.049	0.644	#21	0.080	Not Required	Pass
105	0.015	0.297	0.212	0.047	0.055	0.362	#21	0.074	Not Required	Pass
106	0.017	0.563	0.119	0.057	0.024	0.691	#21	0.045	Not Required	Pass
107	0.017	0.349	0.300	0.055	0.073	0.417	#21	0.074	Not Required	Pass
108	0.000	0.087	0.391	0.030	0.023	0.478	#21	Not Required	Not Required	Pass
109	0.021	0.040	0.083	0.002	0.002	0.123	#21	0.204	Not Required	Pass
110	0.018	0.557	0.287	0.056	0.059	0.735	#21	0.080	Not Required	Pass
111	0.000	0.087	0.391	0.030	0.023	0.478	#21	Not Required	Not Required	Pass
113	0.013	0.219	0.733	0.041	0.032	0.946	#21	0.190	Not Required	Pass
114	0.016	0.223	0.733	0.041	0.032	0.947	#21	0.286	Not Required	Pass
115	0.003	0.056	0.265	0.030	0.023	0.297	#21	0.231	Not Required	Pass
116	0.003	0.056	0.270	0.030	0.023	0.300	#21	0.346	Not Required	Pass

Definitions

Φ_t	Safety factor for tensile
Φ_c	Safety factor for compression
Φ_b	Safety factor for flexure
Φ_v	Safety factor for shear
E	Modulus of elasticity
F _y	Specified minimum yield stress
F _u	Specified minimum tensile strength
A	Cross-sectional area
J	Torsional constant
I _{yp}	Moment of inertia about the Y axes
I	Moment of inertia about the Z axes

I_{zp}	Moment of inertia about the Z axis
I_w	Warping constant
S_{yp}	Plastic section modulus about the Y axis
S_{zp}	Plastic section modulus about the Z axis
KL	Effective length
C_b	Buckling modification factor (from all load combinations)
L_b	Length between braced points
LST	Limited slenderness for tension
LSC	Limited slenderness for compression
LD	Limited deflection
P_n	Nominal axial strength (tension/compression)
M_n	Nominal flexural strength (about Z/Y axis)
V_n	Nominal shear strength (along Z/Y axis)
P	Design ratio in case of axial force
M_z	Design ratio in case of bending about Z axis
M_y	Design ratio in case of bending about Y axis
V_y	Design ratio in case of shear along Y axis
V_z	Design ratio in case of shear along Z axis
(P, M_z, M_y)	Design ratio in case of axial force and bending action
KL/r	Design ratio in case of section slenderness
δ	Design ratio in case of member deflection
OK	Capacity is provided</

REFERENCES	CALCULATIONS	RESULTS																																																																
	IBC 2021 Pile Design Powered bySkyCiv <table><thead><tr><th>Input</th><th>Description</th></tr></thead><tbody><tr><td>Region</td><td>American Standard</td></tr><tr><td>Concrete design code</td><td>American Concrete Institute (ACI 318:2019)</td></tr></tbody></table> Cross-section <table><thead><tr><th>Input</th><th>Description</th><th>Value</th></tr></thead><tbody><tr><td>Shape</td><td>Cross-sectional shape</td><td>Square</td></tr><tr><td>b</td><td>Section width</td><td>48 in</td></tr><tr><td>D</td><td>Section depth</td><td>48 in</td></tr></tbody></table> Material Properties <table><thead><tr><th>Input</th><th>Description</th><th>Value</th></tr></thead><tbody><tr><td>f'_{c}</td><td>Concrete compressive strength</td><td>2.5 ksi</td></tr><tr><td>f_y</td><td>Yield strength of steel</td><td>60 ksi</td></tr><tr><td>d_b</td><td>Rebar diameter</td><td>#5 (0.625) in</td></tr><tr><td>cover</td><td>Concrete cover</td><td>3 in</td></tr></tbody></table> Soil Parameters (IBC 1806) <table><thead><tr><th>Input</th><th>Description</th><th>Value</th></tr></thead><tbody><tr><td>Soil type</td><td>Sand, silty sand, clayey sand, silty gravel & clayey gravel</td><td></td></tr><tr><td>q_a</td><td>Allowable bearing pressure</td><td>2000 psf</td></tr><tr><td>R</td><td>Allowable lateral pressure</td><td>150 psf/ft</td></tr></tbody></table> Loading <table><thead><tr><th>Load</th><th>ASD</th><th>LRFD</th></tr></thead><tbody><tr><td>P</td><td>7.14 kip</td><td>11.71 kip</td></tr><tr><td>V_x</td><td>-2.31 kip</td><td>-3.85 kip</td></tr><tr><td>V_z</td><td>0.153 kip</td><td>0.242 kip</td></tr><tr><td>M_x</td><td>0.551 kip-ft</td><td>0.874 kip-ft</td></tr><tr><td>M_z</td><td>28.42 kip-ft</td><td>48.07 kip-ft</td></tr></tbody></table>	Input	Description	Region	American Standard	Concrete design code	American Concrete Institute (ACI 318:2019)	Input	Description	Value	Shape	Cross-sectional shape	Square	b	Section width	48 in	D	Section depth	48 in	Input	Description	Value	f'_{c}	Concrete compressive strength	2.5 ksi	f_y	Yield strength of steel	60 ksi	d_b	Rebar diameter	#5 (0.625) in	cover	Concrete cover	3 in	Input	Description	Value	Soil type	Sand, silty sand, clayey sand, silty gravel & clayey gravel		q_a	Allowable bearing pressure	2000 psf	R	Allowable lateral pressure	150 psf/ft	Load	ASD	LRFD	P	7.14 kip	11.71 kip	V _x	-2.31 kip	-3.85 kip	V _z	0.153 kip	0.242 kip	M _x	0.551 kip-ft	0.874 kip-ft	M _z	28.42 kip-ft	48.07 kip-ft		
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	Required depth to resist lateral loads (ASD) Allowable lateral pressure $R = 150 \text{ psf/ft}$ Point of application of lateral load: $H = h_1 + h_2 + h_3 = 0 + 0 + 0 = 0 \text{ ft}$ Considering x-direction: Lateral force per section length $H_x = \frac{V_x}{1.57 \times D} = \frac{-2.31}{1.57 \times 48} = -0.368 \frac{\text{kip}}{\text{ft}}$ Moment per section length																																																																	

$$M_o = \frac{M_z + (V_z \times H)}{1.57 \times D} = \frac{28.42 + (-2.31 \times 0)}{1.57 \times 48} = 4.52\% \frac{\text{kip} \cdot \text{ft}}{\text{ft}}$$

Required depth of embedment in earth:

$$L_o^3 - \left(9 \times \frac{H_o \times L_e}{R} \right) - \left(12 \times \frac{M_o}{R} \right) = 0$$

Solving the cubic equation:

$$L_{e,x} = 6.103 \text{ ft}$$

Considering z-direction:

Lateral force per section length

$$H_o = \frac{V_z}{1.57 \times b} = \frac{0.153}{1.57 \times 48} = 0.024 \frac{\text{kip}}{\text{ft}}$$

Moment per section length

$$M_o = \frac{M_z + (V_z \times H)}{1.57 \times b} = \frac{0.551 + (0.153 \times 0)}{1.57 \times 48} = 0.088 \frac{\text{kip} \cdot \text{ft}}{\text{ft}}$$

Required depth of embedment in earth:

$$L_o^3 - \left(9 \times \frac{H_o \times L_e}{R} \right) - \left(12 \times \frac{M_o}{R} \right) = 0$$

Solving the cubic equation:

$$L_{e,z} = 2.169 \text{ ft}$$

Minimum embedded depth

Depth of pile required

$$L_{e,req} = \text{MAX}[L_{e,x}, L_{e,z}] = \text{MAX}[6.103, 2.169] = 6.103 \text{ ft}$$

Actual embedded length

$$L_e = L - h_1 - h_2 = 6.5 - 0 - 0 = 6.5 \text{ ft}$$

Utilisation

$$\text{Ratio} = \frac{L_{e,req}}{L_e} = \frac{6.103}{6.5} = 0.939$$

UTILITY: 0.94

REFERENCES

CALCULATIONS

RESULTS

End-bearing Capacity (ASD)

Allowable bearing pressure

$$q_a = 2000 \text{ psf}$$

Unit weight of concrete

$$w_c = 0.15 \text{ kip/ft}^3$$

Cross-sectional area:

$$A = b \times D = 48 \times 48 = 16 \text{ ft}^2$$

End-bearing pressure:

$$q = \frac{P}{A} = \frac{7.14}{16} = 446.3 \text{ psf}$$

Utilisation

$$\text{Ratio} = \frac{q}{q_a} = \frac{446.3}{2000} = 0.223$$

UTILITY: 0.22

Lateral Soil Pressure (ASD)

Allowable lateral pressure

$$R = 150 \text{ psf/ft}$$

Length to least lateral dimension ratio:

$$\frac{L_e}{\text{MIN}[b, D]} = \frac{6.5}{\text{MIN}[4, 4]} = 1.625$$

L/D ratio ≤ 10 . This pile is classified as a short pile.

Considering x-direction:

Distance from resting surface to pivot point:

$$a = \frac{(4 \times M_o \times L_e) + (3 \times H_o \times L_e^2)}{R}$$

$$(6 \times M_o) + (4 \times H_o \times L_e)$$

$$a = \frac{(4 \times 4.525 \times 6.5) + (3 \times 0.368 \times 6.5^2)}{(6 \times 4.525) + (4 \times 0.368 \times 6.5)} = 4.474 \text{ ft}$$

Earth pressure against the pile at a distance a/2 from the resting surface:

$$p = \frac{0.75 \times [(4 \times M_o) + (3 \times H_o \times L_e)]^2}{L_e^2 \times [(3 \times M_o) + (2 \times H_o \times L_e)]}$$

$$p = \frac{0.75 \times [(4 \times 4.525) + (3 \times -0.368 \times 6.5)]^2}{6.5^2 \times [(3 \times 4.525) + (2 \times -0.368 \times 6.5)]} = 0.241 \frac{\text{kip}}{\text{ft}^2}$$

Allowable lateral soil pressure at a depth of a/2:

$$p_a = R \times \frac{a}{2} = 0.15 \times \frac{4.474}{2} = 0.336 \frac{\text{kip}}{\text{ft}^2}$$

Utilisation - pressure at a depth of a/2

$$\text{Ratio} = \frac{p}{p_a} = \frac{0.241}{0.336} = 0.718$$

UTILITY: 0.72

Earth pressure against the pile at distance L_e :

$$s = \frac{6 \times [(2 \times M_o) + (H_o \times L_e)]}{L_e^2} = \frac{6 \times [(2 \times 4.525) + (-0.368 \times 6.5)]}{6.5^2} = 0.946 \frac{\text{kip}}{\text{ft}^2}$$

Allowable lateral soil pressure at a depth of L_e :

$$p_s = R \times L_e = 0.15 \times 6.5 = 0.975 \frac{\text{kip}}{\text{ft}^2}$$

Utilisation - pressure at a depth of L_e

$$\text{Ratio} = \frac{s}{p_s} = \frac{0.946}{0.975} = 0.97$$

UTILITY: 0.97

Considering z-direction:

Distance from resting surface to pivot point:

$$a = \frac{(4 \times M_o \times L_e) + (3 \times H_o \times L_e^2)}{(6 \times M_o) + (4 \times H_o \times L_e)}$$

$$a = \frac{(4 \times 0.088 \times 6.5) + (3 \times 0.024 \times 6.5^2)}{(6 \times 0.088) + (4 \times 0.024 \times 6.5)} = 4.629 \text{ ft}$$

Earth pressure against the pile at a distance a/2 from the resting surface:

$$p = \frac{0.75 \times [(4 \times M_o) + (3 \times H_o \times L_e)]^2}{L_e^2 \times [(3 \times M_o) + (2 \times H_o \times L_e)]}$$

$$p = \frac{0.75 \times [(4 \times 0.088) + (3 \times 0.024 \times 6.5)]^2}{6.5^2 \times [(3 \times 0.088) + (2 \times 0.024 \times 6.5)]} = 0.021 \frac{\text{kip}}{\text{ft}^2}$$

Allowable lateral soil pressure at a depth of a/2:

$$p_a = R \times \frac{a}{2} = 0.15 \times \frac{4.629}{2} = 0.347 \frac{\text{kip}}{\text{ft}^2}$$

Utilisation - pressure at a depth of a/2

$$\text{Ratio} = \frac{p}{p_a} = \frac{0.021}{0.347} = 0.06$$

UTILITY: 0.06

Earth pressure against the pile at distance L_e :

$$s = \frac{6 \times [(2 \times M_o) + (H_o \times L_e)]}{L_e^2} = \frac{6 \times [(2 \times 0.088) + (0.024 \times 6.5)]}{6.5^2} = 0.047 \frac{\text{kip}}{\text{ft}^2}$$

Allowable lateral soil pressure at a depth of L_e :

$$p_s = R \times L_e = 0.15 \times 6.5 = 0.975 \frac{\text{kip}}{\text{ft}^2}$$

Utilisation - pressure at a depth of L_e

$$Ratio = \frac{s}{p_s} = \frac{0.047}{0.975} = 0.049$$

UTILITY: 0.05

REFERENCES

CALCULATIONS

RESULTS

Shear force and bending moment (LRFD)

Considering x-direction:

Lateral force per section length

$$H_x = \frac{V_x}{1.57 \times D} = \frac{-3.85}{1.57 \times 48} = -0.613 \frac{kip}{ft}$$

Moment per section length

$$M_x = \frac{M_z + (V_x \times H)}{1.57 \times D} = \frac{48.07 + (-3.85 \times 0)}{1.57 \times 48} = 7.654 \frac{kip-ft}{ft}$$

Distance from resting surface to pivot point:

$$a = \frac{(4 \times M_x \times L_e) + (3 \times H_x \times L_e^2)}{(6 \times M_x) + (4 \times H_x \times L_e)}$$

$$a = \frac{(4 \times 7.654 \times 6.5) + (3 \times 0.613 \times 6.5^2)}{(6 \times 7.654) + (4 \times 0.613 \times 6.5)} = 4.473 \text{ ft}$$

Max shear force located at depth a:

$$E = \frac{M_o}{H_x} = \frac{7.654}{-0.613} = 12.48 \text{ ft}$$

$$V_{max,x} = (H_x \times D) \times \left[1 - \left[3 \times \left(\frac{4 \times E}{L_e} + 3 \right) \times \left(\frac{a}{L_e} \right)^2 \right] + \left[4 \times \left(\frac{3 \times E}{L_e} + 2 \right) \times \left(\frac{a}{L_e} \right)^3 \right] \right]$$

$$V_{max,x} = (-0.613 \times 48) \times \left[1 - \left[3 \times \left(\frac{4 \times 12.48}{6.5} + 3 \right) \times \left(\frac{4.473}{6.5} \right)^2 \right] + \left[4 \times \left(\frac{3 \times 12.48}{6.5} + 2 \right) \times \left(\frac{4.473}{6.5} \right)^3 \right] \right]$$

$$V_{max,x} = 9.954 \text{ kip}$$

Max bending moment located at a depth of a/2:

$$M_{max,x} = (H_x \times D \times L_e) \times \left[\left(\frac{E}{L_e} + \frac{a}{2 \times L_e} \right) - \left[\left(\frac{4 \times E}{L_e} + 3 \right) \times \left(\frac{a}{2 \times L_e} \right)^2 \right] + \left[\left(\frac{3 \times E}{L_e} + 2 \right) \times \left(\frac{a}{2 \times L_e} \right)^3 \right] \right]$$

$$M_{max,x} = (-0.613 \times 48 \times 6.5) \times \left[\left(\frac{12.48}{6.5} + \frac{4.473}{2 \times 6.5} \right) - \left[\left(\frac{4 \times 12.48}{6.5} + 3 \right) \times \left(\frac{4.473}{2 \times 6.5} \right)^2 \right] + \left[\left(\frac{3 \times 12.48}{6.5} + 2 \right) \times \left(\frac{4.473}{2 \times 6.5} \right)^3 \right] \right]$$

$$M_{max,x} = 30.9 \text{ kip-ft}$$

Considering z-direction:

Lateral force per section length

$$H_o = \frac{V_z}{1.57 \times b} = \frac{0.242}{1.57 \times 48} = 0.039 \frac{kip}{ft}$$

Moment per section length

$$M_o = \frac{M_y + (V_z \times H)}{1.57 \times b} = \frac{0.874 + (0.242 \times 0)}{1.57 \times 48} = 0.139 \frac{kip-ft}{ft}$$

Distance from resting surface to pivot point:

$$a = \frac{(4 \times M_o \times L_e) + (3 \times H_o \times L_e^2)}{(6 \times M_o) + (4 \times H_o \times L_e)}$$

$$a = \frac{(4 \times 0.139 \times 6.5) + (3 \times 0.039 \times 6.5^2)}{(6 \times 0.139) + (4 \times 0.039 \times 6.5)} = 4.629 \text{ ft}$$

Max shear force located at depth a:

$$E = \frac{M_o}{H_o} = \frac{0.139}{0.039} = 3.611 \text{ ft}$$

$$V_{max,z} = (H_o \times b) \times \left[1 - \left[3 \times \left(\frac{4 \times E}{L_e} + 3 \right) \times \left(\frac{a}{L_e} \right)^2 \right] + \left[4 \times \left(\frac{3 \times E}{L_e} + 2 \right) \times \left(\frac{a}{L_e} \right)^3 \right] \right]$$

$$V_{max,z} = (0.039 \times 48) \times [1 - [3 \times \left(\frac{4 \times 3.611}{6.5} + 3\right) \times \left(\frac{4.629}{6.5}\right)^2] + [4 \times \left(\frac{3 \times 3.611}{6.5} + 2\right) \times \left(\frac{4.629}{6.5}\right)^3]]$$

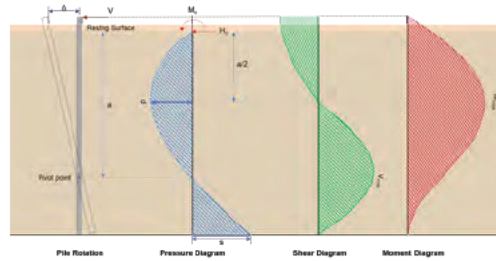
$$V_{max,z} = 0.254 \text{ kip}$$

Max bending moment located at a depth of a/2:

$$M_{max,z} = (H_o \times b \times I_e) \times \left[\left(\frac{E}{I_e} + \frac{a}{2 \times I_e} \right) - \left[\left(\frac{4 \times E}{I_e} + 3 \right) \times \left(\frac{a}{2 \times I_e} \right)^3 \right] + \left[\left(\frac{3 \times E}{I_e} + 2 \right) \times \left(\frac{a}{2 \times I_e} \right)^4 \right] \right]$$

$$M_{max,z} = (0.039 \times 48 \times 6.5) \times \left[\left(\frac{3.611}{6.5} + \frac{4.629}{2 \times 6.5} \right) - \left[\left(\frac{4 \times 3.611}{6.5} + 3 \right) \times \left(\frac{4.629}{2 \times 6.5} \right)^3 \right] + \left[\left(\frac{3 \times 3.611}{6.5} + 2 \right) \times \left(\frac{4.629}{2 \times 6.5} \right)^4 \right] \right]$$

$$M_{max,z} = 0.736 \text{ kip-ft}$$



Minimum Reinforcement Check (LRFD)

Gross area of concrete:

$$A_g = b \times D = 48 \times 48 = 2304 \text{ in}^2$$

Main Reinforcement

22.4.2.2 Required reinforcement:

$$A_{st,req} = \frac{P - (0.85 \times f'_c \times A_g)}{f_y - (0.85 \times f'_c)} = \frac{11.71 - (0.85 \times 2.5 \times 2304)}{60 - (0.85 \times 2.5)} = -84.39 \text{ in}^2$$

10.6.1.1 Maximum reinforcement:

$$A_{st,max} = 0.08 \times A_g = 0.08 \times 2304 = 184.32 \text{ in}^2$$

7.6.1.1 Minimum reinforcement:

$$A_{st,min} = 0.0018 \times A_g = 0.0018 \times 2304 = 4.147 \text{ in}^2$$

Governing minimum reinforcement area:

$$(0.0018 \times A_g) \leq A_{st,req} \leq (0.08 \times A_g)$$

$$A_{min} = 4.147 \text{ in}^2$$

Minimum number of reinforcements:

$$A_{bar} = 0.307 \text{ in}^2$$

$$n_{min} = \frac{A_{min}}{A_{bar}} = \frac{4.147}{0.307} = 14$$

25.2.3 Minimum spacing:

$$s_{min} = \text{MAX}[1.5, 1.5 \times d_b] = \text{MAX}[1.5, (1.5 \times 0.625)] = 1.5 \text{ in}$$

Use: n = 16pcs at 1.5 in minimum spacing

Total reinforcement area:

$$A_{st} = 16 \times 0.307 = 4.909 \text{ in}^2$$

Shear Reinforcement

25.7.2.2 For main reinforcement < 1.41 in: Use #3(0.375 in)

Maximum spacing of shear Reinforcements:

$$s = \text{MIN}[16 \times d_b, 48 \times d_{shear}, \text{MIN}(b, D)] = \text{MIN}[(16 \times 0.625), (48 \times 0.375), \text{MIN}(48, 48)] = 10 \text{ in}$$

Detailing Summary

Main reinforcement

#5 (0.625 in) - 16pcs at 1.5 in min. spacing

Shear reinforcement	#3 (0.375 in) at 10 in max. spacing
---------------------	-------------------------------------

Axial Compression Strength (LRFD)

22.4.2.2 Allowable axial compressive strength:

$$\phi P_N = \phi \times 0.8 \times [(0.85 \times f'_{ck} \times (A_g - A_{st})) + (f_{yk} \times A_{st})]$$

$$\phi P_N = 0.65 \times 0.8 \times [(0.85 \times 2.5 \times [2304 - 4.909]) + (60 \times 4.909)] = 2694 \text{ kip}$$

Utilisation

$$Ratio = \frac{P}{\phi P_N} = \frac{11.71}{2694} = 0.004$$

UTILITY: 0.00

Shear Strength LRFD)

Effective shear width	$b_w = 48 \text{ in}$
Effective shear depth	$d = 44.31 \text{ in}$
Shear reinforcement area	$A_s = 0.221 \text{ in}^2$
Shear reinforcement spacing	$s = 10 \text{ in}$
Concrete type factor (Normal concrete)	$\lambda = 1$
Strength reduction factor for shear	$\phi = 0.75$
Maximum shear in the x-direction	$V_{max,x} = 9.954 \text{ kip}$
Maximum shear in the z-direction	$V_{max,z} = 0.254 \text{ kip}$

22.5.5.1.1 Max shear strength of concrete:

$$V_{c,max} = 5 \times \lambda \times \sqrt{f'_{ck}} \times b_w \times d = 5 \times 1 \times \sqrt{2.5} \times 48 \times 44.31 = 531.8 \text{ kip}$$

Table 22.5.5.1 Shear strength of concrete:

$$V_{ca} = \left(2 \times \lambda \times \sqrt{f'_{ck}} + MIN\left[\frac{P}{6 \times A_g}, (0.05 \times f'_{ck})\right] \right) \times (b_w \times d)$$

$$V_{ca} = \left(2 \times 1 \times \sqrt{2.5} + MIN\left[\frac{11.71}{6 \times 2304}, (0.05 \times 2.5)\right] \right) \times (48 \times 44.31) = 214.5 \text{ kip}$$

Governing shear strength of concrete:

$$V_c = MIN[V_{c,max}, V_{ca}] = MIN[531.8, 214.5] = 214.5 \text{ kip}$$

22.5.1.2 Shear strength of steel (a):

$$V_{s,a} = 8 \times \sqrt{f'_{ck}} \times b_w \times d = 8 \times \sqrt{2.5} \times 48 \times 44.31 = 850.8 \text{ kip}$$

22.5.8.5.3 Shear strength of steel (b):

$$V_{s,b} = \frac{A_s \times f_{yk} \times d}{s} = \frac{0.221 \times 60 \times 44.31}{10} = 58.73 \text{ kip}$$

Governing shear strength of steel:

$$V_s = MIN[V_{s,a}, V_{s,b}] = MIN[850.8, 58.73] = 58.73 \text{ kip}$$

22.5.1.1 Allowable shear strength:

$$\phi V_n = \phi \times (V_c + V_s) = 0.75 \times (214.5 + 58.73) = 204.9 \text{ kip}$$

$$V_{max} = MAX[9.954, 0.254] = 9.954 \text{ kip}$$

Utilisation

$$Ratio = \frac{V_{max}}{\phi V_n} = \frac{9.954}{204.9} = 0.049$$

UTILITY: 0.05

Flexural Strength (LRFD)

Concrete type factor (Normal concrete)	$\lambda = 1$
Strength reduction factor for flexure	$\phi = 0.65$
Modulus of steel reinforcement	$E_s = 200e3 \text{ ksi}$
Maximum concrete strain	$\epsilon_c = 0.0030$
Yield strain of steel f_y/E_s	$\epsilon_y = 0.0003$
Section width	$b = 48 \text{ in}$
Distance to the compression rebar	$d_c = 3.688 \text{ in}$
Distance to the tension rebar	$d = 44.31 \text{ in}$
Total bar area	$A_s = 4.909 \text{ in}^2$
Maximum applied axial load	$P = 11.71 \text{ kip}$
Maximum moment in the x-direction	$M_{max,x} = 30.9 \text{ kip-ft}$
Maximum moment in the z-direction	$M_{max,z} = 0.736 \text{ kip-ft}$

Compressive force due to concrete:

$\beta_1 = 0.85$

$C_{rc} = 0.85 \times \beta_1 \times f'_c \times b \times c$

Compressive force due to bars in compression:

$C_{rs} = f_1 \times A_{sr}$

$\epsilon_1 = (c - d_s) \times \frac{\epsilon_{sy}}{c}$

$f_1 = F_1 \times \epsilon_1 \ (\epsilon_1 < \epsilon_{sy}), f_1 = f_{sy} \ (\epsilon_1 \geq \epsilon_{sy})$

Tensile force due to bars in tension:

$T_{rs} = f_2 \times A_{st}$

$\epsilon_2 = (d - c) \times \frac{\epsilon_{sy}}{c}$

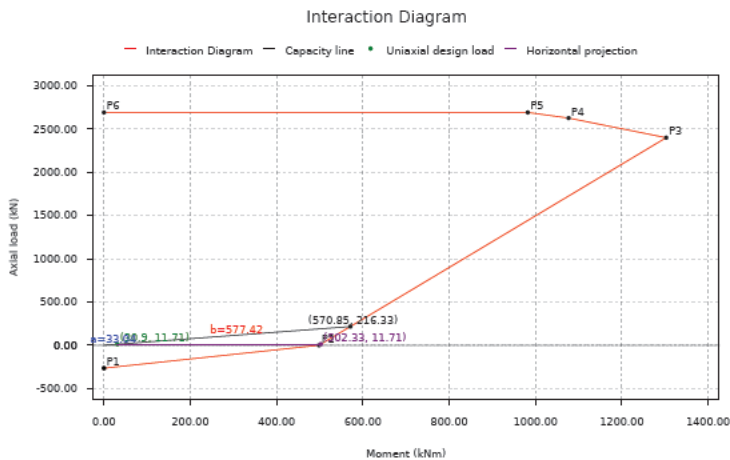
$f_2 = E_s \times \epsilon_2 \ (\epsilon_2 < \epsilon_{sy}), f_2 = \phi_s \times f_y \ (\epsilon_2 \geq \epsilon_{sy})$

Interaction Diagram Summary

Point	Case	M _r	P _r
P1	Pure Tension	0	-265.1
P2	Pure Bending	498.4	0
P3	Balanced Failure	1303	2402
P4	Decompression	1077	2629
P5	Compression Limit	982	2694
P6	Pure Compression	0	2694

Uniaxial Bending Check

$M_f = MAX[30.9, 0.736] = 30.9 \text{ kip-ft}$



Utilisation

$Ratio = \frac{a}{a + b} = \frac{33.04}{33.04 + 577.4} = 0.054$

UTILITY: 0.05

Biaxial Bending Check

Maximum moment in the x-direction
Maximum moment in the z-direction
Nominal uniaxial moment strength about the x-axis
Nominal uniaxial moment strength about the z-axis
Interaction exponent

$M_{max,x}$	=	30.9 kip-ft
$M_{max,z}$	=	0.736 kip-ft
M_{nox}	=	502.3 kip-ft
M_{noz}	=	502.3 kip-ft
α	=	1

Bresler (1960)

According to Bresler (method B):

$$\left(\frac{M_{max,s}}{M_{noe}} \right)^{\alpha} + \left(\frac{M_{max,c}}{M_{noe}} \right)^{\alpha} = 1.0$$

$$\left(\frac{30.9}{502.3} \right)^1 + \left(\frac{0.736}{502.3} \right)^1 = 0.063$$

UTILITY: 0.06

REFERENCES

CALCULATIONS

RESULTS

Results Summary

Result Name	Results
PILE DETAILS	
Length of the pile	6.50 ft
Dimensions	48 x 48 in
Main bar reinforcement	#5-16pcs at 1.5 in min.
Shear reinforcement	#3 at 10 in max.
UTILISATIONS	
Required depth	0.94
End-bearing capacity	0.22
P _a	0.72
P _s	0.97
Axial compression strength	0.00
Shear strength	0.05
Uniaxial bending strength	0.05
Biaxial bending strength	0.06

SCOPE OF WORK

PHOTOVOLTAIC SYSTEM SUMMARY

SYSTEM SIZE: DC - 11.04 KW
AC - 11.50 KW

MODULES: (24) REC SOLAR: REC460AA PURE-RX (460W) MODULES
INVERTER: (1) TESLA POWERWALL 3 (1707000-XX-Y) (11.5KW AND 13.5KWH)
INVERTER/BATTERY
RAPID SHUTDOWN: (12) TESLA MCI-2 RAPID SHUTDOWNS
EXPANSION : (01) TESLA POWERWALL 3 (1807000-XX-Y) EXPANSION BATTERY
GATEWAY: (01) TESLA BACKUP GATEWAY 3

ELECTRICAL INFORMATION

UTILITY NAME: IDAHO POWER
AHJ NAME: VALLEY COUNTY
MAIN SERVICE AMPERAGE: 200A

GOVERNING CODES & STANDARDS

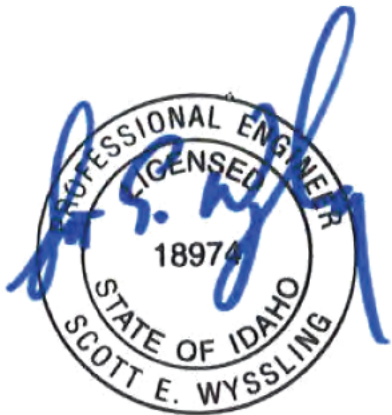
2018 INTERNATIONAL BUILDING CODE
2018 INTERNATIONAL RESIDENTIAL CODE
2018 INTERNATIONAL FIRE CODE
2023 NATIONAL ELECTRICAL CODE

GENERAL NOTES:

- CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO INITIATING CONSTRUCTION.
- CONTRACTOR SHALL REVIEW ALL MANUFACTURER INSTALLATION DOCUMENTS PRIOR TO INITIATING CONSTRUCTION.
- ALL EQUIPMENT SHALL BE LISTED BY U.L. (OR EQUAL) AND LISTED FOR ITS SPECIFIC APPLICATION.
- ALL EQUIPMENT SHALL BE RATED FOR THE ENVIRONMENT IN WHICH IT IS INSTALLED.
- ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- ACCESS TO ELECTRICAL COMPONENTS OVER 150 VOLTS TO GROUND SHALL BE RESTRICTED TO QUALIFIED PERSONNEL.
- WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, CONTRACTOR SHALL SIZE THEM ACCORDING TO APPLICABLE CODES.
- PV MODULE FRAMES SHALL BE BONDED TO RACKING RAIL OR BARE COPPER G.E.C. PER THE MODULE MANUFACTURER'S LISTED INSTRUCTION SHEET.
- PV MODULE RACKING RAIL SHALL BE BONDED TO BARE COPPER G.E.C. VIA WEEB LUG, ILSCO GBL-4DBT LAY-IN LUG, OR EQUIVALENT LISTED LUG.
- GROUNDING ELECTRODE CONDUCTOR (G.E.C.) SHALL BE CONTINUOUS AND/OR IRREVERSIBLY SPLICED/WELDED.
- ALL JUNCTION BOXES, COMBINER BOXES, AND DISCONNECTS SHALL BE INSTALLED IN AN ACCESSIBLE LOCATION.
- WORKING SPACE AROUND ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26

SHEET INDEX

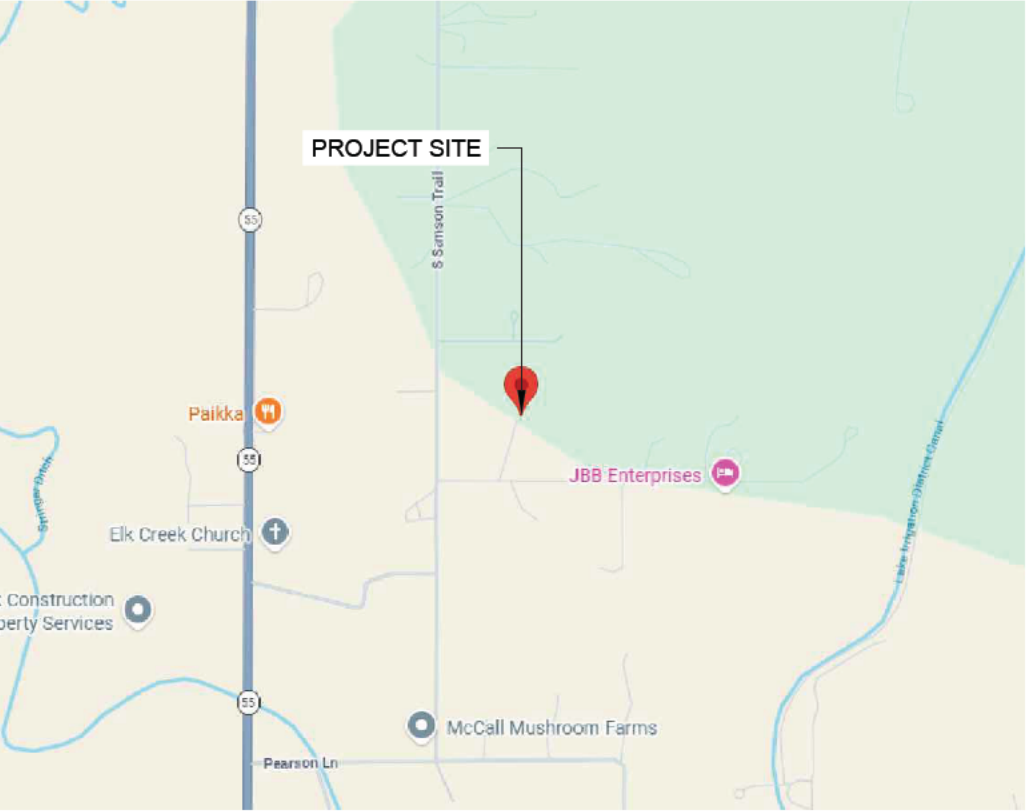
PV-1	COVER SHEET
PV-2	SITE PLAN AND GROUND PLAN
PV-3	GROUND PLAN & MODULES
PV-4	ELECTRICAL SITE PLAN
PV-5	MOUNTING DETAIL
PV-6	ELECTRICAL LINE DIAGRAM
PV-7	WIRING CALCULATIONS
PV-8	PLACARDS
PV-9+	EQUIPMENT SPECIFICATION



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76 N. Meadowbrook Drive, Alpine UT
Idaho COA # 4347
Signed 6/25/2026



1 AERIAL VIEW
PV-1 SCALE: NTS



2 VICINITY MAP
PV-1 SCALE: NTS

REVOLUSUN
MOUNTAIN STATES

457 STEELHEAD WAY,
BOISE IDAHO 83704
LICENSE #: ECL 039193
PHONE # (208) 315-4082
EMAIL: rmsoperations@revolusun.com

REVISIONS		
DESCRIPTION	DATE	REV
CLIENT COMMENT	06/23/2026	A
DATE: 06/19/2026		

Signature with Seal

PROJECT NAME & ADDRESS

NOKES, BARBARA
RESIDENCE
34 ILKA LN.,
MCCALL, ID 83638

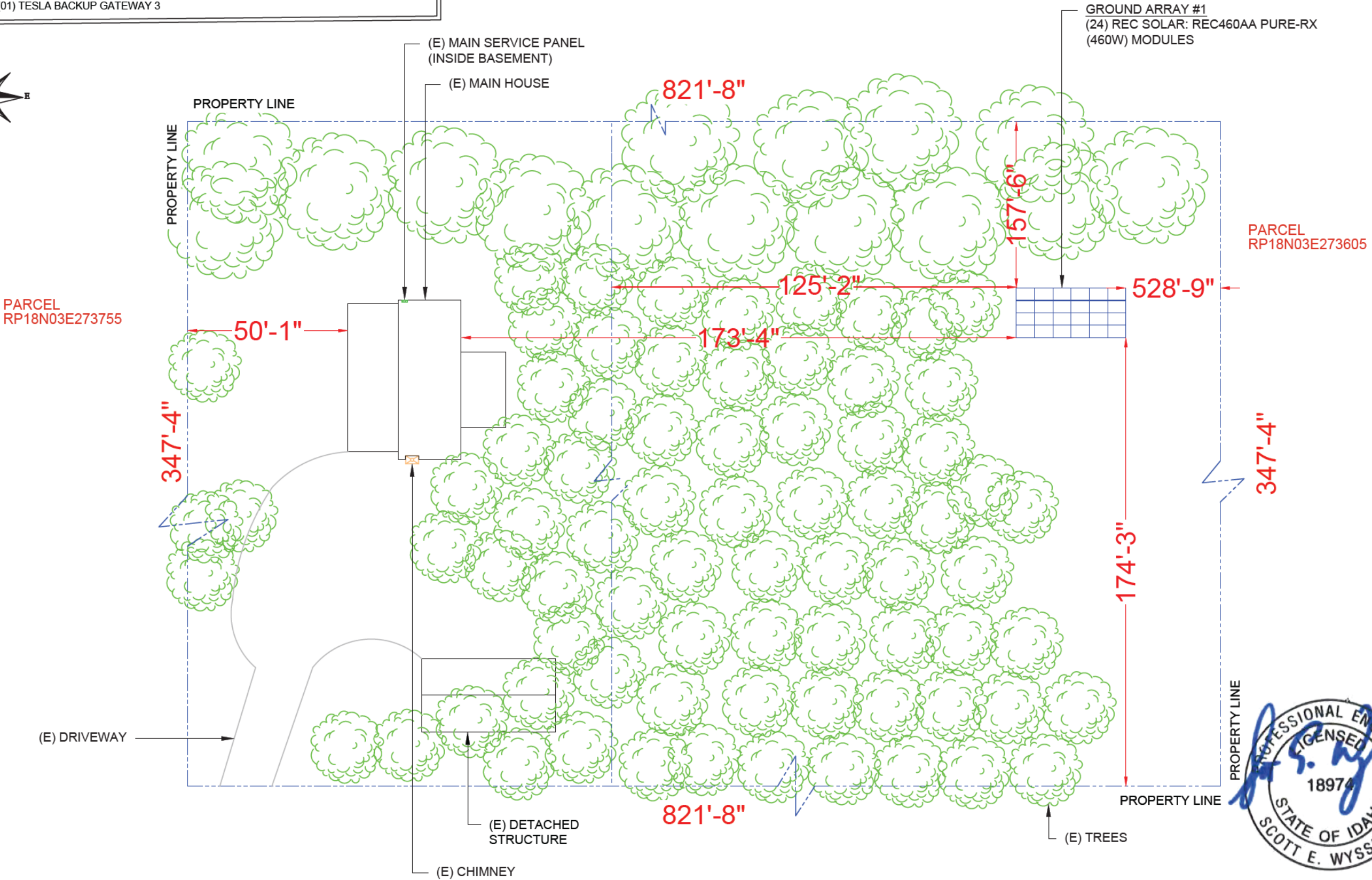
SHEET NAME
COVER SHEET

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-1

SYSTEM SIZE: DC - 11.04 KW
AC - 11.50 KW

MODULES: (24) REC SOLAR: REC460AA PURE-RX (460W) MODULES
INVERTER: (1) TESLA POWERWALL 3 (1707000-XX-Y) (11.5KW AND 13.5KWH) INVERTER/BATTERY
RAPID SHUTDOWN: (12) TESLA MCI-2 RAPID SHUTDOWNS
EXPANSION : (01) TESLA POWERWALL 3 (1807000-XX-Y) EXPANSION BATTERY
GATEWAY: (01) TESLA BACKUP GATEWAY 3



REVOLUSUN
MOUNTAIN STATES

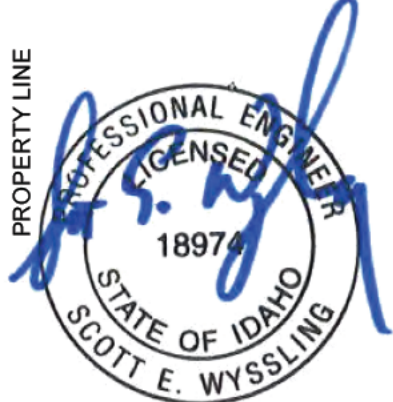
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MCCALL, ID 83638



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Idaho COA # 4347
Signed 6/25/2026

SHEET NAME
SITE PLAN & GROUND PLAN
SHEET SIZE
ANSI B 11" X 17"
SHEET NUMBER
PV-2

MODULE TYPE, DIMENSIONS & WEIGHT

NUMBER OF MODULES = 24 MODULES
MODULE TYPE = REC SOLAR: REC460AA PURE-RX (460W) MODULES
MODULE WEIGHT = 50.04 LBS / 22.7 KG.
MODULE DIMENSIONS = 68.0" x 46.1" = 21.77 SF



SYSTEM SIZE: DC - 11.04 KW
AC - 11.50 KW

MODULES: (24) REC SOLAR: REC460AA PURE-RX (460W) MODULES
INVERTER: () TESLA POWERWALL 3 (1707000-XX-Y) (11.5KW AND 13.5KWH) INVERTER/BATTERY
RAPID SHUTDOWN: (12) TESLA MCI-2 RAPID SHUTDOWNS
EXPANSION : (01) TESLA POWERWALL 3 (1807000-XX-Y) EXPANSION BATTERY
GATEWAY: (01) TESLA BACKUP GATEWAY 3

GROUND ARRAY DESCRIPTION			
ARRAY TYPE			GROUND MOUNT
ARRAY	ARRAY TILT	AZIMUTH	GROUND TILT
#1	50°	180°	0°

NOTE: VISIBLE, LOCKABLE, LABELED AC DISCONNECT
LOCATED WITHIN 10' OF UTILITY METER.

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MOUNTAIN STATES

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REVISIONS

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CLIENT COMMENT	06/23/2026	A

DATE: 06/19/2026

Signature with Seal

PROJECT NAME & ADDRESS

NOKES, BARBARA
RESIDENCE
34 ILKA LN.,
MCCALL, ID 83638

SHEET NAME

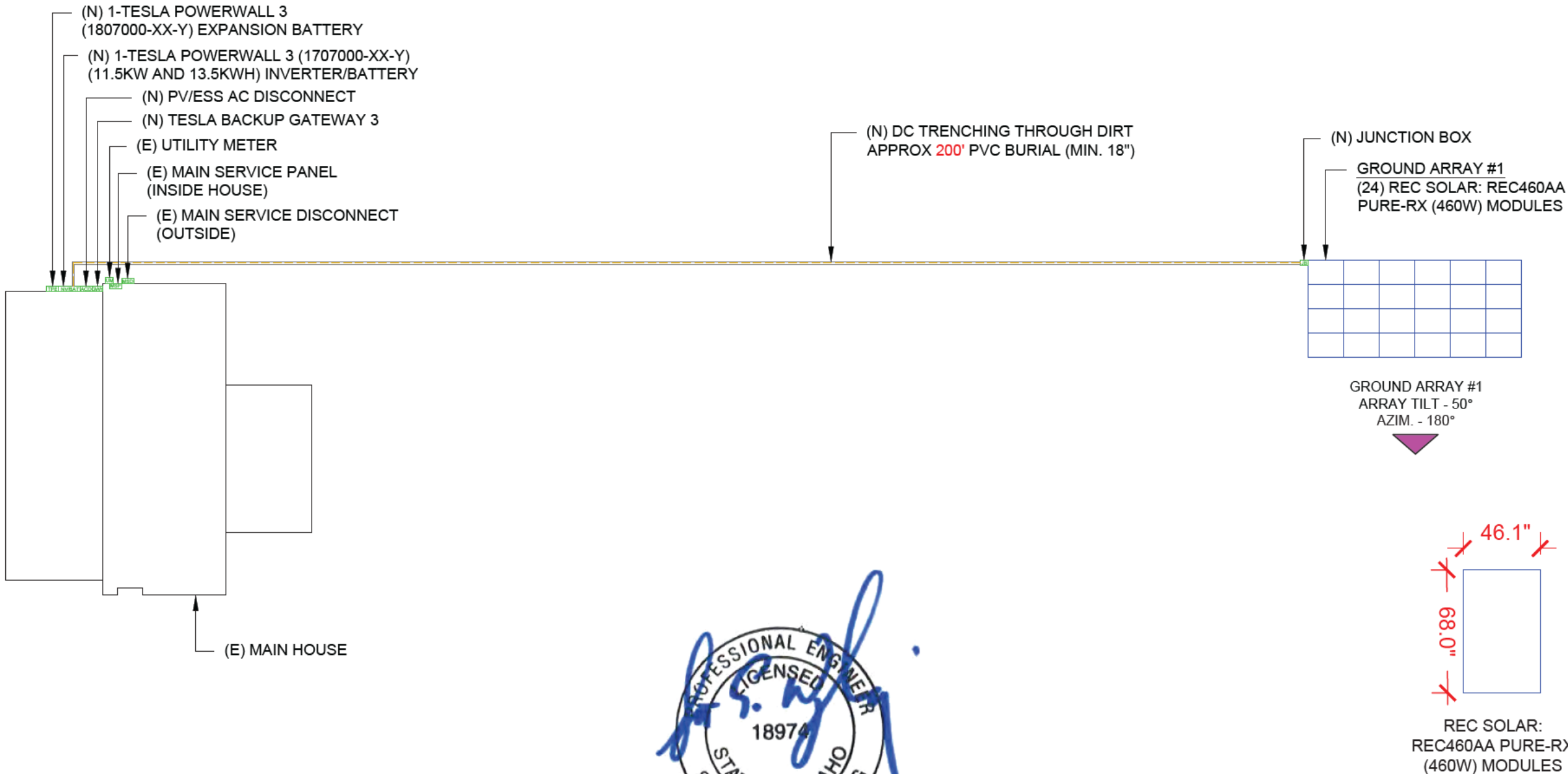
GROUND PLAN &
MODULES

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-3



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Idaho COA # 4347
Signed 6/25/2026

LEGEND

INV/BAT	- INVERTER/BATTERY	JB	- JUNCTION BOX
GWY	- GATEWAY 3	ACD	- PV/ESS AC DISCONNECT
MSD	- MAIN SERVICE DISCONNECT	UM	- UTILITY METER
TPE	- TESLA EXPANSION BATTERY	MSP	- MAIN SERVICE PANEL
			- TRENCH

SYSTEM SIZE: DC - 11.04 KW
AC - 11.50 KW

MODULES: (24) REC SOLAR: REC460AA PURE-RX (460W) MODULES
INVERTER: (1) TESLA POWERWALL 3 (1707000-XX-Y) (11.5KW AND 13.5KWH) INVERTER/BATTERY
RAPID SHUTDOWN: (12) TESLA MCI-2 RAPID SHUTDOWNS
EXPANSION : (01) TESLA POWERWALL 3 (1807000-XX-Y) EXPANSION BATTERY
GATEWAY: (01) TESLA BACKUP GATEWAY 3

(4) STRINGS OF 6 MODULES



BILL OF MATERIALS		
EQUIPMENT	QTY	DESCRIPTION
SOLAR PV MODULES	24	REC SOLAR: REC460AA PURE-RX (460W) MODULES
INVERTER/BATTERY	1	TESLA POWERWALL 3 (1707000-XX-Y) (11.5KW AND 13.5KWH) INVERTER/BATTERY
JUNCTION BOX	1	JUNCTION BOX, 600V, NEMA 3R, UL LISTED
RAPID SHUTDOWN	12	TESLA MCI-2 RAPID SHUTDOWNS
TESLA GATEWAY 3	1	TESLA BACKUP GATEWAY 3
PV/ESS DISCONNECT	1	60A NON-FUSED PV/ESS AC DISCONNECT, 240V NEMA 3R, UL LISTED
EXPANSION	1	TESLA POWERWALL 3 (1807000-XX-Y) EXPANSION BATTERY

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34 ILKA LN.,
MCCALL, ID 83638

SHEET NAME

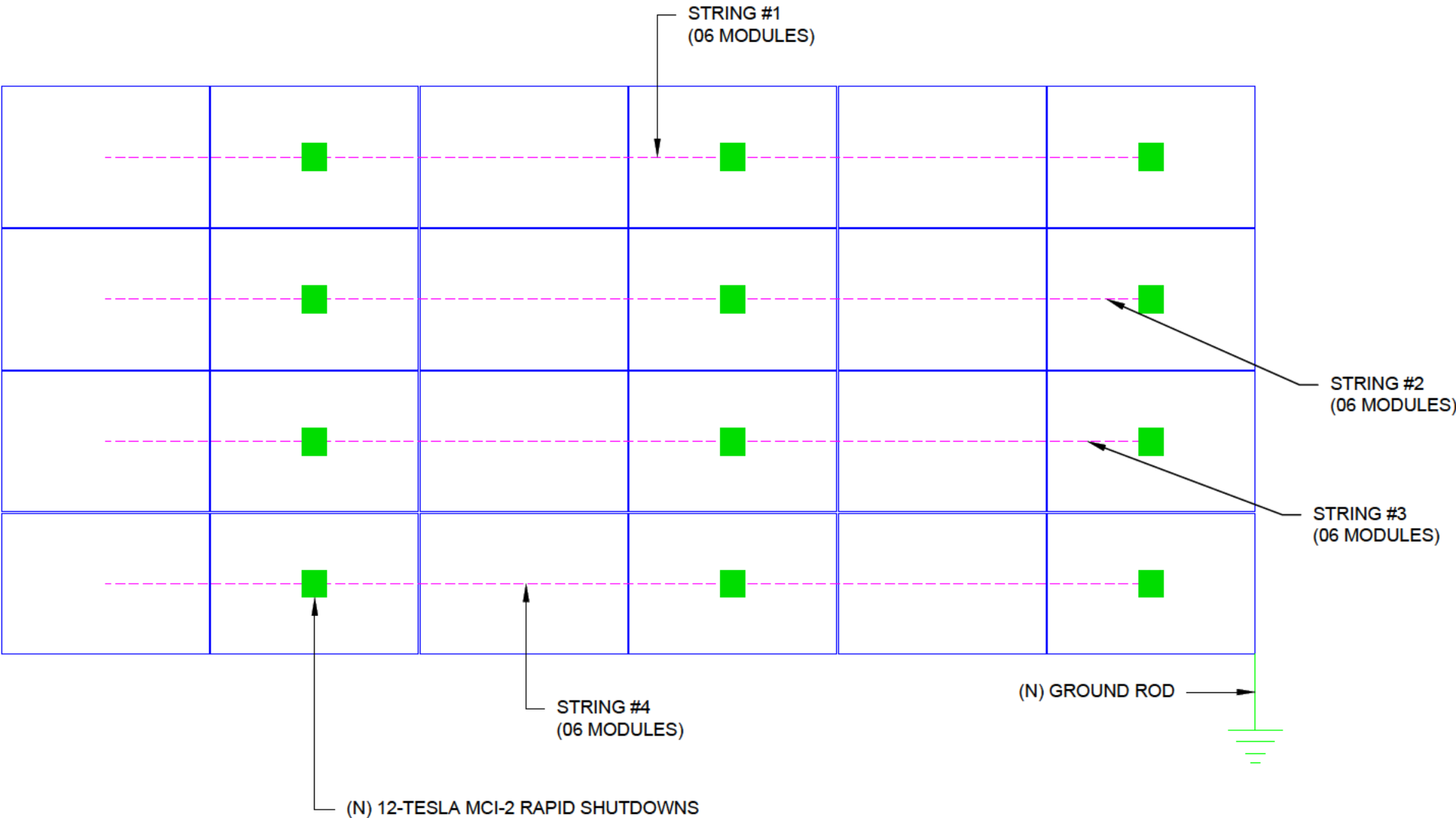
ELEC. SITE
PLAN

SHEET SIZE

ANSI B
11" X 17"

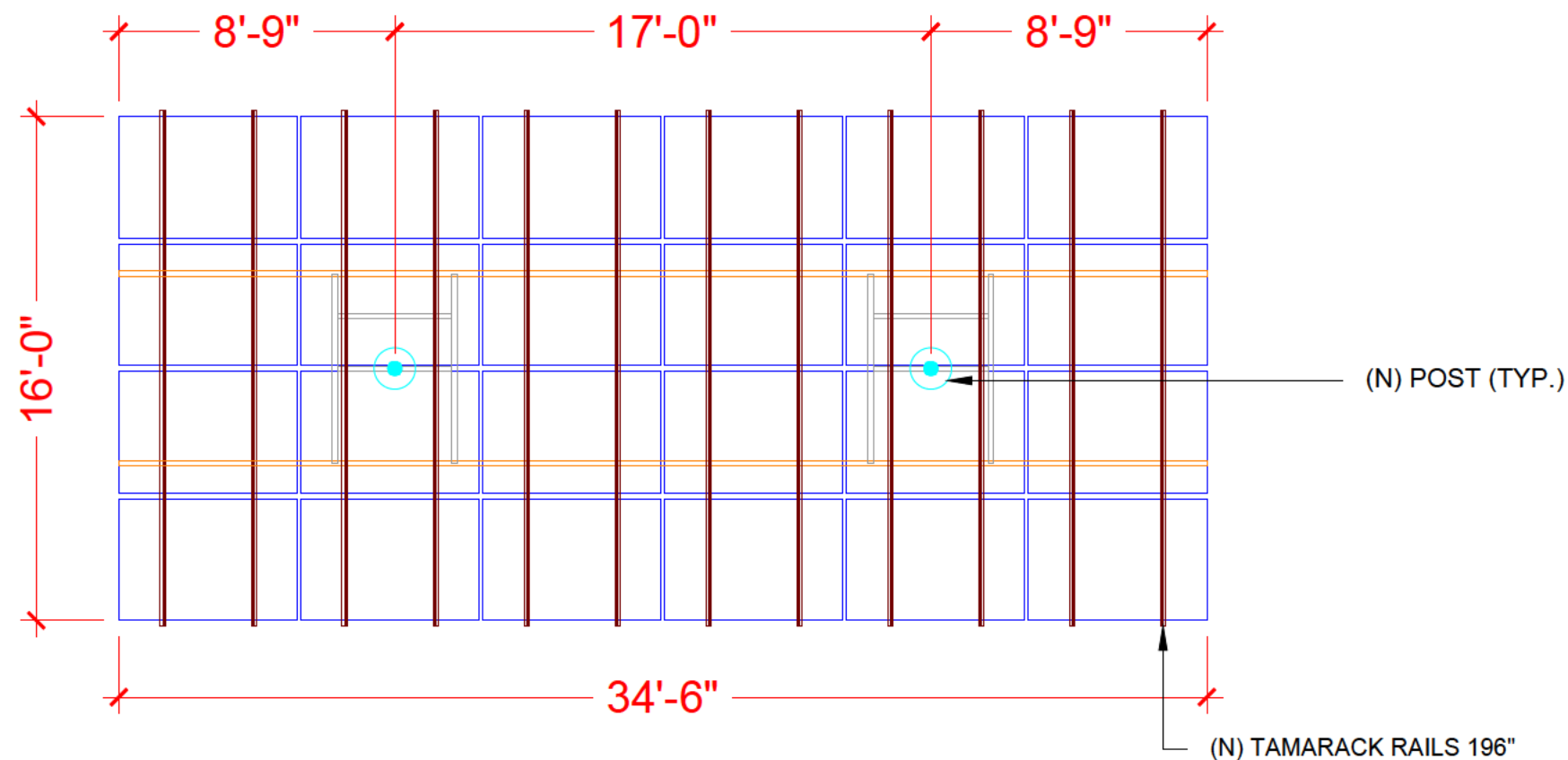
SHEET NUMBER

PV-4



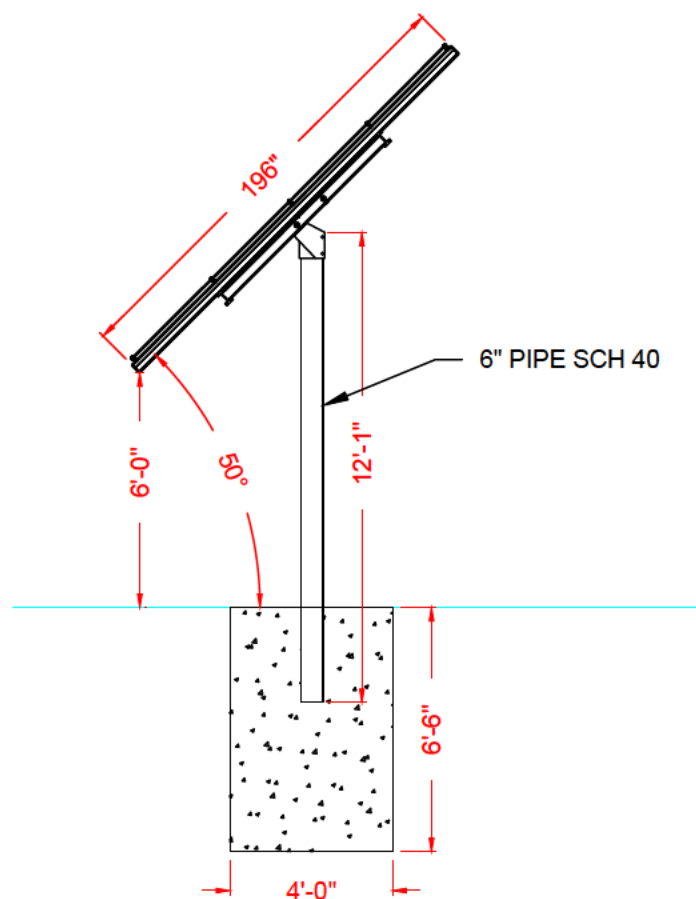


Wyssling Consulting, PLLC
76 N. Meadowbrook Drive, Alpine UT
Idaho COA # 4347
Signed 6/25/2026



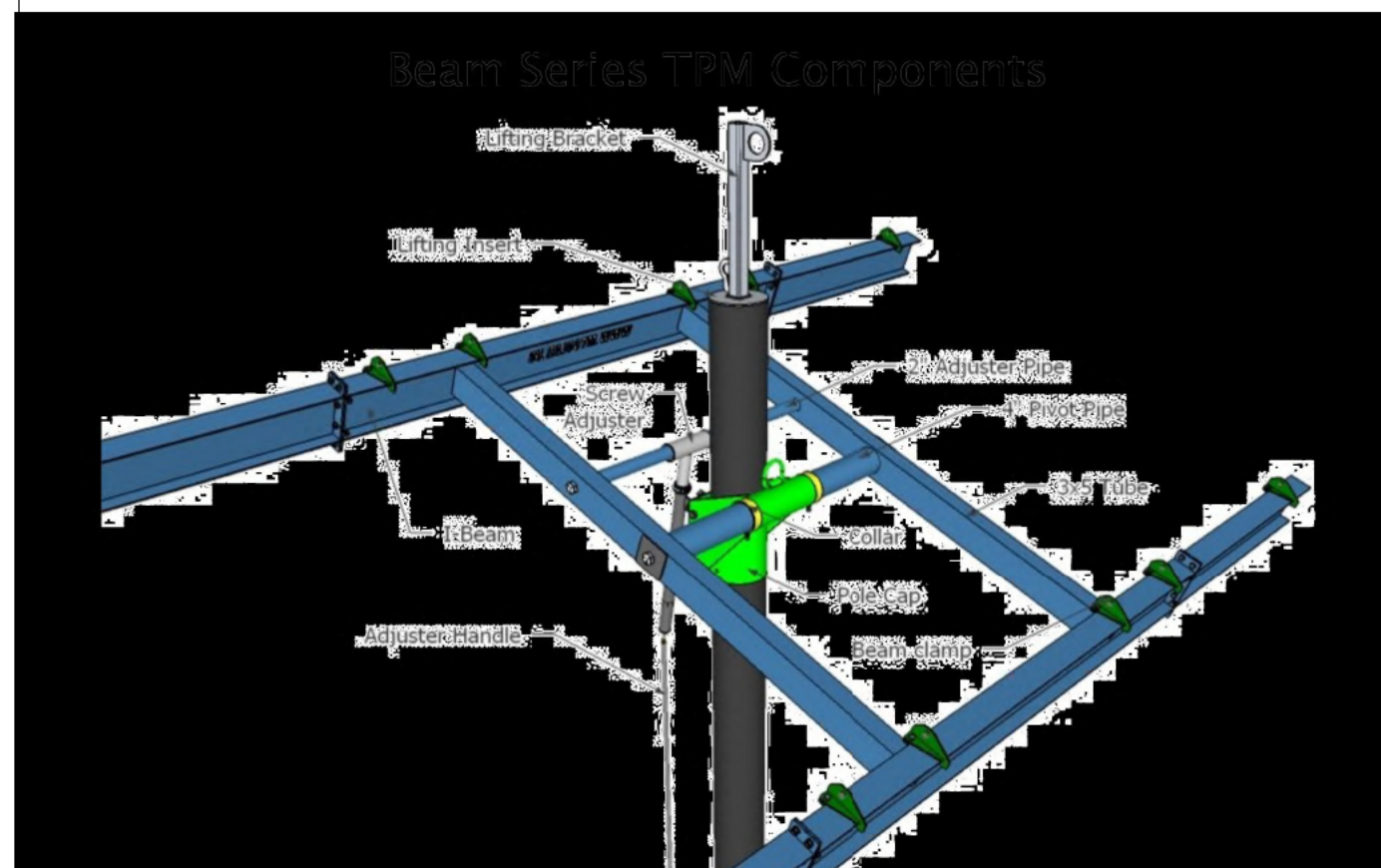
1 MOUNTING DETAIL

PV-5 SCALE: NTS



2 SIDE VIEW

PV-5 SCALE: NTS



REVOLUSUN MOUNTAIN STATES

457 STEELHEAD WAY,
BOISE IDAHO 83704
LICENSE #: ECL 039193
PHONE # (208) 315-4082
EMAIL: rmsoperations@revolusun.com

REVISIONS

DESCRIPTION	DATE	REV
CLIENT COMMENT	06/23/2026	A

DATE: 06/19/2026

Signature with Seal

PROJECT NAME & ADDRESS

NOKES, BARBARA
RESIDENCE
34 ILKA LN.,
MCCALL, ID 83638

SHEET NAME
MOUNTING
DETAIL

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-5

SYSTEM SIZE: DC - 11.04 KW
AC - 11.50 KW

MODULES: (24) REC SOLAR: REC460AA PURE-RX (460W) MODULES
INVERTER: (1) TESLA POWERWALL 3 (1707000-XX-Y) (11.5KW AND 13.5KWH) INVERTER/BATTERY
RAPID SHUTDOWN: (12) TESLA MCI-2 RAPID SHUTDOWNS
BATTERY: (01) TESLA POWERWALL 3 (1807000-XX-Y) EXPANSION BATTERY
GATEWAY: (01) TESLA BACKUP GATEWAY 3

(4) STRINGS OF 6 MODULES

NOTE: ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND APPLICABLE CODES/STANDARDS. THE INSTALLER WILL BE RESPONSIBLE FOR REVIEWING AND VERIFYING EACH INSTRUCTION & CODE BEFORE INSTALLATION.

NOTE: VISIBLE, LOCKABLE, LABELED AC DISCONNECT LOCATED WITHIN 10' OF UTILITY METER.

**REVOLUSUN
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NOKES, BARBARA
RESIDENCE
34 ILKA LN.,
MCCALL, ID 83638

SHEET NAME

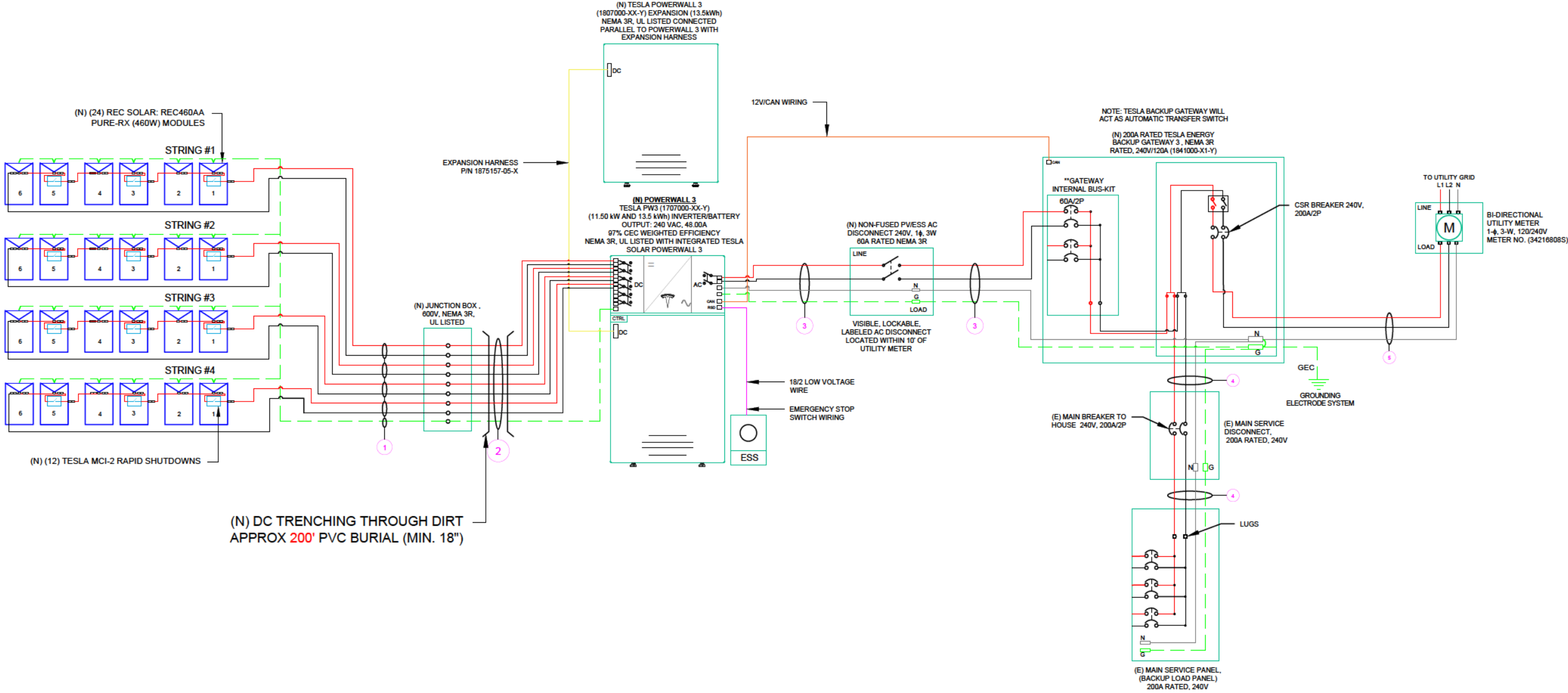
**ELECTRICAL
LINE DIAGRAM**

SHEET SIZE

**ANSI B
11" X 17"**

SHEET NUMBER

PV-6



QTY	CONDUCTOR INFORMATION		CONDUIT TYPE	CONDUIT SIZE
(8)	#10AWG -	PV WIRE/USE -2	N/A	N/A
(1)	#6AWG -	BARE COPPER IN FREE AIR		
(8)	#10AWG -	CU, THWN-2 (L1, L2)	PVC BURIAL (MIN. 18")	3/4"
(1)	#10AWG -	CU, THWN-2 GND		
(3)	#6AWG -	CU, THWN-2 (L1, L2, N)	EMT	1"
(1)	#10AWG -	CU, THWN-2 GND		
(3)	#3/0AWG -	CU, THWN-2 (L1, L2, N)	EMT	2"
(1)	#6AWG -	CU, THWN-2 GND		
(3)	#3/0AWG -	CU, THWN-2 (L1, L2, N)	EMT	2"

SOLAR MODULE SPECIFICATIONS	
MANUFACTURER / MODEL #	REC SOLAR: REC460AA PURE-RX (460W) MODULES
VMP	54.9V
IMP	8.38A
VOC	65.8V
ISC	8.88A
TEMP. COEFF. VOC	-0.24%/°C
MODULE DIMENSION	68.0"L x 46.1"W x 1.18"D (In Inch)

INVERTER SPECIFICATIONS	
MANUFACTURER / MODEL #	TESLA POWERWALL 3 (1707000-XX-Y) (11.5KW AND 13.5KWH) INVERTER/BATTERY
NOMINAL AC POWER	11500 VA
NOMINAL OUTPUT VOLTAGE	240 VAC
NOMINAL OUTPUT CURRENT	48A

AMBIENT TEMPERATURE SPECS	
AMBIENT TEMP (HIGH TEMP 2%)	26°
RECORD LOW TEMP	-25°
CONDUCTOR TEMPERATURE RATE	90°
MODULE TEMPERATURE COEFFICIENT OF Voc	-0.24%/°C
PERCENT OF VALUES	NUMBER OF CURRENT CARRYING CONDUCTORS IN EMT
.80	4-6
.70	7-9
.50	10-20

AC FEEDER CALCULATIONS																						
CIRCUIT ORIGIN	CIRCIUT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	NEUTRAL SIZE	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT SIZE	CONDUIT FILL (%)
INVERTER	PV/ESS AC DISCONNECT	240	48	60.00	60	CU #6 AWG	CU #10 AWG	CU #6 AWG	65	PASS	26	2	75	1	1	75	PASS	10	0.491	0.196	1" EMT	20.0463
PV/ESS AC DISCONNECT	GATEWAY 3	240	48	60.00	60	CU #6 AWG	CU #10 AWG	CU #6 AWG	65	PASS	26	2	75	1	1	75	PASS	5	0.491	0.098	1" EMT	20.0463
GATEWAY 3	MAIN SERVICE DISCONNECT	240	160	200.00	200	CU #3/0 AWG	CU #6 AWG	CU #3/0 AWG	200	PASS	26	2	225	1	1	225	PASS	5	0.0766	0.051	2" EMT	25.4589
MAIN SERVICE DISCONNECT	MAIN SERVICE PANEL	240	160	200.00	200	CU #3/0 AWG	CU #6 AWG	CU #3/0 AWG	200	PASS	26	2	225	1	1	225	PASS	5	0.0766	0.051	2" EMT	25.4589
GATEWAY 3	POI	240	160	200.00	200	CU #3/0 AWG	N/A	CU #3/0 AWG	200	PASS	26	2	225	1	1	225	PASS	5	0.0766	0.051	2" EMT	23.9482
																			CUMULATIVE VOLTAGE	0.346		

DC FEEDER CALCULATIONS																					
CIRCUIT ORIGIN	CIRCIUT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	DERATION FACTOR FOR AMBIENT TEMPERATURE NEC 310.15(B)(2)(a)	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)	VOLTAGE DROP AT FLA (%)	CONDUIT SIZE	CONDUIT FILL (%)
STRING 1	JUNCTION BOX	550	17.00	21.25	30	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	26	2	40	1	1	40	PASS	29	1.24	0.222	N/A	#N/A
STRING 2	JUNCTION BOX	550	17.00	21.25	30	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	26	2	40	1	1	40	PASS	29	1.24	0.222	N/A	#N/A
STRING 3	JUNCTION BOX	550	17.00	21.25	30	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	26	2	40	1	1	40	PASS	29	1.24	0.222	N/A	#N/A
STRING 4	JUNCTION BOX	550	17.00	21.25	30	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	26	2	40	1	1	40	PASS	29	1.24	0.222	N/A	#N/A
JUNCTION BOX	INVERTER	550	17.00	21.25	30	CU #10 AWG	CU #10 AWG	35	PASS	26	8	40	1	0.7	28	PASS	200	1.24	1.533	3/4" PVC	37.38188976

String 1 Voltage Drop:	0.755
String 2 Voltage Drop:	0.755
String 3 Voltage Drop:	0.755
String 4 Voltage Drop:	0.755

ELECTRICAL NOTES

1. ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
2. ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 DEGREE C WET ENVIRONMENT.
3. WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
4. WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
5. DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
6. WHERE SIZES OF SOLADECK, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
7. ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
8. MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
9. MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER G.E.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
10. TEMPERATURE RATINGS OF ALL CONDUCTORS, TERMINATIONS, BREAKERS, OR OTHER DEVICES ASSOCIATED WITH THE SOLAR PV SYSTEM SHALL BE RATED FOR AT LEAST 75 DEGREE C.

REVOLUSUN MOUNTAIN STATES

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Signature with Seal

PROJECT NAME & ADDRESS

NOKES, BARBARA
RESIDENCE
34 ILKA LN.,
MCCALL, ID 83638

SHEET NAME
WIRING
CALCULATIONS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-7

CAUTION:
AUTHORIZED SOLAR
PERSONNEL ONLY!

LABEL LOCATION:
AC DISCONNECT

WARNING: PHOTOVOLTAIC
POWER SOURCE

EVERY 10' ON CONDUIT & ENCLOSURES
LABEL LOCATION:
EMT/CONDUIT RACEWAY
SOLADECK / JUNCTION BOX
CODE REF: NEC 690.31 (D)(2)

WARNING

ELECTRICAL SHOCK HAZARD

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

LABEL LOCATION:
AC DISCONNECT
COMBINER
MAIN SERVICE PANEL
SUBPANEL
MAIN SERVICE DISCONNECT
CODE REF: NEC 706.15(C)(4) AND NEC 690.13(B)

WARNING DUAL POWER SOURCE
SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

LABEL LOCATION:
UTILITY METER
MAIN SERVICE PANEL
SUBPANEL
CODE REF: NEC 705.12(C) & NEC 690.59

WARNING

TURN OFF PHOTOVOLTAIC AC
DISCONNECT PRIOR TO
WORKING INSIDE PANEL

LABEL LOCATION:
MAIN SERVICE PANEL
SUBPANEL
MAIN SERVICE DISCONNECT
COMBINER
CODE REF: NEC 110.27(C) & OSHA 1910.145 (f) (7)

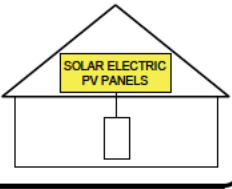
WARNING

POWER SOURCE OUTPUT
CONNECTION. DO NOT
RELOCATE THIS
OVERCURRENT DEVICE

LABEL LOCATION:
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)
SUBPANEL (ONLY IF SOLAR IS BACK-FED)
CODE REF: NEC 705.12(B)(3)(2)

SOLAR PV SYSTEM EQUIPPED
WITH RAPID SHUTDOWN

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



LABEL LOCATION:
AC DISCONNECT
CODE REF: IFC 605.11.3.1(1) & 690.56(C)

RAPID SHUTDOWN SWITCH
FOR SOLAR PV SYSTEM

LABEL LOCATION:
AC DISCONNECT
CODE REF: NEC 690.56(C)(2)

PHOTOVOLTAIC

AC DISCONNECT

LABEL LOCATION:
AC DISCONNECT
CODE REF: NEC 690.13(B)

MAIN PHOTOVOLTAIC
SYSTEM DISCONNECT

LABEL LOCATION:
MAIN SERVICE DISCONNECT (ONLY IF MAIN SERVICE
DISCONNECT IS PRESENT)
CODE REF: NEC 690.13(B)

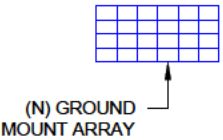
PHOTOVOLTAIC

DC DISCONNECT

LABEL LOCATION:
INVERTER
CODE REF: NEC 690.13(B)

CAUTION:
MULTIPLE SOURCES OF POWER

(N) 1-TESLA POWERWALL 3
EXPANSION BATTERY
(N) INVERTER/BATTERY
(N) PV/ESS AC DISCONNECT
(N) TESLA BACKUP GATEWAY 3
(E) UTILITY METER
(E) MAIN SERVICE PANEL
(INSIDE BASEMENT)
(E) MAIN SERVICE DISCONNECT
(OUTSIDE)



34 ILKA LN., MCCALL, ID 83638

DIRECTORY

PERMANENT PLAQUE OR DIRECTORY PROVIDING THE LOCATION OF THE
SERVICE DISCONNECTING MEANS AND THE PHOTOVOLTAIC SYSTEM.

(ALL PLAQUES AND SIGNAGE WILL BE INSTALLED AS OUTLINED WITHIN:
NEC 690.56(A)&(B), [NEC 705.10])

- ADHESIVE FASTENED SIGNS:
- THE LABEL SHALL BE SUITABLE FOR THE ENVIRONMENT WHERE IT IS INSTALLED.
 - WHERE REQUIRED ELSEWHERE IN THIS CODE, ALL FIELD APPLIED LABELS, WARNINGS, AND MARKINGS SHOULD COMPLY WITH ANSI Z535.4 [NEC 110.21(B) FIELD MARKING].
 - ADHESIVE FASTENED SIGNS MAY BE ACCEPTABLE IF PROPERLY ADHERED. VINYL SIGNS SHALL BE WEATHER RESISTANT [IFC 605.11.1.3]

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RESIDENCE

34 ILKA LN.,
MCCALL, ID 83638

SHEET NAME

PLACARDS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-8

REC ALPHA[®] PURE-RX SERIES

DATASHEET

SOLAR'S MOST TRUSTED



REC ALPHA[®] PURE-RX SERIES DATASHEET



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SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE

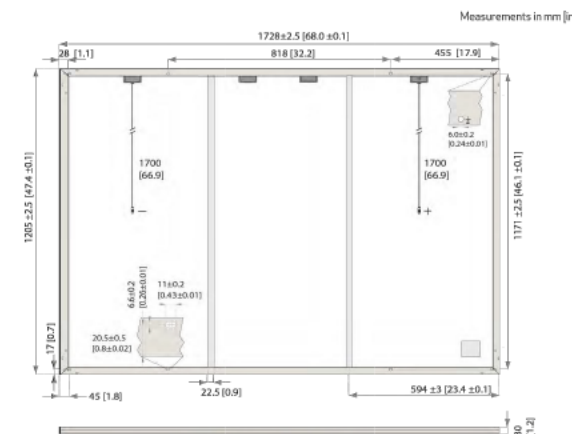
ANSI B
11" X 17"

SHEET NUMBER

PV-9

GENERAL DATA

Cell Type	88 half-cut bifacial REC heterojunction cells, with gapless technology
Glass	3.2 mm solar glass with anti-reflective surface treatment in accordance with EN12150
Backsheet	Highly resistant polymer (Black)
Frame	Anodized aluminum (Black)
Junction Box	4-part, 4 bypass diodes, IP68 rated, in accordance with IEC 62790:2020
Connectors	Stäubli MC4 PV-KBT4 (4 mm ²) in accordance with IEC 62852:2014, IP68 only when connected
Cable	4 mm ² solar cable, 1.70 m + 1.70 m in accordance with EN50618:2014
Dimensions	1728 x 1205 x 30 mm (2.08 m ²)
Weight	22.7 kg
Origin	Made in Singapore



ELECTRICAL DATA

PRODUCT CODE*: RECXXXXA PURE-RX

STC

Power Output - P _{MAX} (WP)	450	460	470
Watt Class Sorting - (W)	0/+10	0/+10	3/+10
Nominal Power Voltage - V _{MPP} (V)	54.3	54.9	55.4
Nominal Power Current - I _{MPP} (A)	8.29	8.38	8.49
Open Circuit Voltage - V _{OC} (V)	65.6	65.8	65.9
Short Circuit Current - I _{SC} (A)	8.81	8.88	8.95
Power Density (W/m ²)	216	221	226
Panel Efficiency (%)	21.6	22.1	22.6

NMOT

Power Output - P _{MAX} (W _p)	343	350	358
Nominal Power Voltage - V _{MPP} (V)	51.2	51.7	52.2
Nominal Power Current - I _{MPP} (A)	6.70	6.77	6.86
Open Circuit Voltage - V _{OC} (V)	61.8	62.0	62.1

Values at standard test conditions (STC: air mass AM 1.5, irradiance 1000 W/m², temperature 25°C), based on a production spread with a tolerance of P_{MAX} V_{OC} & I_{SC} ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM1.5, irradiance 800 W/m², temperature 20°C, windspeed 1 m/s). *Where xxx indicates the nominal power class (P_{MAX}) at STC above.

MODULE RATINGS

Module Operating Temperature [T98] [§]	70°C
Min. Environmental Temperature	-40°C
System Voltage	1000 V
Maximum Test Load (4 Point Mounting, Front) [¶]	+7000 Pa (714 Kg/m ²)
Maximum Test Load (4 Point Mounting, Rear) [¶]	-4000 Pa (408 Kg/m ²)
Maximum Test Load (6 Point Mounting, Front) ^{**}	+8000 Pa (816 Kg/m ²)
Maximum Test Load (6 Point Mounting, Rear) ^{**}	-6000 Pa (612 Kg/m ²)
Max Series Fuse Rating	25 A
Max Reverse Current	25 A

Design load = Test load / 1.5 (safety factor)

[§] 98th percentile operating temperature

[¶] IEC 61730/UL 61730 certified. Refer to installation manual.

^{**} Internal testing. Refer to installation manual.

TEMPERATURE RATINGS*

Nominal Module Operating Temperature	44 ± 2°C
Temperature coefficient of P _{MAX}	-0.24%/°C
Temperature coefficient of V _{OC}	-0.24%/°C
Temperature coefficient of I _{SC}	0.04%/°C

*The temperature coefficients stated are linear values

CERTIFICATIONS

ISO 14001; ISO 9001; IEC45001; IEC62941
IEC 61215:2021; IEC 61730:2023; UL 61730
ISO 11925-2 Ignitability (EN 13501-1 Class E)
IEC 62716 Ammonia Resistance
IEC 61701 Salt Mist (SM6)
IEC 61215:2016 Halstone (35 mm)
UL 61730 Fire Type 2



WARRANTY

	Standard	REC ProTrust
Installed by an REC	No	Yes
Certified Professional	No	Yes
System Size	All	<25 kW 25-500 kW
Product Warranty (yrs)	20	25 25
Power Warranty (yrs)	25	25 25
Labor Warranty (yrs)	0	25 10
Power in Year 1	98%	98% 98%
Annual Degradation	0.25%	0.25% 0.25%
Power in Year 25	92%	92% 92%

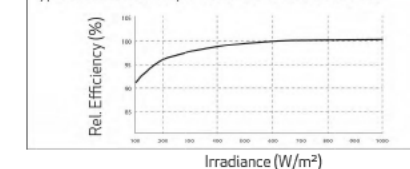
REC ProTrust Warranty applies only for i) REC panels installed by an REC Certified Solar Professional, and ii) panels have been registered by the installer with REC. Subject to System Size and further conditions. See www.recgroup.com for details.

DELIVERY INFORMATION

Panels per Pallet	33
Panels per 40 ft GP/high cube container	594 (18 Pallets)
Panels per 13.6 m truck	660 (20 Pallets)

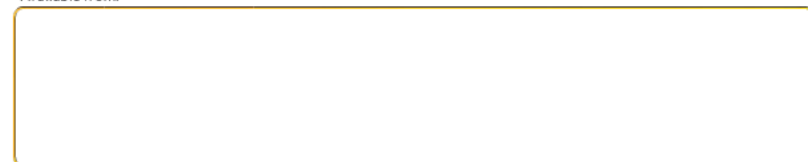
LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC:



REF: PM-DS-12-06-REV-4.3/IEC EN12 2024

Available from:



Founded in 1996, REC Group is an international pioneering solar energy company dedicated to empowering consumers with clean, affordable solar power. As Solar's Most Trusted, REC is committed to high quality, innovation, and a low carbon footprint in the solar materials and solar panels it manufactures. Headquartered in Norway with operational headquarters in Singapore, REC also has regional hubs in North America, Europe, and Asia-Pacific.

REC Solar PTE. LTD.
20 Tuas South Ave. 14
Singapore 637312
post@recgroup.com
www.recgroup.com



450 - 470W
HETEROJUNCTION
TECHNOLOGY

226 W/M² POWER DENSITY
>92% POWER IN YEAR 25
-0.24%/°C TEMPERATURE
COEFFICIENT OF P_{MAX}



9 A MODULE CURRENT
COMPATIBLE WITH MLPE

Powerwall 3

Power Everything

Powerwall 3 is a fully integrated solar and battery system, designed to accelerate the transition to sustainable energy. Customers can receive whole home backup, cost savings, and energy independence by producing and consuming their own energy while participating in grid services. Once installed, customers can manage their system using the Tesla App to customize system behavior to meet their energy goals.

Powerwall 3 achieves this by supporting up to 20 kW DC of solar and providing up to 11.5 kW AC of continuous power per unit. It has the ability to start heavy loads rated up to 185 LRA, meaning a single unit can support the power needs of most homes. Powerwall 3 Expansions make it easier and more affordable to scale up customers' systems to meet their current or future needs. Powerwall 3 is designed for fast and efficient installations, modular system expansion, and simple connection to any electrical service.



Powerwall 3 Technical Specifications

System Technical Specifications

Model Number	1707000-xx-y			
Nominal Grid Voltage (Input & Output)	120/240 VAC			
Grid Type	Split phase			
Frequency	60 Hz			
Nominal Battery Energy	13.5 kWh AC ¹			
Nominal Output Power (AC)	5.8 kW	7.6 kW	10 kW	11.5 kW
Maximum Apparent Power	5,800 VA	7,600 VA	10,000 VA	11,500 VA
Maximum Continuous Current	24 A	31.7 A	41.7 A	48 A
Overcurrent Protection Device ²	30 A	40 A	60 A	60 A
Configurable Maximum Continuous Discharge Power Off-Grid (PV Only, -20°C to 25°C)	15.4 kW ³			
Maximum Continuous Charge Current / Power (Powerwall 3 only)	20.8 A AC / 5 kW			
Maximum Continuous Charge Current / Power (Powerwall 3 with up to (3) Expansion units)	33.3 A AC / 8 kW			
Output Power Factor Rating	0 - 1 (Grid Code configurable)			
Maximum Output Fault Current (1 s)	160 A			
Maximum Short-Circuit Current Rating	10 kA			
Load Start Capability	185 LRA			
Solar to Battery to Home/Grid Efficiency	89% ¹⁴			
Solar to Home/Grid Efficiency	97.5% ⁵			
Power Scalability	Up to 4 Powerwall 3 units supported			
Energy Scalability	Up to 3 Expansion units (for a maximum total of 7 units)			
Supported Islanding Devices	Gateway 3, Backup Switch, Backup Gateway 2			
Connectivity	Wi-Fi (2.4 and 5 GHz), Ethernet, Cellular (LTE/4G ⁶)			
Hardware Interface	Dry contact relay, Rapid Shutdown (RSD) certified switch and 2-pin connector, RS-485 for meters			
AC Metering	Revenue Grade (+/- 0.5%, ANSI C12.20)			
Protections	Integrated arc fault circuit interrupter (AFCI), Isolation Monitor Interrupter (IMI), PV Rapid Shutdown (RSD) using Tesla Mid-Circuit Interrupters			
Customer Interface	Tesla Mobile App			
Warranty	10 years			

¹Values provided for 25°C (77°F), at beginning of life. 3.3 kW charge/discharge power.

²See [Powerwall 3 Installation Manual](#) for fuse requirements if using fuse for overcurrent protection.

³15.4kW off-grid maximum continuous discharge power is only available if on-grid rating is 11.5 kW. If enabled, Powerwall 3 must be installed with an 80 A breaker and appropriately sized conductors.

⁴Typical solar shifting use case.

⁵Tested using CEC weighted efficiency methodology.

⁶The customer is expected to provide internet connectivity for Powerwall 3; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.

REVOLUSUN
MOUNTAIN STATES

457 STEELHEAD WAY,
BOISE IDAHO 83704
LICENSE #: ECL 039193
PHONE # (208) 315-4082
EMAIL: rmsoperations@revolusun.com

REVISIONS		
DESCRIPTION	DATE	REV
CLIENT COMMENT	06/23/2026	A
DATE: 06/19/2026		

Signature with Seal

PROJECT NAME & ADDRESS

NOKES, BARBARA
RESIDENCE
34 ILKA LN.,
MCCALL, ID 83638

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-10

Powerwall 3 Technical Specifications

Solar Technical Specifications	Maximum Solar STC Input	20 kW
	Withstand Voltage	600 V DC
	PV DC Input Voltage Range	60 — 550 V DC
	PV DC MPPT Voltage Range	60 — 480 V DC
	MPPTs	6
	Maximum Current per MPPT (I _{mp})	15 A ^{7,8}
	Maximum Short Circuit Current per MPPT (I _{sc})	19 A ⁸

⁷ Only applicable to Powerwall 3 units with 15 A I_{MP} on the product label. Otherwise, Powerwall 3 has an I_{MP} of 13 A.
⁸ When PV strings are combined on the roof and the DC input current exceeds the MPPT rating, a jumper can be used to combine two MPPTs into a single input to intake DC current up to 30 A I_{MP} / 38 A I_{SC} (or 26 A I_{MP} / 30 A I_{SC} if Powerwall 3 is labeled with 13 A I_{MP} / 15 A I_{SC}).

Environmental Specifications	Operating Temperature	–20°C to 50°C (–4°F to 122°F) ⁹
	Operating Humidity (RH)	Up to 100%, condensing
	Storage Temperature	–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 Rating	NEMA 3R
	Ingress Rating	IP67 (Battery & Power Electronics) IP55 (Wiring Compartment)
	Pollution Rating	PD3
	Operating Noise @ 1 m	< 50 db(A) typical < 62 db(A) maximum

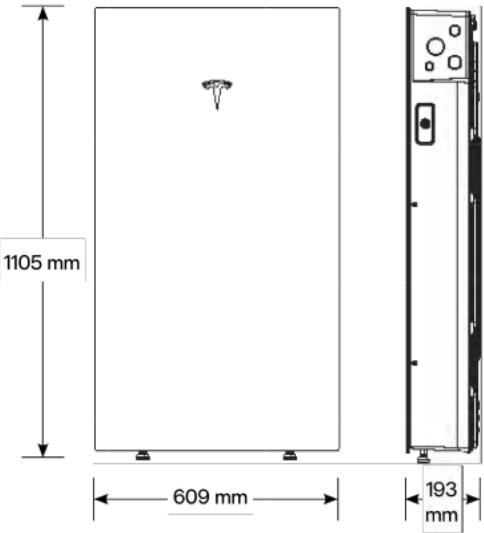
⁹ Performance may be de-rated at operating temperatures above 40°C (104°F).

Compliance Information	Certifications	UL 1741, UL 9540, UL 9540A, UL 3741, UL 1741 PCS, UL 1741 SA, UL 1741 SB, UL 1741 Multimode, UL 1973, UL 1699B, UL 1998, CSA C22.2 No. 0.8, CSA C22.2 No. 107.1, CSA C22.2 No. 330, CSA 22.3 No. 9, IEEE 1547, IEEE 1547A, IEEE 1547.1, CA Rule No.21
	Grid Connection	United States and Canada
	Emissions	FCC Part 15 Class B, ICES 003
	Environmental	RoHS Directive 2011/65/EU
	Seismic	AC156, IEEE 693-2005 (high)
	Fire Testing	Meets the unit level performance criteria of UL 9540A

Powerwall 3 Technical Specifications

Mechanical Specifications	Dimensions	1105 x 609 x 193 mm (43.5 x 24 x 7.6 in) ¹⁰
	Total Weight of Installed Unit	132 kg (291.2 lb)
	Weight of Powerwall 3	124 kg (272.5 lb)
	Weight of Glass Front Cover	6.5 kg (14.5 lb)
	Weight of Wall Bracket	1.9 kg (4.2 lb)
	Mounting Options	Floor or wall mount

¹⁰ These dimensions include the glass front cover being installed on Powerwall 3.



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PROJECT NAME & ADDRESS

NOKES, BARBARA
RESIDENCE
34 ILKA LN.,
MCCALL, ID 83638

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-11

Solar Shutdown Device Technical Specifications

The Solar Shutdown Device is a Mid-Circuit Interrupter (MCI) and is integral to the rapid shutdown (RSD) function required for rooftop PV systems in accordance with Article 690 of the NEC. When paired with Powerwall 3, solar array shutdown is initiated by an External System Shutdown Switch or the On/Off Enable switch located on Powerwall 3. Systems not subject to rapid shutdown requirements must still install one or more MCIs for functional purposes; see the Powerwall 3 installation manual for details.

Electrical Specifications

Model	MCI-1	MCI-2	MCI-2 High Current
Nominal Input DC Current Rating (I_{MP})	13 A	13 A	15 A
Maximum Input Short Circuit Current (I_{SC})	19 A	17 A	19 A
Maximum System Voltage	600 V DC	1000 V DC ¹⁵	1000 V DC ¹⁵
Maximum Disconnect Voltage ¹⁶	600 V DC	165 V DC	165 V DC

¹⁵ Maximum System Voltage is limited by Powerwall to 600 V DC.
¹⁶ Maximum Disconnect Voltage is the maximum voltage allowed across each MCI in the open position (Rapid Shutdown Initiated). An individual MCI-2 has a voltage rating of 165V but in combination (connected in the same string) their voltage ratings are additive.

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

Environmental Specifications

Operating Temperature	-40°C to 50°C (-40°F to 122°F)	-45°C to 70°C (-49°F to 158°F)
Storage Temperature	-30°C to 70°C (-22°F to 158°F)	-30°C to 70°C (-22°F to 158°F)
Enclosure Rating	NEMA 4X / IP65	

Mechanical Specifications

Electrical Connections	MC4 Connector	
Housing	Plastic	
Dimensions	125 x 150 x 22 mm (5 x 6 x 1 in)	173 x 45 x 22 mm (6.8 x 1.8 x 1 in)
Weight	350 g (0.77 lb)	120 g (0.26 lb)
Mounting Options	ZEP Home Run Clip M4 Screw (#10) M8 Bolt (5/16") Nail / Wood screw	Wire Clip

Compliance Information

Certifications	UL 1741 PVRSE, UL 3741, PVRSA (Photovoltaic Rapid Shutdown Array)
RSD Initiation Method	External System Shutdown Switch or Powerwall 3 Enable Switch

UL 3741 PV Hazard Control (and PVRSA) Compatibility See [UL 3741 Application Addendum](#)

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NOKES, BARBARA
RESIDENCE
34 ILKA LN.,
MCCALL, ID 83638

SHEET NAME EQUIPMENT SPECIFICATION
SHEET SIZE ANSI B 11" X 17"
SHEET NUMBER PV-12

Powerwall 3 Expansion Technical Specifications

Battery Technical Specifications

Model Number	1807000-xx-y
Nominal Battery Energy	13.5 kWh
Voltage Range	52 – 92 V DC ¹¹

¹¹ Powerwall 3 Expansion units are connected in parallel and are not field serviceable.

Environmental Specifications

Operating Temperature	–20°C to 50°C (–4°F to 122°F) ¹²
Operating Humidity (RH)	Up to 100%, condensing
Storage Temperature	–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 Rating	NEMA 3R
Ingress Rating	IP67
Pollution Rating	PD3

¹² Performance may be de-rated at operating temperatures above 40°C (104°F).

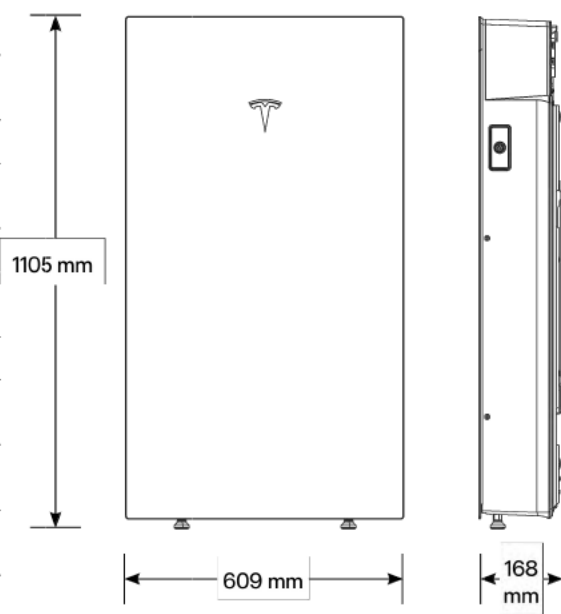
Compliance Information

Certifications	UL 1973, UL 9540
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Mechanical Specifications

Dimensions	1105 x 609 x 168 mm (43.5 x 24 x 6.6 in) ¹³
Total Weight of Wall-Mounted Expansion Unit	118.5 kg (261.2 lb)
Weight of Expansion Unit	110 kg (242.5 lb)
Weight of Glass Front Cover	6.5 kg (14.5 lb)
Weight of Wall Bracket	1.9 kg (4.2 lb)
Weight of Expansion Accessories	0.7 kg (1.5 lb)
Mounting Options	Floor or wall mount
Stacking Capability (Floor Mount Only)	Up to (3) Expansion units behind a Powerwall 3
Compatibility with Other Systems	Only compatible with Powerwall 3
Connection to Powerwall 3 or Expansions	Powerwall 3 Expansion harness ¹⁴

¹³ These dimensions include the glass front cover being installed on Powerwall 3 Expansion.
¹⁴ The Powerwall 3 Expansion harness is a listed component of the UL 9540 certification.



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RESIDENCE
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MCCALL, ID 83638

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-13

Gateway 3

Tesla Gateway 3 controls connection to the grid in a Powerwall system, automatically detecting outages and providing seamless transition to backup power. It provides energy monitoring that is used by Powerwall for solar self-consumption, time-based control, and backup operation.

Performance Specifications

Model Number	1841000-x1-y	AC Meter	+/- 0.5%
Nominal Grid Voltage	120/240 V AC	Communication	CAN
Grid Configuration	Split phase	User Interface	Tesla App
Grid Frequency	60 Hz	Backup Transition	Automatic disconnect for seamless backup
Continuous Current Rating	200 A	Overcurrent Protection Device	100–200 A Service entrance rated Eaton CSR, BWH, or BW, or Square D QOM breakers
Maximum Supply Short Circuit Current	22 kA with Square D or Eaton main breaker 25 kA with Eaton main breaker ¹⁷	Internal Panelboard	200 A 8-space/16 circuit breakers Eaton BR, Siemens QP, or Square D HOM breakers rated to 10–125A
IEC Protective Class	Class I	Warranty	10 years
Overvoltage Category	Category IV		
¹⁷ Only Eaton CSR or BWH main breakers are 25 kA rated.			

Environmental Specifications

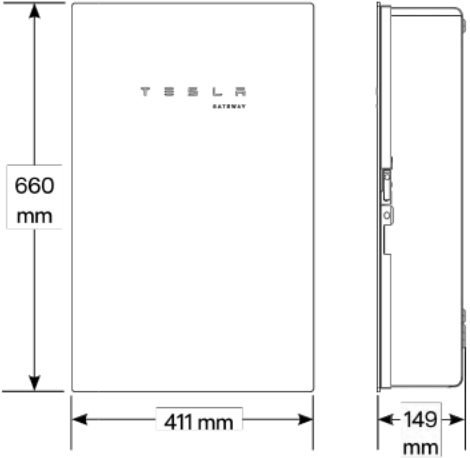
Operating Temperature	–20°C to 50°C (–4°F to 122°F)
Operating Humidity (RH)	Up to 100%, condensing
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R

Compliance Information

Certifications	UL 67, UL 869A, UL 916, UL 1741 PCS, CSA 22.2 107.1, CSA 22.2 29
Emissions	FCC Part 15, Class B, ICES 003

Mechanical Specifications

Dimensions	660 x 411 x 149 mm (26 x 16 x 6 in)
Weight	16.3 kg (36 lb)
Mounting options	Wall mount



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MCCALL, ID 83638

SHEET NAME
EQUIPMENT SPECIFICATION

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-14

POLE MOUNTS

EASY INSTALLATION, MAXIMUM VALUE



POLE MOUNT FEATURES:

TILT ADJUSTMENT

Pole Mounts offer a patented hand-crank adjustable tilt mechanism, making seasonal tilt changes a snap. Tilts from 5- 90 degrees while standing on the ground.

PATENTED HOISTING SYSTEM

Install racking and modules at ground level, then raise array to eye level for wiring, and finally to the top of the pole for completion. Chain hoist and lifting bracket required.

AVAILABLE SIZES

1-50 panel array configurations with modules 3, 4, or 5 high in landscape. Custom configurations available upon request.

RUGGED DESIGN

Built for high wind and high snow loads when necessary. Use our online calculator to determine pole size and frame duty suitable for your site.

ENGINEERING ASSISTANCE

Complimentary in-house design help and stamped drawings for all 50 states available upon request at additional cost.

DEALER / INSTALLER EDUCATION

Webinars and sales support available on request.

CUSTOMER SUPPORT

From purchase to installation, our products are guaranteed. Our team is standing by, ready to assist with any questions you have.

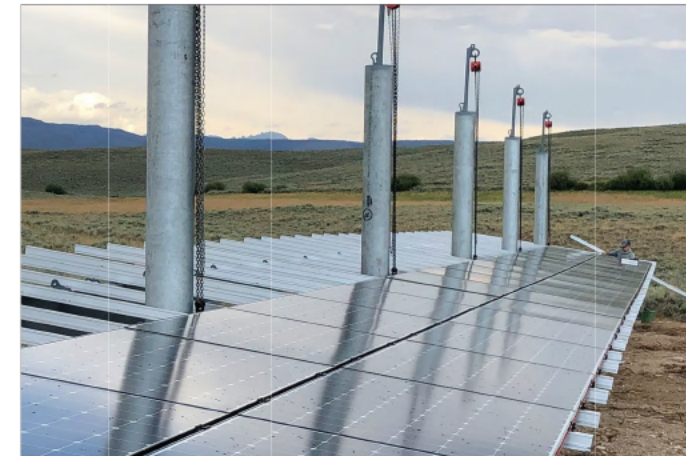
PRODUCT WARRANTY

10 years

MADE IN USA

Montana is not only the namesake of our company, it's where we build your mounts.

SINGLE POLE & MULTI-POLE ARRAYS



ARRAY CONFIGURATIONS (MODULES IN LANDSCAPE ORIENTATION)

#	WxH
1	1x1
2	1x2
3	1x3
4	2x2
6	2x3
8	2x4
9	3x3
10-TALL	2x5
12	3x4
15-TALL	3x5
16	4x4
20	5x4

#	WxH
20-TALL	4x5
24	5x4
28	7x4
30-TALL	5x5
32	8x4
35-TALL	7x5
36	9x4
40	10x4
40-TALL	8x5
44	11x4
45-TALL	9x5
48	12x4
50-TALL	10x5

TOP-2



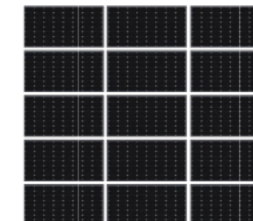
TOP-9



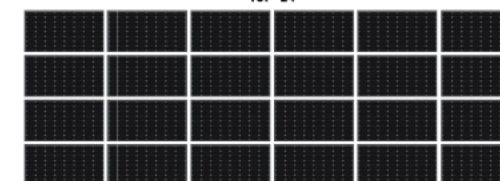
TOP-12



TOP-15 TALL



TOP-24



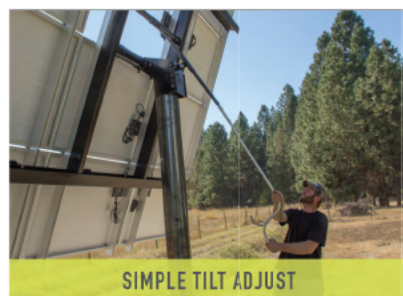
ASSEMBLE AT WAIST LEVEL



WIRE ON THE GROUND



EASY HOISTING - NO HEAVY EQUIPMENT



SIMPLE TILT ADJUST

MT Solar designs and manufactures mounting structures for solar modules and arrays of all sizes. We are dedicated to making the best Pole and Ground Mounts on the market. Our products ultimately promote speed and safety, improving your project's bottom line.

1-844-MT-SOLAR • MTSOLAR.US • P.O. BOX 190, CHARLO, MT 59824

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REVOLUSUN MOUNTAIN STATES

457 STEELHEAD WAY,
BOISE IDAHO 83704
LICENSE #: ECL 039193
PHONE # (208) 315-4082
EMAIL: rmsoperations@revolusun.com

REVISIONS

DESCRIPTION	DATE	REV
CLIENT COMMENT	06/23/2026	A

DATE: 06/19/2026

Signature with Seal

PROJECT NAME & ADDRESS

NOKES, BARBARA
RESIDENCE
34 ILKA LN.,
MCCALL, ID 83638

SHEET NAME EQUIPMENT SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-15

Project Details



Project Name: Nokes|Barbara 4x6 - V1|b

Location: 34 Ilka Ln, McCall, ID 83638, USA

Unique ID: 2P-17-6TOP-HD-57-L-4Hx6W-LIE3

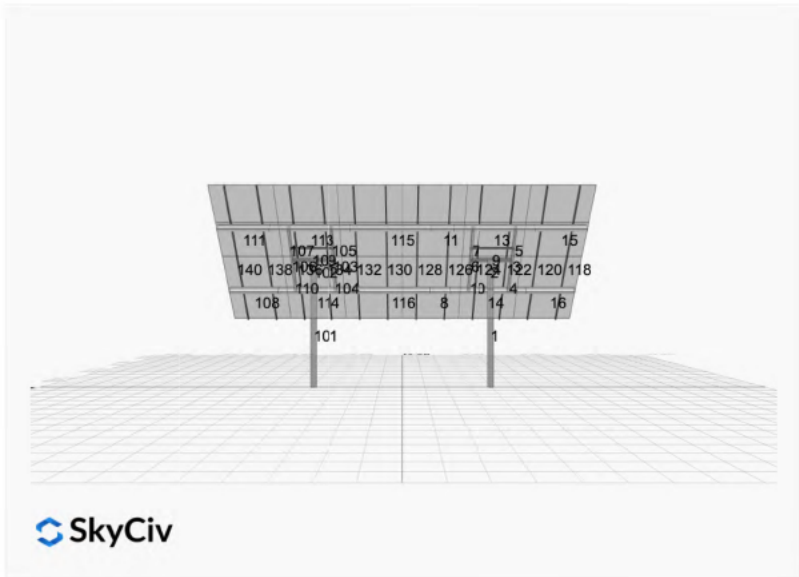
Dealer: _____

Date: Wed Jun 17 2026

Number of Modules: 24

Number of Poles: 2

Date Sold: _____



Array Dimensions N/S	15.97 ft
Array Dimensions E/W	34.50 ft
Winter Tilt Angle (Degrees)	50
Front Edge Clearance	6

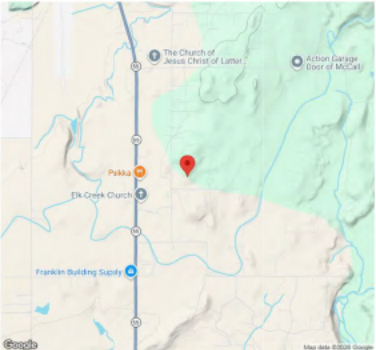
MT Solar Bill of Materials (2P-17-6TOP-HD-57-L-4Hx6W-LIE3)

Part	Short Description	BOM Qty
MTS-PC-6	6IN Pole Cap Assembly	2
MTS-HF-HD	H-Frame Assembly-HD	2
MTS-HD-Wing-57	57IN HD Wing	4
MTS-HD-Spice-57	57IN HD Spice	4
MTS-CLAMP-HOOK-4PK	Hook Clamp	6

Rail Bill of Materials

Part	Qty
Rails (196in Long)	12x
Rail Attachment	24x
Module Mid Clamp	36x
Module End Clamp	24x
Ground Lug	6x

Site Details:



Site Address: 34 Ilka Ln, McCall, ID 83638, USA

Array Specifications

Duty Classification:	HD
Module Width:	47.40 in
Module Length:	68.00 in
Number of Rows:	4
Number of Columns:	6
Total Number of Modules:	24
Winter Tilt Angle:	50
Front Edge Clearance:	6
Total Array Height at Tilt:	18.23 ft
Total Frame Length:	34.00 ft
Module Info/Notes:	REC460AA Pure RX
Array Dimensions N/S:	15.97 ft
Array Dimensions E/W:	34.50 ft
Rail Length:	196.00 in
Rail Spacing:	2.88 ft

Support Specifications

Pole Size:	6in Pipe Sch 40
Pole Length above Grade:	12.12 ft
Number of Poles:	2
Pole Spacing:	17 ft

Foundation Specifications

Foundation Type:	rectangular
Foundation Dimensions:	48x48 in
Foundation Depth (below grade):	6.0 ft
Foundation Volume:	96.00 ft ³

Site Info

Risk Category:	I
Exposure:	B
Soil Classification:	sand
Site Location:	34 Ilka Ln, McCall, ID 83638, USA
Wind Speed:	100 mph

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MCCALL, ID 83638

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-16



AUTHORIZATION TO MARK

This authorizes the application of the Certification Mark(s) shown below to the models described in the Product(s) Covered section when made in accordance with the conditions set forth in the Certification Agreement and Listing Report. This authorization also applies to multiple listee model(s) identified on the correlation page of the Listing Report.

This document is the property of Intertek Testing Services and is not transferable. The certification mark(s) may be applied only at the location of the Party Authorized To Apply Mark.

Applicant: Tesla, Inc.
Address: 3500 Deer Creek Rd.
Palo Alto CA 94304
Country: USA
Party Authorized To Apply Mark: Same as Manufacturer
Report Issuing Office: Intertek Testing Services NA, Inc., Cortland, NY
Control Number: 5005998

Manufacturer: Tesla, Inc.
Address: 550 Milan Drive
Sparks NV 89437
Country: USA
Authorized by: *Charden Janboe*
for L. Matthew Snyder, Certification Manager



This document supersedes all previous Authorizations to Mark for the noted Report Number.

This Authorization to Mark is for the exclusive use of Intertek's Client and is provided pursuant to the Certification agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Authorization to Mark. Only the Client is authorized to permit copying or distribution of this Authorization to Mark and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the agreement and in this Authorization to Mark. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessments and Follow up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the agreement, they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

Intertek Testing Services NA Inc.
545 East Algonquin Road, Arlington Heights, IL 60005
Telephone 800-345-3851 or 847-439-5667 Fax 312-283-1672

Standard(s):	Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources [UL 1741:2021 Ed.3]
	Grid Support Utility Interactive Equipment - Supplement SA to UL 1741:2021 Ed.3 - Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources [UL 1741:2021 Ed.3 (Supplement SA)]
	Grid Support Utility Interactive Inverters and Converters Based Upon IEEE 1547:2018 & IEEE 1547.1:2020 - Supplement SB to UL 1741:2021 Ed.3 - Inverters, Converters, Controllers and Interconnection System Equipment for use with Distributed Energy Resources [UL 1741:2021 Ed.3 (Supplement SB)]
	Energy Storage Systems and Equipment [ANSI/CAN/UL 9540:2023 Ed.3]
	Photovoltaic (PV) DC Arc-Fault Circuit Protection [UL 1699B:2018 Ed.1+R:18May2021]
	Batteries for Use in Stationary and Motive Auxiliary Power Applications [ANSI/CAN/UL 1973:2022 Ed.3]
	Power Conversion Equipment [CSA C22.2#107.1:2016 Ed.4+U1]
	Dc Arc Fault Protection for Photovoltaic Applications [CSA C22.2#292:2018 Ed.1]
	Interconnection of Distributed Energy Resources and Electricity Supply Systems [CSA C22.3#9:2020 Ed.2]
	Photovoltaic Rapid Shutdown Systems [CSA C22.2#330:2023 Ed.2]



AUTHORIZATION TO MARK

Product:	Energy Storage System Grid Support Utility Interactive & Standalone Inverter
Brand Name:	Tesla
Models:	1707000 - followed by two numbers; followed by -; followed by one letter.

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SHEET NAME
EQUIPMENT SPECIFICATION
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ANSI B 11" X 17"
SHEET NUMBER
PV-17