December 3, 2025

Anne Arundel County, Office of Planning and Zoning
2664 Riva Road, 3rd Floor
Annapolis, MD 21401

RE: WHITEHALL MANOR ~ LOT 39R
621 Canal Lane, Annapolis, MD 21409
Variance Application

Sir/Madam:

Attached is a variance request application and associated submittal documents for the above referenced property. To allow solar panels to be constructed as an accessory use, a variance to the Anne Arundel County Code is required. The requested variances to the Code are a Critical Area variance to **Article 17, Section 8-702(b)** for the location of a new structure in the Buffer Modification Area, and a Zoning variance to **Article 18, Section 4-601** for the location of an accessory structure within the 40-foot front yard setback.

The subject property is a legal buildable lot located in the community of Whitehall Manor in Annapolis, Maryland. The property is currently improved with a single-family dwelling and associated improvements. The lot is zoned R2 and is served by a private well and public sewer, by use of a private grinder pump. The property is located entirely within the Chesapeake Bay Critical Area with an LDA land use designation. The property is mapped entirely within a Buffer Modification Area. There are no steep slopes located on site. Primary vegetation consists of numerous mature hardwood trees and lawn area.

The applicant proposes to construct two solar panels for the purpose of providing power to the existing dwelling. Accessory solar generating facilities are a permitted use in the R2 zone. Due to the existing environmental features on site and the architecture of the roof of the existing dwelling, the following variances to the Anne Arundel County Code is being requested: **Article 17, Section 8-702(b)** to place new lot coverage closer to the shoreline than the closest façade of the existing principal structure; **Article 18, Section 4-601** to place a structure within the 40-foot front yard setback for accessory structures. A 32.7-foot variance is required.

The need for the requested variance arises from the existing natural features as well as the architecture of the existing structure. It would not be possible to develop the property with solar energy generating facilities without the requested variances. Locating the solar panels in the rear yard would not be possible due to setbacks to the water and sewer facilities which serve the existing dwelling. The solar panels cannot be located on the roof because the flatness of the roof would require the solar panels to be raised; this would not be consistent with the existing patterns of residential development in the neighborhood. It would also require clearing a section of the

existing canopy to make room for the raised panels. In addition, the roof has not been structurally designed to support the racking system that would be required to install the panels in this location. The solar panels cannot be located in the lawn area to the west of their proposed location, as this would block access to the existing pier. The proposed location is the only location that meets the Critical Area variance criteria.

Additional information and analysis regarding the solar panel location from the perspective of solar energy generated is included as a separate document with this variance filing. The property owner performed this analysis to justify the solar panel locations considering environmental concerns and ensuring that the placement of the panels would not be harmful to neighboring properties. Please refer to the supplemental document titled "Solar Panel Performance Review" for additional information.

Lot coverage for the proposed solar panels has been calculated as the area of the panel bases, which are detailed on the solar panel construction specifications included with this submittal. 18 square feet of additional lot coverage are proposed. The areas underneath the solar panels outside of the bases will remain as vegetated lawn. The additional 18 square feet leaves the site significantly under the allowable lot coverage per Critical Area law.

All work to install the solar panels will be performed by the property owner with the use of very light equipment. There will be no heavy machinery used; the electrical connection from the panels to the house will be hand-trenched. Disturbance has been minimized by ensuring that construction access does not need to be maintained from the road or driveway. The property owner proposes to construct the panels in this manner in order to minimize disturbance to the existing environmental features, including trees, shoreline, and buffer modification area. Grading, clearing, and grubbing are not proposed as a part of the solar panel installation.

The existing water and sewer connections to the dwelling will not need to be modified to accommodate the solar installation. Because disturbance will be kept below 5,000 square feet, addressing stormwater management through MDE's ESD program will not be required. However, the property owner will monitor the runoff from the solar panels and will adjust the ground cover accordingly, installing level spreaders as necessary to prevent erosion. Mitigation plantings will be provided at permit phase to mitigate for disturbance to the buffer modification area, in accordance with the Code.

Denial of the requested variance would constitute an unwarranted hardship and deny the applicant's rights commonly enjoyed by other property owners. The variance request is not based on actions by the applicant and would not confer upon the applicant any special privilege that would typically be denied by COMAR or the local Critical Area Program. The development will not have an adverse effect on water quality or negatively impact fish, wildlife, or plant habitat, and is in conformance with the general purpose and intent of the Critical Area Program. The variance is the minimum necessary to afford relief from the Critical Area legislation. The granting of the variance will not alter the character of the neighborhood, impair the use and

development of adjacent properties, reduce forest cover in the LDA, nor be detrimental to the public welfare.

We believe that these requests meet all the requirements for variance, per Article 18-16-305:

Requirements for Critical Area Variances.

1. Unique physical conditions – Specifically, the existing dwelling and canopy areas. Denial of the requested variance would constitute an unwarranted hardship as it would be impossible develop solar energy generating facilities as an accessory use without locating the solar panels within the Buffer Modification Area, as discussed above.
2. Rights commonly enjoyed – All residentially-zoned properties in Anne Arundel County enjoy the right to install solar panels as an accessory use. To deny the requested variance would deprive the applicant of rights commonly enjoyed by other properties due to its proximity to the shoreline.
3. Will not confer special privilege - Granting this variance would not confer a special privilege to the applicant. Nearby properties also have the opportunity to develop solar as an accessory use. Generating renewable energy in accordance with Maryland's renewable energy goals is not a special privilege for a property owner.
4. Not based on conditions or circumstances that are the result of actions by the applicant – The existing environmental conditions and the property's location within a buffer modification area are not the result of actions by the applicant.
5. Will not adversely affect water quality or adversely impact fish, wildlife, or plant habitat within the County's critical area – The proposed development will not cause adverse impacts to fish, wildlife, or water quality in the Critical Area. Disturbance is minimized only to what is necessary to complete the project. Mitigation will occur in accordance with county regulations and will be addressed during the permitting process. Sediment and erosion controls will be utilized to ensure that construction will not adversely affect the surrounding environmental features located within the Critical Area. These precautions will ensure that water quality, fish, wildlife, and plant habitat will not be adversely affected.
6. Applies to development within the 100-foot buffer and bog areas and is not applicable to this application.
7. The applicant has overcome the presumption contained in COMAR §8-1808. Environmental impacts will be minimized. Access for heavy machinery is not required and there is no clearing or grading associated with the solar panel installation. Permanent disturbance to the buffer modification area is minimal, with only 18 square feet of impervious lot coverage being created with the majority of the existing vegetated lawn being retained. Also, plantings will be added during the building permit process to provide mitigation as needed.
8. The applicant has evaluated site planning alternatives and submitted a pre-file plan to County staff for review.

Requirements for all variances.

1. Minimum necessary - The improvements are modest and are sited minimize disturbance.
2. The granting of the variance will not:
   i. alter the essential character of the neighborhood, and all proposed development will be harmonious with other properties of the surrounding area.
   ii. substantially impair the appropriate use or development of adjacent properties.
   iii. reduce forest cover in the LDA as no clearing is proposed.
   iv. be contrary to acceptable clearing or replanting practices required for development of the Critical Area or Bog Protection Area.
   v. be detrimental to the public welfare.

Pre-file comments were received from the Office of Planning & Zoning in a memo dated November 12, 2025. A point-by-point response to those comments (*in italics*) is provided below:

Critical Area Team

The tree line shown on the plan does not accurately depict the tree line that exists on the site.

- *The full extent of the existing tree canopy areas is now reflected on the site plan.*

The existing trees in this area appear to shade the proposed location of the solar panels.

- *While part of the existing canopy of the 27" hardwood tree is located above the solar panels, the existing canopy is located high above the ground, such that sunlight still angles onto the solar panels without hitting the tree canopy.*

Any clearing must be shown on the plan.

- *No areas of canopy are proposed to be cleared. Some understory branches may be trimmed in order to ensure that the solar panels receive the maximum amount of sunlight. However, this will not affect the overall canopy area of the tree or its health. All construction for the solar panels and the electrical connection to the dwelling will be performed by hand, with no clearing, grubbing, or grading.*

Given the requirements for air, light, and view on waterfront lots, construction drawings/spec should be included for review.

- *Construction specifications have been included with this variance filing. The height and location of the solar panels does not affect the air, light, or view of any neighboring property.*

Zoning Administration Section

The dimensions and height of the proposed accessory structures must be shown on the site plan.

- *Dimensions and maximum height at maximum tilt for the solar panels are now shown on the site plan.*

While solar energy is generally supported by the County, the proposed structures are located very close to the shoreline. The need sufficient to justify a variance must be substantial and urgent and not merely for the convenience of an application. As such, the applicant should provide greater detail about why alternative locations (including roof-mounted panels) are not

feasible and how the locations for these two structures represent the minimum variance necessary to afford relief.

- *A detailed analysis and justification for the solar panel locations prepared by the property owner is included in this variance filing. Please see above and the supplemental documentation.*

The applicant is advised that, in order for the proposed Critical Area variance to be approved, the applicant must demonstrate and the Hearing Officer must find that the proposal complies with each and every one of the Critical Area variance standards provided under Section 18-16-305(b) and (c) of the Zoning Code.

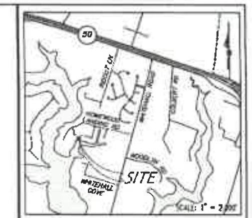
- *The referenced requirements, and how this request meets those requirements, are detailed above.*

In summary, the proposed development meets all criteria required for the Administrative Hearing Officer to grant this variance request. The proposed development represents the minimum disturbance necessary to allow the applicant to develop their property with solar energy generating facilities. We respectfully request that Anne Arundel County Planning & Zoning staff and the Critical Area Commission support this application. Please contact us if you require additional information to complete your review of this variance request.

Sincerely,

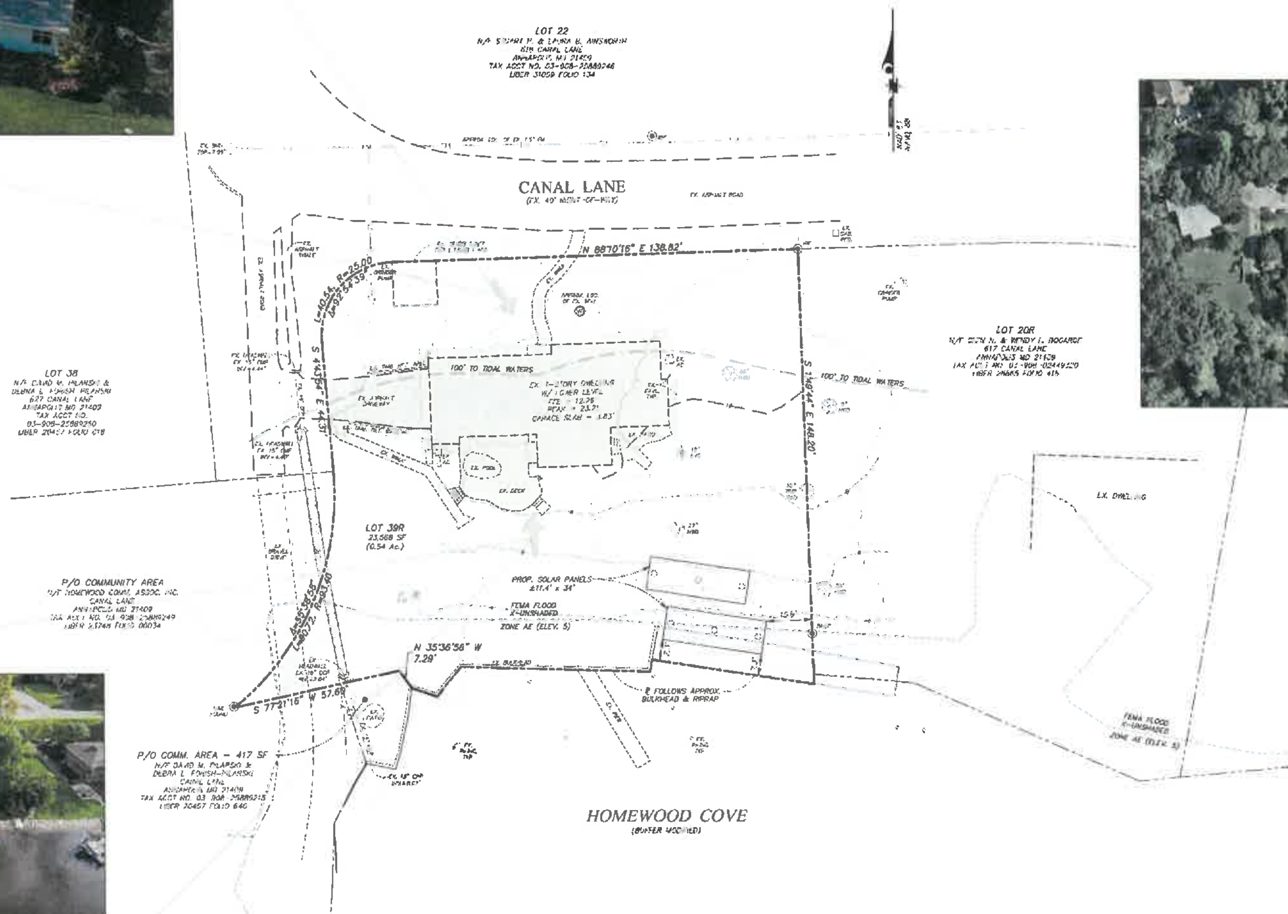
DRUM, LOYKA & ASSOCIATES, LLC

Andrew Price, EIT
Project Engineer



VICINITY MAP

SUBJECT PROPERTY



LEGEND

- Existing Contour
- Existing Woods Line
- Existing Power Pole
- Existing Overhead Electric Line
- Existing Sewer Line
- Existing Spot Elev.
- Existing Well
- 100' to Tidal Waters
- Existing Improvements

SITE TABULATIONS

- Total Site Area: 23,568 S.F. (0.54 Ac.)
- Critical Area Designation: LDA
- Site Zoning: R-2
  - Accessory Structure Setbacks
    - -Front: 40'
    - -Rear: 7'
    - -Side: 7'
    - -Corner Side: 50'
- Lot Coverage:
  - -Existing Lot Coverage: 4,563 S.F. (0.10 Ac.)
  - -Allowable Lot Coverage: 5,446 S.F. (0.13 Ac.)
  - -Proposed Lot Coverage: 4,581 S.F. (0.10 Ac.)

DESIGNED: MMD DRAWN: KLY
ORIG. DATE: 08-28-2025
MODIFIED BY/DATE:
CADD DWG #: WK11825
DLA PROJECT #: WK11825

REVISIONS TO APPROVED PLANS

No.	DATE	BY	DESCRIPTION

Drum, Loyka & Associates, LLC
CIVIL ENGINEERS - LAND SURVEYORS
1410 Forest Drive, Suite 35
Annapolis, Maryland 21403
Phone: 410-280-3122
www.drumloyka.com

OWNER:
JOHN KEITH DONALD
621 CANAL LANE
ANNAPOLIS, MARYLAND 21409

VARIANCE PLAN
WHITEHALL MANOR ~ LOT 39R
621 CANAL LANE, ANNAPOLIS MD 21409
TAX ACCT. NO. 03-908-21353700
TAX MAP 0046 GRID 0006 PARCEL 0273 DISTRICT 3RD
ANNE ARUNDEL COUNTY, MARYLAND

SCALE: 1"=20' | DATE: NOV. 25, 2025 | PROJ. NO: WK11825 | SHEET 1 OF 1

CRITICAL AREA COMMISSION
FOR THE CHESAPEAKE AND ATLANTIC COASTAL BAYS
1804 WEST STREET, SUITE 100
ANNAPOLIS, MD 21401

PROJECT NOTIFICATION APPLICATION

GENERAL PROJECT INFORMATION

Jurisdiction: _____ Date _____

Tax Map #	Parcel #	Block #	Lot #	Section
0046	0273	0006	39R	

FOR RESUBMITTAL ONLY
- Corrections
- Redesign
- No Change
- Non-Critical Area

* Complete only Page 1 General Project Information

Tax ID: 03-908-21353700

Project Name (site name, subdivision name, or other): Whitehall Manor ~ Lot 39R

Project location/Address: 621 Canal Lane

City: Annapolis Zip: 21409

Local case number:

Applicant: Last name: Donald First name: Keith

Company:

Application Type (check all that apply):

Building Permit		Variance	X
Buffer Management Plan		Rezoning	
Conditional Use		Site Plan	
Consistency Report		Special Exception	
Disturbance > 5,000 sq ft		Subdivision	
Grading Permit		Other	

Local Jurisdiction Contact Information:

Last name: _____ First name _____

Phone # _____ Response from Commission Required By _____

Fax # _____ Hearing date _____

SPECIFIC PROJECT INFORMATION

Describe Proposed use of project site:

Construct two solar panels to provide solar energy to existing single-family dwelling.

	Yes		Yes
Intra-Family Transfer		Growth Allocation	
Grandfathered Lot	X	Buffer Exemption Area	X

Project Type (check all that apply)

Commercial		Recreational	
Consistency Report		Redevelopment	
Industrial		Residential	X
Institutional		Shore Erosion Control	
Mixed Use		Water-Dependent Facility	
Other			

SITE INVENTORY (Enter acres or square feet)

	Acres	Sq Ft
IDA Area		
LDA Area	0.54	
RCA Area		
Total Area	0.54	

	Acres	Sq Ft
Total Disturbed Area	0.10	
# of Lots Created	0	

	Acres	Sq Ft		Acres	Sq Ft
Existing Forest/Woodland/Trees	0.30		Existing Impervious Surface	0.10	
Created Forest/Woodland/Trees	0.00		New Impervious Surface	0.00	18
Removed Forest/Woodland/Trees	0.00		Removed Impervious Surface	0.00	
			Total Impervious Surface	0.10	

VARIANCE INFORMATION (Check all that apply)

	Acres	Sq Ft		Acres	Sq Ft
Buffer Disturbance			Buffer Forest Clearing		
Non-Buffer Disturbance	0.10		Mitigation		

Variance Type		Structure	
Buffer		Acc. Structure Addition	
Forest Clearing		Barn	
HPA Impact		Deck	
Impervious Surface	X	Dwelling	
Expanded Buffer		Dwelling Addition	
Nontidal Wetlands		Garage	
Steep Slopes		Gazebo	
Setback		Patio	
Other		Pool	
		Shed	
		Other	X Solar Panels

Chesapeake Bay Critical Area Report
Whitehall Manor ~ Lot 39R
Tax Map 46, Grid 6, Parcel 273
Tax Account No. 03-908-21353700

Property Address: 621 Canal Lane
Annapolis, MD 21409

December 2025

Property Owners & Variance Applicant: Keith Donald

Critical Area Designation: LDA **Zoning:** R2 **Lot Area:** 0.54 Ac.

Site Description
The subject property is a legal building lot located in the community of Whitehall Manor in Annapolis. The property is currently improved with a single-family dwelling and associated improvements. The lot is zoned R2 and is served by a private well and a private grinder pump connecting to public sewer. The property is located entirely within the Chesapeake Bay Critical Area with an LDA land use designation. Primary vegetation consists of multiple hardwood trees and lawn area.

Description and Purpose of Variance Request
The applicant proposes to construct two solar panels for the purpose of providing power to the existing dwelling.

To allow solar panels to be constructed as an accessory use, a variance to the Anne Arundel County Code is required. The requested variances to the Code are a Critical Area variance to **Article 17, Section 8-702(b)** for the location of a new structure in the Buffer Modification Area, and a Zoning variance to **Article 18, Section 4-601** for the location of an accessory structure within the 40-foot front yard setback.

Vegetative Coverage and Clearing
The property's primary vegetation is lawn area with multiple hardwood trees. Any mitigation planting requirements will be addressed during the permit phase of this project.

Impervious Lot Coverage
The site currently has 4,563-sf of lot coverage. The proposed impervious lot coverage for this property is 4,581-sf, which is below the allowable coverage of 5,445-sf.

Drainage and Rainwater Control
No stormwater management currently exists on site. As the limit of disturbance is less than 5,000-sf, stormwater management is not required for this development.

Conclusions – Variance Standards

The need for the requested variance arises from the existing natural features as well as the architecture of the existing structure. It would not be possible to develop the property with solar energy generating facilities without the requested variances. Locating the solar panels in the rear yard would not be possible due to setbacks to the water and sewer facilities which serve the existing dwelling. The solar panels cannot be located on the roof because the flatness of the roof would require the solar panels to be raised; this would not be consistent with the existing patterns of residential development in the neighborhood. It would also require clearing a section of the existing canopy to make room for the raised panels. In addition, the roof has not been structurally designed to support the racking system that would be required to install the panels in this location. The solar panels cannot be located in the lawn area to the west of their proposed location, as this would block access to the existing pier. The proposed location is the only location that meets the Critical Area variance criteria.

Denial of the requested variance would constitute an unwarranted hardship and deny the applicant's rights commonly enjoyed by other property owners. The variance request is not based on actions by the applicant and would not confer upon the applicant any special privilege that would typically be denied by COMAR or the local Critical Area Program. The development will not have an adverse effect on water quality or negatively impact fish, wildlife, or plant habitat, and is in conformance with the general purpose and intent of the Critical Area Program. The variance is the minimum necessary to afford relief from the Critical Area legislation. The granting of the variance will not alter the character of the neighborhood, impair the use and development of adjacent properties, reduce forest cover in the LDA, nor be detrimental to the public welfare.

Reference:

ADC: The Map People, 2002 Anne Arundel County, Maryland, Street Map Book

Anne Arundel County Office of Planning & Zoning, 2007 Critical Area Map

Anne Arundel County Office of Planning & Zoning, 2007 Buffer Exemption Map

Anne Arundel County, Maryland; Chesapeake Bay Critical Area Mapping Program, 2007, Critical Area Map

Federal Emergency Management Agency, 2015. Flood Insurance Rate Map

First American Real Estate Solutions, 2002, Realty Atlas: Anne Arundel County Maryland

Drum, Loyka and Associates LLC, 2024 Variance Plan

U.S. Department of Agriculture, Natural Resource Conservation Service –2003 Soil Survey of Anne Arundel County Maryland.

State Highway Administration of Maryland, 1989. Generalized Comprehensive Zoning Map: Third Assessment District

Anne Arundel County Engineering Record Drawing and Monuments

12/3/2025, 12:48:31 PM

Parcels

Intermediate

County Boundary

Topo_2023

Local Road Label

Index

1:2,092

0 75 150 300 ft

0 20 40 80 m

♥°P6√↑:

SDE

LISTED

MADE IN USA

SKY-RACK 2.0 Ground Mount
Season Adjustable System

INSTALLATION GUIDE

For more information contact: kyle@sinclair-designs.net
Sinclair Design and Engineering 1104 Industrial Avenue, Albion, Michigan, 49224 USA
Tel: (01) 877.517.0311
www.sinclair-designs.com

PRODUCT SPEC SHEET

SDE

Fixed Tilt System or Season Adjustable - Module Clamp Kits or Direct to Frame

FIXED TILT ANGLES	FIXED TILT - 20, 25, 30, 35 DEGREES	TERRAIN	+/- 5DEG E/W
SEASON ADJUST ANGLES	15 - 60 DEGREES	WIRE MANAGEMENT	OPTIONAL POLY U-GUARD
MODULE ORIENTATION	TWO HIGH PORTRAIT	WARRANTY	20-25 YEARS
WIND LOAD	125 MPH	MATERIAL	GRADE 50-60 HSLA STEEL
SNOW LOAD	60 PSF	COATING	GALVANIZED W/CHEM TREAT
GROUND CLEARANCE	24 - 36 IN STANDARD	MANUFACTURING INFO	MADE IN THE USA
MODULE CLAMPS	SDE CLAMP KITS	STRUCTURAL CERTIFICATIONS	UL 2703 LISTED
OR DIRECT TO RAME	OPTIONAL	QUALITY CERTIFICATION	ISO-9001 2015

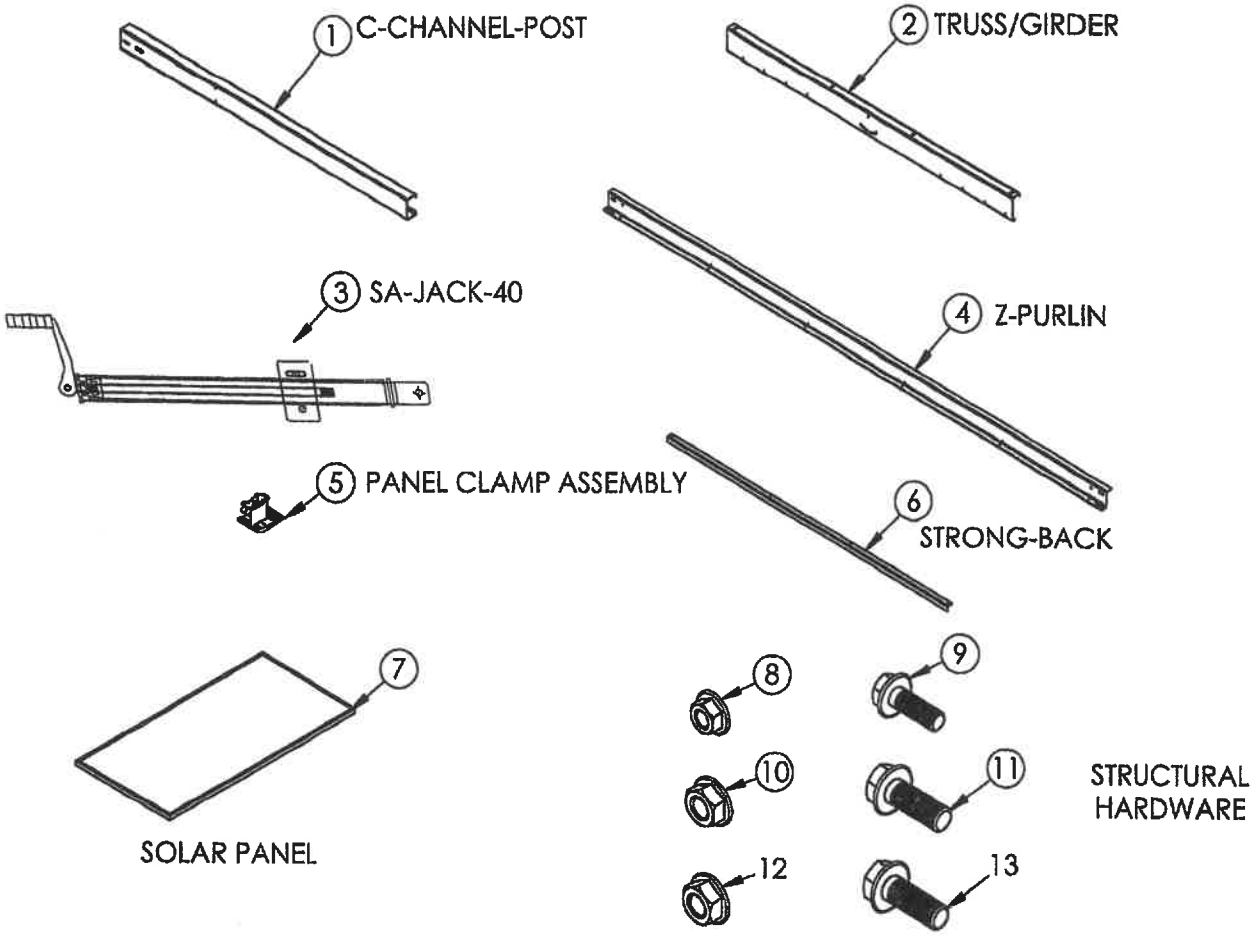
QUALITY ASSURED · ISO 9001:2015 CERTIFIED

UL® LISTED

PREMIUM QUALITY · MADE IN USA · GUARANTEED

STATE OF MICHIGAN · LICENSED PROFESSIONAL ENGINEER

CLAMP DESIGN: Included Parts List

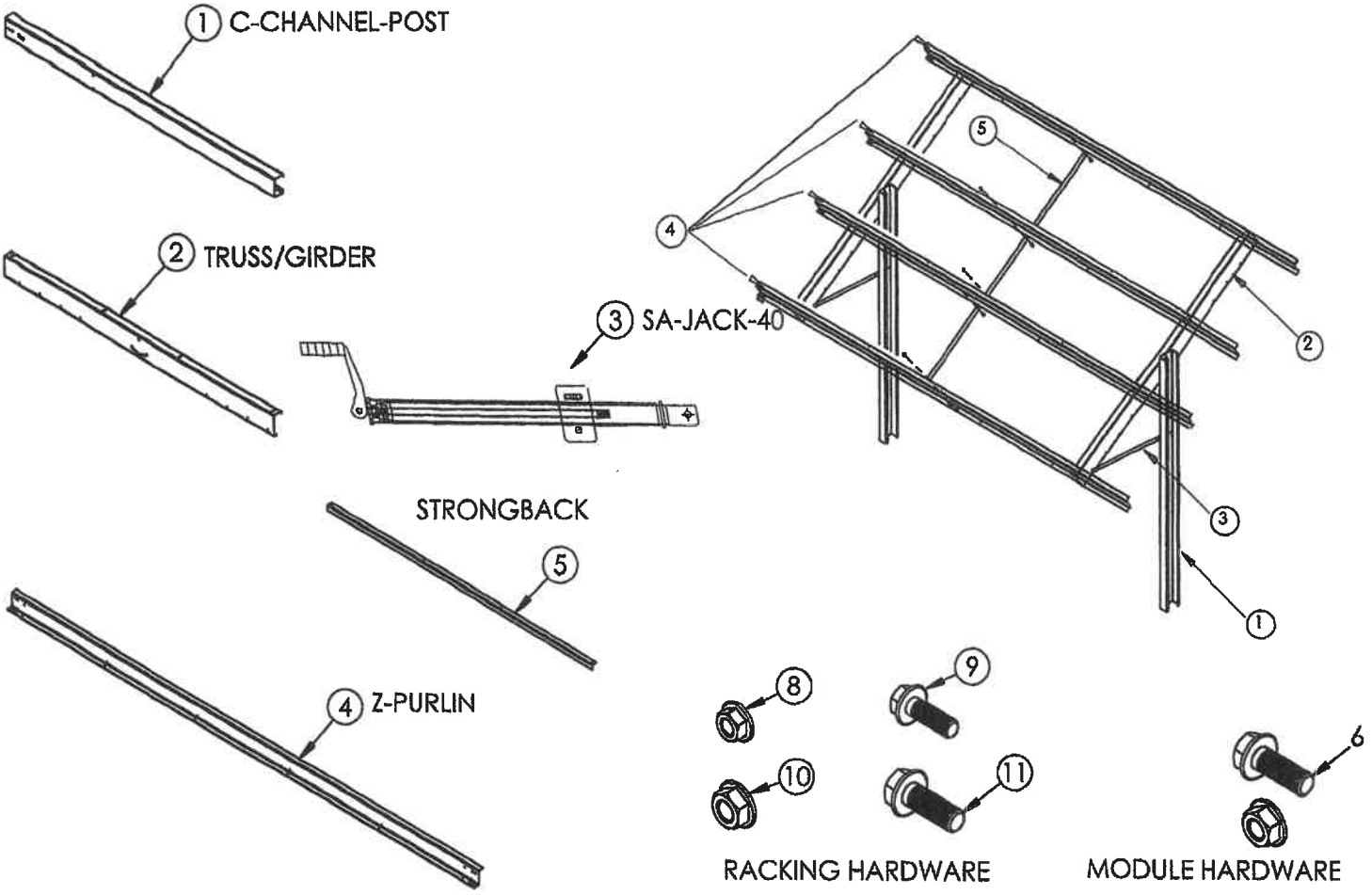


ITEM NO.		QTY
1	C-CHANNEL-POST	2
2	TRUSS/GIRDER	2
3	SA-JACK-40	2
4	Z-PURLIN	4
5	PANEL CLAMP ASSEMBLY	20
6	STRONG-BACK	1
7	PV MODULE	10
8	1/2-13 FLANGE HEAD NUT	14
9	1/2-13 X 1.5 FLANGE HEAD BOLT	14
10	5/8-11 FLANGE HEAD NUT	4
11	5/8-11 X 1.75 FLANGE HEAD BOLT	4

ITEM NO.	Recommended Installation Tools: 1/4 or 1/2 1500 in/lb MIN Impact Driver 1/2 - 3/4 - 15/16 in Impact Sockets (Always take extra batteries)	QTY
5	**TORQUE SPEC =10 ft/lbs**	20
Over Torque of Clamps Could Result in Module Damage		
9	**TORQUE SPEC =57 ft/lbs**	14
11	**TORQUE SPEC = 112 ft/lbs**	2

Note: Z-PURLIN 49.5 East & West Cantilevers are available - See Design Requirements & Bill of Materials

DIRECT TO FRAME DESIGN:
Included Parts List



RACKING HARDWARE MODULE HARDWARE

ITEM NO.	DESCRIPTION	QTY
1	C-CHANNEL-POST	2
2	TRUSS/GIRDER	2
3	SA-JACK-40	2
4	Z-PURLIN	4
5	STRONG-BACK	1
6	1/4-20 SERRATED FLANGED BOLT/NUT	40
7	PV MODULE	10
8	1/2-13 FLANGE HEAD NUT	14
9	1/2-13 X 1.5 FLANGE HEAD BOLT	14
10	5/8-11 FLANGE HEAD NUT	4
11	5/8-11 X 1.75 FLANGE HEAD BOLT	4

TORQUE	Recommended Installation Tools: 1/4 or 1/2 1500 in/lb MIN Impact Driver 1/2 - 3/4 - 15/16 in Impact Sockets (Always take extra batteries)	
6	**TORQUE SPEC =6 ft/lbs**	40
9	**TORQUE SPEC =57 ft/lbs**	14
11	**TORQUE SPEC = 112 ft/lbs**	4

Note: Z-PURLIN 48.5 East & West Cantilevers are available - See Design Requirements & Bill of Materials

Safety Information

IMPORTANT

It is highly recommended that system installation and any subsequent modifications, disassembly, or reassembly be conducted by a factory authorized representative. Contact SDE for additional information.

CAUTION: WATCH FOR WIRES!

Extreme caution should be taken when installing near power lines. For your own personal protection, the following safety steps should be taken:

- Perform as many functions as possible on the ground.
- Watch out for overhead power lines. Check the distance to the power lines before starting installation.
- Recommended minimum distance of 6 meters (20 feet) from all power lines.
- Do not use metal ladders.
- Do not install assembly on a windy day.
- If assembly slips, move away from it and let if fall.
- If any part of the assembly comes in contact with a power line, call your local power company. DO NOT TRY TO REMOVE IT YOURSELF! They will remove it safely.
- Make sure that the assembly is properly grounded.

WARNING

Assembling on windy days can be dangerous. Additional precautions should be taken when assembling in high wind areas. The modules surface, even in slight winds, create strong forces. Be prepared to safely handle these forces at unexpected moments. Do not attempt to assemble, move or mount assembly on windy days or serious, even fatal accidents may occur.
SDE is not responsible or liable for damage or injury resulting from antenna installations.

WARNING

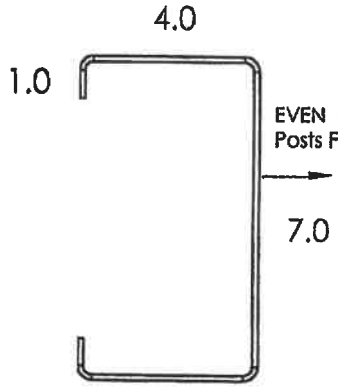
Units improperly installed or installed to an inadequate structure can be susceptible to wind damage. This damage can be very serious and even life threatening. The owner and installer assumes full responsibility that the installation is structurally sound to support all loads (weight, wind and ice) and properly sealed against leaks. SDE will not accept liability for any damage caused due to the many unknown variable applications.

1.0 System Set-up Procedure

Warning: Extreme care must be taken for this setup procedure to avoid bodily injury and/or equipment damage. Wear proper PPE.

1.1 Post Install

Choose a site that is as level as possible. Install depth will be determined by many factors, such as region and local building code & national ASCE requirements.



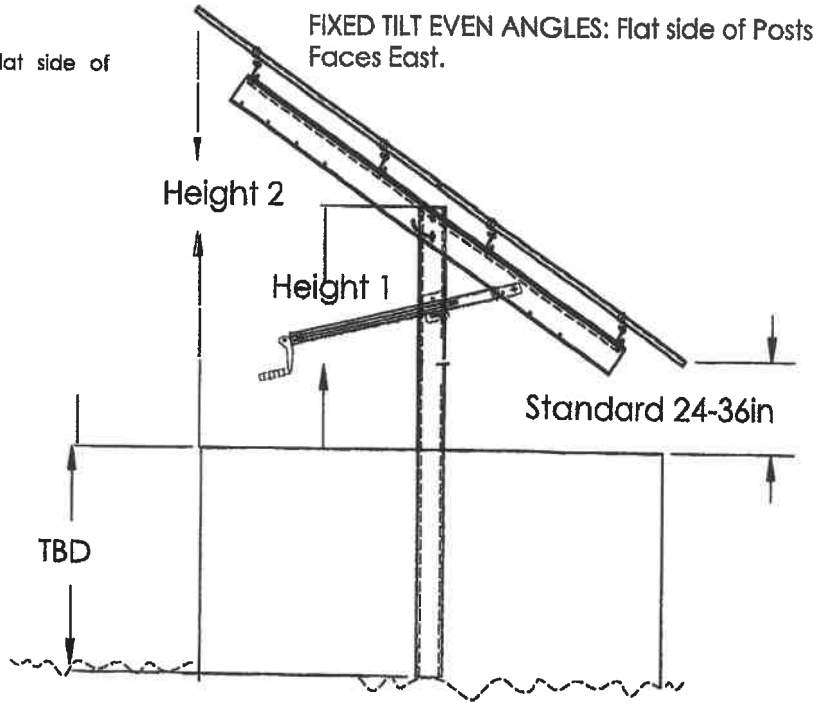
EVEN Angles: Flat side of Posts Faces East

.150 GAGE Formed View

PE Requirement: TBD Below Grade Level.

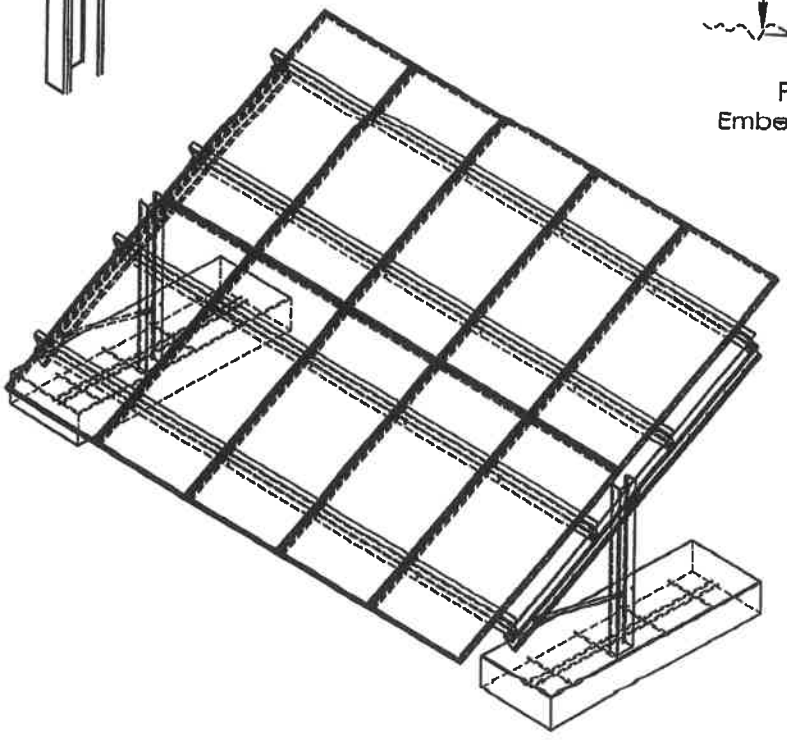
FIXED TILT ODD ANGLES - 25, 35, & Season Adjustable Systems: Flat side of Posts Faces West.

FIXED TILT EVEN ANGLES: Flat side of Posts Faces East.

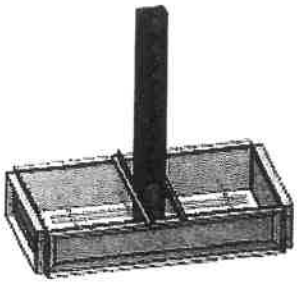


Post Driven: Average Embedment Depth = 6.5 - 8.5ft

Concrete Footer: Average is 24in OD x 60in Deep



Concrete Ballast Block: 120in L x 30in W x 12in H



1.0 System Set-up Procedure - POST DRIVEN SYSTEM

Warning: Extreme care must be taken for this setup procedure to avoid bodily injury and/or equipment damage. Wear proper PPE.

STEP 1: IF USING CLAMPS, VERIFY YOUR PANEL PROGRESSION CALCULATION (Module Width + .4in Clamp Width) Multiplied by # of Modules. This will determine the minimum amount of racking needed.

STEP 2: POST SPACING DIMENSIONS FOR 204in Z-Purlins (Panel Frames Less Than 40in)

160in Center to Center spacing for East Start Section
202In Center to Center spacing (West 10x Panel Add Section)
142in Center to Center spacing (West 8x Panel Add Section)
102in Center to Center spacing (West 6x Panel Add Section)

POST SPACING DIMENSIONS FOR 214in Z-Purlins (Panel Frames from 40in - 43in)

160in Center to Center spacing for East Start Section
212in Center to Center spacing (West 10x Panel Add Section)
153in Center to Center spacing (West 8x Panel Add Section)
111in Center to Center spacing (West 6x Panel Add Section)

POST SPACING DIMENSIONS FOR 186in Z-Purlins (Panel Frames Greater than 43in) Note: We recommend Direct Tie Only for Larger 500W+ Frames.

160in Center to Center spacing for East Start Section
184in Center to Center spacing (West 8x Panel Add Section)
104in Center to Center spacing (West 6x Panel Add Section)

2x Panels cn be added with Cantilever Extensions on the East & West end of the arrays (Z-PURLIN-48.5)

We recommend building the system from East to West, as it is more efficient to overlap the Z-Purlins progressively on top.

1.0 System Set-up Procedure - POST TEMPLATE

204 POST TEMPLATE OVERVIEW BY MODULE QUANTITY
Install from East to West

NORTH

ADD SECTION 5	ADD SECTION 4	ADD SECTION 3	ADD SECTION 2	ADD SECTION 1	EAST START SECTION	# OF MODULES
					142 in	8
					160 in (10x PANEL SECTION)	10
				(ADD 4x CANTILEVERS)	160 in (10x PANEL SECTION)	12
				(ADD 8x CANTILEVERS)	160 in (10x PANEL SECTION)	14
				102 in (6x PANEL SECTION)	160 in (10x PANEL SECTION)	16
				142 in (8x PANEL SECTION)	160 in (10x PANEL SECTION)	18
				202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	20
			(ADD 4x CANTILEVERS)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	22
			(ADD 8x CANTILEVERS)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	24
			102 in (6x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	26
			142 in (8x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	28
			202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	30
		(ADD 4x CANTILEVERS)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	32
		(ADD 8x CANTILEVERS)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	34
		102 in (6x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	36
		142 in (8x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	38
		202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	40
	(ADD 4x CANTILEVERS)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	42
	(ADD 8x CANTILEVERS)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	44
	102 in (6x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	46
	142 in (8x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	48
	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	50
(ADD 4x CANTILEVERS)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	52
(ADD 8x CANTILEVERS)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	54
102 in (6x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	56
142 in (8x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	58
202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	202 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	60

WEST

EAST

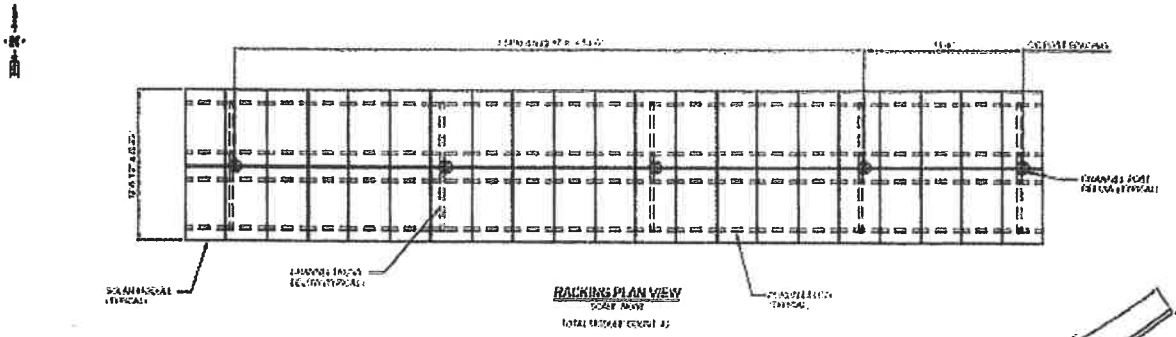
214 POST TEMPLATE OVERVIEW BY MODULE QUANTITY
Install from East to West

ADD SECTION 5	ADD SECTION 4	ADD SECTION 3	ADD SECTION 2	ADD SECTION 1	EAST START SECTION	# OF MODULES
					153 in	8
					160 in (10x PANEL SECTION)	10
				(ADD 4x CANTILEVERS)	160 in (10x PANEL SECTION)	12
				(ADD 8x CANTILEVERS)	160 in (10x PANEL SECTION)	14
				111 in (6x PANEL SECTION)	160 in (10x PANEL SECTION)	16
				153 in (8x PANEL SECTION)	160 in (10x PANEL SECTION)	18
				212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	20
			(ADD 4x CANTILEVERS)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	22
			(ADD 8x CANTILEVERS)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	24
			111 in (6x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	26
			153 in (8x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	28
			212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	30
		(ADD 4x CANTILEVERS)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	32
		(ADD 8x CANTILEVERS)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	34
		111 in (6x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	36
		153 in (8x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	38
		212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	40
	(ADD 4x CANTILEVERS)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	42
	(ADD 8x CANTILEVERS)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	44
	111 in (6x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	46
	153 in (8x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	48
	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	50
(ADD 4x CANTILEVERS)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	52
(ADD 8x CANTILEVERS)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	54
111 in (6x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	56
153 in (8x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	58
212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	212 in (10x PANEL SECTION)	160 in (10x PANEL SECTION)	60

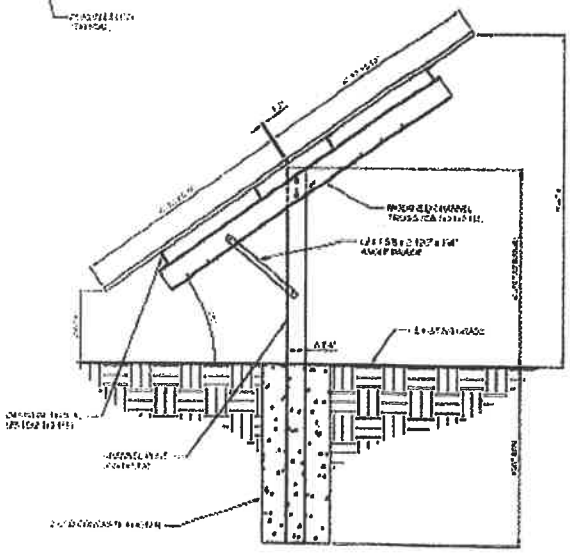
SOUTH

1.0 System Set-up Procedure

1.4 DESIGN EXAMPLE. Note, please reference your SDE draw package that is specific to your project.



RACKING PLAN VIEW



RACKING SIDE ELEVATION VIEW

BILL OF MATERIALS

QUANTITY	SDE ITEM	COMPONENT	COMPONENT WEIGHT (LBS)	TOTALS (LBS)
5	[illegible]	[illegible]	55	275
6	[illegible]	TRUSS	79	558
6	[illegible]	[illegible]	5	27
18	[illegible]	[illegible]	53	954
8	[illegible]	[illegible]	8	64
5	[illegible]	[illegible]	NS	∞
10	[illegible]	[illegible]	NS	∞
6	[illegible]	[illegible]	NS	∞
		WEIGHT DOES NOT INCLUDE HARDWARE OR CLAMPS	TOTAL WEIGHT (LBS)	1911

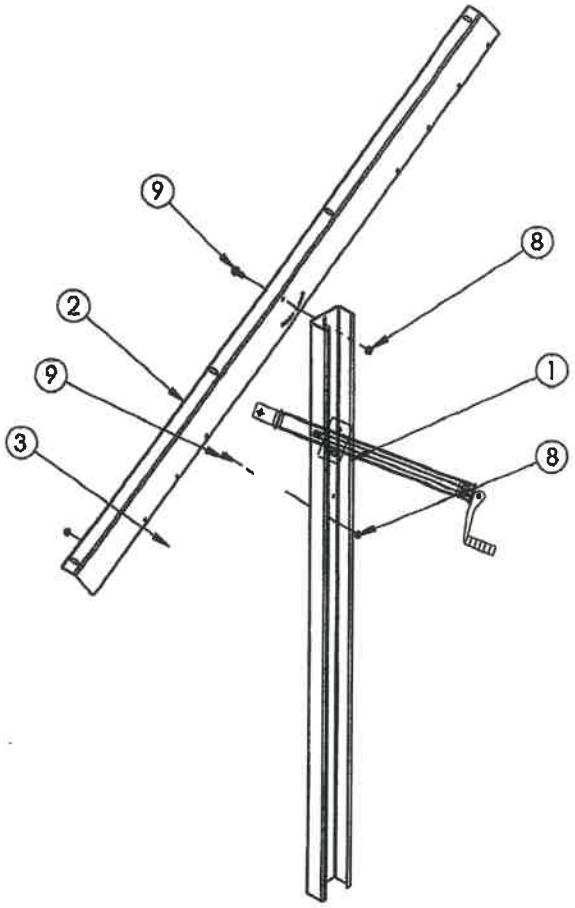
NOTES

1. PANEL PROGRESSION (EACH ARRAY) = (40.94" (PANEL WIDTH) + 0.4" (CLAMP)) x 21 PANELS = 868.14"
2. RACKING PROVIDED = 892.5" (EXCESS OF 24.36"). BEGIN PANEL INSTALLATION APPROXIMATELY 3" FROM EAST END. TRIM EXCESS FROM WEST END
3. POSTS SHALL BE INSTALLED WITH FLAT FACE TO THE EAST FOR EVEN ANGLES (20° & 30°) AND WITH FLAT FACE TO THE WEST FOR ODD ANGLES (25° & 35°) AND SEASON ADJUSTABLE SYSTEMS
4. DRAINAGE SHALL BE DIVERTED AWAY FROM POSTS. POSTS SHALL NOT BE INSTALLED IN SWALES, DRAINAGE AREAS, OR AREAS WHERE WATER MAY BE ALLOWED TO FLOW OR STAND
5. ADJUSTMENT HOLES IN POSTS SHALL BE USED TO LEVEL TRUSSES AND PURLINS PRIOR TO PANEL INSTALLATION
6. CANTILEVER MEMBERS SHALL BE ATTACHED WITH NO LESS THAN 3 - 1/2" Ø SERRATED FLANGE BOLTS. CANTILEVERS SHALL OVERLAP PURLINS BY 6"
7. EXISTING GRADE SHALL BE NOMINALLY FLAT WITH NO MORE THAN 5% SLOPE. ENGINEER SHALL BE CONSULTED IF SLOPE IS GREATER THAN 5%
8. DAMAGED COMPONENTS SHALL BE REJECTED AND REPLACED
9. ALL CONCRETE SHALL BE AIR ENTRAINED (5% TO 8%), HAVE A 3 1/2" TO 4 1/2" SLUMP, AND OBTAIN A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 4,000 PSI AT 28 DAYS

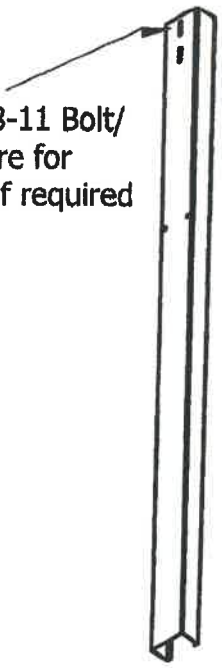
1.0 System Set-up Procedure

1.2 TRUSS-120 ASSEMBLY TO POST

Fasten angled mount on driven post with provided hardware. Then add season adjustable jack with 3x 1/2-13x 1/2 Serrated Flanged Bolts/nuts. Note: the C-Channel has a 6x hole pattern for +/- 1.0 in tolerance.



Use hole # 2 and install 1x 5/8-11 Bolt/ Nut. Hole 1 & 3 can be used are for additional 1.0in+/- tolerance, if required on the installation site.



STEP 1: Install TRUSS to the C-Channel Post with 2x 5/8-11 x 1 1/2in Bolts/Nuts.

STEP 2: SEASON ADJUST SYSTEM: When installing the SA-JACK-40, we recommend hand tightening the hardware, backing off the nut ½ turn, and adding a second nut at each location. This will allow the jack to pivot freely, while also preventing further movement of the hardware.

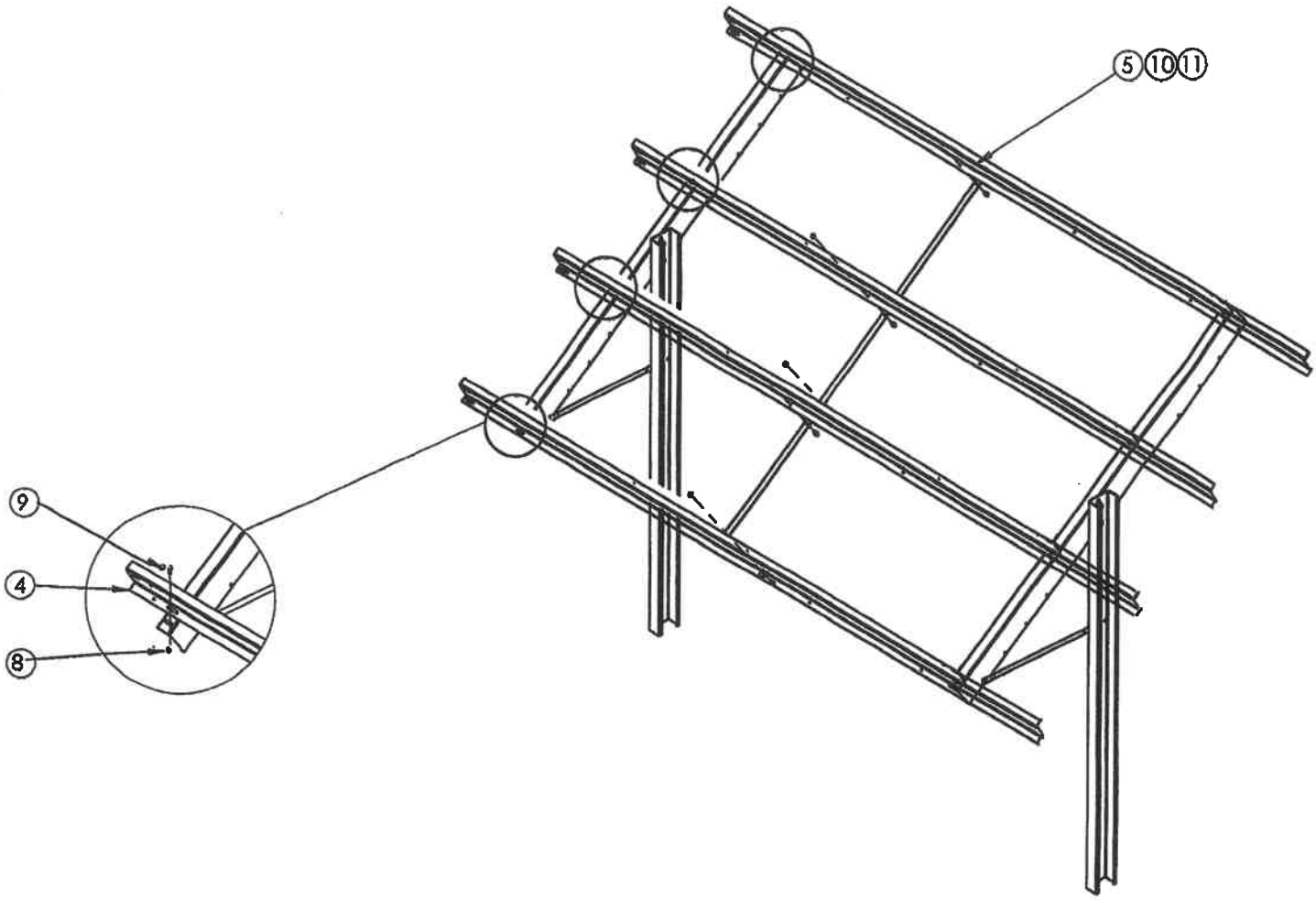
Install SA-JACK-40 to the C-Channel Post & Truss with 3x 1/2-13 x 1 1/2in Bolts & 6x 1/2-13 Nuts. Of note, if adjusting the system alone, only adjust each jack in 5x Degree Increments.

1.0 System Set-up Procedure

1.4 Z-PURLIN to TRUSS ASSEMBLY

Attach 4x Z-Purlins to the SLR-TRUSS with 1/2-13 x 1 1/2 Hardware.

Face Top Z-Purlin Flanges North



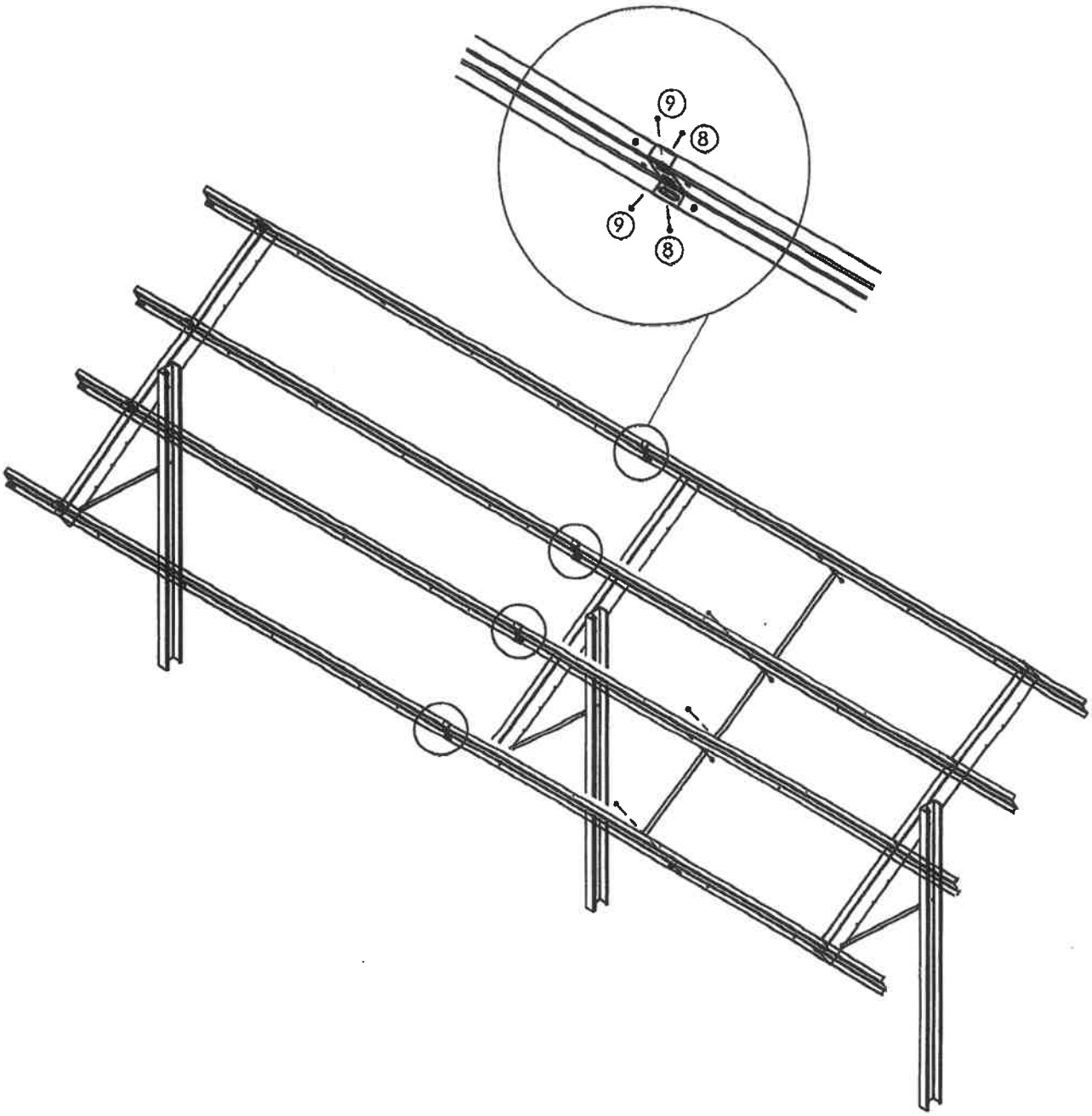
1.5 STRONG-BACK Install

Install STRONG-BACK to Z-purlins with 4x 1/2-13 hardware as detailed above.
Note: These are rarely required to be installed by our Professional Engineers.
Mainly used in Hurricane Zones.

1.0 System Set-up Procedure

Z-PURLIN OVERLAP
Attach 4x Z-Purlins to 4x Z-Purlins with 1/2-13 x 1 1/2 Hardware.

AA-PURLIN-204, 214's, 186's (Overlap by 2 inches and install 2x 1/2-13 x 1 2/2 Serrated Flanged Hardware

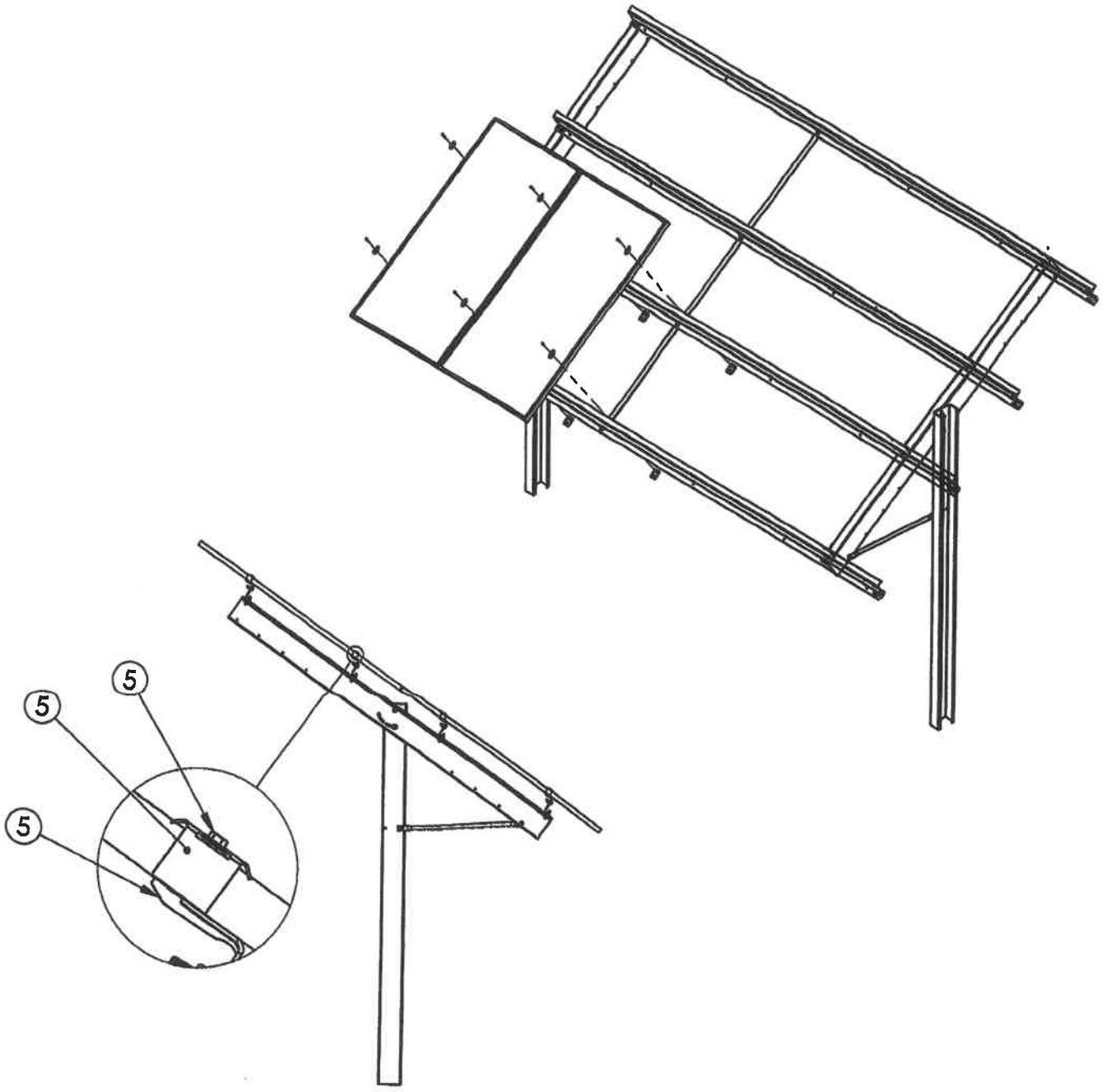


1.6 Panel Installation with Clamps

If Panels are to be installed with provided clamp assemblies. This clamp consists of three parts:
1x 5/16 x 2 1/2 Serrated Flanged Bolt - 1x UL Stainless Mid Clamp - 1x Tapped Aluminum Extrusion

1.6.1 Panel Installation without Clamps

If Panels are to be installed direct to frame, line up the module frame holes with the Z-Purlin slots and install 1/4-20 x 5/8 stainless serrated flanged bolts & nuts.



Solar Panel Performance Review

In consideration of a ground mount solar panel system versus a roof mounted system, the ground mount system is preferred because of the greater amount of sunlight available and the optimized seasonally adjusted solar panel angle. Since the roof is nearly flat, a roof mounted panel array would require significant structural upgrades to the existing roof and would block the water view of two houses across the street.

In addition, a ground mounted system would not be visible by any of the neighbors in the community. Due to the existing roof being mostly flat, any solar panels would need to be built up to get the required angle to the sun. While non-waterfront property owners are not guaranteed to the light, air, and view of tidal waters, the solar panels can be placed in a location that does not impact the enjoyment of the environmental features of the neighborhood from any neighboring properties. The ground location does not impact any views, whereas the roof mounted solar panel system would.

A seasonal comparison of the two mounting options was conducted taking into account the amount of sunlight available as well as the angle of incidence between the sun and the panels as a function of seasons. During the summer months, the angle difference between the ground mount and roof mount is relatively small whereas during the winter months, the angle of incidence would reduce the roof mounted panel efficiency by about a factor of two over the ground mounted option. This factor, combined with the increased shade associated with the roof mounted system contributes to a significant reduction in solar output for the roof mounted system as shown in Figure 1. The seasonal factor between the ground mount and roof mounted system is shown in Figure 2 whereby the benefit of the ground mount system ranges from 1.6 during the summer months up to almost a factor of four during the winter months.

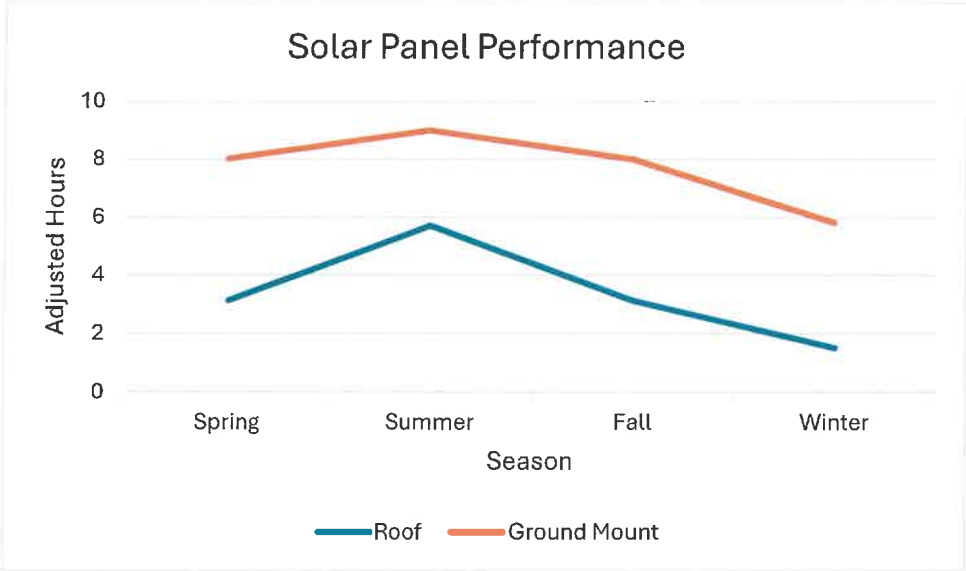


Figure 1 – Daily hours of sunlight available adjusted for angle of incidence.

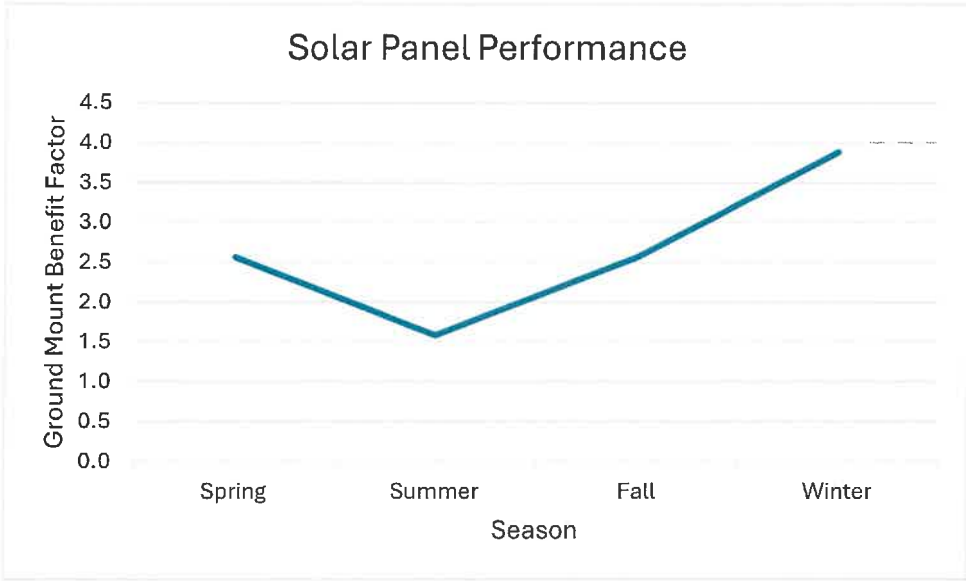


Figure 2 – Seasonal comparison between ground mount and roof mount.

On November 13, 2025, sunlight observations were made on the proposed ground mount location and an alternative roof mount location. For the ground mount system, at least 50% of the panels were exposed to direct sunlight at 7:50 am and 100% by 8:20 am. This lasted until 2:10 pm for 100% and 2:30 pm for 50%. For the roof mount system, at least 50% of the panels were exposed to direct sunlight at 9:40 am and 100% by 10:30 am. This lasted until 12:30 pm for 100% and 1:50 pm for 50%. The results are shown in the table below:

	Roof mount	Ground mount
50% or more	4:10 hours	6:40 hours
100%	2:00 hours	5:50 hours
Average	3:05 hours	6:15 hours

These direct sunlight hours compare favorably with the prediction of 3 hours and 6 hours respectively for the winter months.

Figures 1 through 4 show the location of the six supporting pillars for the two rows of solar panels.

Figure 1

Figure 2

Figure 3

Figure 4

To further illustrate the necessity of the ground mount system versus the roof mount system, three figures are shown depicting the viewing angle from the direction of the sun in the winter months using 3D images from Apple maps at 9:00 am. noon and 2:00 pm, respectively.

Figure 5 – 9:00 am

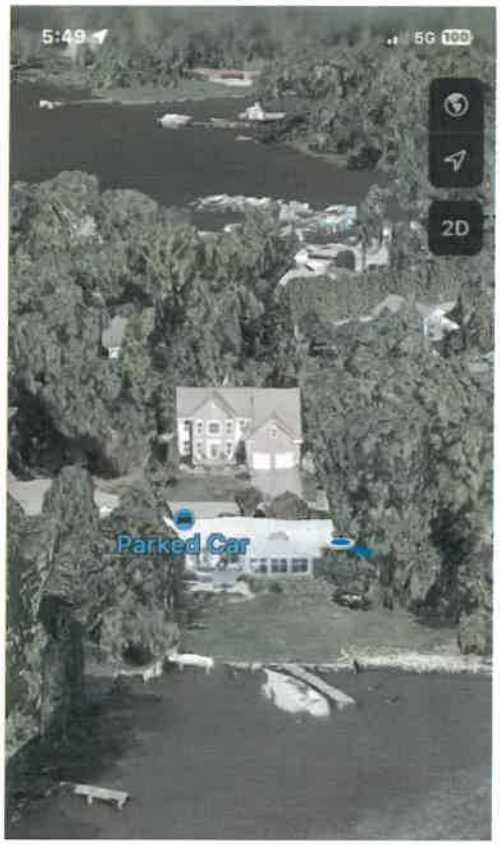


Figure 6 – noon

Figure 7 – 2:00pm

Note that in Figures 5 and 7, (9:00 am and 2:00 pm) the roof is completely shaded. However, in all three figures, the ground mount location is in direct sunlight.

To address the issue of canopy cover, figure 8 shows an overhead view that depicts shading of the second row of panels in the ground mount system. However, if that angle is tilted 15 degrees (equivalent to peak sun elevation in June), the second row of panels is only partially shaded (Figure 9). Trimming some lower branches on the nearest tree would eliminate that shading entirely and would not materially impact the overall health of the tree as a part of regular maintenance.

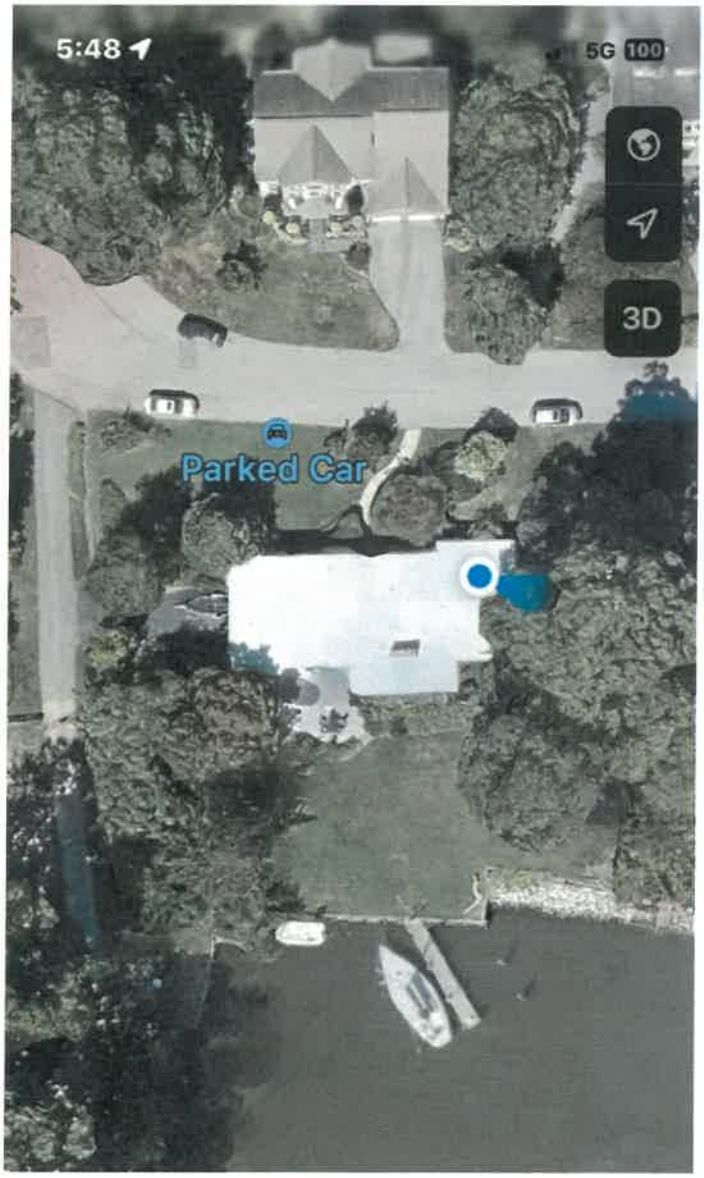


Figure 8 – Directly overhead

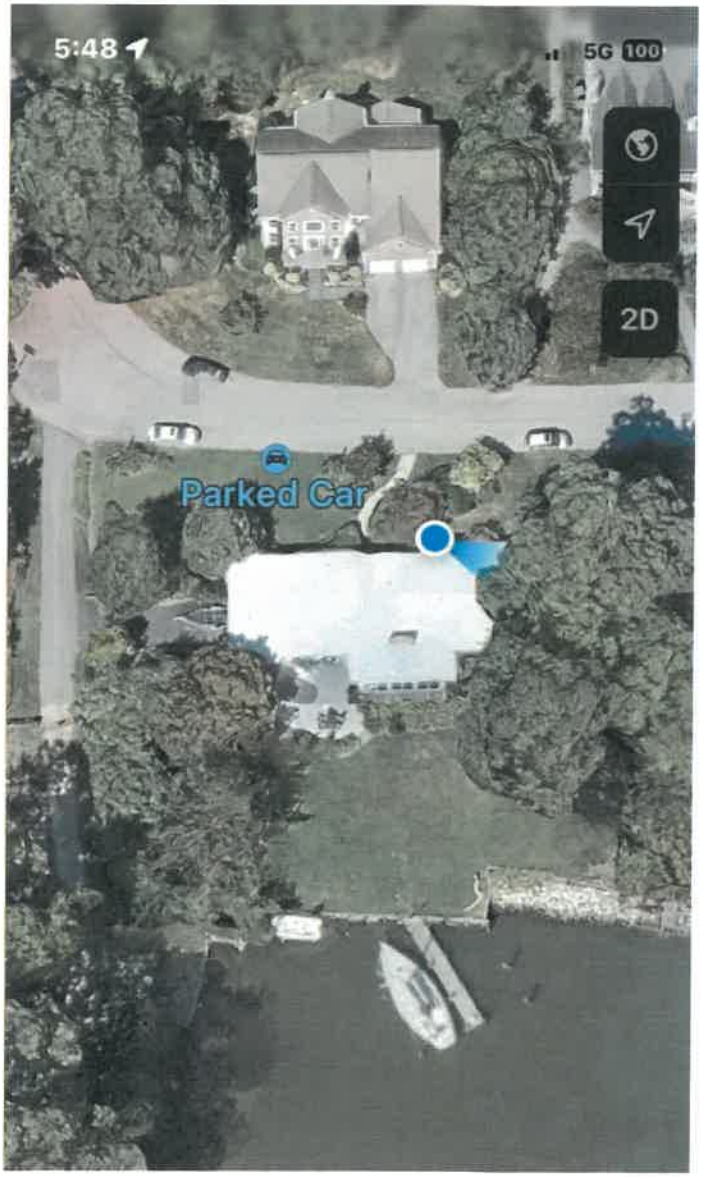


Figure 9 – tilted 15 degrees South

OFFICE OF PLANNING AND ZONING

CONFIRMATION OF PRE-FILE (2025-0104-P)

DATE OF MEETING: 11/12/2025

P&Z STAFF: Sara Anzelmo, Kelly Krinetz

APPLICANT/REPRESENTATIVE: John Donald/Andrew Price EMAIL: kdonald8087@gmail.com, aprice@drumloyka.com

SITE LOCATION: 621 Canal Lane, Annapolis LOT SIZE: 23,568 sf ZONING: R2

CA DESIGNATION: LDA BMA: Yes or BUFFER: N/A APPLICATION TYPE: Variance

From the letter of explanation: The applicant proposes to construct two solar panels along with the electrical infrastructure required to carry the generated solar panel to the existing dwelling. The additional coverage required to construct the support base for the solar panels is minimal, 18 square feet, and the resulting total lot coverage is well below the allowable for the site. The need for the requested variances arises from the unique physical conditions of the site, specifically the location of the existing structure and canopy areas. The additional coverage within the buffer modification area has been minimized to the extent possible.

Due to the location of numerous mature trees and the orientation of the property with respect to the sun, the panels will be located within the BMA, requiring a variance to **Article 17, Section 8-702(b)**. The panels will also be located within the front yard setback for accessory structures, requiring a setback variance to **Article 18, Section 4-601**.

COMMENTS

The **Critical Area Team** commented that the tree line shown on the plan does not accurately depict the tree line that exists on the site. The existing trees in this area appear to shade the proposed location of the solar panels. Any clearing must be shown on the plan. Given the requirements for air, light, and view on waterfront lots, construction drawings/spec should be included for review.

The **Zoning Administration Section** notes that the dimensions and height of the proposed accessory structures must be shown on the site plan. While solar energy is generally supported by the County, the proposed structures are located very close to the shoreline. The need sufficient to justify a variance must be substantial and urgent and not merely for the convenience of an applicant. As such, the applicant should provide greater detail about why alternative locations (including roof-mounted panels) are not feasible and how the locations for these two structures represent the minimum variance necessary to afford relief. The applicant is advised that, in order for the proposed Critical Area variance to be approved, the applicant must demonstrate and the Hearing Officer must find that the proposal complies with each and every one of the Critical Area variance standards provided under Section 18-16-305(b) and (c) of the Zoning Code.

INFORMATION FOR THE APPLICANT

Section 18-16-201 (b) Pre-filing meeting required. Before filing an application for a variance, special exception, or to change a zoning district, to change or remove a critical area classification, or for a variance in the critical area or bog protection area, an applicant shall meet with the Office of Planning and Zoning to review a pre-file concept plan or an administrative site plan. For single lot properties, the owner shall prepare a simple site plan as a basis for determining what can be done under the provisions of this Code to avoid the need for a variance.

*** A preliminary plan checklist is required for development impacting environmentally sensitive areas and for all new single-family dwellings. A stormwater management plan that satisfies the requirements of the County Procedures Manual is required for development impacting environmentally sensitive areas OR disturbing 5,000 square feet or more. State mandates require a developer of land provide SWM to control new development runoff from the start of the development process.

Section 18-16-301 (c) Burden of Proof. The applicant has the burden of proof, including the burden of going forward with the production of evidence and the burden of persuasion, on all questions of fact. The burden of persuasion is by a preponderance of the evidence.
A variance to the requirements of the County's Critical Area Program may only be granted if the Administrative Hearing Officer makes affirmative findings that the applicant has addressed all the requirements outlined in Article 18-16-305. Comments made on this form are intended to provide guidance and are not intended to represent support or approval of the variance request.