



CIVILITY PLEDGE

The way we govern ourselves is often as important as the positions we take. Our collective decisions will be better when differing views have had the opportunity to be fully vetted and considered. All people have the right to be treated with respect, courtesy and openness. We value all input. We commit to conduct ourselves at all times with civility and courtesy to each other.

DESIGN REVIEW COMMITTEE

700 Doug Davis Drive
Hapeville, GA 30354

May 21, 2025 6:00 PM

AGENDA

1. **Call to Order**
2. **Roll Call**

Jonathan Love
John Stalvey
Gregory Morgan
Jacquie Smyth
Sophie Brooks

3. Election of Officers

3.I. Election of Chairman

3.II. Election of Secretary

4. Approval of Minutes

4.I. Minutes of December 18, 2024

Documents:

1. DRC Minutes December 18, 2024

5. Old Business

5.I. 558 Woodrow Avenue Elevation Change

Background:

Avuntee Patel has submitted a request seeking approval to modify the plans for a previously approved single-family home located at 558 Woodrow Avenue. The property is zoned R-SF, Residential Single Family and is subject to the Neighborhood Conservation Area Sub Area E section of the Architectural Design Standards.

Documents:

1. Planners Report- 558 Woodrow Avenue
2. 558 Woodrow Avenue

5.II. 3166 Dogwood Drive Elevation Change

Background: Darrell Harris has submitted a request seeking approval for a design modification of a previously approved law office to be located at 3166 Dogwood Drive. The property is zoned V, Village and is subject to the Commercial/Mixed-Use SubArea C Architectural Design Standards.

Documents:

1. Planners Report - 3166 Dogwood Drive
2. 3166 Dogwood Drive

6. New Business

- 6.I. 329 Maple Street Solar Panels

Background: Malick McGregor has submitted an application seeking approval of the addition of 17 roof-mounted solar panels to the existing single-family dwelling and rear shed and 15 ground-mounted solar panels on a 7' tall pergola at 329 Maple Street. The property is zoned R-1, One Family Detached, and is subject to the Neighborhood Conservation Area, Subarea E, of the Architectural Design Standards.

Documents:

1. Planners Report - 329 Maple Street
2. Application - 329 Maple Street_Redacted

7. Next Meeting Date - Wednesday, June 18, 2025

8. Adjourn



**Design Review Committee Meeting
700 Doug Davis Drive
Hapeville, GA 30354
December 18, 2024, 6:00 PM**

MINUTES

1. Call to Order

Jonathan Love called the meeting to order at 6:00PM.

2. Roll Call

Jonathan Love

Brian Gregory - absent

John Stalvey

Gregory Morgan

Jacquie Smyth

3. Approval of Minutes

3.I Minutes of November 20, 2024

MOTION ITEM: John Stalvey made a motion, Jonathan Love seconded to appoint Jacquie Smyth as secretary pro tem. Motion Carried: 4-0

MOTION ITEM: Jacquie Smyth made a motion, John Stalvey seconded to approve the minutes of November 20, 2024, as submitted. Motion Carried: 4-0

4. Old Business

4.I Kings Landing Subdivision

Window Design Change

Background:

Alex Popham of Epic Development has submitted a revised design review request to change the windows from wood to vinyl and install a thicker trim to accomplish the intent of the window relief. The property is zoned P-D, Planned Unit Development and is subject to the Neighborhood Conservation Area of the Architectural Design Standards.

MOTION ITEM: Gregory Morgan made a motion, Jacquie Smyth seconded to approve the design changes as submitted. Motion Carried: 5-0

4.II 613 Spring Street

Addition

Background:

Joshua Crook has submitted a revised design review request to construct a 900-square foot addition to the existing single-family dwelling at 613 Spring Street. The property is located within the R-SF, Residential Single-Family and is subject to the Neighborhood Conservation Area of the Architectural Design Standards.

MOTION ITEM: John Stalvey made a motion, Gregory Morgan seconded to approve the application with conditions noted in the Planners Report. Motion Carried: 4-0

5. New Business

5.I 3301 Sims Street

New SF Dwelling

Background:

Victoria Cole and Leland Robbins-Murphy have submitted an application seeking approval for the construction of a new 1,742-square foot single-family dwelling with a detached accessory structure at 3301 Sims Street. The property is zoned R-1, One Family Residential and is subject to the Neighborhood Conservation Area of the Architectural Design Standards.

MOTION ITEM: Gregory Morgan made a motion, Jacquie Smyth seconded to approve the application with the condition that the applicant resubmit the plans addressing the outstanding items identified in the Planners Report.

The Committee granted the following design exceptions:

- Design exception for 6.5' driveway
- Design exception for 10' accessory structure
- Design exception request for trim and sill was denied

Motion Carried: 4-0

6. Next Meeting Date – Wednesday, January 15, 2025, at 6:00PM

7. Adjourn

MOTION ITEM: John Stalvey made a motion, Jonathan Love seconded to adjourn the meeting at 6:30PM. Motion Carried: 4-0

Respectfully submitted by,

Jacquie Smyth, Secretary Pro-Tem

Jonathan Love, Chairman



DATE: May 12, 2025
TO: Tonya Hutson
FROM: Lynn Patterson
RE: **Design Review – 558 Woodrow Ave Window Changes**

Key:

Compliant:	✓
Not Compliant:	✗
Incomplete:	👉
Not Applicable:	⊘

BACKGROUND

The City of Hapeville has received a revised design review application from Avuntee Patel to modify the plans for a previously approved single-family home on a lot located at 558 Woodrow Avenue. The applicant is requesting the deletion of two windows. One window is located on the rear upper floor and the other is located on the east side elevation toward the rear of the home.

The property is zoned R-SF, One Family Residential and is subject to the Neighborhood Conservation Area Sub Area E section of the Architectural Design Standards.

T

RECOMMENDATIONS

The deletion of the windows does not negatively impact required fenestration percentages and the impacted windows are located at or toward the rear of the dwelling, which limits the visibility from the public right of way.

Staff recommends approval of the request.

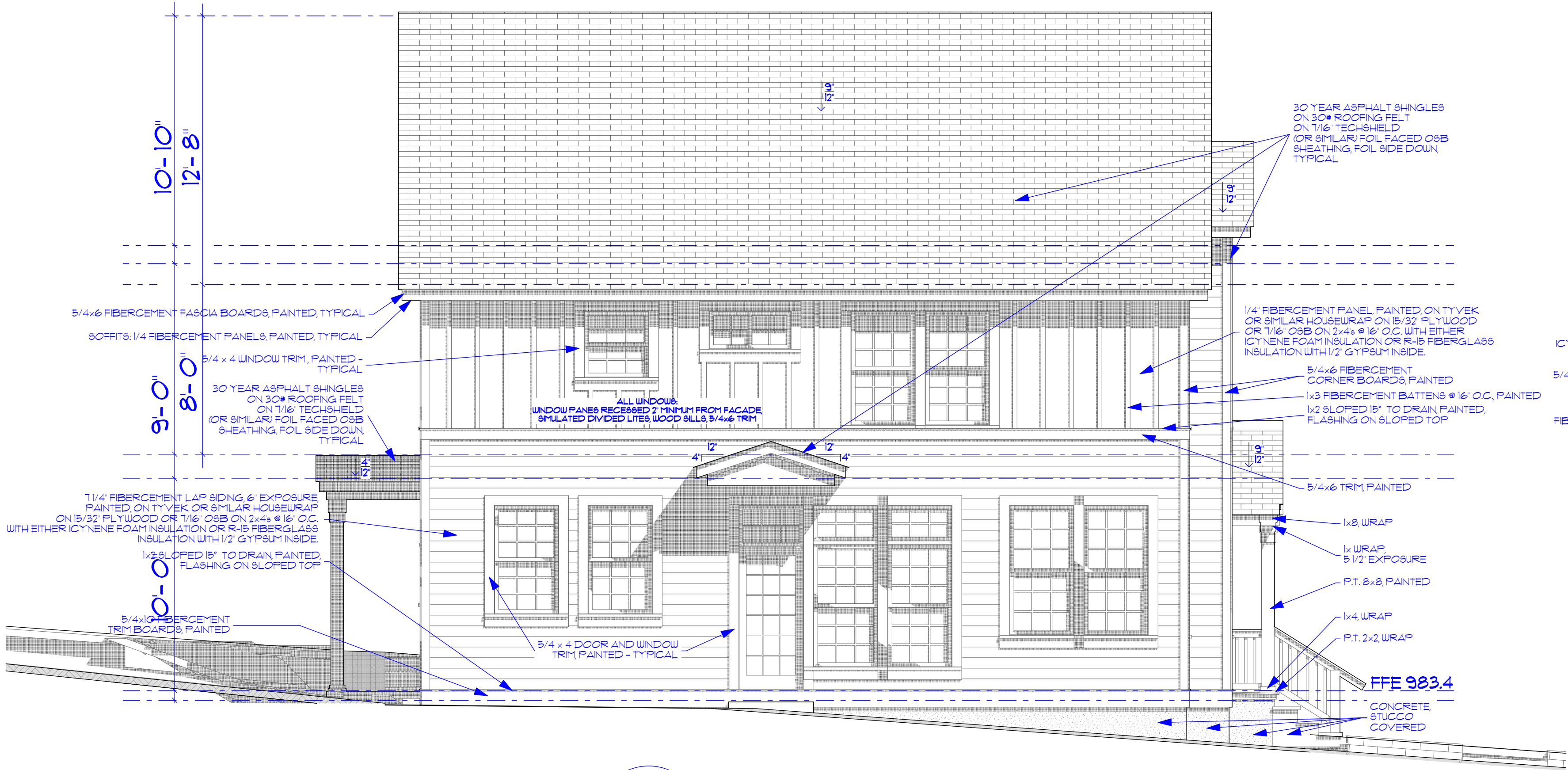
April 14, 2025

(1) 2A-1: South Elevation (rear)

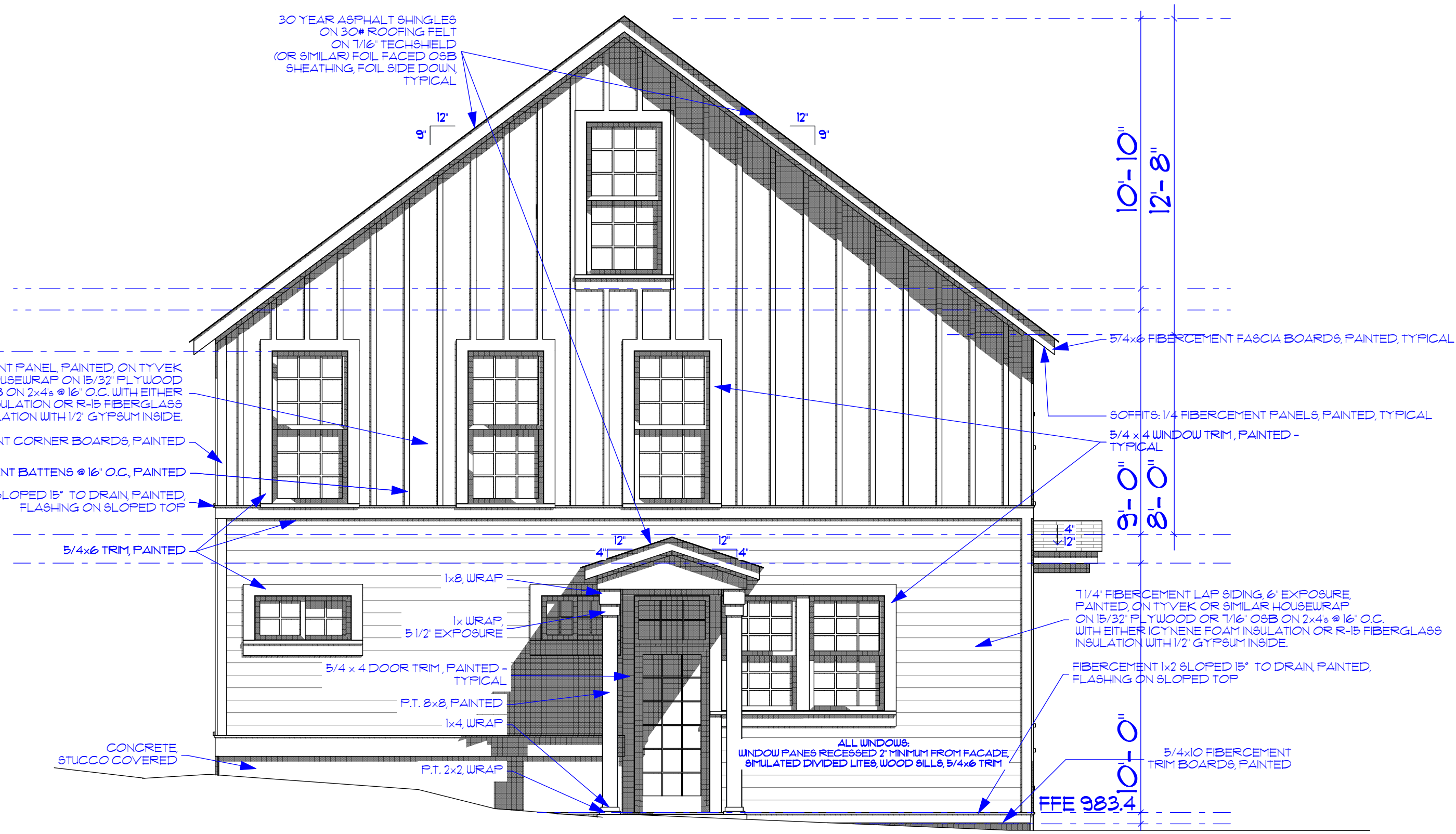
- a. Second window is replaced with a small sliding window to maintain bathroom privacy. Full length window is replaced. Mistake by architect in placing full length window in bathroom. Window is now replaced.

(2) 2A-4: East Elevation (left)

- a. Far left window is removed to fit gas stove hood. Stove placement inside the kitchen is in the southeast and window placement by the architect was not correct to accommodate this. Contractor removed window for stove and hood placement. Window is now removed.



4 EAST ELEVATION (LEFT)
SCALE: 1/4" = 1'-0"
GRAPHIC SCALE



2 SOUTH ELEVATION (REAR)
SCALE: 1/4" = 1'-0"
GRAPHIC SCALE

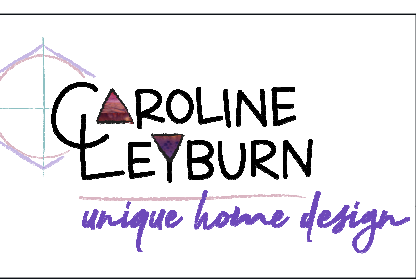
Facade Glazing Calculation

Main Level:	
Windows on right:	(2) 23.00 sq. ft. = 46.00 sq. ft.
Windows at bay:	(2) 18.44 sq. ft. = 36.88 sq. ft.
Narrow window at far left:	(1) 12.34 sq. ft. = 12.34 sq. ft.
Front door and transom:	(1) 26.00 sq. ft. = <u>26.00 sq. ft.</u>
Subtotal:	121.22 sq. ft.
Upper Level:	
Windows on right:	(4) 18.44 sq. ft. = 73.76 sq. ft.
Windows at bay:	(2) 23.00 sq. ft. = 46.00 sq. ft.
Narrow window at far left:	(1) 12.34 sq. ft. = <u>12.34 sq. ft.</u>
Subtotal:	132.10 sq. ft.
Attic Level:	
Window:	(1) 18.44 sq. ft. = <u>18.44 sq. ft.</u>
Subtotal:	18.44 sq. ft.
Total glazed area:	271.76 sq. ft.

Total Area of facade =	896.42 sq. ft.
30% of 896.42 sq. ft. =	268.93 sq. ft.
50% of 896.42 sq. ft. =	448.21 sq. ft.
268.93 sq. ft. < 271.76 sq. ft. < 448.21 sq. ft.	

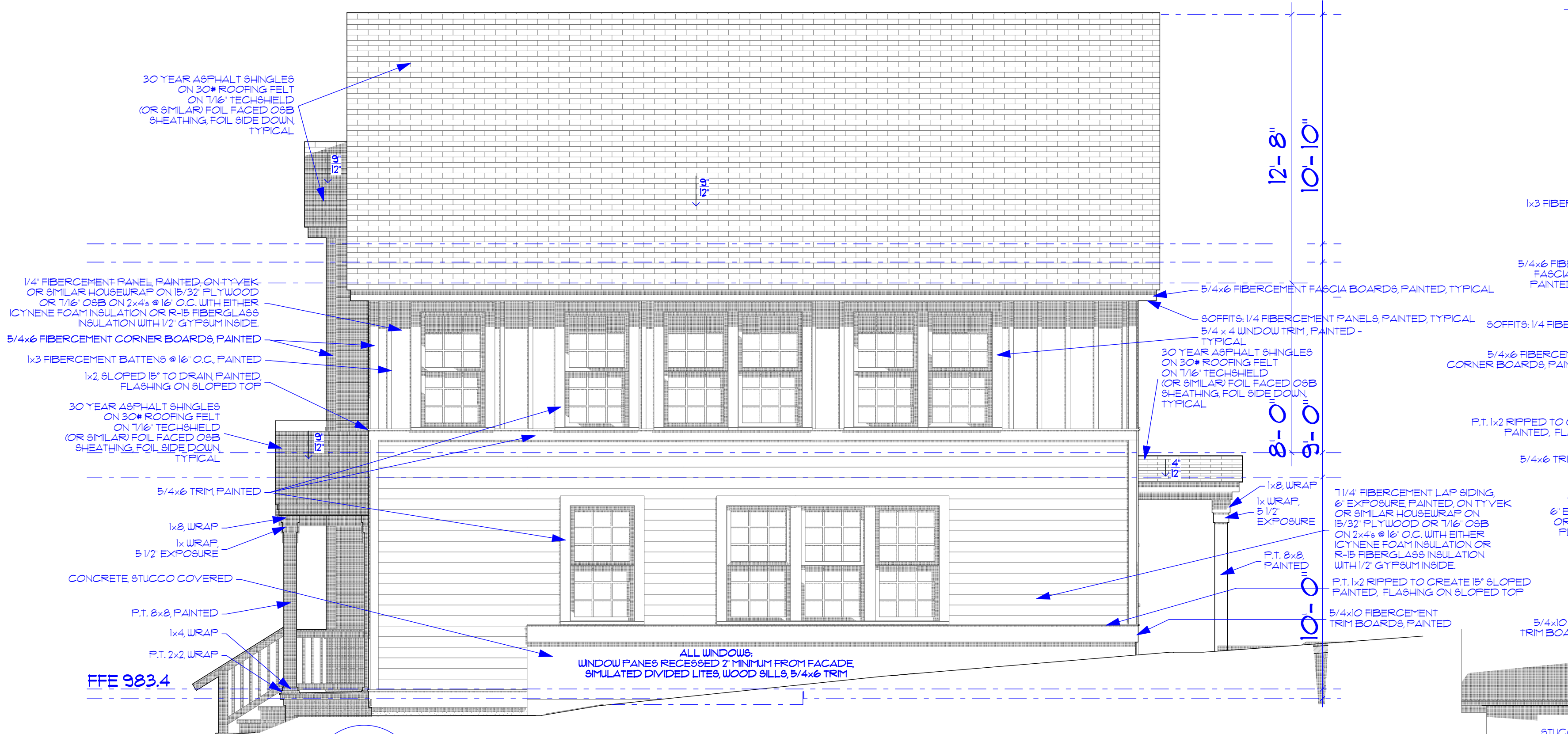
RELEASED
FOR CONSTRUCTION

ELEVATIONS

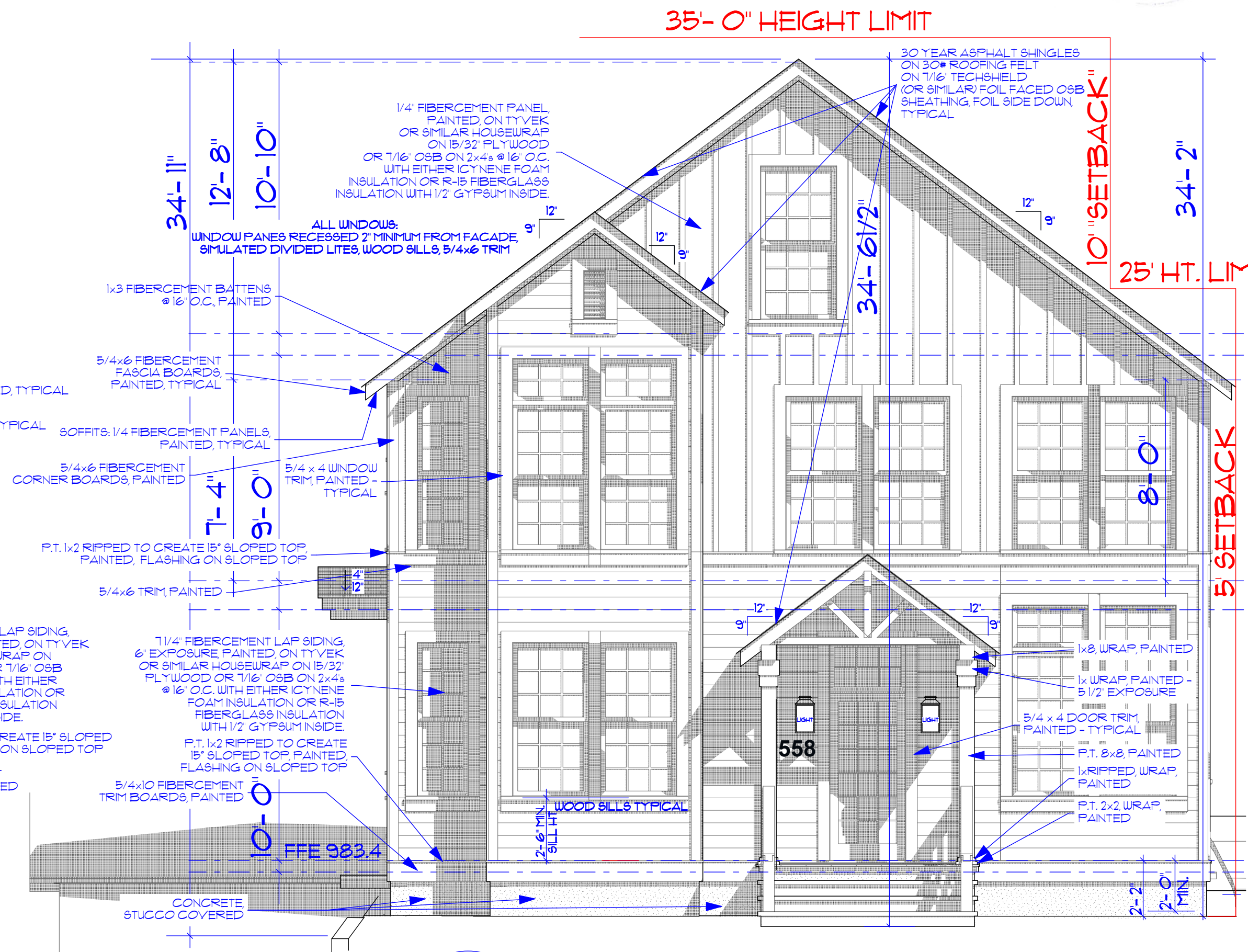


2A-1
08-15-2023

AVUNTEE PATEL
558 Woodrow Ave.
Hapeville, GA 30354

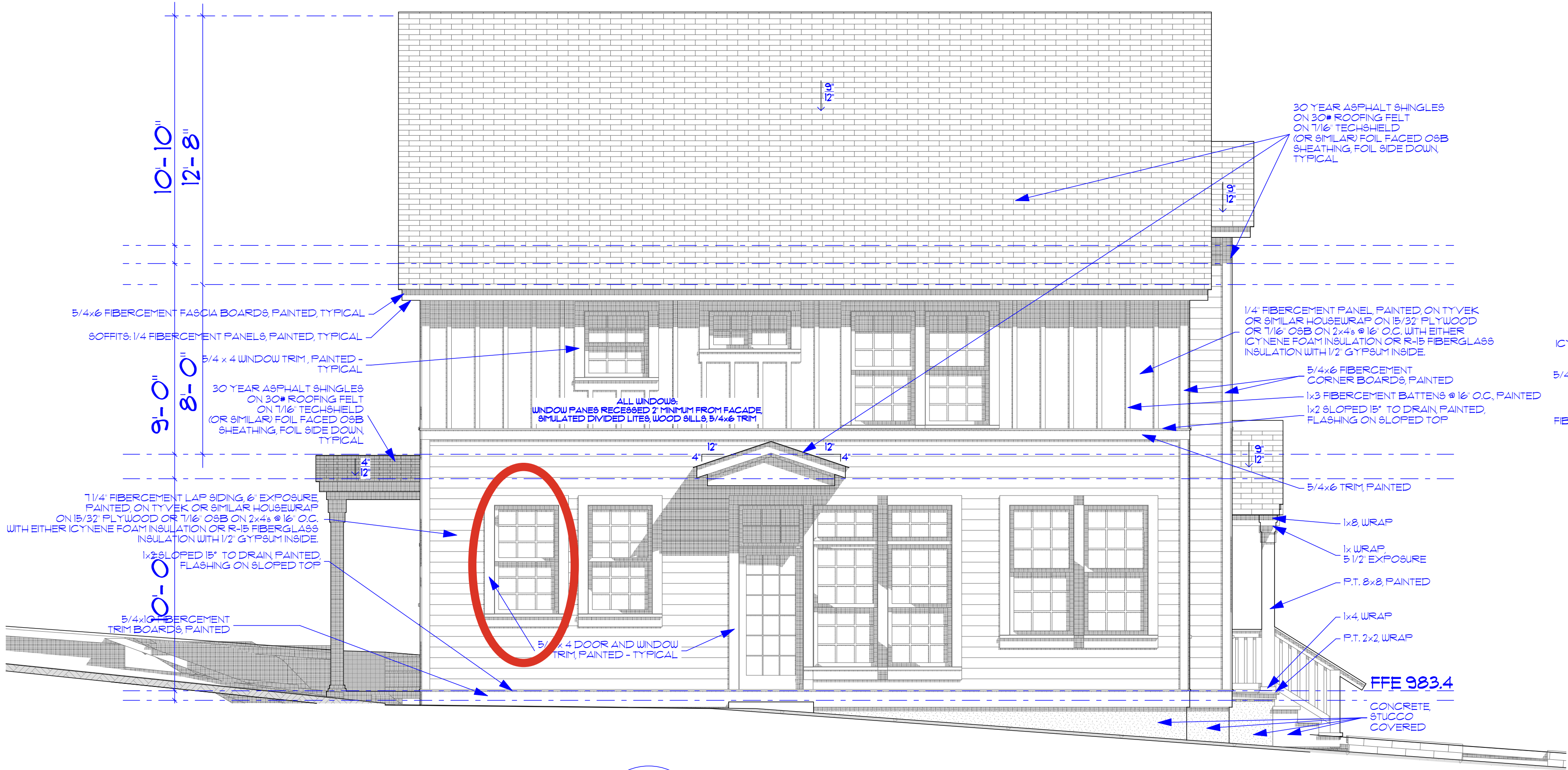


3 WEST ELEVATION (RIGHT)
SCALE: 1/4" = 1'-0"
GRAPHIC SCALE

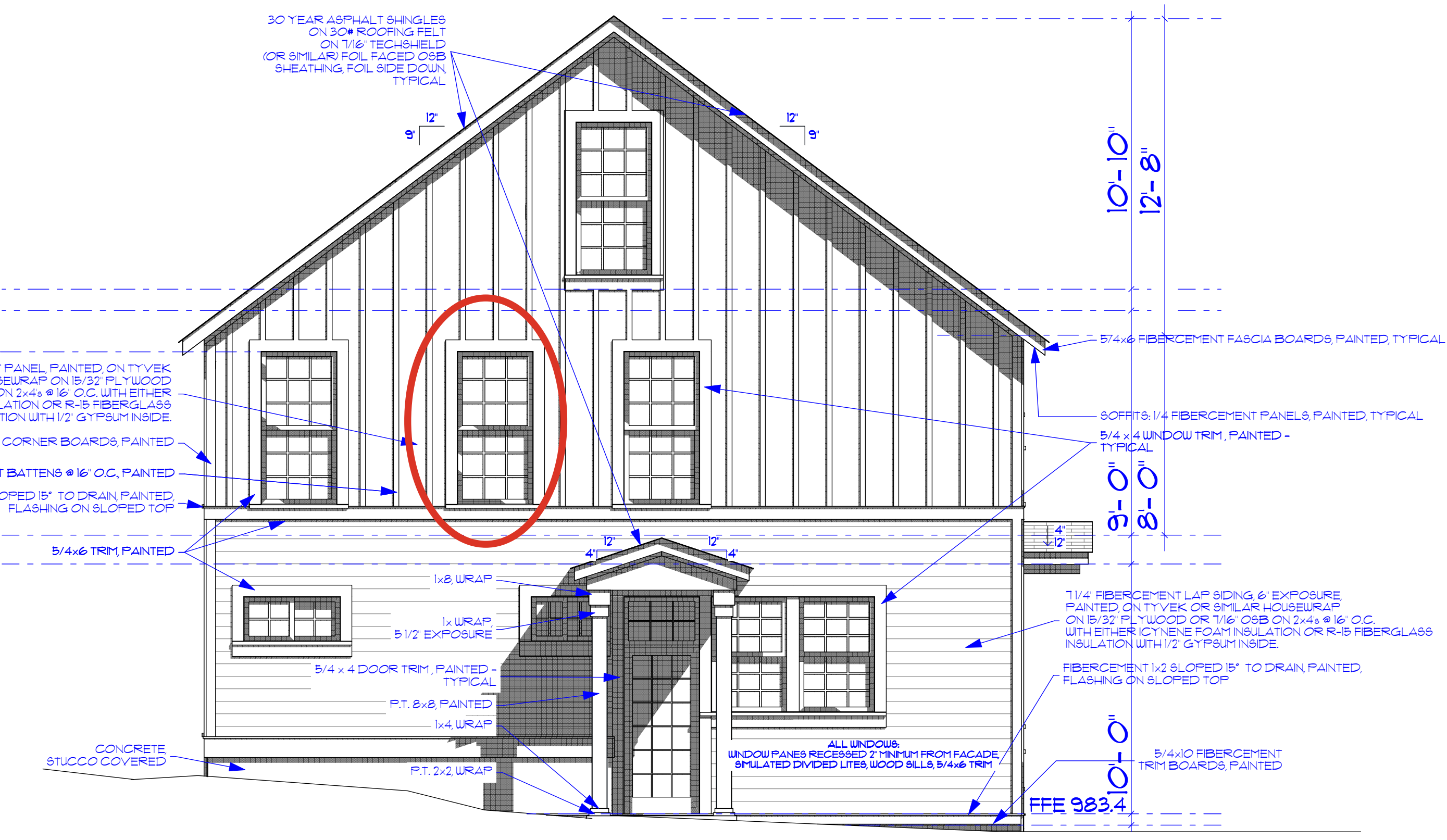


1 NORTH ELEVATION (FRONT)
SCALE: 1/4" = 1'-0"
GRAPHIC SCALE

Proposed Elevation Changes



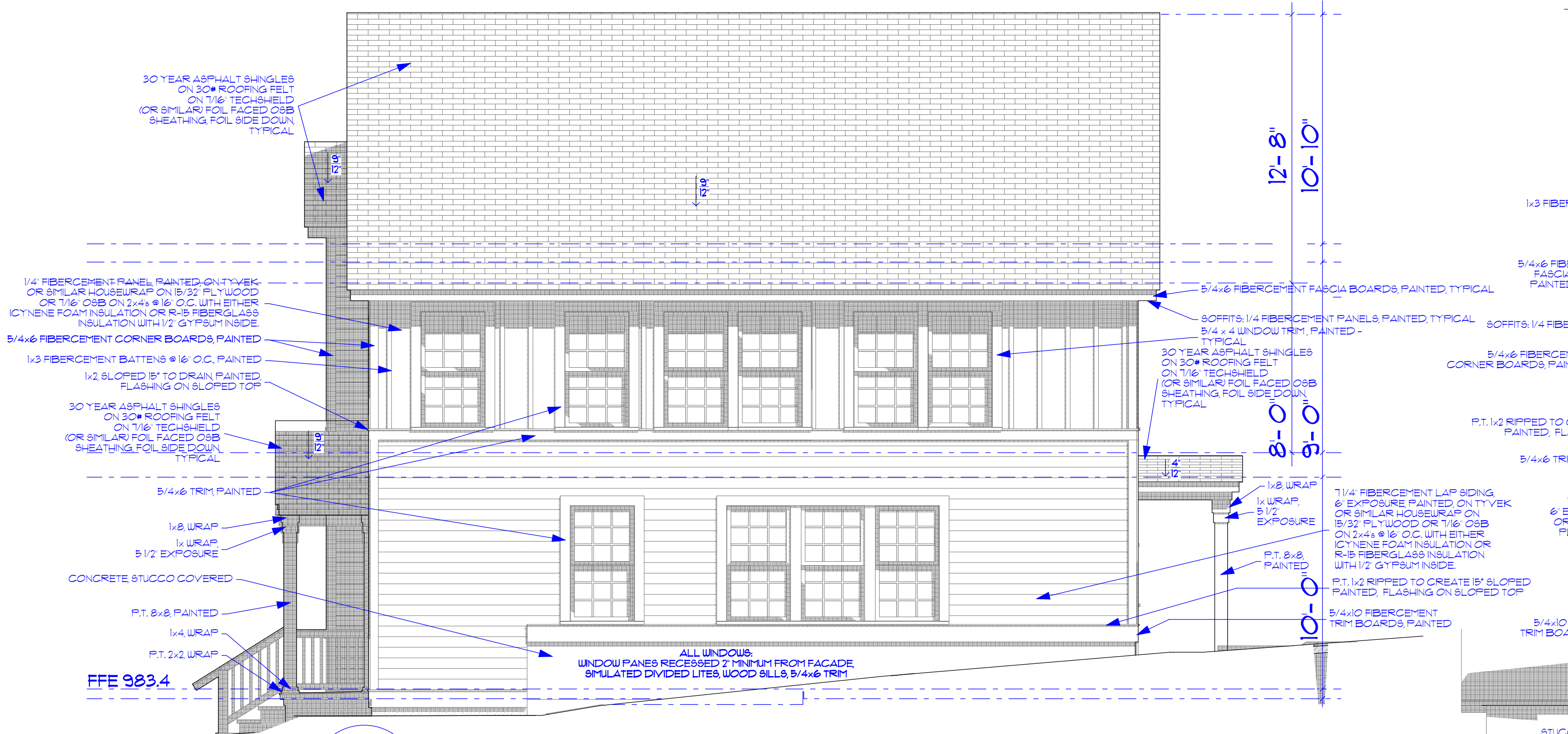
4
2A-1
EAST ELEVATION (LEFT)
SCALE: 1/4" = 1'-0"



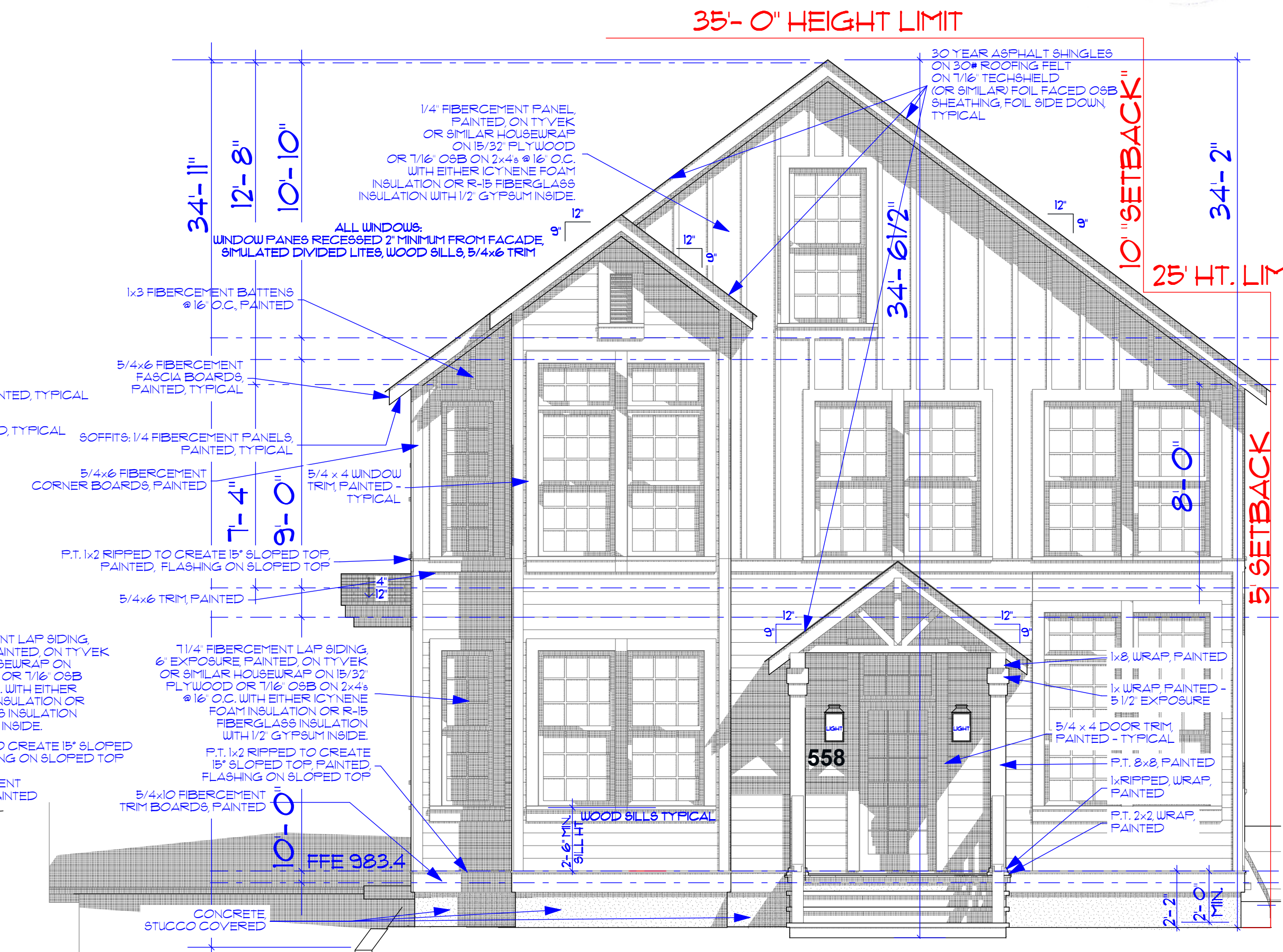
2
2A-1
SOUTH ELEVATION (REAR)
SCALE: 1/4" = 1'-0"

Façade Glazing Calculation

Main Level:	
Windows on right:	(2) 23.00 sq. ft. = 46.00 sq. ft.
Windows at bay:	(2) 18.44 sq. ft. = 36.88 sq. ft.
Narrow window at far left:	(1) 12.34 sq. ft. = 12.34 sq. ft.
Front door and transom:	(1) 26.00 sq. ft. = 26.00 sq. ft.
Subtotal:	121.22 sq. ft.
Upper Level:	
Windows on right:	(4) 18.44 sq. ft. = 73.76 sq. ft.
Windows at bay:	(2) 23.00 sq. ft. = 46.00 sq. ft.
Narrow window at far left:	(1) 12.34 sq. ft. = 12.34 sq. ft.
Subtotal:	132.10 sq. ft.
Attic Level:	
Window:	(1) 18.44 sq. ft. = 18.44 sq. ft.
Subtotal:	18.44 sq. ft.
Total glazed area:	271.76 sq. ft.
Total Area of façade =	896.42 sq. ft.
30% of 896.42 sq. ft. =	268.93 sq. ft.
50% of 896.42 sq. ft. =	448.21 sq. ft.
268.93 sq. ft. < 271.76 sq. ft. < 448.21 sq. ft.	



3
2A-1
WEST ELEVATION (RIGHT)
SCALE: 1/4" = 1'-0"



1
2A-1
NORTH ELEVATION (FRONT)
SCALE: 1/4" = 1'-0"

RELEASED FOR CONSTRUCTION

ELEVATIONS

CAROLINE LEYBURN
unique home design

2A-1
08-15-2023

AVUNTEE PATEL
558 Woodrow Ave.
Hapeville, GA 30354



DATE: May 12, 2025
 TO: Tonya Hutson
 FROM: Lynn Patterson
 RE: **Design Review – 3166 Dogwood Drive Revisions May 2025**

BACKGROUND

The City of Hapeville has received a revised design review application from Darrell Harris to build a 2 story 24' 8", 2,994 SF commercial building to house law offices at 3166 Dogwood Drive. Building materials are brick and stucco.

The property is zoned V, Village. It is subject to the Commercial/Mixed-Use SubArea C Architectural Design Standards.

<u>Original Approved Design</u>	<u>Proposed Design Change</u>
<i>Front Elevation</i>	
An upper roof with the same parapet detail as the lower roof.	The upper roof has been eliminated, and the parapet detail extends across the front facade, except where the brick is shown.
The curtainwall above the front entry extends above the lower roof.	The aluminum guardrail extends along the entire parapet.
The upper roof is wrapped by windows on the left-side	The top of the curtainwall above the front entry has been lowered to just below the second-floor ceiling.
<i>Right Side Elevation</i>	
An upper roof with the same parapet detail as the lower roof.	The upper roof and parapet have been eliminated.
The upper roof is wrapped by windows.	No scuppers and downspouts are shown.
Two scuppers and two downspouts.	No roof over-flow drains.
Two roof over-flow drains	
<i>Left Side Elevation</i>	
An upper roof with the same parapet detail as the lower roof.	The upper roof and parapet have been eliminated.
The upper roof is wrapped by windows.	No scuppers and downspouts are shown.
Three scuppers and three downspouts.	No roof over-flow drains.
Three roof over-flow drains.	
<i>Rear Elevation</i>	
An upper roof with the same parapet detail as the lower roof.	The upper roof and parapet have been eliminated.
A large section of window that extends from the top of the first floor to just below the upper roof parapet.	The large section of window that extends from the top of the first floor to just below the upper roof parapet has been eliminated.
	Three scuppers and three downspouts have been added.

	Three roof over-flow drains have been added.
	A rear door for an exterior storage closet has been added.
	A canopy has been added to the staff entry door.

FINDINGS

The height of the building meets the required 24' minimum.

Flat roofs and parapets are allowed.

Downspouts and scuppers are aluminum and compliant.

The proposed canopy at the rear will require a design exception.

Request for Approval of Exterior Elevation Changes for 3166 Dogwood Drive

This request is for approval of changes that have been made on the owner's behalf to reduce costs without sacrificing the aesthetic appeal or function of the structure. The proposed changes do not alter the approved location, exterior finishes, vertical height, or footprint of the structure.

The currently approved exterior elevations show the following:

Front Elevation:

1. An upper roof with the same parapet detail as the lower roof.
2. The curtainwall above the front entry extends above the lower roof.
3. The upper roof is wrapped by windows on the left-side

Right Side Elevation:

1. An upper roof with the same parapet detail as the lower roof.
2. The upper roof is wrapped by windows.
3. Two scuppers and two downspouts.
4. Two roof over-flow drains

Left Side Elevation:

1. An upper roof with the same parapet detail as the lower roof.
2. The upper roof is wrapped by windows.
3. Three scuppers and three downspouts.
4. Three roof over-flow drains.

Rear Elevation:

1. An upper roof with the same parapet detail as the lower roof.
2. A large section of window that extends from the top of the first floor to just below the upper roof parapet.

The proposed changes to the exterior elevations show the following:

Front Elevation:

1. The upper roof has been eliminated, and parapet detail extends across the front façade, except where the brick is shown.
2. The aluminum guardrail extends along the entire parapet.
3. The top of the curtainwall above the front entry has been lowered to just below the second-floor ceiling.

Monday, March 31, 2025

Right Side Elevation:

1. The upper roof and parapet have been eliminated.
2. No scuppers and downspouts are shown.
3. No roof over-flow drains.

Left Side Elevation:

1. The upper roof and parapet have been eliminated.
2. No scuppers and downspouts are shown.
3. No roof over-flow drains.

Rear Elevation:

1. The upper roof and parapet have been eliminated.
2. The large section of window that extends from the top of the first floor to just below the upper roof parapet has been eliminated.
3. Three scuppers and three downspouts have been added.
4. Three roof over-flow drains have been added.
5. A rear door for an exterior storage closet has been added.
6. A canopy has been added to the staff entry door.

The applicant believes that the approval of the exterior changes will not present a nuisance or unduly burden the neighborhood or the adjacent properties. Further, the applicant believes that the changes do not negatively affect the aesthetics of the structure and are necessary to realize a reduction in the overall cost of the project.

Monday, March 31, 2025

CEB

ARCHITECTS

200 Dogwood Hwy

Doyle, GA 30027

(404) 552-3802

(404) 552-3855

(404) 561-1611

charles@cebarch.com

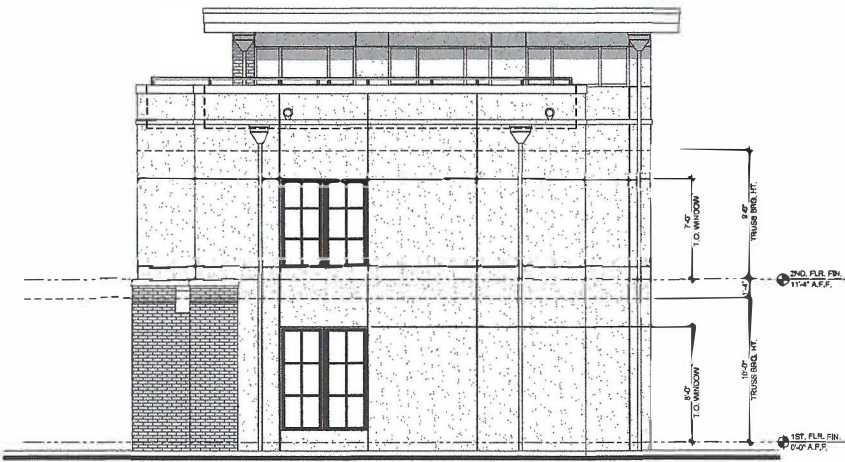
CHARLES A. & TAYLOR P.A.C.

ARCHITECTS • PLANNERS • ENGINEERS

Jasmine Blake-Stewart Office Building

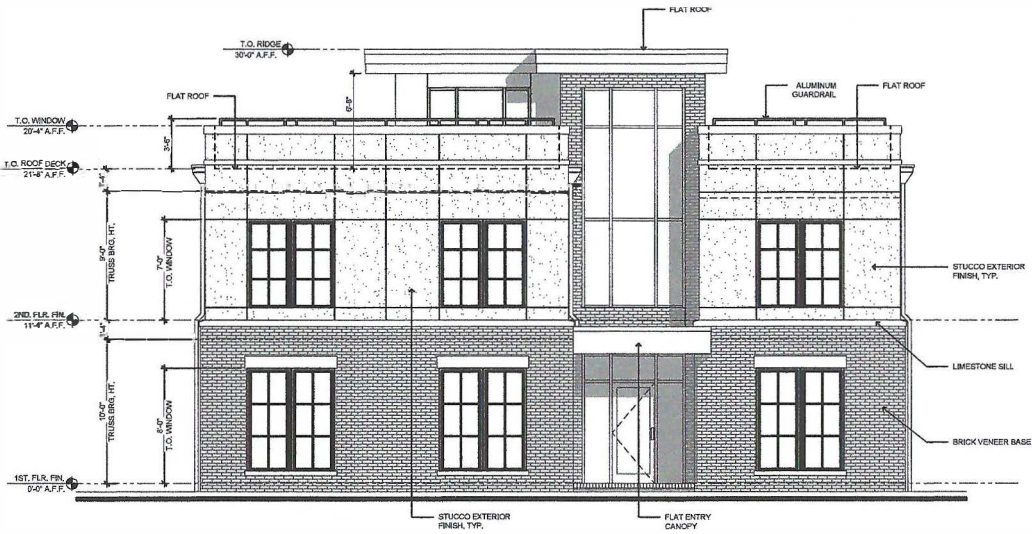
3166 Dogwood Drive, Hapeville, GA 30354 - Fulton County

BUILDING ELEVATIONS



RIGHT SIDE ELEVATION

SCALE	2
1/4" = 1'-0"	



FRONT ELEVATION

SCALE	1
1/4" = 1'-0"	

No.	Description	Date

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ISSUED FOR CONSTRUCTION

Project Number

Date05/07/2023

Drawn ByBAR

Checked ByCEB

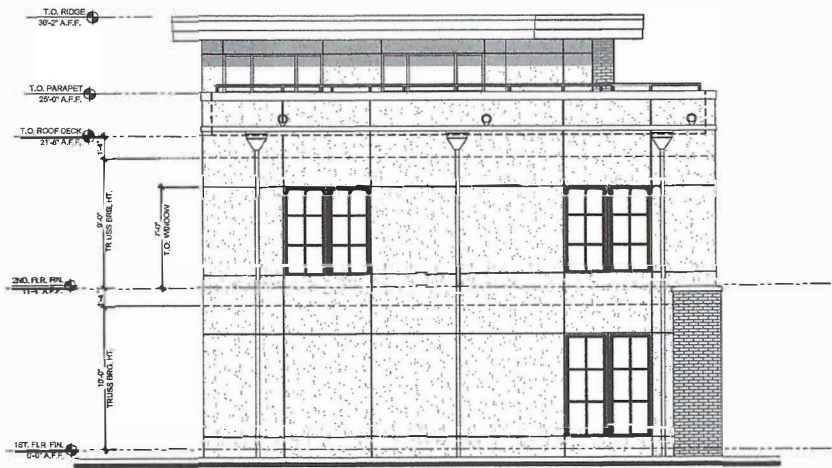
A2.1

ScaleAs indicated



Jasmine Blake-Stewart Office Building
3186 Dogwood Drive, Hapeville, GA 30354 - Fulton County

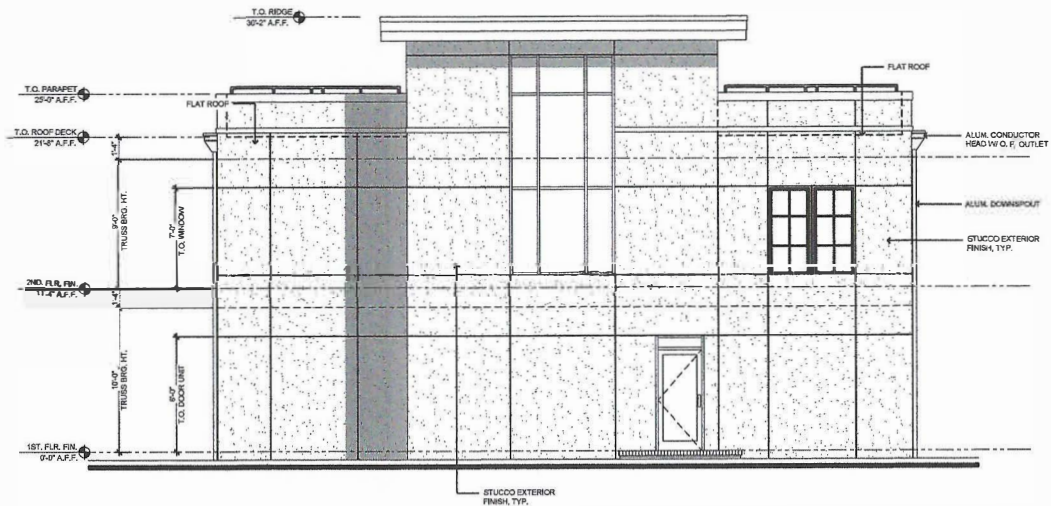
BUILDING ELEVATIONS



LEFT SIDE ELEVATION

SCALE
1/4" = 1'-0"

2



REAR ELEVATION

SCALE
1/4" = 1'-0"

1

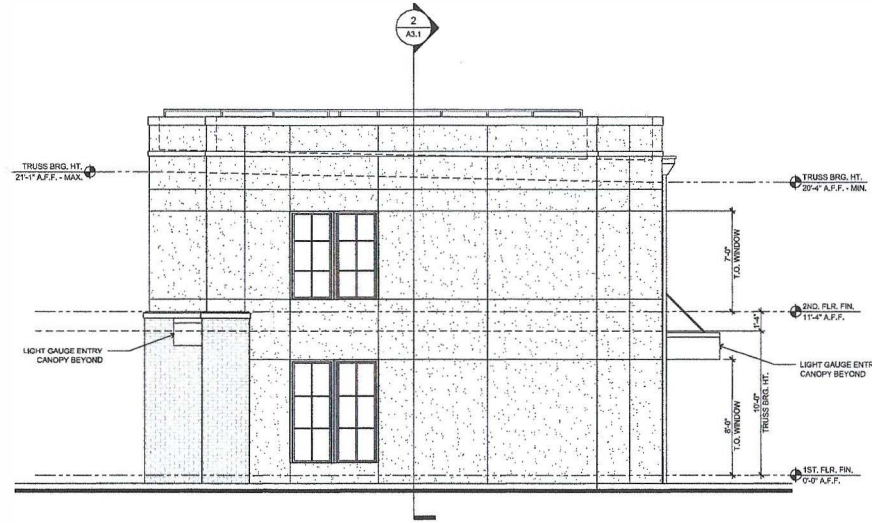
No.	Description	Date

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Project Number
Date 05/07/2023
Drawn By BAR
Checked By CEB

A2.2
Scale As indicated

Proposed Elevation Change



RIGHT SIDE ELEVATION

SCALE
1/4" = 1'-0"

2



FRONT ELEVATION

SCALE
1/4" = 1'-0"

1



Jasmine Blake-Stewart Office Building

3166 Dogwood Drive, Hapeville, GA 30354 - Fulton County

BUILDING ELEVATIONS



No.	Description	Date

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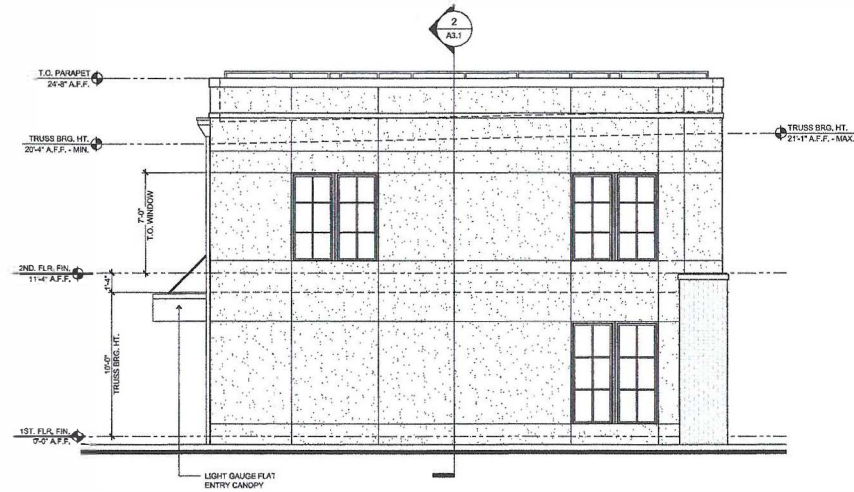
Project Number
Date 05/07/2023
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A2.1

Scale As indicated

ISSUED FOR CONSTRUCTION

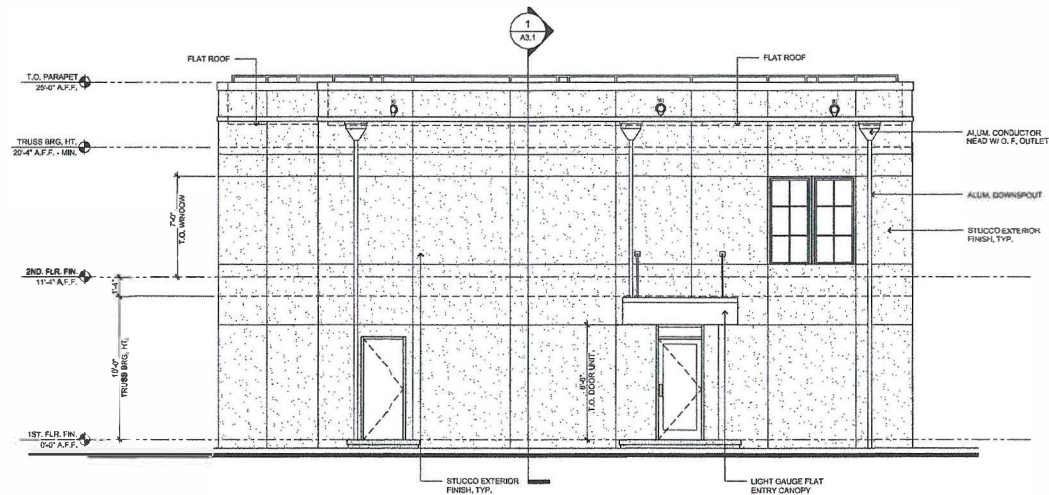
Proposed Elevation Change



LEFT SIDE ELEVATION

SCALE
1/4" = 1'-0"

2



REAR ELEVATION

SCALE
1/4" = 1'-0"

1



Architects • Planners • Engineers

Jasmine Blake-Stewart Office Building

3166 Dogwood Drive, Hapeville, GA 30354 • Fulton County

BUILDING ELEVATIONS



No.	Description	Date

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Project Number
Date 05/07/2023
Drawn By BAR
Checked By CEB

A2.2

Scale As indicated

ISSUED FOR CONSTRUCTION



DATE: May 12, 2025
TO: Tonya Hutson
FROM: Lynn Patterson
RE: **Design Review – 329 Maple St Solar Array**

The City of Hapeville has received a Design Review Application from Malick McGregor for the addition of 17 roof mounted solar panels to the existing single-family dwelling and rear shed and 15 ground mounted solar panels on a 7' tall pergola at 329 Maple Street.

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

APPLICABLE CODE SECTION

Sec. 93-30-1. Intent.

The city has identified a need to facilitate the siting, construction, installation, and decommissioning of solar energy systems (SESs) in a manner that encourages local economic development and protects the health, safety, and welfare of the citizens of the city, and at the same time mitigates any adverse impacts to the city or the community.

Sec. 93-30-2. Definitions.

Rooftop solar energy system means an SES that is structurally mounted to the roof of a house, building, or other structure and does not qualify as an integrated SES.

Sec. 93-30-3. Permitted use.

Integrated SES, rooftop SES, and ground mounted SES are permitted as accessory uses in all districts, subject to the requirements of this article. No other SES are permitted anywhere in the city.

Sec. 93-30-4. Applicability.

- (a) This article applies to the siting, construction, installation, and decommissioning of any new SES to be constructed or installed after the effective date of the ordinance from which this article derived within the jurisdiction of the city.
- (d) Unless otherwise expressly stated herein, an SES shall comply with all applicable federal, state, and local laws, including the requirements of this chapter and applicable building, fire, electric, and plumbing codes. If a provision in this article directly conflicts with a requirement of this chapter, this article shall control.

Sec. 93-30-6. Requirements for rooftop solar energy systems.

- (a) *Solar access.* Consistent with O.C.G.A. § 44-9-20 et seq., a property owner may obtain a solar easement from another property owner for the purpose of ensuring the rooftop SES adequate exposure to sunlight.
- (b) *Tree removal.* The removal of trees or natural vegetation for a rooftop SES shall be avoided to the extent reasonably practicable and shall comply with the requirements of section 93-2-14.
- (c) *Height.* A rooftop SES shall be given an equivalent exemption, if any, to the applicable zoning district's height restrictions for roof-mounted mechanical devices or equipment, except a rooftop SES mounted on a sloped roof shall not vertically exceed the highest point of the roof to which it is attached.
- (d) *Roof setback.* A setback from all roof edges, as defined by most recent the International Fire Code adopted by the state at the time the rooftop solar energy system is installed, shall be provided for rooftop solar energy systems to ensure that firefighters may access the roof in a quick and safe manner and may penetrate the roof to create ventilation if necessary.
- (e) *Visibility.* Solar energy systems shall not be allowed on a street-facing sloped roof unless the building owner demonstrates that other locations will result in a decrease in expected energy production of at least 40 percent.
- (f) *Slope.* Street facing rooftop SES shall be flush with or parallel to the roofline on a sloped roof. Solar panels not visible from the right-of-way may be tilted up to 15 percent from the roofline on a sloped roof.
- (g) *Equipment placement.* Solar energy equipment shall be installed, when possible, inside walls and attic spaces to reduce their visual impact.
- (h) *Decommissioning plan.* A decommissioning plan will be required for all rooftop systems and subject to current state and local regulations.

Sec. 93-30-7. - General requirements for all ground mounted solar energy systems.

The following requirements apply to all ground mounted SESs, in addition to the specific requirements in this article that apply to intermediate and large scale SESs respectively.

- (1) *Residential zoning.* Ground mounted SES shall not be visible from the public right-of-way for any properties zoned residential or where the primary use of the property is residential.
- (2) *Solar access.* Consistent with O.C.G.A. § 44-9-20 et seq., a property owner may obtain a solar easement from another property owner for the purpose of ensuring a ground mounted SES adequate exposure to sunlight.
- (3) *Impervious surface.* Ground mounted structures and components of the ground mounted SES, including transformers and foundations, shall be considered impervious and included when determining lot coverage. However, for purposes of compliance with this chapter's maximum lot coverage requirements found in [section 93-22.1-1](#), the panels of a ground mounted SES shall be considered pervious if they maintain sheet flow and allow for water to infiltrate under and around them through a pervious surface and into the subsoil.
- (4) *Lighting.* To reduce light pollution, lighting of a ground mounted SES shall:
 - a. Not be allowed in any residential district or where the primary use of a lot is residential;
 - b. Be limited to the minimum reasonably necessary for its safe operation;
 - c. Be directed downward where reasonably feasible;
 - d. Incorporate full cut-off fixtures; and

e. Reasonably utilize motion sensors.

(5) *Tree removal.* The removal of trees or natural vegetation for a ground mounted SES shall be avoided to the extent reasonably practicable and shall comply with the requirements of [section 93-2-14](#).

(6) *Decommissioning.* Unless otherwise approved by the planning commission, decommissioning shall begin no later than 12 months after a ground mounted SES has ceased to generate electricity or thermal energy:

a. For a ground mounted SES allowed without a permit, within six months of the beginning of decommissioning, the SES and all structures associated with it shall be removed, all materials shall be recycled or otherwise reused to the extent reasonably practicable, and the property shall be returned to its condition prior to the installation of the SES or to some other condition reasonably appropriate for the designated land use; and

b. For a ground mounted SES allowed with a permit, the SES shall be decommissioned in accordance with the most recent decommissioning plan approved by the planning commission, and as further described in the special use permit provision of this article.

Sec. 93-30-10. Permit required.

It shall be unlawful for any person to place, install, alter, relocate, or modify any SES without first obtaining a permit from the city planner in the manner set forth in this article and otherwise complying with the terms herein.

Sec. 93-30-11. Permit application submission, requirements, decision, and appeal.

(a) *Submission.* SES applications must be delivered to the department of community services. All permit applications must be stamped by planning and zoning department personnel indicating the submission date.

(b) *Requirements for all SES.* The applicant shall submit the following information on a form provided by the department of community services:

- (1) The address of the property on which the SES will be located;
- (2) The applicant's name, address, telephone number, and email address;
- (3) The property owner's name, address, telephone number, and email address;
- (4) If known, the installation company's name, address, telephone number, email address, and license number;
- (5) Evidence of the applicant's control of the property, such as a deed, lease, or option agreement with the landowner; and
- (6) A site plan of the property that depicts the locations of all existing and proposed structures (including solar arrays, inverters, transformers, electrical substations, and buildings), property lines, rights-of-way, roads, required setbacks, and visual buffers.

(d) *Approval of the department of community services.* The department of community services shall review all SES applications that require a permit for compliance with the building codes and indicate such compliance in a written report attached to the application. After completing any such report, the department of community services shall forward the application, including any other documents submitted by the applicant, and the report to the city planner.

(e) *Decision of the city planner.*

- (1) Provided that the application is complete, all permit fees have been paid, and the proposed SES and the lot on which the SES is to be placed are in compliance with all requirements of this division and

all other ordinances and laws of the city, the city planner shall render a determination and shall inform the applicant of his or her decision within 45 calendar days of the submission date. The city planner shall give notice to the applicant of his or her decision on such application by hand delivery or by mailing such notice, by certified mail, return receipt requested, to the address on the permit application on or before the 45th day.

Upon the expiration of the 45-day period without a decision being made on the application, the applicant shall be permitted to erect and maintain the SES under this statutory provision unless and until the city planner notifies the applicant of a denial of the application and states the reasons for the denial. No person erecting a SES under this provision shall acquire any vested rights to continued maintenance of such SES, and following a subsequent denial of a SES application by the city planner, the SES must be brought into compliance with this division.

- (2) The city planner shall reject any application that is incomplete or contains false material information or omissions within 45 calendar days of the submission date. Applications subsequently submitted in conformity with this section shall be deemed to have been submitted on the date of resubmission rather than the original submission date.
- (3) If the city planner determines that a previously issued SES was issued pursuant to an application that contained false material information or omissions, he or she shall promptly revoke such permit and the sign shall be immediately removed.

(f) *Appeal.* An applicant who is dissatisfied by a decision of the city planner on the application for a SES permit has the right to appeal that decision. Any such appeal shall occur under the following procedures:

- (1) The applicant shall deliver a written notice of appeal to the city planner within 14 calendar days of his or her receipt of the notice of the decision. In the event that that no appeal is made within the 14-day period, the decision of the city planner shall become final. In the event that an appeal is filed, the city planner shall promptly transmit to the board of appeals all documents constituting the record upon which the decision appealed from was made.

- (2) The board of appeals shall:

- a. Hold a hearing on any timely filed appeal no more than 30 days after the notice of appeal was received; and
- b. Make its final determination of the appeal not more than 30 days after the date of such hearing.

The review by the board of appeals shall be limited to a determination of whether or not the decision of the city planner was clearly erroneous.

- (3) Any appeal of the decision of the board of appeals shall be taken to the county superior court by a petition for a writ of certiorari.



Sec. 93-30-12. Permit expiration date.

If work authorized under a permit has not been completed to the satisfaction of the code enforcement officer using common industry standards within six months after the date of issuance, the permit shall become null and void.

Sec. 93-30-13. Permit fees.

Each application for a SES permit must be accompanied by a payment for the permit fee. The fee for a SES permit shall be as established by the adoption of a resolution for permit fees by mayor and council. A copy of the fee schedule shall be available electronically on the city website or as hard copy in the department of community services.

FINDINGS

1. The ground array is behind a fence so not visible from the public right of way.
2. A decommissioning plan has been provided.

The array is recommended for Design Committee approval.

CITY OF HAPEVILLE

DESIGN REVIEW APPLICATION

SUBMITTAL DATE: April 4th, 2025

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

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

Applicant: Malick McGregor **Contact Number:** [REDACTED]

Applicants Address: 329 Maple St. Hapeville, GA 30354

E-Mail Address: almc@perfectenergy.us **Zoning Classification:** Residential

Address of Proposed Work: 329 Maple St. Hapeville, GA 30354

Parcel ID# (INFORMATION MUST BE PROVIDED): 14-0094-0010-133-5

Property Owner: Malick McGregor **Contact Number:** [REDACTED]

Project Description (including occupancy type): 10.08 Kw DC Solar System with 6.6 kWh Backup battery pack.

Contractors Name: Perfect Energy, Inc. **Contact Number:** [REDACTED]

Contact Person: Al McGregor **Contact Number:** [REDACTED]

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

6d333bba-6936-4fdd-
babb-b7f5f94f974b

Digitally signed by 6d333bba-6936-4fdd-
babb-b7f5f94f974b
Date: 2025.04.04 12:15:59 -06'00'

Applicants Signature

April 4th, 2025

Date

Project Class (check one):

☒ Residential ☐ Commercial ☐ Mixed-Use Development

Project Type:

☐ New Commercial Construction ☐ Addition to Existing Commercial Building

☐ Addition to Existing Residential Structure ☐ Accessory Structure

☐ Site Plan, Grading & Landscaping ☐ New Single-Family Residential Construction

☒ Other

Total Square Footage of proposed New Construction: no change

Total Square Footage of existing building: 1,369

Estimated Cost of Construction: \$66,000.00

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

Brick & mortar. Asphalt shingle roof.

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

Solar panels will be installed on the roof, and pergola. Electric boxes will be at the West wall near the North wall corner.

Will any trees be removed to accommodate the project? NO

NOTICE

Please be advised that the Community Service Department is here to assist all applicants regarding application procedures, meeting schedules and necessary deadlines. The Community Service Department does **NOT** make any final decisions for the Design Review Committee, Sign Committee, Planning Commission, Board of Appeals or rezoning request to Mayor and Council.

A complete application and dimensioned architectural drawings must be submitted before the Community Service Department will accept an application and forward the same to the appropriate entity.

Building inspections issued by the City of Hapeville are contracted out to State of Georgia Certified Inspectors. These inspectors make the final decisions regarding building, electrical, plumbing and HVAC work completed in the City of Hapeville. The Hapeville Fire Marshal conducts inspections issued through the Community Services Department as needed. Both the Certified Inspectors and Fire Marshal make the final decisions before Certificates of Occupancy's are issued.

Please be advised that the Community Service Department shall not be responsible for your purchasing materials, equipment, items, signs, etc... before you receive final approval by any entity whose approval is required.

I understand that it is a felony to make false statements or writings to the City of Hapeville, Georgia pursuant to O.C.G.A. 16-10-20 and I may be prosecuted for a violation thereof.

(Please Print & Initial)

I  swear or affirm that before receipt of an application, I have received this notice and I read and write the English language or I have had someone read and explain this document to me.



DEPARTMENT OF PLANNING AND ZONING

DESIGN REVIEW APPLICATION INSTRUCTIONS AND ACKNOWLEDGEMENT

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

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

Malick McGregor

Malick McGregor

4/4/25

Printed Name

Signature

Date

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

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

After Recording Return To:
McMichael & Gray, P.C.
2055 North Brown Road, Suite 250
Lawrenceville, GA 30043

Order No.: MID-GA-240735-PUR ✓

Property Appraiser's Parcel I.D. Number:
✓ 14 -0094-0010-133-5

THIS DOCUMENT HAS BEEN
E-RECORDED AT
Deed BOOK 08595 PAGE 332
COUNTY Fulton STATE GA
DATE: 11/15/25 TIME: 11:31 A.M./P.M.

LIMITED WARRANTY DEED

STATE OF GEORGIA

COUNTY OF FULTON

THIS INDENTURE, made this 19th day of December, 2024, between

✓ **Sergio Bernardo and Mishele Walker**

as party or parties of the first part, hereinafter called Grantor, and

✓ **Malick McGregor**

as party or parties of the second part, hereinafter called Grantee (the words "Grantor" and "Grantee" to include their respective heirs, successors and assigns where the context requires or permits).

WITNESSETH that: Grantor, for and in consideration of the sum of Ten And No/100 Dollars (\$10.00) and other good and valuable considerations in hand paid at and before the sealing and delivery of these presents, the receipt whereof is hereby acknowledged, has granted, bargained, sold, aliened, conveyed and confirmed, and by these presents does grant, bargain, sell, alien, convey and confirm unto the said Grantee,

✓ ALL THAT TRACT OR PARCEL OF LAND LYING AND BEING IN LAND LOT 94 OF THE 14TH DISTRICT, OF FULTON COUNTY, GEORGIA, BEING LOT 24, BLOCK C OF MRS. EMMA A. MOORE PROPERTY, AS PER PLAT THEREOF RECORDED IN PLAT BOOK 19, PAGE 68, FULTON COUNTY, GEORGIA RECORDS, WHICH PLAT IS INCORPORATED HERIN AND MADE A PART HEREOF BY REFERENCE FOR A MORE DETAILED DESCRIPTION.

THIS DEED IS GIVEN SUBJECT TO ALL EASEMENTS AND RESTRICTIONS OF RECORD, IF ANY.

SUBJECT to all zoning ordinances, easements and restrictions of record affecting said premises.

TO HAVE AND TO HOLD the said tract or parcel of land, with all and singular the rights, members and appurtenances thereof, to the same being, belonging, or in anywise appertaining, to the only proper use, benefit and behoof of the said Grantee forever in **FEE SIMPLE**.

AND THE SAID Grantor will warrant and forever defend the right and title to the above described property unto the said Grantee against the claims of all persons owning, holding or claiming by, through or under the said Grantor.

IN WITNESS WHEREOF, the Grantor has signed and sealed this deed, the day and year above written.

Signed, sealed and delivered in the presence of:

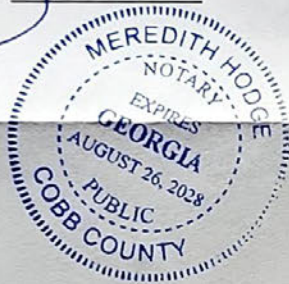
[Signature]
Unofficial Witness

[Signature] (Seal)
Sergio Bernardo

[Signature]
Notary Public

[Signature] (Seal)
Mishele Walker

My Commission Expires: _____
[Notary Seal]





April 4, 2025

To: City of Hapeville

Re: Decommissioning Plan

Project Address: 329 Maple St. Hapeville, GA 30354

Project Scope: 10.08-DC-STC / 9kW-AC Roof Mount & 7' pergola Grid-Tied PV System.

If an owner were to decommission this system, the steps would be:

- Remove and recycle modules, racks, conduit, and wiring.
- Patch existing holes in roof.
- Dispose of inverters through existing electrical equipment recycling programs.

This photovoltaic (PV) system is wholly owned by the customer and decommissioning would be their responsibility. The system lifetime is 30+ years. Most PV systems installed nationwide have been installed over the past 13 years which means they still have over 20 years of remaining lifespan. As such, there has not been a large demand for industry specializing in the recycling or decommissioning of PV modules and equipment outside of utility scale projects. However, since PV modules contain recyclable materials (glass, plastic, aluminum, copper, and silicon), they can be recycled through the existing channels used to process these materials.

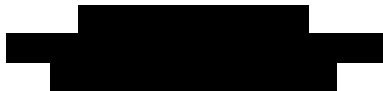
Cordially

A handwritten signature in blue ink, appearing to read "Malick McGregor", is written over the printed name.

Perfect Energy, Inc.

Malick McGregor

CEO



PROJECT NARRATIVE:

SYSTEM DESCRIPTION:

- 1. 10.08 KW DC GRID-TIED SOLAR PHOTOVOLTAIC SYSTEM WITH BATTERY BACK UP.
- 2. (3) ARRAYS ON A SINGLE STORY RESIDENCE WITH A COMP SHINGLE ROOF AND (1) ARRAY ON A SOLAR ENGINEERED PERGOLA AND (1) ARRAY ON A SHED.
- 3. (1) HYBRID INVERTER LOCATED ON EXTERIOR OF RESIDENCE AND (9) MICROINVERTERS LOCATED UNDERNEATH MODULES.
- 4. CONNECT SYSTEM TO **UPGRADED** MAIN SERVICE PANEL LOCATED INSIDE RESIDENCE WITH NEW PV BREAKER.
- 5. AC DISCONNECT AND RAPID SHUTDOWN SWITCH LOCATED EXTERIOR OF RESIDENCE.
- 6. PV BREAKERS ALSO LOCATED IN AC COMBINER PANEL LOCATED ADJACENT TO INVERTER.
- 7. RUN EMT CONDUIT ON EXTERIOR OF RESIDENCE, ROMEX CABLE THROUGH ATTIC OF RESIDENCE, AND TRENCH SCH 40 PVC FROM BOTH PERGOLA AND SHED TO RESIDENCE.
- 8. ROOF STRUCTURE: 2"X4" TRUSSES AT 24" O.C.
- 9. FIRE RATING: ET SOLAR CLASS-C MODULE WITH UNIRAC CLASS-A RACKING

SYSTEM EQUIPMENT LIST:

- (32) 315W ET SOLAR MODULES: ELITE POLY ET-P672315WB
- (9) APSYSTEMS DS3-S MICROINVERTERS (DUAL)
- (1) SOL-ARK HYBRID 12.0KW INVERTER: SOL-ARK-12K-2P-N
- (1) MIDNITE SOLAR 16 KWh BATTERY: MNPOWERFLO16 WALL MOUNT BATTERY
- (1) 100 AMP 'BACKED-UP' SUBPANEL PANEL
- (1) 100 AMP COMBINER PANEL
- (1) SQUARE-D DU323NRB 100A 2-POLE NON-FUSED AC DISCONNECT
- (34) UNIRAC FLASH LOC FOOTINGS
- (~135') UNIRAC SOLARMOUNT STANDING RAILING
- (2) UNIRAC SOLARMOUNT RAIL SPLICES
- (22) UNIRAC UNIVERSAL MIDCLAMPS
- (24) UNIRAC UNIVERSAL ENDCLAMPS
- (1) 80 AMP 2-POLE PV BREAKER (AT MSP)

DESIGN CRITERIA:

- EXPOSURE: B
- ASCE 7-16 RISK II 3 SEC WIND GUST = 107 MPH
- GROUND SNOW LOAD = 5 PSF

REFERENCE CODES AND CONSTRUCTION NOTES:

THIS PROJECT SHALL COMPLY WITH THE FOLLOWING CODES:

2023 NATIONAL ELECTRICAL CODE (NEC),
2018 INTERNATIONAL BUILDING CODE (IBC),
2018 INTERNATIONAL RESIDENTIAL CODE (IRC),
MANUFACTURER AND PV INDUSTRY STANDARDS,
AND ALL STATE AND JURISDICTION BY-LAWS AND ORDINANCES.

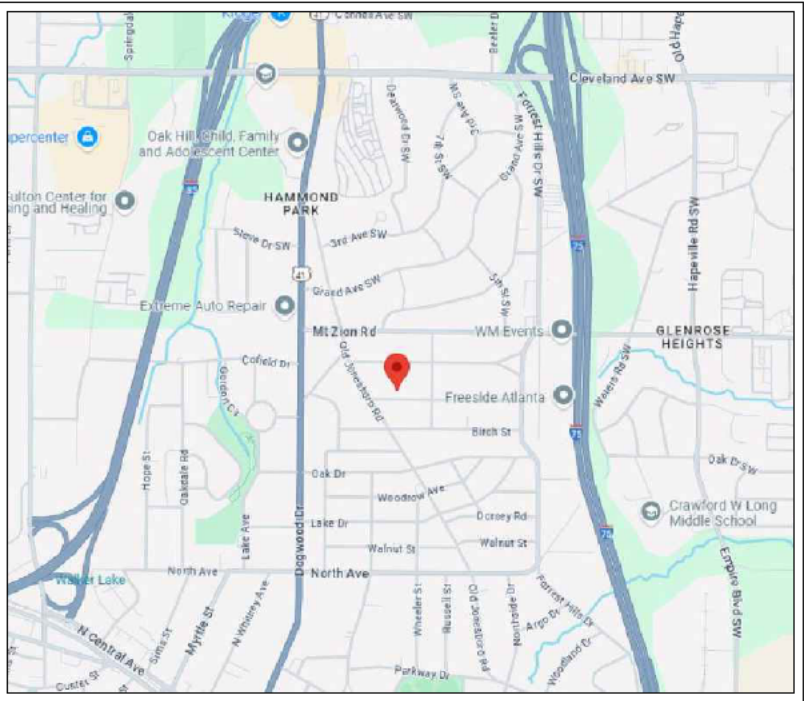
PROJECT SHALL BE INSTALLED BY A LICENSED CONTRACTOR OR **PROPERTY HOME OWNER.**

SHEET INDEX

- PV-1 COVER
 - PV-2 SITE PLAN
 - PV-3 ELECTRICAL LAYOUT
 - PV-4 ARRAY LAYOUT
 - PV-5 STRUCTURAL ELEVATION
 - PV-6 SINGLE LINE DIAGRAM
 - PV-7 ELECTRICAL NOTES
 - PV-9 SIGNAGE
 - PV-9 SITE DIRECTORY
- ATTACHMENTS:
- + MODULE SPEC SHEET
 - + INVERTER SPEC SHEET
 - + RACKING SPEC SHEET



VICINITY MAP: (NOT TO SCALE)



FRONT OF RESIDENCE:



MALICK MCGREGOR
329 MAPLE ST
HAPEVILLE, GA 30354
(OWNER / BUILDER)

DRAFTER
SIGNATURE

DRAWING
TYPE

COVER SHEET

PROJECT ADDRESS

MALICK MCGREGOR
329 MAPLE ST
HAPEVILLE, GA 30354

DATE

4/04/2025

REVISION #

SHEET NUMBER

PV-1

1

SITE PLAN

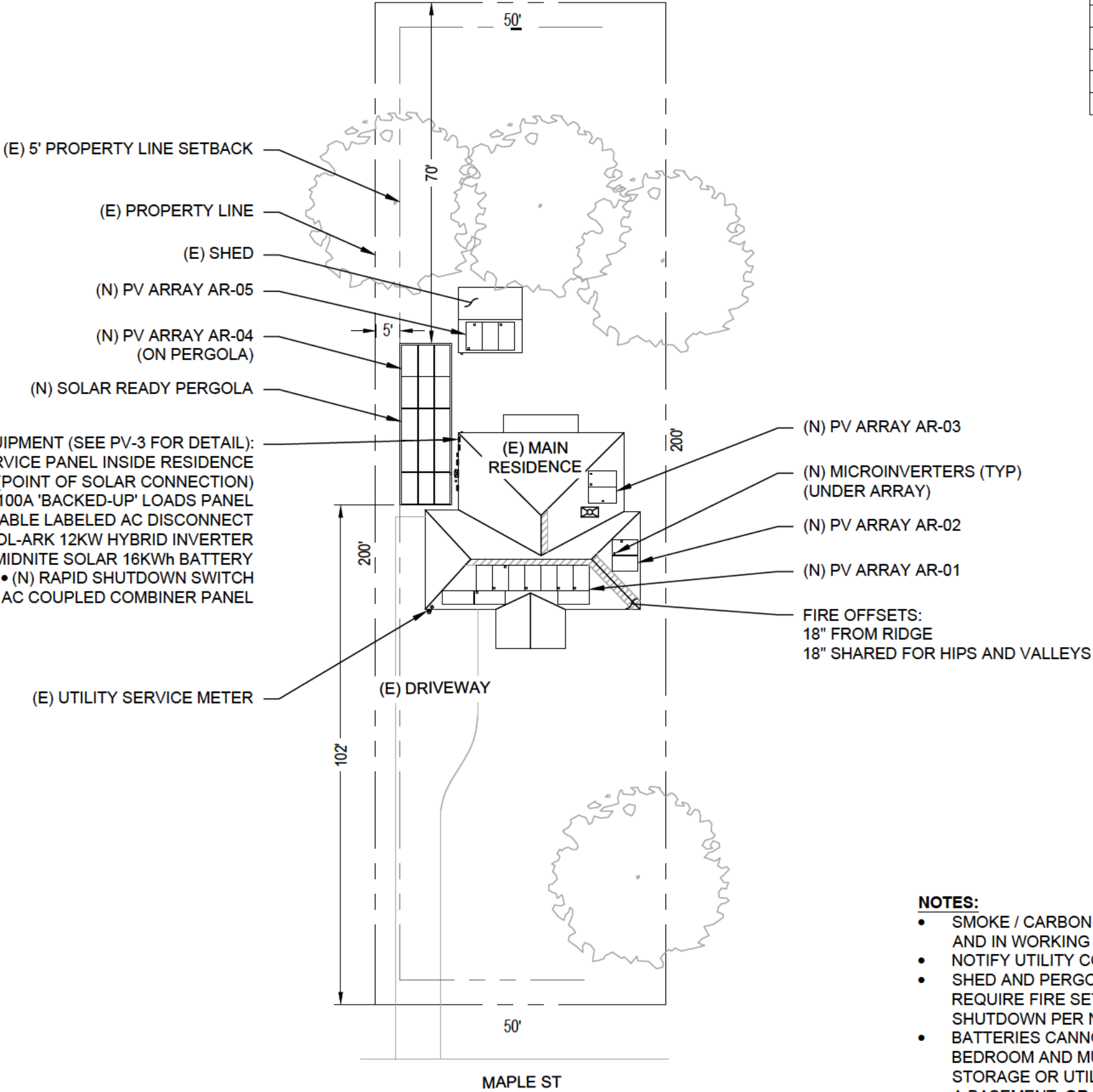
SCALE: 1" = 25'

APN#:14=009400101335
YEAR BUILT: 1920
TOTAL ROOF AREA: 1593.9 SQFT
ARRAY AREA: 295.8 SQFT
TOTAL COVERAGE: 18.6%
OK TO USE 18" RIDGE SETBACK



NOTE: SOLAR READY PERGOLA TO BE DESIGNED AND ENGINEERED BY THEIR PARTY AND NOT TO BE GREATER THAN 7' IN HEIGHT.

- ELECTRICAL EQUIPMENT (SEE PV-3 FOR DETAIL):
- **UPGRADED** MAIN SERVICE PANEL INSIDE RESIDENCE (POINT OF SOLAR CONNECTION)
 - (N) 100A 'BACKED-UP' LOADS PANEL
 - (N) VISIBLE LOCKABLE LABELED AC DISCONNECT
 - (N) SOL-ARK 12KW HYBRID INVERTER
 - (N) MIDNITE SOLAR 16KWh BATTERY
 - (N) RAPID SHUTDOWN SWITCH
 - (N) AC COUPLED COMBINER PANEL



ARRAY INFORMATION				
ARRAY	# OF MODULES	PITCH	MAGNETIC ORIENTATION	TRUE ORIENTATION
AR-01	10	36°	174°	180°
AR-02	2	36°	84°	90°
AR-03	2	27°	84°	90°
AR-04	15	5°	264°	270°
AR-05	3	27°	174°	180°

- NOTES:
- SMOKE / CARBON MONOXIDE ALARMS ARE REQUIRED TO BE INSTALLED AND IN WORKING CONDITION.
 - NOTIFY UTILITY COMPANY BEFORE ACTIVATION OF PV SYSTEM.
 - SHED AND PERGOLA ARE NOT OCCUPANCY STRUCTURES AND DO NOT REQUIRE FIRE SETBACKS. PERGOLA DOES NOT REQUIRE RAPID SHUTDOWN PER NEC 690.12 EXCEPTION.
 - BATTERIES CANNOT BE INSTALLED IN A ROOM THAT OPENS INTO A BEDROOM AND MUST ONLY BE INSTALLED IN A SHEETROCKED GARAGE, STORAGE OR UTILITY (ELECTRICAL) CLOSET, THE NON-LIVABLE SPACE OF A BASEMENT, **OR OUTSIDE** (IRC R328.4).

MALICK MCGREGOR
329 MAPLE ST
HAPEVILLE, GA 30354
(OWNER / BUILDER)

DRAFTER
SIGNATURE

DRAWING
TYPE

SITE PLAN

PROJECT ADDRESS

MALICK MCGREGOR
329 MAPLE ST
HAPEVILLE, GA 30354

DATE

4/04/2025

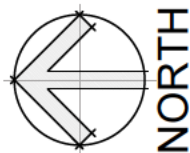
REVISION #

SHEET NUMBER

PV-2

PERGOLA ARRAY LAYOUT

SCALE: 1/4" = 1'

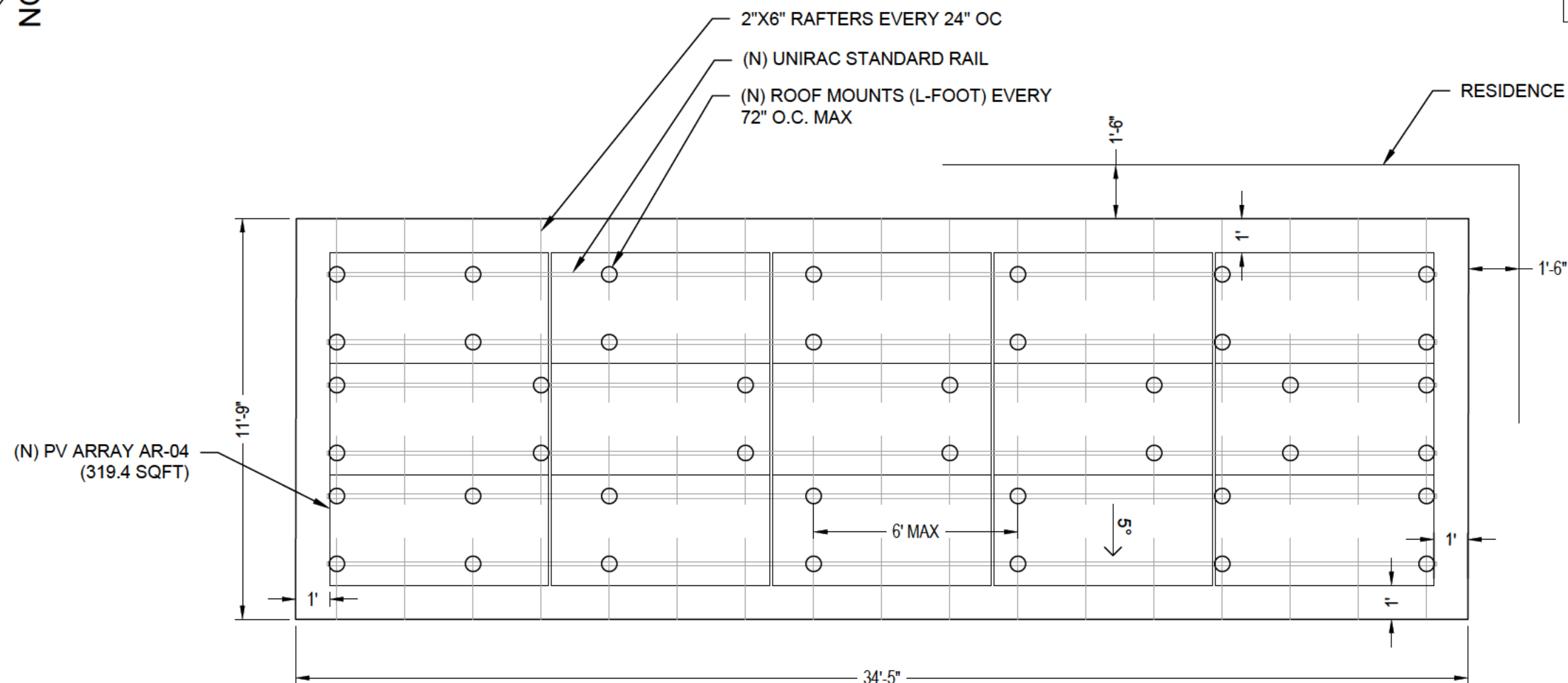


NOTES:

- STAGGER PENETRATIONS TO EVENLY DISTRIBUTE LOAD ACROSS ALL TRUSSES UNDER ARRAY.
- ALL DIMENSIONS ARE APPROXIMATIONS.

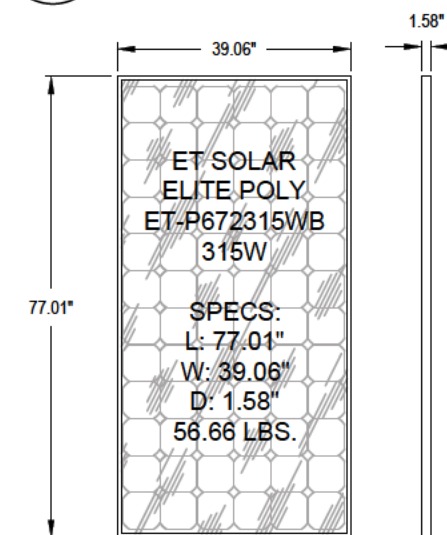
CONSTRUCTION NOTES

- ROOF PITCH: 5°
- ROOF STRUCTURE: 2"x6" RAFTERS AT 24" O.C.
- MOUNTS ARE ON GRID SPACING, OCCURRING AT RAFTERS.
- VERIFY RAFTER LOCATIONS IN FIELD.
- REFER TO MODULE AND RACKING MFR'S INSTALL MANUALS.
- MAX SPAN BETWEEN MOUNTS: 72" O.C.
- APPROX (42) MOUNTS TOTAL
- ALL FASTENERS STAINLESS STEEL U.O.N.



MODULE DETAIL

SCALE: 1/2" = 1'



PERGOLA EQUIPMENT LIST:

(15) 315W ET SOLAR MODULES: ELITE POLY ET-P672315WB
(42) UNIRAC L-FOOT
(~195') UNIRAC SOLARMOUNT STANDING RAILING
(12) UNIRAC SOLARMOUNT RAIL SPLICES
(24) UNIRAC UNIVERSAL MIDCLAMPS
(12) UNIRAC UNIVERSAL ENDCLAMPS

ASSUMPTIONS:

EXPOSURE: B
ASCE 7-16 RISK II 3 SEC WIND GUST = 107 MPH
GROUND SNOW LOAD = 5 PSF

LOAD INFORMATION			
	QUANTITY	WEIGHT / UNIT	TOTAL WEIGHT
MODULES	15	56.66 LBS	849.9 LBS
L-FOOT	42	0.31 LBS	13.0 LBS
RAILING	195 FT	0.75 LBS/FT	146.3 LBS
RAIL SPLICES	12	0.45 LBS	5.4 LBS
MID CLAMPS	24	0.11 LBS	2.6 LBS
END CLAMPS	12	0.10 LBS	1.2 LBS
WEIGHT OF ARRAY			1018.4 LBS
AREA			319.4 SQFT
WEIGHT PER AREA			3.19 LBS / SQFT
WEIGHT PER PENETRATION			24.2 LBS / PEN

MALICK MCGREGOR
329 MAPLE ST
HAPEVILLE, GA 30354
(OWNER / BUILDER)

DRAFTER
SIGNATURE

DRAWING
TYPE

ARRAY LAYOUT

PROJECT ADDRESS

MALICK MCGREGOR
329 MAPLE ST
HAPEVILLE, GA 30354

	DATE
--	------

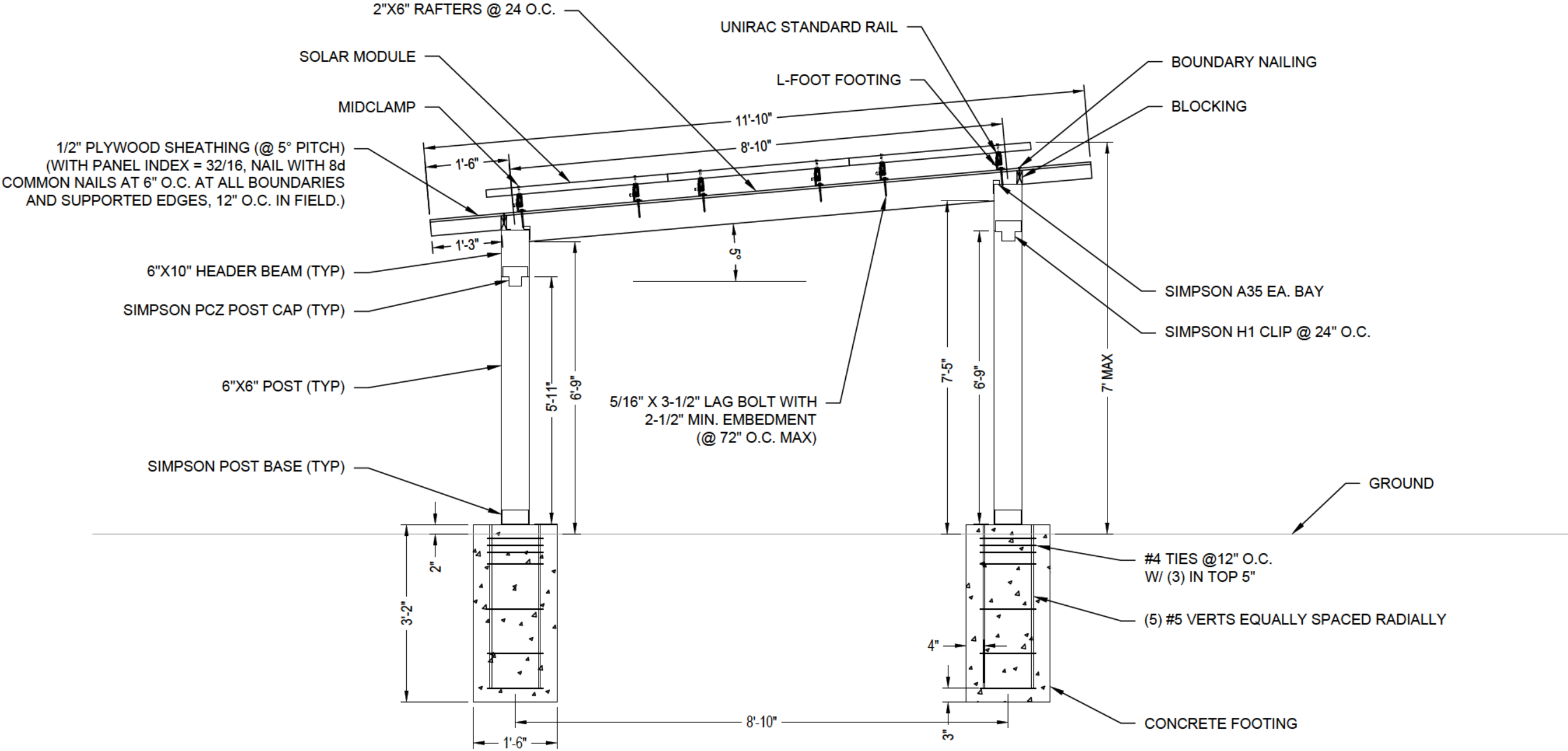
4/16/2025

REVISION #

SHEET NUMBER

PG-1

LAG BOLT SCHEDULE			
LOCATION	INFIELD	3' SIDE ZONES	3' CORNER ZONES
BOLT SIZE	5/16" x 3-1/2"	5/16" x 3-1/2"	5/16" x 3-1/2"
MIN EMBED	2-1/2"	2-1/2"	2-1/2"



MALICK MCGREGOR
329 MAPLE ST
HAPEVILLE, GA 30354
(OWNER / BUILDER)

DRAFTER
SIGNATURE

DRAWING
TYPE

SIDE VIEW

PROJECT ADDRESS

MALICK MCGREGOR
329 MAPLE ST
HAPEVILLE, GA 30354

DATE

4/16/2025

REVISION #

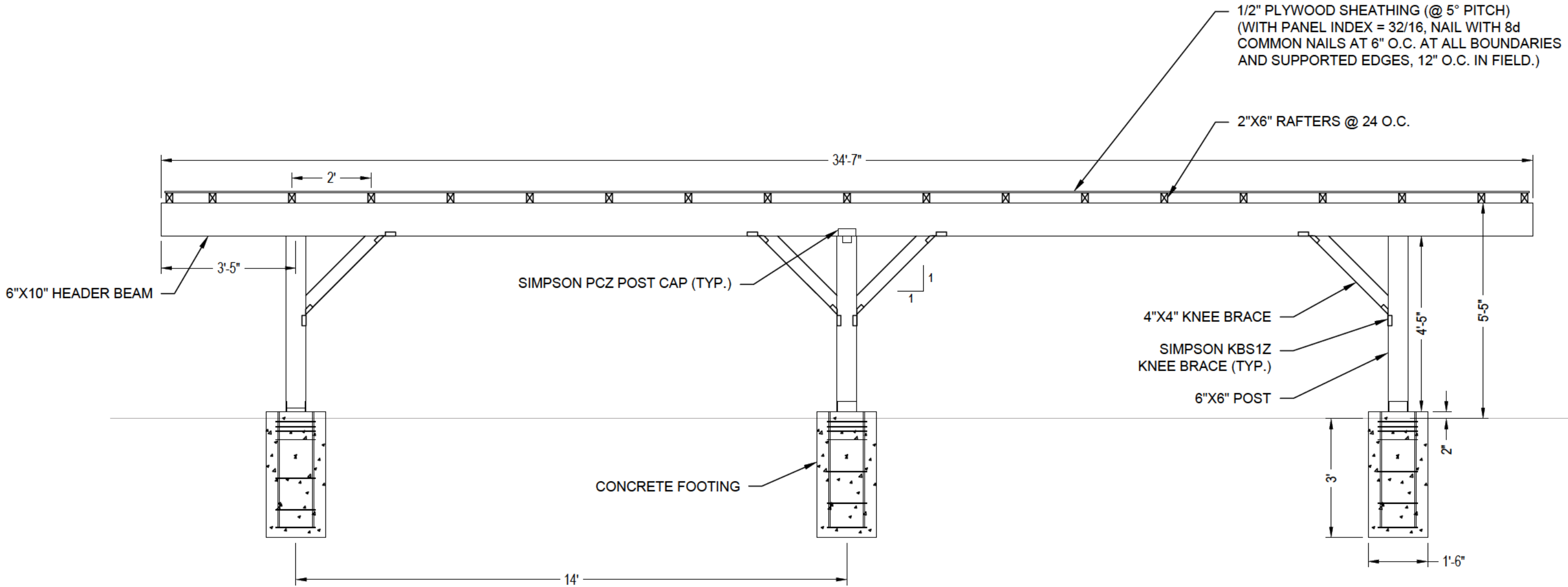
SHEET NUMBER

PG-2

1

PERGOLA FRONT ELEVATION

SCALE: 3/8" = 1'

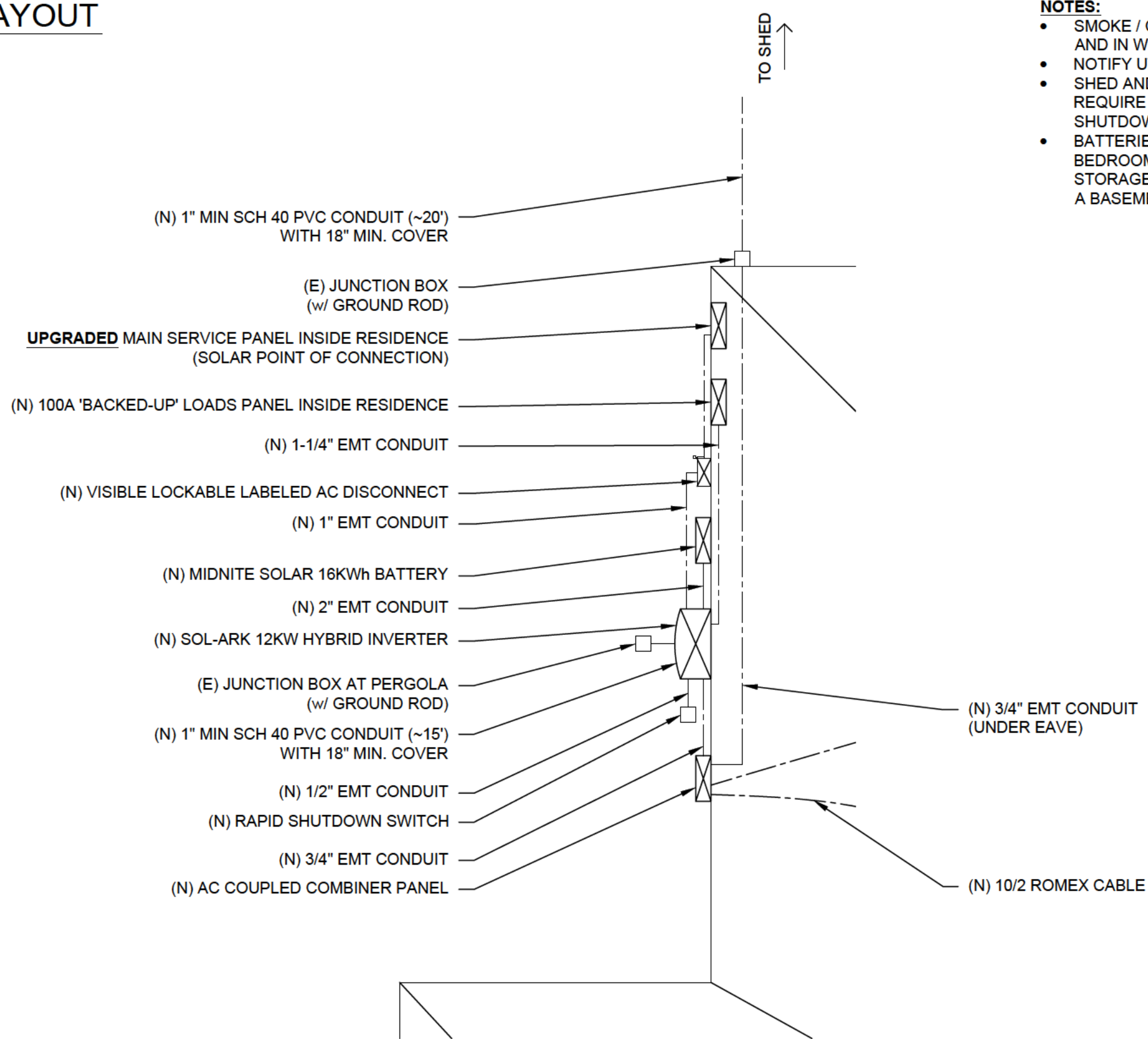


MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354 (OWNER / BUILDER)	DRAFTER SIGNATURE	FRONT ELEVATION	PROJECT ADDRESS MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354	DATE 4/16/2025	SHEET NUMBER PG-3 Page 33 of 62
	DRAWING TYPE			REVISION #	

1

ELECTRICAL LAYOUT

SCALE: 3/8" = 1'



- NOTES:**
- SMOKE / CARBON MONOXIDE ALARMS ARE REQUIRED TO BE INSTALLED AND IN WORKING CONDITION.
 - NOTIFY UTILITY COMPANY BEFORE ACTIVATION OF PV SYSTEM.
 - SHED AND PERGOLA ARE NOT OCCUPANCY STRUCTURES AND DO NOT REQUIRE FIRE SETBACKS. PERGOLA DOES NOT REQUIRE RAPID SHUTDOWN PER NEC 690.12 EXCEPTION.
 - BATTERIES CANNOT BE INSTALLED IN A ROOM THAT OPENS INTO A BEDROOM AND MUST ONLY BE INSTALLED IN A SHEETROCKED GARAGE, STORAGE OR UTILITY (ELECTRICAL) CLOSET, THE NON-LIVABLE SPACE OF A BASEMENT, **OR OUTSIDE** (IRC R328.4).

MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354 (OWNER / BUILDER)	DRAFTER SIGNATURE	ELECTRICAL LAYOUT	PROJECT ADDRESS MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354	DATE 4/04/2025	SHEET NUMBER PV-3 Page 34 of 62
	DRAWING TYPE			REVISION #	

1

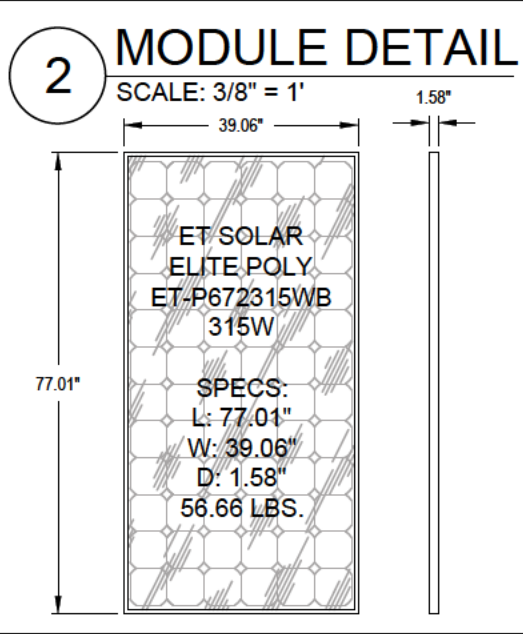
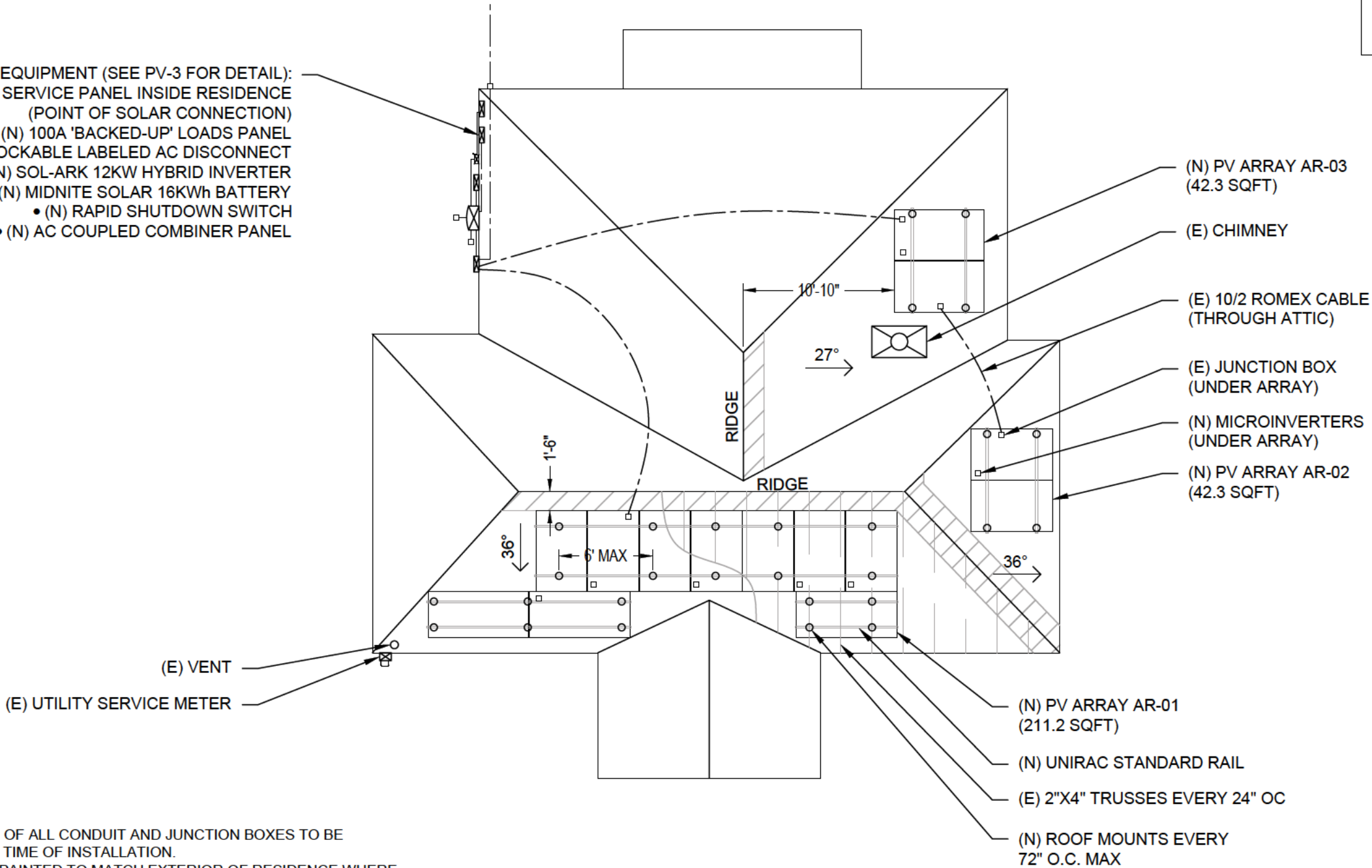
ARRAY LAYOUT

SCALE: 1/8" = 1'



- CONSTRUCTION NOTES
- ROOF PITCH: 36° AND 27°
 - ROOF CLADDING: SINGLE LAYER COMPOSITION SHINGLE
 - ROOF STRUCTURE: 2"X4" ENGINEERED TRUSSES AT 24" O.C.
 - MOUNTS ARE ON GRID SPACING, OCCURRING AT RAFTERS.
 - VERIFY RAFTER LOCATIONS IN FIELD.
 - REFER TO MODULE AND RACKING MFR'S INSTALL MANUALS.
 - MAX SPAN BETWEEN MOUNTS: 72" O.C.
 - APPROX (28) NEW MOUNTS TOTAL
 - PLUMBING AND MECHANICAL VENTS SHALL NOT BE COVERED BY SOLAR MODULES.
 - ALL FASTENERS STAINLESS STEEL U.O.N.

- ELECTRICAL EQUIPMENT (SEE PV-3 FOR DETAIL):
- **UPGRADED** MAIN SERVICE PANEL INSIDE RESIDENCE (POINT OF SOLAR CONNECTION)
 - (N) 100A 'BACKED-UP' LOADS PANEL
 - (N) VISIBLE LOCKABLE LABELED AC DISCONNECT
 - (N) SOL-ARK 12KW HYBRID INVERTER
 - (N) MIDNITE SOLAR 16KWh BATTERY
 - (N) RAPID SHUTDOWN SWITCH
 - (N) AC COUPLED COMBINER PANEL



- ADDITIONAL NOTES:
- FINAL LOCATION OF ALL CONDUIT AND JUNCTION BOXES TO BE DETERMINED AT TIME OF INSTALLATION.
 - CONDUIT TO BE PAINTED TO MATCH EXTERIOR OF RESIDENCE WHERE APPLICABLE AND IS TO BE SUPPORTED EVERY 10' MAX.
 - 30" WIDE X 36" DEEP WORKING SPACE CLEARANCES REQUIRED ABOUT ALL ELECTRICAL EQUIPMENT.
 - STAGGER PENETRATIONS TO EVENLY DISTRIBUTE LOAD ACROSS ALL TRUSSES UNDER ARRAY.
 - ALL DIMENSIONS ARE APPROXIMATIONS.

MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354 (OWNER / BUILDER)	DRAFTER SIGNATURE	ARRAY LAYOUT	PROJECT ADDRESS MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354	DATE 4/04/2025	SHEET NUMBER PV-4.1 Page 35 of 62
	DRAWING TYPE			REVISION #	

1

ARRAY LAYOUT

SCALE: 1/8" = 1'

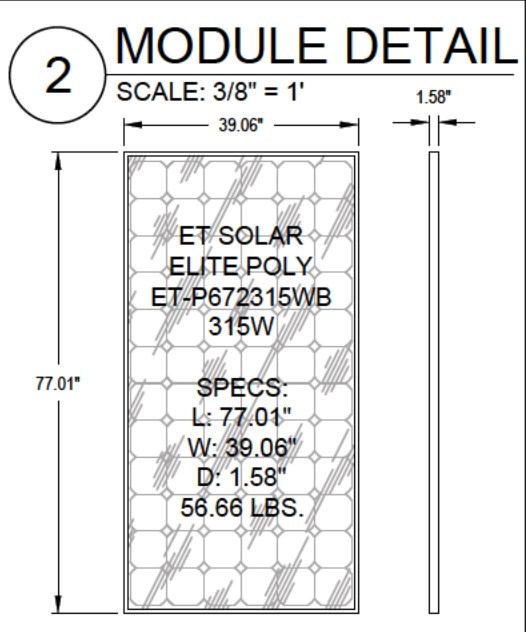
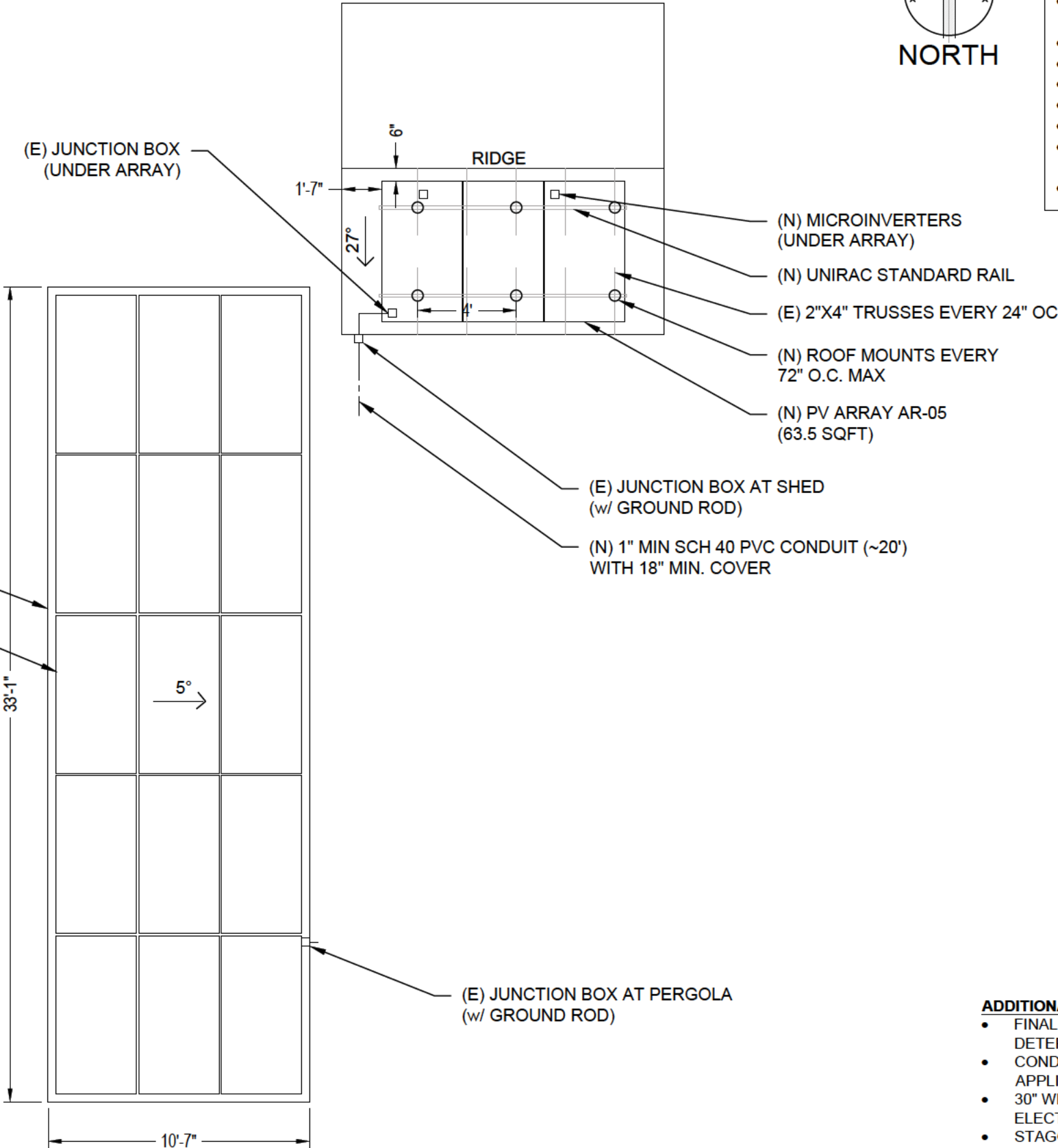


- CONSTRUCTION NOTES
- PITCH: 5° (PERGOLA) AND 27° (SHED)
 - ROOF CLADDING: SINGLE LAYER COMPOSITION SHINGLE
 - ROOF STRUCTURE: 2"X4" ENGINEERED TRUSSES AT 24" O.C.
 - MOUNTS ARE ON GRID SPACING, OCCURRING AT RAFTERS.
 - VERIFY RAFTER LOCATIONS IN FIELD.
 - REFER TO MODULE AND RACKING MFR'S INSTALL MANUALS.
 - MAX SPAN BETWEEN MOUNTS: 72" O.C.
 - APPROX (6) NEW MOUNTS TOTAL
 - PLUMBING AND MECHANICAL VENTS SHALL NOT BE COVERED BY SOLAR MODULES.
 - ALL FASTENERS STAINLESS STEEL U.O.N.

NOTE: SOLAR READY PERGOLA TO BE DESIGNED AND ENGINEERED BY THEIR PARTY AND NOT TO BE GREATER THAN 7' IN HEIGHT.

(N) SOLAR READY PERGOLA

(N) PV ARRAY AR-04
(319.4 SQFT)



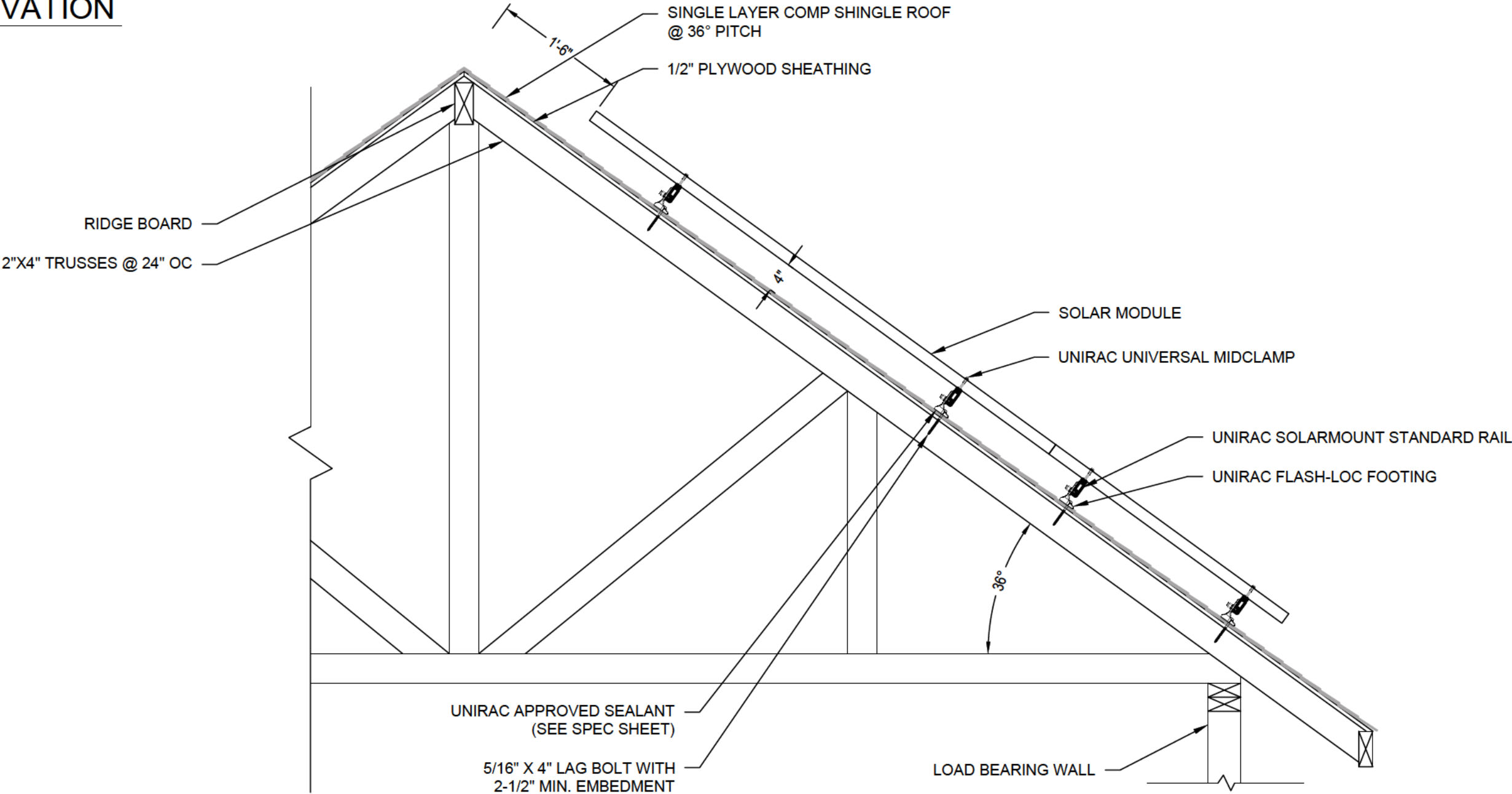
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 - CONDUIT TO BE PAINTED TO MATCH EXTERIOR OF RESIDENCE WHERE APPLICABLE AND IS TO BE SUPPORTED EVERY 10' MAX.
 - 30" WIDE X 36" DEEP WORKING SPACE CLEARANCES REQUIRED ABOUT ALL ELECTRICAL EQUIPMENT.
 - STAGGER PENETRATIONS TO EVENLY DISTRIBUTE LOAD ACROSS ALL TRUSSES UNDER ARRAY.
 - ALL DIMENSIONS ARE APPROXIMATIONS.

MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354 (OWNER / BUILDER)	DRAFTER SIGNATURE	ARRAY LAYOUT	PROJECT ADDRESS MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354	DATE 4/04/2025	SHEET NUMBER PV-4.2 Page 36 of 62
	DRAWING TYPE			REVISION #	

1

ROOF ELEVATION

SCALE: 3/4" = 1'



LOAD INFORMATION			
	QUANTITY	WEIGHT / UNIT	TOTAL WEIGHT
MODULES	14	56.66 LBS	793.2 LBS
INVERTERS	7	5.8 LBS	40.6 LBS
FOOTINGS	28	0.64 LBS	73.6 LBS
RAILING	115 FT	0.75 LBS/FT	86.3 LBS
RAIL SPLICES	2	0.45 LBS	0.9 LBS
MID CLAMPS	18	0.11 LBS	2.0 LBS
END CLAMPS	20	0.10 LBS	2.0 LBS
WEIGHT OF ARRAY			998.6 LBS
AREA			295.8 SQFT
WEIGHT PER AREA			3.38 LBS / SQFT
WEIGHT PER PENETRITION			35.7 LBS / PEN.

ASSUMPTIONS:

EXPOSURE: B
ASCE 7-16 RISK II 3 SEC WIND GUST = 107 MPH
GROUND SNOW LOAD = 5 PSF

STRUCTURAL EVALUATION:

DEAD LOAD:
3.38 PSF < 4.0 PSF OK
35.7 LBS/PEN < 45 LBS/PEN OK

FOOTING SPACING:
72" < 90" OK
(SEE IRONRIDGE SPAN TABLE)

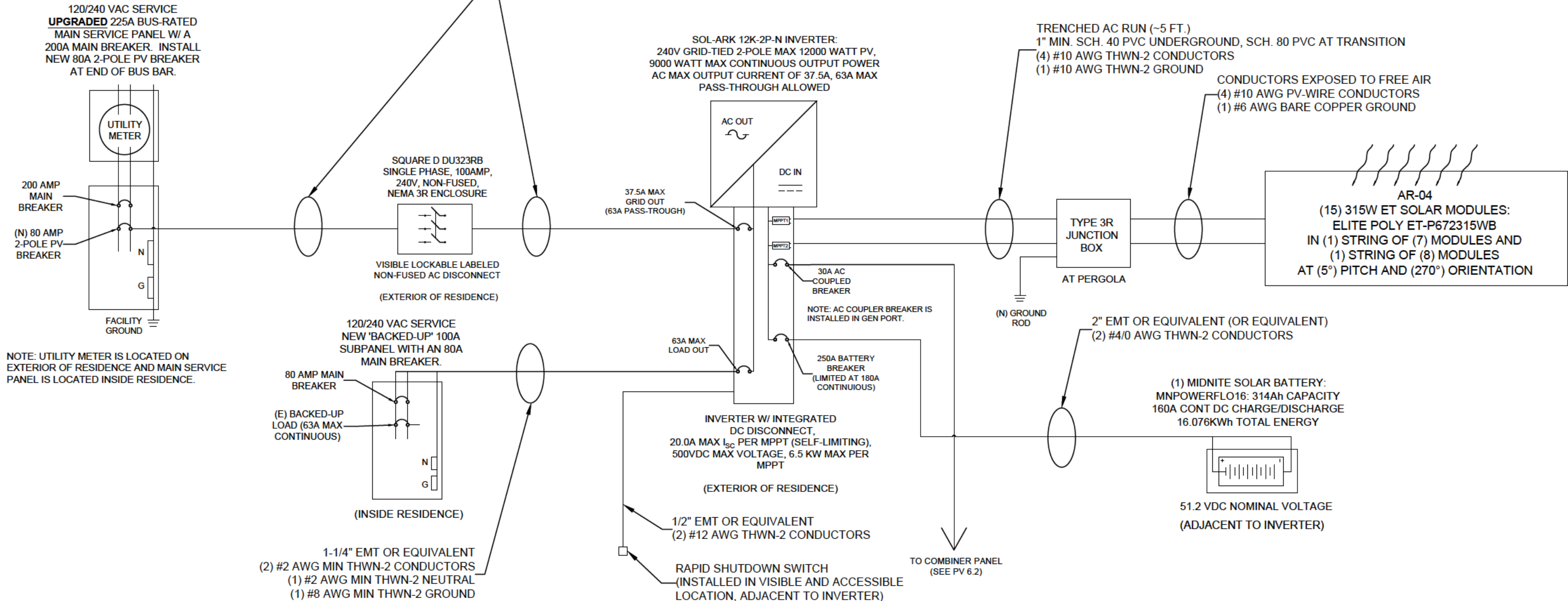
MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354 (OWNER / BUILDER)	DRAFTER SIGNATURE	STRUCTURAL ELEVATION	PROJECT ADDRESS MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354	DATE 4/04/2025	SHEET NUMBER PV-5 Page 37 of 62
	DRAWING TYPE			REVISION #	

1

ELECTRICAL DIAGRAM

NO SCALE

- NOTES:
- MAIN SERVICE PANEL TO BE UPGRADED TO A 225A BUS RATED SERVICE PANEL WITH A 200A MAIN BREAKER.
 - TOTAL OCPD REQUIRED IS $37.5A \times 1.25 = 50A$, THUS SATISFYING THE 120% RULE. HOWEVER, INSTALL AN 80A BREAKER TO ALLOW FOR PASS-THROUGH TO 'BACKED-UP' SUBPANEL.



10.18 KW DC SOLAR ARRAY:

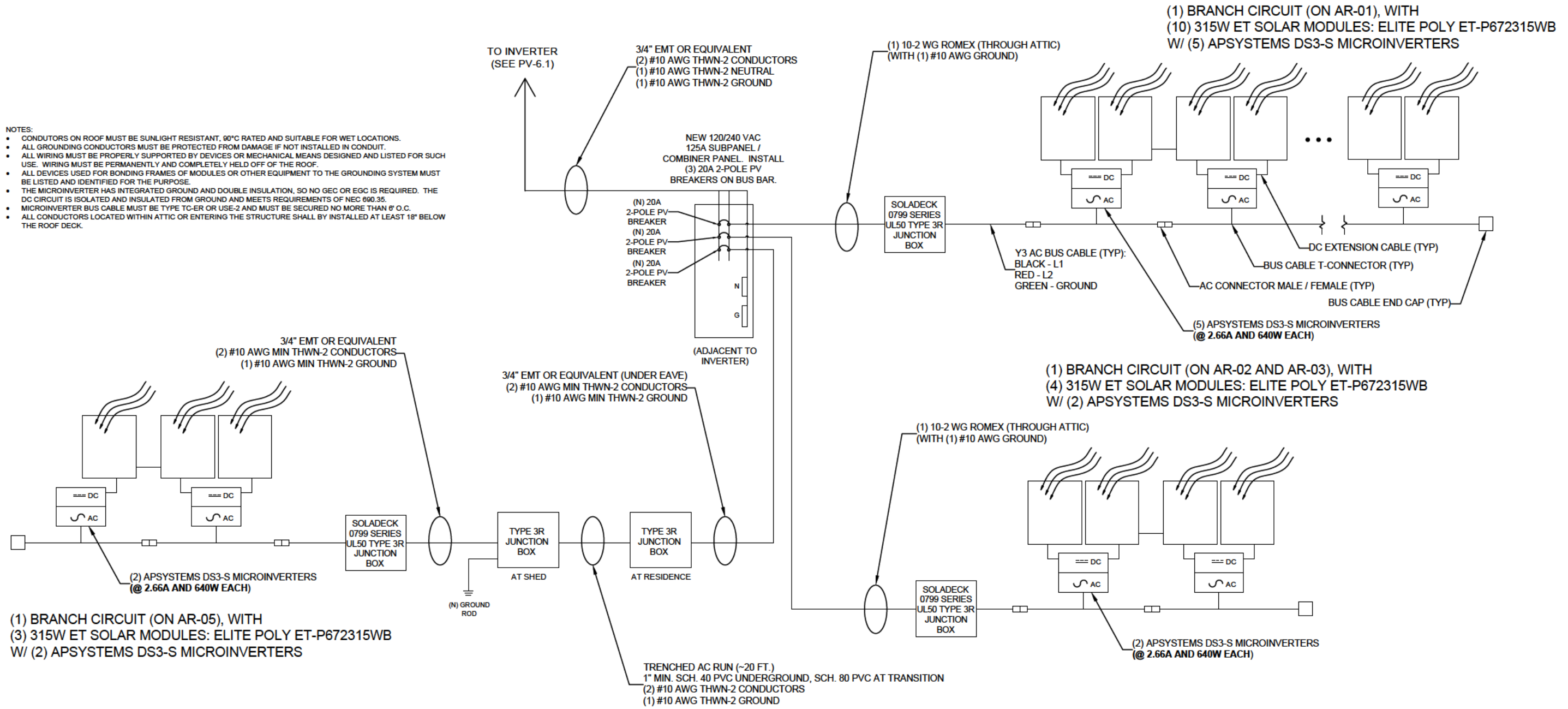
(15) 315W ET SOLAR MODULES: ELITE POLY ET-P672315WB, WITH
SOL-ARK HYBRID 12.0KW INVERTER: SOL-ARK-12K-2P-N, WITH
(1) STRING OF (8) MODULES IN SERIES (ON AR-04), AND
(4) STRING OF (7) MODULES IN SERIES (ON AR-04), AND
(3) BRANCH CIRCUITS (ON AR-01, AR-02, AR-03, AND AR-05), CONSISTING A TOTAL OF:
(17) 315W ET SOLAR MODULES: ELITE POLY ET-P672315WB, WITH
(9) APSYSTEMS DS3-S MICROINVERTERS (DUAL)

MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354 (OWNER / BUILDER)	DRAFTER SIGNATURE	SINGLE LINE DIAGRAM	PROJECT ADDRESS MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354	DATE 4/04/2025	SHEET NUMBER PV-6.1 Page 38 of 62
	DRAWING TYPE			REVISION #	

1

ELECTRICAL DIAGRAM

NO SCALE



10.18 KW DC SOLAR ARRAY:
(15) 315W ET SOLAR MODULES: ELITE POLY ET-P672315WB, WITH
SOL-ARK HYBRID 12.0KW INVERTER: SOL-ARK-12K-2P-N, WITH
(1) STRING OF (8) MODULES IN SERIES (ON AR-04), AND
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(9) APSYSTEMS DS3-S MICROINVERTERS (DUAL)

MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354 (OWNER / BUILDER)	DRAFTER SIGNATURE	SINGLE LINE DIAGRAM	PROJECT ADDRESS MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354	DATE 4/04/2025	SHEET NUMBER PV-6.2 Page 39 of 62
	DRAWING TYPE			REVISION #	

10.08 KW DC SOLAR ARRAY: (15) 315W ET SOLAR MODULES: ELITE POLY ET-P672315WB, WITH SOL-ARK HYBRID 12.0KW INVERTER: SOL-ARK-12K-2P-N, WITH (1) STRING OF (8) MODULES IN SERIES (ON AR-04), AND (4) STRING OF (7) MODULES IN SERIES (ON AR-04), AND (3) BRANCH CIRCUITS (ON AR-01, AR-02, AR-03, AND AR-05), CONSISTING A TOTAL OF: (17) 315W ET SOLAR MODULES: ELITE POLY ET-P672315WB, WITH (9) APSYSTEMS DS3-S MICROINVERTERS (DUAL)		<table><tr><th colspan="2">PV MODULE SPECS</th></tr><tr><td>MAKE</td><td>ET SOLAR</td></tr><tr><td>MODEL</td><td>ELITE POLY ET-P672315WB</td></tr><tr><td>SHORT CIRCUIT CURRENT</td><td>9.12 A</td></tr><tr><td>OPEN CIRCUIT VOLTAGE</td><td>45.75 VDC</td></tr><tr><td>OPERATING CURRENT</td><td>8.56 A</td></tr><tr><td>OPERATING VOLTAGE</td><td>36.81 VDC</td></tr><tr><td>NOMINAL POWER</td><td>315 W</td></tr><tr><td>V(OC) TEMPERATURE COEFFINIENT</td><td>-0.34 %/°C</td></tr></table>		PV MODULE SPECS		MAKE	ET SOLAR	MODEL	ELITE POLY ET-P672315WB	SHORT CIRCUIT CURRENT	9.12 A	OPEN CIRCUIT VOLTAGE	45.75 VDC	OPERATING CURRENT	8.56 A	OPERATING VOLTAGE	36.81 VDC	NOMINAL POWER	315 W	V(OC) TEMPERATURE COEFFINIENT	-0.34 %/°C	<table><tr><th colspan="2">ALLOWABLE SOLAR BACKFEED CALCULATION AT MSP</th></tr><tr><td>UPGRADED BUS BAR RATING</td><td>225 A</td></tr><tr><td>MAIN BREAKER RATING</td><td>200 A</td></tr><tr><td>SOLAR BACKFEED OCPD</td><td>50 A</td></tr><tr><td colspan="2">MAX ALLOWABLE BACKFEED (225A X 120%) - 200A BREAKER = 70A ALLOWABLE > 50A SOLAR, SO OK TO CONNECT VIA PV BREAKER (PER NEC 705.12).</td></tr></table>		ALLOWABLE SOLAR BACKFEED CALCULATION AT MSP		UPGRADED BUS BAR RATING	225 A	MAIN BREAKER RATING	200 A	SOLAR BACKFEED OCPD	50 A	MAX ALLOWABLE BACKFEED (225A X 120%) - 200A BREAKER = 70A ALLOWABLE > 50A SOLAR, SO OK TO CONNECT VIA PV BREAKER (PER NEC 705.12).																	
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ELECTRICAL NOTES - ALL PV MODULES, ARRAY FRAMING AND RACKING SHALL BE GROUNDED PER MFR'S SPECIFICATIONS. - ALL EQUIPMENT WILL BE UL 1703, UL 1741, OR UL 2703 LISTED AND CERTIFIED. - MODULES WILL BE GROUNDED WITH INTEGRATED GROUNDING MODULE CLAMPS. ARRAY FRAME WILL BE GROUNDED WITH ILSCO GBL-4DBT (OR EQUIVALENT - SUITABLE FOR DIRECT BURIAL AND CONTACT WITH COPPER OR ALUMINUM) LAY IN TYPE GROUNDING LUG. USE SPECIFIED MODULE GROUNDING POINTS. - ALL WIRE TERMINATIONS, SPLICES AND CONNECTIONS SHALL BE MADE USING A LISTED DEVICE OR ELECTRICAL BOX SUITED FOR THE PURPOSE. ALL WIRES NOT IN CONDUIT TO BE PROVIDED WITH STRAIN RELIEF AT ENTRY INTO JUNCTION BOXES. - PROVIDE AND INSTALL CONDUIT EXPANSION FITTINGS, PER MANUFACTURER'S SPECIFICATIONS, IN CONDUIT RUNS WHERE THERMAL EXPANSION IS 0.25" OR MORE, BASED ON RECORD MAXIMUM AND MINIMUM TEMPERATURES FOR THE SITE (SEE NEC TABLE 310.15(B)(2)(C), AND USING EXPANSION COEFFICIENT OF STEEL. - BOTH ENDS OF ALL METALLIC CONDUIT CONTAINING GROUNDING ELECTRODE CONDUCTORS SHALL BE BONDED PER NEC 250.64(E). - PROVIDE AND INSTALL ALL GROUNDING AS REQUIRED BY NEC ARTICLES 250, 690 AND SYSTEM MANUFACTURER. - INSTALLATIONS WHICH USE TRANSFORMER-LESS INVERTERS - PV WIRE TYPE IS REQUIRED FOR ALL DC WIRE RUNS IN FREE AIR, OR NOT IN CONDUIT. - EACH CURRENT CARRYING CONDUCTOR IN ALL PV SOURCE CIRCUITS OR PV OUTPUT CIRCUITS SHALL BE DISCONNECTED/ FUSED, WHEN NECESSARY. - CONTRACTOR SHALL VERIFY EXISTENCE OF UNDERGROUND UTILITIES PRIOR TO ANY EXCAVATIONS. - ELECTRICAL TRENCH RUNS, WHERE USED, SHALL USE SCHEDULE 40 PVC CONDUIT AND PROVIDE 18" MIN CLEARANCE FROM TOP OF CONDUIT TO GRADE, AND MAGNETIC WARNING TAPE AT 12" BELOW GRADE. 24" CLEARANCE AND SCHEDULE 80 PVC IS REQUIRED IN AREAS WHERE SUBJECT TO VEHICLE TRAFFIC. - CHECK WITH LOCAL JURISDICTION FOR ANY ADDITIONAL FILL AND COMPACTION REQUIREMENTS, SPOILS TREATMENT AND/OR EROSION CONTROL MEASURES PRIOR TO EXCAVATION. - INSTALLATIONS IN LIGHTENING-PRONE LOCATIONS ARE RECOMMENDED TO UTILIZE DC LIGHTENING ARRESTORS IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. - SUPPLY SIDE CONNECTIONS SHALL ONLY BE MADE WITH LISTED AND APPROVED TAPS. - ALL WIRE RUNS SHALL NOT EXCEED 2% CALCULATED VOLTAGE DROP. - VERIFY EXISTING GROUNDING ELECTRODE. IF NONE EXISTS, A NEW GROUND ROD MAY BE REQUIRED. MIN. SIZE 8' LONG x 5/8" DIA, COPPER CLAD. BOND TO GAS, AND HOT AND COLD WATER PIPES. - USE WATERPROOF FITTINGS FOR ALL EXTERIOR CONDUIT. - GROUNDING ELECTRODE CONDUCTOR (AC SIDE OF INVERTER) IS #8 IF IN CONDUIT, OR #6 AWG IF EXPOSED AND SUBJECT TO DAMAGE, AND SHALL BE CONTINUOUS FROM INVERTER TO GROUND ROD. USE IRREVERSIBLE SPLICES WHERE NECESSARY. - EQUIPMENT GROUNDING CONDUCTOR (DC SIDE OF INVERTER) IS #10 IF IN CONDUIT, OR #6 AWG IF EXPOSED AND SUBJECT TO DAMAGE (NEC 690.46).		<table><tr><th colspan="2">MICRO-INVERTER SPECS</th></tr><tr><td>MAKE</td><td>APSYSTEMS</td></tr><tr><td>MODEL</td><td>DS3-S</td></tr><tr><td>PEAK OUTPUT POWER</td><td>640 W</td></tr><tr><td>MAX INPUT DC VOLTAGE</td><td>60 V</td></tr><tr><td>MAX DC SHORT CIRCUIT CURRENT</td><td>2 X 16 A</td></tr><tr><td>NOMINAL OUTPUT CURRENT</td><td>2.66 A</td></tr><tr><td>NOMINAL VOLTAGE</td><td>240 V</td></tr><tr><td>NIMINAL VOLTAGE RANGE</td><td>211-264 V</td></tr><tr><td>MAXIMUM MODULES PER 20A BRANCH CIRCUIT</td><td>12 (6 X 2 MODULES)</td></tr><tr><td>MAX AC OUTPUT CURRENT</td><td>16.0 A</td></tr><tr><td>AC OVERCURRENT PROTECTION</td><td>20 A</td></tr></table>		MICRO-INVERTER SPECS		MAKE	APSYSTEMS	MODEL	DS3-S	PEAK OUTPUT POWER	640 W	MAX INPUT DC VOLTAGE	60 V	MAX DC SHORT CIRCUIT CURRENT	2 X 16 A	NOMINAL OUTPUT CURRENT	2.66 A	NOMINAL VOLTAGE	240 V	NIMINAL VOLTAGE RANGE	211-264 V	MAXIMUM MODULES PER 20A BRANCH CIRCUIT	12 (6 X 2 MODULES)	MAX AC OUTPUT CURRENT	16.0 A	AC OVERCURRENT PROTECTION	20 A	<table><tr><th colspan="2">DC MAX VOLTAGE CALCULATION (COLD TEMP)</th></tr><tr><td>MODULE VOC</td><td>45.75 VDC</td></tr><tr><td>VOC TEMP COEFFICIENT</td><td>-0.34%/°C</td></tr><tr><td>EXTREME LOW TEMP</td><td>-10 °C</td></tr><tr><td>ΔT FROM STC</td><td>35 °C</td></tr><tr><td>ΔVOC</td><td>5.44 VDC</td></tr><tr><td>ADJUSTED MODULE VOC</td><td>51.19 VDC</td></tr><tr><td colspan="2">ADJUSTED STRING VOLTAGE FOR LOW TEMP 51.19 VDC < 60 VDC, SO OK</td></tr><tr><td colspan="2">8 MODULES: 409.5 VDC < 500 VDC, SO OK</td></tr><tr><td colspan="2">7 MODULES: 358.3 VDC < 500 VDC, SO OK</td></tr></table>		DC MAX VOLTAGE CALCULATION (COLD TEMP)		MODULE VOC	45.75 VDC	VOC TEMP COEFFICIENT	-0.34%/°C	EXTREME LOW TEMP	-10 °C	ΔT FROM STC	35 °C	ΔVOC	5.44 VDC	ADJUSTED MODULE VOC	51.19 VDC	ADJUSTED STRING VOLTAGE FOR LOW TEMP 51.19 VDC < 60 VDC, SO OK		8 MODULES: 409.5 VDC < 500 VDC, SO OK		7 MODULES: 358.3 VDC < 500 VDC, SO OK	
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MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354 (OWNER / BUILDER)		DRAFTER SIGNATURE	PROJECT ADDRESS MALICK MCGREGOR 329 MAPLE ST HAPEVILLE, GA 30354		DATE 4/04/2025	SHEET NUMBER PV-7 Page 40 of 62																																											
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ELECTRICAL CALCS																																																	

1

PLACARDS

SIGNAGE NOTES

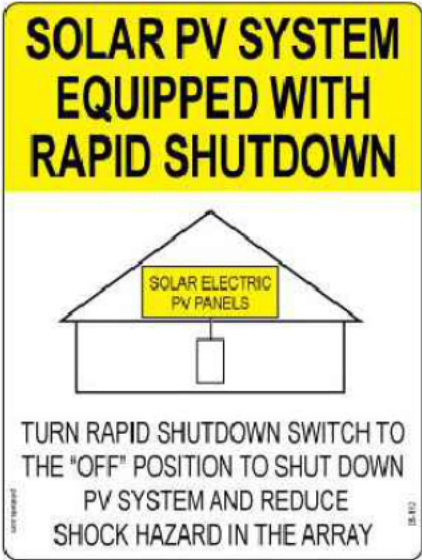
- SIGNAGE SHALL BE PERMANENTLY AFFIXED TO EQUIPMENT WITH POP-RIVETS, SCREWS OR APPROVED ADHESIVE.
- OUTDOOR SIGNAGE SHALL BE UV STABLE AND SUITABLE FOR ITS ENVIRONMENT. CONDUIT STICKERS SHALL BE SHALL BE REFLECTIVE.
- PLAQUES SHALL BE METAL OR PLASTIC WITH ENGRAVED OR MACHINE PRINTED LETTERS OR ELECTRO-PHOTO PLATING, SHALL HAVE RED BACKGROUND WITH WHITE LETTERING. MINIMUM FONT SIZE SHALL BE 3/8" HEIGHT AND ALL CAPITAL LETTERS.
- DEVICES MARKED WITH "LINE" AND "LOAD" ARE NOT SUITABLE FOR FOR BACKFEED OR REVERSE CURRENT.
- SIGNAGE CANNOT BE HAND WRITTEN.
- NET METER BASE, PRODUCTION METER BASE, AND SOLAR AC DISCONNECT ENGRAVED LABELS MUST BE MECHANICALLY FASTENED WITH RIVETS, SCREWS, OR BOLTS.**

DIRECT CURRENT PHOTOVOLTAIC POWER SOURCE	
MAXIMUM VOLTAGE	409.5 V
MAXIMUM CIRCUIT CURRENT	9.2 A

LABEL PLACEMENT: INVERTER

SOLAR PV SYSTEM AC POINT OF CONNECTION	
AC OUTPUT CURRENT	37.5 A
NOMINAL AC VOLTAGE	240 V
THIS PANEL FED BY MULTIPLE SOURCES (UTILITY AND SOLAR)	

LABEL PLACEMENT: MAIN SERVICE PANEL



LABEL PLACEMENT: MAIN SERVICE PANEL

WARNING: ELECTRIC SHOCK HAZARD
THE DC CONDUCTORS OF PHOTOVOLTAIC SYSTEM ARE **UNGROUNDED** AND MAY BE ENERGIZED.

LABEL USED ON UNGROUNDED SYSTEMS ONLY
PLACEMENT: INVERTER, **DC DISCONNECT**

WARNING - Electric Shock Hazard
No user serviceable parts inside
Contact authorized servicer for assistance

LABEL PLACEMENT: INVERTER, AC DISCONNECT

WARNING
THREE POWER SOURCES: UTILITY GRID, BATTERY, AND PV ELECTRIC SYSTEM.

LABEL PLACEMENT: ALL DISCONNECT MEANS, PV BREAKER

BATTERY STORAGE UNIT

PLACEMENT: BATTERY

RAPID SHUTDOWN SWITCH FOR SOLAR PV AND ESS SYSYEM

REFELECTIVE MATERIAL REQUIRED
PLACEMENT: RAPID SHUTDOWN SWITCH

WARNING

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

DC VOLTAGE IS ALWAYS PRESENT
WHEN SOLAR MODULES ARE EXPOSED TO SUNLIGHT

LABEL PLACEMENT: DC DISCONNECT

WARNING

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

LABEL PLACEMENT: AC DISCONNECTS, PV BREAKER

SOLAR DISCONNECT

LABEL PLACEMENT: ALL AC AND DC DISCONNECTS

WARNING - Dual Power Sources
Second source is photovoltaic system

LABEL PLACEMENT: MAIN PANEL NEAR METER

PV SYSTEM DISCONNECT FOR UTILITY OPERATION

WEATHER RESISTANT PLASTIC PLACARD
PLACEMENT: AC BREAKER

WARNING
INVERTER OUTPUT CONNECTION
DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL PLACEMENT: AC BREAKER (INSIDE OF PANEL, NEXT TO BREAKER)

CAUTION: SOLAR ELECTRIC SYSTEM CONNECTED

LABEL PLACEMENT: MAIN PANEL (COVER)

PHOTOVOLTAIC POWER SOURCE

LABEL PLACEMENT: AC CONDUIT

WARNING

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

LABEL PLACEMENT: INVERTER

CAUTION: BATTERY CIRCUIT

LABEL PLACEMENT: BATTERY CONDUIT

WARNING: PHOTOVOLTAIC POWER SOURCE

LABEL PLACEMENT:
WARNING LABEL SHALL BE PLACED ON INTERIOR AND EXTERIOR DC CONDUIT, RACEWAYS, ENCLOSURES, CABLE ASSEMBLIES, JUNCTION BOXES, AND DISCONNECTS. MARKING SHALL BE PLACED ON INTERIOR AND EXTERIOR DC CONDUIT, RACEWAYS, ENCLOSURES AND CABLE ASSEMBLIES EVERY 10 FEET (3048 MM) 1 FOOT OF TURNS OR BENDS AND WITHIN 1 FOOT ABOVE AND BELOW PENETRATIONS OF ROOF/CEILING ASSEMBLIES, WALLS OR BARRIERS

MALICK MCGREGOR
329 MAPLE ST
HAPEVILLE, GA 30354
(OWNER / BUILDER)

DRAFTER
SIGNATURE

DRAWING
TYPE

PLACARDS

PROJECT ADDRESS

MALICK MCGREGOR
329 MAPLE ST
HAPEVILLE, GA 30354

DATE

4/04/2025

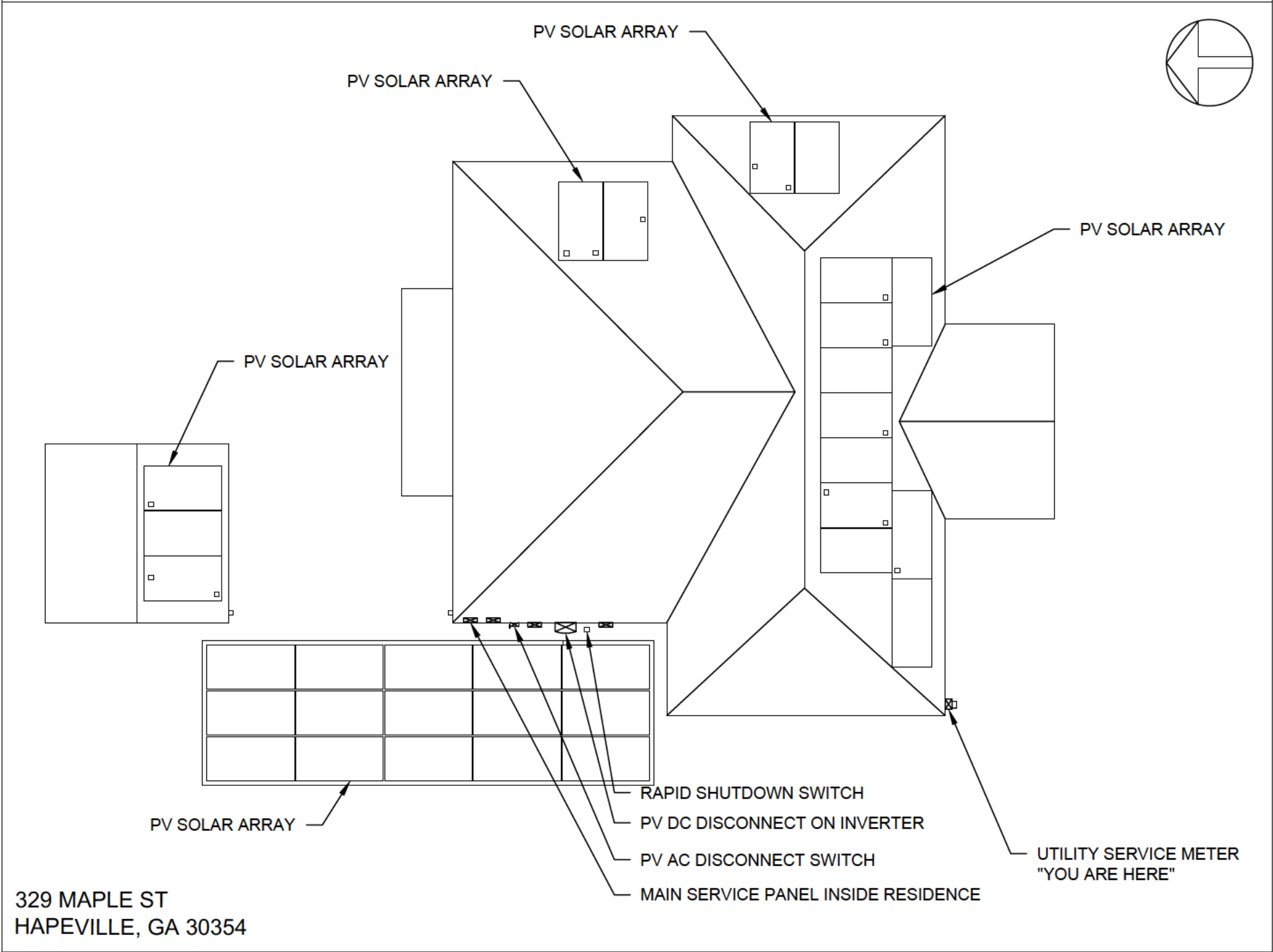
REVISION #

SHEET NUMBER

PV-8

WARNING

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING
SOURCES WITH DISCONNECTS LOCATED AS SHOWN:



We Make Solar Evolve

ELITE POLY

Polycrystalline Module

ET-P672325WW/WB 325W

ET-P672320WW/WB 320W

ET-P672315WW/WB 315W

Rich Product Portfolio & Innovative Product Strategy, satisfy customer needs to the best, and keep the customers' overall costs to the lowest.



High Conversion Efficiency

Industry-leading processing techniques realize great module efficiency to a maximum of 16.75%, steady power output guaranteed.



Anti-reflective Coating and Reduce O&M Costs

Easier to clean by rainwater to remove dirt on the glass surface, making higher power output and lower maintenance costs.



0 to +5W Positive Tolerance

Gain more power yields than expected.



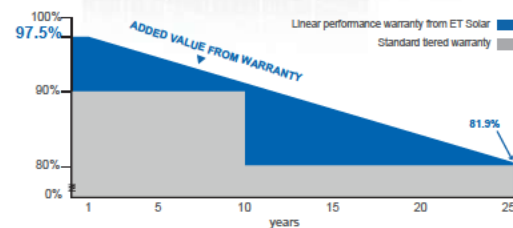
Excellent Loading Capability

2400Pa wind loads, 5400Pa snow loads.
Durable and long-lasting.



Top-quality & Trustworthy Product

Rigorous Quality Management System built.
Multiple internationally recognized PV industry standard certifications attained.



25 25-year performance warranty

10 10-year warranty on materials and workmanship

IEC 61215 Ed.2
IEC 61730
IEC 61701
IEC 62716



ET Solar

www.etsolar.com

M/ET-PD-EN-EU2017V2

ELECTRICAL SPECIFICATIONS (STC)

Model Type	ET-P672325WW ET-P672325WB	ET-P672320WW ET-P672320WB	ET-P672315WW ET-P672315WB
Peak Power (Pmax)	325W	320W	315W
Module Efficiency	16.75%	16.49%	16.23%
Maximum Power Voltage (Vmp)	37.28V	37.13V	36.81V
Maximum Power Current (Imp)	8.72A	8.62A	8.56A
Open Circuit Voltage (Voc)	46.31V	45.94V	45.75V
Short Circuit Current (Isc)	9.28A	9.24A	9.12A
Power Tolerance	0 to +5W		
Operating Temperature	- 40 ~ + 85°C		
Maximum System Voltage	DC 1000V		
Nominal Operating Cell Temperature	45±2°C		
Fire Safety	Class C		
Maximum Series Fuse Rating	20A		

ELECTRICAL SPECIFICATIONS (NOCT)

Model Type	ET-P672325WW ET-P672325WB	ET-P672320WW ET-P672320WB	ET-P672315WW ET-P672315WB
Peak Power (Pmax)	240W	237.3W	232.3W
Maximum Power Voltage (Vmp)	34.4V	34.1V	33.9V
Maximum Power Current (Imp)	6.98A	6.97A	6.85A
Open Circuit Voltage (Voc)	42.8V	42.5V	42.3V
Short Circuit Current (Isc)	7.48A	7.45A	7.35A

MECHANICAL SPECIFICATIONS

Cell Type	156.75 mm x 156.75 mm
Number of Cells	72 cells in series
Weight	25.7 kg (56.66 lbs)
Dimension	1956×992×40mm (77.01×39.06×1.58 inch)
Max Load	5400 Pascals (112 lb/ft ²)
Junction Box	≥IP67 rated
Connector	MC4 Compatible
Output cable	PV 1-F 4mm ²

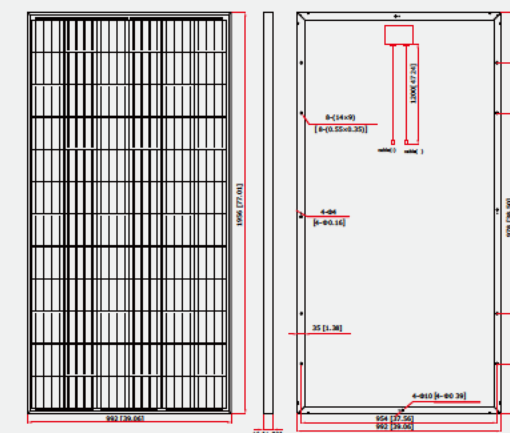
TEMPERATURE COEFFICIENT

Temp. Coeff. of Isc (TK Isc)	0.04% /°C
Temp. Coeff. of Voc (TK Voc)	-0.34% /°C
Temp. Coeff. of Pmax (TK Pmax)	-0.41% /°C

PACKING MANNER

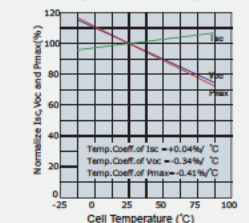
Container	40' HQ
Pieces per Pallet	26
Pieces per Container	572

PHYSICAL CHARACTERISTICS Unit:mm (inch)

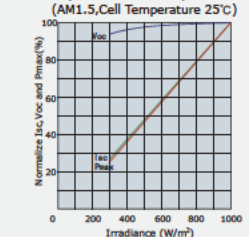


ELECTRICAL CHARACTERISTICS

Temperature Dependence of Isc, Voc and Pmax



Irradiance Dependence of Isc, Voc and Pmax (AM1.5, Cell Temperature 25°C)



Note: the specifications are obtained under the Standard Test Conditions (STCs): 1000 W/m² solar irradiance, 1.5 Air Mass, and cell temperature of 25°C. The NOCT is obtained under the Test Conditions: 800 W/m², 20°C ambient temperature, 1m/s wind speed, AM 1.5 spectrum. Please contact support@etsolar.com for technical support. The actual transactions will be subject to the contracts. This parameters is for reference only and it is not a part of the contracts. The specifications are subject to change without prior notice.

DATASHEET

12K-2P-N

Residential Hybrid Inverter

Inverter Model:		Sol-Ark-12K-P
SKU:		12K-2P
Input Data (PV)		
Max. Allowed PV Power (STC)		13,000W
Rated MPPT Operating Voltage Range		175 - 425V
MPPT Voltage Range		150 - 500V
Startup Voltage		125V
Max. Input Voltage ¹		500V
Max. Operating Input Current per MPPT		20A (self-limiting)
No. of MPP Trackers		2
No. of PV Strings per MPPT		2
Max. AC Coupled Input		9,600W
Output Data (AC)		
Nominal AC Voltage		120/240V, 120/208V, 220V
Grid Frequency		50 / 60Hz
Real Power, max continuous ²		9,000W
Max. Output Current		37.5A
Peak Apparent Power (10s, off-grid)		16,000VA @ 240V
Peak Apparent Power (100ms, off-grid)		25,000VA @ 240V
Max Output Fault Current (100ms)		104A
Max. Grid Passthrough Current		63A
Power Factor Output Range		+/- 0.9 adjustable
Backup Transfer Time		4ms
CEC Efficiency		96.5%
Max Efficiency		97.5%
Design (DC to AC)		Transformerless DC
Stackable		Up to 9 in parallel
Battery Input Data (DC)		
Battery Technologies		Lithium / Lead Acid
Nominal DC Voltage		48V
Operating Voltage Range		43 - 63V
Capacity		50 – 9900Ah
Max. Battery Charge / Discharge Current		185A
Charging Controller		3-Stage with Equalization
Grid to Battery Charging Efficiency		96.0%
External Battery Temperature Sensor (BTS)		Included
Automatic Generator Start (AGS)		2 Wire Start - Integrated
BMS Communication		CANBus & RS485 MODBUS
General Data		
Dimensions (H x W x D)		750 x 450 x 254 mm (29.5 x 17.7 x 10 in)
Weight		35.4 kg / 78 lb.
Enclosure		IP65 / NEMA 3R
Ambient Temperature		-25~55°C, > 45°C Derating
Noise		< 30 dB @ 25°C (77°F)
Idle consumption - No Load		60W
Communication and Monitoring		Wi-Fi & LAN Hardware Included
Standard Warranty		10 Years
Protection and Certifications		
Certifications and Listings		UL1741-2010/2018, IEEE1547a 2003/2014, FCC 15 Class B, UL1741SB, CA Rule 21, HECO Rule 14H
PV DC Disconnect Switch – NEC 240.15		Integrated
Ground Fault Detection – NEC 690.5		Integrated
PV Rapid Shutdown Control – NEC 690.12		Integrated
PV Arc Fault Detection – NEC 690.11		Integrated
PV Input Lightning Protection		Integrated
PV String Input Reverse Polarity Protection		Integrated
AC Output Breaker - 63A		Integrated
250A Battery Breaker / Disconnect		Integrated
Surge Protection		DC Type II / AC Type II

1. See Installation Guide for more details on sizing array strings. The highest input voltage is based on the open-circuit voltage of the array at the minimum design temperature.
2. Max. continuous AC output of 9,000W (loads / grid sell) + DC output of 3,000W (batteries) = 12,000W total



INSTALLATION GUIDE
AND USER MANUAL

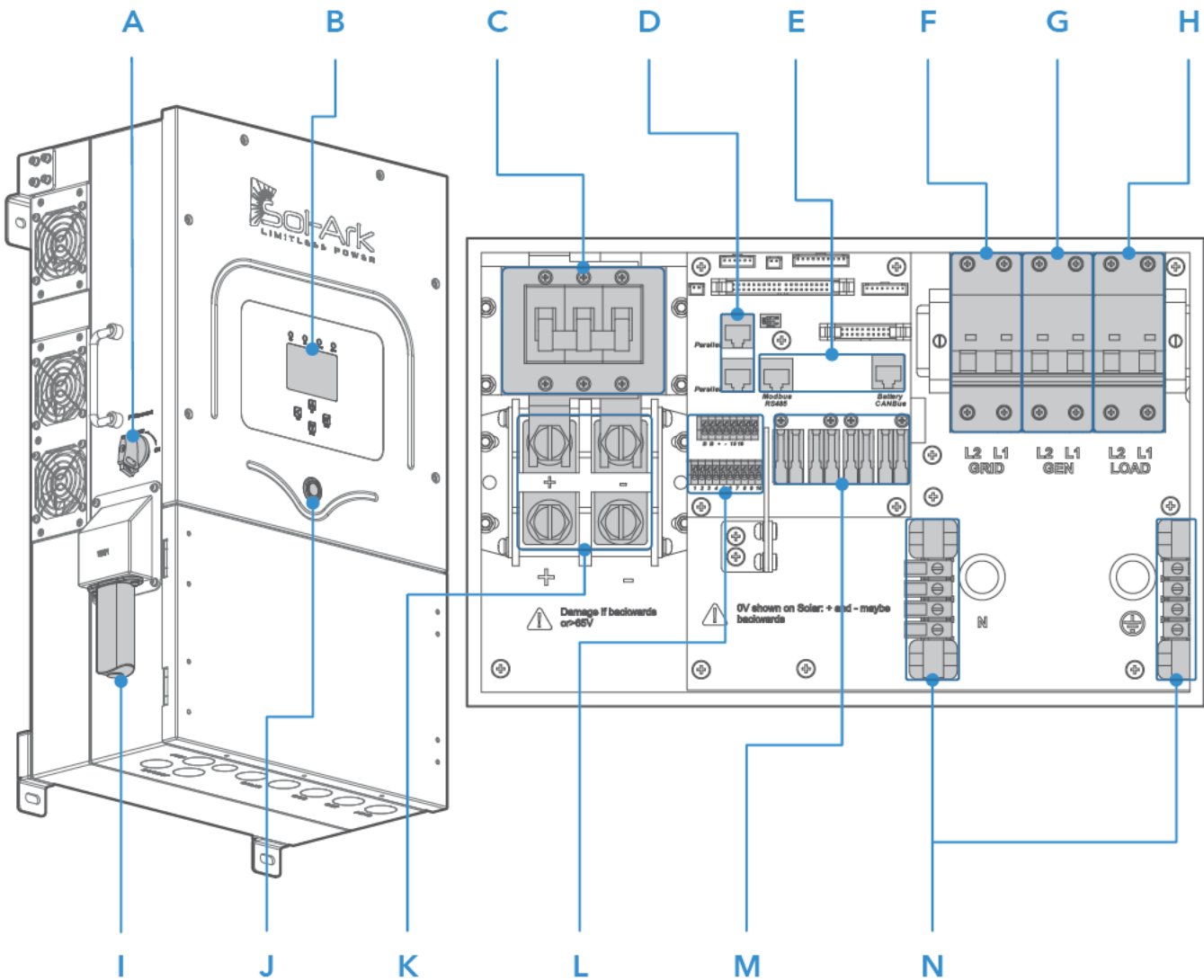
Sol-Ark 12K-2P-N

OUTDOOR MODEL

RESIDENTIAL
NORTH AMERICA



1.1 General Description



Component	Name	Component	Name
A	PV DC disconnect	H	(63A) LOAD breaker
B	LCD touch screen	I	Wi-Fi / Ethernet dongle
C	(250A) Battery breaker	J	ON / OFF Button
D	Parallel RJ45 ports	K	Battery terminals
E	BMS RJ45 ports (RS485 / CAN)	L	Input pinouts for sensors and accessories
F	(63A) GRID breaker	M	2x MPPT inputs
G	(50A) GEN breaker	N	GROUND / NEUTRAL Busbars

1.3 Connection Requirements

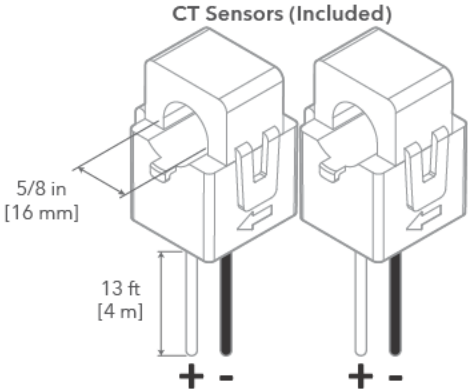
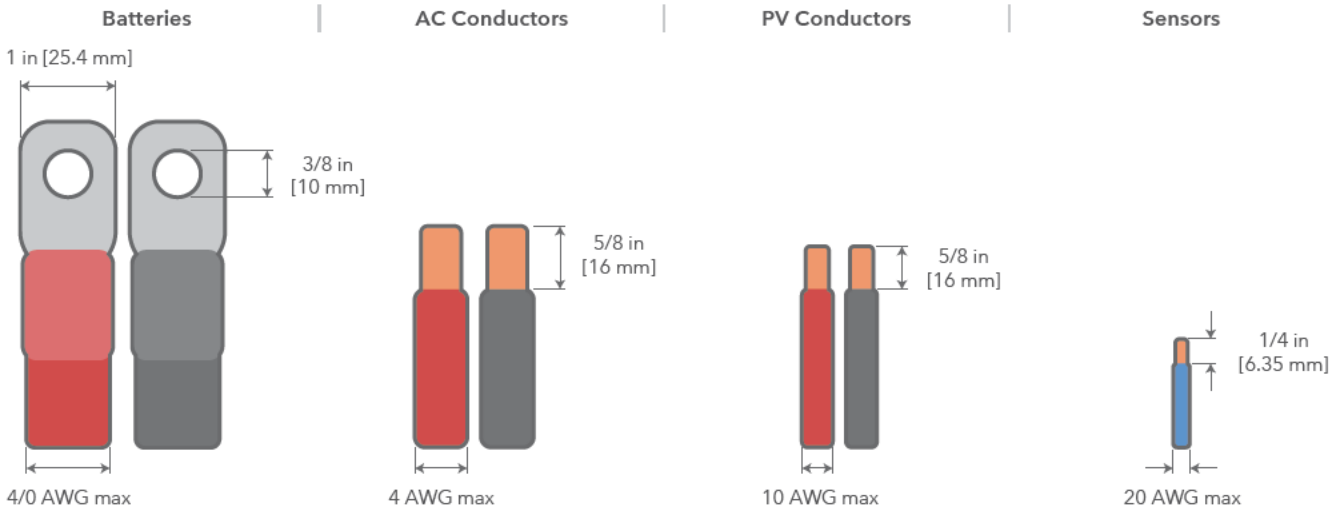
1. AC / DC Connection Requirements

⚠ All wire runs should be sized to be at or below a 2.5% voltage drop at full load. Wire size must comply with your local electrical code.

Port	Terminal / Breaker Rating	Terminal Wire Size Range (min-max)
GRID	63A _{AC}	6 - 4 AWG
LOAD	63A _{AC}	6 - 4 AWG
GEN	50A _{AC}	6 - 4 AWG
MPPT	25A _{DC}	12 - 10 AWG
Battery Port	185A _{DC}	2/0 - 4/0 AWG

2. Sensors and Communications Requirements

Component	Wire Size Range	Max Distance
CT Sensor	16-20 AWG	0' - 13' [4 m]: 16 AWG included 13' - 20' [6 m]: CAT6 extendable
Communications	24 - 23 AWG	0' - 100' [30 m]: 24 AWG 100' - 400' [120 m]: 23 AWG
RJ45 Parallel Communication	CAT 5E or better	0' - 7' [2.1 m]: Included 7' - 20' [6m]: Extendable



2. Installation

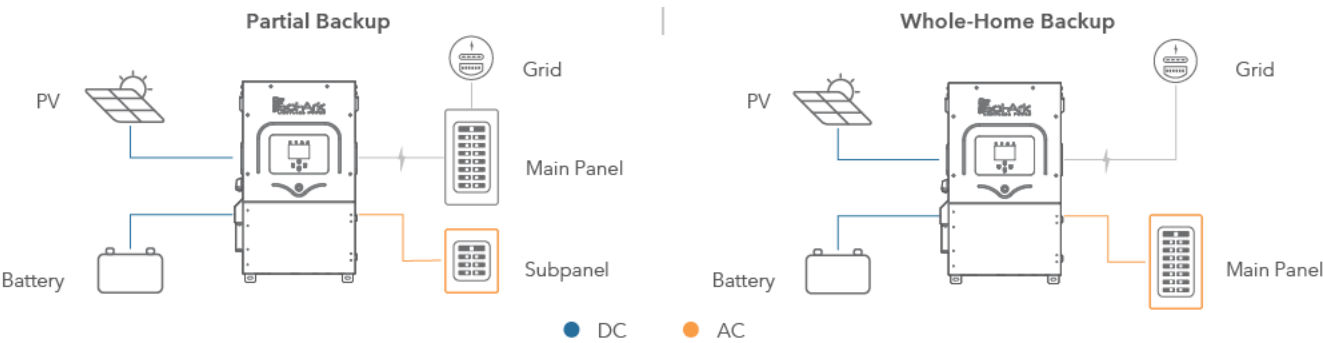
Backup Circuits

- A. The "LOAD" connected service panel will be referred to as the **Essential Loads Panel**.
- B. You must keep the essential loads panel within the limitations of the unit:
 - Grid Tie → 15.12 kW = 240V * 63A max (passthrough).
 - Off-Grid → 9 kW = 240V * 37.5A continuous (AC output) + 3 kW to batteries (DC output). Total usable power output of 12 kW.
- C. Verify that every load circuit power (P=V*I) does not surpass the aforementioned limits.

Single System Install

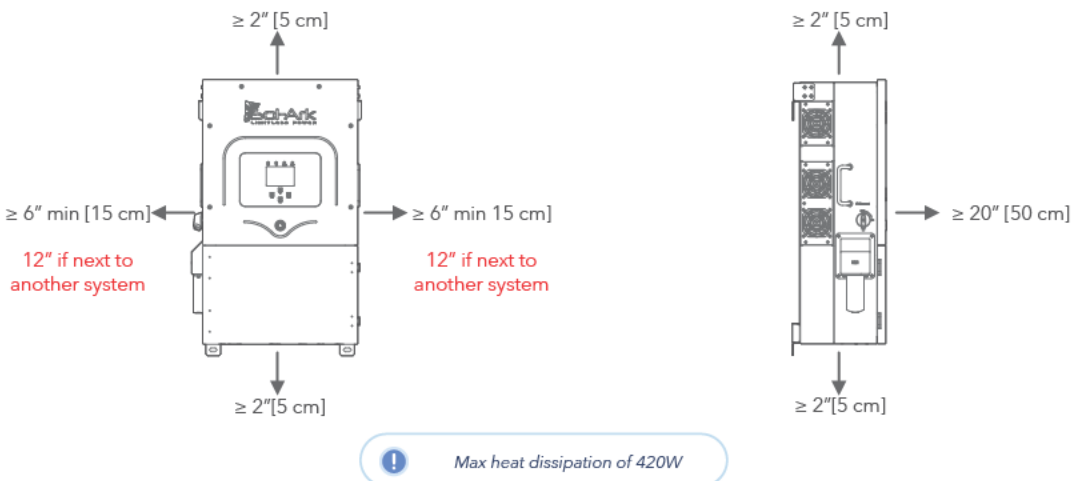
- A. **FOR PARTIAL BACKUP:** Connect the output of your back-feed breaker or line side tap (depending on the point of interconnection) to the "GRID" breaker.
 - An external disconnect must be installed between the interconnection and the Sol-Ark. Size the disconnect according to code.
 - Connect the "LOAD" output to the Essential Loads Panel. Follow electric code to select proper wire gauge.
- B. **FOR WHOLE-HOME BACKUP:** Connect the incoming grid directly to the "GRID" input breaker.
 - An external disconnect must be installed between the grid and the Sol-Ark. Size the disconnect according to code.
 - Connect the "LOAD" output to the Main Service Panel. Follow electric code to select proper wire gauge.

It is possible to connect a generator or an AC coupled source (40A max or 9,600W) such as string or micro inverters to the "GEN" breaker of the inverter. Only one AC source can be connected to the "GEN" breaker at a time.



2.1 Mounting the Sol-Ark

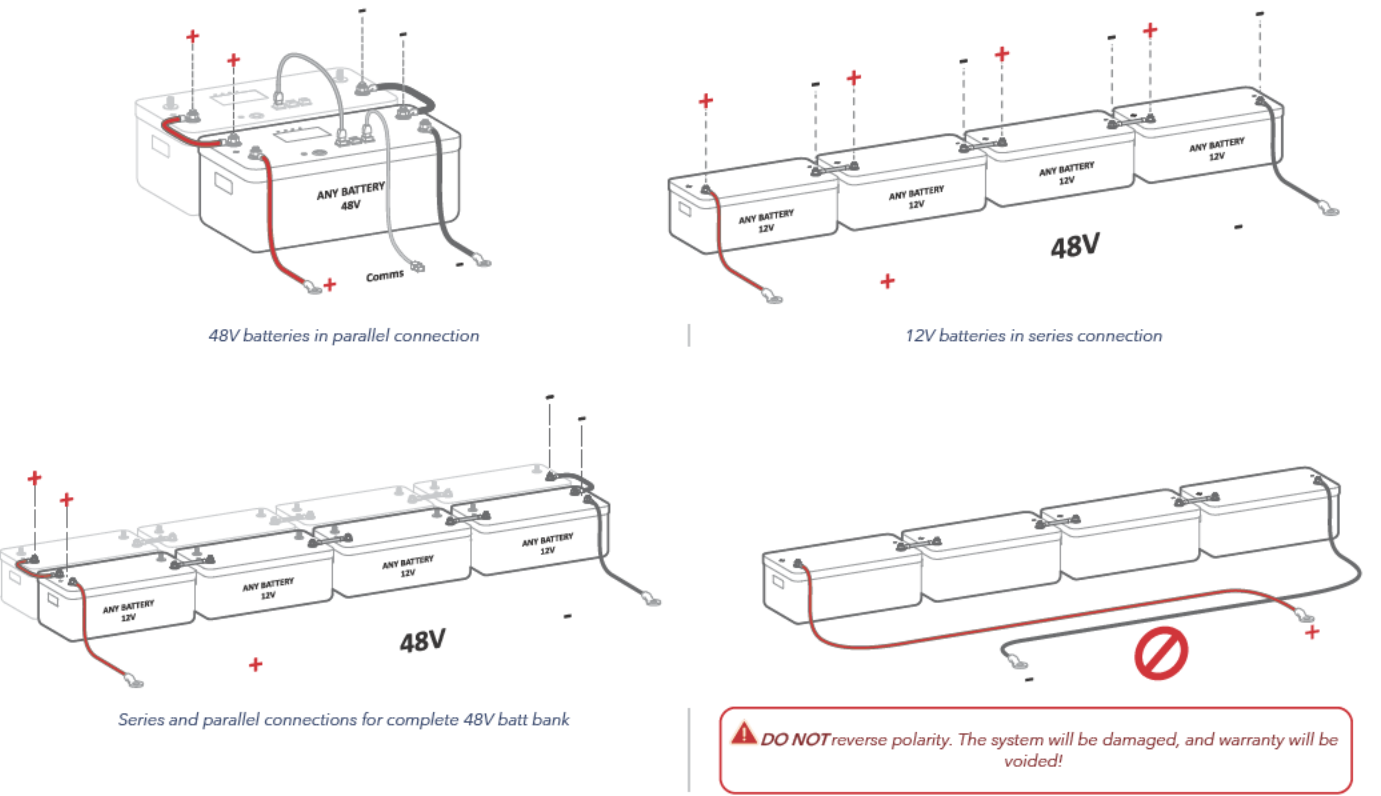
- A. Considering the dimensions of the inverter, find a suitable location for the system. There must be at least 2 in [5 cm] of vertical clearance and 6 in [15 cm] of side clearance for proper heat dissipation.



2.2 Integrating Batteries

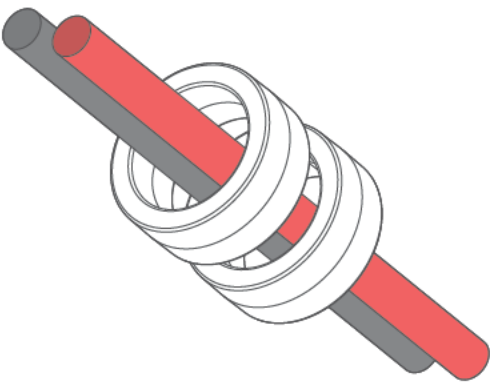
- A. ⚠ Sol-Ark 12K-2P-N must be OFF while the batteries are being connected.
- B. Depending on the battery voltage, wire up the battery bank in the possible configurations shown below.
- C. Battery breakers must be OFF when wiring. If your battery bank does not have internal breakers, maintain the necessary safety measures when handling.

⚠ Sol-Ark 12K-2P-N is a **48V_{DC} nominal system**. **DO NOT** connect the inverter to any other battery configuration. If you use 12V batteries, you **MUST NOT** exceed four (4) batteries in series, as shown. The inverter can work with any battery chemistry as long as it remains within the range of **43V_{DC} to 63V_{DC}**.



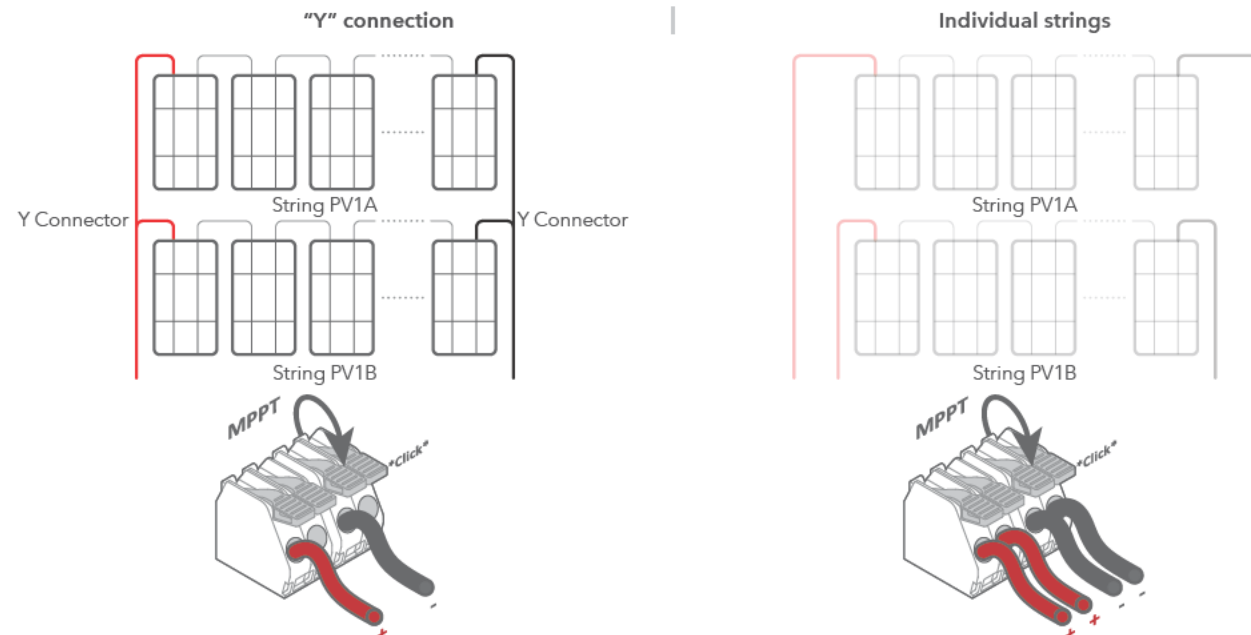
1. Battery Toroid

Install the included toroids on the battery conductors as shown in the next figure. Ensure that both (+) and (-) wires pass through both toroids simultaneously.



! The Sol-Ark 12K-2P-N has 2 independent MPPTs that support up to 2 PV strings each. MPPTs can handle a maximum **V_{oc} of 500V** and an **I_{sc} of 25A** but will self-limit and operate at **20A max**.

- Max DC solar input = 13 kW (± 5%) | Max input power per MPPT = 6.5 kW | Max recommended input voltage per MPPT = 425 V_{oc} | Max input current per MPPT = 20A (self-limiting).
- ! Design for a max input current of 20A per MPPT. The inverter will self-limit beyond 20A. If I_{sc} exceeds 25A, damage will occur.
- ! **PV Source Circuit max voltage of 500V_{DC}; damage can occur with PV strings whose open-circuit voltage exceeds 500V_{DC}**
- ! Strings in parallel on the same MPPT must have the same designed open-circuit voltage (V_{oc}), otherwise the system will be limited to the lowest string voltage.
 - PV1 A/B must have the same V_{oc}.
 - If the solar panels are oriented in different directions and connected in the same MPPT, there will be a loss in PV efficiency.
- ! Per NEC Art 690.43, exposed non-current-carrying metal parts of PV module frames, electrical equipment, and conductor enclosures of PV systems shall be connected to an equipment grounding conductor. All grounding conductors and grounding electrodes should be installed according to NEC Art 690.47 or as required by the AHJ.
- For ground mounted arrays, Sol-Ark recommends installing an auxiliary grounding electrode placed near the array to ensure optimal earth-to-ground resistance of the grounding system. This auxiliary electrode would need to follow the requirements of NEC Art 250.54.
- Connect the solar panel strings using either of the following configurations:



AC Coupling

The Sol-Ark 12K-2P-N is a system that supports the addition of AC coupled solar panels. The max solar input power can be expanded by coupling micro or string inverters into the "GEN" or "LOAD" breakers. A full AC coupled solar system is not recommended as power control and monitoring is limited. Having DC coupled modules or a combination of DC coupled and AC coupled solar panels is always preferred.

AC coupled inverters need to be either UL 1741SA or UL 1741 certified. This certification confirms the inverters' ability to disconnect from the grid based on frequency and ensures that the Sol-Ark will safely be able to frequency shift to control the AC coupled production.

! Batteries are **REQUIRED** to AC couple solar panels to the "GEN" breaker. The AC coupled inverters can still produce solar power even during grid outage events or in Off-Grid systems. Furthermore, the total AC coupling production will be monitored.

Maximum allowed AC coupling input: 9,600W

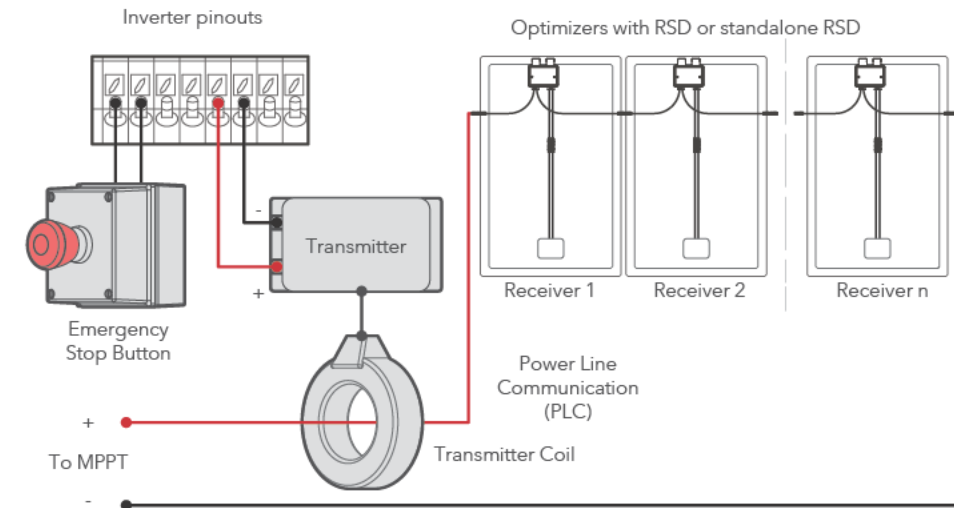
Maximum combined solar input (DC + AC): 16,000W

Optimal: 13,000W_{DC} + 3,000W_{AC}

2.10 Emergency Stop and Rapid Shutdown

The (B, B) emergency stop pins of the Sol-Ark 12K-2P-N are an ordinarily open contact that triggers rapid shutdown (RSD) when closed. RSD will cut all power including the Sol-Ark's internal power supply and stop all AC outputs. The internal 12Vdc (-3%) power supply of the Sol-Ark (pins 15 & 16) will disconnect any RSD transmitter that will then shut down all solar panels when the emergency stop button is pressed.

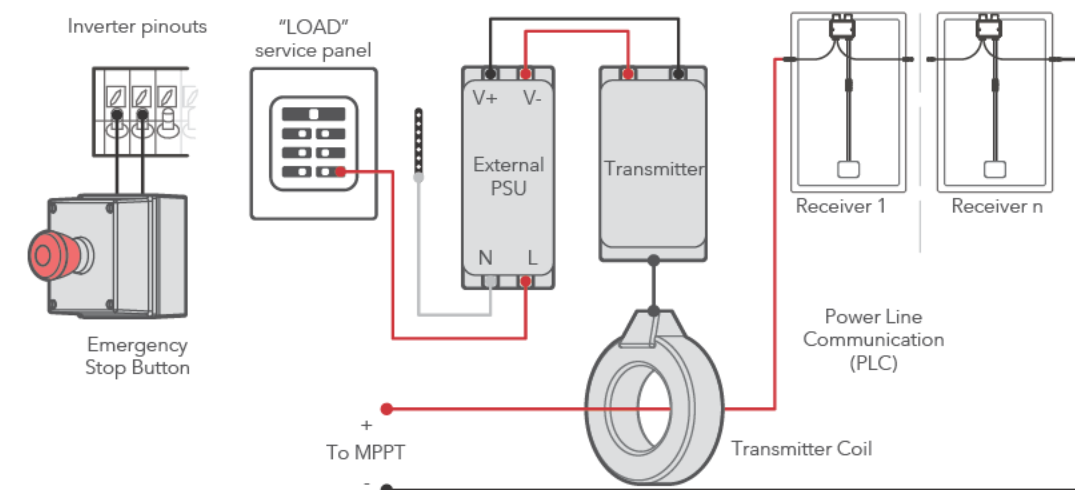
- Emergency stop button connects to (B, B) pins of the Sol-Ark.
- RSD transmitter connects to pins 15 & 16 (12Vdc power supply)
- ! Transmitters placed inside the user area of the Sol-Ark can cause interference.



RSD Warning!

The Built-in 12Vdc power supply of the Sol-Ark 12K-2P-N (Pins 15 & 16) is rated for **100mA (1.2W)**. Do not exceed! If unsure of the current (A) rating of the transmitter, contact the manufacturer before connecting.

A transmitter that exceeds the maximum 100mA limit can still be integrated into the Sol-Ark inverter through an external power supply connected to the "LOAD" output. Pressing the e-stop button will disconnect all AC outputs, cutting power to the "LOAD" service panel which will initiate rapid shutdown.



Rapid Shutdown Recommendations

TIGO TS4-A-O

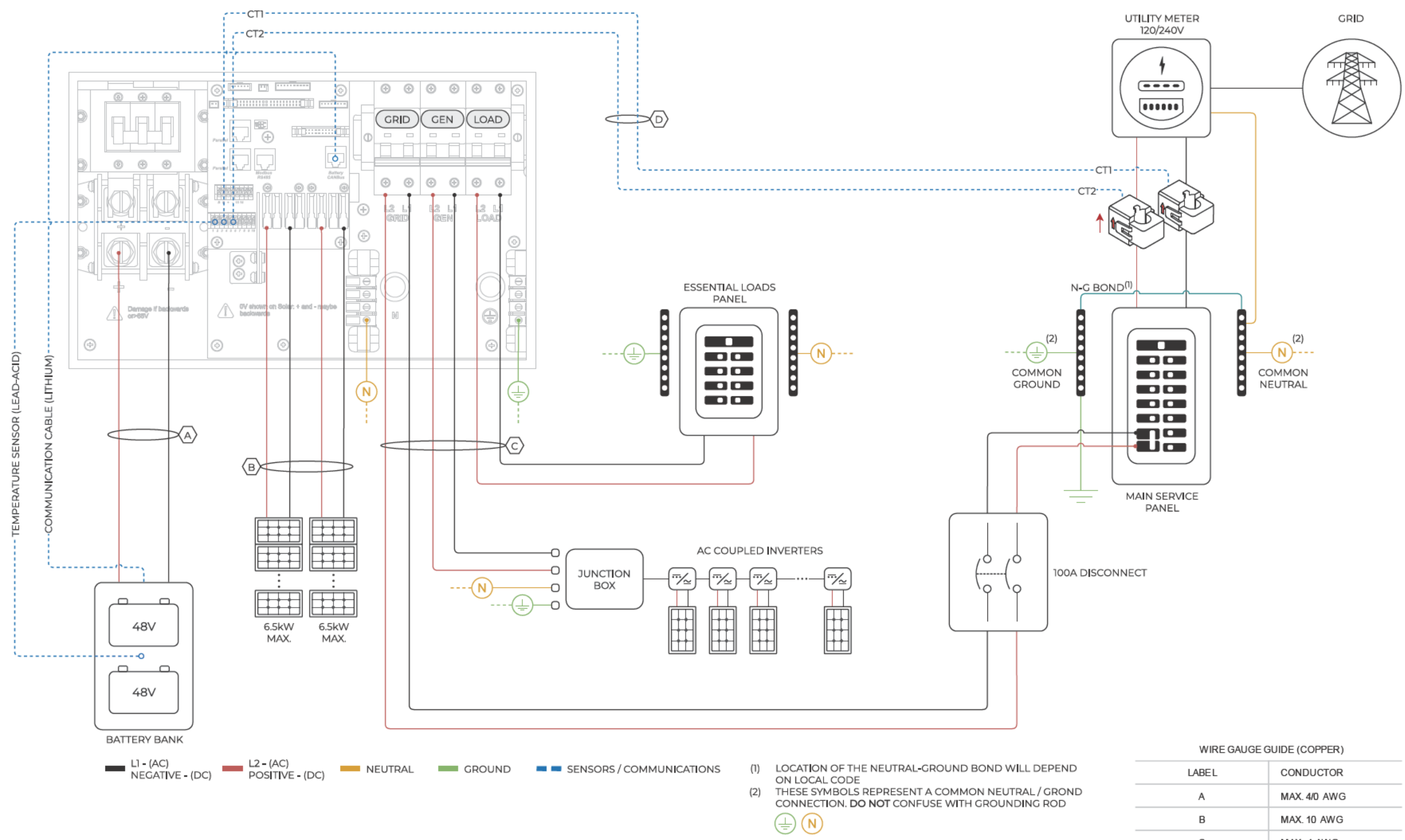
TIGO TS4-A-F

TIGO TS4-O

TIGO TS4-O-DUO

APsmart RSD S-PLC / RSD-D

Standard Wiring Diagram – AC Coupling in GEN



MNPowerflo16 Wall Floor Mount Battery

Energy Capacity: 16kWh
Nominal Voltage: 51.2V

Version: v1.1.3



Eve A+ Grade Lithium
Iron Phosphate Cells
(A+ is the best grade and is used in electric vehicles)

20 Year Design Life
Longest in the Industry
15-Year Warranty

- 1 Battery automatically assigns addresses. No dip switch programming required.
- 2 Automatically identify the inverter protocol and communicate with the MidNite AIO inverter in a closed loop.
- 3 Each battery can be monitored with the MidNite Pro app or optional software.
- 4 BMS Firmware can be upgraded remotely with the MidNite AIO Inverter.
- 5 The battery is actively balanced @2 amps improving battery efficiency and SOC reporting.



Product Advantages

Longer Life and Safer

- EVE or REPT A+ grade lithium iron phosphate
- Battery management system with multi-level protection
- Module-level endothermic decomposition and cooling fire extinguishing

Flexible and Expandable

- Up to 16 units in parallel, the system's energy capacity is up to 257kWh

Higher Energy Density

- The battery takes up less space and has an energy density of up to 178Wh per kilogram

Easy to Install and Use

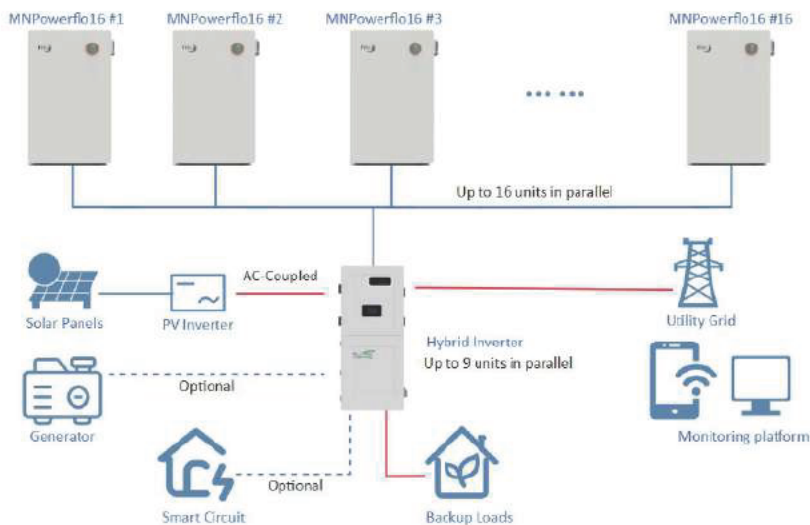
- Applications Residential, Commercial, Industrial, Off-grid, grid tie and self-consumption. Compatible with all 48V inverters that support LFP
- Compatible with the "PYLON" protocol

Smart

- Guaranteed not to lose closed loop communication from future updates with MidNite AIO inverter

Compliance

- UL 1973, UL 9540A, UL9540



Product Name Electrical Characteristics

Nominal Voltage	51.2V
Nominal Capacity	314Ah
Energy	16,076Wh
Battery Chemistry	Lithium Iron Phosphate (LFP)
Cycle Life	8,000 cycles @77°F (25°C), 0.5C/0.5C
Operating Voltage	46.4~57.6V
Communication Interfaces	CAN/RS485/RS232
Scalable	Up to 16 units

Charge&Discharge

Nominal Charging Current	160A
Nominal Discharging Current	160A
Max. Discharging Current	210A

Environmental

Environment	Outdoor, Indoor
Charging Temperature	-4°F to 122°F (-20°C to 50°C) *
Discharging Temperature	-4°F to 122°F (-20°C to 50°C)
Storage Temperature	14°F to 113°F (-10°C to 45°C)
Altitude	Maximum 9,843 ft (3,000 m)
Cooling Method	Natural Convection
IP Rating	IP65

Mechanical

Dimension(L x W x D)	31.50 x19.69x8.94in(800*500*227mm)
Weight	284lbs(128.9kg)
Installation	Wall mount or floor mount

* When the ambient temperature is below 32°F (0°C), the internal heating pads start to operate.
The battery begins charging when the cell temperature is between 32°F and 122°F (0°C and 50°C).





DS3 Series

The most powerful Dual Microinverter

- One microinverter connects to two solar modules
- Max output power reaching 640VA, 768VA or 880VA
- Two independent input channels (MPPT)
- CA Rule 21 (UL 1741 SB) compliant
- NEC 2020 690.12 Rapid Shutdown Compliant
- Encrypted Wireless ZigBee Communication
- Phase Monitored and Phase Balanced

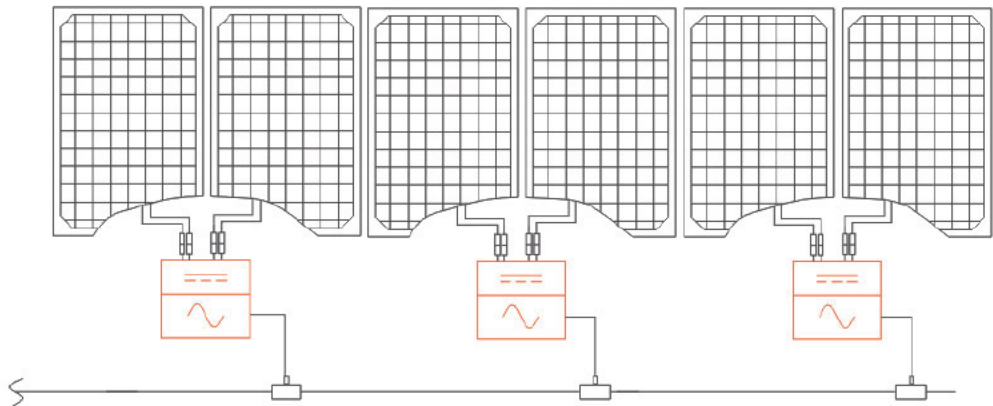
PRODUCT FEATURES

APsystems' 3rd generation of dual-module microInverters, the DS3 product family represents the culmination of years of power conversion expertise and innovation in high-efficiency, high-density power conversion to maximize the peak performance of today's high-capacity PV modules.

The DS3 series reaches unprecedented levels of power output. It features 2 input channels, each with independent MPPT, and encrypted wireless ZigBee communication. An innovative and compact design makes the product lighter while maximizing power production, and silicone-encapsulated components reduce stress on electronics, facilitate thermal dissipation, and enhance weatherproofing. Reliability is significantly increased thanks to 20% fewer components than previous generations. A 24/7 energy access through apps or web based portal facilitate remote diagnosis and maintenance.

The DS3 series is grid-interactive and fully compliant with CA Rule 21 requirements. With an excellent performance and high conversion efficiency, a unique integration with less components, the APsystems DS3 series is a gamechanger for residential and commercial solar.

WIRING SCHEMATIC



2024/02/22 Rev2.0

Datasheet | DS3 Microinverter Series

Model	DS3-S		DS3-L	DS3
Region	USA / Canada			
Input Data (DC)				
Recommended PV Module Power (STC) Range	250Wp-480Wp+		265Wp-570Wp+	300Wp-660Wp+
Peak Power Tracking Voltage	28V-45V			
Operating Voltage Range	26V-60V			
Maximum Input Voltage	60V			
Maximum Input Current	16A x 2	18A x 2	20A x 2	
Maximum input short circuit current	20A per input	22.5A per input	25A per input	
Output Data (AC)				
Maximum Continuous Output Power	640VA	768VA	880VA	
Nominal Output Voltage/Range ⁽¹⁾	240V / 211V-264V			
Nominal Output Current	2.66A	3.2A	3.7A	
Maximum Output Fault Current (ac) And Duration	5.691Apk, 26.75ms of duration; 3.307Arms			
Nominal Output Frequency/ Range ⁽¹⁾	60Hz/58.8Hz-61.2Hz(HECO:57Hz-63Hz)			
Power Factor (Default/Adjustable)	0.99/0.8 leading...0.8 lagging			
Maximum Units per 12AWG Branch ⁽²⁾	6 (20A breaker)	5 (20A breaker)	4 (20A breaker)	
Maximum Units per 10AWG Branch ⁽²⁾	9 (30A breaker)	7 (30A breaker)	6 (30A breaker)	
Efficiency				
Peak Efficiency	97.3%			
CEC Efficiency	97%			
Nominal MPPT Efficiency	99.5%			
Night Power Consumption	20mW			
Mechanical Data				
Operating Ambient Temperature Range ⁽³⁾	-40°F to +149°F (-40°C to +65°C)			
Storage Temperature Range	-40°F to +185°F (-40°C to +85°C)			
Dimensions (W x H x D)	10.3" x 8.6" x 1.6" (263mm x 218mm x 41.2mm)		10.3" x 8.6" x 1.7" (263mm x 218mm x 42.5mm)	
Weight	5.7lbs(2.7kg)		6.8lbs(3.1kg)	
DC Connector Type	Stäubli MC4 PV-ADBP4-S2&ADSP4-S2			
Cooling	Natural Convection - No Fans			
Enclosure Environmental Rating	Type 6			
Features				
Communication (Inverter To ECU) ⁽⁴⁾	Encrypted ZigBee			
Isolation Design	High Frequency Transformers, Galvanically Isolated			
Energy Management	Energy Management Analysis (EMA) system			
Warranty ⁽⁵⁾	10 Years Standard ; 25 Years Optional			
Compliance				
Safety and EMC Compliance	UL1741; CSA C22.2 No. 107.1-16; UL1741SA; UL1741SB; IEEE1547; Rule 21; SRD-V2.0; FCC Part15; ICES-003; NEC2014&NEC2017&NEC2020 Section 690.11 DC Arc-Fault circuit Protection; NEC2014&NEC2017&NEC2020 Section 690.12 Rapid Shutdown of PV systems on Buildings			

(1) Nominal voltage/frequency range can be extended beyond nominal if required by the utility.
(2) Limits may vary. Refer to local requirements to define the number of microInverters per branch in your area.
(3) The inverter may enter to power de-grade mode under poor ventilation and heat dissipation installation environment.
(4) Recommend no more than 80 inverters register to one ECU for stable communication.
(5) To be eligible for the warranty, APsystems microInverters need to be monitored via the EMA portal. Please refer to our warranty T&Cs available on usa.APsistemas.com.

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Specifications subject to change without notice please ensure you are using the most recent update found at web : usa.APsistemas.com

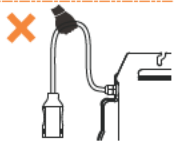
Step 1 Verify that the grid voltage matches the microinverter rating

Step 2 Y3 AC bus cable distribution

- a. One end of the AC bus cable is used to access the junction box connected to the power grid.
b. Wire the conductors of the AC bus as follows:
European Standard: L - BROWN; N - BLUE; PE - YELLOW GREEN;
American Standard: L1 - BLACK; L2 - RED; PE - GREEN.

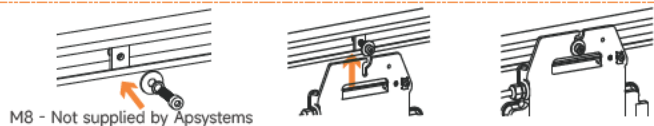
NOTE: Wiring color codes may vary according to local regulations. Before connecting to the AC bus, ensure that all wires of the installation match. Incorrect cabling can irreparably damage the microinverters, and such damage is not covered by the warranty.

ATTENTION: Do NOT carry the microinverter by the AC cable. This could lead to partial or complete disconnection of the AC cable from the unit, resulting in no operation or poor operation.



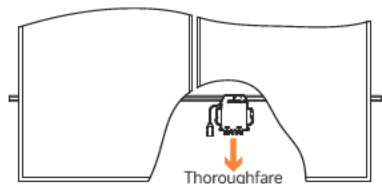
Step 3 Attaching the APsystems microinverters to the racking

- a. Mark the location of each microinverter on the rack relative to the PV module junction box or any other obstructions.
b. Install one microinverter at each of these marked locations using the hardware recommended by your module racking vendor.



NOTE: Install the microinverters (including DC and AC connectors) beneath the PV modules to protect them from direct exposure to rain, UV, or other adverse weather conditions. Leave a minimum of 1.5 cm (3/4 inch) space below and above the microinverter casing to allow proper airflow. The racking must be grounded in accordance with local electrical codes.

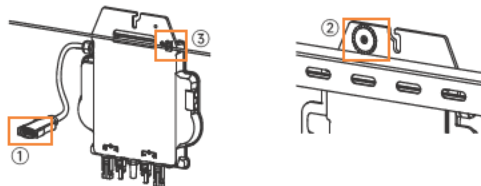
Tip: When flush-mounting photovoltaic modules on the rooftop, ensure that the DC connectors, antenna, and LED indicator of the microinverter are facing outwards. This arrangement facilitates monitoring of indicator status and ensures optimal communication quality.



Step 4 Grounding the system

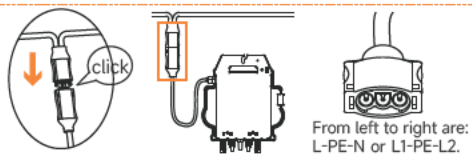
There are three ways to connect grounds on the APsystems DS3:

- ① Y3 AC Bus cable has an embedded PE wire to ground the inverters in the AC circuit box.
② If the rack is grounded, the grounding washer on the inverter could create a tight bond onto the rack as a ground connection. This is also a solution to ground the rack through inverter when the inverters are grounded.
③ If an external connection is necessary, an external wire can be bonded to the grounding lug on the exterior of the inverter and connected to ground.



Step 5 Connecting the APsystems microinverter to the AC bus cable

Insert the microinverter AC connector into the trunk cable connector. Ensure you hear the "click" sound as evidence of a secure connection.

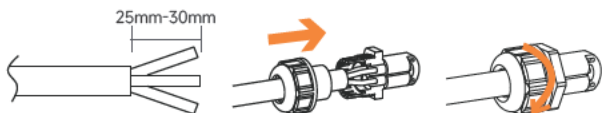


- ① Best Practice: Use the AC Bus Cable Unlock Tool to disconnect the connectors.
② NOTE: Cover any unused connectors with the Bus Cable Y-CONN to protect them.



Step 6 Installing a bus cable end cap at the end of the AC bus cable

- a. Strip cable jacket.
b. Insert the cable end into the seal.
c. Rotate the nut with 4-5N·m until the latching mechanism meets the base.

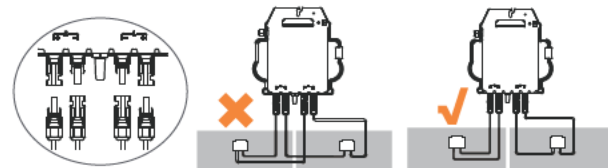


Step 7 Connecting APsystems microinverters to the PV modules

When plugging in the DC cables, the microinverter should immediately blink green ten times. This will happen as soon as the DC cables are plugged in and will indicate that the microinverter is functioning correctly. This entire check function will start and end within 10 seconds of plugging in the unit. Therefore, pay close attention to these lights while connecting the DC cables.

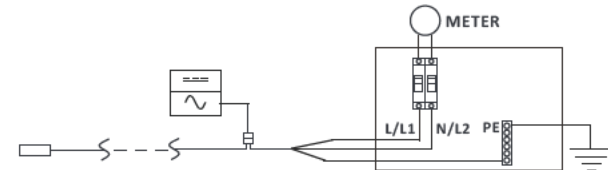
WARNING: Double-check to ensure that all AC and DC wiring has been correctly installed. Verify that none of the AC and/or DC wires are pinched or damaged. Confirm that all junction boxes are properly closed.

Each PV panel must be meticulously connected to the same channel. Do not split positive and negative DC cables into two different input channels, as this will damage the microinverter and void the warranty.



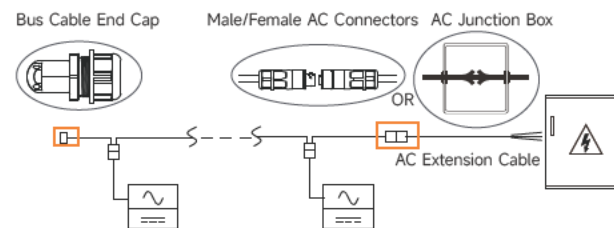
Step 8 Connecting APsystems microinverters to the grid

- a. Please install bi-polar circuit breakers with the appropriate rated current or according to local regulations. These circuit breakers are mandatory for grid connection.
b. Installation of leakage current breakers or AFCI/GFCI breakers is not recommended.



Step 9 AC extension cable

When an AC extension cable is required, users can either connect the AC bus cable and AC extension cable within a junction box or use a pair of male/female AC connectors provided by APsystems as optional accessories.

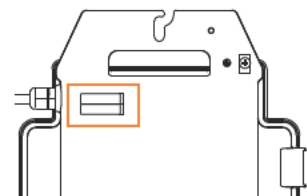


Step 10 Completing the APsystems installation map

- a. Each APsystems Microinverter comes with 2 removable serial number labels.
b. Complete the installation map by affixing the ID label of each microinverter at the appropriate location.
c. The second serial number label can be adhered to the solar module frame. This label will assist in later confirmation of the microinverter's position without the need to dismantle the PV module.

NOTE:

- ① The arrangement of the microinverters' serial numbers in the installation map is designed for standard installations.
② The Installation Map can be found in the appendix on the last page of this manual.
③ When configuring the ECU, use the ECU_APP (accessible through the EMA Manager) to scan the serial numbers on the map (refer to the ECU instruction manual for further details).

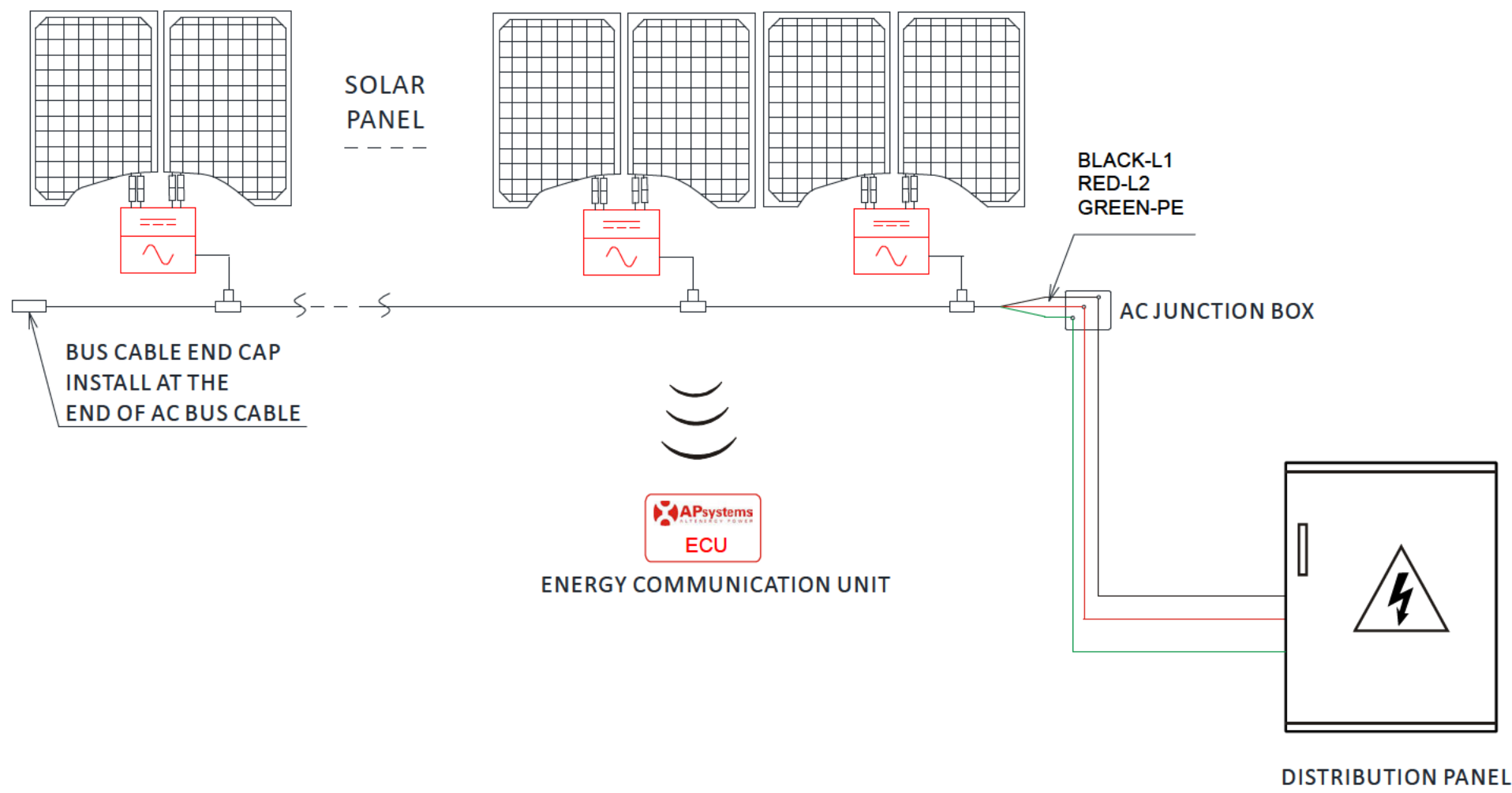


Please scan this QR code to have access to our APPs and Products information. Product information is subject to change without notice.(Please download manuals at www.APsystems.com).



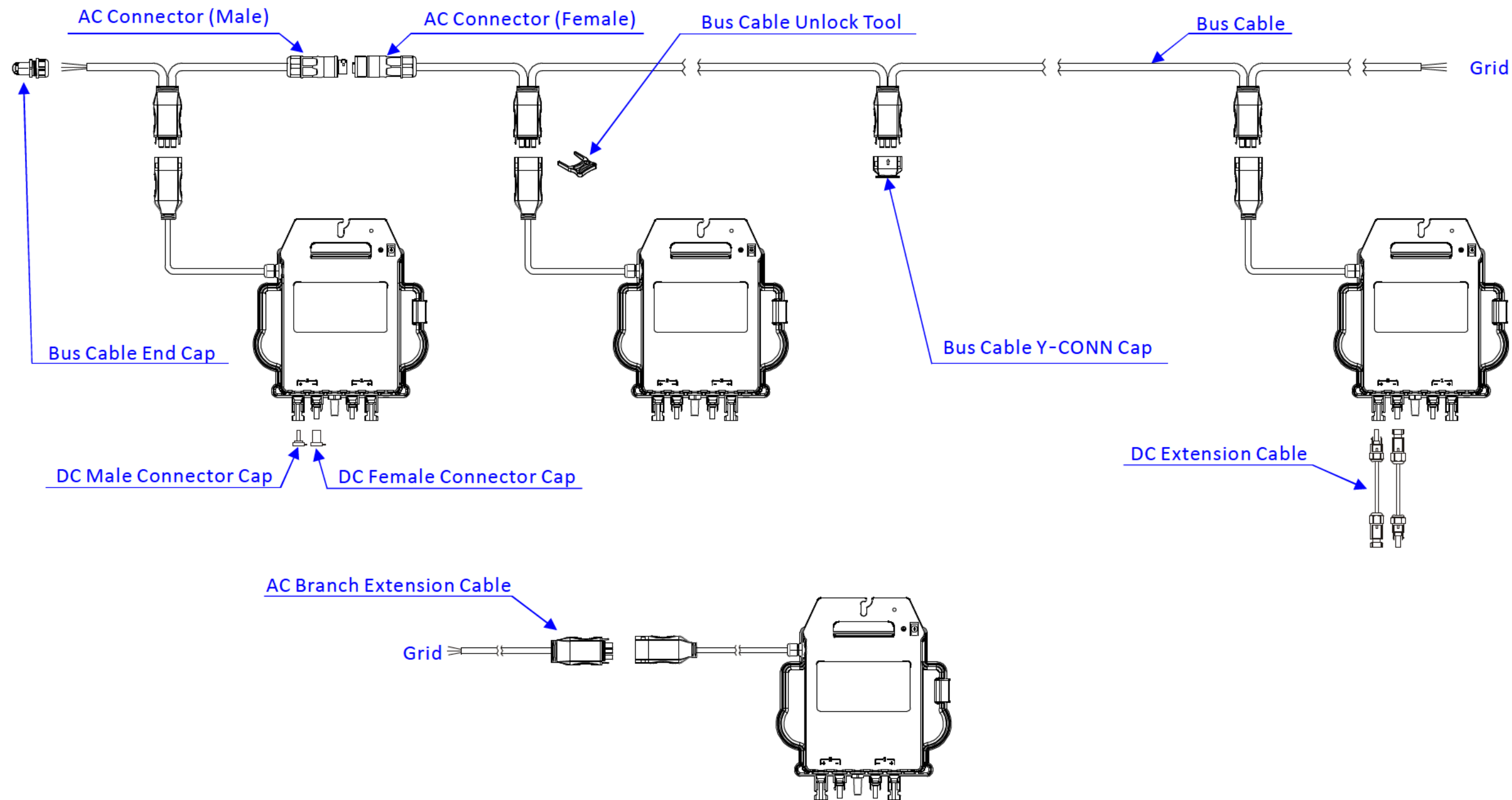
9. Wiring Diagram

9.1 Sample Wiring Diagram - Split Phase



10.DS3 series Accessory

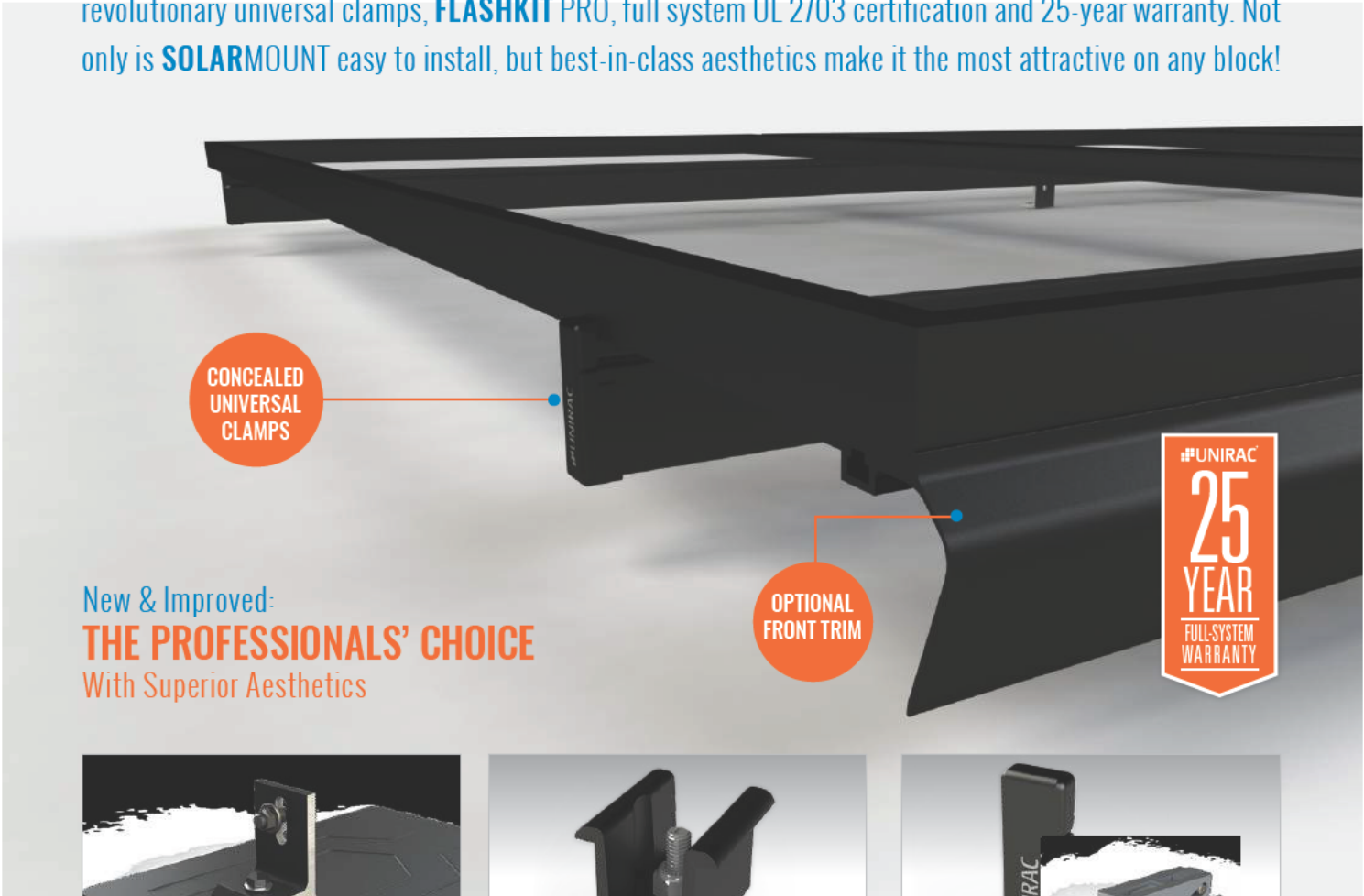
10.2Wiring Diagram



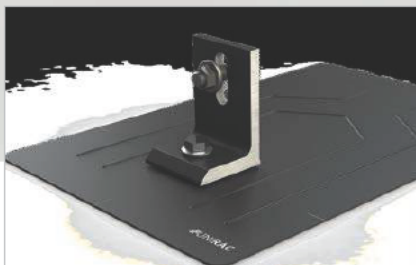
SOLARMOUNT



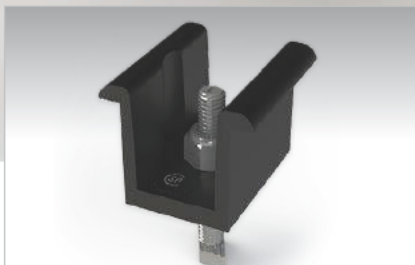
SOLARMOUNT is the professionals' choice for residential PV mounting applications. Every aspect of the system is designed for an easier, faster installation experience. **SOLARMOUNT** is a complete solution with revolutionary universal clamps, **FLASHKIT PRO**, full system UL 2703 certification and 25-year warranty. Not only is **SOLARMOUNT** easy to install, but best-in-class aesthetics make it the most attractive on any block!



New & Improved:
THE PROFESSIONALS' CHOICE
With Superior Aesthetics



NOW FEATURING FLASHKIT PRO
The Complete Roof Attachment Solution
FEATURING SHED & SEAL TECHNOLOGY



NOW WITH UNIVERSAL MIDCLAMPS
Accommodates 30mm-51mm module frames
One tool, one-person installs are here!



REVOLUTIONARY NEW ENDCLAMPS
Concealed design and included End Caps

THE PROFESSIONALS' CHOICE FOR RESIDENTIAL RACKING

BEST INSTALLATION EXPERIENCE • CURB APPEAL • COMPLETE SOLUTION • UNIRAC SUPPORT

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SOLARMOUNT



BETTER DESIGNS

TRUST THE INDUSTRY'S BEST DESIGN TOOL

Start the design process for every project in our U-Builder on-line design tool. It's a great way to save time and money.

BETTER SYSTEMS

ONE SYSTEM - MANY APPLICATIONS

Quickly set modules flush to the roof on steep pitched roofs. Orient a large variety of modules in Portrait or Landscape. Tilt the system up on flat or low slow roofs. Components available in mill, clear, and dark finishes to optimize your design financials and aesthetics.

BETTER RESULTS

MAXIMIZE PROFITABILITY ON EVERY JOB

Trust Unirac to help you minimize both system and labor costs from the time the job is quoted to the time your teams get off the roof. Faster installs. Less Waste. More Profits.

BETTER SUPPORT

WORK WITH THE INDUSTRIES MOST EXPERIENCED TEAM

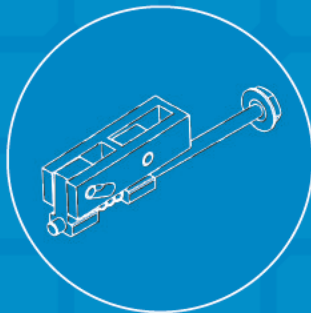
Professional support for professional installers and designers. You have access to our technical support and training groups. Whatever your support needs, we've got you covered. Visit Unirac.com/solarmount for more information.



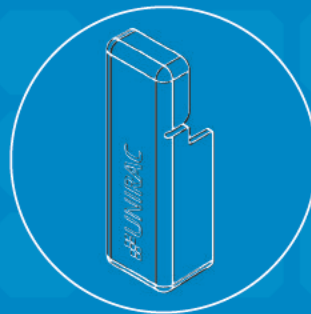
UL2703

BONDING & GROUNDING
MECHANICAL LOADING
SYSTEM FIRE CLASSIFICATION

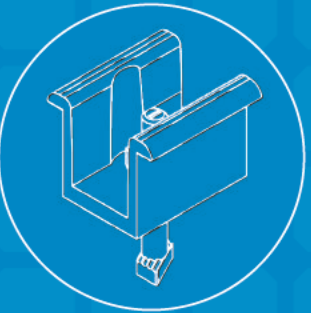
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ENDCLAMPS



END CAPS INCLUDED
WITH EVERY ENDCLAMP

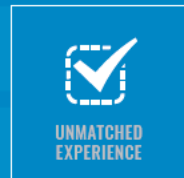


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UNMATCHED
EXPERIENCE



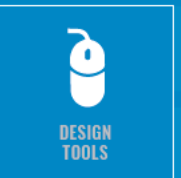
CERTIFIED
QUALITY



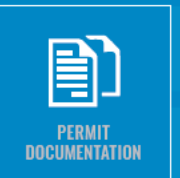
ENGINEERING
EXCELLENCE



BANKABLE
WARRANTY



DESIGN
TOOLS



PERMIT
DOCUMENTATION

TECHNICAL SUPPORT

Unirac's technical support team is dedicated to answering questions & addressing issues in real time. An online library of documents including engineering reports, stamped letters and technical data sheets greatly simplifies your permitting and project planning process.

CERTIFIED QUALITY PROVIDER

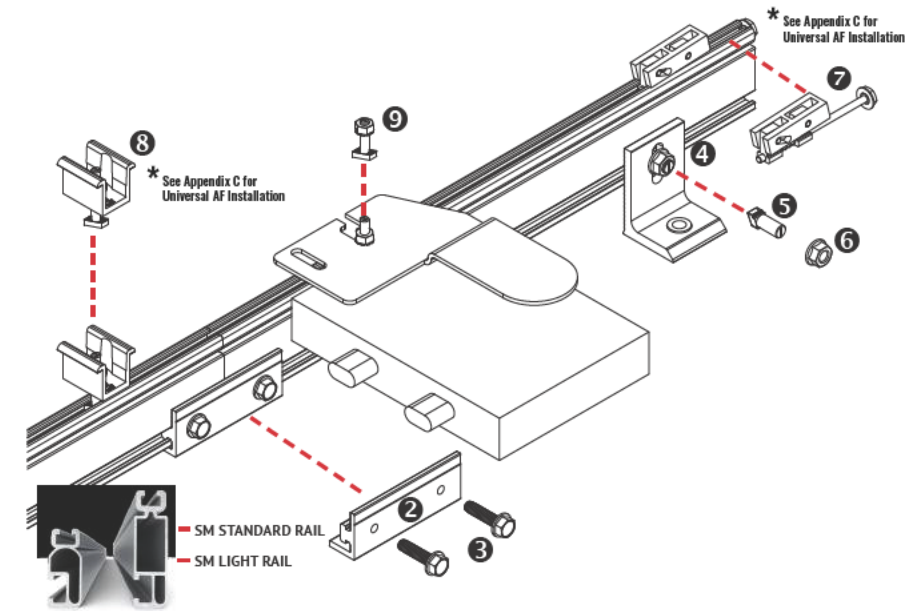
Unirac is the only PV mounting vendor with ISO certifications for 9001:2008, 14001:2004 and OHSAS 18001:2007, which means we deliver the highest standards for fit, form, and function. These certifications demonstrate our excellence and commitment to first class business practices.

BANKABLE WARRANTY

Don't leave your project to chance, Unirac has the financial strength to back our products and reduce your risk. Have peace of mind knowing you are providing products of exceptional quality. SOLARMOUNT is covered by a 25 year limited product warranty and a 5 year limited finish warranty.

ENHANCE YOUR REPUTATION WITH QUALITY RACKING SOLUTIONS BACKED BY ENGINEERING EXCELLENCE AND A SUPERIOR SUPPLY CHAIN

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Wrenches and Torque		
	Wrench or Socket Size	Recommended Torque (ft-lbs)
Mid Clamp ⑥	1/2"	11
MLPE Mount ⑥	1/2"	10
End Clamp ⑥	1/2"	5
L-Foot to Rail ④	1/2"	30
Rail Splice ②	1/2"	10

Anti-Seize ⑥⑨	
Stainless steel hardware can seize up, a process called galling. To significantly reduce its likelihood: 1. Apply minimal lubricant to bolts only where indicated in installation process, preferably Anti-Seize commonly found at auto parts stores (Anti-seize has been factory applied to mid clamp bolts) 2. Shade hardware prior to installation, and 3. Avoid spinning stainless nuts onto bolts at high speed.	

- ① **RAIL**: Supports PV modules. Use at least two per row of modules. Aluminum extrusion, available in mill, clear anodized, or dark anodized.
- ② **RAIL SPLICE**: Non structural splice joins, aligns, and electrically bonds rail sections into single length of rail. Forms a rigid splice joint, 4 inches long, preassembled with bonding hardware. Available in dark anodized or mill finish.
- ④ **L-FOOT**: Use to secure rails through roofing material to building structure. Refer to loading tables or U-Builder for spacing.
- ⑤ **L-FOOT T-BOLT**: (3/8" x 3/4" or 1") – Use one per L-foot to secure rail to L-foot. Stainless steel. Supplied with L-foot in combination with flange nut, provides electrical bond between L-foot and rail.
- ⑥ **SERRATED FLANGE NUT**: Use one per L-foot to secure and bond rail to Lfoot. Stainless steel. Supplied with L-foot.
- ⑦ **MODULE ENDCLAMP**: Pre-assembled universal clamp that secures module to rail at module flange by tightening 1/2" hex head bolt.
- ⑧ **MODULE MIDCLAMP**: Pre-assembled clamp provides module to module and module to rail bond. Aluminum clamp with stainless steel bonding pins and T-bolt. Available in clear or dark finish.
- ⑨ **MICROINVERTER MOUNTING BOLT**: Preassembled bolt, nut, and captive star washer attaches and bonds microinverter to rail.

NOTE - POSITION INDICATOR: T-bolts have a slot in the hardware end corresponding to the direction of the T-Head.

SYSTEM LEVEL FIRE CLASSIFICATION

The system fire class rating requires installation in the manner specified in the SOLARMOUNT Installation Guide. SOLARMOUNT has been classified to the system level fire portion of UL 1703. This UL 1703 classification has been incorporated into our UL 2703 product certification. SOLARMOUNT has achieved system level performance for steep sloped roofs. System level fire performance is inherent in the SOLARMOUNT design, and no additional mitigation measures are required. The fire classification rating is only valid on roof pitches greater than 2:12 (slopes ≥ 2 inches per foot, or 9.5 degrees). The system is to be mounted over fire resistant roof covering rated for the application. There is no required minimum or maximum height limitation above the roof deck to maintain the system fire rating for SOLARMOUNT. Module Types & System Level Fire Ratings are listed below:

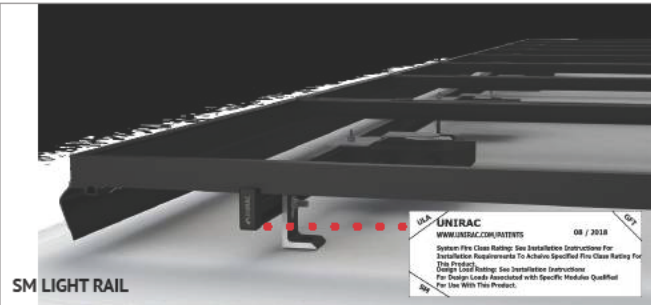
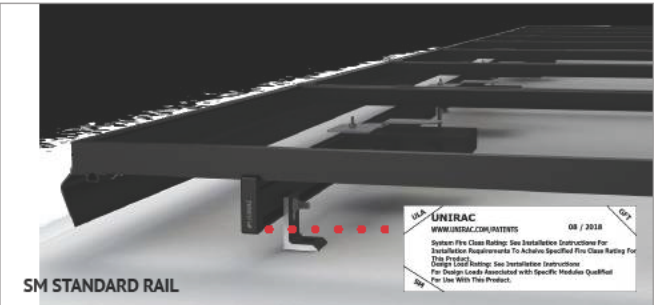
Rail Type	Module Type	System Level Fire Rating	Rail Direction	Module Orientation	Mitigation Required
Standard Rail	Type 1, Type 2, Type 3, Type 10, Type 19, Type 22, & Type 25	Class A, Class B & Class C	East-West	Landscape OR Portrait	None Required
			North-South	Landscape OR Portrait	None Required
Light Rail	Type 1 & Type 2	Class A, Class B & Class C	East-West	Landscape OR Portrait	None Required
			North-South	Landscape OR Portrait	None Required

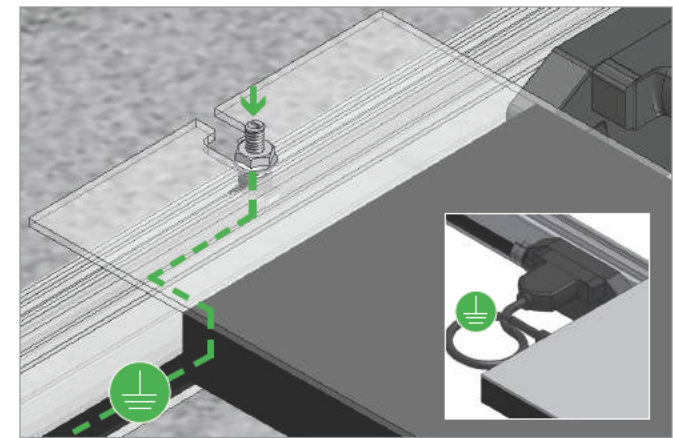
This racking system may be used to ground and/or mount a PV module complying with UL1703 only when the specific module has been evaluated for grounding and/or mounting in compliance with the included instructions.

UL2703 CERTIFICATION MARKING LABEL

Unirac SOLARMOUNT is listed to UL 2703. Certification marking is embossed on all mid clamps as shown. Labels with additional information will be provided. After the racking system is fully assembled, a single label should be applied to the SOLARMOUNT rail at the edge of the array. **Before applying the label, the corners of the label that do not pertain to the system being installed must be removed so that only the installed system type is showing.**

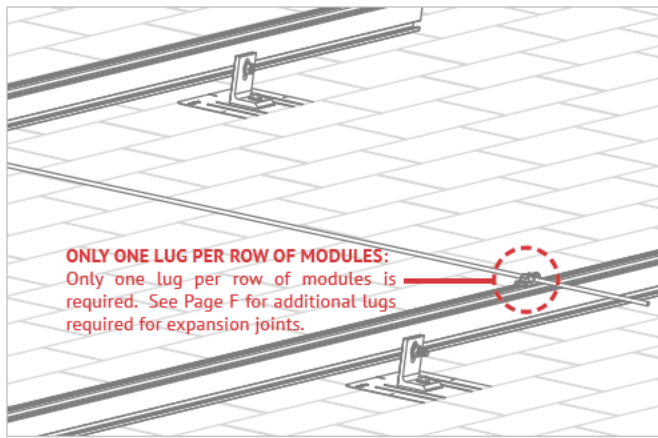
Note: The sticker label should be placed such that it is visible, but not outward facing.





SM EQUIPMENT GROUNDING THROUGH ENPHASE MICROINVERTERS
The Enphase M215 and M250 microinverters have integrated grounding capabilities built in. In this case, the DC circuit is isolated from the AC circuit, and the AC equipment grounding conductor (EGC) is built into the Enphase Engage integrated grounding (IG) cabling.
In order to ground the SOLARMOUNT racking system through the Enphase microinverter and Engage cable assembly, there must be a minimum of three PV modules connected to the same trunk cable within a continuous row. Continuous row is defined as a grouping of modules installed and bonded per the requirements of this installation guide sharing the same two rails. The microinverters are bonded to the SOLARMOUNT rail via the mounting hardware. Complete equipment grounding is achieved through the Enphase Engage cabling with integrated grounding (IG). No additional EGC grounding cables are required, as all fault current is carried to ground through the Engage cable.

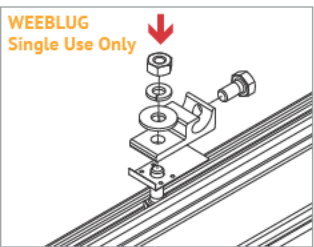
SOLARMOUNT INTEGRATED BONDING ADVANTAGE
WITH SYSTEM GROUNDING THROUGH ENPHASE MICROINVERTERS AND TRUNK CABLES
LOSE ALL THE COPPER & LUGS



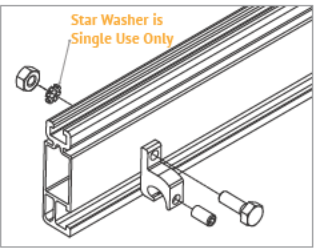
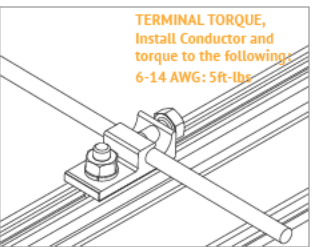
GROUNDING LUG MOUNTING DETAILS:
Details are provided for both the WEEB and IlSCO products. The WEEBLug has a grounding symbol located on the lug assembly. The IlSCO lug has a green colored set screw for grounding indication purposes. Installation must be in accordance with NFPA NEC 70, however the electrical designer of record should refer to the latest revision of NEC for actual grounding conductor cable size.

Required if not using approved integrated grounding microinverters

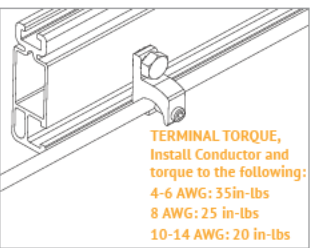
GROUNDING LUG - BOLT SIZE & DRILL SIZE		
GROUND LUG	BOLT SIZE	DRILL SIZE
WEEBLug	1/4"	N/A - Place in Top SM Rail Slot
ILSCO Lug	#10-32	7/32"
- Torque value depends on conductor size. - See product data sheet for torque value.		



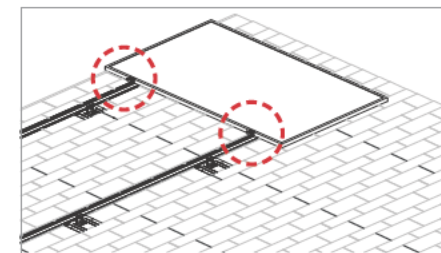
WEEBLUG CONDUCTOR - UNIRAC P/N 0080025:
Apply Anti Seize and insert a bolt in the aluminum rail and through the clearance hole in the stainless steel flat washer. Place the stainless steel flat washer on the bolt, oriented so the dimples will contact the aluminum rail. Place the lug portion on the bolt and stainless steel flat washer. Install stainless steel flat washer, lock washer and nut. Tighten the nut until the dimples are completely embedded into the rail and lug.
TORQUE VALUE 10 ft lbs. (See Note on PG. A)
See product data sheet for more details, Model No. WEEB-LUG-6.7



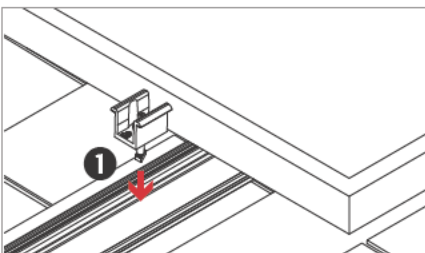
ILSCO LAY-IN LUG CONDUCTOR - UNIRAC P/N 008009P: Alternate Grounding Lug
- Drill, deburr hole and bolt thru both rail walls per table.
TORQUE VALUE 5 ft lbs. (See Note on PG. A)
See ILSCO product data sheet for more details, Model No. GBL-4DBT.



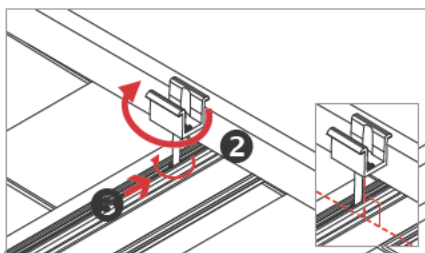
NOTE: ISOLATE COPPER FROM ALUMINUM CONTACT TO PREVENT CORROSION



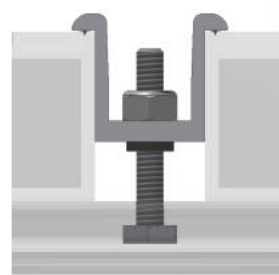
INSTALL MIDCLAMPS: Midclamp is supplied as an assembly with a T-bolt for module installation. Clamp assemblies may be positioned in rail near point of use prior to module placement.



INSERT MIDCLAMP ASSEMBLY: Insert 1/4" T-Bolt into top slot of rail

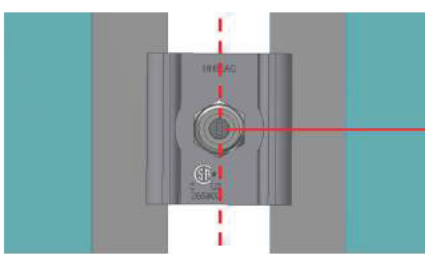


MIDCLAMP: Rotate midclamp assembly and slide until clamp is against module frame. Do not tighten nut until next module is in position. Ensure bolt is perpendicular to rail.

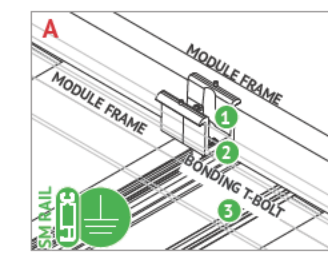


PLACE ADJACENT MODULE AGAINST CLAMPS: Modules must be tight against clamps with no gaps. Tighten nut to required torque.

TORQUE VALUE (See table and notes on PG. A)
11 ft-lbs. No anti-seize.

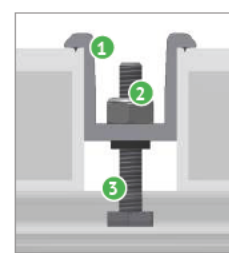


POSITION INDICATOR - SERRATED T-BOLT: Verify the T-bolt position indicator is perpendicular to the rail.

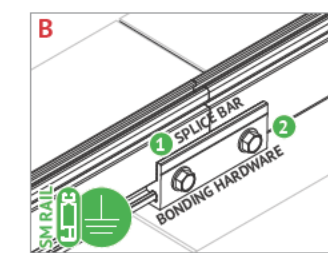


BONDING MIDCLAMP ASSEMBLY

- 1 Aluminum mid clamp with stainless steel bonding pins that pierce module frame anodization to bond module to module through clamp
- 2 Stainless steel nut bonds aluminum clamp to stainless steel T-bolt
- 3 Serrated T-bolt head penetrates rail anodization to bond T-bolt, nut, clamp, and modules to SM rail

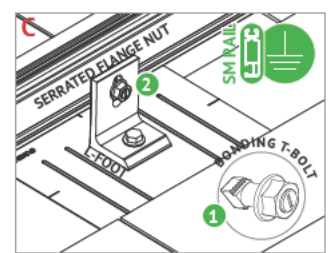


BONDING MIDCLAMP ASSEMBLY



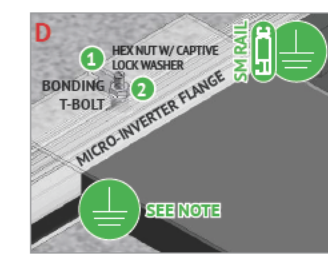
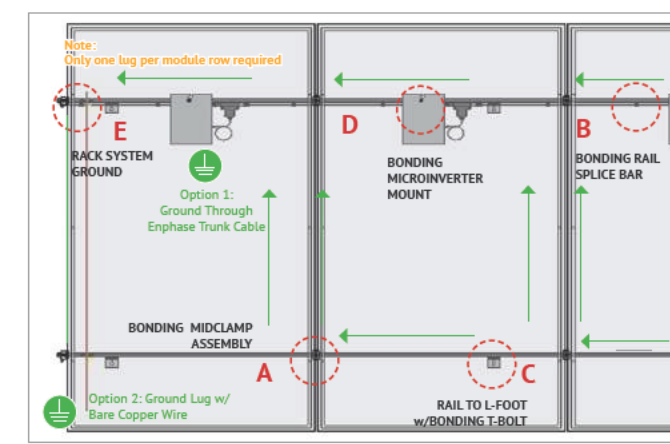
BONDING RAIL SPLICE BAR

- 1 Bonding Hardware creates bond between splice bar and each rail section
 - 2 Aluminum splice bar spans across rail gap to create rail to rail bond. Rail on at least one side of splice will be grounded.
- Note: Splice bar and bolted connection are non-structural. The splice bar function is rail alignment and bonding.



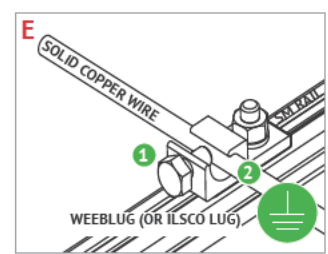
RAIL TO L-FOOT w/ BONDING T-BOLT

- 1 Serrated flange nut removes L-foot anodization to bond L-foot to stainless steel T-bolt
- 2 Serrated T-bolt head penetrates rail anodization to bond T-bolt, nut, and L-foot to grounded SM rail



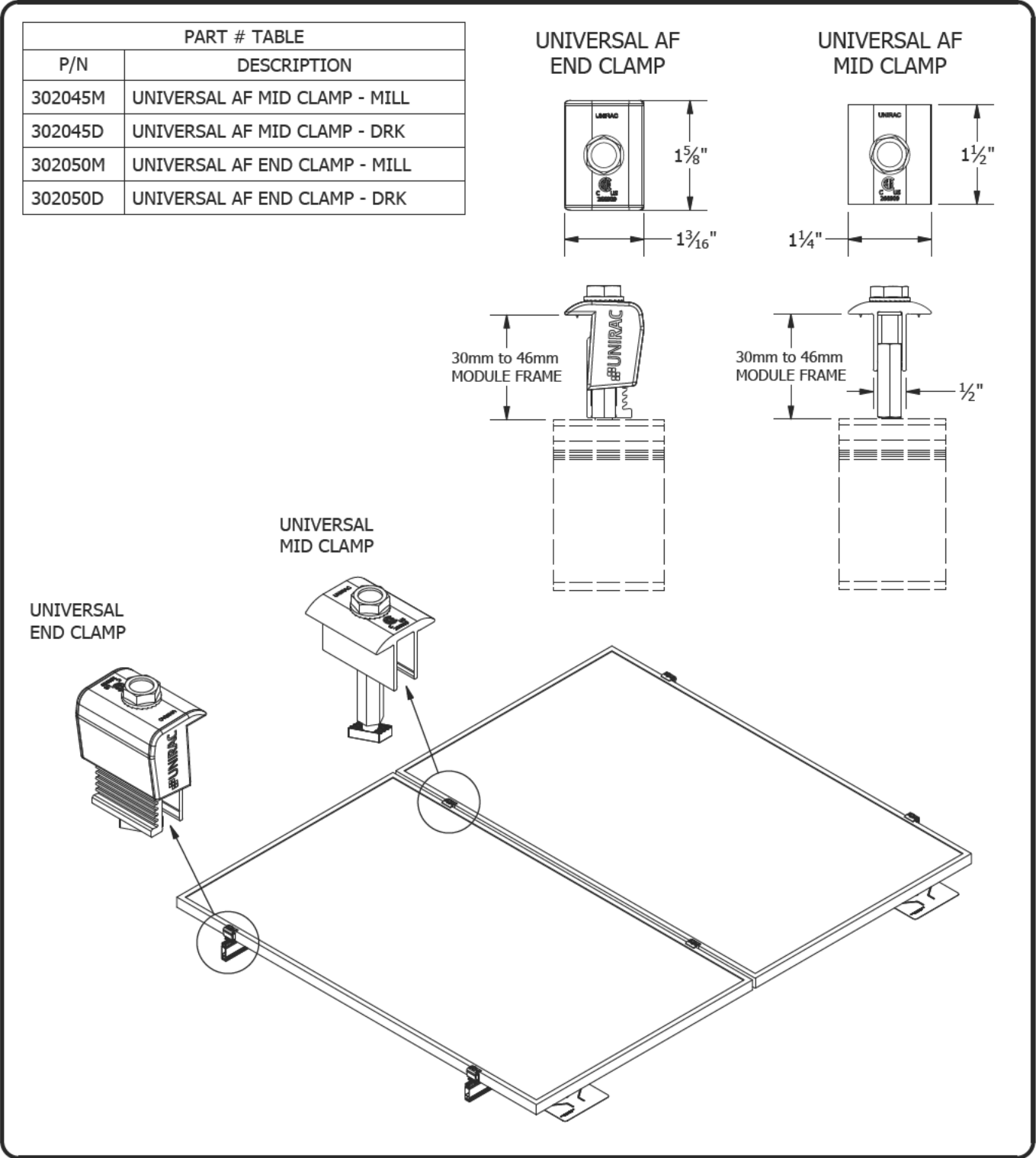
BONDING MICROINVERTER MOUNT

- 1 Hex nut with captive lock washer bonds metal microinverter flange to stainless steel T-bolt
- 2 Serrated T-bolt head penetrates rail anodization to bond T-bolt, nut, and L-foot to grounded SM rail. System ground including racking and modules may be achieved through the trunk cable of approved microinverter systems. See page J for details



RACK SYSTEM GROUND

- 1 WEEB washer dimples pierce anodized rail to create bond between rail and lug
- 2 Solid copper wire connected to lug is routed to provide final system ground connection. NOTE: Ilco lug can also be used when secured to the side of the rail. See page K for details



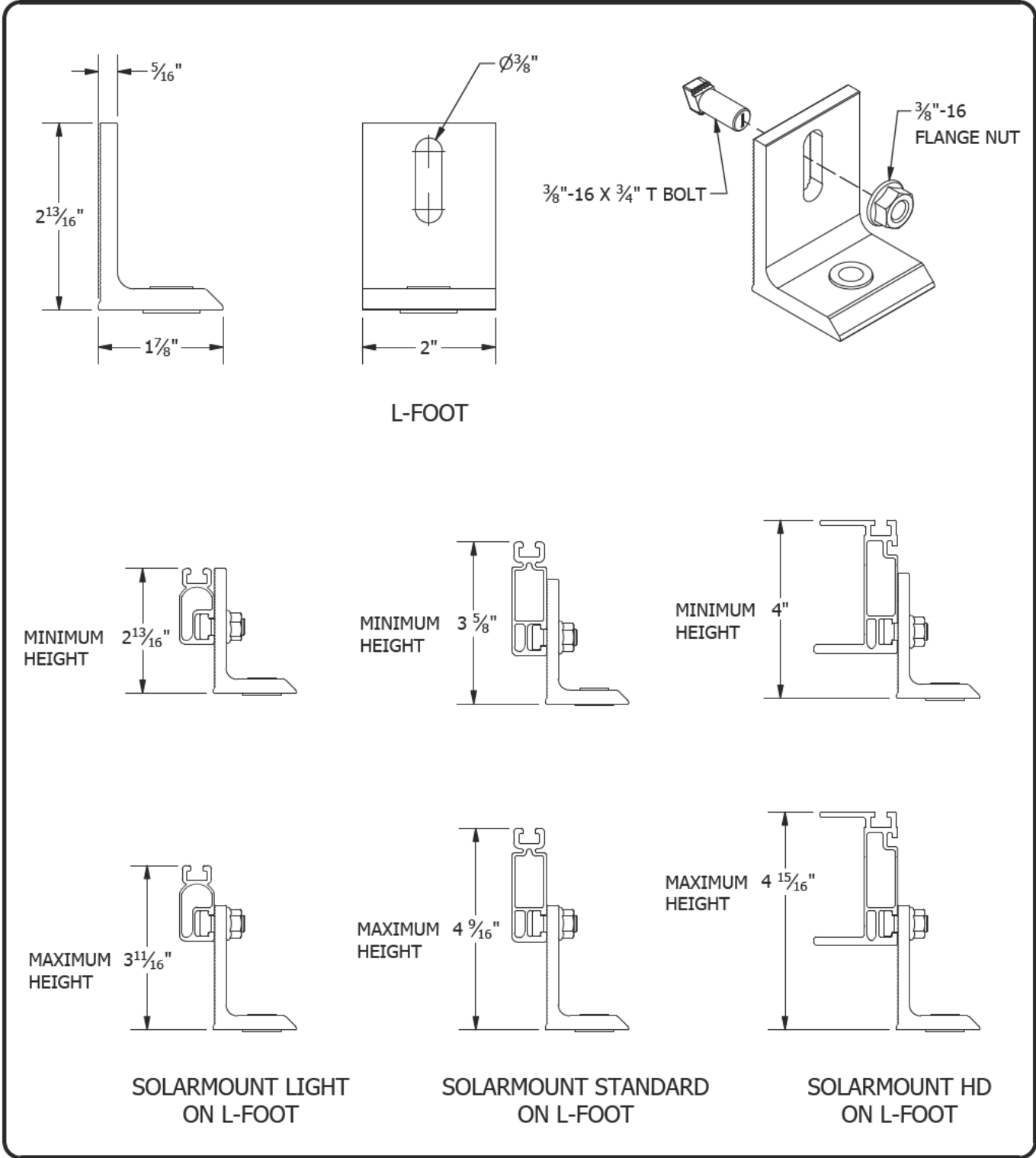
1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	SOLARMOUNT
DRAWING TYPE:	PART & ASSEMBLY
DESCRIPTION:	UNIVERSAL AF CLAMPS
REVISION DATE:	9/28/2020

DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL	
PRODUCT PROTECTED BY ONE OR MORE US PATENTS	
LEGAL NOTICE	

SM-A01B

SHEET



1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

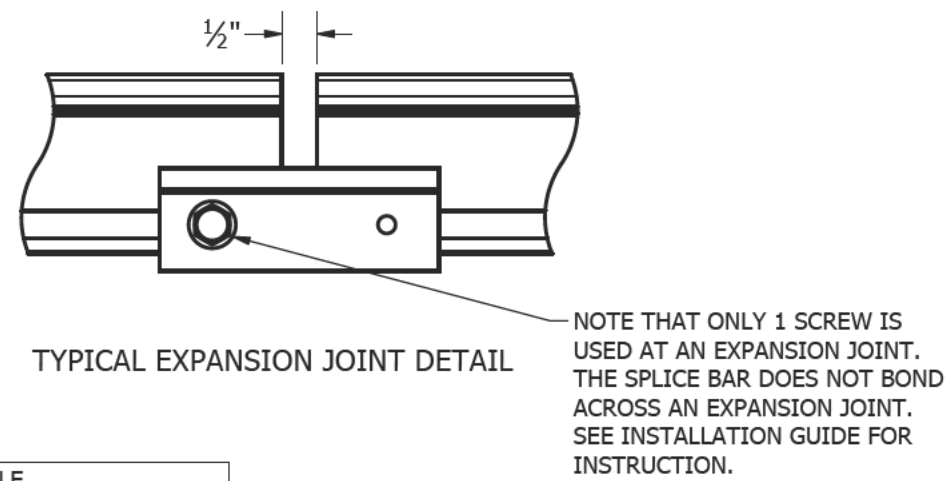
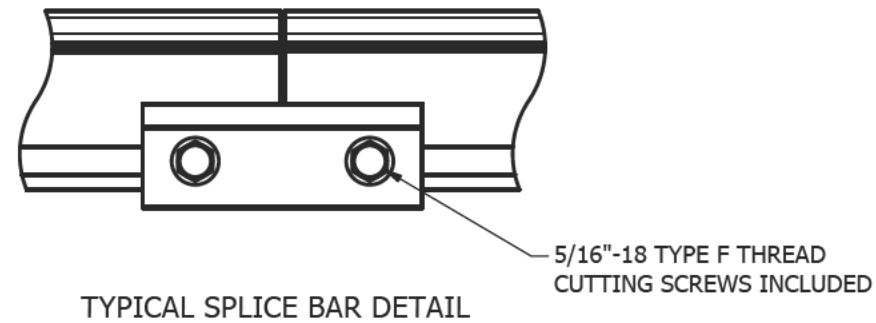
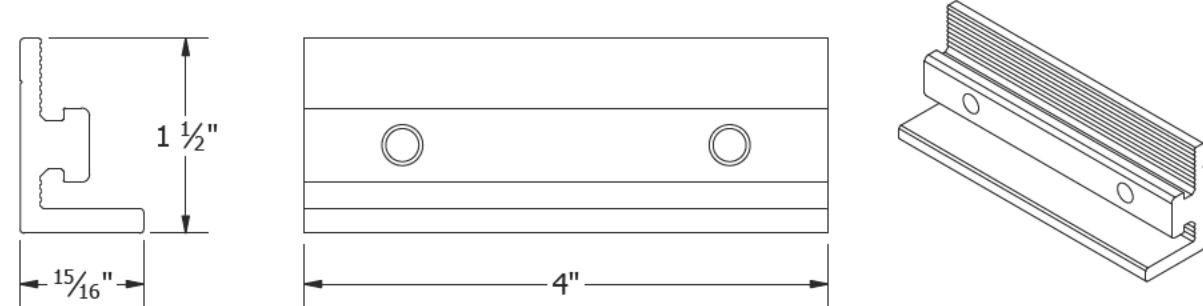
PRODUCT LINE:	SOLARMOUNT
DRAWING TYPE:	PART & ASSEMBLY
DESCRIPTION:	L-FOOT
REVISION DATE:	11/19/2018

DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL	
PRODUCT PROTECTED BY ONE OR MORE US PATENTS	
LEGAL NOTICE	

SM-A11

SHEET

BONDING SPLICE BAR



PART # TABLE	
P/N	DESCRIPTION
303019M	BND SPLICE BAR PRO SERIES MILL
303019D	BND SPLICE BAR PRO SERIES DRK



1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

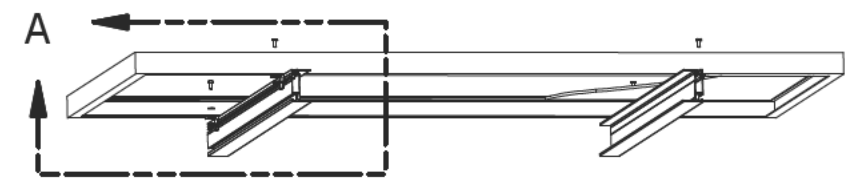
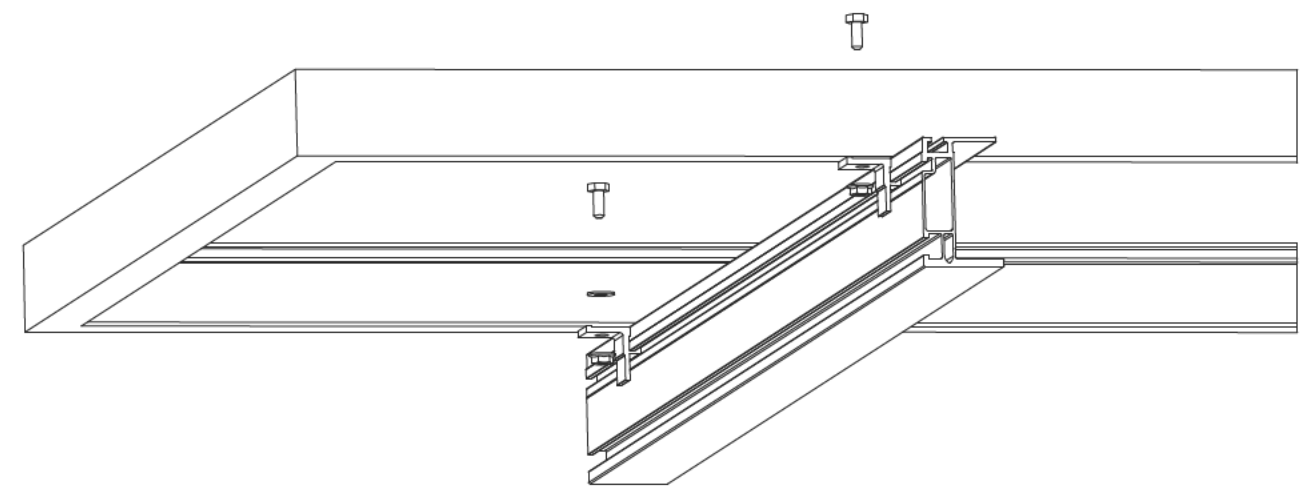
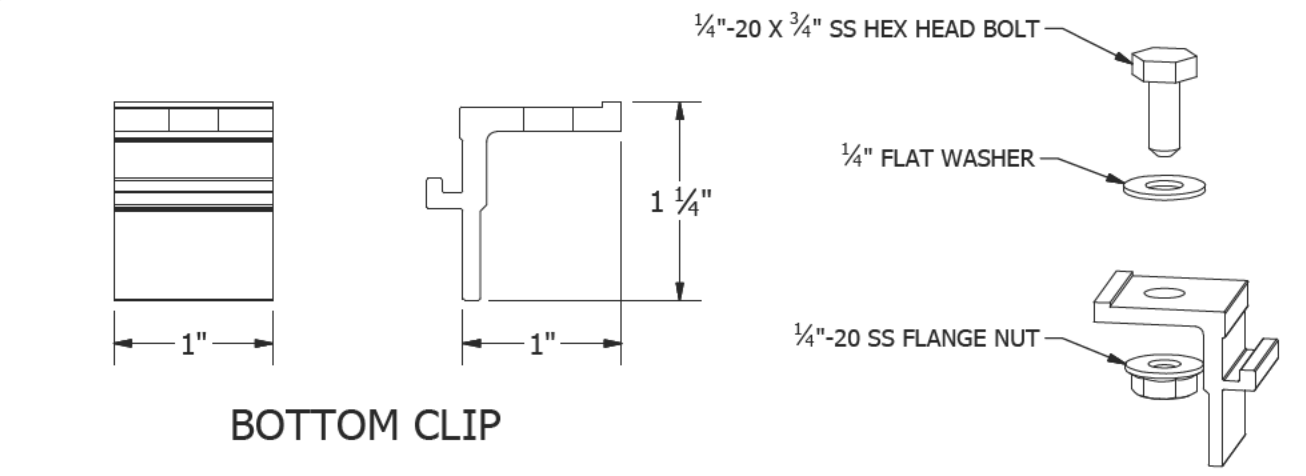
PRODUCT LINE:	SOLARMOUNT
DRAWING TYPE:	PART & ASSEMBLY
DESCRIPTION:	BONDING SPLICE BAR PRO SERIES
REVISION DATE:	9/17/2019

DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL
PRODUCT PROTECTED BY ONE OR MORE US PATENTS LEGAL NOTICE

SM-A05

SHEET

BOTTOM CLIP



PART # TABLE	
P/N	DESCRIPTION
302000C	SMHD BOTTOM CLIPS W/HDW CLR



1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE:	SOLARMOUNT HD
DRAWING TYPE:	PART & ASSEMBLY
DESCRIPTION:	BOTTOM CLIP
REVISION DATE:	9/27/2017

DRAWING NOT TO SCALE ALL DIMENSIONS ARE NOMINAL
PRODUCT PROTECTED BY ONE OR MORE US PATENTS LEGAL NOTICE

SM-A10

SHEET

TECHNICAL BULLETIN



SOLARMOUNT RAIL SPANS

TB-2020-015 | Rev: 2020-06-04

Longer Attachment Spans for Solarmount System

Unirac is committed to bringing the best products to our valued customers. Recent collaborations with third-party engineering firms and research institutions have resulted in optimized engineering of the Solarmount product line. As a result, we are now able to bring our customers even better spans in all wind and snow conditions (see table below). This update maintains the exact same product form factor, install experience, and accessory compatibility, and does not require any additional training for installers. This means the results of this investment come completely as an added value to our customers. We will continue to push the bounds to provide the best system performance while maintaining our industry-best 25-year warranty.

Span Table

The table provides guide on span for each rail. Below table is based on ASCE-7-16, Non-Exposed, Roof Zone 1, 2e, Exposure B and Mean Building Height of 30ft. For more precise design specifications refer to the detailed span tables.

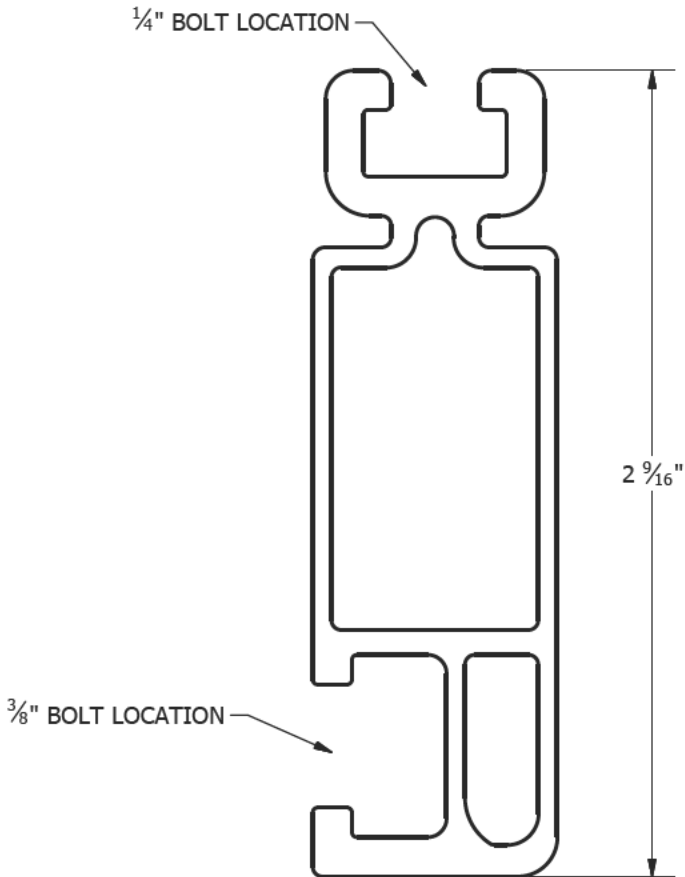
Load		Rail Span												
Snow (psf)	Wind Speed (mph)	16 in	24 in	32 in	36 in	48 in	60 in	64 in	72 in	80 in	96 in	112 in	120 in	144 in
0	90	SMLT									SM			SMHD
	110	SMLT									SM			SMHD
	130	SMLT									SM			SMHD
	160	SMLT									SM			SMHD
	180	SMLT									SM			SMHD
10	90	SMLT									SM			SMHD
	110	SMLT									SM			SMHD
	130	SMLT									SM			SMHD
	160	SMLT									SM			SMHD
	180	SMLT									SM			SMHD
20	90	SMLT									SM			SMHD
	110	SMLT									SM			SMHD
	130	SMLT									SM			SMHD
	160	SMLT									SM			SMHD
	180	SMLT									SM			SMHD
30	90	SMLT									SM			SMHD
	110	SMLT									SM			SMHD
	130	SMLT									SM			SMHD
	160	SMLT									SM			SMHD
	180	SMLT									SM			SMHD
40	90	SMLT									SM			SMHD
	110	SMLT									SM			SMHD
	130	SMLT									SM			SMHD
	160	SMLT									SM			SMHD
	180	SMLT									SM			SMHD
50	90	SMLT									SM			SMHD
	110	SMLT									SM			SMHD
	130	SMLT									SM			SMHD
	160	SMLT									SM			SMHD
	180	SMLT									SM			SMHD
60	90	SMLT									SM			SMHD
	110	SMLT									SM			SMHD
	130	SMLT									SM			SMHD
	160	SMLT									SM			SMHD
	180	SMLT									SM			SMHD

*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance

1 of 1

FOR QUESTIONS OR CUSTOMER SERVICE VISIT UNIRAC.COM OR CALL (505) 248-2702

PUB2020JAND06. Current Technical Bulletins are located at Unirac.com/Technical-Support



PART # TABLE		
P/N	DESCRIPTION	LENGTH
320132M	SM RAIL 132" MILL	132"
310132C	SM RAIL 132" CLR	132"
320168M	SM RAIL 168" MILL	168"
310168C	SM RAIL 168" CLR	168"
320168D	SM RAIL 168" DRK	168"
320208M	SM RAIL 208" MILL	208"
310208C	SM RAIL 208" CLR	208"
320240M	SM RAIL 240" MILL	240"
310240C	SM RAIL 240" CLR	240"
310240D	SM RAIL 240" DRK	240"



1411 BROADWAY BLVD. NE
ALBUQUERQUE, NM 87102 USA
PHONE: 505.242.6411
WWW.UNIRAC.COM

PRODUCT LINE: SOLARMOUNT

DRAWING TYPE: PART DETAIL

DESCRIPTION: STANDARD RAIL

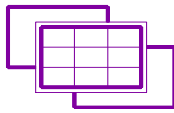
REVISION DATE: 9/11/2017

DRAWING NOT TO SCALE
ALL DIMENSIONS ARE
NOMINAL

PRODUCT PROTECTED BY
ONE OR MORE US PATENTS
LEGAL NOTICE

SM-P01

SHEET



18-January-2024

Unirac
1411 Broadway Blvd. NE
Albuquerque, NM 87101
Tel: 505 242 6411

Attn.: Engineering Department

Subject: Engineering Certification for the Unirac SOLARMOUNT Flush Rail System to Support Photovoltaic Panels.

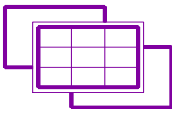
The Unirac SOLARMOUNT Flush-to-Roof is an extruded aluminum rail system that is engineered to hold most framed solar modules to a roof structure and installed parallel to the roof.

We have reviewed the SOLARMOUNT system, a proprietary mounting system constructed from modular parts which are intended for rooftop installation of solar photovoltaic (PV) panels; and have reviewed the U-Builder 2.0 Online tool. This U-Builder 2.0 software includes analysis for the SOLARMOUNT rails (SM LIGHT rail, SM STANDARD rail, and SM HEAVY DUTY rail) with Standard, Universal AF, and Pro Series hardware. All information, data, and analysis are in compliance with the following codes, city ordinances, and typical specifications:

- Codes:**
1. ASCE/SEI 7-10, 7-16 Minimum Design Loads for Buildings and Other Structures.
 2. International Building Code, 2012 & 2018 Edition w/ Provisions from SEAOC PV-2 2017.
 3. International Residential Code, 2012 & 2018 Edition w/ Provisions from SEAOC PV-2 2017.
 4. AC428, Acceptance Criteria for Modular Framing Systems Used to Support Photovoltaic (PV) Panels, November 1, 2012 by ICC-ES.
 5. Aluminum Design Manual, 2015 & 2020 Edition.

Following are typical specifications to meet the above code requirements:

- Design Criteria:** Ground Snow Load = 0 - 100 (psf)
Basic Wind Speed = 85 - 190 (mph)
Roof Mean Height = 0 - 60 (ft)
Roof Pitch = 0 - 45 (degrees)
Exposure Category = B, C & D
- Attachment:** **Shingle Roof:**
L-Foot, Flashkit Pro, Flashloc Comp, Flashloc Duo, Flashkit Pro SB
Metal Roof:
Standing Seam attachments, PM-9000S, PM Adjust Slotted
Tile Roofs:
Solar Hooks, Tile Replacement
- Attachment Spacing:** Per U-Builder 2.0 Engineering report.
- Cantilever:** The maximum cantilever length is L/3, where “L” is the span noted in the U-Builder 2.0 online tool.
- Clearance:** 2” to 10” clear from top of roof to top of PV panel
- Tolerance(s):** 1.0” tolerance for any specified dimension in this report is allowed for installation



- Installation Orientation:** See SOLARMOUNT Rail Flush Installation Guide.
Landscape - PV Panel long dimension is parallel to ridge/eave line of the roof and the PV panel is mounted on the long side.
Portrait - PV Panel short dimension is parallel to ridge/eave line of the roof and the PV panel is mounted on the short side.

Components and Cladding Roof Zones:
The Components and Cladding Roof Zones shall be determined based on ASCE 7-10 & 7-16 Component and Cladding design.

- Notes:**
1. U-Builder 2.0 Online tool analysis is only for Unirac SM SOLARMOUNT Rail Flush systems and do not include roof capacity check.
 2. Risk Category II per ASCE 7-16.
 3. Topographic factor, kzt is 1.0.
 4. Array Edge Factor $Y_E = 1.5$
 5. Average parapet height is 0.0 ft.
 6. Wind speeds are LRFD values.
 7. Attachment spacing(s) apply to a seismic design category E or less.

Design Responsibility:
The U-Builder 2.0 design software is intended to be used under the responsible charge of a registered design professional where required by the authority having jurisdiction. In all cases, this U-Builder 2.0 software should be used under the direction of a design professional with sufficient structural engineering knowledge and experience to be able to:

- Evaluate whether the U-Builder 2.0 Software is applicable to the project, and
- Understand and determine the appropriate values for all input parameters of the U-Builder 2.0 software.

This letter certifies that the Unirac SM SOLARMOUNT Rails Flush, when installed according to the U-Builder 2.0 engineering report and the manufacturer specifications are in compliance with the above codes and loading criteria.

- This certification excludes evaluation of the following components:
- 1) The structure to support the loads imposed on the building by the array; including, but not limited to: strength and deflection of structural framing members, fastening and/or strength of roofing materials, and/or the effects of snow accumulation on the structure.
 - 2) The attachment of the SM SOLARMOUNT Rails to the existing structure.
 - 3) The capacity of the solar module frame to resist the loads.

This requires additional knowledge of the building and is outside the scope of the certification of this racking system.

Please feel free to call for any questions or clarifications.

Prepared By:
Engineering Alliance, Inc
Sugar Land, TX



18-JAN-2024

30 ft
Roof Height

19 sq.ft

CROSS-SLOPE
Rail Direction

PRO SERIES

Flashloc Comp

Attachment

Maximum Allowable Rail Spans for Rooftop Solar Panels Parallel to the Roof Surface (inches)

* Cells with an asterisks indicates that the L-foot must be oriented in the Y- direction as indicated in the image.

10 Highlighted cell indicate 3-rail system span. Contact Unirac Engineering Services for support.

49 Highlighted cell with strikethrough indicate 3-rail system span and module clamp allowable capacity exceeds with 3-rails. 4-Rail system required. Contact Unirac Engineering Services for support.