# Agenda HISTORIC DISTRICT COMMISSION

Regular meeting 6:30 p.m. March 6, 2024 Board Meeting Room of Town Hall Annex, 105 E. Corbin St.

**Public charge:** The Hillsborough Historic District Commission pledges to the community of Hillsborough its respect. The commission asks members of the public to conduct themselves in a respectful, courteous manner with the commission members and with fellow community members. At any



time should any member of the commission or community fail to observe this public charge, the chair or the chair's designee will ask the offending person to leave the meeting until that individual regains personal control. Should decorum fail to be restored, the chair or the chair's designee will recess the meeting until such time that a genuine commitment to this public charge can be observed.

**Public comment guidelines:** All meetings shall be open to the public. The public may attend, but public comment shall be limited to those members of the public who have expert testimony or factual evidence directly related to an application on the agenda. Other public comments are permissible at the discretion of the Chair but shall not be used to render the Commission's decision on an agenda item. At the discretion of the Chair, a time limit may be placed on speakers other than the applicant to afford each citizen an equitable opportunity to speak in favor of, or in opposition to, an application.

### 1. Call to order, roll call, and confirmation of quorum

### 2. Commission's mission statement

To identify, protect, and preserve Hillsborough's architectural resources and to educate the public about those resources and preservation in general. The Hillsborough Historic District presents a visual history of Hillsborough's development from the 1700s to the 1960s. In 1973, the town chose to respect that history through the passage of the preservation ordinance creating the historic district.

### 3. Agenda changes

### 4. Minutes review and approval

Approve minutes from regular meeting on February 7, 2024

### 5. Written decisions review and approval

Approve written decisions from regular meeting on February 7, 2024

### 6. Old business

A. Certificate of Appropriateness Application: **114 W. Queen Street** – Applicant is proposing to add porches to the main house, add an accessory dwelling unit to the brick kitchen structure in the backyard, and construct two sheds in the northeast corner of the property (PIN 9874071780)

### 7. New business

- A. Certificate of Appropriateness Application: **102 W. Queen Street** Applicant is requesting to install 15 roof-mounted solar panels (PIN 9874073693)
- B. Certificate of Appropriateness Application: **124 E. Union Street** Applicant is requesting to add rear and side additions to the existing house and a new accessory dwelling unit/garage behind the existing house (9874171925)

### 8. Fee schedule updates

### 9. General updates

### 10. Adjournment

Interpreter services or special sound equipment for compliance with the American with Disabilities Act is available on request. If you are disabled and need assistance with reasonable accommodations, call the Town Clerk's Office at 919-296-9443 a minimum of one business day in advance of the meeting.

### **Minutes**

### HISTORIC DISTRICT COMMISSION

### Regular meeting

6:30 p.m. Feb 7, 2024

Board Meeting Room of Town Hall Annex, 105 E. Corbin St.

Present: Chair Will Senner, Vice Chair Mathew Palmer, and members G.

Miller, Hannah Peele and Sara Riek

Absent: Members Elizabeth Dicker and Bruce Spencer

Staff: Planner Joseph Hoffheimer and Town Attorney Bob Hornik

### 1. Call to order, roll call, and confirmation of quorum

Chair Will Senner called the meeting to order at 6:30 p.m. He called the roll and confirmed the presence of a quorum.

### 2. Commission's mission statement

Senner read the statement.

### 3. Agenda changes

There were no changes to the agenda.

### 4. Minutes review and approval

Minutes from regular meeting on Jan. 10, 2024.

Motion: Member G. Miller moved approval of the Jan. 10, 2024, minutes with a correction. Member

Sara Riek seconded.

Vote: 5-0.

Correction: The word "Huffman" will be added to the beginning of Paragraph 7 on p. 2, which currently

begins with the word "confirmed."

### 5. Written decisions review and approval

Written decisions from regular meeting on Jan. 10, 2024.

Motion: Miller moved approval of the written decisions from the regular meeting on Jan. 10, 2024, as

submitted. Senner seconded.

Vote: 5-0.

### 6. New business

A. Certificate of Appropriateness Application: 318 W. Queen St.

Applicant is requesting approval to construct a front-yard wooden picket fence with two arched gates (PIN 9864872602).

Senner opened the public hearing and asked whether there were any conflicts of interest or bias among the commissioners. All commissioners disclosed that they had visited the site in preparation for reviewing the application. No other conflicts were disclosed.

101 E. Orange St., PO Box 429, Hillsborough, NC 27278 919-732-1270 | www.hillsboroughnc.gov | @HillsboroughGov



Planner Joseph Hoffheimer was sworn in. Christina Ferguson, the applicant, was sworn in.

Hoffheimer presented the staff report and noted the inventory information, application materials, and applicable design standards would be entered into the record as evidence. He provided the staff comments:

- The Historic District Commission approved an addition for this property in April 2023. The
  property has since changed ownership, and this application is only for fencing in front of the
  existing house.
- The Historic District Design Standards discourage new fences in front yards, but the proposed fence would replace (and then extend) an existing section of picket fence in front of the house.
- The Historic Inventory does not indicate when the existing section of fence was constructed.
- The applicant has confirmed that the fence will be painted white and that there will be a couplemonth curing period after installation.
- The front-yard fence at 114 W. Queen St. (exhibits 11-12) received after-the-fact approval from the commission in 2012. There was a condition that a finish be applied to the fence once it cured and that the color and treatment be coordinated with staff. This condition may have never been enforced and was approved under prior ownership and Town staff.
- The front-yard fence at 110 E. Queen St. (exhibits 13-14) is freestanding, similar to the existing fence at 318 W. Queen St.
- The front-yard fence at 168 W. Margaret Lane (exhibits 15-16) was approved by the commission in February 2010 and moved closer to the house in May 2013. It was to be painted white, but this does not appear to have ever happened.

There was discussion of the current state of the fence. Ferguson said that there is rot on the fence posts and that the entire fence is unstable and wobbly.

There was discussion of the age of the fence, and Ferguson confirmed that there is no documentation of its age, though it does appear in the earliest Google Maps images from 2011.

Senner referenced Item 8 of the Design Standards for Fences and Walls, which indicates that it is not generally appropriate to locate new fences or walls in front yards. He said that based on other fences in the district, it seems that fences at the front line of the house are more in character with the district. He expressed concern that a front yard fence might separate the house from the community and detract from the front elevation of the property.

There was discussion of whether this proposal would be considered a replacement of the existing fence in kind. Hoffheimer clarified that the fence was likely extended farther in the past, but staff did not find any evidence of the fence extending beyond its current dimensions. It was pointed out that the part of the fence that creates a division between the house and the street would be considered an in-kind replacement and that adding additional fence perpendicular to the street would not have a much larger impact. There was discussion of whether extending the existing partial fence would make the property look less incongruous with the district, if painted white.

Ferguson addressed the possibility of locating the fence at the front line of the house. She said the reason for wanting to extend the existing fence to enclose the front yard is to keep the homeowners' dogs from running into the street when the homeowners are using the porch. The commissioners acknowledged

that they are unable to consider that as part of their evaluation and instead must consider the proposal's congruity with the district. Ferguson added that there are generally many examples of front yard fences at homes of a similar vintage.

Senner reiterated that in his opinion a fence along the street is incongruous with the character of the district, and that a fence along the front line of the house would be less incongruent. Miller agreed that a fence at the line of the house would be less incongruous but said that he did not find the proposal completely incongruous since there is already a fence at the street. The rest of the commissioners agreed that they did not find the proposal incongruous because of the current existence of the partial fence.

Hoffheimer reiterated the obstacles of not knowing the age of the fence, whether it is historic, or how far it used to extend. He suggested that its current siting arguably makes it character defining. He also reminded the commissioners that staff's interpretation of congruency is not that everything must be identical.

There was discussion of the standards for replacing the fence if it were historic. Hoffheimer confirmed that even if it were an in kind replacement it would have to come before the commission because of its siting in the front yard. He also noted that this application included a number of example photos of neighboring properties. Ferguson added that she modeled this application after the example application on the website, which uses the fence in question as an example.

Ferguson confirmed that the portion of the fence that currently exists is two sections on either side of a large gate, parallel to the street. She would like to replace what exists and add two additional sections perpendicular to the street to enclose the front yard. On the west side the fence will tie into an existing fence just behind the front of the house. The whole rear yard is currently fenced. She added that 314 W. Queen St., the neighbor to the east, has a fully enclosed front yard fence.

Ferguson confirmed that the new front gate will be the same size as the existing gate.

The commissioners acknowledged that there were many examples provided, and that a significant number of examples were adjacent to the applicant property.

There was discussion of how the fence perpendicular will rise with the slope of the grade. Commissioners expressed preference for the top of the fence following the grade rather than using a stepped rise. Ferguson confirmed that she would also prefer that the top follow grade, and that she is willing to use whatever approach is least incongruous with the district.

Senner closed the public hearing and called for deliberation. He summarized the discussion and noted that there appeared to be agreement among the majority of commissioners that extending the fence would not be incongruous given the existing partial fence.

Motion: Peele moved to find as fact that the 318 W. Queen St. application is not incongruous with

the overall character of the Historic District and complies with all relevant standards of evaluation based on the commission's discussion of the application and the standards of evaluation in Section 3.12.3 of the Unified Development Ordinance because the plans are consistent with the Historic District Design Standards: Fences and Walls, and that the applicant will be replacing in kind the portion of the fence that is existing, and the

additional fencing will match that section in style. Riek seconded.

Vote: 4-1. Nay: Senner.

Motion: Miller moved to approve the application with conditions.

Motion died for lack of a second.

Conditions: Fence will follow the slope of the land (i.e., not stepped). Fence will be painted white

within six months of the installation of the fence, based on the curing time the applicant

has stated.

There was discussion of whether adding the condition for no stepping is necessary, and whether there was sufficient evidence to make that a requirement of the approval, given that the applicant has stated intent to conform to those desires. Hoffheimer said that if there were any changes to what was stated under oath at the meeting, staff should be informed. He reminded the commissioners that staff review projects after completion and enforce compliance with the commission's decisions.

Motion: Peele moved to approve the application as submitted. Riek seconded.

Vote: 3-2. Nays: Miller and Senner.

### 7. Old business

A. Certificate of Appropriateness Application: 202 W. King St.

Applicant is requesting to replace seven existing wood windows with Fibrex windows (PIN 9864965347).

Senner reopened the public hearing for the application. The applicant was not present at the meeting.

Hoffheimer told the commissioners that the applicant had asked to continue the application at the March meeting.

Motion: Senner moved to table the 202 W. King St. application until the March meeting. Miller

seconded.

Vote: 5-0.

B. Certificate of Appropriateness Application: 114 W. Queen St.

Applicant is proposing to add porches to the main house, add an accessory dwelling unit to the brick kitchen structure in the backyard, and construct two sheds in the northeast corner of the property (PIN 9874071780).

Hoffheimer gave an update to the commissioners that the applicant was provided a copy of the minutes, and that the applicant had provided additional updates earlier in the day. Given that staff and commissioners had not had much time to review the new materials, staff recommended tabling the application until the next meeting.

Senner reopened the public hearing.

The commissioners reiterated to the applicant their request for more details about and clear labeling of existing and proposed features.

Motion: Senner moved to continue the public hearing at the March meeting. Palmer seconded.

Vote: 5-0.

### 8. Amend Historic District Design Standards

A. Amend standards for Historic vs. Non-Historic, Masonry, Windows, Sustainability and Energy Retrofit, Utilities, Site Features and Plantings, Fences and Walls, Walkways Driveways and Off- Street Parking, and Art

Hoffheimer presented the amended design standards. The commissioners discussed the proposed changes.

### B. Amend Ordinary Maintenance and Repair and Minor Works

The commissioners discussed the proposed changes to the Ordinary Maintenance and Repair and Minor Words design standards. They proposed some additional changes:

- P. 135, Paragraph "Minor Work/Staff-Issued Certificate of Appropriateness": Add "over replacement" to the end of the first new sentence so it reads, "... to restore and preserve historic materials over replacement."
- P. 143, H.1.i. Add quotes around "seasonal decorations" so it is clear what the word seasonal modifies

There was discussion of why solar panels and electric vehicle charging stations are categorized as ordinary maintenance rather than minor works. Hoffheimer clarified that this categorization makes the process easier for applicants so the town can be more open to residents adding renewable energy resources.

### C. Amend Compatibility Matrix

The commissioners reviewed the amended compatibility matrix.

### D. Amend Definitions

The commissioners reviewed the amended definitions.

Motion: Senner moved to approve the proposed changes to the design standards with the

additional proposed changes. Peele seconded.

Vote: 5-0.

### 9. General updates

Hoffheimer gave a brief update about staff considering re-evaluating the use of the terms "contributing" and "ordinary maintenance," which used to be called "exempt works."

Hoffheimer discussed the status of a potential inventory update for the National Register historic district.

There was discussion of updating and clarifying the application process, including raising application fees. Staff have requested feedback from the commissioners about application fees, which go toward the administrative costs of the program. There was general support among the commissioners for a progressive fee schedule based on the project's estimated budget. There was also general support for raising the after the fact application fee. Setting the after the fact fee at double the regular application fee was proposed as an option. The commissioners requested additional information to inform discussion at the next meeting: a current fee schedule; last year's annual revenue generated from the fees in comparison to the program's

costs; and a proposed fee schedule. There was additional discussion of further verifying or certifying estimated construction costs, which impact the fee that applicants currently are required to pay.

There was discussion about the possibility of including more rigorous requirements for application materials such as professional elevations. There was also discussion of whether additional application requirements would create barriers that might prevent residents from bringing projects before the commission. It was noted that the updates to the design standards were intended to make it easier for residents to get project approval if the proposal meets the design standards.

There was further discussion of educating the public about the commission's mission.

### 10. Adjournment

Senner adjourned the meeting at 8:12 p.m. without a vote.

Respectfully submitted,

Joseph Hoffheimer

Planner

Staff support to the Historic District Commission

Googl Ofoffheim

Approved: Month X, 202X

### BEFORE THE HILLSBOROUGH HISTORIC DISTRICT COMMISSION

) Application for) Certificate of Appropriateness) 318 W. Queen Street)

This application for a Certificate of Appropriateness ("COA") proposing a front-yard picket fence with two arched gates came before the Hillsborough Historic District Commission (the "HDC") on February 7, 2024. The HDC held a quasi-judicial hearing and, based on the competent, material, and substantial evidence presented at the hearing, voted 3-2 to approve the Application. In support of that decision, the HDC makes the following Findings of Fact and Conclusions of Law:

### **FINDINGS OF FACT**

- 1. The property at issue (the "Property") is located at 318 W. Queen Street in the Town of Hillsborough. The Owner and Applicant is Christina Ferguson (the "Applicant").
- 2. The Application requests that the HDC grant a Certificate of Appropriateness to:

Build a new picket fence in the same style as the existing sections of picket fencing on the south, street-facing side of the property; The existing approx. 14' of fencing is in poor repair and supported at the back by metal stakes; The fence would extend along the same line to the east and west of the front gate, in front of existing

shrubbery and trees approximately 75' in total in length, including the gate; The existing gate would also be replaced with a similar gate, which would be an arched 6'double gate; On the east side (the right side, facing the house from the street), near the driveway, the Applicant wishes to place the same style of fencing roughly parallel to the driveway to the inside of existing shrubs extending north by 45' (including a new double-gate at the existing walkway to match the existing double-gate on the street-facing side) and then west by 14 feet to the house; On the west side of the property (the left side, facing the house from the street), the Applicant is requesting permission to extend the fence north by approximately 43' to connect with an existing brick wall, which is the same terminus as for existing fence that encloses the back yard; The fence would have a 2" gap between pickets, consistent with the front and side fence belonging to the neighbor directly to the east of (314 West Queen Street), which is of a similar style.

All work will be in accordance with the drawings and plans entered into evidence at the hearing.

3. The Property is in the Hillsborough Historic District (the "District"), designated by Ordinance No. 4.3.1.2, adopted September 11, 2023. The Hillsborough Historic District Design Standards (the "Standards"), specifically the standards for *Fences and Walls*, were used to evaluate this request, and the Application is consistent with these standards for the following reasons:

- a. Many examples were provided, and a significant number of examples were adjacent to the property in question.
- b. Extending the fence would not be incongruous given the existing partial fence.
- 4. The following individual(s) testified during the evidentiary hearing:
  - a. Joseph Hoffheimer, Staff Support to the Historic District Commission, presented the staff report and comments.
  - b. Christina Ferguson, Applicant, appeared to present testimony and evidence in support of the Application.

# **CONCLUSIONS OF LAW**

Based on the foregoing FINDINGS OF FACT, the HDC makes the following CONCLUSIONS OF LAW:

- 1. The Application is not incongruous with the special character of the Hillsborough Historic District. Therefore, the COA is hereby approved with the following conditions:
  - a. All necessary permits required by law must be obtained before work may commence. Planning staff must be notified prior to making any alterations to the approved plans.

This the 6th day of March, 2024.

Will Senner, Chair Hillsborough Historic District Commission

### **APPEALS**

A decision of the Commission on an application for a Certificate of Appropriateness may be appealed to the Orange County Superior Court by an aggrieved party. Such appeal shall be made within thirty (30) days of filing of the decision in the office of the Planning Director or the delivery of the notice required in Section 3.12.11, whichever is later. Such appeals to the Orange County Superior Court are in the nature of certiorari and the court shall determine such appeals based on the record generated before the Commission.

### ITEM #6. A:

Address: 114 W. Queen Street

Year Built: c. 1969 (House), c. 1837, c. 1960 (Strudwick Kitchen)

### **Historic Inventory Information (2013)**

House: This two-story, gambrel-roofed, Dutch Colonial Revival-style house is two bays wide and double-pile with two gabled dormers on the façade. The house has a brick veneer and nine-over-nine wood-sash windows on the first floor with plain weatherboards and six-over-six windows in the gables and flush sheathing and six-over-six windows in the dormers. The entrance, on the left (west) end of the façade, has one-light-over-one-panel sidelights and a narrow transom and there is a dentil cornice on the façade. A one-story, side-gabled wing on the left elevation has plain weatherboards and six-over-six wood-sash windows. The house stands on the site of the Haralson-Studwick House, which was razed in 1960; the associated antebellum brick kitchen remains standing in the rear yard. County tax records date the house to 1969.

Strudwick Kitchen: One-story, side-gabled brick building was constructed as a kitchen for the Haralson-Strudwick House, which originally stood on this site. The building has a one-to-five common-bond brick exterior with gable-end brick chimneys. It has nine-over-nine wood-sash windows and a double-leaf three-panel door with flat brick arches. The kitchen is thought to have been built by Dr. Edmund Strudwick, who purchased the property from Archibald Haralson in 1837 and enlarged the main house at that time. The house was destroyed in 1960 and the kitchen was enlarged to serve as a residence. However, the additions have since been removed and the kitchen has been restored to its original form. A new house was constructed on the site in 1969.

### **Contributing Structure?** Yes

### **Proposed work**

- Add porches to the main house.
- Add an accessory dwelling unit to the brick kitchen structure in the backyard.
- Construct two sheds in the northeast corner of the property.

### **Application materials**

No new application materials have been submitted since the February regular HDC meeting.

### **Staff Comments**

- The applicant has requested to continue the application to the April regular HDC meeting.
- Section 7.E of the Rules of Procedure states the following: "all applications for certificates of appropriateness shall be reviewed and acted upon within a reasonable time, not to exceed 180 days from the date that a complete application for a Certificate of Appropriateness is filed, unless an extension of time is agreed to by the applicant."

### ITEM #7. A:

Address: 102 W. Queen Street

Year Built: c. 1923

### **Historic Inventory Information (2013)**

This one-story, hip-roofed, Craftsman-style bungalow is three bays wide and triple-pile with a stuccoed foundation, plain weatherboards, and an interior brick chimney. The house has eight-over-one Craftsman-style wood-sash windows and knee brackets in the gables. The one-light-over-two-panel door is sheltered by a two-bay-wide, front-gabled porch supported by grouped posts on shingle-covered piers, with a sheaf-of-wheat railing between the piers. The porch gable features a grid of narrow boards filled with weatherboards and has a rectangular louvered vent in the center. There is a gabled ell at the left rear (northwest). A loose-stack stone retaining wall extends across the front of the property along West Queen Street. County tax records date the building to 1927; however, the house is present on 1924 Sanborn map.

### **Contributing Structure?** Yes

### **Proposed work**

15 roof-mounted solar panels

### **Application materials**

- COA application
- Project description and plans
- Structural letter
- Specifications

### **Applicable Design Standards**

• Roofs: 10

• Sustainability and Energy Retrofit: 9, 10

• Site Features and Plantings: 10

### **Staff Comments**

- The solar panels on the ell face Churton Street so require commission approval. The other panels do not face a street and would meet the minor works requirements. Staff recommend treating this proposal as one application, approving the panels that are not visible from Churton Street, and deliberating about the panels that face Churton Street.
- The east-facing solar panels three buildings away at 116 W. Queen Street are visible from Churton Street.



### **APPLICATION**

# **Certificate of Appropriateness and Minor Works**

Planning and Economic Development Division 101 E. Orange St., PO Box 429, Hillsborough, NC 27278 919-296-9470 | Fax: 919-644-2390 planning@hillsboroughnc.gov www.hillsboroughnc.gov

9874 07 369	93	4702 - 4 HISTOR	RIC	102 West Queen Street, Hillsborough, NC, 27278	
Orange County Parcel ID Nu	mber	Zoning District		Address of Project	
Top Tier solar Solutions LLC	C/Michael Whitson		Susan S	Shipp	
Applicant Name		•	Property Owner (if different than applicant)		
1530 Center Pa	ark Drive		102 West Queen Street,		
Applicant's Mailing Address		-	Property Owner's Mailing Address		
Charlotte, NC 28217			Hillsbor	ough, NC, 27278	
City, State ZIP		•	City, State ZIP		
855-997-1213			(540)90	)5-2767	
Applicant Phone Number		•	Property Owne	r's Phone Number	
NC@toptiersolarsol	utions.com		susancook	shipp@gmail.com	
Applicant's Email		-	Property Owne	r's Email	
Description of Proposed Wo	15 PV Solar roof m	nounted modules, 5	.925 kW, grid tied, f	lush mounted, installed on existing structure.	
Estimated Cost of Construct	ion: \$ \$23,448.	75			

The Historic District Design Standards, Exterior Materials Compatibility Matrix, and Certificate of Appropriateness application process can be found on the Town of Hillsborough's website: https://www.hillsboroughnc.gov/hdc.

### **Applicant and Owner Acknowledgment and Certification**

I am aware that Historic District Design Standards, Exterior Materials Compatibility Matrix, and Unified Development Ordinance requirements are the criteria by which my proposal will be evaluated for compatibility, and I certify that I, and/or my design professional under my direction, have reviewed my application materials with Planning Staff for compliance to the standards in those adopted documents. I understand that I, or my representative, must attend the HDC meeting where this application will be reviewed. I further understand that town employees and/or commissioners may need access to my property with reasonable notice to assess current conditions, and to assist them in making evidence-based decisions on my application and that I am not to speak to any commissioner about my project until the public meeting at which it is under consideration.

### **Submittal Requirements**

The following documents and plans are required to accompany your COA application in order for it to be deemed complete and scheduled for commission review. Planning staff will determine when all submittal requirements have been met. The first FOUR complete COA applications submitted by the deadline will be heard on any HDC agenda.

vide a digital copy if plans are larger than 11"x17")
Detailed narrative describing the proposed work and how it complies with all adopted standards.
Existing and Proposed Dimensioned Plans (see below):
<ul> <li>Site Plan (if changing building footprint or adding new structures, impervious areas or site features, including hardscaping)</li> </ul>
<ul> <li>Scaled Architectural Plans (if changing building footprint or new construction)</li> </ul>
<ul> <li>Scaled Elevations (if adding or changing features of a structure)</li> </ul>
<ul> <li>Landscaping Plans (required for all new construction and for significant landscaping or tree removal and re-planting)</li> </ul>
<ul> <li>Tree Survey (required for new construction when trees over 12" diameter at breast height are on site - show both existing and those to be removed)</li> </ul>
Sign Specifications (if adding, changing, or replacing signage)
Itemized list of existing and proposed exterior materials including photos and specifications, colors, etc.
(Siding, trim and fascia, roof and foundation materials, windows, shutters, awnings, doors, porch and deck
flooring, handrails, columns, patios, walkways, driveways, fences and walls, and signs, etc.).
Photographs, material samples, examples of comparable properties in the district (if using them as basis for specific designs), plans, or drawings that will help to clarify the proposal, if applicable, or if required by staff as part of the review.

## Staff Use Only:

COA fee (\$1 per \$1000 of construction costs, sor Minor Works fee (\$10 flat fee):	\$10 minimum)	Amount: \$	23.00	
☐ After-the-fact application (\$100 or double *whichever is greater		Amount: \$	23.00	
Receipt #: D6 CPJ GMP 7 M Recei	ved by: Joseph Hoff	leiner Da	te: <u>2113124</u>	
This application meets all Unified Development for compliance with all approved materials.				
☑ N/A ☐ Yes	Zoning Officer:		Andreas and the second and and and and and and and and and a	
This application meets public space division re	quirements.			
✓ N/A ☐ Yes Publi	c Space Manger:			
Historic Architectural Inventory Information				
Original date of Construction:				
Description of the Property:				
Applicable Design Standards:  Other reviews needed?  Hillsborough Zoning Compliance Permit	<ul><li>Orange County Building F</li></ul>	Permit □ Oth	er:	
Minor Works Certificate of Appropriateness A  ☐ Approved				
Minor Works Reference(s):				
Certificate of Appropriateness Decision  ☐ Approved ☐ Denied	Commission Vote:			
Conditions or Modifications (if applicable):				
	Historic District Staff Signat	ure	Date	

# PHOTOVOLTAIC ROOF MOUNT SYSTEM

15 MODULES-ROOF MOUNTED - 5.925 kW DC, 6.000 kW AC

102 W QUEEN ST, HILLSBOROUGH, NC 27278

**GENERAL NOTES** 

ALL COMPONENTS ARE UL LISTED AND CEC CERTIFIED, WHERE WARRANTED

19. ALL WIRING METHODS SHALL BE IN ACCORDANCE WITH NEC 690.31

OPERATION.

THE SOLAR PV SYSTEM WILL BE INSTALLED IN ACCORDANCE WITH ARTICLE 690 OF THE NEC 2017.

THE UTILITY INTERCONNECTION APPLICATION MUST BE APPROVED AND PV SYSTEM INSPECTED PRIOR TO PARALLEL

# PROJECT DATA PROJECT 102 W QUEEN ST, ADDRESS HILLSBOROUGH, NC 27278 OWNER: SUSAN SHIPP DESIGNER: ESR SCOPE: 5.925 KW DC ROOF MOUNT SOLAR PV SYSTEM WITH 15 MISSION SOLAR: MSE395SX9R 395W PV MODULES WITH 15 SOLAREDGE: S440 POWER OPTIMIZERS AND 01 SOLAREDGE: SE6000H-US (240V/6000W)

AUTHORITIES HAVING JURISDICTION: BUILDING: ORANGE COUNTY ZONING: ORANGE COUNTY UTILITY: DUKE ENERGY

# SHEET INDEX

**INVERTER** 

PV-1 COVER SHEET PV-2 SITE PLAN

PV-3 ROOF PLAN & MODULES
PV-4 ELECTRICAL PLAN
PV-5 STRUCTURAL DETAIL
PV-6 ELECTRICAL LINE DIAGRAM
PV-7 WIRING CALCULATIONS

PV-8 LABELS

PV-9+ EQUIPMENT SPECIFICATIONS

# **SIGNATURE**

### ALL CONDUCTORS OF A CIRCUIT, INCLUDING THE EGC, MUST BE INSTALLED IN THE SAME RACEWAY, OR CABLE, OR OTHERWISE RUN WITH THE PV ARRAY CIRCUIT CONDUCTORS WHEN THEY LEAVE THE VICINITY OF THE PV ARRAY. WHERE METALLIC CONDUIT CONTAINING DC CONDUCTORS IS USED INSIDE THE BUILDING. IT SHALL BE IDENTIFIED AS "CAUTION: SOLAR CIRCUIT" EVERY 10FT. HEIGHT OF THE AC DISCONNECT SHALL NOT EXCEED 6'-7" PER NEC CODE 240.24. A GROUNDING ELECTRODE SYSTEM IN ACCORDANCE WITH CEC 690.47 AND 250.50 THROUGH 60 AND 250-166 SHALL BE PROVIDED, PER NEC GROUNDING ELECTRODE SYSTEM OF EXISTING BUILDING MAY BE USED AND BONDED TO THE SERVICE ENTRANCE. IF EXISTING SYSTEM IS INACCESSIBLE OR INADEQUATE A SUPPLEMENTAL GROUNDING ELECTRODE WILL BE USED AT THE INVERTER LOCATION CONSISTING OF A UL LISTED 8 FT. GROUND ROD WITH ACORN CLAMP. GROUNDING ELECTRODE CONDUCTORS SHALL BE NO LESS THAN #8 AWG AND NO LARGER THAN #6 AWG COPPER AND BONDED TO THE EXISTING GROUNDING ELECTRODE TO PROVIDE FOR A COMPLETE SYSTEM. PHOTOVOLTAIC MODULES ARE TO BE CONSIDERED NON-COMBUSTIBLE PHOTOVOLTAIC INSTALLATION WILL NOT OBSTRUCT ANY PLUMBING. MECHANICAL, OR BUILDING ROOF VENTS. 10. ALL WIRING MUST BE PROPERLY SUPPORTED BY DEVICES OR MECHANICAL MEANS DESIGNED AND LISTED FOR SUCH USE. WIRING MUST BE PERMANENTLY AND COMPLETELY HELD OFF THE ROOF SURFACE. ALL SINAGE TO BE PLACED IN ACCORDANCE WITH THE LOCAL BUILDING CODE. IF EXPOSED TO SUNLIGHT, IT SHALL BE UV RESISTANT, ALL PLAQUES AND SINAGE WILL BE INSTALLED AS REQUIRED BY THE NEC AND AHJ. 12. INVERTER(S) USED IN UNGROUNDED SYSTEM SHALL BE UL 1741 LISTED. 13. THE INSTALLATION OF EQUIPMENT AND ALL ASSOCIATED WIRING AND INTERCONNECTION SHALL BE PERFORMED ONLY BY QUALIFIED PERSONS [NEC 690.4(C)] 14. ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED (OR BETTER), INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND 15. ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH NEC ARTICLE 250. 16. SYSTEM GROUNDING SHALL BE IN ACCORDANCE WITH NEC 690.41 17. PV SYSTEM CIRCUITS INSTALLED ON OR IN BUILDINGS SHALL INCLUDE A RAPID SHUTDOWN FUNCTION IN ACCORDANCE WITH NEC 690.12 18. DISCONNECTING MEANS SHALL BE LOCATED IN A VISIBLE, READILY ACCESSIBLE LOCATION WITHIN THE PV SYSTEM EQUIPMENT OR A MAXIMUM OF 10 FEET AWAY FROM THE SYSTEM [NEC 690.13(A)]

20. WORK CLEARANCES AROUND ELECTRICAL EQUIPMENT WILL BE MAINTAINED PER NEC 110.26(A)(1), 110.26(A)(2) AND 110.26(A)(3).

ROOFTOP MOUNTED PHOTOVOLTAIC PANELS AND MODULES SHALL BE TESTED, LISTED & IDENTIFIED IN ACCORDANCE WITH

22. ELECTRICAL CONTRACTOR TO PROVIDE CONDUIT EXPANSION JOINTS AND ANCHOR CONDUIT RUNS AS REQUIRED PER NEC.

# **VICINITY MAP**



### **HOUSE PHOTO**



# **CODE REFERENCES**

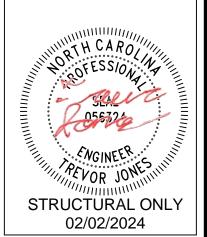
2018 NORTH CAROLINA BUILDING CODE 2018 NORTH CAROLINA RESIDENTIAL CODE 2018 NORTH CAROLINA FIRE CODE 2017 NATIONAL ELECTRICAL CODE



### **TOP TIER SOLAR SOLUTIONS**

1530 CENTER PARK DR #2911, CHARLOTTE, NC 28217, UNITED STATES

REVISIONS				
DESCRIPTION	DATE	REV		
INITIAL DESIGN	02/02/2024			



PROJECT NAME & ADDRESS

SUSAN SHIPP RESIDENCE

102 W QUEEN ST HILLSBOROUGH, NC 2

., 27

DRAWN BY

SHEET NAME

**COVER SHEET** 

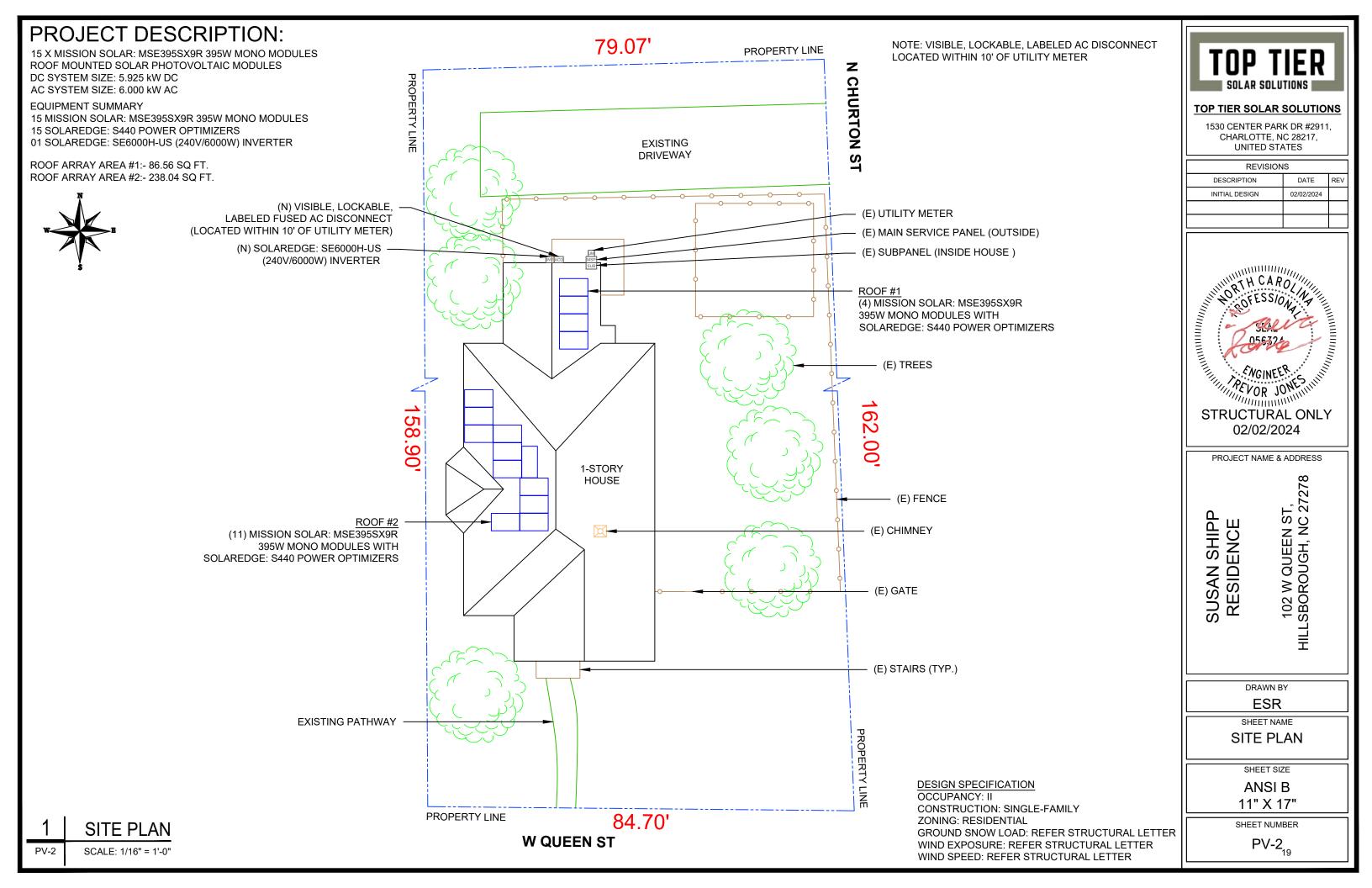
SHEET SIZE

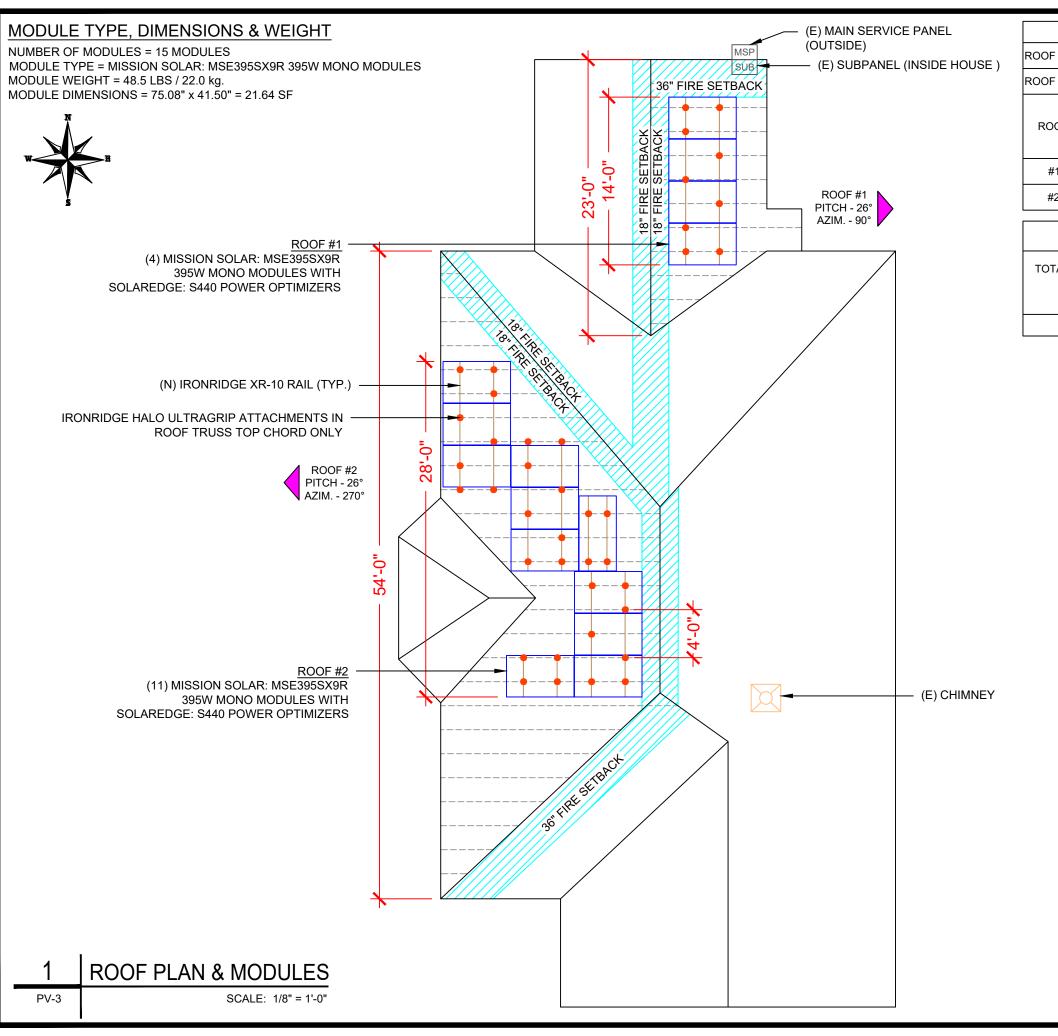
ANSI B

11" X 17"

PV-1,

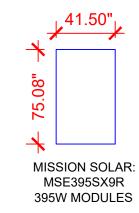
SHEET NUMBER





	ROOF DESCRIPTION				
ROOF TYPE			ASPHALT SHINGLE		
ROOF LAYER			1 LA	YER	
I ROOF I I		ROOF PITCH	AZIMUTH	TRUSS SIZE	TRUSS SPACING
#1	4	26°	90°	2"X4"	24"
#2	11	26°	270°	2"X4"	24"

ARRAY AREA & ROOF AREA CALC'S			
TOTAL PV ARRAY AREA (SQ. FT.)  TOTAL ROOF AREA AREA AREA (Sq. Ft.)  ROOF AREA COVERED BY ARRAY (%)		AREA COVERED BY	
324.60	2664.50	12	



### **LEGEND**

JB - JUNCTION BOX

7 - INVERTER

- AC DISCONNECT

- UTILITY METER

- MAIN SERVICE PANEL

JB - SUB PANEL

- VENT, ATTIC FAN (ROOF OBSTRUCTION)

- ROOF ATTACHMENT

— — - TRUSS

MSP

---- - CONDUIT



### TOP TIER SOLAR SOLUTIONS

1530 CENTER PARK DR #2911, CHARLOTTE, NC 28217, UNITED STATES

REVISIONS			
DESCRIPTION	DATE	REV	
INITIAL DESIGN	02/02/2024		



PROJECT NAME & ADDRESS

SUSAN SHIPP RESIDENCE 102 W QUEEN ST, HILLSBOROUGH, NC 27278

DRAWN BY

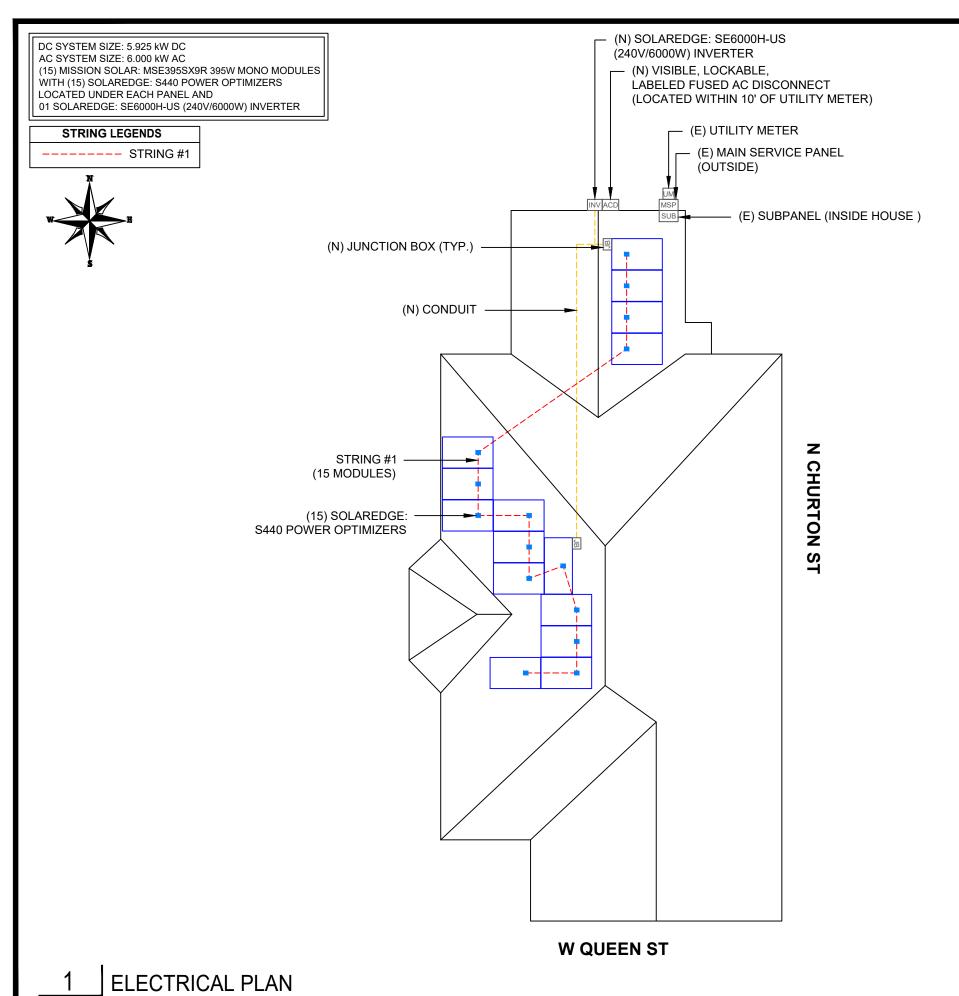
ROOF PLAN & MODULES

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER

PV-3<sub>20</sub>



BILL OF MATERIALS	
EQUIPMENT DESCRIPTION	QTY
SOLAR PV MODULES: MISSION SOLAR: MSE395SX9R 395W MODULE	15
OPTIMIZERS: SOLAREDGE: S440 POWER OPTIMIZERS	15
INVERTER: SOLAREDGE: SE6000H-US (240V/6000W) INVERTER	01
JUNCTION BOXES: JUNCTION BOX UL 1741, NEMA 3R CSA C22.2 NO.290	2
AC DISCONNECT: FUSED AC DISCONNECT, 60A FUSED, (2) 35A FUSES 240V NEMA 3R, UL LISTED	1
IRONRIDGE XR10 RAIL (RAIL 168" (14 FEET) CLEAR) (XR-10-168A)	14
BONDED SPLICE, XR10 (XR10-BOSS-01-M1)	2
UNIVERSAL MODULE CLAMP, CLEAR (UFO-CL-01-A1)	42
STOPPER SLEEVE, 40MM, MILL (UFO-STP-40MM-M1)	24
GROUNDING LUG (XR-LUG-03-A1)	6
IRONRIDGE HALO ULTRAGRIP ATTACHMENTS (QM-HUG-01-M1)	40
RD STRUCTURAL SCREW,3.0L (HW-RD1430-01-M1)	80
SQUARE-BOLT BONDING HARDWARE (BHW-SQ-02-A1 )	40



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INITIAL DESIGN	02/02/2024		

PROJECT NAME & ADDRESS

SUSAN SHIPP RESIDENCE

102 W QUEEN ST, HILLSBOROUGH, NC 27278

DRAWN BY **ESR** 

SHEET NAME

**ELECTRICAL PLAN** 

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER

**LEGEND** 

JB - JUNCTION BOX

INV - INVERTER

- AC DISCONNECT

- UTILITY METER

- MAIN SERVICE PANEL MSP

- SUB PANEL

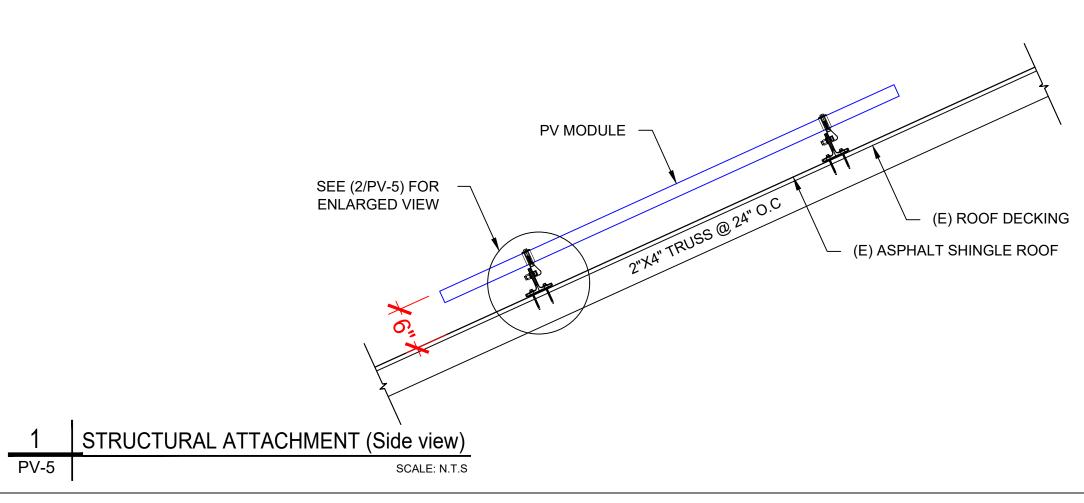
- VENT, ATTIC FAN (ROOF OBSTRUCTION) - ROOF ATTACHMENT

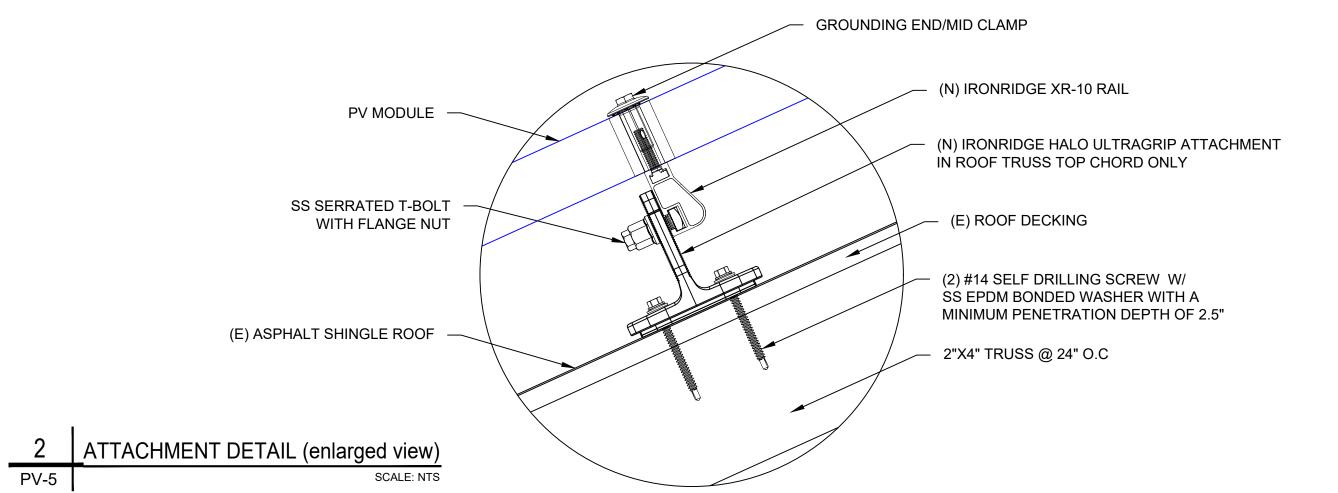
- TRUSS

- CONDUIT

SCALE: 3/32" = 1'-0"

PV-4



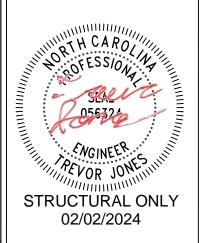




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PROJECT NAME & ADDRESS

102 W QUEEN ST, HILLSBOROUGH, NC 27278

SUSAN SHIPP RESIDENCE

DRAWN BY

SHEET NAME

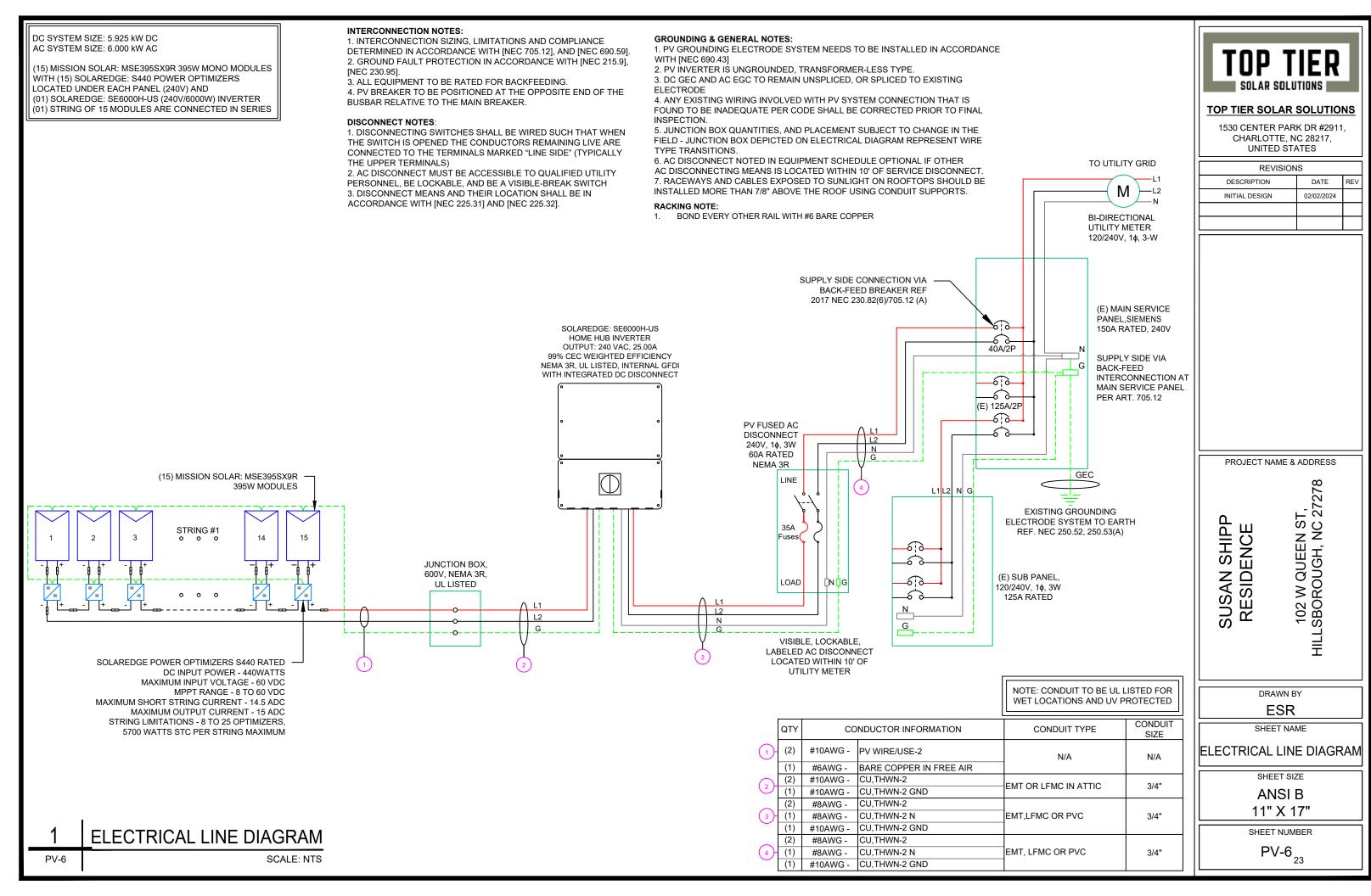
STRUCTURAL DETAIL

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER

PV-5<sub>22</sub>



١.					
	SOLAR M	ODULE SPECIFICATIONS			
MANUEACTURER / MODEL #	MISSION SOLAR: MSE395SX9R 395W MODULE	MANUFACTURER / M		М	
	W. WOLVER CHELLY WORLD	IMPORTOR GOLF II. MOLOGOOPACI GOOFF IMOLOGOLE	NOMINAL AC	C POW	ER
	\ (A 4 D	00.001	NOMINAL O	UTPUT	V
	VMP	36.99V	NOMINAL O	UTPUT	C
	IMP	10.68A			Ĭ
	VOC	45.18V	PERCENT		
	ISC	11.24A	VALUES	3	_
1	TEMP, COEFF, VOC	-0.259%°C	.80		
	MODULE DIMENSION	75.08"L x 41.50"W x 1.57"D (In Inch)	.70		
	MODULE DIMENSION	175.00 E X 71.00 W X 1.57 D (III IIICII)	50		

INVERTER SPECIFICATIONS			
I MANIJEACILIRER/MODEL#	SOLAREDGE: SE6000H-US (240V/6000W) INVERTER		
NOMINAL AC POWER	6.000 kW		
NOMINAL OUTPUT VOLTAGE	240 VAC		
NOMINAL OUTPUT CURRENT	25.00A		

			_
H-US (240V/6000W)		AMBIENT TEMP (HIGH TEMP 2%)	36°
		RECORD LOW TEMPERATURE	-12°
	]	MODULE TEMPERATURE COEFFICIENT OF Voc	-0.259%/°C
	]		
	_		

AMBIENT TEMPERATURE SPECS

PERCENT OF	NUMBER OF CURRENT
VALUES	CARRYING CONDUCTORS IN EMT
.80	4-6
.70	7-9
.50	10-20

	DC FEEDER CALCULATIONS																				
CIRCUIT ORIGIN	CIRCUIT DESTINATION	VOLTAGE (V)	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	GROUND SIZE	CONDUCTOR SIZE	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTO RS IN RACEWAY	90°C AMPACITY (A)	FOR AMBIENT	FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	90°C AMPACITY DERATED (A)	AMPACITY CHECK #2		CONDUCTOR RESISTANCE (OHM/KFT)		CONDUIT	CONDUIT FILL (%)
STRING 1	JUNCTION BOX	380	15.00	18.75	20	BARE COPPER #6 AWG	CU #10 AWG	35	PASS	36	2	40	0.91	1	36.4	PASS	5	1.24	0.049	N/A	#N/A
JUNCTION BOX	INVERTER	380	15.00	18.75	20	CU #10 AWG	CU #10 AWG	35	PASS	36	2	40	0.91	1	36.4	PASS	20	1.24	0.196	3/4" EMT	11.87617
																	String 1 V	oltage Drop	0.245		

										AC FEED	ER CALCULAT	TIONS										
CIRCUIT ORIGIN	CIRCUIT DESTINATION	VOLTAGE	FULL LOAD AMPS "FLA" (A)	FLA*1.25 (A)	OCPD SIZE (A)	NEUTRAL SIZE	GROUND SIZE	CONDUCTOR	75°C AMPACITY (A)	AMPACITY CHECK #1	AMBIENT TEMP. (°C)	TOTAL CC CONDUCTORS IN RACEWAY	90°C AMPACITY (A)	FOR AMBIENT	DERATION FACTOR FOR CONDUCTORS PER RACEWAY NEC 310.15(B)(3)(a)	AMPACITY	AMPACITY CHECK #2	FEEDER LENGTH (FEET)	CONDUCTOR RESISTANCE (OHM/KFT)		CONDITION	CONDUIT FILL (%)
INVERTER	AC DISCONNECT	240	25	31.25	35	CU #8 AWG	CU #10 AWG	CU #8 AWG	50	PASS	36	2	55	0.91	1	50.05	PASS	5	0.778	0.081	3/4" EMT	Γ 24.5591
AC DISCONNECT	POI	240	25	31.25	35	CU #8 AWG	CU #10 AWG	CU #8 AWG	50	PASS	36	2	55	0.91	1	50.05	PASS	5	0.778	0.081	3/4" EMT	24.5591

CUMULATIVE VOLTAGE DROP 0.162

### **ELECTRICAL NOTES**

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



### **TOP TIER SOLAR SOLUTIONS**

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INITIAL DESIGN	02/02/2024							

PROJECT NAME & ADDRESS

SUSAN SHIPP RESIDENCE

102 W QUEEN ST, HILLSBOROUGH, NC 27278

DRAWN BY **ESR** 

SHEET NAME

WIRING CALCULATIONS

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER

### PHOTOVOLTAIC POWER SOURCE

**EVERY 10' ON CONDUIT & ENCLOSURES** 

LABEL- 1: LABEL LOCATION: EMT/CONDUIT RACEWAY SOLADECK / JUNCTION BOX CODE REF: NEC 690.31 (D)(2)

# **⚠ WARNING**

### **ELECTRIC SHOCK HAZARD**

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

LABEL- 2: LABEL LOCATION: AC DISCONNECT CODE REF: NEC 690.13(B)

# **⚠ WARNING**

### **DUAL POWER SUPPLY**

SOURCE: UTILITY GRID AND PV SOLAR ELECTRIC SYSTEM

LABEL- 3: LABEL LOCATION: MAIN SERVICE PANEL CODE REF: NEC 705.12(C) & NEC 690.59

# **SOLAR PV BREAKER:**

# BREAKER IS BACKFED DO NOT RELOCATE

LABEL-4:
LABEL LOCATION:
MAIN SERVICE PANEL
CODE REF: NEC 705.12(C) & NEC 690.59

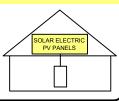
# **△** WARNING

POWER SOURCE OUTPUT CONNECTION. DO NOT RELOCATE THIS OVERCURRENT DEVICE

LABEL- 5:
<u>LABEL LOCATION:</u>
MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)
SUBPANEL (ONLY IF SOLAR IS BACK-FED)
CODE REF: NEC 705.12(B)(3)(2)

# SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

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



LABEL - 6: LABEL LOCATION: AC DISCONNECT

CODE REF: [NEC 690.56(C)(1)(A)]

# RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

LABEL- 7:

<u>LABEL LOCATION:</u>
AC DISCONNECT

MAIN SERVICE PANEL (ONLY IF SOLAR IS BACK-FED)

CODE REF: NEC 690.56(C)(2)

### DC DISCONNECT

LABEL - 8: LABEL LOCATION: INVERTER CODE REF: NEC 690.13(B)

# AC DISCONNECT PHOTOVOLTAIC SYSTEM POWER SOURCE

NOMINAL OPERATING AC VOLATGE 240 V

RATED AC OUTPUT CURRENT

25.00 A

LABEL- 9: LABEL LOCATION: AC DISCONNECT CODE REF: NEC 690.54

**MAXIMUM VOLTAGE** 

480 V

MAXIMUM CIRCUIT CURRENT

16.50 A

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

LABEL- 10: <u>LABEL LOCATION:</u> ON THE RIGHT SIDE OF THE INVERTER (PRE-EXISTING ON THE INVERTER) CODE REF: NEC 690.53



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PROJECT NAME & ADDRESS

SUSAN SHIPP RESIDENCE 102 W QUEEN ST, HILLSBOROUGH, NC 27278

DRAWN BY

SHEET NAME

LABELS

SHEET SIZE

ANSI B

11" X 17"

SHEET NUMBER

PV-8<sub>25</sub>

MSE PERC 66





-0 to +3%



### FRAME-TO-FRAME WARRANTY

Degradation guaranteed not to exceed 2% in year one and 0.58% annually from years two to 30 with 84.08% capacity guaranteed in year 25. For more information, visit www.missionsolar.com/warranty

### CERTIFICATIONS



C-SA2-MKTG-0027 REV 4 03/18/2022





If you have questions or concerns about certification of our products in your area,

# True American Quality True American Brand

Mission Solar Energy is headquartered in San Antonio, Texas where we manufacture our modules. We produce American, high-quality solar modules ensuring the highest-in-class power output and best-in-class reliability. Our product line is tailored for residential, commercial and utility applications. Every Mission Solar Energy solar module is certified and surpasses industry standard regulations, proving excellent performance over the long term.

Demand the best. Demand Mission Solar Energy.



### Certified Reliability

- Tested to UL 61730 & IEC Standards
- PID resistant
- · Resistance to salt mist corrosion



### Advanced Technology

- 9 Rushar
- · Passivated Emitter Rear Contact
- · Ideal for all applications



### Extreme Weather Resilience

- Up to 5,400 Pa front load & 3,600 Pa back load Tested load to UL 61730



### **BAA Compliant for Government Projects**

- Buy American Act
- American Recovery & Reinvestment Act





# UL 61730 / IEC 61215 / IEC 61730 / IEC 61701

Class Leading 390-400W

Current-v

# MSE PERC 66

**ELECTRICAL SPECIFICATION** 

19.4

0/+3

11.19

10.63

20

1,000

19.7

0/+3

11.24

45.18

10.68

36.99

20

1,000

-0.367%/°C

-0.259%/°C

19.9

0/+3

11.31

45.33

10.79

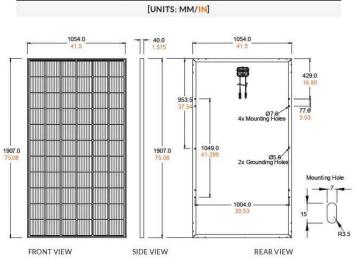
37.07

20

1,000

PRODUCT TYPE MSExxxSX9R (xxx = Pmax)

Module Efficiency



Irrd. = 400 W/m<sup>2</sup>

Irrd. = 200 W/m<sup>4</sup>

61215, 61730, 61701

VOLTAGE (V)

CERTIFICATIONS AND TESTS

61730

BASIC DIMENSIONS

# Short Circuit Current Open Circuit Voltage Rated Current Fuse Rating System Voltage TEMPERATURE COEFFICIENTS Normal Operating Cell Temperature (NOCT) Temperature Coefficient of Pmax Temperature Coefficient of Voc Temperature Coefficient of Isc

	OPERATIN	5 CONDITIONS
CURRENT-VOLTAGE CURVE	Maximum System Voltage	1,000Vdc
MSE385SX9R: 385WP, 66 CELL SOLAR MODULE	Operating Temperature Range	-40°F to 185°F (-40°C to +85°C)
	Maximum Series Fuse Rating	20A
voltage characteristics with dependence on irradiance and module temperature	Fire Safety Classification	Type 1*
Cells Temp. =25°C  Incident  Irrd. = 1000 W/m <sup>2</sup>	Front & Back Load (UL Standard)	Up to 5,400 Pa front and 3,600 Pa back load, Tested to UL 61730
111d. = 1000 W/III	Hail Safety Impact Velocity	25mm at 23 m/s
Incident Irrd. = 800 W/m <sup>2</sup> Incident Irrd. = 600 W/m <sup>2</sup>	note, the 'Fire Class' Rating is designated	ed materials that result in a Type I fire rating. Pleas for the fully-installed PV system, which includes, be nounting used, pitch and roof composition.
	MECHAN	NICAL DATA

ME	ECHANICAL DATA
Solar Cells	P-type mono-crystalline silicon
Cell Orientation	66 cells (6x11)
Module Dimension	1,907mm x 1,054mm x 40mm
Weight	48.5 lbs. (22 kg)
Front Glass	3.2mm tempered, low-iron, anti-reflective
Frame	40mm Anodized
Encapsulant	Ethylene vinyl acetate (EVA)
Junction Box	Protection class IP67 with 3 bypass-diodes
Cable	1.2m, Wire 4mm2 (12AWG)
Connector	Staubli PV-KBT4/6II-UR and PV-KST4/6II-UR MC4, Renhe 05-8

s	HIPPING	INFOR	RMATIO	N
Container Feet	Ship To	Pallet	Panels	390W Bin
53'	Most States	30	780	304.20 kW
Double Stack	CA	26	676	263.64 kW
	PALLE	T [26 PAN	NELS]	
Weight 1,300 lbs. (572 kg)	Height 47.56 in (120.80 cm	) (1	Width 46 in 16.84 cm)	Length 77 in (195.58 cm)

Mission Solar Energy reserves the right to make specification changes without notice.

www.missionsolar.com | info@missionsolar.com

8303 S. New Braunfels Ave., San Antonio, Texas 78235

Mission Solar Energy

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DESCRIPTION	DATE	REV
INITIAL DESIGN	02/02/2024	

PROJECT NAME & ADDRESS

**SUSAN SHIPP** RESIDENCE 102 W QUEEN ST, HILLSBOROUGH, NC 27278

DRAWN BY **ESR** 

SHEET NAME **EQUIPMENT SPECIFICATION** 

> SHEET SIZE ANSI B

11" X 17"

SHEET NUMBER

www.missionsolar.com | info@missionsolar.com

# CERTIFICATE OF COMPLIANCE

Certificate Number E364743

Report Reference E364743-20201208

2021-August-04

Mission Solar Energy LLC Issued to:

8303 S New Braunfels Ave San Antonio TX, 78235 US

This is to certify that representative samples of

PHOTOVOLTAIC MODULES AND PANELS WITH SYSTEM VOLTAGE RATINGS OVER 600 VOLTS

See Addendum Page for Product Designation(s).

Have been investigated by UL in accordance with the

Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 61730-1, Photovoltaic (PV) Module Safety Qualification -

Part 1: Requirements for Construction

UL 61730-2, Photovoltaic (PV) Module Safety Qualification -

Part 2: Requirements for Testing

CSA C22.2 No. 61730-2:2019, Photovoltaic (PV) Module Safety Qualification - Part 2: Requirements for Testing

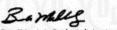
Additional Information: See the UL Online Certifications Directory at

https://ig.ulprospector.com for additional information

This Certificate of Compliance does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.



Any information and documentation in volving UL Mark ceruloes are provided on behalf of UL LLC (UL) or any authorized licence of UL. For que clonic, plea ce contacts local UL Cu clonic Bendle Perceptial ties this (Milanmabou bildications)

# CERTIFICATE OF COMPLIANCE

Certificate Number E364743

Report Reference E364743-20201208

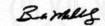
2021-August-04

This is to certify that representative samples of the product as specified on this certificate were tested according to the current UL requirements

Photovoltaic Modules and Panels with System Voltage Ratings Over 600 Volts (QIIA) Models:

Model	Where XXX is wattage
MSEXXXSX6S, may be followed by -IV	where XXX is 405-425
MSEXXXSX6W, may be followed by -IV	where XXX is 405-425
MSEXXXSX6Z, may be followed by -IV	where XXX is 405-425
MSEXXXSX5R, may be followed by -IV	where XXX is 375-390
MSEXXXSX5K, may be followed by -IV	where XXX is 335-355
MSEXXXSX5T, may be followed by -IV	where XXX is 330-350
MSEXXXSX9W, may be followed by -IV	where XXX is 420-440
MSEXXXSX9Z, may be followed by -IV	where XXX is 415-435
MSEXXXSX9R , may be followed by -IV	where XXX is 380-400
MSEXXXSX9K, may be followed by -IV	where XXX is 345-365
MSEXXXSX9T, may be followed by -IV	where XXX is 340-360

-IV indicates Type 4 module



u ce Mahrenhol z Orector North American Certification Program

Any information and documentation in colong, UL Mark cervices are provided on behalf of UL LLC (UL) or any authorized licenses of UL. For questions, please contents local UL Customer Berlos Peoresentative at http://ul.com/aboutul/locations/



### **TOP TIER SOLAR SOLUTIONS**

1530 CENTER PARK DR #2911, CHARLOTTE, NC 28217, UNITED STATES

REVISIONS									
DESCRIPTION	DATE	REV							
INITIAL DESIGN	02/02/2024								

PROJECT NAME & ADDRESS

102 W QUEEN ST, HILLSBOROUGH, NC 27278 SUSAN SHIPP RESIDENCE

> DRAWN BY **ESR**

SHEET NAME **EQUIPMENT SPECIFICATION** 

> SHEET SIZE ANSI B

11" X 17"

SHEET NUMBER

PV-10

# **Power Optimizer**

# For Residential Installations

S440 / S500 / S500B / S650B



### Enabling PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Detects abnormal PV connector behavior, preventing potential safety issues\*
- Module-level voltage shutdown for installer and firefighter safety
- Superior efficiency (99.5%)

- / Mitigates all types of module mismatch loss, from manufacturing tolerance to partial shading
- Faster installations with simplified cable management and easy assembly using a single bolt
- Flexible system design for maximum space
- Compatible with bifacial PV modules



# / Power Optimizer

# For Residential Installations

S440 / S500 / S500B / S650B

	S440	S500	S500B	S650B	UNIT
INPUT					
Rated Input DC Power <sup>(1)</sup>	440	2	600	650	W
Absolute Maximum Input Voltage (Voc)	60	)	125	85	Vdc
MPPT Operating Range	8-	60	12.5 - 105	12.5 - 85	Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	14.5		15		Adc
Maximum Efficiency	1	9	9.5		%
Weighted Efficiency		9	B.6		%
Overvoltage Category	<u> </u>				
OUTPUT DURING OPERTION					
Maximum Output Current		19	15		Adc
Maximum Output Voltage	60	)	8	<b>3</b> 0	Vdc
<b>OUTPUT DURING STANDBY (POWER OPTIMIZER</b>	DISCONNECTED	FROM INVERTER	OR INVERTER OF	F)	
Safety Output Voltage per Power Optimizer	1 ± 0.1				Vdc
STANDARD COMPLIANCE(2)					
EMC	FCC Part 1	5 Class B, IEC61000-6-2	, IEC61000-6-3, CISPR11, I	EN-55011	
Safety	IEC62109-1 (class II safety), UL1741				
Material		UL94 V-0,	UV Resistant		
RoHS		Y	'es		-
Fire Safety		VDE-AR-E 210	00-712:2018-12		
INSTALLATION SPECIFICATIONS					
Maximum Allowed System Voltage		10	100		Vdc
Dimensions (W x L x H)	129 x 15	5 x 30	129 x 1	65 x 45	mm
Weight	72	0	7.	90	gr
Input Connector		M	[4(3)		
Input Wire Length		(	0.1		m
Output Connector	MC4				
Output Wire Length		(+) 2.3,	(-) 0.10		m
Operating Temperature Range <sup>(4)</sup>	-40 to +85			°C	
Protection Rating		IP	68		
Relative Humidity		0 -	100		%

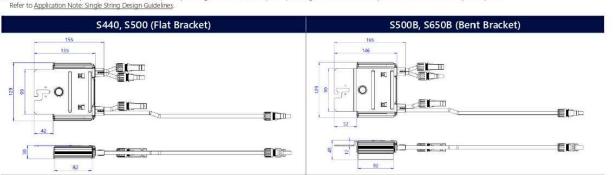
- (1) Rated power of the module at STC will not exceed the Power Optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed
- (2) For details about CE compliance, see <u>Declaration of Conformity CE</u>.
- (3) For other connector types please contact SolarEdge.

  (4) Power de-rating is applied for ambient temperatures above +85°C for S440 and S500, and for ambient temperatures above +75°C for S500B. Refer to the
- Power Optimizers Temperature De-Rating Technical Note for details.

PV System Design Usi	ng a Solar Edge Inverter <sup>(5)</sup>	SolarEdge Home Wave Inverter Single Phase	SolarEdge Home Short String Inverter Three Phase	Three Phase for 230/400V Grid	Three Phase for 277/480V Grid	
Minimum String Length	S440, S500	8	9	16	18	
(Power Optimizers)	S500B, S650B	6	8	1	4	
Maximum String Length (Po	ower Optimizers)	25	20	5	0	
Maximum Continuous Pow	er per String	5700	5625	11250	12750	W
	ted Power per String naximum is permitted only when the between strings is 2,000W or less)	See <sup>(6)</sup>	See <sup>(6)</sup>	13500	15000	W
Parallel Strings of Different	Lengths or Orientations		Yes			

(5) It is not allowed to mix S-series and P-series Power Optimizers in new installations in the same string.

(6) If the inverter's rated AC power < maximum nominal power per string, then the maximum power per string will be able to reach up to the inverters maximum input DC power.



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**(€ RoHS** 

### **TOP TIER SOLAR SOLUTIONS**

1530 CENTER PARK DR #2911, CHARLOTTE, NC 28217, UNITED STATES

REVISIONS					
DESCRIPTION	DATE	REV			
INITIAL DESIGN	02/02/2024				

PROJECT NAME & ADDRESS

102 W QUEEN ST, HILLSBOROUGH, NC 27278

SUSAN SHIPP RESIDENCE

> DRAWN BY **ESR**

SHEET NAME **EQUIPMENT SPECIFICATION** 

> SHEET SIZE ANSI B

11" X 17"

SHEET NUMBER PV-11

<sup>\*</sup> Functionality subject to inverter model and firmware version

# SolarEdge Home Hub Inverter

# For North America

SE3800H-US / SE5700H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US<sup>(1)</sup>



### Optimized battery storage with HD-Wave technology

- Record-breaking 99% weighted efficiency with 200% DC oversizing
- Small, lightweight, and easy to install
- Modular design, future ready with optional upgrades to:
- DC-coupled storage for full or partial home
- Built-in consumption monitoring
- Direct connection to the SolarEdge Home **EV** Charger

- Multi-inverter, scalable storage solution, with enhanced battery power up to 10kW
- Integrated arc fault protection and rapid shutdown for NEC 2014 – 2023, per article 690.11 and 690.12
- Embedded revenue grade production data, ANSI C12.20 Class 0.5



# / SolarEdge Home Hub Inverter For North America

SE3800H-US / SE5700H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US<sup>(1)</sup>

Applicable to inverters with part number		SEXXX	XXH-USMNBBXXX	/ SEXXXXH-USSN	IBBXXX		
	SE3800H-US	SE5700H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	Unit
OUTPUT – AC ON GRID						Į.	
Rated AC Power	3800 @ 240V 3300 @ 208V	5760 @ 240V 5000 @ 208V	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208V	W
Maximum AC Power Output	3800 @ 240V 3300 @ 208V	5760 @ 240V 5000 @ 208V	6000 @ 240V 5000 @ 208V	7600	10000	11400 @ 240V 10000 @ 208	W
AC Output Voltage (Nominal)			208	/ 240			Vac
AC Output Voltage (Range)			183 -	- 264			Vac
AC Frequency Range (min - nom - max)			59.3 - 60	0 - 60.5 <sup>(2)</sup>			Hz
Maximum Continuous Output Current @ 240V	16	24	25	32	42	47.5	А
Maximum Continuous Output Current @ 208V	16	24	24	-	-	48	Α
GFDI Threshold				1			А
Total Harmonic Distortion (THD)			<	: 3			%
Power Factor			1. adiustable	-0.85 to 0.85			
Utility Monitoring, Islanding Protection, Country Configurable Thresholds				'es			
Charge Battery from AC (if allowed)		Yes					
Typical Nighttime Power Consumption				2.5			W
OUTPUT – AC BACKUP <sup>(3)</sup>				America			
Rated AC Power in Backup Operation <sup>(4)</sup>	7600	5760	6000	7600 11400*	10000 11400*	11400	W
AC L-L Output Voltage Range in Backup			211 -	- 264		1	Va
AC L-N Output Voltage Range in Backup	105 – 132					Va	
AC Frequency Range in Backup (min - nom - max)	91197 15994				Hz		
Maximum Continuous Output Current in Backup				32	42		1 12
Operation	32	24	25	47.5	47.5	47.5	Α
GFDI GFDI				1	47.3		А
THD				5			%
	DCED AC			. 2			70
OUTPUT – SOLAREDGE HOME EV CHA	RGER AC			N M M M			
Rated AC Power			100.0	500			W
AC Output Voltage Range			211 -	- 264			Va
On-Grid AC Frequency Range (min - nom - max)			59.3 – 6	50 – 60.5			Hz
Maximum Continuous Output Current @240V (grid, PV and battery)			2	40			Aa
INPUT – DC (PV AND BATTERY)							
Transformer-less, Ungrounded			Υ	es			
Max Input Voltage			4	80			Vd
Nom DC Input Voltage			3	80			Vd
Reverse-Polarity Protection			Υ	es			
Ground-Fault Isolation Detection			600kΩ S	Sensitivity			
INPUT – DC (PV)				*			
Maximum DC Power @ 240V	7600	11520	12000	15200	20000	22800	W
Maximum DC Power @ 208V	6600	10000	10000	-		20000	W
Maximum Input Current <sup>(5)</sup> @ 240V	20	16	16.5	20 30	- 30	30	Ad
Maximum Input Current <sup>(5)</sup> @ 208V	9	13.5	13.5	-	-	27	Ad
Max. Input Short Circuit Current				15			
Maximum Inverter Efficiency				9.2			%
CEC Weighted Efficiency			99			99 @ 240V 98.5 @ 208V	%
2-pole Disconnection			v	es es		20.0 @ 2007	1

(1) These specifications apply to inverters with part numbers SExxxxH-USMNxxxxx or SExxxxH-USSNxxxxxx and connection unit model number DCD-1PH-US-PxH-F-x.

(2) For other regional settings please contact SolarEdge support.

(3) Not designed for standalone applications and requires AC for commissioning. Backup functionality is only supported for 240V grid.

(4) Rated AC power in Backup Operation is valid for installations with multiple inverters. For a single backup inverter operation, rated AC power in Backup is 90% of the value stated.

(5) A higher current source may be used; the inverter will limit its input current to the values stated.

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PROJECT NAME & ADDRESS

SUSAN SHIPP RESIDENCE

102 W QUEEN ST, HILLSBOROUGH, NC 27278

DRAWN BY **ESR** 

SHEET NAME **EQUIPMENT SPECIFICATION** 

> SHEET SIZE ANSI B

11" X 17"

SHEET NUMBER PV-12

# / SolarEdge Home Hub Inverter

# For North America

SE3800H-US / SE5700H-US / SE6000H-US / SE7600H-US / SE10000H-US / SE11400H-US<sup>(1)</sup>

Applicable to inverters with part number	SEXXXXH-USMNBBXXX / SEXXXXH-USSNBBXXX						
	SE3800H-US	SE5700H-US	SE6000H-US	SE7600H-US	SE10000H-US	SE11400H-US	Unit
OUTPUT – DC (BATTERY)	<u>'</u>						
Supported Battery Types			SolarEdge Home Ba	ttery, LG RESU Prim	ie		T
Number of Batteries per Inverter		Up to 3	SolarEdge Home Ba	attery, up to 2 LG RE	SU Prime		
Continuous Power <sup>(6)</sup>	7600 @ 240V 3800 @ 208V	5760 @ 240V 5000 @ 208V	6000	114	400	11400 @ 240V 10000 @ 208V	W
Peak Power <sup>(6)</sup>	7600 @ 240V 3800 @ 208V	5760 @ 240V 5000 @ 208V	6000	114	400	11400 @ 240V 10000 @ 208V	W
Max Input Current	20			26.5			Add
2-pole Disconnection			Up to inverter rat	ted backup power			
SMART ENERGY CAPABILITIES							
Consumption Metering			Buil	t-in <sup>(7)</sup>			Ī
Backup & Battery Storage	Wit	h Backup Interface	(purchased separate	ely) for service up to	200A; up to 3 inve	rters	
EV Charging		Direct connection to SolarEdge Home EV Charger					
ADDITIONAL FEATURES							
Supported Communication Interfaces		RS485, Ethernet, Cellular <sup>(8, 9)</sup> , Wi-Fi <sup>(9)</sup> , SolarEdge Home Network					
Revenue Grade Metering, ANSI C12.20		Built-in <sup>(7)</sup>					
Integrated AC, DC and Communication Connection Unit		Yes					
Inverter Commissioning	With	the SetApp mobile	application using b	uilt-in Wi-Fi Access	Point for local conn	ection	
DC Voltage Rapid Shutdown (PV and Battery)		Yes, accordi	ing to NEC 2014 – 2	023 per article 690.	11 and 690.12		
STANDARD COMPLIANCE							
Safety		JL1741, UL1741 SA,	UL1741 SB, UL1741 P	CS, UL1699B, UL199	8, UL9540, CSA 22.	2	
Grid Connection Standards		IEEE1	547-2018, Rule 21, R	ule 14H, CSA C22.3	No. 9		
Emissions			FCC part	15 class B			
INSTALLATION SPECIFICATIONS							
AC Output and EV AC Output Conduit Size / AWG Range			1" maximun	n / 14-4 AWG			
DC Input (PV and Battery) Conduit Size / AWG Range			1" maximum	n / 14-6 AWG			
Dimensions with Connection Unit (H x W x D)	17.7 x	14.6 x 6.8 / 450 x 37	0 x 174	17.7 x 14.6 x 6.8 / 450 x 370 x 174**	21.06 x 14.6 x 7.3 / 535 x 370 x 185** 535 x 370 x 208***	21.06 x 14.6 x 8.2 / 535 x 370 x 208***	in , mn
Weight with Connection Unit		30.8 / 14		30.8 / 14**	41.7 / 18.9**	44.9 / 20.3***	lb/
Noise	< 50			dB			
Cooling		Natural Convection					
Operating Temperature Range			-40 to +140 /	'-40 to +60 <sup>(10)</sup>			°F/'
Protection Rating			NEM	1A 4X			

<sup>\*\*</sup> Supported with PN SEXXXXH-USSNBBXX4 or SEXXXXH-USMNBBXX4.



### **TOP TIER SOLAR SOLUTIONS**

1530 CENTER PARK DR #2911, CHARLOTTE, NC 28217, UNITED STATES

REVISION	S	
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INITIAL DESIGN	02/02/2024	

PROJECT NAME & ADDRESS

SUSAN SHIPP RESIDENCE

102 W QUEEN ST, HILLSBOROUGH, NC 27278

DRAWN BY **ESR** 

SHEET NAME EQUIPMENT **SPECIFICATION** 

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER

PV-13

<sup>\*\*\*</sup> Supported with PN SEXXXXH-USSNBBXX5 or SEXXXXH-USMNBBXX5.

<sup>(6)</sup> Discharge power is limited up to the inverter rated AC power for on-grid and backup applications, as well as up to the installed batteries' rating.

<sup>(</sup>b) Discharge power is limited up to the inverter rated AL power for on-grid and backup applications, as well as up to the installed batteries fatung.

(7) For consumption metering current transformers should be ordered separately: SECT-SPL-225A-T-20 or SEACT0750-400NA-20 units per box. Revenue grade metering is only for production metering.

(8) Information concerning the Data Plan's terms & conditions is available in the following link: <u>SolarEdge Communication Plan Terms and Conditions</u>.

(9) The part number SEXXXXH-USXNBBXXX only supports the Wi-Fi communication interface, and the part number SEXXXXH-USXNBBXXX only supports the cellular communication interface.

(10) Full power up to at least 50°C / 122°F; for power de-rating information refer to the <u>Temperature Derating Technical Note for North America</u>.



# **XR** Rail Family

### Solar Is Not Always Sunny Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame. XR Rails are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

# **XR Rail Family**

The XR Rail Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail to match.



### XR10

XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves 6 foot spans, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear anodized finish
- Internal splices available



### XR100

XR100 is the ultimate residential mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 8 feet.

- · 8' spanning capability
- · Heavy load capability Clear & black anodized finish
- · Internal splices available



### XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans 12 feet or more for commercial applications.

- 12' spanning capability
- · Extreme load capability
- · Clear anodized finish · Internal splices available

### Rail Selection

The following table was prepared in compliance with applicable engineering codes and standards. Values are based on the following criteria: ASCE 7-10, Roof Zone 1, Exposure B, Roof Slope of 7 to 27 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed span tables and certifications.

Lo	ad	Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
	100						
None	120						
None	140	XR10		XR100		XR1000	
	160						
	100						
10-20	120						
10-20	140						
	160						
30	100						
30	160						
40	100						
40	160						
50-70	160						
80-90	160						



### Compatible with Flat & Pitched Roofs



XR Rails are compatible with FlashFoot and other pitched roof



IronRidge offers a range of tilt leg options for flat roof mounting applications.



All XR Rails are made of marine-grade aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

**Corrosion-Resistant Materials** 





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SHEET NAME **EQUIPMENT SPECIFICATION** 

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER

PV-14



# **UFO Family of Components**

### **Simplified Grounding for Every Application**

The UFO family of components eliminates the need for separate grounding hardware by bonding solar modules directly to IronRidge XR Rails. All system types that feature the UFO family—Flush Mount, Tilt Mount and Ground Mount—are fully listed to the UL 2703 standard.

UFO hardware forms secure electrical bonds with both the module and the rail, resulting in many parallel grounding paths throughout the system. This leads to safer and more reliable installations.



# Bonded Splice Each Bonded Splice us

Each Bonded Splice uses self-drilling screws to form a secure connection. No bonding strap needed.

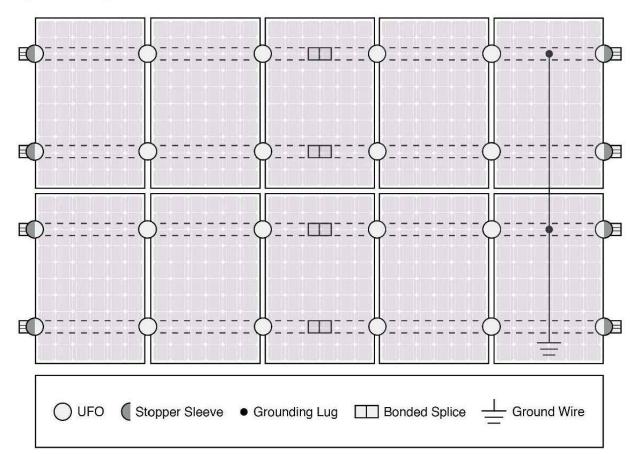


Grounding Lug
A single Grounding Lug
connects an entire row
of PV modules to the
grounding conductor.

### **Bonded Attachments**

The bonding bolt attaches and bonds the L-foot to the rail. It is installed with the same socket as the rest of the system.

### System Diagram



Approved Enphase microinverters can provide equipment grounding of IronRidge systems, eliminating the need for grounding lugs and field installed equipment ground conductors (EGC). A minimum of two microinverters mounted to the same rail and connected to the same Engage cable is required. Refer to installation manuals for additional details.

### **UL Certification**

The IronRidge Flush Mount, Tilt Mount, and Ground Mount Systems have been listed to UL 2703 by Intertek Group plc.

UL 2703 is the standard for evaluating solar mounting systems. It ensures these devices will maintain strong electrical and mechanical connections over an extended period of time in extreme outdoor environments.



	Cross-System	Companing	
Feature	Flush Mount	Tilt Mount	Ground Mount
XR Rails	•	•	XR1000 Only
UFO/Stopper	~	~	~
Bonded Splice	~	•	N/A
Grounding Lugs	1 per Row	1 per Row	1 per Array
Microinverters & Power Optimizers	Darfon - M	0-72, M250-60, M2 IIG240, MIG300, G P320, P400, P405	
Fire Rating	Class A	Class A	N/A
Modules	The second profession and discussions	ated with over 400 llation manuals for	

# TOP TIER

### TOP TIER SOLAR SOLUTIONS

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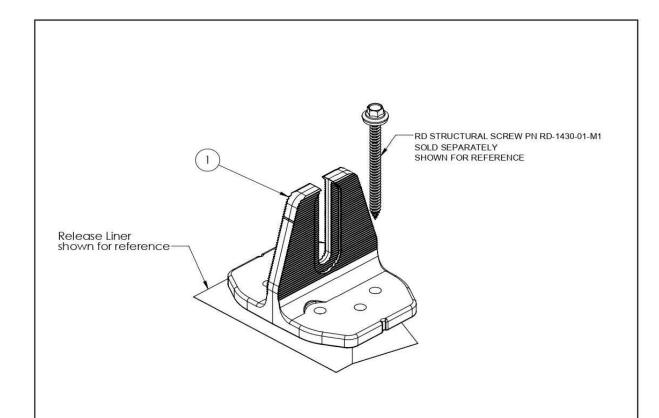
SHEET NUMBER

PV-15

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# QuickMount® Halo UltraGrip



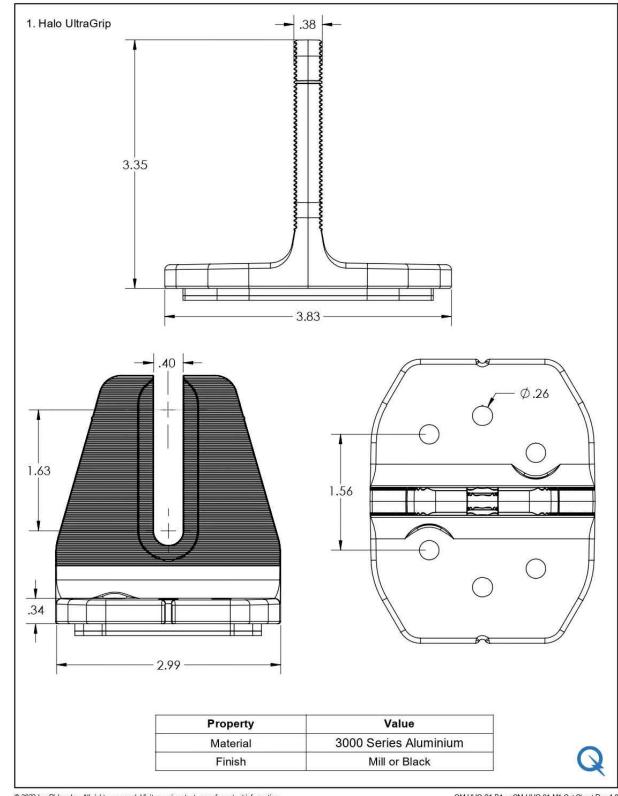
ITEM NO	DESCRIPTION	QTY IN KIT
1	QM Halo UltraGrip(Mill or Black)	1

PART NUMBER	DESCRIPTION
QM-HUG-01-M1	Halo UltraGrip - Mill
QM-HUG-01-B1	Halo UltraGrip - Black



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QM-HUG-01-B1 or QM-HUG-01-M1 Cut Sheet Rev 1.0



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QM-HUG-01-B1 or QM-HUG-01-M1 Cut Sheet Rev 1.0

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11" X 17"

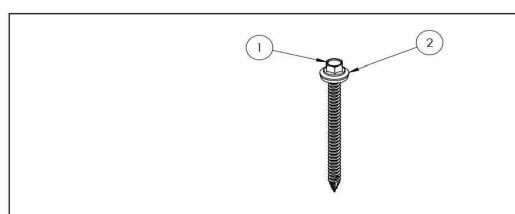
SHEET NUMBER

PV-16





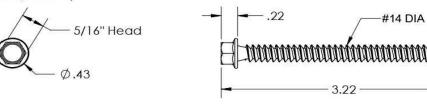
# QuickMount® RD Structural Screw



ITEM NO	DESCRIPTION	QTY IN KIT
1	Self Drilling Screw, #14, Wood Tip	1
2	Washer, EPDM Backed	1

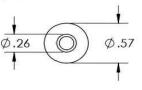
PART NUMBER	DESCRIPTION	
RD-1430-01-M1	RD Structural Screw	

1. Self Drilling Screw, #14, Wood Tip



Property	Value	
Material	300 Series Stainless Steel	
Finish	Clear	

2. Washer, EPDM Backed



Value	1
. 01 . 1 01 1	_

Property Value

Material 300 Series Stainless Steel

Finish Clear

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QM-RD-1430-01-M1 Cut Sheet Rev 1.0



### TOP TIER SOLAR SOLUTIONS

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REVISIONS			
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DRAWN BY

SHEET NAME
EQUIPMENT
SPECIFICATION

SHEET SIZE

ANSI B 11" X 17"

SHEET NUMBER

PV-17<sub>34</sub>



PHONE: 385-202-4150 WWW.EZSOLARPRODUCTS.COM



PHONE: 385-202-4150 WWW.EZSOLARPRODUCTS.COM

REV

SHEET 2 OF 3

SIZE

SCALE: 1:2

DWG. NO.

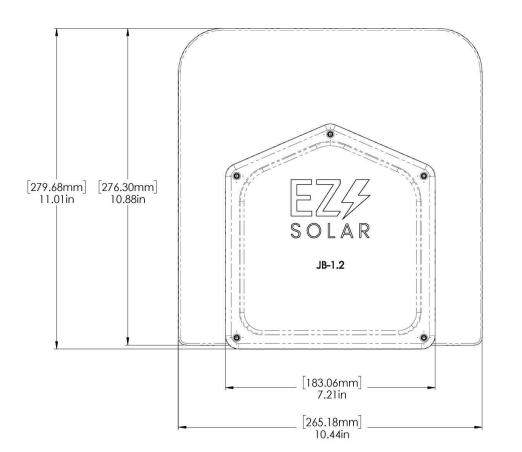
JB-1.2

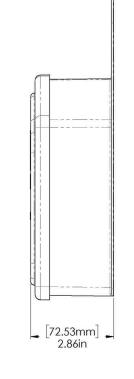
WEIGHT: 1.45 LBS

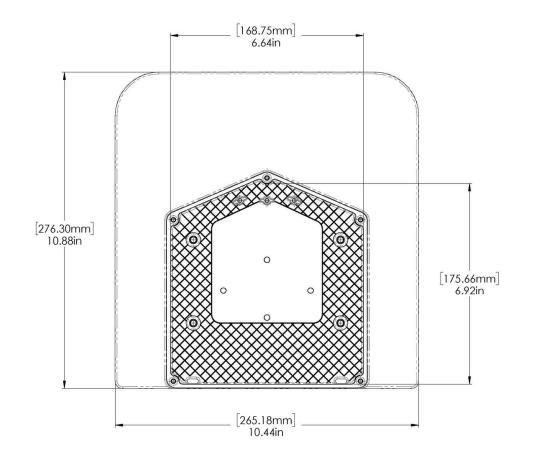
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	JB-1.2 BODY	POLYCARBONATE WITH UV INHIBITORS	1
2	JB-1.2 LID	POLYCARBONATE WITH UV INHIBITORS	1
3	#10 X 1-1/4" PHILLIPS PAN HEAD SCREW		6
4	#8 X 3/4" PHILLIPS PAN HEAD SCREW		6

SIZE	DWG. NO.		REV
В	JB-1.2		
SCALE: 1:2	WEIGHT: 1.45 LBS	SHEE	T 1 0F 3

TORQUE SPECIFICATION:	15-20 LBS
CERTIFICATION:	UL 1741, NEMA 3R CSA C22.2 NO. 290
WEIGHT:	1.45 LBS









### **TOP TIER SOLAR SOLUTIONS**

1530 CENTER PARK DR #2911, CHARLOTTE, NC 28217, UNITED STATES

REVISIONS			
DESCRIPTION	DATE	REV	
INITIAL DESIGN	02/02/2024		

PROJECT NAME & ADDRESS

SUSAN SHIPP RESIDENCE

102 W QUEEN ST, HILLSBOROUGH, NC 27278

DRAWN BY **ESR** 

SHEET NAME **EQUIPMENT SPECIFICATION** 

> SHEET SIZE ANSI B

11" X 17" SHEET NUMBER

PV-18







February 02, 2024

Contractor Name: Top Tier Solar Solutions Contractor Address: 1530 Center Park Dr #2911,

Charlotte, NC 28217

Subject: Proposed Solar Panel Installation

Susan Shipp Residence, 102 W Queen St, Hillsborough, NC

DC System Size: 5.925 kW PV Letters Job #004-5383

To Whom it May Concern,

We have reviewed information, provided by our client, related to the proposed solar panel installation at the above-referenced address. The purpose of the review was to determine if the existing roof is structurally adequate for the proposed installation. Based on our review and analysis of the given information, and in accordance with governing building codes, it is our professional opinion that the existing structure is permitted to remain unaltered for the proposed solar installation.

### **Design Parameter Summary**

Governing Building Code: 2018 North Carolina Residential Code

Risk Category: II Wind Exposure: B

Design Wind Speed: 115 mph Ground Snow Load: 15 psf

### **Roof Information**

Roof Structure: 2x4 Manufactured Trusses @ 24" O.C. (Roof 1 & 2)

Roofing Material: Asphalt Shingles

Roof Slope: 26 degrees (Roof 1 & 2)

### **Roof Connection Details**

Wood Screws: (2) #14 Self-Drilling Screw with a min. 2.5" embedment into roof truss top chord only, at 48" O.C. max Stagger attachments to avoid overloading any individual truss top chord.

### **Engineering Analysis**

The proposed installation - including weight of panels, racking, mounts, and inverters where applicable - will be approximately 3 psf. In the areas where panels are installed, roof live loads will not be present. Also, where applicable, roof snow loads will be reduced because the slippery surface of the panels will cause the roof to shed additional snow loads relative to the existing roof surface. The member forces in the area of the solar panels are not increased by more than 5%, and so per provisions in the adopted building codes, the structure need not be altered for gravity loading.

The proposed installation will be 6" max. above the roof surface (flush mounted) and parallel to the roof surface. Therefore, any increase in wind loading on the building structure from the solar panel installation is expected to be negligible. Wind is the governing lateral load case. Because the increase in lateral loading is not increased by more than 10%, per provisions in the adopted building codes, the structure need not be altered for lateral loading.

Wind uplift on the panels has been calculated in accordance with the relevant provisions of ASCE 7-10. This loading has been used to verify the adequacy of the connection specified above. Connection locations should be in accordance with design drawings.

IronRidge XR10 rails will support the modules and will fasten to the roof structure with IronRidge QuickMount Halo Ultragrip along the rail.

#### Conclusion

The roof structure need not be altered for either gravity loading (including snow) or lateral loading (including wind). Therefore, the existing structure is permitted to remain unaltered. Connections to the roof must be made per the "Roof Connection Details" section above. Copies of all relevant calculations are enclosed.

#### **Limitations and Disclaimers**

The opinion expressed in this letter is made in reliance on the following assumptions: the existing structure is in good condition; the existing structure is free from defects in design or workmanship; and the existing structure was code-compliant at the time of its design and construction. These assumptions have not been independently verified, and we have relied on representations made by our client with respect to the foregoing. The undersigned has not inspected the structure for defects, although we have reviewed the information provided by our client, including pictures where applicable.

Electrical design is excluded from this analysis. Waterproofing is the sole responsibility of the installer and is also excluded from this analysis. Solar panels must be installed per manufacturer specifications. Structural design and analysis of the adequacy of solar panels, racks, mounts, and other components is performed by each component's respective manufacturer; the undersigned makes no statement of opinion regarding such components. This letter and the opinions expressed herein are rendered solely for the benefit of the permitting authority (city or county building department) and your office, and may not be utilized or relied on by any other party.

If you have any questions or concerns, please contact me at (208)-994-1680, or email me directly at Trevor@pyletters.com.

Sincerely, Trevor A. Jones, P.E.



2/2/2024



## **Standard Loading Comparison**

This calculation justifies the additional solar load by comparing existing to proposed gravity loads in the location of the solar panels.

Without Solar

With Solar

Dead Load	vv mode Botal	vvidi Bolar	
Asphalt Shingles	5	5	psf
1/2" Plywood	1	1	psf
Framing	4	4	psf
Insulation	1	1	psf
1/2" Gypsum Ceiling	2	2	psf
M,E, & Misc	1.5	1.5	psf
Solar Panel	0	3	psf
Total Dead Load	14.5	17.5	psf
Snow Load			
Ground Snow Load, Pg	15		psf
Exposure Factor, C <sub>e</sub>	0.90		7
Thermal Factor, C <sub>t</sub>	1.1		
Importance Factor, I <sub>s</sub>	1		7
Flat Roof Snow Load	10		Eqn. 7.3-1 or jurisdiction min.
Slope	20	5	degrees
Unobstructed Slippery Surface?	No	Yes	
Slope Factor, C <sub>s</sub>	1.00	0.73	
Sloped Roof Snow Load	10.4	7.6	psf
Live Load			
Roof Live Load	10	0	psf
<b>Load Combination</b>			
D + Lr	24.5	17.5	psf
D + S	24.9	25.1	psf
Max. Load	24.9	25.1	psf
% of original		100.90%	

**Result:** 

Because the total forces are not increased by more than 5%, per the relevant code provisions stated in the body of the letter, the existing roof structure is permitted to remain unaltered.

This calculation justifies the connection of the solar panels to existing roof members, by showing the connection capacity is equal to or greater than the uplift force demands.

#### **Connection Demand**

Spacing perpendicular to rail, in	38
Roof Angle, degrees	26
Roof Layout	Gable
Wind Speed, mph	115
Exposure Coefficient, K <sub>z</sub>	0.57
Topographic Factor, K <sub>zt</sub>	1.00
Directionality Factor, K <sub>d</sub>	0.85
Elevation Factor, K <sub>e</sub>	0.98
Velocity Pressure q <sub>z</sub> , psf	16.2

<b>Zones:</b>	<u>1</u>	<u>2</u>	<u>3</u>
	40	10	40

Spacing parallel to rail, in
$GC_p$ (max)
Even a and Domato 2 (v. 1.5)

Exposed Panels? ( $\gamma_E = 1.5$ )

Effective Wind Area on each con., ft<sup>2</sup> Pressure Equalization Factor, γ<sub>a</sub>

Uplift Force, psf

Max. Uplift Force / Connection (0.6 WL), lbs

Solar Dead Load (0.6 DL). Lbs

Max. Uplift Force (0.6 WL - 0.6 DL), lbs

<u>1</u>	<u>2</u>	<u>3</u>
48	48	48
0.90	2.20	2.60
No	No	No
12.5	12.5	12.5
0.76	0.76	0.76
16.0	27.1	32.1
120.1	203.6	240.7
22.5	22.5	22.5
97.6	181.1	218.1

#### **Connection Capacity**

Attachment FTG	IronRidge QuickMount Halo Ultragrip
----------------	-------------------------------------

Attachment location	Framing
Fastener Type	Wood Screw
Fastener Diameter, in	0.242
Embedment Length, in	2.5

Nominal Withdrawal Capacity W, lbs

# of Screws

Load Duration Factor C<sub>d</sub>

Lumber Species & Grade

Screw Adj. Withdrawal Cap. W', lbs Attachment FTG Strength with Cd, lbs

Max applied load, lbs	
Max allowable load, lbs	

2.3	
SPF #2 (Assum	ed)

304
2
1.6
973
1606

218	
973	

#### Compare Adjusted Withdrawal Capacity to ASD Factored Demand

Zones:	<u>1</u>	<u>2</u>	<u>3</u>	
	O.K.	O.K.	O.K.	

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Project Details			
Name	susan shipp	Date	02/01/2024
Location	102 West Queen Street, Hillsborough, NC 27278	Total modules	15
Module	Mission Solar Energy: MSE395SX9R (40mm)	Total watts	5,925
Dimensions	Dimensions: 75.08" x 41.5" x 1.57" (1907.0mm x 1054.0mm x 40.0mm)	Attachments	40
ASCE	7-10	Rails per row	2



System Weight	
Total system weight	847.2 lbs
Weight/attachment	21.2 lbs
Racking weight	119.7 lbs
Distributed weight	2.5 psf

Load Assumptions	
Wind exposure	В
Wind speed	115 mph
Ground snow load	15 psf
Attachment spacing portrait	4.0'
Attachment spacing landscape	4.0'

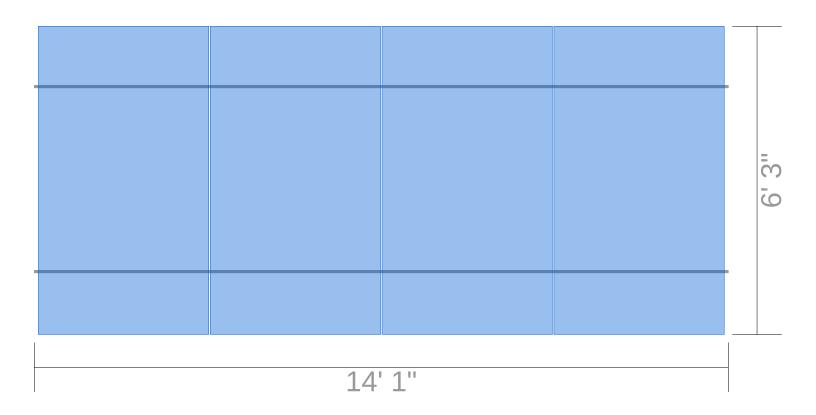
Roof Information			
Roof Material Family	Comp Shingle	Roof material	Comp Shingle
Risk category	II	Roof attachment	Halo UltraGrip (Rafter attached)
		Staggered attachments	Yes
Attachment hardware	Square		
Specific gravity	0.42		



Roof Plane A					
Height	15 ft	Slope	26 °	Rafter spacing	24 in

Roof Plane A: Roof Section 1				
Details		Weights		
Panels: 4	Provided rail: 56' [4 x 168"]	Total weight: 226.6 lbs		
Rail orientation: East-West	Attachments: 9	Weight/attachment: 25.2 lbs		
Panel orientation: Portrait	Splices: 2	Total Area: 88.2 sq ft		
Entry type: Graphical	Clamps: 10	Distributed weight: 2.6 psf		

#### Diagram



#### Segments

Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps
А	4	14' 1"	14' 1"	1' 1"	56' [4 x 168"]	9	2	10



#### Span Details XR10 - Portrait

Zone	Max span	Max cantilever
1	5' 11"	2' 4"
2	5' 11"	2' 4"
3	4' 11"	2'

Reaction Forces XR10 - Portrait					
Zone	Uplift (PSF)	Down (lbs)	Uplift (lbs)	Lateral Par (Ibs)	<b>Lateral</b> Perp (lbs)
1	10.7	203	113	67	3
2	19.8	203	233	67	3
3	30.5	203	368	67	3

#### Attachment Span Details Halo UltraGrip (Rafter attached) - Portrait

Zone	Max attachment span
1	5' 11"
2	5' 11"
3	4' 11"

## \*Optional - Attachment Span Details Halo UltraGrip (Deck attached) - Portrait

Zone	Max attachment span
1	4' 6"
2	3' 3"
3	2' 1"

<sup>\*</sup> Based on minimum 7/16" sheathing thickness

#### Span Details XR10 - Landscape

Zone	Max span	Max cantilever
1	7' 5"	3'
2	7' 5"	3'
3	6' 4"	2' 6"

Reaction Forces XR10 - Landscape					
Zone	Uplift (PSF)	Down (lbs)	Uplift (lbs)	Lateral Par (lbs)	Lateral Perp (lbs)
1	10.7	112	63	37	1
2	19.8	112	129	37	1
3	30.5	112	205	37	1

## Attachment Span Details Halo UltraGrip (Rafter attached) - Landscape

Zone	Max attachment span
1	7' 5"
2	7' 5"
3	6' 4"

## \*Optional - Attachment Span Details Halo UltraGrip (Deck attached) - Landscape

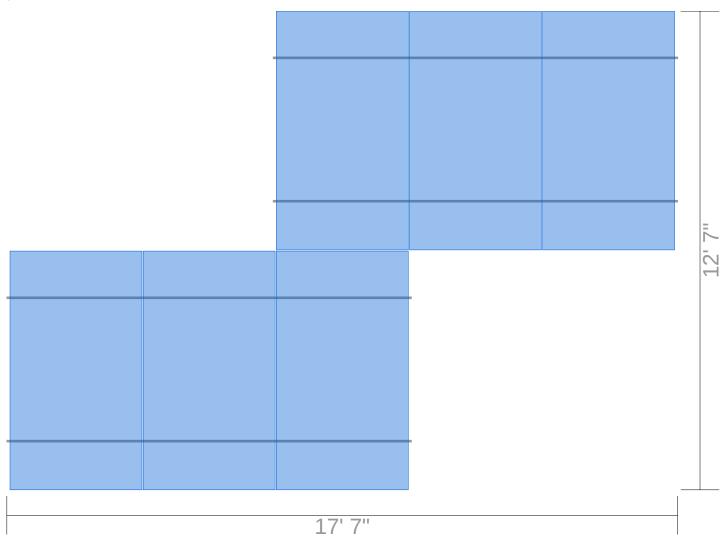
Zone	Max attachment span
1	7' 5"
2	5' 11"
3	3' 9"

<sup>\*</sup> Based on minimum 7/16" sheathing thickness



Roof Plane A: Roof Section 2				
Details		Weights		
Panels: 6	Provided rail: 56' [4 x 168"]	Total weight: 327.2 lbs		
Rail orientation: East-West	Attachments: 14	Weight/attachment: 23.4 lbs		
Panel orientation: Portrait	Splices: 0	Total Area: 133.0 sq ft		
Entry type: Graphical	Clamps: 16	Distributed weight: 2.5 psf		

#### Diagram



#### Segments

Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps	
А	3	10' 7"	10' 7"	1' 4"	28' [2 x 168"]	7	0	8	
			Row seame	nt totals (x 2) →	56' [4 x 168"]	14	0	16	



#### Span Details XR10 - Portrait

Zone	Max span	Max cantilever
1	5' 11"	2' 4"
2	5' 11"	2' 4"
3	4' 11"	2'

Reaction Forces XR10 - Portrait					
Zone	<b>Uplift</b> (PSF)	Down (lbs)	Uplift (lbs)	Lateral Par (Ibs)	Lateral Perp (lbs)
1	10.7	203	113	67	3
2	19.8	203	233	67	3
3	30.5	203	368	67	3

#### Attachment Span Details Halo UltraGrip (Rafter attached) - Portrait

Zone	Max attachment span
1	5' 11"
2	5' 11"
3	4' 11"

## \*Optional - Attachment Span Details Halo UltraGrip (Deck attached) - Portrait

Zone	Max attachment span
1	4' 6"
2	3' 3"
3	2' 1"

<sup>\*</sup> Based on minimum 7/16" sheathing thickness

#### Span Details XR10 - Landscape

Zone	Max span	Max cantilever
1	7' 5"	3'
2	7' 5"	3'
3	6' 4"	2' 6"

Reaction Forces XR10 - Landscape					
Zone	Uplift (PSF)	Down (lbs)	Uplift (lbs)	Lateral Par (lbs)	Lateral Perp (lbs)
1	10.7	112	63	37	1
2	19.8	112	129	37	1
3	30.5	112	205	37	1

## Attachment Span Details Halo UltraGrip (Rafter attached) - Landscape

Zone	Max attachment span
1	7' 5"
2	7' 5"
3	6' 4"

## \*Optional - Attachment Span Details Halo UltraGrip (Deck attached) - Landscape

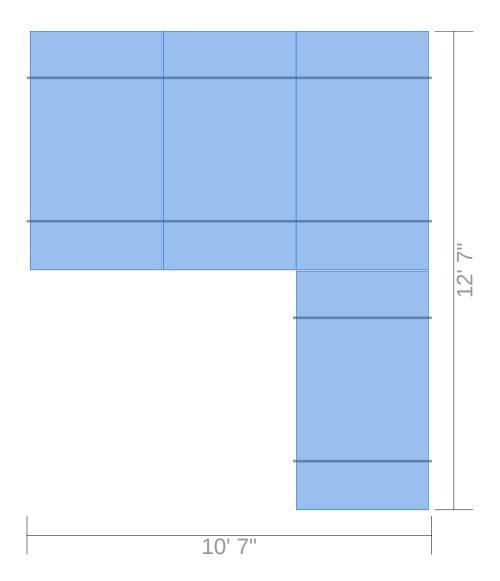
Zone	Max attachment span
1	7' 5"
2	5' 11"
3	3' 9"

<sup>\*</sup> Based on minimum 7/16" sheathing thickness



Roof Plane A: Roof Section 3		
Details		Weights
Panels: 4	Provided rail: 56' [4 x 168"]	Total weight: 228.5 lbs
Rail orientation: East-West	Attachments: 12	Weight/attachment: 19.0 lbs
Panel orientation: Portrait	Splices: 0	Total Area: 89.0 sq ft
Entry type: Graphical	Clamps: 12	Distributed weight: 2.6 psf

#### Diagram



#### Segments

Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps
А	3	10' 7"	10' 7"	1' 4"	28' [2 x 168"]	7	0	8
В	1	3' 8"	3' 8"	0"	28' [2 x 168"]	5	0	4



#### Span Details XR10 - Portrait

Zone	Max span	Max cantilever
1	5' 11"	2' 4"
2	5' 11"	2' 4"
3	4' 11"	2'

Reaction Forces XR10 - Portrait					
Zone	<b>Uplift</b> (PSF)	Down (lbs)	Uplift (lbs)	Lateral Par (Ibs)	Lateral Perp (lbs)
1	10.7	203	113	67	3
2	19.8	203	233	67	3
3	30.5	203	368	67	3

#### Attachment Span Details Halo UltraGrip (Rafter attached) - Portrait

Zone	Max attachment span
1	5' 11"
2	5' 11"
3	4' 11"

## \*Optional - Attachment Span Details Halo UltraGrip (Deck attached) - Portrait

Zone	Max attachment span
1	4' 6"
2	3' 3"
3	2' 1"

<sup>\*</sup> Based on minimum 7/16" sheathing thickness

#### Span Details XR10 - Landscape

Zone	Max span	Max cantilever
1	7' 5"	3'
2	7' 5"	3'
3	6' 4"	2' 6"

Reaction Forces X	Reaction Forces XR10 - Landscape				
Zone	Uplift (PSF)	Down (lbs)	Uplift (lbs)	Lateral Par (lbs)	Lateral Perp (lbs)
1	10.7	112	63	37	1
2	19.8	112	129	37	1
3	30.5	112	205	37	1

## Attachment Span Details Halo UltraGrip (Rafter attached) - Landscape

Zone	Max attachment span
1	7' 5"
2	7' 5"
3	6' 4"

## \*Optional - Attachment Span Details Halo UltraGrip (Deck attached) - Landscape

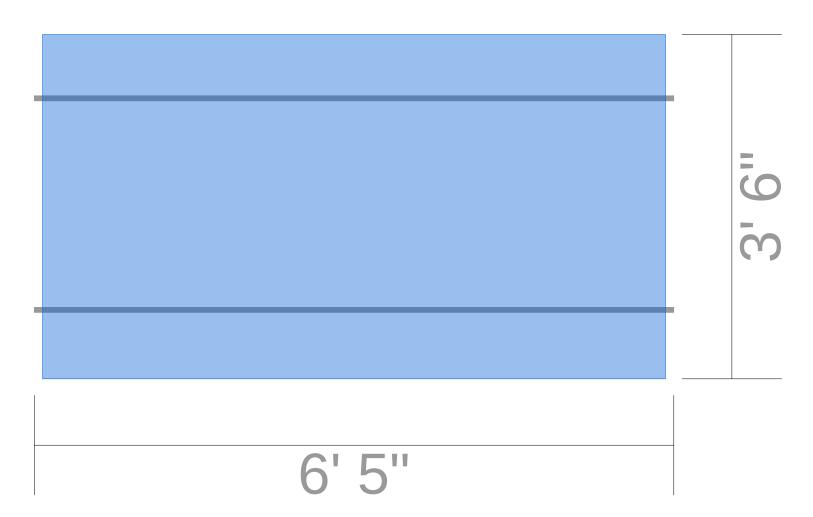
Zone	Max attachment span
1	7' 5"
2	5' 11"
3	3' 9"

<sup>\*</sup> Based on minimum 7/16" sheathing thickness



Roof Plane A: Roof Section 4		
Details		Weights
Panels: 1	Provided rail: 28' [2 x 168"]	Total weight: 64.9 lbs
Rail orientation: East-West	Attachments: 5	Weight/attachment: 13.0 lbs
Panel orientation: Landscape	Splices: 0	Total Area: 22.2 sq ft
Entry type: Graphical	Clamps: 4	Distributed weight: 2.9 psf

#### Diagram



#### Segments

Identifier	Columns	Row length	Rail length	Cantilever	Rail	Attachments	Splices	Clamps
А	1	6' 5"	6' 5"	1' 3"	28' [2 x 168"]	5	0	4

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Page 8 of 16



#### Span Details XR10 - Portrait

Zone	Max span	Max cantilever
1	5' 11"	2' 4"
2	5' 11"	2' 4"
3	4' 11"	2'

Reaction Forces X	Reaction Forces XR10 - Portrait														
Zone	Uplift (PSF)	Down (lbs)	Uplift (lbs)	Lateral Par (Ibs)	<b>Lateral</b> Perp (lbs)										
1	10.7	203	113	67	3										
2	19.8	203	233	67	3										
3	30.5	203	368	67	3										

#### Attachment Span Details Halo UltraGrip (Rafter attached) - Portrait

Zone	Max attachment span
1	5' 11"
2	5' 11"
3	4' 11"

## \*Optional - Attachment Span Details Halo UltraGrip (Deck attached) - Portrait

Zone	Max attachment span
1	4' 6"
2	3' 3"
3	2' 1"

<sup>\*</sup> Based on minimum 7/16" sheathing thickness

#### Span Details XR10 - Landscape

Zone	Max span	Max cantilever
1	7' 5"	3'
2	7' 5"	3'
3	6' 4"	2' 6"

Reaction Forces X	Reaction Forces XR10 - Landscape														
Zone	Uplift (PSF)	Down (lbs)	Uplift (lbs)	Lateral Par (lbs)	Lateral Perp (lbs)										
1	10.7	112	63	37	1										
2	19.8	112	129	37	1										
3	30.5	112	205	37	1										

## Attachment Span Details Halo UltraGrip (Rafter attached) - Landscape

Zone	Max attachment span
1	7' 5"
2	7' 5"
3	6' 4"

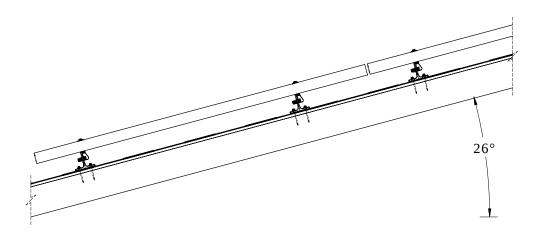
## \*Optional - Attachment Span Details Halo UltraGrip (Deck attached) - Landscape

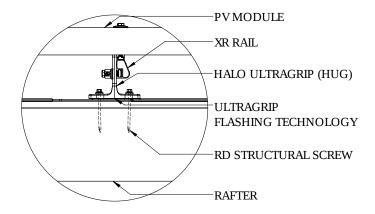
Zone	Max attachment span
1	7' 5"
2	5' 11"
3	3' 9"

<sup>\*</sup> Based on minimum 7/16" sheathing thickness

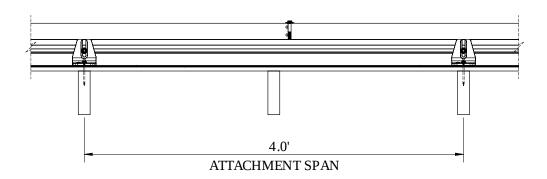


#### Side View (portrait)



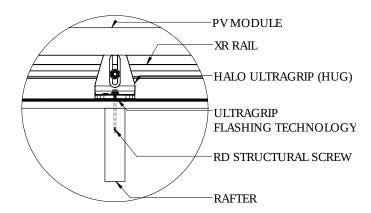


#### Front View (portrait)



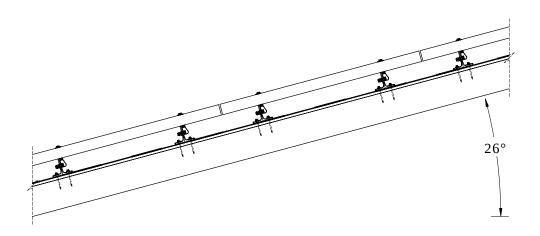


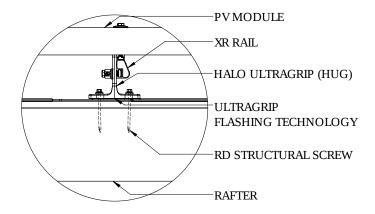
#### Front View (portrait)



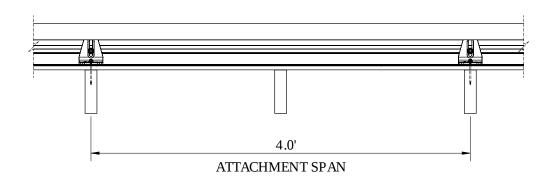


#### Side View (landscape)



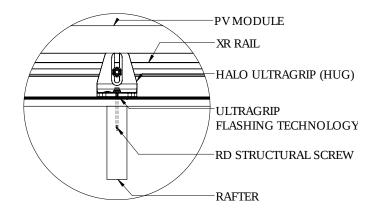


#### Front View (landscape)

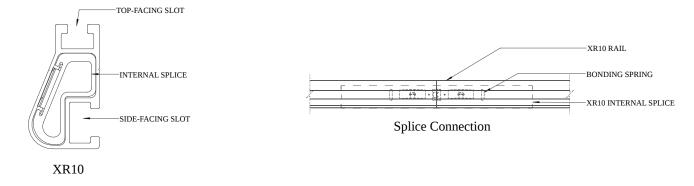




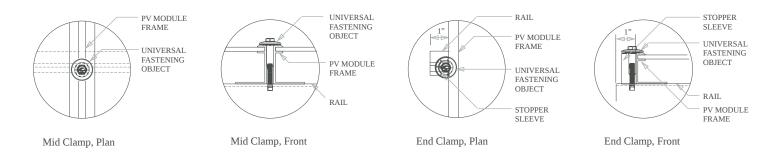
#### Front View (landscape)



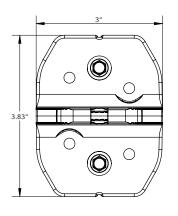
#### **Splice Details**

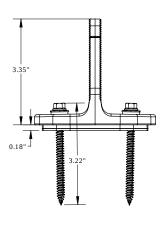


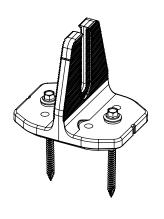
#### Clamp Detail

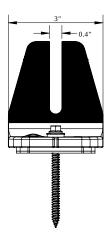












Plan View

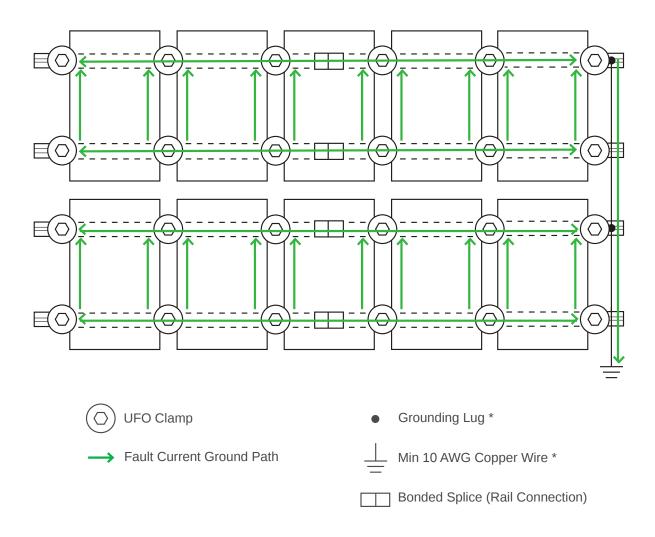
Side View

Perspective View

Front View



#### **Grounding Diagram**



<sup>\*</sup> Grounding Lugs and Wire are not required in systems using Enphase microinverters.



#### **Bill of Materials**

Part	Spares	Total Qty
Rails & Splices		
XR-10-168A XR10, Rail 168" Clear	0	14
XR10-BOSS-01-M1 Bonded Splice, XR10	0	2
Clamps & Grounding		
UFO-CL-01-A1 Universal Module Clamp, Clear	0	42
UFO-STP-40MM-M1 Stopper Sleeve, 40MM, Mill	0	24
XR-LUG-03-A1 Grounding Lug, Low Profile	0	6
Attachments		
QM-HUG-01-M1 Halo UltraGrip, Mill	0	40
HW-RD1430-01-M1 RD Structural Screw, 3.0L * Add desired additional screws by adjusting spares column.	0	80
BHW-SQ-02-A1 Square-Bolt Bonding Hardware	0	40

### **ATTACHMENTS**

#### **PRE-INSTALLATION**

Verify module compatibility. See Page 21 for info.

#### **TOOLS REQUIRED**

- Cordless Drill (non-impact) 3/8" Socket
- Impact Driver (for lag bolts) 1/8" Drill Bit
- Torque Wrench (0-250 in-lbs) 1/4" Drill Bit
- 7/16" Socket T30 Bit П П
- 1/2" Socket **Channel Lock Pliers**
- 9/16" Socket #3 Phillips Bit
- 3/16" Hex Bit П 7/32" Drill Bit

#### **BONDING HARDWARE TORQUE VALUES**

Please refer to each attachment's individual section for full details on all torque values and instructions.

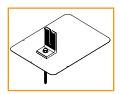
- 3/8" Bonding Hardware Nuts (7/16" Socket): 250 in-lbs
- All Tile Hook Carriage Bolts (7/16" Socket): 132 in-lbs
- Flat Roof Attachment Nuts (9/16" Socket): 250 in-lbs
- Lynx Set Screw (3/16" Hex Drive): 150 in-lbs
- Lynx Flange Nut (1/2" Socket): 150 in-lbs

#### **ATTACHMENTS**

#### **COMPOSITION SHINGLE**



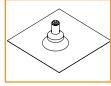




FlashFoot2

FlashVue

QM L-Mount



QM QBase

٩

QM Classic Comp Mount



HUG (Halo UltraGrip)

#### TILE



Knockout Tile



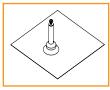
QM Tile Replacement



All Tile Hook and Flashing (optional)



QM Quick Hook and Flashing (optional)



QM QBase Tile

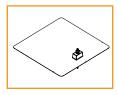


QM Tile Conduit Penetration

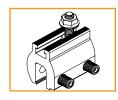
#### **ADDITIONAL ROOF TYPES**



QM Qbase Shake -Slate - Metal Shingle



**QM Classic Mount** Shake



QM Lynx Metal Roof Attachment

#### **LOW SLOPE ROOF**



Flat Roof Attachment



QM QBase Mount

<sup>&</sup>gt; If using previous version of Integrated Grounding Mid Clamps, End Clamps, Expansion Joints and for a list of approved 3rd party components please refer to Alternate Components Addendum (Version 1.9)

#### **PRE-INSTALLATION**

□ Verify module compatibility. See Page 21 for info.

#### **TOOLS REQUIRED**

- ☐ Cordless Drill (non-impact) ☐ 1/8" Drill bit
- ☐ Impact Driver (for lag bolts) ☐ 1/4" Drill bit
- □ Torque Wrench (0-250 in-lbs) □ T30 Torx Bit
- □ 7/16" Socket □ Channel Lock Pliers
- ☐ 1/2" Socket ☐ #3 Phillips Bit
- □ 9/16" Socket □ Paddle Bit
- □ 7/32" Drill bit

#### **BONDING HARDWARE TORQUE VALUES**

Please refer to each attachment's individual section for full details on all torque values and instructions.

- ☐ Universal Fastening Object (7/16" Socket): 80 in-lbs
- ☐ Rail Grounding Lug Nut (7/16" Socket): 80 in-lbs
- ☐ Module Grounding Lug
  - ☐ Grounding Nut (7/16" Socket): 60 in-lbs
  - ☐ Grounding Lug Terminal Screws (7/16" Socket): 20 in-lbs
- ☐ Microinverter Kit Nuts (7/16" Socket): 80 in-lbs
- ☐ Frameless Module Kit Nuts (7/16" Socket): 80 in-lbs
- □ 3/8" Bonding Hardware Nuts (7/16" Socket): 250 in-lbs
- ☐ Contour Clamp (T-30 Torx Bit): 80 in-lbs

#### COMPONENTS



XR Rail



Wire Clip



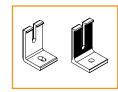
**BOSS** 



UFO and Stopper Sleeve (30-46MM)



CAMO



Ironridge L-Foot and QM L-Foot



End Cap



Rail Grounding Lug



Module Grounding Lug



Microinverter Kit



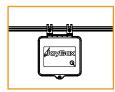
3/8" Bonding Hardware



8" Bonding Jumper Single Use Only



QM Classic Conduit Comp Mount



JAYBOX



QM Composition Conduit Penetration



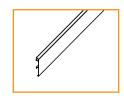
QM Tile Conduit Mount



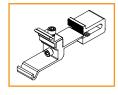
Frameless End/Mid Clamp



Frameless Module Kit



Contour Trim



Contour Clamp

Unless otherwise noted, all components have been evaluated for multiple use. They can be uninstalled and reinstalled in the same or new location.

		Flush Mount System Span Table (inches) - Portrait or Landscape Installation																																						
R	ail:														FIL	1511 1010										Stallat	1011													
XI	R10																IVI	X IVIO	iule Le	ngth:			nodule	3F: 24	3F															
																				Ex	posure																			
	Roof	Groui	nd Snow	: 0 psf		10 psf			20 psf			30 psf			40 psf			50 psf			60 psf			70 psf*			80 psf*			90 psf*		1	LOO psf	*		L10 psf*	k .	1	20 psf*	
Speed		Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3	Zone 1	Zone 2	Zone 3
(mph)	(deg.) 8-27	84	75	61	72	72	61	61	61	61	60	60	60	54	54	54	49	49	49	45	45	45	42	42	42	40	40	40	38	38	38	36	36	36	34	34	34	33	33	33
mph	28-45	84	84	84	72	72	72	60	60	60	60	60	60	55	55	55	52	52	52	49	49	49	48	48	48	40	43	43	J0	//1	41	39	39	39	37	37	37	36	36	36
115	8-27	84	72	58	72	72	58	61	61	58	60	60	58	54	54	54	49	49	49	45	45	45	42	42	42	40	40	40	38	38	38	36	36	36	34	34	34	33	33	33
mph	28-45	81	81	81	72	72	72	60	60	60	60	60	60	55	55	55	52	52	52	49	49	49	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36
120	8-27	84	72	56	72	72	56	61	61	56	60	60	56	54	54	54	49	49	49	45	45	45	42	42	42	40	40	40	38	38	38	36	36	36	34	34	34	33	33	33
mph	28-45	79	78	78	72	72	72	60	60	60	60	60	60	55	55	55	52	52	52	49	49	49	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36
130	8-27	83	64	51	72	64	51	61	61	51	60	60	51	54	54	51	49	49	49	45	45	45	42	42	42	40	40	40	38	38	38	36	36	36	34	34	34	33	33	33
mph	28-45	75	73	73	72	69	69	60	60	60	60	60	60	55	55	55	52	52	52	49	49	49	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36
140	8-27	81	59	48	72	59	48	61	59	48	60	59	48	54	54	48	49	49	48	45	45	45	42	42	42	40	40	40	38	38	38	36	36	36	34	34	34	33	33	33
mph	28-45	72	68	68	67	67	67	59	59	59	58	58	58	54	54	54	51	51	51	48	48	48	48	48	48	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36
150	8-27	75	55	44	72	55	44	61	55	44	60	55	44	54	54	44	49	49	44	45	45	44	42	42	42	40	40	40	38	38	38	36	36	36	34	34	34	33	33	33
mph	28-45	67	64	64	65	64	64	57	57	57	57	57	57	53	53	53	50	50	50	48	48	48	45	45	45	43	43	43	41	41	41	39	39	39	37	37	37	36	36	36
160	8-27	72	52	42	72	52	42	60	52	42	59	52	42	54	52	42	49	49	42	45	45	42	42	42	42	40	40	40	38	38	38	36	36	36	34	34	34	33	33	33
mph	28-45	64	60	60	64	60	60	56	56	56	55	55	55	52	52	52	49	49	49	48	48	48	44	44	44	42	42	42	41	41	41	39	39	39	37	37	37	36	36	36
170	8-27	67	48	39	67	48	39	59	48	39	58	48	39	53	48	39	49	48	39	45	45	39	42	42	39	40	40	39	38	38	38	36	36	36	34	34	34	33	33	33
mph	28-45	61	56	56	60	56	56	54	54	54	53	53	53	50	50	50	48	48	48	45	45	45	43	43	43	42	42	42	40	40	40	39	39	39	37	37	37	36	36	36
180	8-27	64	48	37	64	48	37	58	48	37	57	48	37	52	48	37	49	48	37	45	45	37	42	42	37	40	40	37	38	38	37	36	36	36	34	34	34	33	33	33
mph	28-45	58	53	53	58	53	53	52	52	52	52	52	52	49	49	49	48	48	48	44	44	44	43	43	43	41	41	41	40	40	40	38	38	38	37	37	37	36		36
		= min 7	72" span			= min 6	4" span			= min 4	18" span											*	= Note:	addition	al instal	lation re	equireme	nt for C	AMO m	odule cla	mp. Se	e Note 1	2 on Pag	e 3 for o	letails.			REV 03/0	)5/2021	

<sup>=</sup> min 72" span = min 64" span = min 64" span = min 64" span = Shaded cells indicate conditions in which UFO Mid Clamp connection capacity is exceeded. See Note 10 on page 2 for details.

<sup>\* =</sup> Note: additional installation requirement for CAMO module clamp. See Note 12 on Page 3 for details.

I, Joseph Hoffheimer, hereby certify that all property owners within 100 feet of and the owners of <a href="PIN 9864964688">PIN 9864964688</a> (the affected property) have been sent a letter of notification of the Certificate of Appropriateness application before the Historic District Commission by first class mail in accordance with the Hillsborough Zoning Ordinance.

2/21/2024Joseph HoffheimerDate(for Hillsborough Planning Department)

PIN	OWNER1_LAS	OWNER1_FIRS	OWNER2_LAS	OWNER2_FIF	ADDRESS1	CITY	STATE	ZIPCODE
9874071780	MORRIS	CLAIR E ETAL	MORRIS	BARBARA S	114 W QUEEN ST	HILLSBOROUGH	NC	27278
9874072378	SMITH	LEE	CROWTHER	HAROLD B	219 N CHURTON ST	HILLSBOROUGH	NC	272782535
9874072692	MACAULAY	JOHN D	MACAULAY	KAREN J	104 W QUEEN ST	HILLSBOROUGH	NC	27278
9874073693	SHIPP	SUSAN COOK			102 W QUEEN ST	HILLSBOROUGH	NC	27278
9874073765	VANDEMARK	AARON B	VANDEMARK	AIMEE C	309 N CHURTON ST	HILLSBOROUGH	NC	27278
9874076318	DICKERSON	CHAPEL			PO BOX 736	HILLSBOROUGH	NC	27278
9874076697	SENNER	WILLIAM B	SENNER	KATHRYN M	103 E QUEEN ST	HILLSBOROUGH	NC	27278
9874076891	SENNER	WILLIAM B	SENNER	KATHRYN M	103 E QUEEN ST	HILLSBOROUGH	NC	27278



#### ITEM #7. B:

Address: 124 E. Union Street

Year Built: c. 1949

#### **Historic Inventory Information (2013)**

A front-gabled wing projects slightly from the center of this one-story, side-gabled Colonial Ranch house. The house is five bays wide and double-pile with a brick veneer, vinyl windows (including a single window in the front gable and paired windows in the side gables), and an exterior brick chimney on the left (east) elevation. The four-light-over-four-panel door has a pedimented surround with fluted pilasters and a dentil cornice. A side-gabled porch on the left elevation is supported by decorative metal posts and has vinyl siding in the gable. A shed-roofed porch at the right rear (southwest) has been enclosed with vinyl siding. County tax records date the building to 1949.

#### **Contributing Structure?** Yes

#### **Proposed work**

- · Rear addition to the existing house
- Side addition to the existing house
- New accessory dwelling unit/garage behind the existing house

#### **Application materials**

- COA application
- Narrative
- Existing photos
- Proposed project
- Landscaping and lighting
- Paint and shingle samples
- Material list
- Examples of similar projects
- Site plan
- Existing and proposed elevations

#### **Applicable Design Standards**

- New Construction of Outbuildings and Garages: 1 − 7, 10
- New Construction of Accessory Dwelling Units: 1 − 6, 8 − 12
- Additions to Residential Buildings: 1 14
- Walkways, Driveways, and Off-Street Parking: 8 10
- Exterior Lighting: 5
- Architectural Metals: 1, 2
- Doors: 8
- Porches, Entrances, and Balconies: 1, 2, 9, 10

Sustainability and Energy Retrofit: 5

#### **Staff Comments**

- Staff find that the proposed shutters meet the design standards.
- Because the proposed outbuilding would function as both an ADU and a garage, staff
  recommend applying both the New Construction of Outbuildings and Garages and New
  Construction of Accessory Dwelling Units standards referenced on the previous page.
- Staff had questions about *New Construction of Outbuildings and Garages* 2 and 3 and *New Construction of Accessory Dwelling Units* 1, 5, 6, and 8. The applicant has provided several photo examples of garage/accessory structures within two blocks of the subject property.
- Staff have verified that the ADU portion of the outbuilding will include 416 heated square feet, which should comply with current zoning requirements. However, the commission is still allowed to discuss the size of the entire structure.
- Staff find the rear addition to be typical of other additions that the commission has recently approved. There was discussion in a recent meeting about *Additions to Residential Buildings* 6 that may be worth revisiting if this addition is proposed along with another structure.
- The partially enclosed side porch and the added door to it would be visible from the street, and the relevant standards have been highlighted on the previous page.
- The windows on the proposed addition are not listed in the material list but are noted as aluminum-clad in the elevations.

# TOWN OF HILLSBOROUGH

#### **APPLICATION**

#### Certificate of Appropriateness and Minor Works

Planning and Economic Development Division 101 E. Orange St., PO Box 429, Hälsborough, NC 27278 919-296-9470 | Fax: 919-644-2390 planning@hillsboroughnc.gov www.hillsboroughnc.gov

124 East Union S		
Ostrict Address of Project Same- Current NY address		
Property Owner (if different than applicant) 254 Todd Road		
Property Owner's Mailing Address Katonah, NY 10536		
City, State ZIP 914-393-6774		
Property Owner's Phone Number kimtouzeau@gmail.com		
Property Owner's Email		
e and construction of ADU/garage		

The Historic District Design Standards, Exterior Materials Compatibility Matrix, and Certificate of Appropriateness application process can be found on the Town of Hillsborough's website: https://www.hillsboroughnc.gov/hdc.

#### Applicant and Owner Acknowledgment and Certification

I am aware that Historic District Design Standards, Exterior Materials Compatibility Matrix, and Unified Development Ordinance requirements are the criteria by which my proposal will be evaluated for compatibility, and I certify that I, and/or my design professional under my direction, have reviewed my application materials with Planning Staff for compliance to the standards in those adopted documents. I understand that I, or my representative, must attend the HDC meeting where this application will be reviewed. I further understand that town employees and/or commissioners may need access to my property with reasonable notice to assess current conditions, and to assist them in making evidence-based decisions on my application and that I am not to speak to any commissioner about my project until the public meeting at which it is under consideration.

Kurbaly C. Terigony	2/14/24		
Applicant's Signature (Optional)	One	Property Owner's Signature (Required)	Date

Last revised: Decrember 2023

#### **Submittal Requirements**

The following documents and plans are required to accompany your COA application in order for it to be deemed complete and scheduled for commission review. Planning staff will determine when all submittal requirements have been mer. The first FOUR complete COA applications submitted by the deadline will be heard on any HOC agenda.

All applications must include the following documents and plans: (Provide a digital copy if plans are larger than 11"x17")

- Detailed narrative describing the proposed work and how it complies with all adopted standards.
- Existing and Proposed Dimensioned Plans (see below);
  - Site Plan (if changing building footprint or adding rww structures, impervious areas or site features, including hardscaping)
  - Scaled Architectural Plans (if changing building footprint or new construction)
  - Scaled Elevations (if adding or changing features of a structure)
  - Landscaping Plans (required for all new construction and for significant landscaping or tree removal and re-planting)
  - Tree Survey (required for new construction when trees over 12" diameter at breast height are on site show both existing and those to be removed)
  - Sign Specifications (if adding, changing, or replacing signage)
- Itemized list of existing and proposed exterior materials including photos and specifications, colors, etc... (Siding, trim and fascia, roof and foundation materials, windows, shutters, awrengs, doors, porch and deck flooring, handrails, columns, patios, walkways, driveways, fences and walls, and signs, etc.).
- Photographs, material samples, examples of comparable properties in the district (if using them as basis for specific designs), plans, or drawings that will help to darify the proposal, if applicable, or if required by staff as part of the review.

#### Staff Use Only:

COA fee (\$1 per \$1000 of construction costs or Minor Works fee (\$10 flat fee):	i, \$10 minimum)	Amount \$ 450	
The section Acres 166 (2-10 test 466).		Amount: 5	
After the fact application (\$100 or doub *whichever is greater	le the COA (cc*):	Attourt: 5	The control of the co
• • • • • • • • • • • • • • • • • • •		Total Due: 5 450	Control of the Contro
Receipt # PWYTPJRYN Reco	rived by: Joseph Hi	offheimer and	2/15/24
This application meets all Unitied Developme for compliance with all approved materials.	ent Ordinance requirement	s and has been review	P ME ST
□ N/A □ Yes	Zoning Officer:		and an advantage of the state o
This application meets public space division i	equirements.		
□ N/A □ Yes Pub	es Space Manger:		
Historic Architectural Inventory Information			
Original date of Construction: 1949	an-manneng k selengik sigik sigikasusan manamanan		
Description of the Property:			
Brick ranch home on .5 acre			
Applicable Design Standards:			
Other reviews needed?  CHillsborough Zoning Compliance Permit	☐ Orange County Buildin	g Permit 🗀 Othe	Sphiliferrans to construct of construction for the sphilipse sphil
Minor Works Certificate of Appropriateness	Application Decision		
☐ Approved ☐ Referred to HDC			
Minor Works Reference(s):		•	
Certificate of Appropriateness Decision			
☐ Approved ☐ Denied	Commission Vote:		
Conditions or Modifications (if applicable):			William de la
	· · · · · · · · · · · · · · · · · · ·		paudici anni popoli.
	Historic District Staff Sign	rature	Date .

#### Town of Hillsborough Historic District - Certificate of Appropriateness narrative - 124 E Union Street

**HOUSE NARRATIVE:** The house under consideration for this renovation/addition project is located at **124 E Union Street**. A front-gabled wing projects slightly from the center of this one-story, side-gabled Colonial Ranch house. The house is five bays wide and double-pile with a brick veneer, vinyl windows (including a single window in the front gable and paired windows in the side gables), and an exterior brick chimney on the left (east) elevation. The four-light-over-four-panel door has a pedimented surround with fluted pilasters and a dentil cornice. A side-gabled porch on the left elevation is supported by decorative metal posts and has vinyl siding in the gable. A shed-roofed porch at the right rear (southwest) has been enclosed with vinyl siding. County tax records date the building to 1949.

Please see existing condition photos below:



2021 Front elevation from E Union Street prior to shutter removal



Current Front elevation from E Union Street



Left front looking Southwest



Left looking west



Rear elevation looking northwest



Rear Elevation looking northeast



West Elevation looking east



Left Elevation looking east



Front Elevation looking southeast

### PROPOSED PROJECT

Proposed changes to the house are a rear 20' by 25' addition, a small 8'-4.5" by 18'-5" addition on the west side and a small 11'-1 9/16" by 8'-6 5/16" addition on the east side. All additions are proposed to have Hardie board lap siding (smooth side out), Miratec trim, aluminum clad SDL windows, asphalt shingles to match, brick foundation to match. The only exception to this is the proposed rear steps are proposed to have flagstone treads and stone foundations/risers with wood railings/pickets. No changes are proposed on the front elevation of the house other than the replacement of shutters which were removed during a recent renovation by the previous owners (see image below from 2019 of the house prior to renovation). The replacement shutters will be operable wood shutters. The only visual changes from the street are all behind the front plane of the house. 3'-9" of the west addition will be visible from the street but it's 34'-6" from the front plane of the house and 111' from E Union Street so it's impact visually on the front is much reduced. The front left porch is being retained visually from the street; however, a minor rear portion of it is being enclosed along with the new east side addition. The tallest portion of the house addition is proposed to be 4 feet below the ridge line of the existing house. Additionally proposed behind the house is a new building which will be a 25' by 58' garage/ADU/studio with a 13' by 24' shed porch on the east side. This new building will be Hardie board lap siding (smooth side out), Miratec trim, asphalt shingles, aluminum clad SDL windows, steel garage door (no wood grain finish), fiberglass doors (on the west and east elevations) and aluminum clad glass door on south elevation. The ridge of the new building is proposed to be 22'-10 5/8" tall and the existing ridge of the house is 23'-17/16". However, due to the slope of the property the ridge of the new building is actually more than 1'-8" below the existing house. The new building is proposed to be 165' from E Union Street. From a massing standpoint the footprint of the existing house with addition is 2,404 square feet and the footprint of the garage/ADU/studio is 1,762 square feet.

#### LANDSCAPING

A 16" maple, 21" maple and 6" dogwood are proposed to be removed due to their proximity to the new building proposed (all of these trees are below the size of the HDC's jurisdictional threshold). An existing 45" oak and 33" beech/maple are proposed to be retained. 20 Ilex Compacta hollies will be planted to screen the new parking area and garage bay entrances from the adjacent neighbor's property.

#### **LIGHTING**

The homeowners would like to change the existing fixture next to the front door and add the same fixture to be adjacent to all exterior doors as shown below:



Cumberland 1-Light Black Outdoor Wall Light Fixture with Clear Glass

by Bel Air Lighting

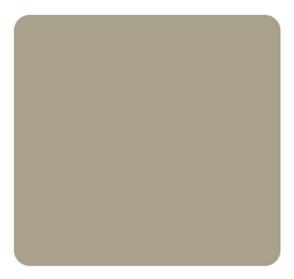
Product Images







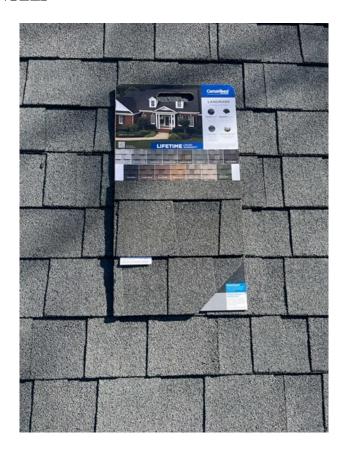




Shutter color

977 Brandon Beige

# **SHINGLES**

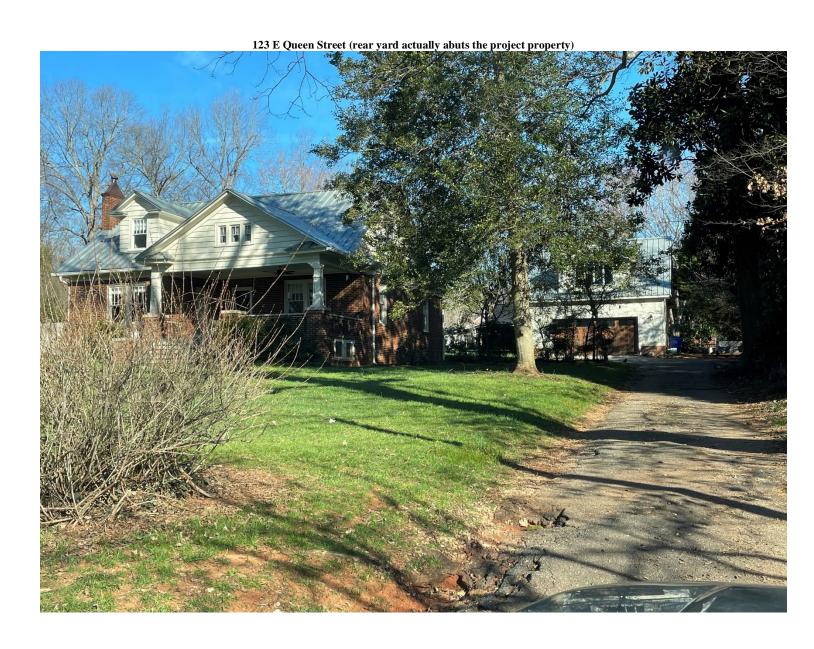


Georgetown Gray CertainTeed

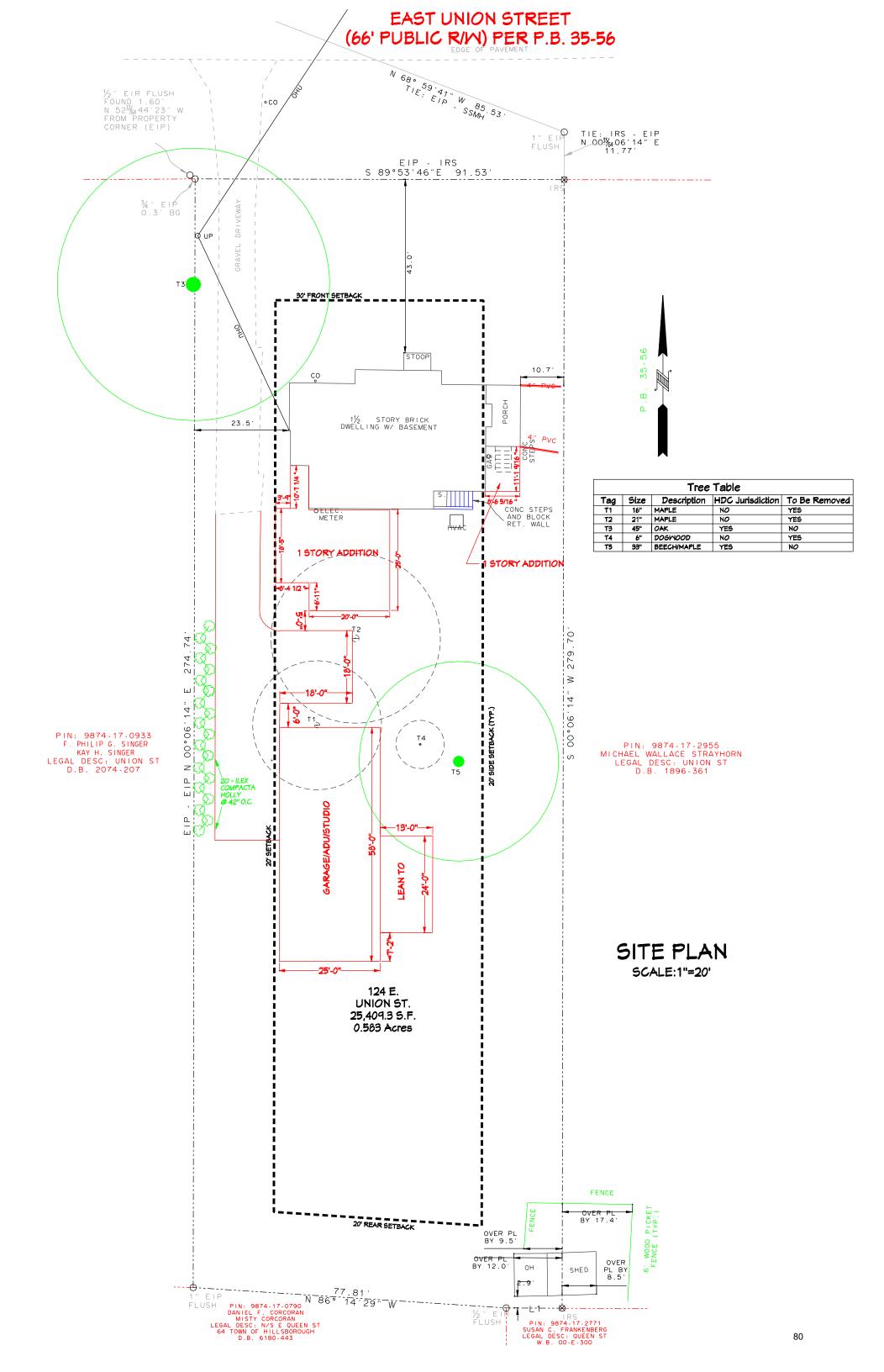
# MATERIAL LIST

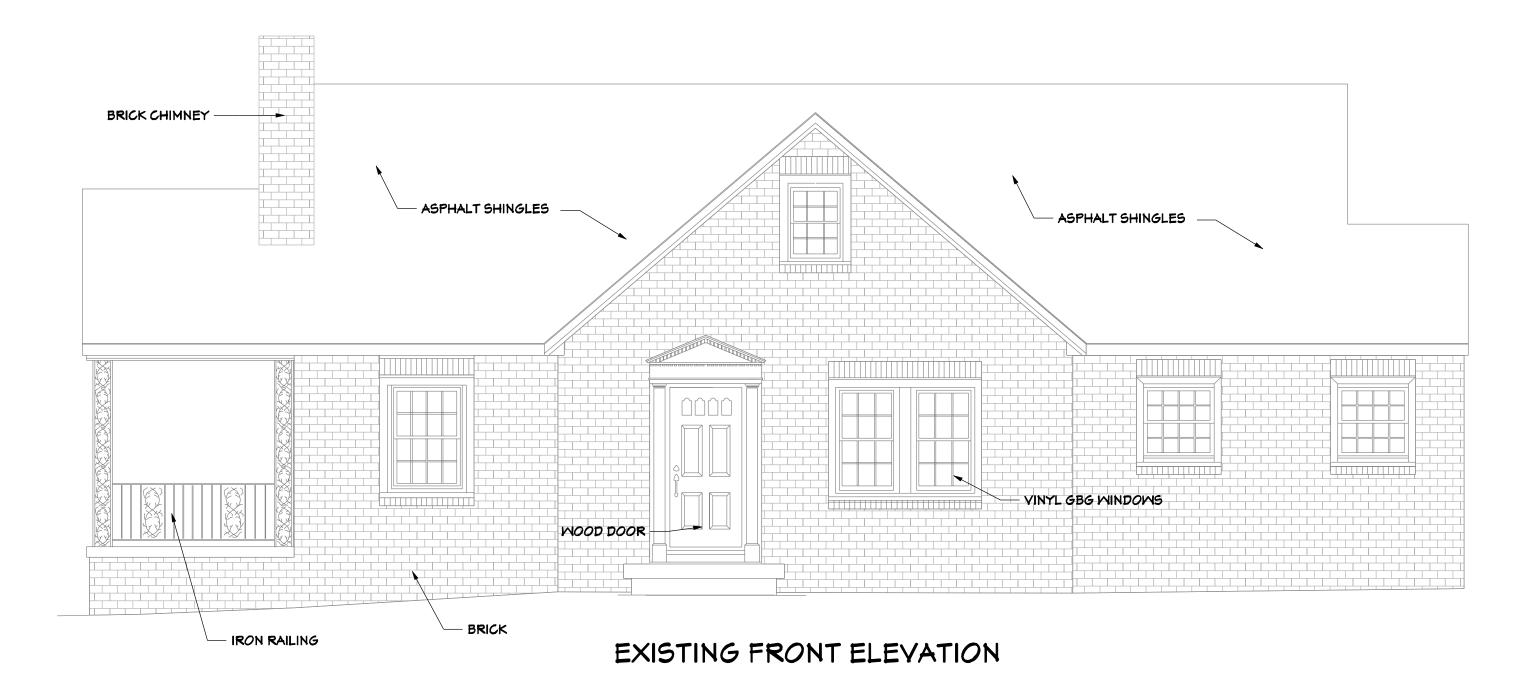
	EXISTIN	IG HOUSE/ADDITION		
Item	Existing	Proposed Material(s)	Color	
siding	Brick veneer	Hardieboard siding (smooth)	match existing	
trim	Vinyl siding	Miratec	match existing	
foundation	Brick	Brick	match existing	
roof	Asphalt shingles	Asphalt shingles	Georgetown Gray	
window trim/sashes	vinyl	Miratec	match existing	
Shutters	None	Wood	SW 977 Brandon beige	
front door (to remain)	wood	No change	n/a	
east side door	Wood	will be obscured by addition	n/a	
south side door	Wood	To be removed	n/a	
new rear patio doors	n/a	Fiberglass clad wood	match existing	
new south side doors	n/a	Fiberglass clad wood	match existing	
new door trim	n/a	Miratec	match existing	
front porch flooring	concrete	no change	n/a	
east side porch flooring	Broken tile	No change	n/a	
new stoop flooring	n/a	Flagstone	natural	
new stoop stairs	n/a	Flagstone	natural	
new stoop foundation	n/a	Stacked stone	natural	
	NEW G	ARAGE/ADU/STUDIO		
Driveways		Gravel	natural	
Siding	n/a	Hardieboard (smooth)	match existing	
trim	n/a	Miratec	match existing	
foundation	n/a	concrete	natural	
roof	n/a	Asphalt shingles	match existing	
Windows	n/a	Aluminum clad SDL	match existing	
West door	n/a	Fiberglass clad SDL	match existing	
East door	n/a	Fiberglass clad SDL	match existing	
South door	n/a	Aluminum clad (no muntins)	match existing	
Columns	n/a	wood	white	

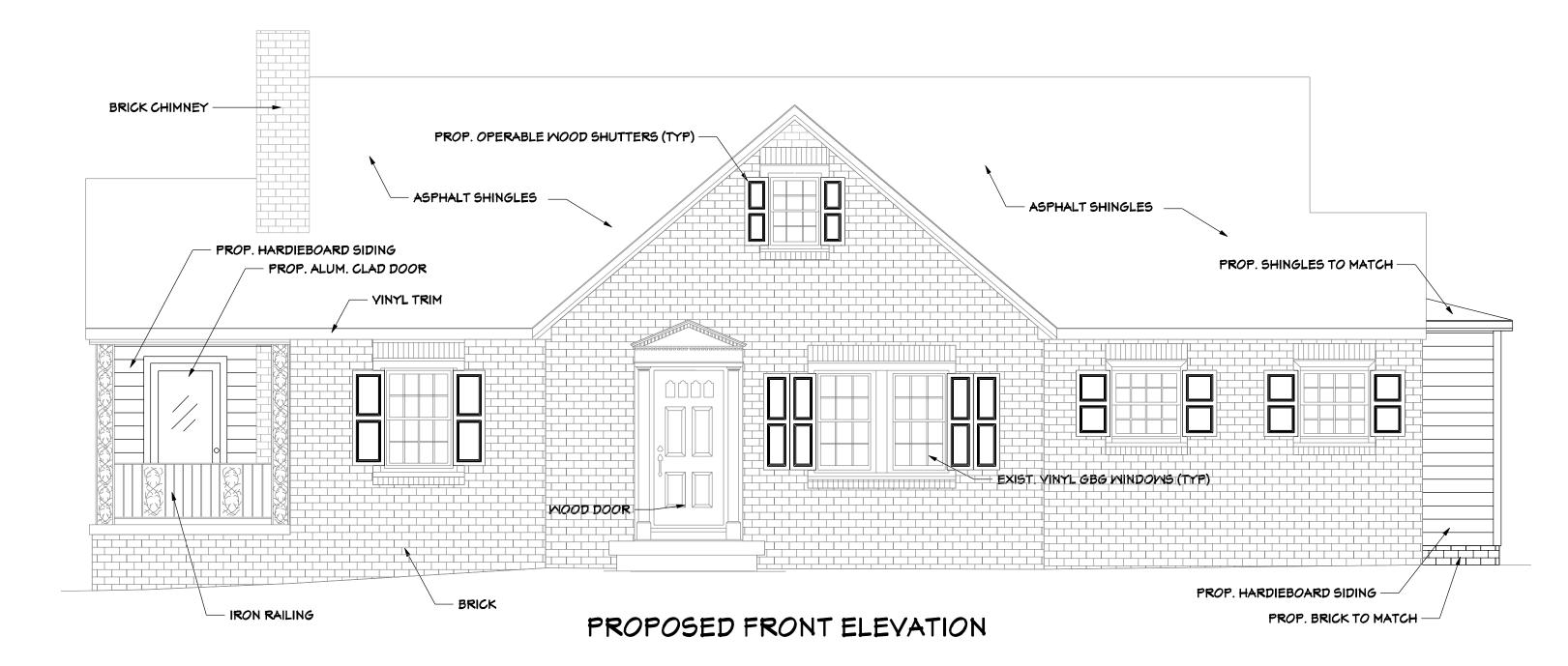


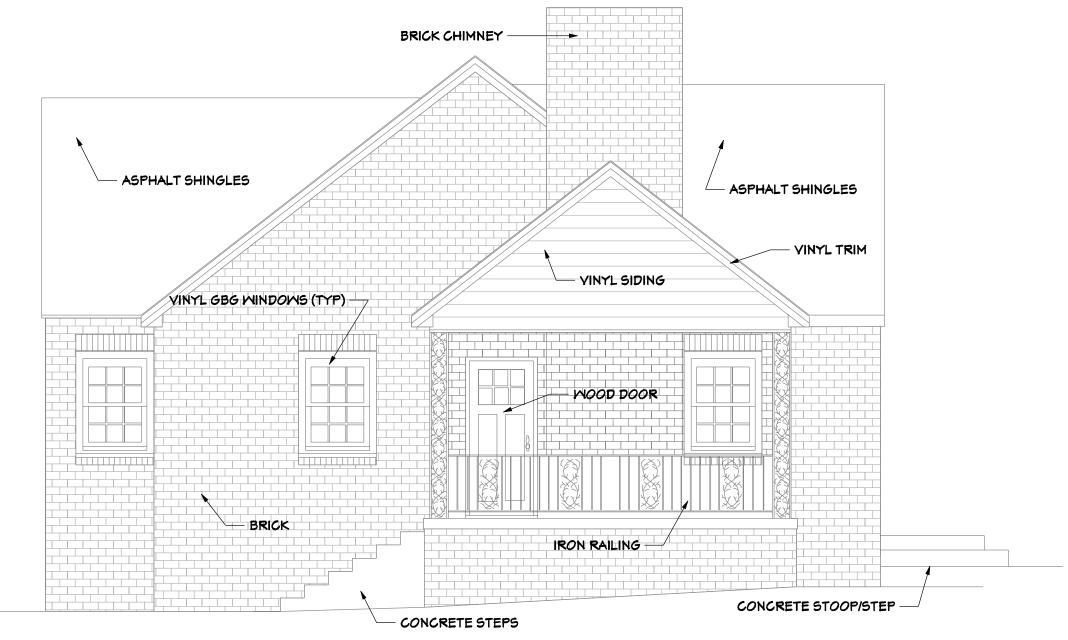




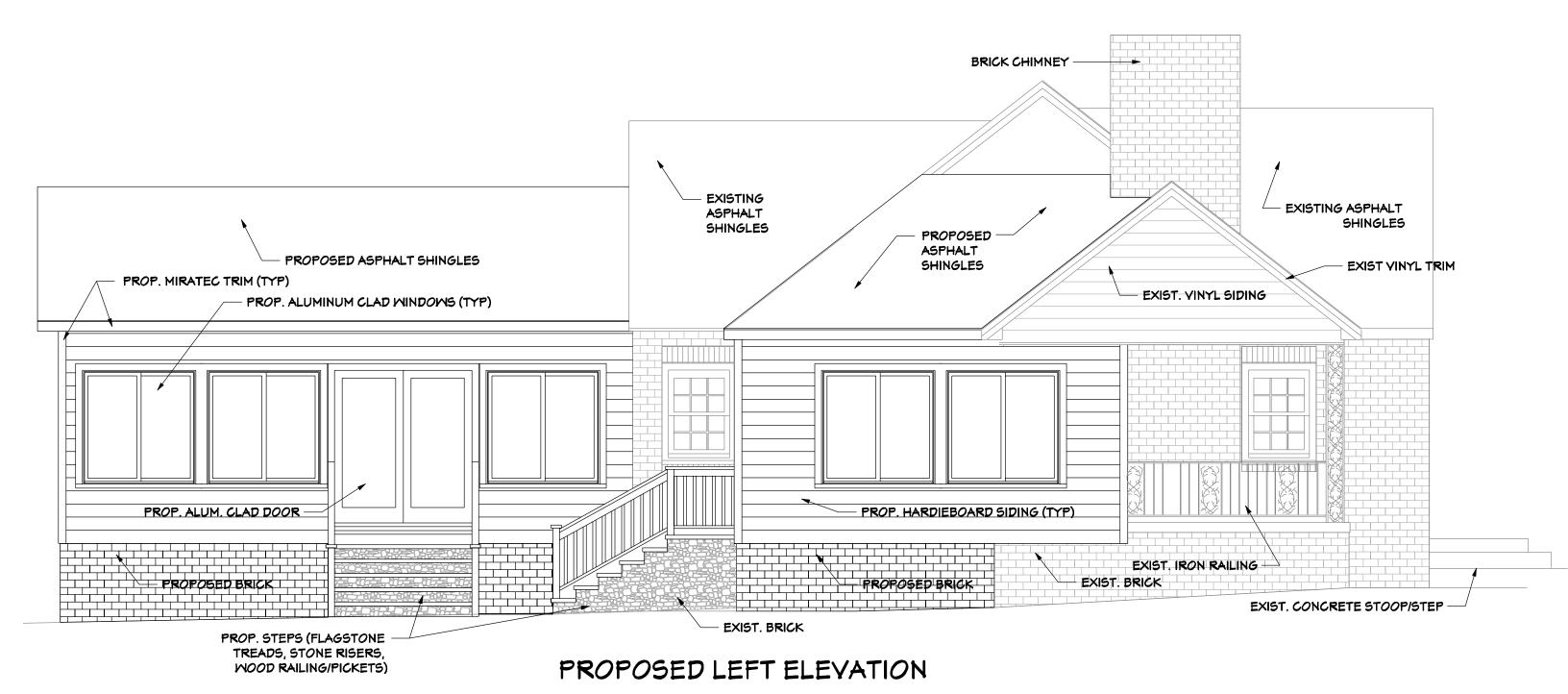


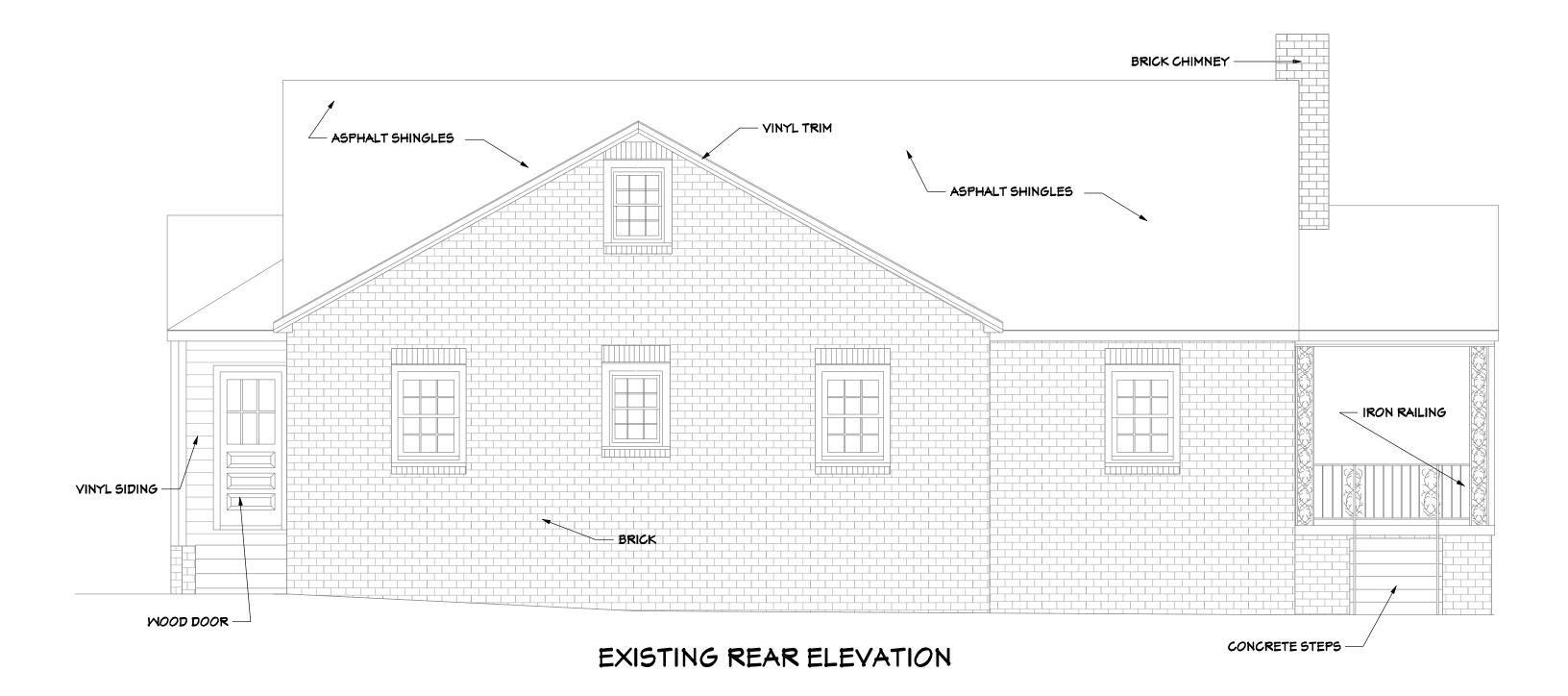


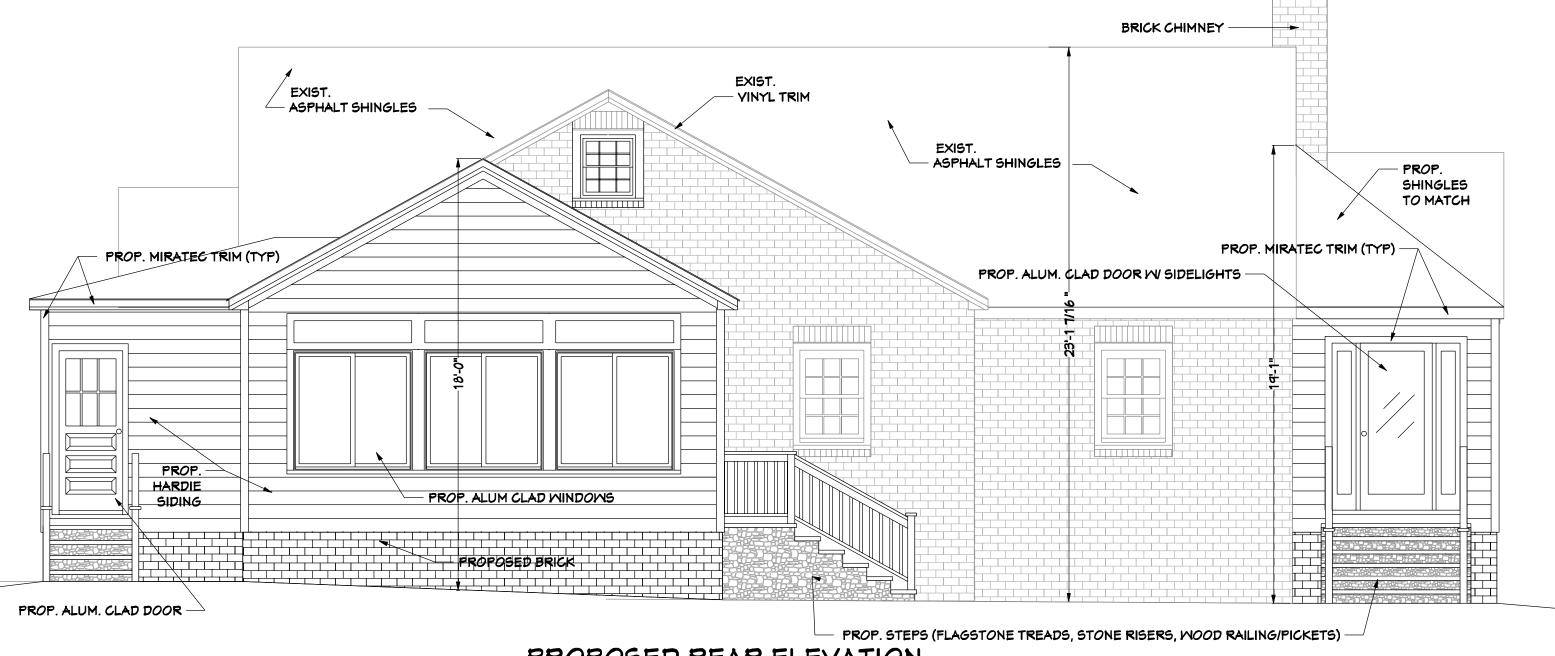




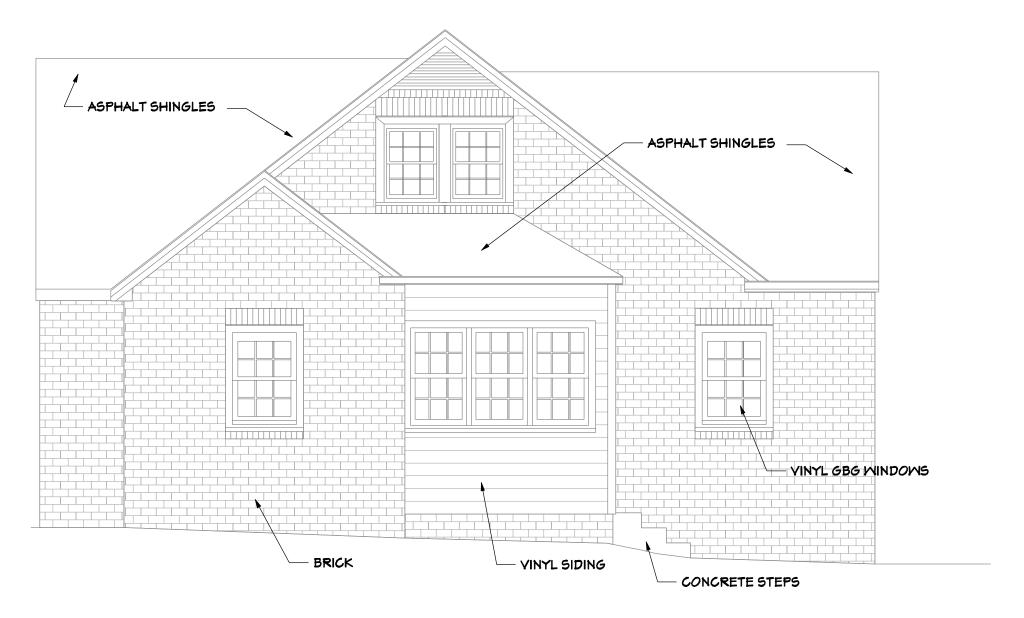
EXISTING LEFT ELEVATION



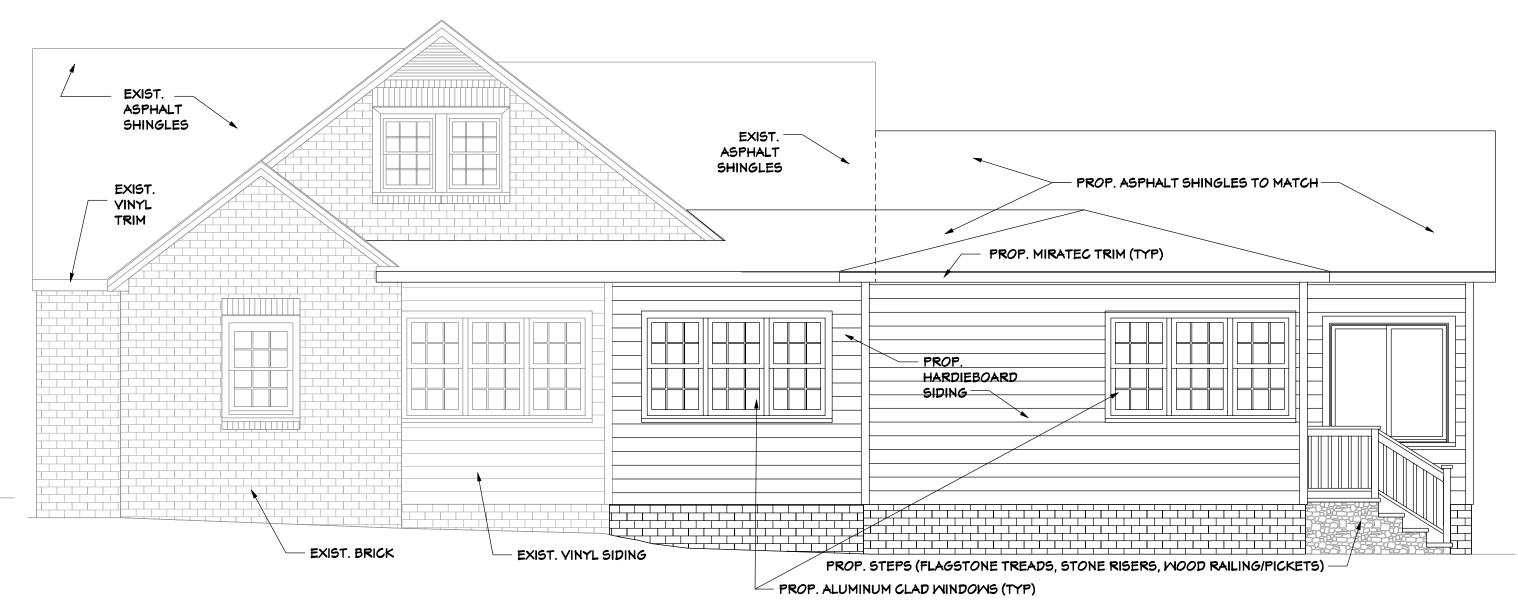




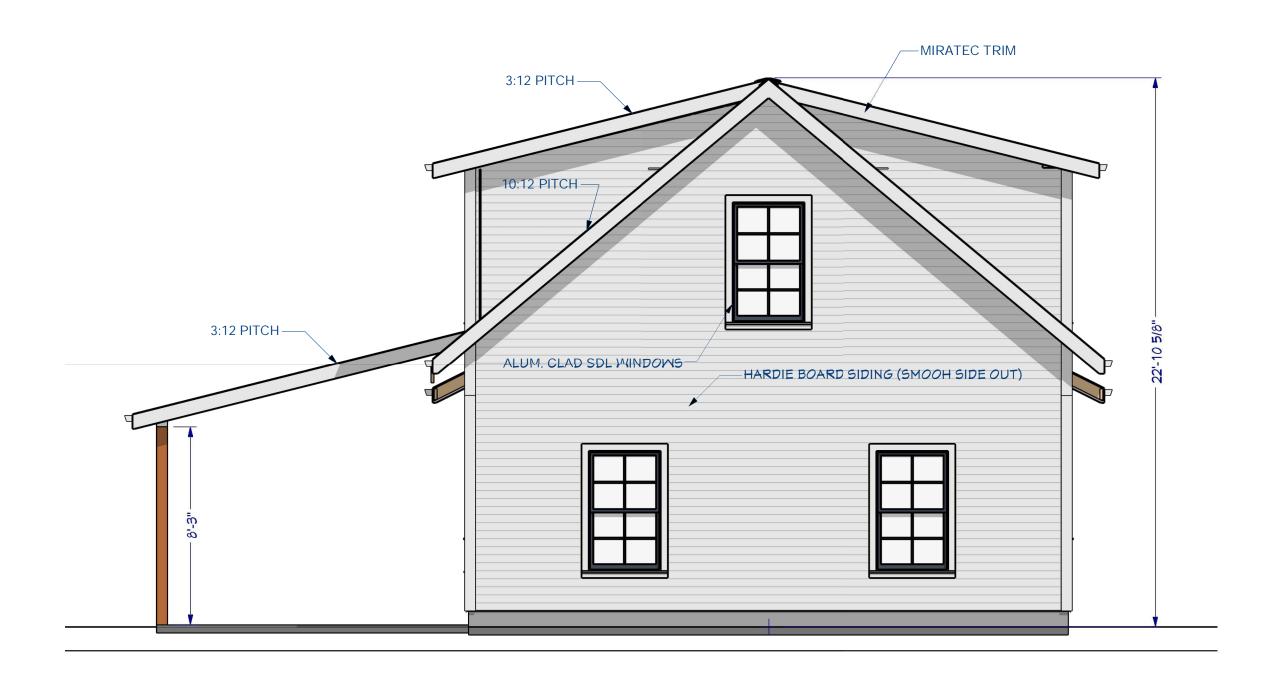
PROPOSED REAR ELEVATION



EXISTING RIGHT ELEVATION

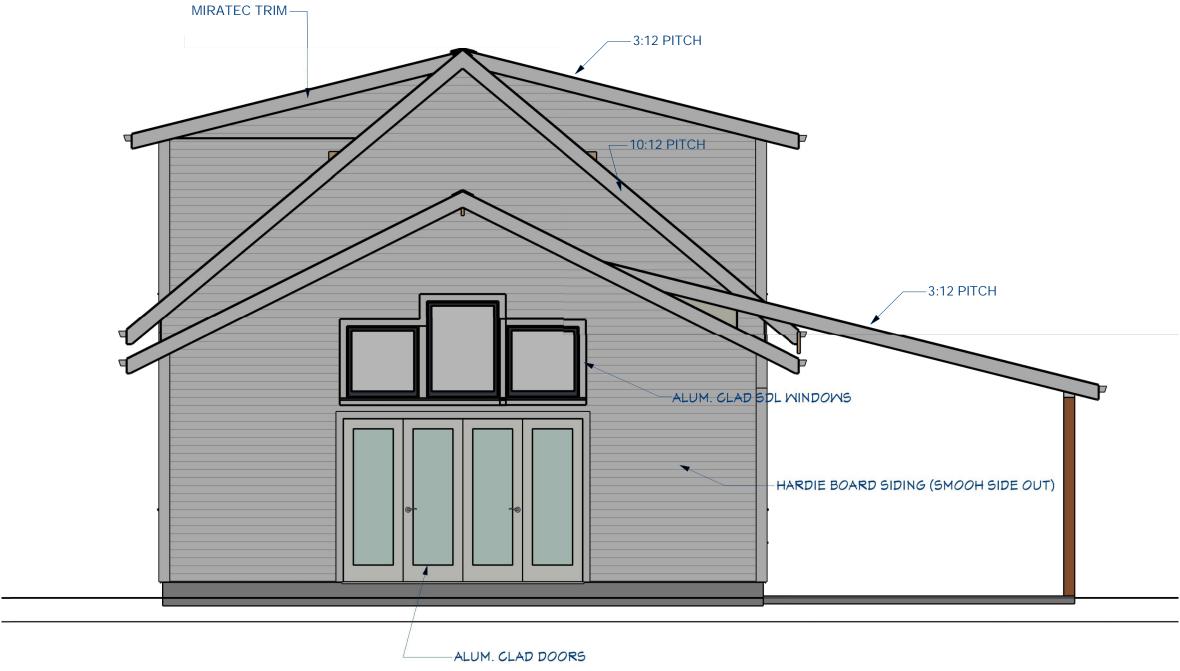


PROPOSED RIGHT ELEVATION





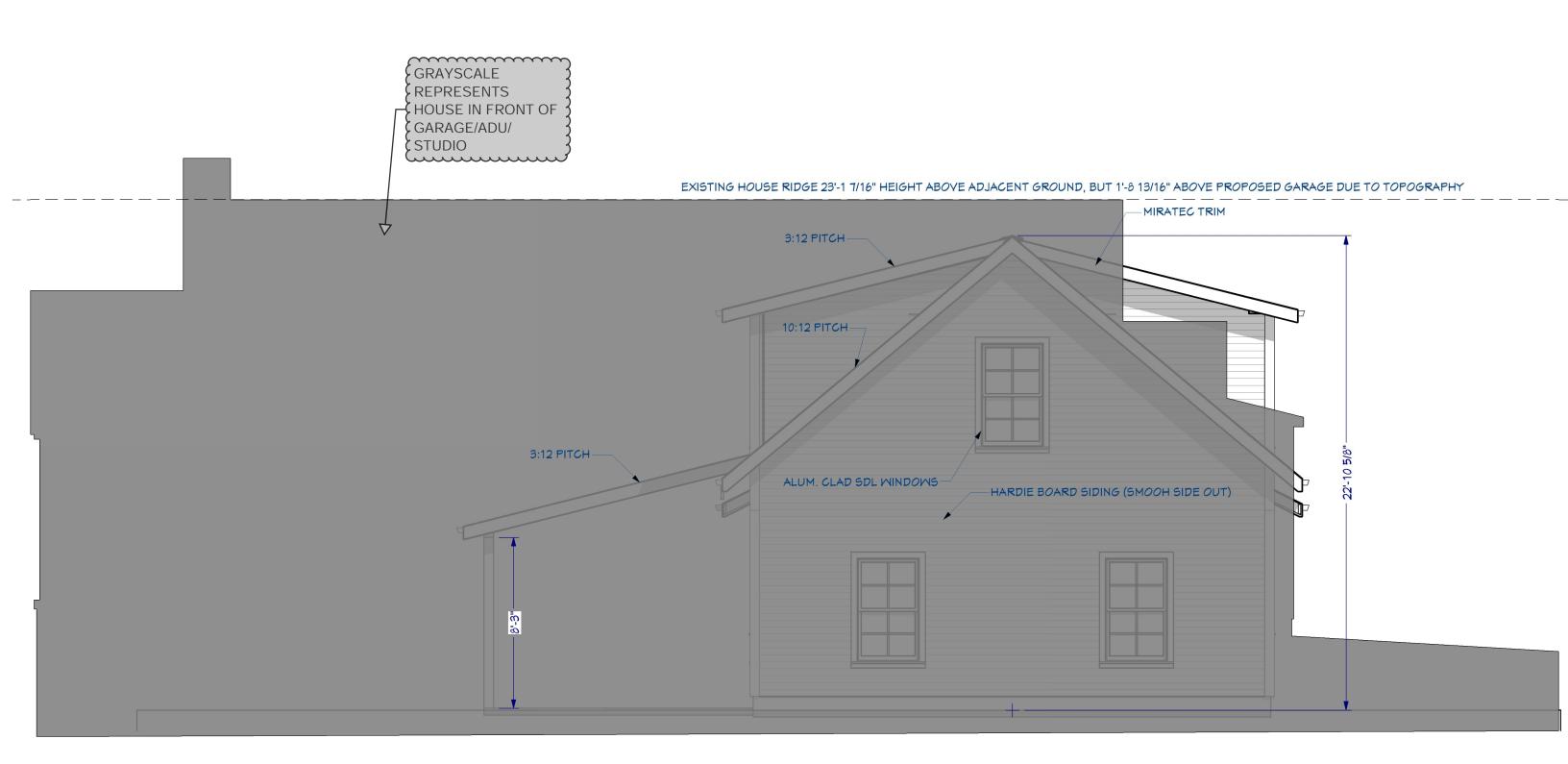
Exterior Elevation Left (EAST)



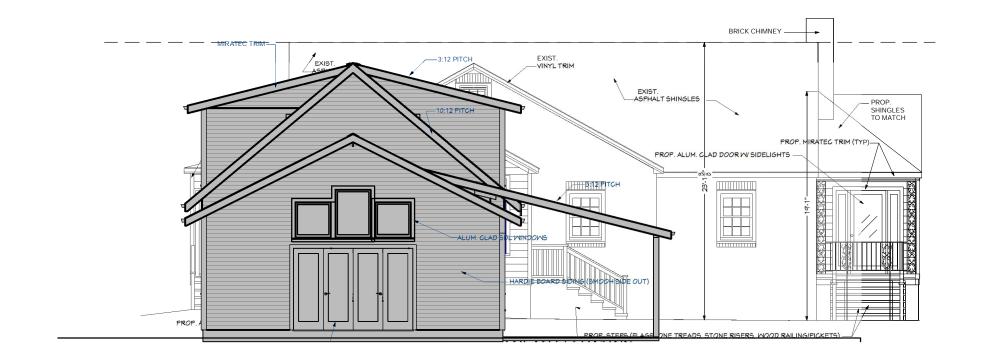
Exterior Elevation Back (SOUTH)



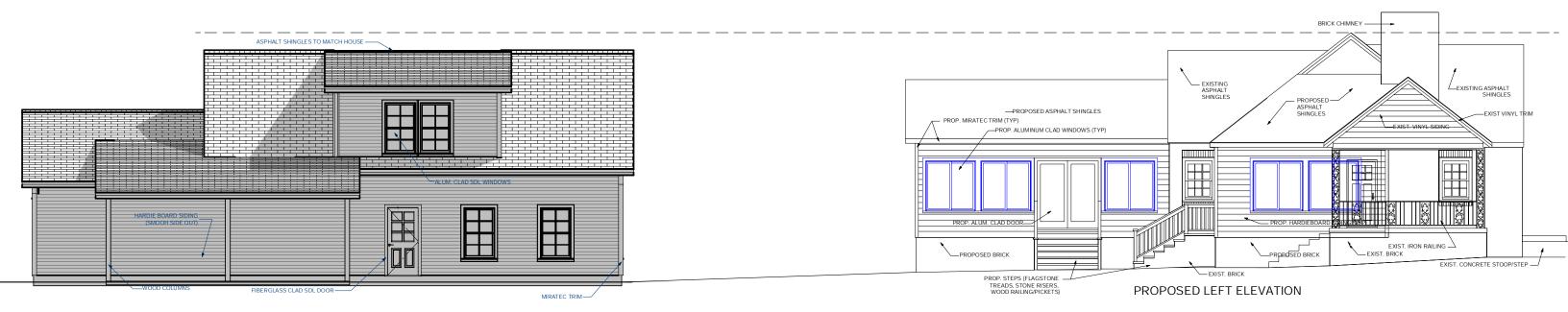
Exterior Elevation Right (WEST)



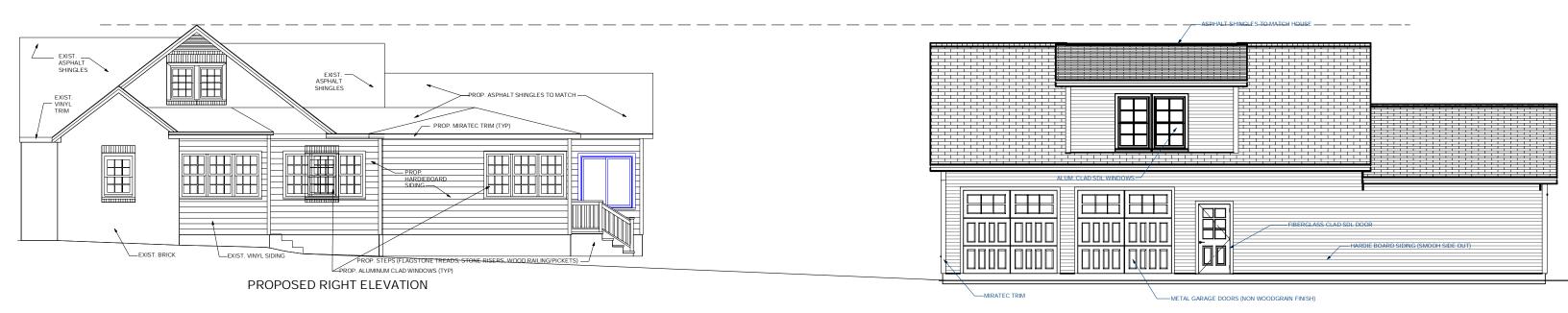
VIEW OF PROPOSED GARAGE/ADU/STUDIO FROM E. QUEEN STREET



**Exterior Elevation Back** 



**Exterior Elevation Left** 

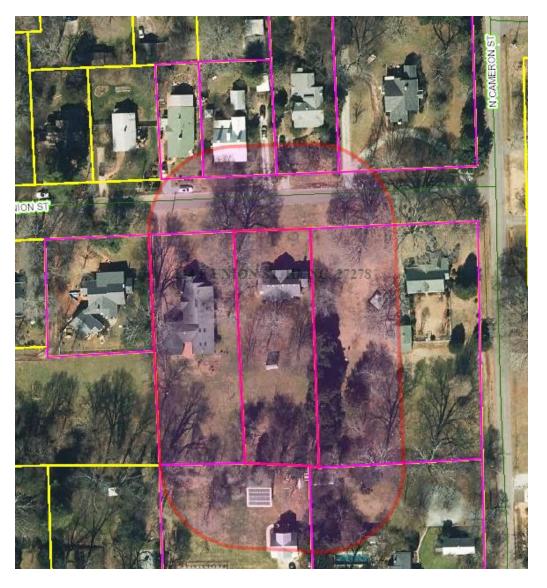


**Exterior Elevation Right** 

I, Joseph Hoffheimer, hereby certify that all property owners within 100 feet of and the owners of <a href="PIN 9874171925">PIN 9874171925</a> (the affected property) have been sent a letter of notification of the Certificate of Appropriateness application before the Historic District Commission by first class mail in accordance with the Hillsborough Zoning Ordinance.

<u>2/21/2024</u> <u>Joseph Hoffheimer</u>
Date (for Hillsborough Planning Department)

PIN	OWNER1_LAST	OWNER1_FIRS	OWNER2_LAST	OWNER2_FIRST	ADDRESS1	CITY	STATE	ZIPCODE
9874089011	GLADIN	SUSAN E	PATRICK	MICHAEL W	116 E UNION ST	HILLSBOROUGH	NC	27278
9874089294	LEIKIN	LINDA	COLLINS	MICHAEL	121 E UNION ST	Hillsborough	NC	27278
9874170790	CORCORAN	DANIEL F	CORCORAN	MISTY	123 E QUEEN ST	HILLSBOROUGH	NC	27278
9874170933	SINGER	F PHILIP G	SINGER	KAY H	120 E UNION ST	HILLSBOROUGH	NC	272782146
9874171925	TOUZEAU	KIMBERLY C	TOUZEAU	JEFFREY C	124 E UNION ST	HILLSBOROUGH	NC	27278
9874172771	FRANKENBERG	SUSAN C			131 E QUEEN ST	HILLSBOROUGH	NC	272782137
9874172955	STRAYHORN	MICHAEL WAL			132 E UNION ST	HILLSBOROUGH	NC	27278
9874180264	MCCULLOUGH	DAVID W	MCCULLOUGH	FRANCES M	123 EAST UNION ST	HILLSBOROUGH	NC	27278
9874181340	EIDENIER	ELON GERALD	EIDENIER	ELIZABETH H	127 E UNION ST	HILLSBOROUGH	NC	27278
9874182256	ROBERTS INVEST				143 W TRYON ST	HILLSBOROUGH	NC	27278



## Item #8. Proposed fee updates:

#### Minor Works:

- FY 22-23: \$1 per \$1,000 in construction costs; \$10 minimum
- FY 23-24: \$1 per \$1,000 in construction costs; \$10 minimum
- FY 24-25: \$25

## Certificates of Appropriateness (COAs) heard by the Historic District Commission:

- FY 22-23: \$1 per \$1,000 in construction costs; \$10 minimum
- FY 23-24: \$1 per \$1,000 in construction costs; \$10 minimum
- FY 24-25: \$150

## After-the-fact COAs for Minor Works:

- FY 22-23: none (typically \$10 for a "new" Minor Works application)
- FY 23-24: none (typically \$10 for a "new" Minor Works application)
- FY 24-25: \$300

## After-the-fact Certificates of Appropriateness for Major Works:

- FY 22-23: double the COA fee; \$100 minimum
- FY 23-24: \$300
- FY 24-25: \$300

## **Examples from other communities:**

## Salisbury:

• Minor Works: \$0

• COAs heard by the commission: \$25

After-the-fact COAs: \$250

#### New Bern:

• Minor Works: \$50

• After-the-fact Minor Works: \$150

• COAs heard by the commission: \$150

• After-the-fact COAs: \$300

• Tree replacements: \$25

• One full-time staff member and 30 major COAs in 2023; 1,100 structures in local districts

#### Charlotte:

• Minor Works: \$0

• After-the-fact Minor Works: \$500

• Minor COAs heard by the commission: \$750

• Major COAs heard by the commission: \$1,390

• Demolitions: \$2,690

## **Currituck County:**

• All COAs: \$25

### Hickory:

• All COAs: \$61

#### Chapel Hill:

• Minor Works: \$150

COAs heard by the commission: \$455

#### Monroe:

• Minor Works: \$25

• Major COAs: \$100 (increased from \$75)

### Raleigh:

Minor Works: \$35

Major COAs (New Construction/Additions): \$362

• Major COAs (Demolitions): \$724

• Major COAs (Other): \$180