

TOWN OF SALISBURY, CONNECTICUT
HISTORIC DISTRICT COMMISSION

APPLICATION FOR CERTIFICATE OF APPROPRIATENESS

Appl. No. _____ Name of property Congregational Church of Salisbury, UCC
Ctf. Issued _____ Ctf. No. _____ Property No. _____
Date June 20, 2021

Application is hereby made for the issuance of a Certificate of Appropriateness under an "Ordinance Establishing Historic Districts within the Town of Salisbury", duly adopted on February 9, 1970 and enacted pursuant to the enabling authority contained in Sections 7-147(a) through 7-147(k) of the General Statutes of Connecticut, for the proposed work described below and as shown on the photographs, plans, or drawings (where applicable or appropriate), accompanying this application:

Address of proposed work 30 Main Street, Salisbury CT

Owner Congregational Church of Salisbury, UCC Owner's address 30 Main Street, Salisbury CT
Applicant, if not owner _____

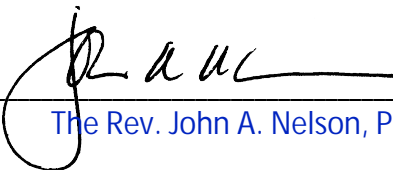
Agent or contractor MHR Development, LLC

Address P.O. Box 1034 New Canaan, CT 06840-1034

Proposed work is in connection with: ___ a dwelling; ___ an accessory building;
___ a commercial building; ___ an industrial building; x other (specify) church

Nature and description of proposed work (attach extra sheets as necessary);

Revised from COA originally presented during SHDC meeting on May 4, 2021. Standing seam metal roof COA, please see attached sheets for details.

Signature of Applicant  6/20/2021
The Rev. John A. Nelson, Pastor

Action taken:

Planning and Zoning Commission _____ Date _____

Building Inspector _____ Date _____

Historic District Commission _____ Date _____

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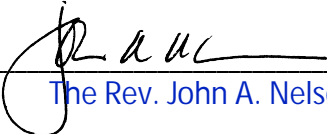
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Nature and description of proposed work (attach extra sheets as necessary);

Revised from COA originally presented during SHDC meeting on May 4, 2021. Solar panels COA, please see attached sheets for details.

Signature of Applicant  6/20/2021
The Rev. John A. Nelson, Pastor

Action taken:

Planning and Zoning Commission _____ Date _____

Building Inspector _____ Date _____

Historic District Commission _____ Date _____



The Congregational Church of Salisbury

UNITED CHURCH OF CHRIST

An Open and Affirming Congregation

April 28, 2021

The Congregational Church of Salisbury is requesting a Certificate of Appropriateness for installation of a new roof on our Meeting House and Parish Hall, and installation of a 42 kW DC roof-mounted solar panel array system.

The church is facing several major capital replacements of our furnaces, air conditioning, and roofing in the next several years. The installation of new roofs and the installation of a solar array gives us the opportunity to improve our energy efficiency, reduce our carbon footprint and strengthen our ability to act as good stewards of our air, land, and water.

Our church mission includes revering and caring for God's creation. In order to fulfill our mission, we are committed to correcting our misuses of creation and drawing on the gift of human creativity to adopt environmentally friendly solutions and alternatives to current practices.

Biblical Scripture teaches us to see the earth and its ecosystems first as expressions of God's abundant love, and secondarily as resources for us to use.

Through this roofing and solar project our church has a good opportunity to give public witness to our faith by putting theory into practice, and the Salisbury Historic District Commission can support tangible steps toward environmental sustainability. With God, the time to do a new thing boldly is always now!

We are mindful of the historic importance of our church in the fabric of the Salisbury Historic District, its proximity to the Scoville Memorial Library and Town Hall, and its prominent visibility along Main Street. For those reasons, we have chosen standing seam metal as a roofing material and solar panels that are less obtrusive than other models.

30 Main Street • P.O. Box 392 • Salisbury, CT 06068

Phone 860.435.2442 • Fax 860.435.2056

welcome@salisburyucc.org • www.salisburyucc.org



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RESPONSES TO QUESTIONS

TO: Salisbury Historic District Commission

FROM: MHR Development, LLC on the behalf of the Congregational Church of Salisbury, UCC

RE: **Responses to Questions Asked by Carol Mason on June 14, 2021**

DATE: June 21, 2021

1. What solar plan would work retaining the current roof material?
 - a. Before any solar array is installed on any building, the roofing underneath it needs to be fairly new; otherwise, when re-roofing is necessary any solar panels would have to be removed. Most solar installers will not install panels on a roof nearing the end of its useful life.
 - b. The church can install solar on an asphalt shingle roof, but installation on an asphalt shingle roof would require penetrating the roof with a lag bolt that connects to the roof trusses; this method is not optimal. However, a standing seam metal roof allows for panels to be clipped directly to the ridges of the standing seam metal roof without requiring roof penetrations. Additionally, the standing seam metal roof is lighter than an asphalt shingle roof and provides additional structural benefits (rigidity) for the building.
 - i. The Meeting House roof is in need of replacement making this the ideal time to replace the asphalt shingle roof with a standing seam metal roof. The church will have a metal roof, much like the roofing on the Town Hall, except with a consistent color.
 - ii. The Parish Hall roof will need to be replaced within the next 3 – 5 years and would need to be replaced prior to installing solar. The church Trustees have opted to replace the Parish Hall roof now with a long-lasting (>50 years) standing seam metal roof.
2. Would you describe more details on solar panels: weight, how they work, reduced glare, etc.
 - a. Size & Weight: The panel is 42" wide x 69" long x 1 ½" thick and weighs approximately 2 ½ pounds per square foot.
 - b. Panels contain crystalline silicone cells that absorb radiation from the sun and convert it to electricity. The silver wire transmits the energy generated from each cell and isn't visible from a distance.
 - c. Front Glass: 3.2mm, tempered, low-iron, anti-reflective. These low-profile solar panels have a standard non-reflective glass coating.

3. What would you accomplish by reducing your plan by one roof of solar panels - using the roof on the newer back section, the parish hall?
 - a. The proposed solar system, to support the planned energy project, is approximately 38 – 40 kW DC. Limiting the system to the Parish Hall roof, the back section, would provide only approximately 18.5 kW DC and therefore, would not meet the needs of the planned energy efficient equipment. Installing solar only on the Parish Hall roof would reduce the energy produced by the proposed solar system by more than half.
 - i. Sanctuary / Meeting House: Four rows of 14 modules (56 modules). This array of modules, measuring 50' wide by 23' tall, provides about 4' of space below the panels for snow guards. The Meeting House roof consists of approximately 51 – 54% of the planned solar system.
 - ii. Parish Hall: Three rows of 18 modules (54 modules filling). This would be about 64' wide by 17' 3" tall, leaving about 5' for snow guards.

4. With the solar system in place, would you anticipate additional equipment be needed on the outside, such as generators to supplement the solar system?
 - a. The electrical equipment that supports the solar system, the combiner boxes and power inverters, will be located inside the building. We have taken great care to find locations in the basement of the building which will accommodate equipment that is typically installed on the exterior of the building.
 - b. ZREC meter and disconnect switch will be located outside next to the existing electric meter. The location and accessibility of these items is specified by Eversource Energy.
 - i. Solar ZREC Meter Socket: Approximately 18" tall by 10" wide and 5" deep (the standard ZREC meter will be mounted on it, just like the electric meter in the attached picture; see blue box in Figure 8).
 - ii. Solar Disconnect Switch: Approximately 22" tall by 10" wide and 6" deep (see purple box in Figure 8).
 - c. A 1" metal conduit will be connecting the solar system to the ZREC meter and disconnect switch (see Figure 9 for estimated locations).
 - i. This conduit is to be run externally and can either run down along the corner of the building and then across or it can run across the overhang and then down next to the existing downspout. The conduit can be encased or painted to match the existing clapboard siding.
 - d. Generators are not required to supplement the solar system.

5. Once the panels are added (if approved), since they are removable / replaceable, a COA would be required if you 'upgrade' or change to a different specification.
 - a. The church Trustees understand that changes to the exterior of the building are subject to approval by the Historic District Commission and must go through the process required by the Town of Salisbury.

Mockup of Solar Panel and Standing Seam Metal Roof

Samples of the proposed standing seam metal roofing and the solar panels for the Congregational Church of Salisbury (30 Main Street, Salisbury, CT) were delivered to the Town Hall on Tuesday, June 15, 2021. Please note, in comparison to the samples displayed at Town Hall, when installed at the church the solar panels will be viewed from a distance and at an angle when they are mounted on the roofs. The height of the roof (approximately 20' – 30' at the eaves) needs to be taken into consideration as well as the roof pitch (approximately 7:12 or 30°). Given a set-back for snow breaks, the closest panel will be 25' (Parish Hall) and 35' (Meeting House) from the ground.



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DESCRIPTION OF PROPOSED WORK

TO: Salisbury Historic District Commission

FROM: MHR Development, LLC on the behalf of the Congregational Church of Salisbury, UCC

RE: **Application to the Salisbury Historic District Commission**
Standing Seam Metal Roof

DATE: June 21, 2021

The proposed standing seam metal is interrelated to the proposed solar system. The proposed new standing seam metal roof will facilitate installation of monochromatic (all black) solar PV panels in connection with the church's comprehensive sustainability initiative. The solar PV panels are designed to clip directly to the standing seam roof, thus eliminating the need for typical racking equipment that is anchored by penetrations (lag bolts) into the roof framing system.

Given the year the Meeting House was built (1800), having a metal roof that mimics copper is cited as a historic trend by the National Park Service, Department of the Interior: <https://www.nps.gov/tps/how-to-preserve/briefs/4-roofing.htm#historic>.

Standing Seam Metal Roof

The proposed standing seam metal roof will allow for a low-profile (mechanical) attachment of solar panels to the raised roof seams. The air gap (approximately two inches) between the roof panels will help cool the solar panels and maximize energy production.

The church Trustees have selected dark bronze as the preferred color for the proposed metal roof since it most closely mimics the patina of a slightly aged copper roof (see figure 7). The secondary color choice is matte black. The standing seam metal roof would be a darker color than the roof of the Town Hall across the street, 27 Main Street (see figures 10 & 11). The proposed metal roof will be constructed using 1" standing seam, single-lock, 24-gauge Galvalume metal with 17" panels. Standing seam metal provides an aspect of structural rigidity to the roof framing and is approximately half the weight (per square foot) of the existing asphalt roofing. The metal roof is anticipated to last twice as long (over 50 years) compared to an asphalt roof and would therefore help protect the historical structure by reducing how often the roof would need to be replaced.



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DESCRIPTION OF PROPOSED WORK

TO: Salisbury Historic District Commission

FROM: MHR Development, LLC on the behalf of the Congregational Church of Salisbury, UCC

RE: **Application to the Salisbury Historic District Commission**
Solar Panel Installation

DATE: June 21, 2021

Monochromatic Solar PV Panels

To minimize the visual impact of PV panels on the church, the chosen color of the metal roof will be compatible with the color of the solar panels making the solar array inconspicuous. The panel and frame assemblages will be all-black (monochromatic) rather than the standard panels which have a silver-colored metal frame. The color of the proposed standing seam metal roof would help the all-black panels blend in, thus less obvious when viewed from public ways. The proposed solar panels are made in America.

We have asked that the commissioners view local properties that have examples of these panels as outlined in an email dated June 18, 2021 and shared with the chairperson. Also, an example of the solar panel is available at Town Hall.

Low-Profile Panel Racking System

The proposed standing seam metal roof will facilitate a low-profile (mechanical) attachment of solar panels to the raised roof seams. The air gap (approximately two inches) will help cool the panels and maximize energy production. The solar equipment will be installed without damaging, replacing, or removing any original or historic materials or configurations and the building's structural integrity will not be compromised as a result of the installation of the solar system. The proposed solar system is estimated to weigh between 2 ½ to 3 pounds per square foot. Installation of the mechanically attached solar system will be entirely reversible: the system may be removed without damaging the roof.

Structural Engineering Assessment for Solar Panels

The condition of the roof framing and structural capacity of the various roof structures have been evaluated. Marchetti Consulting Engineers advised that: "With consideration to the additional weight (between 2 ½ to 3 pounds per square foot) the structural elements in the existing roof are more than adequate to accept this additional loading."

See letter from Marchetti Consulting Engineers below.

Joseph P. Marchetti

Marchetti Consulting Engineers
170 Kent Road, Box 239
Cornwall Bridge, Ct 06754

Phone/Fax (860)672-6548

April 25, 2021

Mark Robbins
MHR Development LLC
Box 1034
New Canaan, Ct. 06840

Re: Salisbury Congregational Church

To whom it may concern,

Marchetti Consulting Engineers has conducted a site visit to the above referenced address. The purpose of this visit was to inspect roof areas where a solar array is proposed. With consideration to the additional weight (between 2 ½ to 3 pounds per square foot) the structural elements in the existing roof are more than adequate to accept this additional loading.

Please contact our office with any questions.

Sincerely,

Joseph Marchetti MC

Net-Zero Ready Energy and Occupant Health Improvements

The proposed solar PV panels are a critical component of the comprehensive sustainability initiative underway at the church. The installation of the proposed solar system will help the church to conserve resources for financial sustainability while reducing its long-term environmental impact. Additional environmental sustainability / energy efficiency measures under development include:

- Comprehensive (warm white) interior LED lighting and controls upgrade – elimination of fluorescent (mercury containing) light fixtures; warm white, antique style, LED bulb replacement for existing metal carriage lights
- Energy recovery ventilators (ERVs) – to provide filtered fresh air while conserving energy
- Bipolar ionization for air handling units (AHUs) supporting clean air initiative
- Replacement of aging (freon based) condensing unit with new high-efficiency unit (with biodegradable refrigerant)
- Decommissioning of old, oil-fired furnaces and implementation of zero-emission air-source heat pumps
- Smart, occupancy based, temperature control systems
- Implementation of attic insulation (biodegradable) to reduce heat loss
- Envelope improvements to reduce air and moisture infiltration
- Water conservation fixtures – hydro-electric controlled touchless faucets

If the size of the solar system were to be reduced, it would not be sufficient to support the implementation of zero-emission air-source heat pumps and the furnaces would remain on oil making it impossible for the church to achieve net-zero energy status.

APPENDIX

- Congregational Church of Salisbury Lines of Site
 - Northwestern Angle (figure 1)
 - Southwestern Angle (figures 2 & 3)
 - Southeastern Angle (figure 4)
 - Front View (figures 5 & 6)
- Solar Panel and Metal Roof Rendering (figure 7)
- Estimated ZREC & Disconnect Switch Sizes and Estimated Locations for Conduit (figures 8 & 9)
- Solar Array Layout Example (shown on existing asphalt roof, figure 10)
- Monochromatic Solar Panel and Standing Seam Metal Roof Information (figures 11 & 12)
- Example of Existing Local Metal Roof – Salisbury Town Hall (figures 13 & 14)
- Example of Existing Solar on Church Roof
 - Essex Congregational Church (figure 15)
 - First Congregational Church of Southington (figure 16)
 - Spring Glen United Church, Hamden (figure 17)
 - Wapping Community Church, South Windsor (figure 18)

Congregational Church of Salisbury Lines of Site – Northwestern Angle



Figure 1

Congregational Church of Salisbury Lines of Site – Southwestern Angle



Figure 2

Congregational Church of Salisbury Lines of Site – Southwestern Angle



Figure 3

Congregational Church of Salisbury Lines of Site – Southeastern Angle



Figure 4

Congregational Church of Salisbury Lines of Site – Front View



Figure 5



Figure 6

Solar Panel and Metal Roof Rendering



Figure 7

Estimated ZREC & Disconnect Switch Sizes and Estimated Locations for Conduit

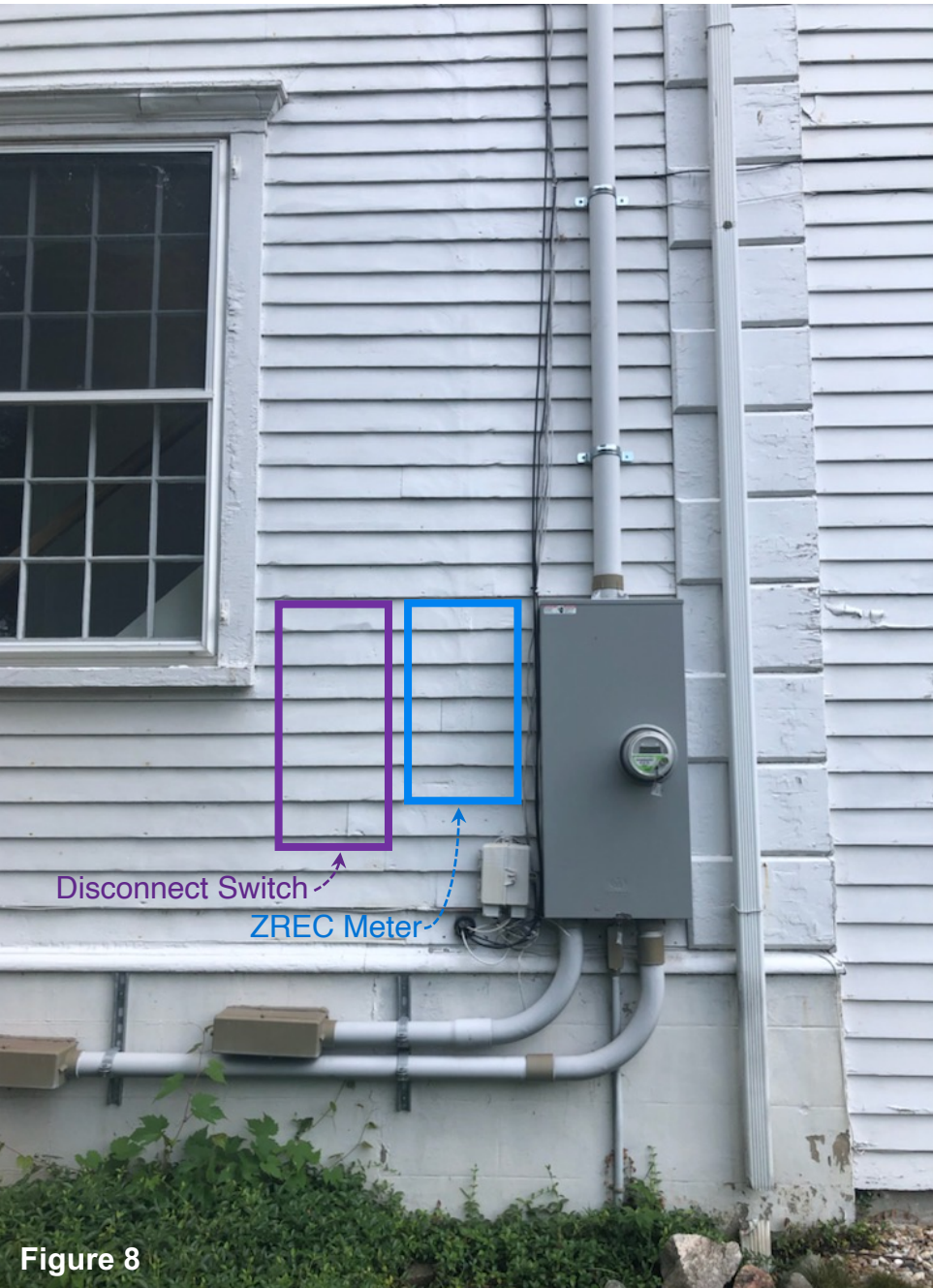


Figure 8



Figure 9

Solar Array Layout Example (shown on existing asphalt roof)



Figure 10

Monochromatic Solar Panel and Standing Seam Metal Roof Information



Figure 11



Dark Bronze

Figure 12



Example of Existing Local Metal Roof – Salisbury Town Hall



Figure 13

Example of Existing Local Metal Roof – Salisbury Town Hall



Figure 14

Example of Existing Solar on Church Roof – Essex Congregational Church



Figure 15

Example of Existing Solar on Church Roof – First Congregational Church of Southington



Figure 16

Example of Existing Solar on Church Roof – Spring Glen United Church, Hamden



Figure 17

Example of Existing Solar on Church Roof – Wapping Community Church, South Windsor



Figure 18