



TOWN OF BETHANY

Land-Use Administrator
Town Hall – 40 Peck Road
Bethany, Connecticut 06524-3378
Telephone: (203) 393-2100 X 135 Fax: (203) 393-0828

July, 2017

General Instructions

- Permit applications may be submitted by mail. However, **do not send the application fee** at time of submittal.
- After the building official has completed his review and approved your permit, we will notify you of the fee. You can submit the fee at that time, and only one check will be required.

Ground-Mounted PV Systems

- 1) Contact the Quinnipiac Valley Health District at (203) 248-4528. You will need to obtain a permit from them for any ground-mounted system. They will need to see a site plan. You can make an appointment with them to meet either at the Bethany Town Hall or their North Haven office.
- 2) Call Town Hall and speak with Isabel (203) 393-2100 x135 or Lina (203) 393-2100 x113. It is possible that you may also need an Inland Wetlands permit. The process of obtaining an Inland Wetlands permit takes two months (minimum). Please plan accordingly.
- 3) Complete and submit the necessary documentation as outlined below. Again, call Isabel x135 or Lina x113 if you have any questions.

Roof-Mounted PV Systems

- 1) If structural upgrades to the roof are needed, you will need to complete the building permit application.
- 2) Simply complete and submit the necessary documentation as outlined below. Call Isabel x135 or Lina x113 if you have any questions.

Documents included in PV packets (all documents are two-sided):

- Zoning Permit Application (to be completed for all pv systems)
- Electrical Permit Application (to be completed for all pv systems)
- CT Standardized PV Permit Application (to be completed for all pv systems)
- Usage Guide for Structural Review Worksheet (to be completed in lieu of getting an engineer's review of the design system)
- Building Permit (only to be used for ground-mounted arrays or if structural upgrades are needed)
- Structural plans stamped by an engineer must be received for both roof- and ground-mounted systems.
- We will also need a copy of your license(s) and a workers' compensation certificate with the Town of Bethany listed as the additional insured (in the lower left corner).

TOWN OF BETHANY

Administrative Zoning Permit

Permit #:

Job Location: _____ Assessor's Map: _____ Lot number: _____

Applicant Name: _____ Email: _____

Applicant Address: _____

Home#: _____ Work#: _____ Cell#: _____

Note: Owner authorization required if applicant is not the owner of the property.

Owner Name: _____ Email: _____

Owner Address: _____

Home#: _____ Work#: _____ Cell#: _____

Description of Work: _____

Superstructure Dimensions: _____ Feet Deep _____ Feet Long _____ Feet High

Lot width: _____ Ft. Lot Area: _____ Acres **Total Cost (Sheds only):** _____

Building Coverage (%): _____ Ground Coverage (%): _____

Zoning District: R-65 R-130 B & I Area of Disturbance: _____ Acres

Setbacks: Front: _____ Rear: _____ Right Side: _____ Left Side: _____

Are there any easements, restrictive covenants, conservation easements or conservation restrictions related to this property? Yes/No (circle one). If yes, please provide copies. Number of copies _____

By signing below I certify that the project will conform to all applicable laws, regulations and ordinances of the State of Connecticut and the Town of Bethany and that all information stated within is true and accurate. Falsification of information contained within may result in the revocation of this permit. I also grant permission for the zoning enforcement officer to conduct inspections during the pendency of the application and for the life of the permit.

Signature: _____ Date: _____
Owner Applicant

Remarks: _____

In accordance with Public Act 03-144, the applicant may provide notice of the zoning certification associated with a building permit or certificate of occupancy by publication in a newspaper having substantial circulation in this municipality stating that the certification has been issued. Any such notice shall contain (A) a description of the building, use or structure, (B) the location of the building, use or structure, (C) the identity of the applicant, and (D) a statement that an aggrieved person may appeal to the zoning board of appeals in accordance with the provisions of section 8-7, as amended by this act.

APPROVED / DENIED By: _____ Date: _____

Reason for Denial: _____

NOTICE:

Issuance of this permit states that the applicant has provided sufficient evidence for **Zoning Compliance**. (See Inspection Process form for Certificate of Zoning Compliance information upon completion.)

Applicant must obtain the following signatures. All departments must review the same site and building plans. If a change has occurred in the plans, it is the applicant's responsibility to obtain a new application and begin the process again.

QVHD:
Date: _____ Plan Date: _____ Signature: _____

Wetlands Enforcement Officer:
Date: _____ Plan Date: _____ Signature: _____

Public Works Director:
Date: _____ Plan Date: _____ Signature: _____

Tree Warden:
Date: _____ Plan Date: _____ Signature: _____

THIS SECTION IS FOR OFFICE USE ONLY

<u>What's Required?</u>	No	Yes	Rec'd
Owner Authorization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private Road Waiver	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inspection Process form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bethany Zoning Regulations Section 11 Compliance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 sets of Site Plans - dated: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 set of Building Plans - dated: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flood Hazard Zone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Zoning Certificate of Compliance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wetlands Permit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Reviewed by: _____ Date Submitted: _____

Zoning Permit #: _____ Date Issued: _____

NOTICE:

- All mechanicals require separate permits and appropriate fees.
- Certificates of Use and Occupancy are required prior to occupancy of a building.

Permit shall become invalid if the authorized work is not commenced within six months after issuance of the permit or if the authorized work is suspended or abandoned for a period of six months after the time of commencing the work.

APPROVED BUILDING PLANS MUST BE AVAILABLE ON THE JOB SITE AT ALL TIMES.

Zoning Enforcement Officer:

Date: _____ Plan Date: _____ Signature: _____

Fire Marshal:

(Required for Commercial Permits Only)

Date: _____ Plan Date: _____ Signature: _____

QVHD:

(Required only if no Zoning Permit Needed)

Date: _____ Plan Date: _____ Signature: _____

THIS SECTION IS FOR OFFICE USE ONLY

What's Required?	No	Yes	Rec'd
Owner Authorization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inspection Process form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Worker's Compensation Documentation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State Registration or Contractor's License	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 sets of Building Plans - dated: _____ (if needed)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Delinquent taxes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Building Certificate of Approval	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Fees:

Date Received: _____

Amount: _____

Received By: _____

Reviewed by: _____

Date submitted to Bldg Dept: _____

Bldg Permit #: _____

Date issued: _____

Permit # [For Jurisdiction Use]: _____

**Connecticut Standardized
Solar Photovoltaic (PV) Permit Application**

Date: _____
Property Type, Residential (R) Commercial (C), Other (specify): _____
General Description of Photovoltaic Array: _____
System Size (kW DC): _____

Property Owner: _____
Street Address: _____ Parcel ID #: _____
Town: _____ State: _____ Zip: _____
Phone: _____ Cell: _____
Email: _____ Fax: _____
Additional Information: _____

Contractor: _____
Street Address: _____
Town: _____ State: _____ Zip: _____
Contact Name: _____ Title: _____
Phone: _____ Cell: _____
Email: _____ Fax: _____
License Type: _____ State: _____
License Number: _____ Exp. Date: _____
Scope of Work: _____

Subcontractor or Professional Engineer: _____
Street Address: _____
Town: _____ State: _____ Zip: _____
Contact Name: _____ Title: _____
Phone: _____ Cell: _____
Email Address: _____ Fax: _____
License Type: _____ State: _____
License Number: _____ Exp. Date: _____
Scope of Work: _____

Please list on a separate sheet, included as attachment I, all of the above subcontractor information for any additional subcontractors employed on the project.

SOLAR PV SYSTEM INFORMATION

Mounting Description

Mounting Type (roof, pole, ground, other-specify): _____
Mounting System Manufacturer: _____ Product Name and Model #: _____

Connecticut Standardized Solar PV Permit Application

Building Information (For Roof-Mounted Systems Only)

Building Type (e.g. house, shed, barn, slab): _____

Building Height (in feet): _____

Electrical Description

Size (amps) and type (phase, voltage) of electrical service: _____

Amperage of main breaker: _____ Will the value of main breaker change? (Yes/No): _____ To: _____

Rated amperage of the bus bar in the main panel: _____

Type of interconnection (e.g. breaker-load side, supply-side interconnect): _____

Electrical panel location: _____

If load side interconnect, will solar intertie into a subpanel? (Yes/No): _____

If yes, rated amperage of the subpanel bus bar? _____ Value of breaker protecting subpanel bus bar? _____

Attachments for application (See Instructions on the next page. Example attachments are available for download at www.energizect.com/sunrisene)

- | | |
|--------------------------|---|
| <input type="checkbox"/> | 1. Additional Subcontractors and Information |
| <input type="checkbox"/> | 2. One-Line Electrical Drawing |
| <input type="checkbox"/> | 3. One-Line Site Plan Drawing |
| <input type="checkbox"/> | 4. Attachment Details (Line Drawing) |
| <input type="checkbox"/> | 5. Solar PV Module Specification Sheets From Manufacturer |
| <input type="checkbox"/> | 6. Inverter Specification Sheets From Manufacturer |
| <input type="checkbox"/> | 7. Pole or Ground Mount Information (if applicable) |
| <input type="checkbox"/> | 8. Structural Evaluation (if required by municipality) |
| <input type="checkbox"/> | 9. Additional Information for Large Solar PV Systems (as Specified by the Municipality) |

*NOTE: Applications should submit either Attachment 4 for roof-mounted systems OR Attachment 7 for pole/ground mount-mounted systems, not both.

Certification

I hereby certify that I am the owner of record of the named property or; the proposed work is authorized by the owner of record and/or I have been authorized to make this application as an authorized agent, and we agree to conform to all applicable codes, laws, regulations and ordinances. All information contained within is true and accurate to the best of my knowledge and belief. No work shall start until the Jurisdiction has approved the permit or until the Contractor has received approval from _____ [Jurisdiction Name].

Signature of Property Owner or Authorized Agent _____

Typed or Printed Name of Signatory _____ Date _____

Connecticut Standardized Solar PV Permit Application

Please Complete the Application Form (pages 1-2) and provide ALL applicable Attachments based on the below instructions for Attachments 1-8. Attachment 8 is a Structural Evaluation to completed if required by the municipality. Additional information required by a municipality for large solar PV systems can be submitted as a 9th Attachment. Example Attachments (e.g. sample drawings can be found at www.energizect.com/sunrisne).

Each Attachment—Subcontractor List, Drawings and Calculations—Must Include:

- Date
- Property Owner
 - Name
 - Address
 - Contact phone number
- Installation Company
 - Name of company and contact person
 - Address
 - Contact phone number
- Drawing number and Revision number or other control method
- Drawing designer

Attachment 1. Additional Subcontractor List (If Needed, as per Permit Application)

Attachment 2. One-Line Electrical Drawing Must Show:

- Size of electrical service
 - Size of Main Breaker
 - Size of Bus Bar (If Known)
- Type of electrical service
- If interconnection point is a subpanel
 - Size of Subpanel Main Breaker
 - Size of Subpanel Bus Bar (If Known)
- Nominal power of solar system (Watts)
 - DC Capacity: Nameplate "STC" Value of all panels, watts
 - AC Capacity: Total AC capacity of Inverters, watts
- Batteries (If Present): Type, Quantity, Nominal Voltage, Capacity kWh
 - H₂ mitigation methods (If Necessary)
- Interconnection method
 - Size of overcurrent protection
- Number, type and electrical configuration of solar panels
- Number and type of Inverters
- Values for source stickers: NEC 690.53; NEC 690.54 (Encouraged, Not Required)
- Wiring methods
 - Wire Type(s), Size
 - Conduit Type(s), Size
- Solar metering (If Appropriate)
- Electrical current contribution from all PV sources
- Electrical grounding details: Wire Type, Size, GEC

Attachment 3. One-Line Site Plan Drawing Must Show:

- Location of solar panels
- Location of Inverters and major equipment
- Location of roof obstructions (Vents, Chimneys, etc.)
- Location of Main Breaker Panel
- Location of Utility Meter
- Location of AC disconnect
- Location of batteries and/or charge controllers (If Appropriate)
- Location of solar metering (If Appropriate)
- Planned conduit path (Encouraged, Not Required)
- Gross dimensions of structure (If Appropriate)
- Approximate layout of building or other structure (If Appropriate)
- Property lines, zoning, and setback considerations (If Appropriate)
- Trenching details: Location, Depth and Length of Trench (If Appropriate)
- A notation indicating scale —or not to scale (Both are Acceptable)

Attachment 4. Attachment Details for Roof-Mounted Systems (Line Drawing) Must Show:*

- Racking System
 - Manufacturer of racking structure
 - Model
 - Type
- Flashing description

Connecticut Standardized Solar PV Permit Application

(Attachment 4 Continued)

- Fastener detail
 - Type of fasteners, e.g. Lag Screws, Seam Clamps, Ballast
 - If Lag Screws include (1) Type (e.g. Zinc, Stainless steel), (2) Size of Lag, (3) Depth of Thread Penetration, (4) Type of Sealant (e.g. caulk)
- Mitigation of Dissimilar Metals
 - Describe how any dissimilar metals will be isolated

Attachment 5. Solar PV Module Specification Sheets
(provide PDF from manufacturer)

Attachment 6. Inverter Specification Sheets (provide PDF from manufacturer)

Attachment 7. Pole Mount or Ground Mount Information (if applicable):*

- Racking system
- Mounting specification sheets and details from manufacturer (PDFs)
- Manufacturer's Pre-Engineered Document or PE Stamp
- Code Compliance Manual (If Requested by Municipality)
- One-way distance from the Solar PV system to the interconnection point
- Electrical grounding details
- Height of solar PV system at maximum design tilt
- Applicable zoning information if not shown on site plan (e.g. setback from property line)

Attachment 8. Structural Evaluation (if required by the municipality)

- **NOTE:** *If this Attachment is required by the municipality it must be submitted in a format accepted by the municipality (see two examples, listed below). Installers should contact the municipality's Building Department to determine what documentation will meet the municipality's Structural Evaluation requirements.*

Two potentially acceptable formats are:

1. Structural Review Worksheet (available at www.energizect.com/sunrisene). This worksheet can be used by an installer to meet the Structural Evaluation requirements for the municipal Building Department if that department specifically authorizes its use for that purpose.
OR
2. Proof of a Structural Review performed by a Registered Design Professional (e.g. Professional Engineer).

Attachment 9. Additional information required for larger solar PV systems

- This Standardized Solar PV Permit Application can also be used to permit larger systems. If a municipality requires additional information to permit larger systems, they should specify the information needed as a 9th attachment to the application.

USAGE GUIDE FOR STRUCTURAL REVIEW WORKSHEET

This Structural Review Worksheet can be used to evaluate the integrity of a roof's framing for a proposed solar PV system. To use this Worksheet in an official capacity, you will need permission from the municipal building department. The Worksheet identifies structural conditions in a home's roof framing that may raise concerns with the installation of solar PV, including increased dead load and wind uplift.

This worksheet only applies to installations that meet the following basic criteria, as well as the more detailed criteria below and elsewhere in the Worksheet:

- Installation on one or two family home built after 1900
- Installation on home with regular, stick-built framing (not home with trusses)
- Installation on home with asphalt shingle or standing metal seam roof
- Solar PV panels are flush mounted (i.e., installed parallel to the roof)

User Qualifications for the Structural Review Worksheet

Users of this worksheet should have demonstrable knowledge of typical residential roof framing systems. A number of certification programs may be acceptable evidence of qualifications, if approved by the local jurisdiction, for example:

- Registered Design Professional (Professional Engineer or Architect)
- Licensed Home Inspector
- Engineer-in-Training (EIT)
- North American Board of Certified Energy Practitioners (NABCEP) PV Installation Professional certification
- Other approved certifications that require training in structural inspection of residential framing systems.

Visibility Requirements

Worksheet users must be able to view the roof framing to evaluate its strength. Enough of the framing must be exposed to be able to determine at a minimum:

- Rafter size and spacing
- Ridge board versus ridge beam
- Configuration of rafter cross-ties (e.g. attic floor, collar ties), including size and spacing

- Existence of framing irregularities (e.g. skylights, dormers) in the vicinity of the proposed PV panels
- Type of roof sheathing (e.g. plywood, oriented strand board (OSB), straight board sheathing)

If the framing is concealed by finishes, such as in spaces with cathedral ceilings, a Registered Design Professional should investigate the framing and review the proposed installation. Openings may be required in the finishes to observe the framing and document the construction details listed above.

Anchorage to Structure

Use of this worksheet is contingent upon fastening the PV system directly to the rafters. If the installer wishes to attach to the sheathing between the rafters, a registered design professional should evaluate the proposed design and confirm the available sheathing capacity. If the sheathing alone is not adequate to resist downward gravity and wind uplift forces, the addition of blocking between the rafters at the attachment locations may be a possible solution.

Structural Information

(To be used as a standalone supplemental form or in conjunction with the Structural Evaluation portion of this Worksheet on the following pages, 3-4)

Please fill in the following Roof Description Information:

ROOF DESCRIPTION:

Wind Exposure Category (B / C / D):¹ _____

Roofing Type (e.g. asphalt shingle, slate, clay tile, cedar shake, metal seam, single-ply membrane, built-up): _____

Age of roof: _____ Number of Layers: _____

Roof Type (e.g. gable, hipped, flat): _____

Framing Type (e.g. stick-built, trusses): _____

If trusses, list manufacturer, if known: _____

Rafter Material (wood, steel, etc.; if wood, specify rafter species²): _____

Rafter Size (e.g. 2x6): _____ Rafter Spacing (e.g. 16"): _____

Maximum unsupported rafter span: _____ Feet _____ Inches

Ceiling joist or rafter tie size and spacing (e.g. 2x6@16"): _____

Ceiling joist or rafter tie orientation (relative to rafters): parallel perpendicular

Height of ceiling joist or rafter tie measured vertically above top of rafter support walls (enter "0" if ceiling joists are located at the top of the support walls): _____

Height of roof ridge measured vertically above top of rafter support walls: _____

Ridge type (beam or board): _____

Framing Irregularities in vicinity of proposed panel installation (e.g. modifications, skylights, dormers that interrupt rafter spans): _____

Heavy equipment or unusual loads suspended from rafters in the vicinity of proposed panel installation: _____

Other information/Comments: _____

¹ http://publiccodes.cyberregs.com/icod/irc/2009/icod_irc_2009_3_par010.htm

² Obtain species from grade stamps on the rafters. If no grade stamps, assume Spruce-Pine-Fir #2.

Please perform the following Roof Load Calculations

ROOF LOAD CALCULATIONS:

- a. Total weight of PV modules, rails, mountings, hardware and wiring _____ Lbs
- b. Total number of attachments (mountings) _____ Mountings
- c. Weight per attachment point (mounting) a÷b _____ Lbs/Attachment
- d. Maximum spacing between adjacent attachment (mounting) points _____ Feet-Inches
- e. Total surface area of PV modules (square feet) _____ Ft²
- f. Distributed weight of PV modules a÷e _____ Lbs/ft²

Structural Evaluation

Please answer the questions in the Maximum Rafter Span Table Qualifier

MAXIMUM RAFTER SPAN TABLE QUALIFIER:

1. Was the house built after 1900? Yes No
2. Does the roof have only one layer of asphalt roofing shingles or standing metal seam? Yes No
3. Does the roof have a slope of 4:12 or greater? Yes No
4. Is roof framing stick-built wood framing? Yes No
5. Are rafters continuously tied with ceiling framing from one supporting wall to the other at the eave level, noting that the ceiling framing must match the rafter spacing and direction? Yes No
6. Is the framing in the vicinity of the solar array free of irregularities (see Roof Description for examples)? Yes No
7. Is the framing in the vicinity of the solar array free of heavy equipment or unusual loads? Yes No
8. Is the roof framing free of visible indications of distress (e.g. ridge sagging, walls out of plumb, significant ceiling cracks, split rafters)? Yes No
9. Is the roof framing free of signs or knowledge of previous damage (e.g. water incursion, fire damage, impact from an object, termite damage, etc.)? Yes No
10. Is the new PV system flush mounted, with a maximum angle of 5 degrees relative to the roof line and a maximum gap of 6" between the roof surface and the solar panels? Yes No
11. Is the maximum weight of PV modules less than or equal to 4 lbs/ft² (see "Roof Load Calculations" p. 2)? Yes No
12. Is the "weight per attachment point" less than 45 lbs (see "Roof Load Calculations" p. 2)? Yes No

If all answers are "Yes," proceed to Rafter Span Verification. If any answer is "No," enter "NA" for your answer to Question 13 on the next page and employ a Registered Design Professional to evaluate the roof structure.

Structural Evaluation

RAFTER SPAN VERIFICATION

Refer to the Rafter Span Table below to determine whether the "Maximum Unsupported Span" (provided in the "Roof Description" on page 2) is less than the maximum allowed rafter span. (Consider wood species, rafter size, and rafter spacing in your assessment)

MAXIMUM RAFTER SPANS

- Ground snow load = 30 psf
- Maximum Dead Load Including PV Panels = 14 psf
- Ceiling not attached to rafters (deflection ≤ L/180)

Rafter Spacing	Species and Grade	Rafter Size				
		2x4	2x6	2x8	2x10	2x12
		Maximum Rafter Spans (ft-in)				
12"	Spruce-Pine-Fir #2	8'-4"	12'-4"	15'-8"	19'-1"	22'-2"
	Douglas Fir-Larch #2	8'-10"	12'-11"	16'-5"	20'-0"	23'-3"
	Hem-Fir #2	8'-10"	12'-11"	16'-5"	20'-0"	23'-3"
16"	Spruce-Pine-Fir #2	7'-4"	10'-8"	13'-7"	16'-7"	19'-2"
	Douglas Fir-Larch #2	7'-8"	11'-2"	14'-2"	17'-4"	20'-1"
	Hem-Fir #2	7'-8"	11'-2"	14'-2"	17'-4"	20'-1"
19.2"	Spruce-Pine-Fir #2	6'-8"	9'-9"	12'-4"	15'-1"	17'-6"
	Douglas Fir-Larch #2	7'-0"	10'-3"	12'-11"	15'-10"	18'-4"
	Hem-Fir #2	7'-0"	10'-3"	12'-11"	15'-10"	18'-4"
24"	Spruce-Pine-Fir #2	6'-0"	8'-9"	11'-1"	13'-6"	15'-8"
	Douglas Fir-Larch #2	6'-3"	9'-2"	11'-7"	14'-2"	16'-5"
	Hem-Fir #2	6'-3"	9'-2"	11'-7"	14'-2"	16'-5"

13. According to the Rafter Span Table, is the observed "Maximum Unsupported Span" less than the "Maximum Rafter Span" listed in the table? Yes No NA

STRUCTURAL REVIEW WORKSHEET CONCLUSION:

If your answer to Question 13 is "Yes," you do not need to employ a Registered Design Professional to evaluate the roof structure unless required to do so by the local jurisdiction.

Disclaimer:
This worksheet should not be used to replace a Jurisdiction's requirement that a registered design professional perform a structural analysis for a roof-mounted solar PV installation, unless a municipal building department specifically authorizes its use for that purpose.