

Getting to Zero Net Energy: Streamlined Permitting for Residential Solar PV

Presented by City of Chula Vista's Sustainable Communities Program

May 6, 2015

Sabrina Bornstein, Project Manager, Center for Sustainable Energy

Sustainable Communities Program

- Provides resources to stakeholders of the Chula Vista built environment to improve compliance with **energy efficiency** and **green building codes** and to promote construction of **sustainable buildings**.
- Part of the **City of Chula Vista's Local Government Partnership program**, which is funded by California utility customers and administered by San Diego Gas & Electric® under the auspices of the California Public Utilities Commission.



Center for Sustainable Energy™

- Independent nonprofit organization
- Our mission: Accelerating the transition to a sustainable world powered by clean energy
 - Program management
 - Training and education
 - Technical assistance



What is “Zero Net Energy”?

A Zero-Net-Energy Code Building is one where the **net amount of energy produced by on-site renewable energy resources** is equal to **the value of the energy consumed annually by the building**, at the level of a single “project” seeking development **entitlements** and building code **permits**, measured using the California Energy Commission’s Time Dependent Valuation metric.

-- California Energy Commission, 2013 Integrated Energy Policy Report

California's ZNE Goals

- All **new residential construction** will be ZNE by 2020
- All new and 50 percent of existing **state-owned public buildings** will be **retrofit** to ZNE by 2025
- All **new commercial buildings** will be ZNE by 2030
- 50 percent of **existing commercial buildings** will be **retrofit** to ZNE by 2030

Getting to Zero Net Energy – Workshop Series

- **Overview of Permitting, Ordinances and Incentives in Chula Vista**
 - Tues, April 14
- **Introduction to Solar Water Heating**
 - Tues, April 21
- **Streamlined Permitting for Residential Solar PV**
 - Wed, May 6
- **Introduction to Energy Storage**
 - Tues, May 19
- **Electric Vehicle Charging in Buildings**
 - Wed, June 10

Register at www.energycenter.org/events



STREAMLINED PERMITTING FOR RESIDENTIAL SOLAR PV



California Climate & Solar Goals

- **1990 GHG levels by 2020 (AB 32)/80% reduction by 2050**
- **33% renewables by 2020 (SB 1078)/ 50% by 2030 (Gov. goal/proposed legislation)**
- **3,000 MW rooftop solar by 2017 (SB 1)/12,000 MW by 2020 (Gov. goal)**

Rooftop Solar Challenge: Golden State Solar Impact



Streamlined Permitting Reduces Red Tape

- Permitting, inspection, and interconnection accounts for \$1,100-\$1,750 (NREL) to \$2,500 (SunRun)
- PV installation delays as a result of permitting procedures average 3.5 weeks (SunRun) to 8 weeks (CPF)
- Many installers avoid operating in, on average, 3-4 cities each because of hurdles (NREL)

A Statewide Approach

- California is home to 500+ jurisdictions
- Each jurisdiction may have 2-5 different authorities within its boundaries
- Varying levels of knowledge related to solar at different jurisdictions
- Expedite efforts to establish streamlined & standardized permitting

Governor's Solar Permitting Task Force

- Partnership between CSE and the Governor's Office of Planning and Research (OPR)
- Collaboration from Building officials, state agencies, and Industry
- Goal was to reduce cycle time and transaction costs for permitting authorities and solar installers while maintaining high quality and safety standards

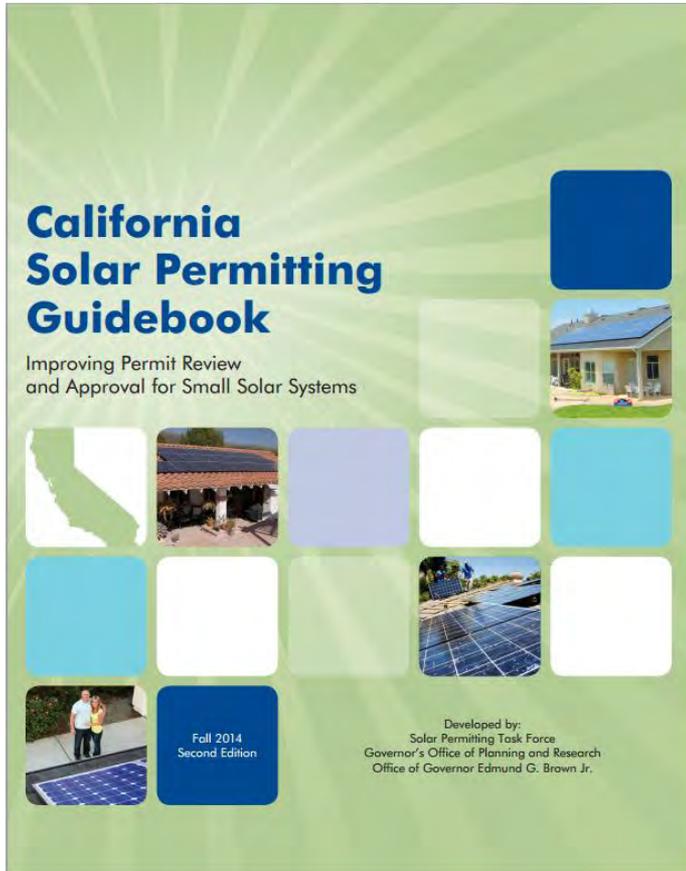


Governor's Solar Permitting Task Force

More than nine months of collaboration from 75 members representing over 60 organizations that include:

- Governor's Office of Planning and Research
- International Code Council
- California Public Utility Commission
- Sungevity
- California Building Officials
- CALSEIA
- California Energy Commission
- City of Chula Vista
- San Jose Fire Department
- Building Standards Commission
- California Building Industry Association
- Sunrun
- City of Fresno
- Division of the State Architect
- City of Walnut Creek
- City of Los Angeles
- Underwriters Laboratories
- Steel Framing Industry Association
- Optony, Inc.
- SolarCity
- City of Bakersfield
- Los Angeles County
- City of Elk Grove
- Brooks Engineering
- Contra Costa County
- City of San Francisco
- CalFire
- Dept. of Housing and Community Development
- State Fire Marshall

California Solar Permitting Guidebook



- Partnership between CSE and the Governor's Office of Planning and Research (OPR)
- Provides a roadmap for local governments to establish a streamlined permitting processes for small, solar rooftop systems under 10kw
- Guidance on interpretation of codes and standards
- Seven toolkit documents for cities to streamline their permit process

Purpose and Use of the Guidebook

- Designed to help building owners and solar installers navigate permitting as efficiently as possible
- Practices recommended in this Guidebook apply to permitting agencies of all sizes
- Written for permit applicants with all levels of expertise

Overview

Part 1 **CURRENT LAWS, REGULATIONS AND CODES:** This section explains current legal requirements for solar installations in California.

Part 2 **THE PROJECT APPROVAL PROCESS:** This section describes important aspects of permit review and project inspection.

Part 3 **RECOMMENDATIONS FOR EXPEDITED LOCAL SOLAR PERMITTING:** These sections recommend a streamlined local permitting process for small, simple solar PV and solar thermal installations, and provide standard forms that can be used to streamline permitting.

Part 4

Part 5 **RESOURCES AND INFORMATION:** This section provides informational materials that can help local governments clarify current state requirements for all solar installations.

Focus of the Guidebook

- This Guidebook focuses on the permit review and approval to install a rooftop solar system.
- It does not address zoning, land use approvals or environmental review that may be required for larger solar projects.
- This Guidebook addresses both solar PV and solar water heating (solar thermal) technologies (under construction).

Permitting Guidebook Toolkit

1. Eligibility checklist for systems <10 kw
2. Simplified applicant submittal requirements
3. Standard electrical plans with fire access requirements (2)
4. Well-defined structural criteria for expedited permitting
5. An inspection reference guide
6. One bulletin with state codes for solar installations
7. Implementation guide and sample ordinance

AB 2188 (Muratsuchi)

Components:

- Signed into law in September 2014
- Mandates a standardized, streamlined solar permitting process statewide for $\leq 10\text{kW}$ systems
- Cities must implement ordinance by September 30, 2015

Minimum Eligibility Criteria for Expedited Permitting

Expedited Permitting Ordinance

Improving the Permitting Process

Inspection Process

Changes to HOA Approval Process

AB 2188 Implementation Guide

- Prepared by Energy Policy Initiatives Center, University of San Diego School of Law
- Provides guidance for implementing AB 2188 in substantial conformance with the Guidebook
- Includes a model ordinance



Guidebook and AB2188 Training

- Working with building official professional associations to create a series of Guidebook trainings for Q1 and Q2 2015
- Curriculum standardized and developed by CSE
- Training participants will be eligible for continuing education units
- CSE offers technical assistance to local jurisdictions



Chula Vista Permitting Best Practices

- ✓ Permit forms and guide online
- ✓ One inspection required
- ✓ Minimize inspection turnaround and offer convenient inspection scheduling

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Residential Solar Photovoltaic Systems

Font Size: [+] Share & Bookmark: [+/-] Feedback: [+] Print

This Guide is designed to help you through the permitting and construction processes associated with a solar photovoltaic system project. For further information on Photovoltaic systems, please review our handout, "[Solar Photovoltaic Systems Minimum Submittal Requirements](#)". [Form 4613](#). You should also check with the Planning Division (619-691-5101) to see if there are any specific zoning issues you should be concerned about.

To apply for a solar street from the libra must provide us wit

1. A complete
2. Three copie photovoltaic or call us at
3. Two copies panels, locc in parallel, r and for the r

DEPARTMENT OF PLANNING & BUILDING
BUILDING DIVISION
276 Fourth Avenue, Chula Vista CA 91910
619-691-5272 619-585-5681 FAX

FORM 4613

SOLAR PHOTOVOLTAIC SYSTEMS: MINIMUM SUBMITTAL REQUIREMENTS

If you install a photovoltaic power system, you must first obtain a building permit.

As a permit applicant, you will need to complete the forms listed below, provide three copies of the plans listed below, and pay the necessary plan check fees. See Form 4610, "Who May Prepare Plans & Incomplete Plans."

Applicants, whose projects require other approvals such as Planning Use Permits, Design Review, etc., should consult those other Departmental Divisions first and, at a minimum, obtain their preliminary approval prior to submitting plans to the Building Division for a building permit. Those other approvals may require that you make separate submittals to other departmental divisions.

Please note that Planning Division approval is required. You can reach Planning Division (Zoning Administration) at (619) 691-5101.

For clarification or additional information for a specific project, please call (619) 691-5272 or visit the Public Service Center, Building Division, at 276 Fourth Avenue, Chula Vista.

I. PLAN SPECIFICATION

You must submit three identical sets of plans to the Building Division. Plans must be drawn to scale and must be of sufficient clarity to indicate the location and extent of the work proposed. Plans must show in detail that the proposed work will conform to the provisions of all building regulations in effect in the City of Chula Vista on the day you submit plans and pay fees. Label and dimension all items on the plans. Section IV "Provisions to Standards" identifies

Documents referenced in this Form

- Form 4695, How to Prepare a Residential Plot Plan
- Form 4610, Who May Prepare Plans & Incomplete Plans

B. Owner/Builder Form

An owner/builder verification form is required for all owner/builder projects. This form will be sent by mail to the owner or may be given at the Building Counter to the owner with a valid identification.

III. PLAN CHECK FEES

The plan check fees you must pay are based on the construction valuation established by the Building Division. They must be paid at the time the plans are submitted by cash or check. Please make checks payable to the "City of Chula Vista." If in haste to bring a blank check. If you need assistance in estimating fees for plan submittal, call (619) 691-5272.

IV. REQUIRED INFORMATION ON THE PLANS

You must include the items listed below on the plans and provide the required supporting documentation. Please submit two copies of supporting documentation at time of permit application.

CSE Resources and Contact Information

Solar Permitting Guidebook:

energycenter.org/solarguidebook

solarpermitting@energycenter.org

PACE:

energycenter.org/pace

California Solar Initiative:

CSI@energycenter.org

energycenter.org/california-solar-initiative

Webinars:

energycenter.org/localgov

The screenshot shows the website for the Center for Sustainable Energy. The page is titled "Property Assessed Clean Energy (PACE) Programs". It includes a navigation menu with options like HOME, ABOUT, PROGRAMS, EDUCATION, POLICY, NEWS, BLOG, EVENTS, JOBS, and CONTACT. The main content area has a sidebar with "POLICY" and "PACE FINANCING WEBINAR" sections. The main text explains the PACE program and provides a "Step 1. Choose your building type" section with radio buttons for Residential, Multi-Family, and Commercial. Below that is "Step 2. Type in your address/jurisdiction or click on the map below." with a search box for "Chula Vista" and a map of California showing various jurisdictions.

The screenshot shows the website for the Center for Sustainable Energy. The page is titled "California Solar Initiative" and "Solar Electric". It includes a navigation menu with options like HOME, ABOUT, PROGRAMS, EDUCATION, POLICY, NEWS, BLOG, EVENTS, JOBS, and CONTACT. The main content area has a sidebar with "CALIFORNIA SOLAR INITIATIVE" and "Solar Electric" sections. The main text describes solar photovoltaic (PV) systems and their benefits. Below the text is a large image of a house with solar panels on the roof and a swimming pool in the foreground.

Rebates and Incentives

- CSI Residential Solar: funding exhausted
- CSI Commercial Solar: Wait list created as of 2/5/2015 (application fee not due at this time)
- New Solar Homes Partnership (CEC)
- 30% Federal Tax Credit is available through 12/31/2016. Consult with your tax professional.

Questions?

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Project Manager

(213) 805-7267

Sabrina.Bornstein@energycenter.org

Chula Vista Solar Permit Streamlining

Wednesday, May 6, 2015 12-1:30pm

Conference Room: B112, Building C



Website

- Online Resources:
 - State Requirement (SB 2188)
 - City Code (CVMC 15.24.065)
 - Forms and Guide

www.chulavistaca.gov/departments/development-services/building/build-green

Building Department (619)-691-5272

CVMC 15.24.065 Photovoltaic Pre-wiring Requirements

All new residential units shall include electrical conduit specifically designed to allow the later installation of a photovoltaic (PV) system which utilizes solar energy as a means to provide electricity.

Review Process

- Current City Process (10 Days)
- Proposed (≤ 5 Days)

STEPS FOR PERMIT REVIEW AND APPROVAL

Local Enforcing Agency Review

Submit permit application and materials



Permit review and approval



Construction of solar PV system



Site inspection and final approval

Local Utility Approval

Submit request to “interconnect” the solar installation to the local electricity grid



Site inspection and interconnection approval



Center for Sustainable Energy™



Solar PV Forms

- Permit (Residential)

Fees:

- \$250 (Solar PV)
- \$234.75 (Minor upgrade)

	DEPARTMENT OF PLANNING & BUILDING BUILDING DIVISION 276 Fourth Avenue Chula Vista CA 91910 619-691-5272 619-409-5428 FAX	RESIDENTIAL ADDITION • REMODEL PATIO • WALL/FENCE • POOL WORKSHEET
	FORM 4562	

MINIMUM PLAN SUBMITTAL REQUIREMENTS (GRAY AREAS FOR OFFICE USE ONLY.)

RESIDENTIAL ADDITION • RESIDENTIAL REMODEL			
<input type="checkbox"/> Two Sets Three complete sets of fully dimensioned, drawn to scale plans which include all of the following:			
<input type="checkbox"/> Title Sheet	<input type="checkbox"/> Foundation Plan	<input type="checkbox"/> Elevations	<input type="checkbox"/> Roof Plan
<input type="checkbox"/> Plot/Site Plan	<input type="checkbox"/> Floor Plan	<input type="checkbox"/> Cross Sections	<input type="checkbox"/> Structural framing plans & details
<input type="checkbox"/> Two sets of Title 24 Energy compliance documentation (Certificates to be copied onto actual plan sheets)	<input type="checkbox"/> Two copies of single line diagram (services over 200 amps)	<input type="checkbox"/> Two copies of structural calculations (non-conventional framing)	<input type="checkbox"/> Two copies of engineered truss details (if roof/floor trusses are used)
<input type="checkbox"/> Two copies of soils report or Soils Waiver Form 4597			
PATIO COVER • PATIO ENCLOSURE • BALCONY • DECK • CARPORT • SHED			
<input type="checkbox"/> Three copies of Plot/Site plan			
<input type="checkbox"/> Two copies of roof, floor, framing, foundation plans & structural details OR; two copies of City of Chula Vista standard drawings			
MASONRY WALL • RETAINING WALL • FENCE		THEME WALLS IN PLANNED COMMUNITIES	
<input type="checkbox"/> Three copies of Plot/Site plan		<input type="checkbox"/> Masonry Wall Worksheet	
<input type="checkbox"/> Two copies of structural sections, details/calculations, and foundation details --OR--		<input type="checkbox"/> Four copies of Plot/Site plan	
<input type="checkbox"/> Two sets of engineering plans (wet ink signature --OR-- letter from Engineer)		<input type="checkbox"/> Two copies of structural sections, details/calculations, and foundation details (show interior property line placement) --OR--	
		<input type="checkbox"/> Three sets of engineering plans (wet ink signature --OR-- letter from Engineer)	
POOL/SPA			
<input type="checkbox"/> Three copies of Plot/Site plan (show distances from edge of pool/spa to buildings and slopes)			
<input type="checkbox"/> Two sets of engineering plans (wet ink signature --OR-- letter from Engineer)			
Site Address:		Parcel #:	
Applicant Name:		<input type="checkbox"/> Agent for Owner	<input type="checkbox"/> Agent for Contractor
Address:	City:	State:	Zip Code:
Phone #:	Fax #:	E-mail:	
Owner:		Phone:	
Address:	City:	State:	Zip Code:
Contractor:		Phone:	Fax #:
Address:	City:	State:	Zip Code:
Chula Vista Business License #:	State Contractor's License #:	Class:	Expires:
RESIDENTIAL ADDITION • RESIDENTIAL REMODEL		Activity #:	
Type of Addition/Description of Work		Addition Square Footage	2nd Story Fireplace(s)
			<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Y <input type="checkbox"/> N
PATIO COVER • CARPORT • DECK • SHED • BALCONY			Activity #:
Patio Cover	Deck	Balcony	Sq Footage City Stnd Open Lattice ICBO # Type of Construction
Patio Enclosure	Shed	Carport	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Wood <input type="checkbox"/> Metal <input type="checkbox"/> Other
MASONRY WALL • RETAINING WALL • FENCE			Activity #:
Masonry Wall sq ft	City Stnd	Retaining Wall sq ft	City Stnd Type of Fence Fence sq ft
	<input type="checkbox"/> Y <input type="checkbox"/> N		<input type="checkbox"/> Y <input type="checkbox"/> N
POOL/SPA			Activity #:
Type of Construction		Pool sq ft	Solar Heater Spa
<input type="checkbox"/> Gunite <input type="checkbox"/> Vinyl <input type="checkbox"/> Fiberglass			<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Y <input type="checkbox"/> N
WORK NOT LISTED ABOVE:			

Applicant/Agent	Development Services Technician	Date
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Guide to Streamlined Rooftop Solar PV



D e v e l o p m e n t S e r v i c e s D e p a r t m e n t
Building Division | Development Processing

Solar Requirements for Streamlined Rooftop Solar Photovoltaic Permitting 10KW or Less in One-and Two-Family Dwellings

This information bulletin is published to guide applicants through a streamlined permitting process for solar photovoltaic (PV) projects 10 kW in size or smaller. This bulletin provides information about submittal requirements for plan review, required fees and inspections.

1. Approval Requirements

The following permits are required to install a small residential rooftop solar PV system with a maximum power output of 10 kW or less:

- a) Building permit; Residential Addition/Alteration.
- b) Minor electrical permit if electrical panel upgrade is required. (Specify on plans)

Planning review and Fire Department approval are not required for small residential rooftop solar PV installations of this size.

2. Submittal Requirements

- a) Completed permit application form. This permit application form can be downloaded at <http://www.chulavistaca.gov/departments/development-services/forms-specifications>.
- b) Demonstrate compliance with the eligibility checklist for expedited permitting. These criteria can be



Eligibility Checklist for Streamlined Small Residential Rooftop Solar Permitting

These criteria are intended for streamlined solar permitting process. If any items are checked NO, revise design to fit within Eligibility Checklist, otherwise permit application may go through standard process.

General Requirements

- A. System size is 10 kW AC CEC rating or less Y N
- B. The solar array is roof-mounted on one- or two-family dwelling or accessory structure Y N
- C. The solar panel/module arrays will not exceed the maximum legal building height. Y N
- D. Solar system is utility interactive and without battery storage Y N
- E. Permit application is completed and attached Y N
- F. Permit pulled by a C-46 (Solar Contractor) or C-10 (Electrical Contractor) Y N

Electrical Requirements

- A. No more than four photovoltaic module strings are connected to each Maximum PowerPoint Tracking (MPPT) input where source circuit fusing is included in the inverter
 - 1) No more than two strings per MPPT input where source circuit fusing is not included Y N
 - 2) Fuses (if needed) are rated to the series fuse rating of the PV module Y N
 - 3) No more than one noninverter-integrated DC combiner is utilized per inverter Y N
- B. For central inverter systems: No more than two inverters are utilized Y N
- C. The PV system is interconnected to a single-phase AC service panel of nominal 120/240 Vac with a bus bar rating of 225 A or less Y N
- D. The PV system is connected to the load side of the utility distribution equipment Y N
- E. A Solar PV Standard Plan and supporting documentation, that conform to the standard plans contained in the most current version of the California Solar Permitting Guidebook adopted by the Governor's Office of Planning and Research, is completed and attached Y N
- F. The existing electrical system including existing line, load, ground and bonding wiring as well as main panel and subpanel sizes are adequately sized, based on the existing electrical system's current use, to carry all new PV electrical loads. Y N

Structural Requirements

- A. A completed Structural Criteria for Residential Flush-mount Solar Arrays and supporting documentation is attached. Y N

Fire Safety Requirements

- A. Clear access and ventilation pathways provided Y N
- B. Fire classification solar system is provided Y N
- C. All required markings and labels are provided including a directory plaque as required by the San Diego Area Electrical News Letters Article 690. Y N
- D. A diagram of the roof layout of all panels, modules, clear access and ventilation pathways and approximate locations of electrical disconnecting means and roof access points is completed and attached Y N

Job Address: _____ Permit #: _____

Contractor/Installer: _____ License # & Class: _____

Signature: _____ Date: _____ Phone #: _____



Structural Criteria Checklist

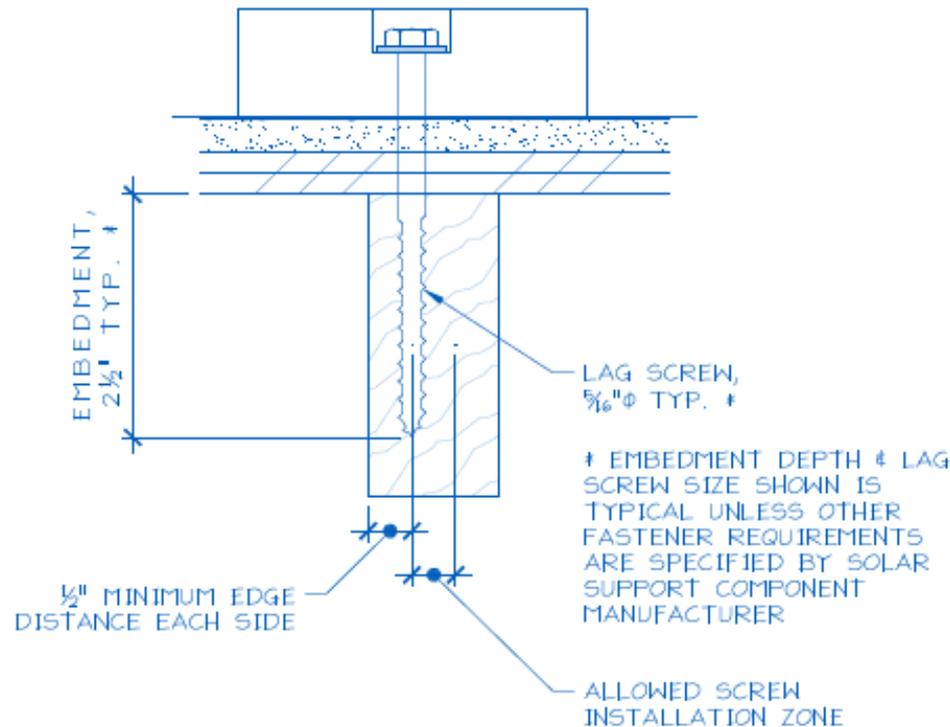


Figure 2. Typical Anchor with Lag Screw Attachment.

Figure 1. Sample Solar Panel Array and Anchor Layout Diagram (Roof Flat).

When this table is used:

Tables with relevant cells circled, or Web-based calculator results attached.

E. Is a roof plan of the module and anchor layout attached? (see Figure 1)

Y

N

Sustainable Communities Program



Thank you for attending!