

# **Residential Solar Plan Review Quality Submittal Guidelines**



**This packet applies to roof-mounted solar photovoltaic and hot water systems only.**

City of Scottsdale  
One Stop Shop  
7447 E. Indian School Road, Suite 105  
480-312-2500

**SCOTTSDALE**



**GREEN BUILDING  
PROGRAM**

September 2009

## General Information for Residential Solar Systems

**\*\*Photovoltaic and hot water systems do require a building permit\*\***

**Stepping through the approval process:**

**PLAN REVIEW → PERMIT → INSPECTIONS**

### **1. PLAN REVIEW**

- Provide 2 complete sets demonstrating all MAG requirements (see attached)
- Provide 2 site plans (see example and attached minimum requirements). Systems compatible with the “Solar Panel Placement Design Guidelines for Single-Family Homes” will be eligible to receive a counter review; all other proposals will be required to submit for a full plan review. *Incomplete site plans will not be accepted.*
- Provide 2 panel elevations. Show all dimensions. Include distance from roof surface to top of panels, panel tilt angles, parapet heights and roof slope(s). (see attached example)

### **2. PERMIT**

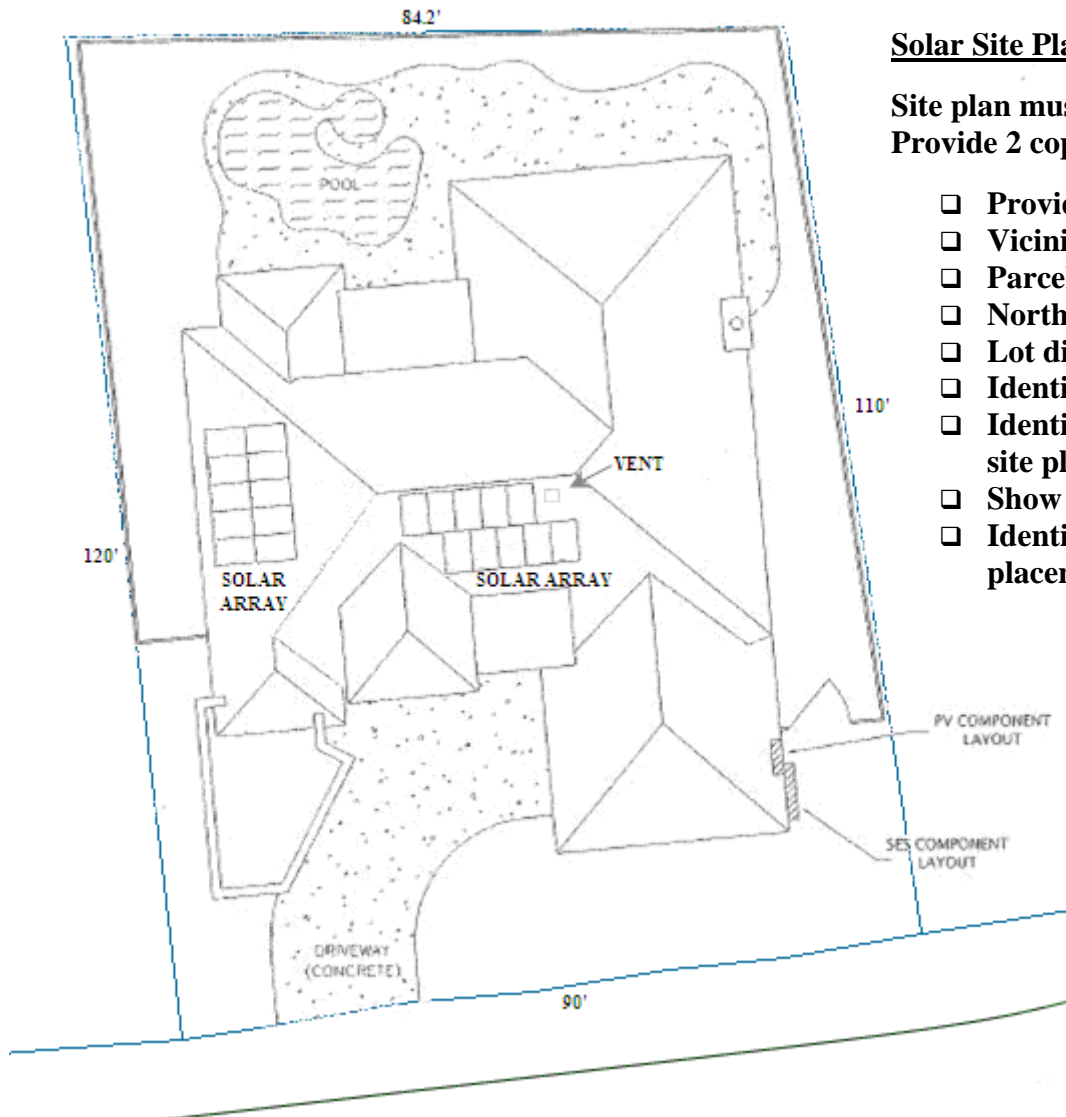
Please note the following requirements for obtaining permits over the counter:

- Plan review fees, if required, must be paid for the same day the plans are reviewed or submitted for review. This is true whether permits are issued that day or not.
- Permits can only be signed for by property owners or licensed contractors. All other persons involved with the project (including but not limited to relatives, architects, designers or construction managers) must have a statement signed by the property owner naming who has permission to sign and receive documents on the owner’s behalf to obtain plan reviews and building permits at the City of Scottsdale
- On permits not listing a licensed contractor, an owner-occupied single family residence property owner can do the work themselves or act as their own general contractor and hire subcontractors to do the work. When choosing to do the work themselves, or to act as their own general contractor, the property owner or designee (see item above) must sign the “Owner-Builder Declaration form” required by the Tax Audit Division of the City of Scottsdale. For detailed information about this form call 480-312-2400 or visit [www.scottsdaleaz.gov/taxes](http://www.scottsdaleaz.gov/taxes).

### **3. INSPECTIONS**

- An inspection card will be issued detailing the required inspections. Typically one final inspection is conducted; however actual inspections may vary depending on your project.

# SOLAR SITE PLAN CHECKLIST/EXAMPLE

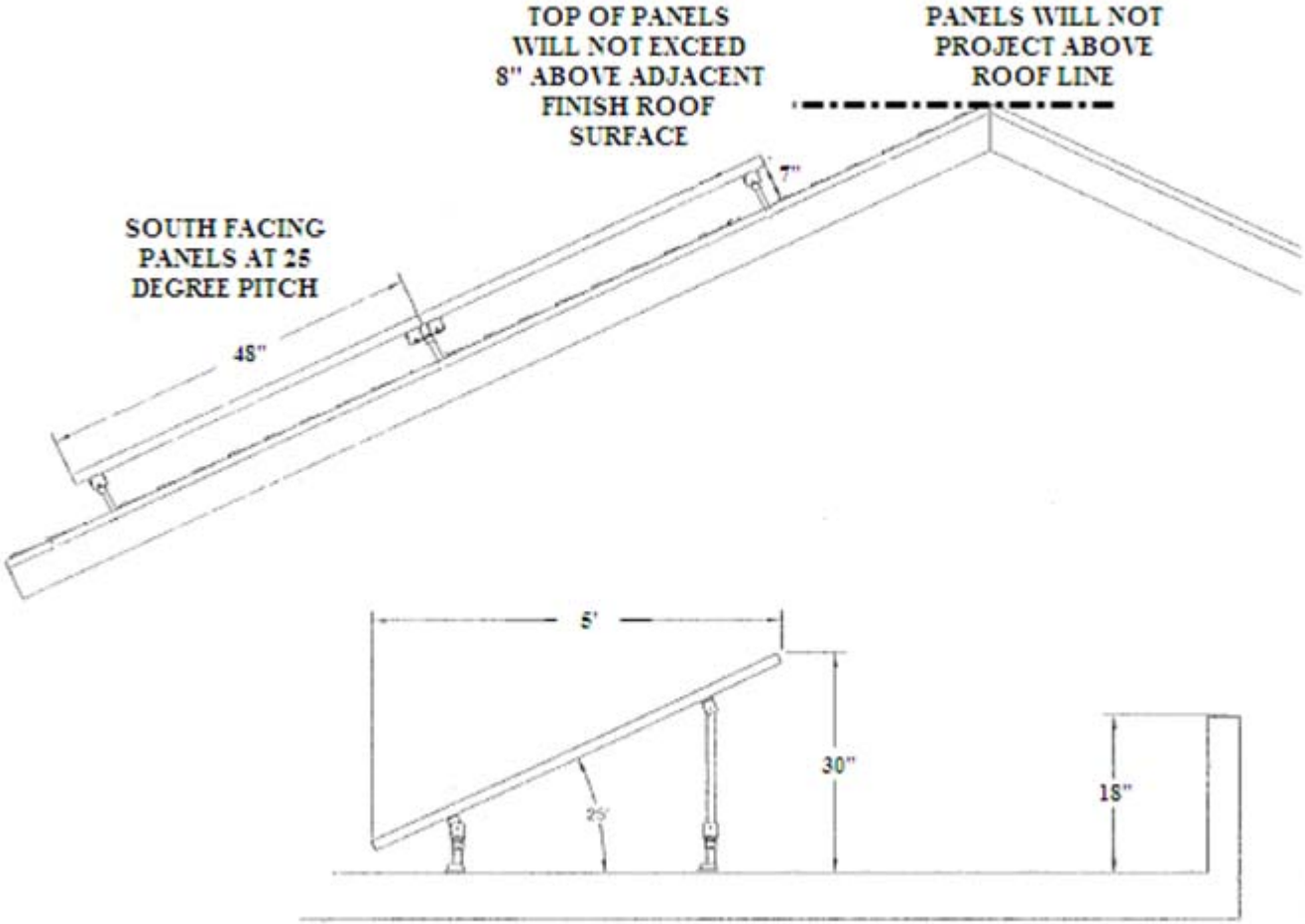


## Solar Site Plan Checklist:

Site plan must be legible, show entire lot, and be proportional in scale.  
Provide 2 copies of site plan.

- Provide Zoning
- Vicinity Map
- Parcel # (APN), lot & subdivision
- North Arrow
- Lot dimensions
- Identify street
- Identify easements (i.e. NAOS or drainage easement—represent on site plan with dashed lines)
- Show all ridge lines, and/or parapets
- Identify all vents, chimneys, or other apparatus that may affect placement of panels

# SOLAR ELEVATION EXAMPLE



Maricopa Association of Governments  
Building Codes Committee Standard

PERMIT SUBMITTAL REQUIREMENTS  
RESIDENTIAL SOLAR DOMESTIC WATER HEATING SYSTEMS

September 19, 2007

In an effort to promote uniformity through MAG jurisdictions under the purview of safety, the following submittal requirements are adopted as a MAG standard for securing necessary plumbing/building permits for residential (single-family) Solar Domestic Hot Water (DHW) systems:

1. The location of the solar panel system shall be indicated on the plans, including roof plan, elevation and mounting details for panel installation.
2. Standard plans shall be required and/or on file for systems with water storage on roof (e. g. – integrated collector storage systems or thermosyphon systems).
3. Systems structural engineering analysis shall not be required for flat plate collectors whose weight does not exceed 20 lbs per square foot on roof slopes of 4/12 or less and 16 lbs per square foot on roof slopes greater than 4/12.
4. Standard plans (where permitted by local jurisdiction) shall be on file, including Solar Rating and Certification Corporation (SRCC) System Data (specification sheet).
5. Note on plans that Solar Domestic Water Heating equipment shall be installed in accordance with applicable plumbing codes and in accordance with SRCC and State of Arizona Guidelines.
6. The permit cost for installing a Solar Domestic Water Heating systems shall be treated the same as a water heater replacement.

NOTE:

Local planning and zoning regulations involving such requirements as setback, height limitations, color, reflectivity or other design considerations, may apply. See the local governing jurisdiction for further information.

**MAG BUILDING CODES COMMITTEE**  
**Permit Submittal Requirements**  
**Residential (Single-Family) Solar Photovoltaic (PV) Systems**  
**For Utility Grid-Tie Connection**

Revised August 2007

In an effort to promote uniformity through MAG jurisdictions under the purview of life safety (NEC Article 690), the following submittal requirements are proposed as a MAG standard for securing necessary electrical/building permits for residential (single-family) photovoltaic (PV) systems:

1. Location of PV installation indicated on plans (roof plan and elevation).

Systems structural engineering analysis shall not be required for flat plate collectors whose weight does not exceed 20 lbs per square foot on roof slopes of 4/12 or less and 16 lbs per square foot on roof slopes greater than 4/12.

2. Mounting details for PV panel installation.
3. Electrical one-line and three-line (showing phases, neutral and ground) diagram.
4. Cut sheet and listing for inverter (DC to AC conversion).
5. Note on plans that PV equipment shall be installed in accordance with NEC 690 and posted with applicable warnings, signage & plaques per NEC 705-10, 690-17 & 690-64(b)(5).

Local planning and zoning regulations, involving such requirements as setback, height limitations, color, reflectivity or other design considerations, may apply.

See the local governing jurisdiction for further information.



City of Scottsdale  
**Green Building Program**  
 “Sustainable Building in the Sonoran Desert”

**SOLAR PANEL PLACEMENT DESIGN GUIDELINES  
 FOR SINGLE FAMILY HOMES**

The following guidelines are to be used in the design and placement of solar panels (photovoltaic and solar thermal systems) on pitched and flat roofs of single-family dwellings for the purpose of compatible design. With a little foresight and planning, a solar system can be effectively integrated into the design of new and existing roofs. Those projects which comply with the design guidelines qualify for over the counter plan review. All other proposals will be required to be submitted for plan review.

**A. South Facing Pitched Roofs (within 45° east or west of due south)**

- 1) Solar panels should be low profile and parallel with the plane of the pitched roof.
- 2) Top of the panels should not exceed 8 inches above the adjacent finish roofing surface (e.g. - tile, shingles). Panels should not project above the roof ridge line.
- 3) Placement of panels should be uniform. Consider the panels as part of the overall roof configuration. Match the shape and proportions of the array with the shape and proportions of the roof.
- 4) Color of panel frames and support structure should be neutral and compatible with roof surface color (exposed frames and components should have a non-reflective surface).



- + Per guidelines  
 - Not per guidelines





B. North and East/West Facing Pitched Roofs (within 45° of south of due east or west)

- 1) Panel tilt angle should not exceed 15 degrees above horizontal plane.
- 2) Height of panels should not exceed 24 inches above the roof surface at any point. Panels should not project above the roof ridge line.
- 3) Placement and height of panels should be uniform. Consider the panels as part of the overall roof configuration. Match the shape and proportions of the array with the shape and proportions of the roof.
- 4) Color of panel frames and support structure should be neutral and compatible with roof surface color (exposed frames and components should have a non-reflective surface).



Solar panels on west and east facing pitched roof below the maximum allowable height of 24 inches above roof surface at any point.

Match the shape and proportions of the array with the shape and proportions of the roof.





View from southwest corner  
Solar panels on west facing pitched roof exceed the maximum allowable height of 24 inches above roof surface at any point.



View from northwest corner  
Solar panels on west facing pitched roof also project above the roof ridge line. Support structure color is not compatible with roof surface color.

C. Flat roofs (1/2 inch or less per foot slope)

- 1) Top of panels should not exceed 30 inches above the adjacent finish roofing surface on flat roofs with or without parapets.
- 2) Placement and height of panels should be uniform. Consider the panels as part of the overall roof configuration.
- 3) Color of panel frames and support structure should be neutral and compatible with roof surface color (exposed frames and components should have a non-reflective surface).



Solar panels on flat roof with parapets.



Solar panels on flat roof without parapets.





Solar panels on flat roof with parapets.

