



City of Malibu

23825 Stuart Ranch Road • Malibu, California • 90265-4861
Phone (310) 456-2489 • Fax (310) 456-7650 • www.malibucity.org

PHOTOVOLTAIC SYSTEMS

A GUIDE TO PLAN CHECK REQUIREMENTS & INSPECTION REQUIREMENTS

This guide outlines the plan check submittal requirements and the inspections process for the installation of all residential and commercial photovoltaic (PV) systems within the City of Malibu. The intent of these guidelines is to provide a standardized outline of requirements to obtain code compliance in both the plan check and the inspection process and to facilitate the installation of the photovoltaic system in a safe compliant manner with a minimum of effort and cost. All photovoltaic system proposals should fundamentally include adequate component documentation, structural attachment, and code compliant wiring methods. When installations fail to meet these minimum requirements, the PV system may pose a potential hazard to public health and safety, and to private and public property.

All photovoltaic system installations will require an approval from the Planning Division. Their review will verify conformance to setbacks, height, and conformance with other local ordinances and the Local Coastal Implementation Plan. Generally, a standard roof or ground mount installation will be approved “over the counter”. Complex or large installations may require a detailed planning review that necessitates a review submittal into the planning division. Please contact the planning division at 310-456-2489, extension 485 if you have questions regarding the PV Planning Approval.

All Photovoltaic Systems will require the issuance of an electrical permit for the electrical installation and equipment, and a building permit for the structural attachment of the array whether roof mounted or ground mounted. The City of Malibu is located within Exposure C with a design wind speed of 110mph. *Wind Uplift structural calculations, stamped and signed will be required for all installations.* The calculations and the necessary information required include the total weight of the arrays, roofing material present, and array mounting hardware detail sheets. The calculations must demonstrate the existing roof elements will support the array and withstand the wind uplift forces for the Exposure C zone for both the roof structure and the roof mounting hardware. *Stamped and signed structural calculations* for wind uplift will also be required for ground mounted Photovoltaic Systems.

All Photovoltaic Systems must show compliance with 2017 Los Angeles County adoption of California Building Code Residential Code R324, including section R324.7 Access and Pathways. Review of this section will be conducted by the City of Malibu

Please contact the plan check staff with any questions regarding attachments and wind uplift resistance Daryl Schay 310-456-2489, extension 299 or dschay@malibucity.org.



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PHOTOVOLTAIC SYSTEM PLAN CHECK REQUIREMENTS

The following information is required for all Photovoltaic System Plan Checks.

ADMINISTRATIVE:

- Planning Division Approval prior to plan check submittal (3 sets of plans)
- 2 - complete sets of plans with above listed approvals
- 2 - Submittal packages of all manufacturers information and specifications

SITE PLAN:

- Full dimension site plan identifying property lines, lot size, streets, and all structures located on the property with dimensions to property lines
- Roof plan with Array Panel layout showing compliance with Residential Code R324.7 Access and Pathways for roof mounted systems
- Plot plan with location of ground mounted array for ground mounted system
- Location of service meter and all photovoltaic system components

PLANS REQUIRED:

- Site plan (see above)
- Single line diagram with:
 - Array configuration
 - Array wiring identified
 - Combiner/Junction box identified
 - Conduit from array to PV power source disconnect identified
 - Equipment grounding
 - Disconnect identified
 - Inverter specified
 - Conduit from disconnect to inverter identified
 - Conduit from disconnect to panel identified
 - System grounding
 - Point of connection attachment method identified

NOTES REQUIRED ON PLANS:

- "All work shall comply with 2017 Los Angeles County Residential Building Code; 2017 Los Angeles County Electrical Code"
- "All work shall be performed by a California Licensed Solar Contractor (C-46) or a California Licensed Electrical Contractor (C-10)"
- "Local utility provider shall be notified prior to use and activation of any solar photovoltaic system installation"

INVERTER INFORMATION:

- Inverter manufacturers information and specifications
- Inverter Model Number: _____
- Inverter Listed for utility interactive
- Maximum continuous output at 40°C: _____
- Input voltage range of inverter: _____

PV MODULE INFORMATION:

- PV Module manufacturers information and specifications
- PV Module listed
- Open-circuit voltage (Voc) from listing label: _____
- Maximum permissible system voltage from listing label: _____
- Short-circuit current (Isc) from listing label: _____
- Maximum series fuse rating from listing label: _____
- Maximum power at Standard Test Conditions (Pmax on label): _____
- Voltage at Pmax on listing label: _____
- Current at Pmax on listing label: _____

ARRAY INFORMATION:

- Number of modules in series: _____
- Number of parallel source circuits: _____
- Total number of modules: _____
- Operating Voltage (number of modules in series X module current a Pmax)

- Maximum system voltage(690.7): _____
- Short-circuit current (690.8): _____

WIRING AND OVERCURRENT PROTECTION:

- Wiring type is 90° wet rated
- Conductor ampacities are sufficient
 - Maximum PV source circuit current: _____
 - Minimum PV source circuit current: _____
 - Minimum PV output circuit ampacity: _____
 - Minimum inverter output circuit ampacity: _____
- Source circuit overcurrent protection is sufficient
- Overcurrent protection on Inverter Output Circuit is sufficient (amps): _____
- Point of connection meets provisions of NEC 690.64/705.12
 - Point of connection busbar rating: _____

ROOF INFORMATION (for rooftop systems only):

- PV Array conductors are run through structure: _____
- Weight of array per square foot: _____
- Age of building (buildings less than 30 years old and array weight is less than 6lbs/sqft, engineering will not be required): _____
- Building is over 30 years old roof engineering required
 - Size of rafters: _____
 - Span of rafters: _____
 - Spacing of rafters: _____
- Roof material type: _____
- PV panel mounting attachment system: _____
- PV panel wind uplift calculations and details
- Method of sealing roof penetrations: _____

GROUND MOUNTING STRUCTURE (for ground mounted arrays only):

- Weight of array (lbs/sqft): _____
- Array support details provided
- Array support engineering for wind loads or seismic where required
- Array support engineering approved: ____ Yes ____ No
- Details for the attachment of module to mounting structure

REQUIRED PHOTOVOLTAIC SIGNAGE:

- DC Combiner/Junction Box:**

“Warning. Electrical shock hazard. The direct current circuit conductors of this photovoltaic power system are ungrounded but may be energized with respect to ground due to leakage paths and/or ground faults.”

“CAUTION: SOLAR CURCUIT” marking on all interior and exterior DC conduits, raceways, enclosures, and cable assemblies.

- DC DISCONNECT:**

“Warning. Electrical shock hazard. The direct current circuit conductors of this photovoltaic power system are ungrounded but may be energized with respect to ground due to leakage paths and/or ground faults.”

“PV System-DC Disconnect”

“Open-Circuit Voltage _____ Vdc”

“Operating Voltage _____ Vdc”

“Maximum System Voltage _____ Vdc”

“Operating Current _____ Amps”

“Short Circuit Current _____ Amps”

“Maximum Power _____ Watts”

- INVERTER:**

“Warning. Electrical shock hazard. Do not touch terminals. Terminals on both the line and load sides may be energized in the open position.”

- AC DISCONNECT:**

“Open Circuit Voltage _____ Vdc”

“Operating Voltage _____ Vdc”

“Maximum System Voltage _____ Vdc”

“Operating Current _____ Amps”

“Short Circuit Current _____ Amps”

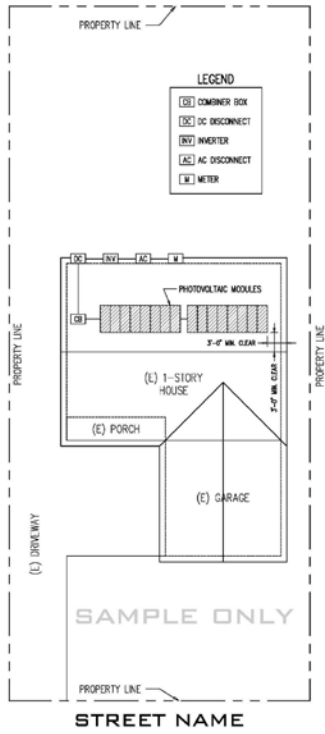
“Maximum Power _____ Watts”

- METER:**

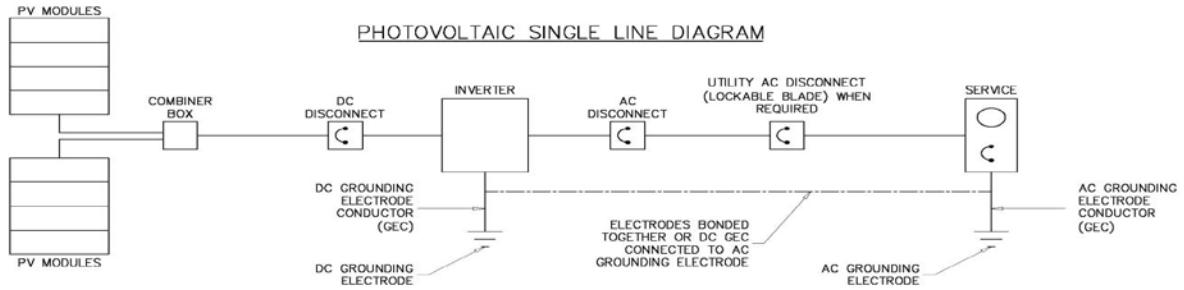
“Warning – Dual Power Supply”

“Caution: Solar Electric System”

SAMPLE SITE PLAN:



SAMPLE SINGLE LINE DIAGRAM:



- ALL WIRING IN A SOLAR PHOTOVOLTAIC SYSTEM SHALL BE IDENTIFIED
- FOR INFORMATIONAL PURPOSES ONLY.



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PHOTOVOLTAIC SYSTEM INSPECTION WORKSHEET

Inspectors shall verify all elements of the Photovoltaic installation identified herein have been completed satisfactorily prior to final approval of the installation and authorization to activate the Photovoltaic System.

ONE LINE DIAGRAM:

- PV Module number correct
- PV Module properly grounded with lugs on each module or equivalent
- PV array wiring compliant with plans
- Conduit and cable supports
- Plug connectors fully engaged
- Inverter model number correct

STRUCTURAL ATTACHMENT OF ARRAYS:

- Supports or footings match approved details
- Model attachment match approved details

PV SYSTEM SIGNS:

- Durable signs to withstand environment
- DC Combiner/ Junction box warning statement
- Signage identifying Photovoltaic Power Source at DC disconnect(s)
- Warning sign
- PV-DC disconnect
- Open Circuit Voltage
- Operating Voltage
- Maximum system voltage (690.7)
- Operating Current
- Short-circuit current (690.9)
- Maximum Power
- Inverter
- Warning sign
- Signage identifying AC point of connection (690.54)
- Maximum power
- Open Circuit Voltage
- Operating AC Voltage
- Maximum system voltage
- Operating current
- Short Circuit current
- Meter
- Warning – Dual Power Supply
- Caution: Solar Electric System

FINAL APPROVAL AND ACCEPTANCE

- Installation in conformance with approved plans and the NEC



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PHOTOVOLTAIC FEES

The below listed fees are subject to change and shall be based on the most recent City of Malibu Fee Schedule. All fees can be found on the City website in the following location, www.malibucity.org/fees.

Standard Photovoltaic Systems:

APPROVALS:

PLANNING APPROVAL:		Contact Planning Dept.
ELECTRICAL PLAN CHECK:	½ HOUR	\$ 91.50
BUILDING PLAN CHECK :	½ HOUR	\$ 91.50

PERMITS:

ELECTRICAL PERMIT:	½ HOUR INSPECTION	\$ 91.50
BUILDING PERMIT:	½ HOUR INSPECTION	\$ 91.50
BUILDING STANDARDS COMMISSION FEE:	\$1 per \$25,000 of valuation	
BUILDING STRONG MOTION SURCHARGE:	0.00013 x valuation	

Any additional Photovoltaic fees and charges have be waived by the City of Malibu in the interest of promoting renewable energy sources, energy saving technologies, and green building strategies.