



Carson City Building Division

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PHOTOVOLTAIC SYSTEMS

Scope:

This information is applicable to photovoltaic panels or arrays installed as a supplemental power source to the available power feed from your local utility. Photovoltaic panels installed as part of a stand-alone alternative power system for a dwelling, in lieu of power from your local utility. These requirements are applicable to both residential and commercial installations.

For submittal purposes, it is assumed the system design may include battery storage with an inverter to convert the Direct Current (DC) to Alternating Current (AC), or a system with Direct Current (DC) converted to Alternating Current (AC), which is then utilized onsite or sold back to the utility. For systems designed to strictly use DC power with DC utilization equipment, please contact the Carson City Building Division staff for further information and requirements.

General Information:

- These permits are issued to a Nevada licensed **Electrical Contractor** possessing Carson City Business License. The Electrical Contractor shall possess a Nevada State Contractors Board (NSCB) licensing type C-2 or C-2g. **OR** residential installations being issued to an **owner/builder** in compliance with the requirements of Nevada Revised Statute (NRS) 624.031. **OR** issued to a contractor or party approved at the discretion of the Chief Building Official.
- Due to Carson City's snow and wind loads, roof mounted systems shall include design by a Nevada licensed Engineer. The design shall take into consideration the dead load from the system components, as well as the potential for accumulated drifting snow and any wind loading placed on the attachments.

NOTE: This requirement is not applicable to ground mounted systems; however, a mounting detail, furnished from the manufacturer will be required as a part of the plan submittal, or a mounting detail from the Electrical contractor installing the system will be accepted as an alternative.

- All ground mounted systems, and all commercial roof mounted systems shall comply with the requirements of the Carson City Planning Division. For additional information, please contact the Carson City Planning Division at (775) 887-2180.
- Plans shall be on **11" x 17" or larger** paper sizes, and all design sheets within the plan set should be the same size. The plans shall be designed to comply with applicable minimum approved scale.
- Plans **shall be photocopies, or original blue or black ink drawings**. The use of colored ink, other than blue or black, or the use of colored ink beyond that which is used for licensing seals and/or original signatures on plan sets, would constitute grounds for an automatic rejection of the application. Plans with original pencil drawings or notes will be rejected.
- Plans shall be fully dimensioned, and drawn to an **approved architectural scale 1/4"=1'-0" minimum**, with plan **details and elevations prepared using a 1/2"=1'-0" or greater scale**. The scale shall be indicated on each page, and separate detail or elevation. **Site plans** shall be fully dimensioned and drawn to one of the following **approved engineering scales: 1"=10', 1"=20' & 1"=30'**
- **When plans are prepared by an Owner/Builder**, in compliance with Nevada Revised Statute (NRS), the plan set must have the owner's name and address printed under the heading of "Designer" the cover sheet. Below this information shall be an original signature with date of signing. To avoid confusing this signature with a copy or facsimile, Carson City Building Division staff recommends that this signature be in colored ink. (Some color other than black)
- **Plans prepared by a Nevada licensed Electrical Contractor** shall have the following information on the printed in a on the Cover Sheet of the plan set:
 - Business Name
 - Business Address
 - Bid Limit

- License Classification Type
- License Number
- License Expiration Date
- Name of Qualified Employee, with an original signature
- **Plans prepared by a Nevada licensed Registered Design Professional** (Architect, Residential Designer, or Engineer) shall comply with the applicable Nevada Administrative Code (NAC) for their licensure

Submittal

- A minimum submittal shall include the following items. Incomplete plan submittals will not be accepted:
 - **Two (02)** complete sets of plans **for Residential Systems** or **Three (03)** complete sets **for Commercial Systems** - which shall include the following, as applicable:
 - **Cover Sheet** – Indicate the project address, contractor(s) contact information, code(s) & adopted amendments used, Seismic Zone, Wind Load, Snow Load, and allowing an area for Carson City Building Division approval stamps and redline comments.
 - **Site Plan (Ground mounted systems only)** – The Site Plan shall indicate the location of the photovoltaic panels or arrays, with all underground electrical conduit(s) including material type and sizes (Ex.: 3" PVC, 2 ½" RMC, etc.). Show the location of the electrical main service panel with amperage (100 Amp, 200 Amp, etc.), voltage and phasing identified. Also, indicate the transfer switch type (automatic versus manual) at the service.

NOTE: For residential properties on well and/or septic one (01) additional site plan shall be submitted for review by the Carson City Health & Human Services Dept. (HHS)

- **Foundation Plan (Ground mounted systems only)** – This is a dimensioned plan view of the footing locations, with details showing the footing designs.
- **Roof Plan** – This is a plan view of the panels and system installation. Typically, this plan sheet include the mounting details, unless prepared separately by a Registered Design Professional (Architect, Residential Designer, or Engineer)
- **Building Elevation / Screening Detail (Commercial only)** – A building elevation is used to establish that the roof mounted panels on commercial buildings are not seen from street level. This typically includes a screening detail, if necessary, to shield the collectors from street level. Please contact the Planning Division for clarification.
- **Floor Plan** – This is a scaled **Electrical Floor Plan** of the photovoltaic equipment room or building used to house the batteries, inverter and any applicable equipment. The Floor Plan must include the type, location and size of all vents used to vent the gases from the battery banks, if applicable.
- **Electrical One-Line Diagram** – This is a line drawing, which shows the components of the system, and their relationship to each other in the installation. This is not a scaled drawing, but is merely a conceptual representation of the system design used to verify compliance. The one-line diagram shall show the photovoltaic panels or arrays, the Over Current Protection Device (OCPD) type rating and size (circuit breaker, fuse, etc.), the conductor sizes/types and the wiring method used, with panel voltage, phasing, and size in amperes. Show the inverter type and rating along with the type and size of all system batteries.

NOTE: Indicate if the photovoltaic panels will be wired in series (voltage multiplied – individual module times voltage) or parallel (current multiplied – individual module times ampere). If this information is not provided, staff will assume that the modules are wired in parallel.

- Provide a **Load Calculation** of the total ampere and voltage generated by the photovoltaic array.

Note: A 125% short circuit increase is required on the photovoltaic array, and a further 125% increase is required on the conductor size. (*'11 NEC 690.8(A)(1) & 690.8(B)(1)*)

- Two (02) copies of the **manufacturer's specifications** for the panels, inverter, DC voltage panels, with Over Current Protection Device (OCPD), etc

NOTE: This information may be 8 ½" x 11" copies, submitted as supplemental supporting documents to the plans, which are 11" x 17" minimum.