



**Boulder County
Land Use Department
Publications**

Small Wind Electric Systems Checklist

Land Use Department
Courthouse Annex Building
2045 13th Street
PO Box 471
Boulder, CO 80302

**Building Safety &
Inspection Services:**
Phone: 303-441-3926

Email: building_official@bouldercounty.org
Website: www.bouldercounty.org/lu

Office Hours:

8 a.m.-4:30 p.m. Mon., Wed., Thurs., Fri.
10 a.m.-4:30 p.m. Tuesday

Building Permits can be applied for
and issued until 4 p.m.

Small Wind Electric Systems Checklist

Planning Review Requirements

Ground-mounted small wind electric systems require Site Plan Review Waiver (SPRW) approval in all zone districts provided they do not exceed the maximum height of the zone district. Ground-mounted systems will be reviewed through the Site Plan Review (SPR) process if they are proposed to exceed the height of the zone district, up to 80 feet. Small wind-powered energy systems cannot exceed 80 feet in height.

Roof-mounted small wind-powered energy systems are allowed without a planning review process provided the system does not exceed the roofline by five feet or the maximum height of the zone district by five feet. Larger roof-mounted systems (up to 15 feet) must be reviewed and approved through the SPRW process.

The cost for all planning reviews for residential scale wind turbines is \$100. To schedule a **Pre-application Conference** with a Planner, call 303-441-3930.

The SPRW or SPR process must be completed before a building permit application can be processed. Once your SPRW or SPR application has been approved, utilize the checklists in this handout to help prepare and submit your building permit application.

Building Plan Submittal Requirements

Per Article 694 of the 2014 NEC (National Electrical Code), Small Wind Electric Systems are reviewed by the county electrical inspectors.

The following checklist, along with the required items, is to be submitted with your building permit application. Each item on the list is to be marked to verify that it is part of the submittal. Incomplete information may result in plan rejection or delay in the approval of your project.

Provide the following information:

- A completed application form. Include the proposed wind electric system capacity in watts, and whether the system is a stand-alone or interactive-grid-tied system.
- A deposit (the balance of fees is due at the time of permit issuance).
- Two complete sets of plans and a digital copy of the PDF files are to be submitted to Building Safety and Inspection Services for plan review.
- Any documents or information required as part of a Site Plan Review approval.

Site Plan – Equipment Outside a Building

Please show the following on the site plan:

- Location of all disconnects.
- Location of all batteries.
- Location of all rectifiers, wind generator turbine(s).
- Location and connection of all grounding electrode conductors.
- Clearances around all equipment.
- Dimensions between equipment and structures.
- Dimensions between equipment and property lines.
- Proposed height of the wind-powered structure from grade to the highest part of the equipment.

Note: See the Pole or Ground Mounted Turbine Section for additional site plan requirements.

Floor Plan – Equipment Within a Building

- Show the location of all disconnects.
- Show the location of all batteries.
- Show the location of all rectifiers, inverters, & charge controllers.
- Show the location and connection of all grounding electrode conductors.
- Show the location of all equipment within structures.
- Label the use of the room in which the equipment is placed.
- Show clearances of the equipment.

Wiring Requirements

Provide a one-line diagram that includes the following information:

- Label whether the system is stand-alone or interactive-grid-tied.
- Conductor sizes.
- Conductor insulation types (i.e. THHN, THWN, direct burial cables, etc.)
- Conductor material (i.e. copper/aluminum).
- AC or DC load identifier labeling.
- Conduit sizes.
- Conduit material (i.e. non-metallic, EMT, etc.)
- Over current device ratings.
- Existing and new panel amperage ratings (buss ratings).

Equipment Requirements

Provide product listing sheets for all equipment with the following information:

- Wind turbine specifications and documentation showing all equipment as listed products.
- Fuse ratings.
- Rectifier and inverter output current ratings.
- Rectifier and inverter UL listings.
- All associated documentation (i.e. batteries, inverters, rectifiers, disconnects, charge controllers, over-current devices, etc).
- Method of grounding for live current carrying parts and equipment grounding for the metal parts of towers and supports of the wind turbines.
- Nacelles and other control equipment installed in exterior areas shall be listed and labeled for exterior installations and use.

Note: Lightning protection may be required to bond to the grounding electrode system.

Turbines

Roof Mounted Turbines

Provide the following information:

- Provide a structural plan approval from a Colorado Registered Structural Engineer approving the design for the anticipated dead loads and wind loads for the location. The approval should show how the existing roof structure will have the ability to support the added weight and lateral loads imposed on the roof. The engineer must reference the required wind and snow loads for the site.
 - See the current *Boulder County Ground Snow Load Map and Wind Speed Map* to find the wind/snow loading in the area of the proposed construction.
- For flat roof installations provide method of roof repair for roof penetrations.

Pole or Ground Mounted Wind Turbines

Provide the following information:

- Site Plan Review waiver approval (as of June 2009)
- Site plan to include the following:
 - Location and height of wind turbine support on property.
 - Dimensions of structure to other structures from the property lines.
 - Dimensions of structure to other structures on the property easements including any existing utilities.
 - Engineered structure and footing designs. (See structural approval above).

Small Wind Electric System Rough Inspections

Boulder County will perform a rough inspection on the small wind electric system. This inspection should be scheduled after the installation of the supporting framework for the wind turbine has been installed to the footings and/or roof mounting supports, the bonding and grounding is installed, and the nacelle, rectifier, charge controller, and/or inverter equipment may be in place. Open trenching for the supply conductors from the wind electric system support structure to the service equipment should also be inspected at this time to verify the correct trench depth and the type and size of the conductors. In addition to the rough inspection, at the completion of the work, the Building Safety and Inspection Services team will also conduct a final inspection. Please call for these required inspections when ready.

If you have any questions, contact Boulder County Building Safety and Inspection Services:

Plan Review Staff: 720-564-2640

Email: building_official@bouldercounty.org



