

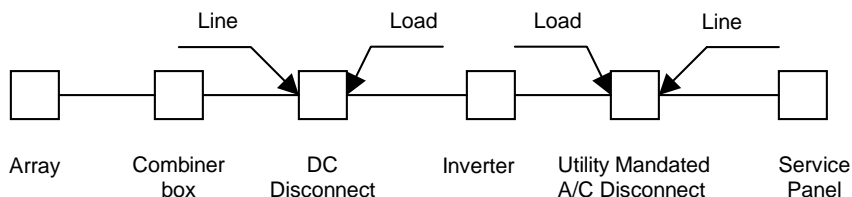
## Alternative Energy

### PHOTO VOLTAIC SYSTEMS

#### Electrical Requirements

- ❑ Photo Voltaic (hereafter referred to as PV) plans must be organized so that required items are presented in the order they appear on the checklist. Plans not correctly organized must be submitted and will not be reviewed as a walk through and additional charges will apply.
  - ❑ The first requirement is to involve your local Electrical Utility. PPRBD will require, in writing, Utility approval of Inverter and location of Utility mandated A/C disconnect.
  - ❑ Floor/Site plan showing the following:
    - The direction north.
    - Location of all existing and new Service Gear and Electrical Equipment relative to structures involved in this scope of work.
    - Location of all utility mandated equipment.
    - Routing of all raceways clearly showing Interior and Exterior.
  - ❑ Manufacturers Specifications for all new electrical equipment being installed as part of this scope of work. (Including method of grounding PV modules).
  - ❑ Calculations page showing in order:
    - Number of modules per string
    - ISC of each string
    - Conductor sizing per NEC (Use methods and terminology found in the NEC).
    - Temperature derating per 310.15(B)(2)(c) NEC (if derating from 90 degrees C conductor insulation in wet locations must be type 2 i.e. USE-2 etc.).
    - Compliance with 310.15(B)(2)(A) NEC
    - Compliance with 690.64 (B) NEC
    - Voltage of Battery Assembly
  - ❑ One Line (Must be on separate sheet for residential)
    - Conductor size type and quantity.
    - Conduit size type and quantity.
    - Routing and size of D/C Grounding Electrode Conductor.
    - All new and existing electrical gear involved in this scope of work.
  - ❑ Disconnect installation and system labeling.
    - All exterior disconnects must have engraved mechanically fastened label mounted on the exterior of the gear. This includes labeling on exterior panels to comply with 705.10 NEC. **NOTE: DO NOT COVER MANUFACTURERS INFORMATION!**
    - All interior labeling must be durable and affixed to the exterior of the equipment being labeled.
    - The wording for compliance with 705.10 NEC must be as follows (all sources must be listed).
      - “Multiple electric power sources present on the premises”
        - Utility power source
        - PV source
        - Wind generator
        - Internal combustion generator
        - Etc.
- For compliance with 705.10 NEC for exterior service panel, see above

One line for basic Utility Interactive Photo Voltaic System:



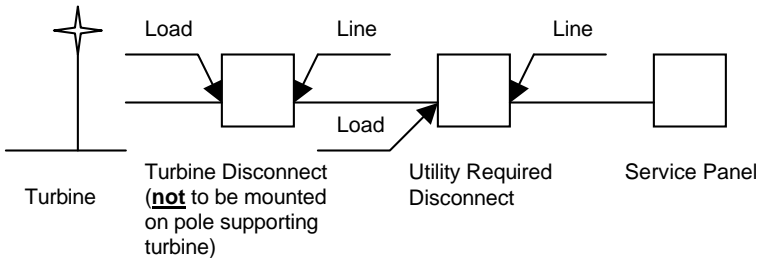
#### Construction Requirements

- ❑ Provide diagram of array placement
- ❑ Determine if system is roof flat mount, roof elevated, or ground mount (over 6' in height)
  - Roof flat mount:
    - Provide installation instructions for racking system
      - Engineering required for site fabricated racking systems
  - Roof elevated Mount:
    - Provide installation instructions for racking system
      - Engineering required for site fabricated racking systems
    - Provide engineer letter regarding ability of existing roof to handle the elevated racking system
  - Ground mount (over 6' in height):
    - Provide framing plan or racking system installation instructions
      - Engineering may be required for site built frame systems

## WIND TURBINES

### Electrical Requirements

- ❑ Wind power generation plans must be organized so that required items are presented in the order they appear on the checklist. Plans not correctly organized must be submitted and will not be reviewed as a walk through and additional charges will apply.
  - ❑ Pikes Peak Regional Building Department( PPRBD) will require approval ,in writing, from your Utility specifically approving your turbine/inverter and the location of Utility mandated A/C disconnect and/or metering.
  - ❑ Floor/Site plan showing the following.
    - The direction north
    - All existing and new service gear and electrical equipment relative to the structures involved in this scope of work.
    - The location of all Utility mandated equipment.
  - ❑ Manufacturers specifications for all equipment being installed as part of this scope of work.(Charge controllers ,turbines ,etc.)
  - ❑ Calculations page showing in order.
    - Calculation of conductor size (Turbine output maximum \* 125% gives the ampacity to be used for calculations)
    - Buss in backfed panel shown to be loaded less than or equal to 120% of the buss rating.
    - Calculations must use methodology and terminology found in the National Electrical Code.
  - ❑ One line diagram ,on a separate sheet, showing:
    - Conductor size, type, and quantity.
    - Conduit size, type, and quantity.
    - Rating/Size of all overcurrent devices.
    - Rating of all panel busses involved in the scope of work
  - ❑ Requirements for disconnect locations and labeling.
    - Turbine disconnect must not be mounted on pole supporting turbine.
    - All exterior disconnects must have an engraved label mechanically fastened, mounted on the exterior of the disconnect. NOTE: DO NOT COVER MANUFACTURERS INFORMATION!
    - For turbines with A/C output, a disconnect is required at the pole. This disconnect is not allowed to be mounted on the pole.
    - The service panel must be marked to comply with 705.10 NEC. The wording must be as follows and must appear on the exterior of the panel.
      - “Multiple electric power sources present on the premises.”
        - Utility power source
        - PV power source
        - Wind generator
        - Internal combustion generator
        - Etc. (Every source must be listed)
- For compliance with 705.10 NEC for exterior service panel, see above.



### Construction Requirements

- ❑ Soils report
- ❑ Engineered foundation design
- ❑ Manufacturers information regarding support pole
  - If support pole is to be site fabricated, engineering will be required for the pole.