

Redington Wind Farm "Narrow Road" Specifications

Rev E

1. Standard Travel Width: 12' travel width

- a) Shoulder width will be 2' each side.
- b) Wide-outs may be built approximately every 1/2 mile for passing, 20' travel width for 200' length.
- c) Vegetation must be cleared, no higher than road surface, 6' beyond each shoulder.

2. Mountaintop Travel Width: 32' travel width

- a) Shoulder width will be 2' wide on inside shoulder and 4' wide on outside.
- b) Roadway will be built as 32' wide for initial construction period to allow safe movement of the turbine assembly crane on the mountain-top.
- c) Roadway will be seeded and allowed to revegetate to a nominal width of 12' after construction.

3. General - Road Curves

- a) Travel surface width in curves will be designed wide enough to accommodate a non-rear-steering trailer with a 50' wheelbase.
- b) Vegetation must be cleared, no higher than road surface, 6' beyond each shoulder.

4. Minimum Outer Curve Radius: 115'

- a) Minimum outside curve radius is designed to accommodate 90 meter turbines, with 45 meter blades.
- b) Minimum road travel width through a switchback turn will be wide enough to accommodate a non-rear-steering trailer with 50' wheelbase.
- c) Shoulders and terrain must be even with the road surface, and vegetation no higher than 2' above the road surface, on all affected areas of curves needed to accommodate the passage of 145' long blades. Blades will be transported using front- and rear-steering trailers, with a maximum blade overhang past the front wheels of 20', and a maximum overhang past the rear wheels of 70'.

5. Maximum Vertical Crown: As Noted

- a) The maximum vertical crown specification will apply to both crowns (high points) and dips (low points).
- a) The maximum vertical crown for standard approach roads will be 30" /50'.
- b) The maximum vertical crown for mountaintop (crane transit) roads will be 6" /50'.

6. Surface Grading

- a) Road surfaces will be smooth, without potholes, for transportation of turbine components.
- b) Side-to-side slope on all standard approach roads must not exceed 5%.
- c) Side-to-side slope on mountaintop (crane transit) roads must not exceed 1%.
- d) Maximum new road vertical grade will be 14%. Short sections of existing incoming roads are permissible up to 18%.

6. Nacelle Truck Dimensions

The nacelle will be transported on a 7-line platform trailer the wheelbase is 40' long by 10' wide 56 tires (we can provide drawing).

7. Blade Truck Dimensions

This is a custom configured blade truck. A "normal" truck would have entirely different configurations. Wheelbase is ~ 50'. Front overhang is 20', rear overhang with the V90 is ~ 70"

Overall Weight:

The Vestas V80 transport specification shows the "float" (trailer) and tractor at 50K kG (55 Tons), and the Nacelle and associated frame, adapter ring and lifting yoke at a sum of 75K kG (81.5 Tons). A leading transportation firm indicates these are ballpark worst-case numbers.

Axle/Trailer Loading:

The blend of information from a transportation firm and p7-9 of the Vestas spec is to assume 15 Tons/axle as a worst-case axle load, spread across the 12 foot road width. The tractors will use 4 big tires, the trailers up to 8 (see below). This is slightly below the Vestas' spec, which says 15 metric tons / axle on p 5, but should be OK, as we will use "more wheels" to get up Redington.

Trailer Length:

Transportation firm will use a platform trailer at Redington. The platform trailer is 40' long, with 8 axles, 8 wheels per axle, approx. 5' spacing between axles.

An alternate trailer is shown in the Vestas transportation specification, which is longer, with less axles, (the "low boy" designed for highway use). One of these might be used for the 70 ton electrical transformer. If loading is an issue, we would switch to the platform trailer mentioned above.

For the Tractor, please use the dimensions from the Vestas spec, p8, which shows 25 feet (8 meters). Actual tractor lengths, and the axle spacing, may be different than this.