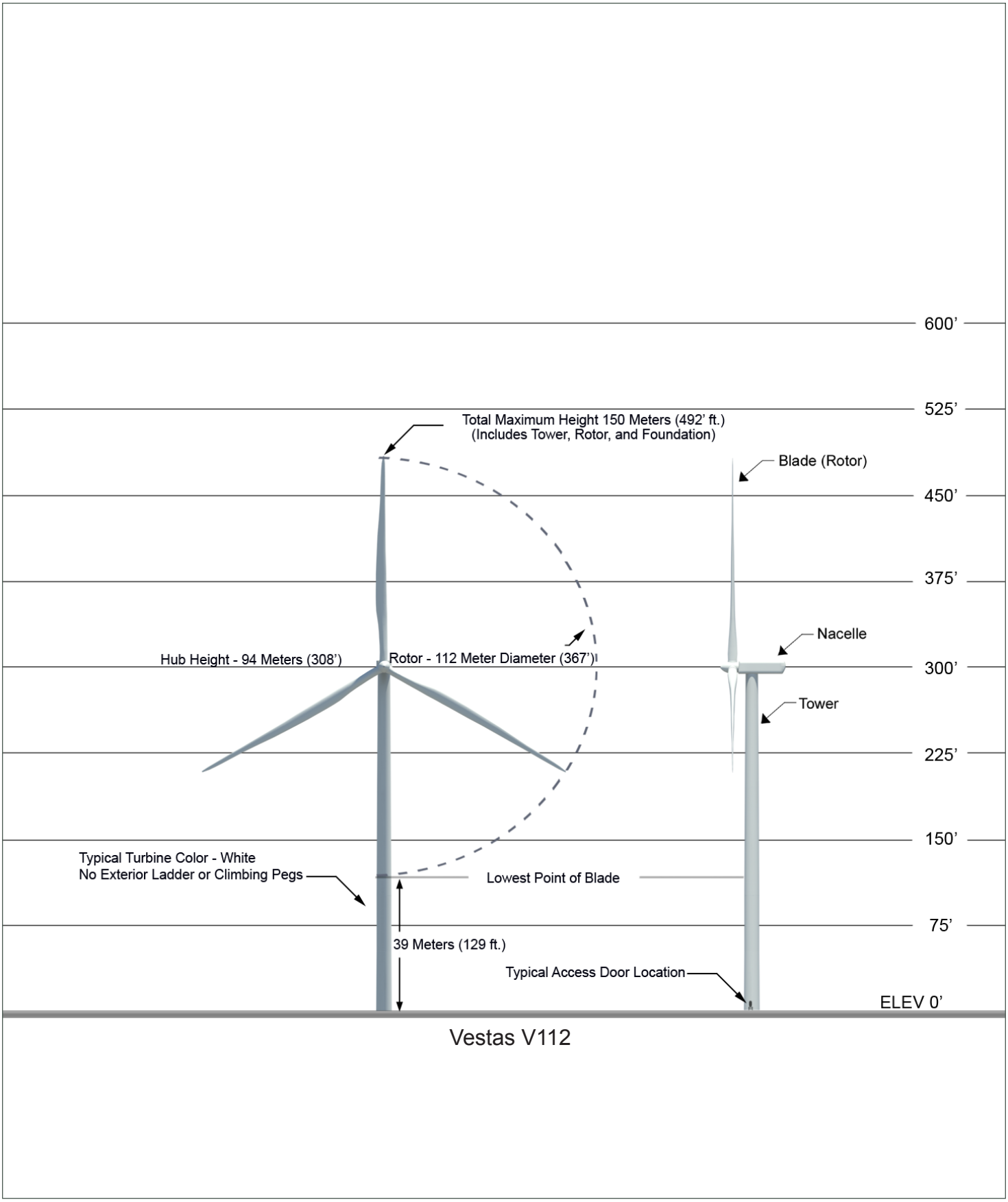



Vestas V112

Title

**Marble River Wind**

*Towns of Clinton and Ellenburg - Clinton County, New York*

Computer Model of Proposed Turbine
Vestas V112

June 2010

Author

MARBLE RIVER WIND FARM

Horizon Wind Energy
An EDP Renewables Company

EDR

# V112-3.0 MW

### Designed for low cost of energy

Designed for low and medium wind speed sites, the V112-3.0 MW turbine delivers a highly competitive cost of energy. The turbine delivers high productivity due to its large swept area, higher rotor efficiency and better serviceability and reliability, which in turn improve availability. Its reliability is assured through Vestas state-of-the-art testing centre.

The turbine design blends new, yet proven, technical advancements with established Vestas concepts from other platforms. Examples of existing concepts are the pitch and yaw system, control system and the free flow CoolerTop. A new concept is our GridStreamer™ technology which provides excellent grid compliance for existing and future requirements, lower balance of plant costs and better system optimisation possibilities leading to higher production. The V112-3.0 MW provides maximum siting flexibility for customers worldwide as it is split into 70-tonne modules during transportation, enabling use of standard equipment and trailers.

The turbine components are designed with modularity in mind. The resulting plug-and-play system makes it easier to service and hence minimises loss of production. To a large extent the modules are standard parts across the turbine platforms, leading to better control over the supply chain and faster component replacements.

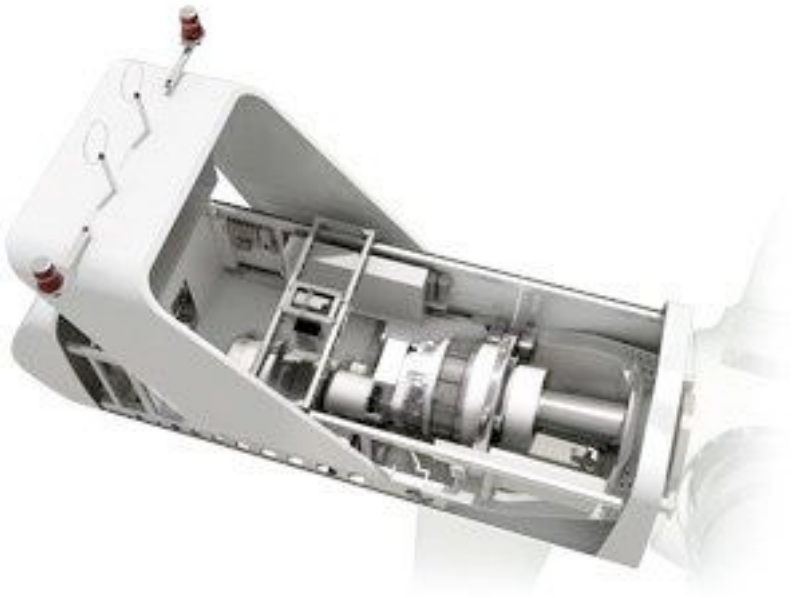
# Data

### Operational data

Rated power: 3,000 kW
Cut-in wind speed: 3 m/s
Rated wind speed: 12 m/s
Cut-out wind speed: 25 m/s
Wind Class – IEC IIA and IEC IIIA
Max. Altitude: 2000 m
Operational temperature range: standard range -20°C to 40°C (low temperature option -30°C to 40°C)

### Rotor

Rotor diameter: 112 m
Swept area: 9,852 m2
Operational interval: 6.2 to 17.7 rpm
Nominal revolutions: 12.8 rpm



### Electricity

Frequency: 50 Hz/60 Hz
Converter type: full scale converter
Generator type: permanent magnet generator

### Power regulation

Pitch regulated with variable speed