

Wind Turbines



Transport Guidelines

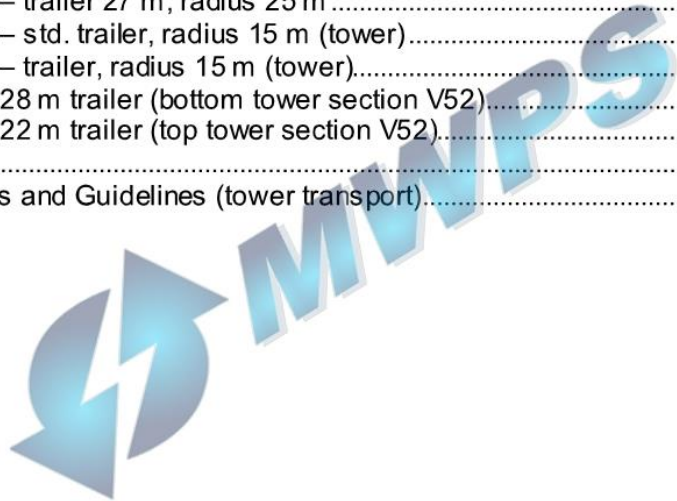


Practical Information on Transport

For guidance only

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TRANSPORT GUIDELINES
VESTAS V52**

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PREFACE

Please note that the following pages do not contain details on the measurements and weight of individual turbine components. This information can be found in the General Specifications for the turbine type in question.

As for details on turbine installation procedures please contact our Service Department.

Sea Transport

According to the Vestas Group Insurance policy we hereinafter refer to the following:

The marine transit rates agreed for this insurance apply only to cargoes and/or interests carried by mechanically self-propelled vessels of steel construction, classed by classification societies (to be informed upon request). Provided such vessels are:

- a) (i) not bulk and/or combination carriers over 10 years of age.
(ii) not mineral oil tankers exceeding 50,000 GRT which are over 10 years of age.
- b) (i) not over 15 years of age, OR
(ii) over 15 years of age but not over 25 years of age and have established and maintained a regular pattern of trading on an advertised schedule to load and unload at specified ports.

ROAD STRUCTURE

The road structure fully depends on the contours of the land whether based on crowned roads or side sloped design.

Drainage

Water should always be drained from the road and can never be allowed to stay on the road.

It should be drained either to the surrounding fields or be led to a drainage point beside the road. In order to do so, it is necessary to plan for this already at the base level.

Material

Base material must be interlocking rock/stone NOT containing clay but sand/gravel or other non-water binding material.

The finish material must be compactable non-slippery gravel.

Load capacity

The thickness of the base depends on the underlying soil – a soil analysis may be necessary.

The thickness of the finishing material should be min. 30 cm to ensure that there is enough material for grading the road afterwards to avoid bringing up heavy material from the base material.

The load capacity per axle should never be less than 15 ton/metric per axle.

DELIVERY REQUIREMENTS

VESTAS V52

Figures are based on a two sectional 49 metre tubular tower

Parameter	Units	Value
Delivery	*****	*****
Access road minimum width	m	5.0*
Access road minimum bend radius	m	See drawings: page 7-16
Access road maximum longitudinal slope	degrees	8 ^{°**}
Access road maximum lateral slope	degrees	0-2 [°]
Access road minimum specification (axle load)	ton	15 t
Erection – See Erection Manual	*****	*****

* Straight road

** Based on drained roads consisting of crushed rock or similar with top layer of gravel. Gradients in excess of 8° (1:7, 14%) are subject to acceptance by the haulier and the Crane Hire Company. A general inspection by Vestas, the Carrier and the Client of the access and site road is essential.

Additional Information

The area used for the erection crane should not be in excess of 1° (1:20) (2%) in the longitudinal and lateral slope.

The area for truck unloading should not be in excess of 1° (1:20) (2%) in the longitudinal and lateral slope. (Area for erection crane and truck unloading do not have to be on same level)

As for transport and erection requirements on V47 turbines with a tower height of more than 50 meters, please contact Vestas for further assistance.

CRADLES AND FLANGE BRACKETS

Cradles or flange brackets are used for tower support during storage and transport. Lifting brackets for towers are used during loading and unloading of towers. If the towers are supplied by Vestas, Vestas will also be able to supply the cradles or flanges brackets and lifting brackets.

This should be agreed upon in each case.

Cradle



UNLOADING AND ERECTION EQUIPMENT

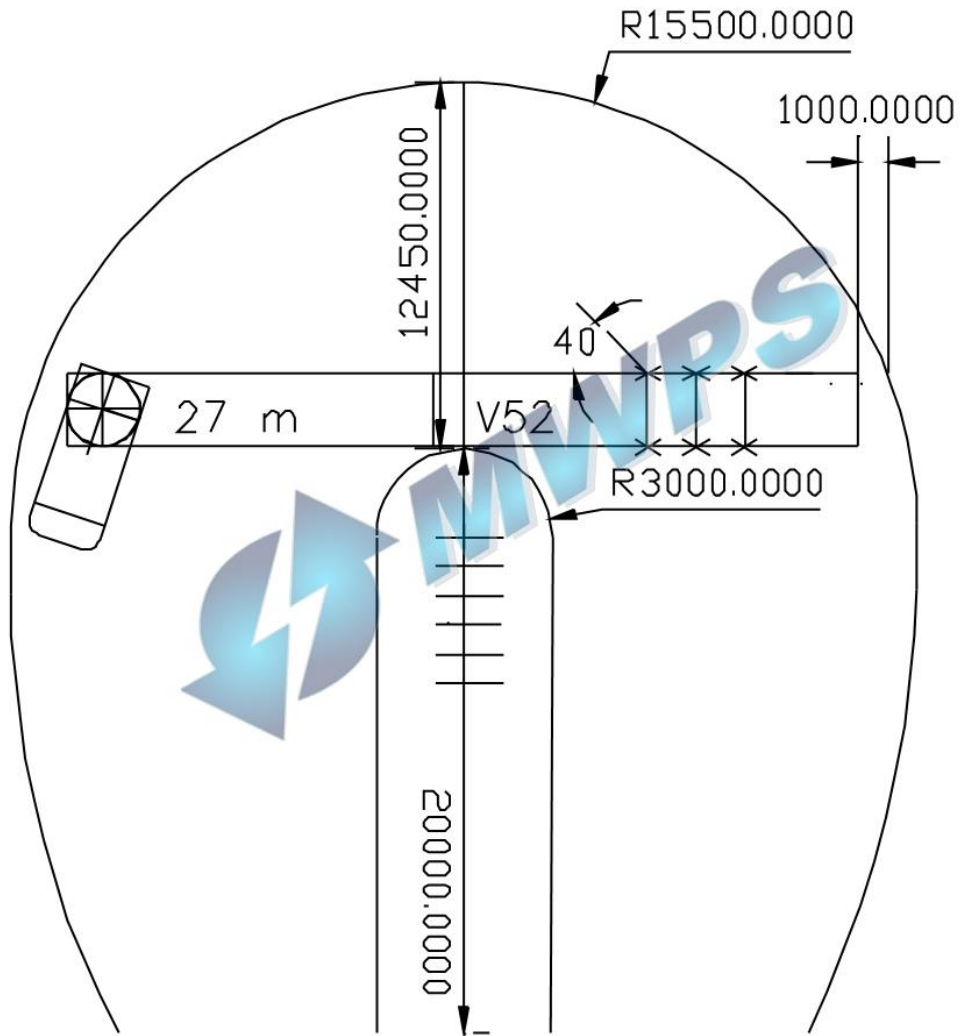
Special unloading and erection equipment (certified for Vestas by Third Party) are supplied by Vestas, but we recommend that Crane Companies bring their own standard lifting slings and shackles for general lifts.

ROAD TRANSPORT WITH TRAILER, 27 M

V52-850 kW blades

Radius required for 27 meter telescopic trailer with electric/hydraulic manually controlled rear steering wheels.

Radius: 3 meter

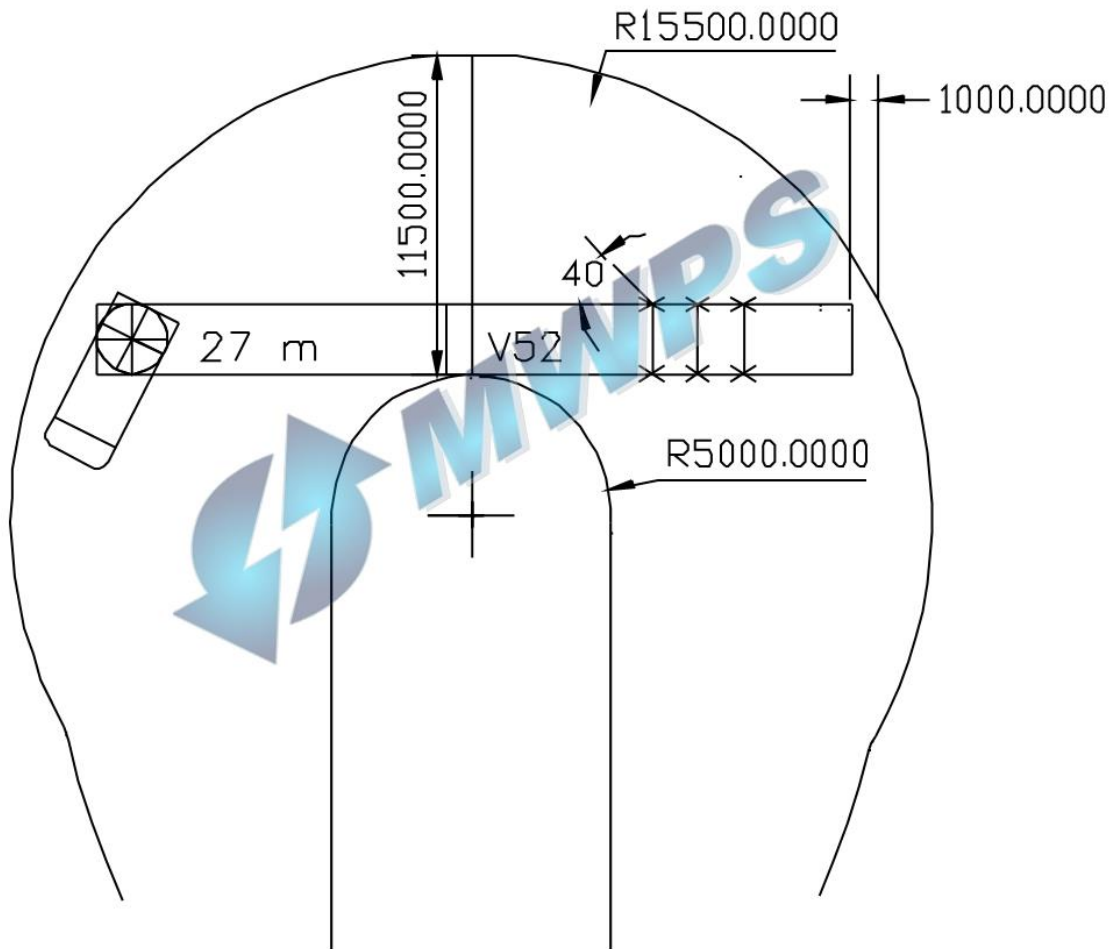


ROAD TRANSPORT WITH TRAILER, 27 M

V52-850 kW blades

Radius required for 27 meter telescopic trailer with electric/hydraulic manually controlled rear steering wheels.

Radius: 5 meter

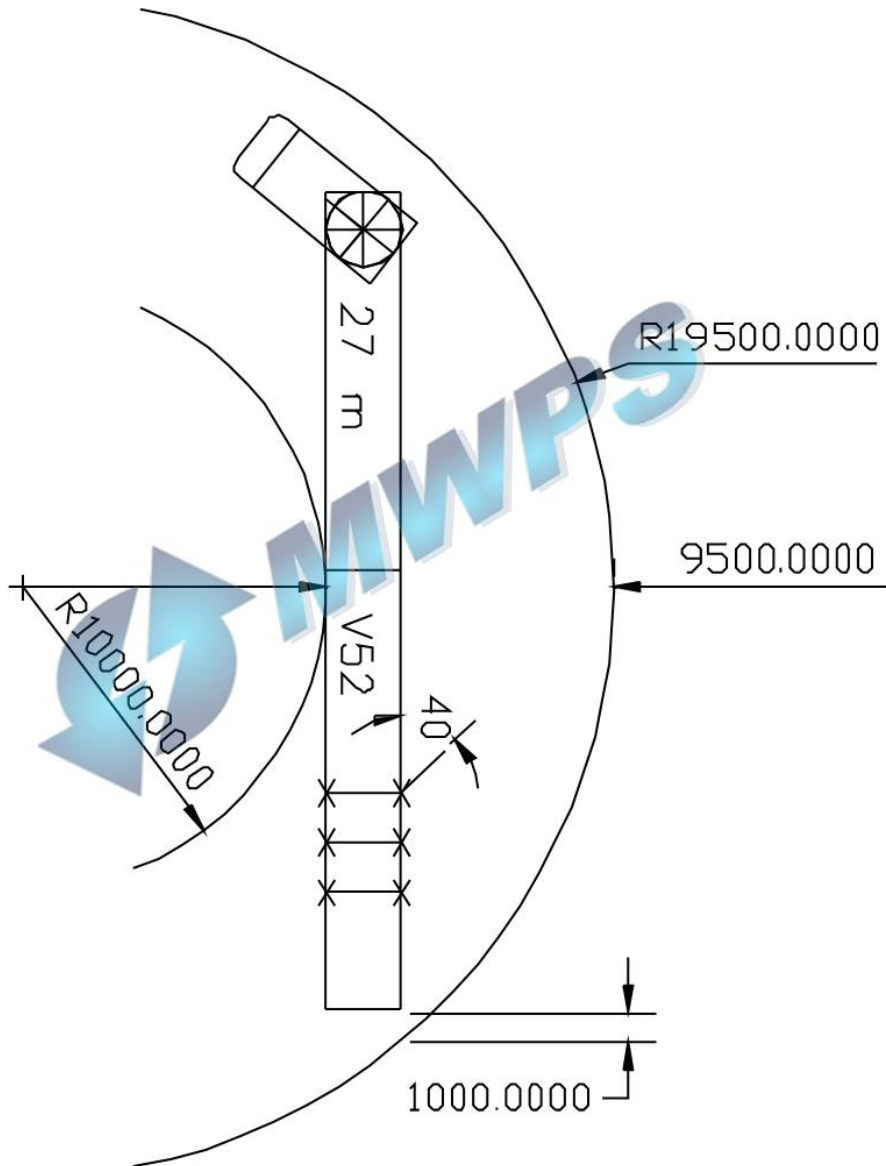


ROAD TRANSPORT WITH TRAILER, 25 M

V52-850 kW blades

Radius required for 27 meter telescopic trailer with electric/hydraulic manually controlled rear steering wheels.

Radius: 10 meter

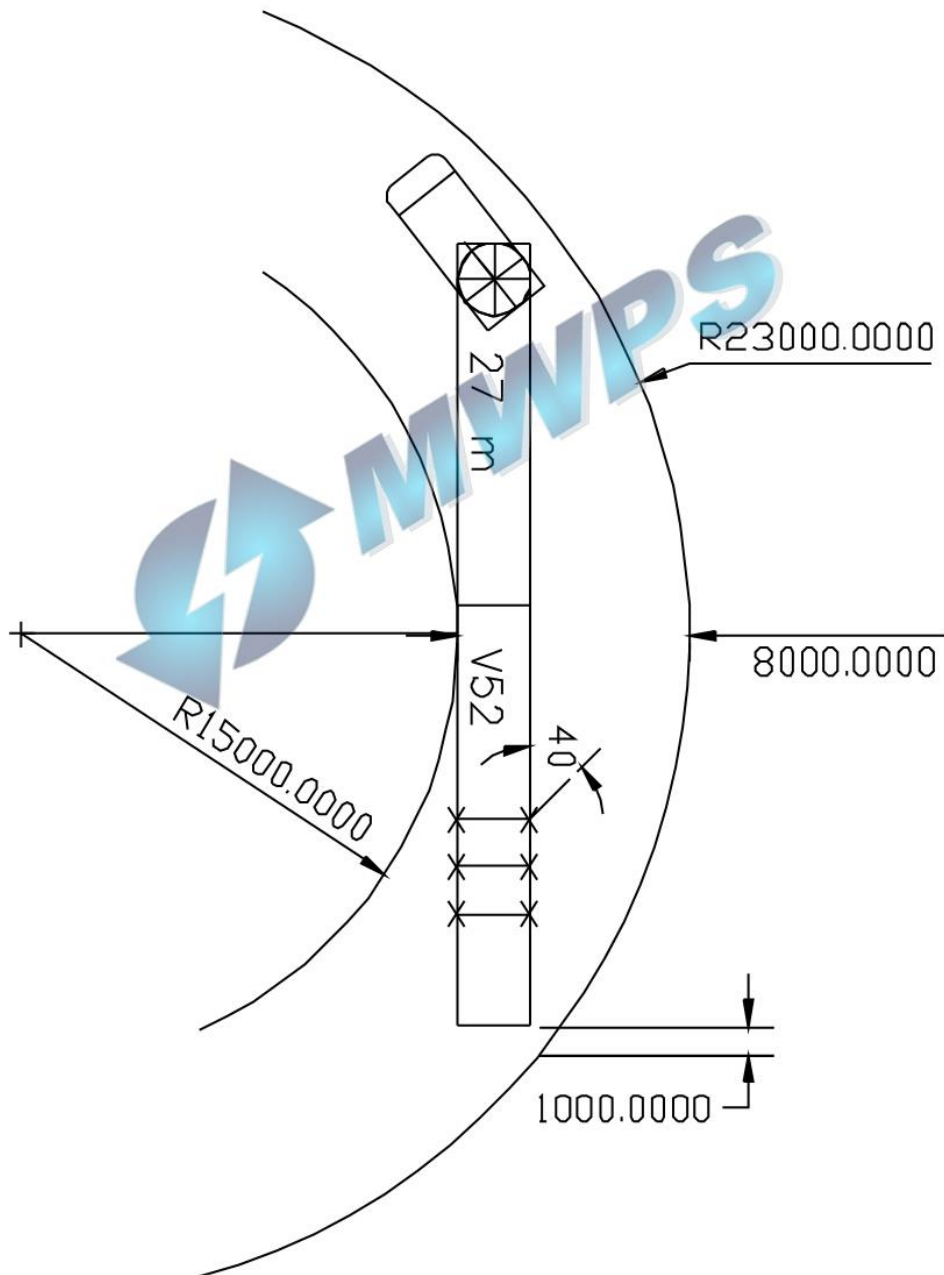


ROAD TRANSPORT WITH TRAILER, 27 M

V52-850 kW blades

Radius required for 27 meter telescopic trailer with electric/hydraulic manually controlled rear steering wheels.

Radius: 15 meter

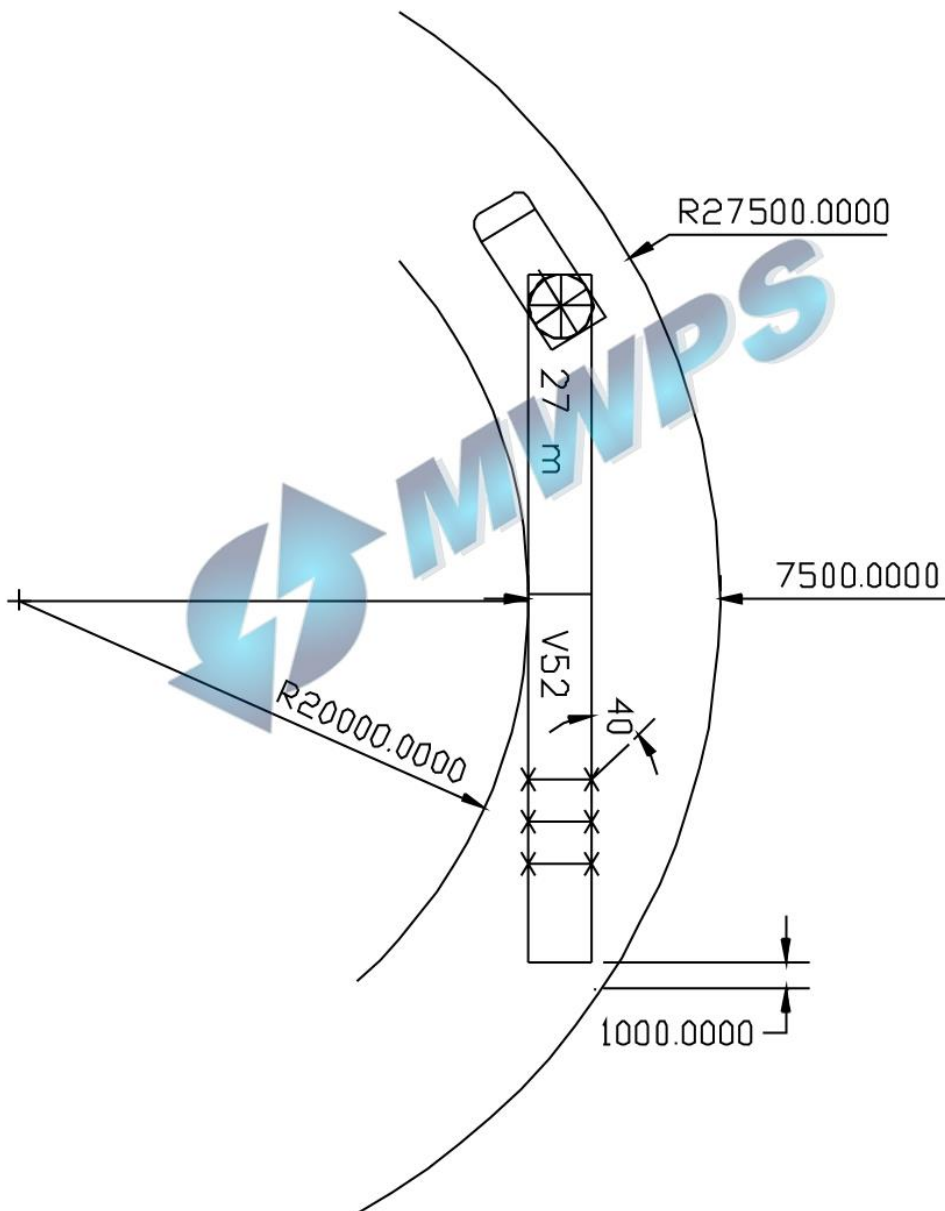


ROAD TRANSPORT WITH TRAILER, 27 M

V52-850 kW blades

Radius required for 27 meter telescopic trailer with electric/hydraulic manually controlled rear steering wheels.

Radius: 20 meter

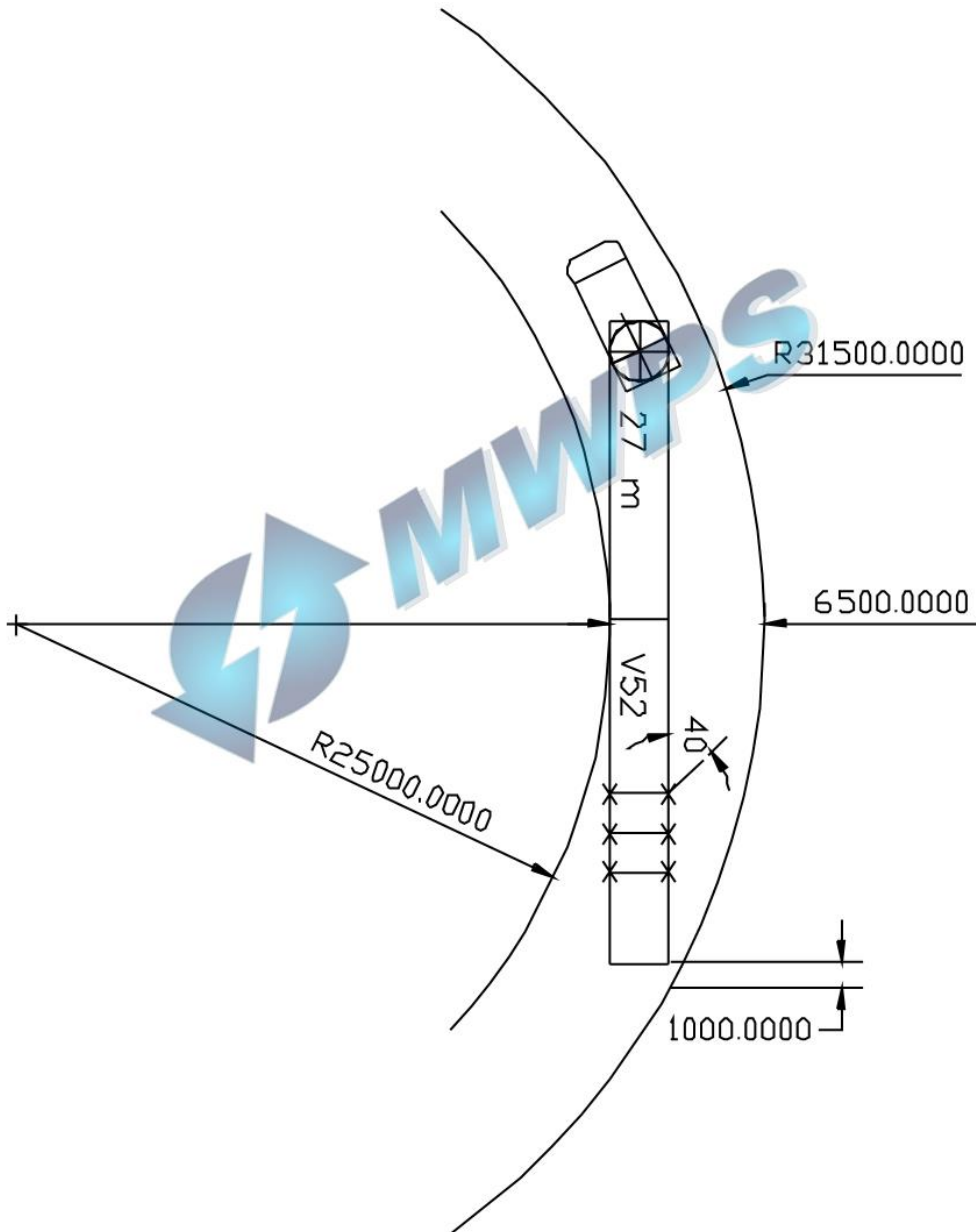


ROAD TRANSPORT WITH TRAILER, 27 M

V52-850 kW blades

Radius required for 27 meter telescopic trailer with electric/hydraulic manually controlled rear steering wheels.

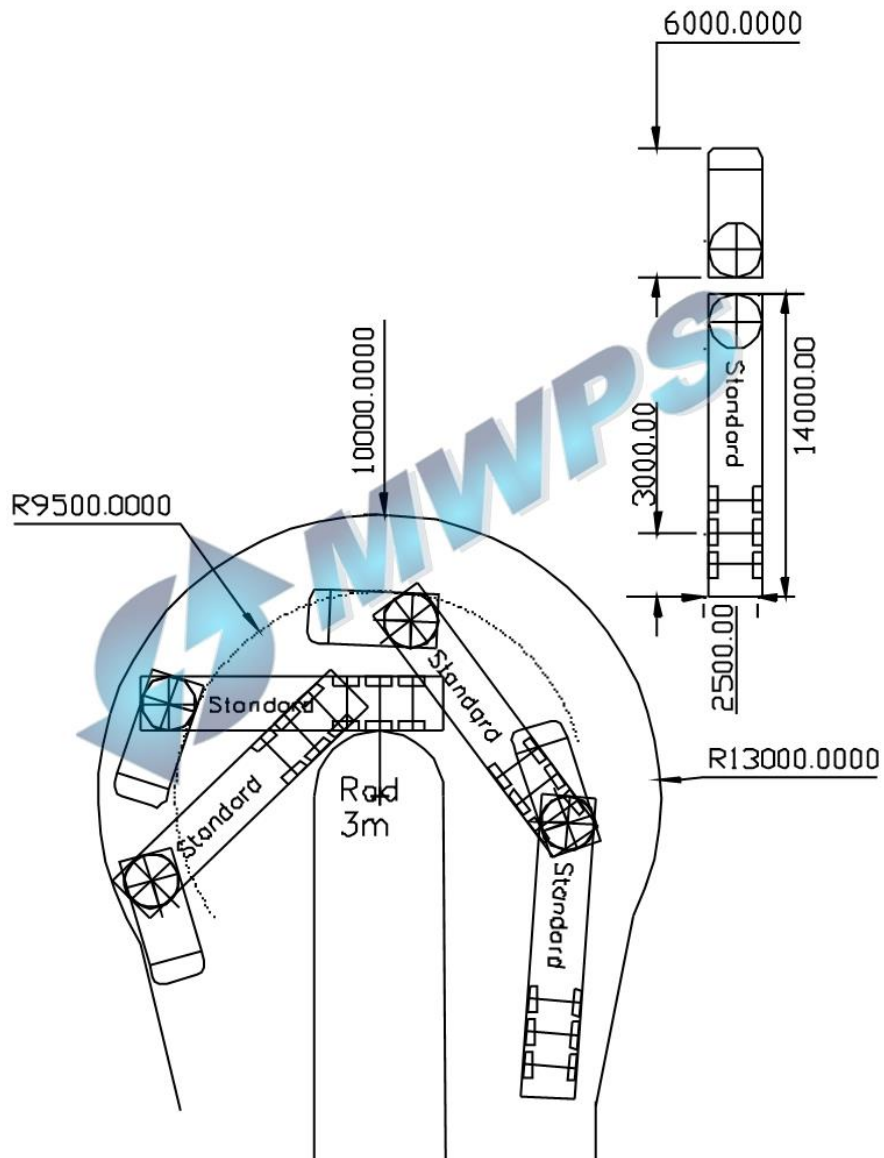
Radius: 25 meter



ROAD TRANSPORT STANDARD TRAILER

Radius required for standard 3 axle trailer

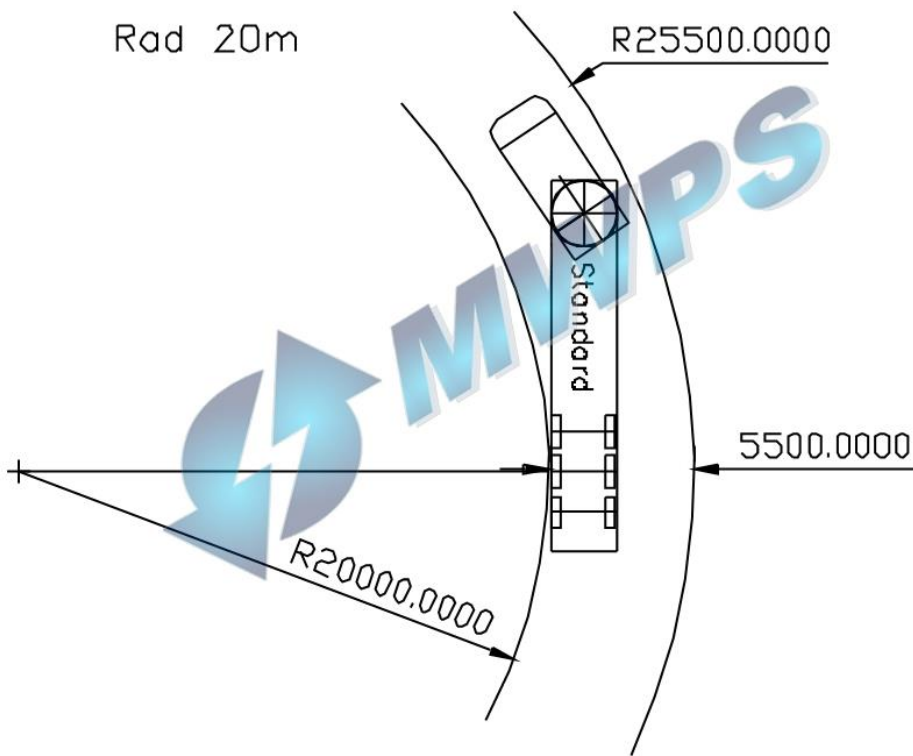
Radius: 3 m



ROAD TRANSPORT STANDARD TRAILER

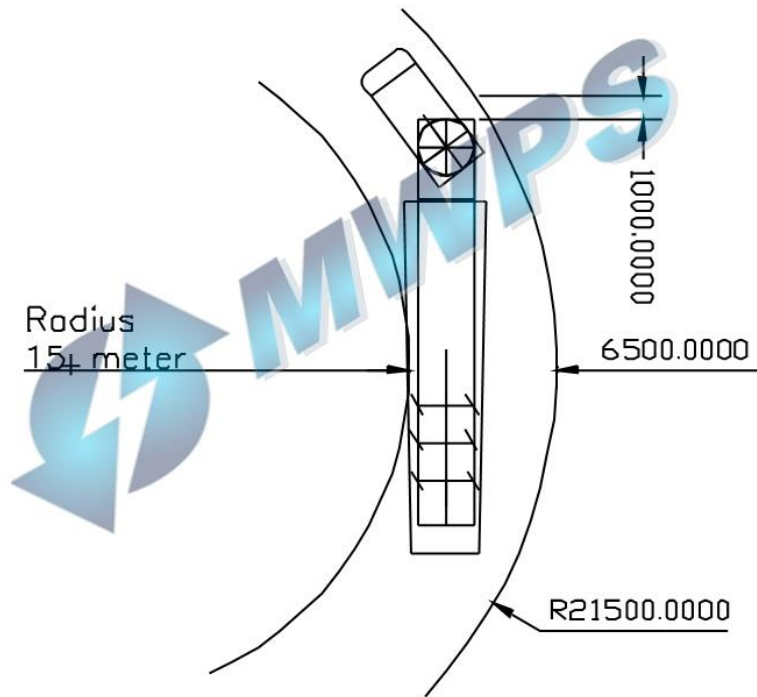
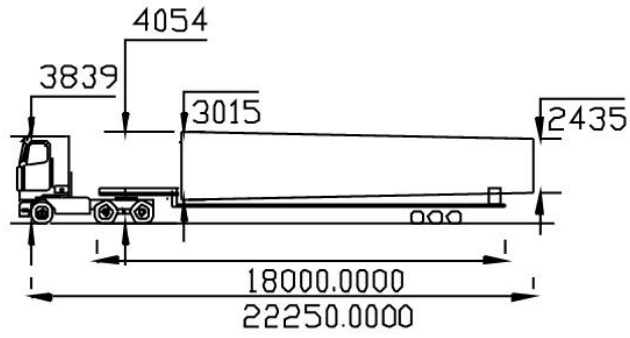
Radius required for standard 3 axle trailer

Radius: 20 m



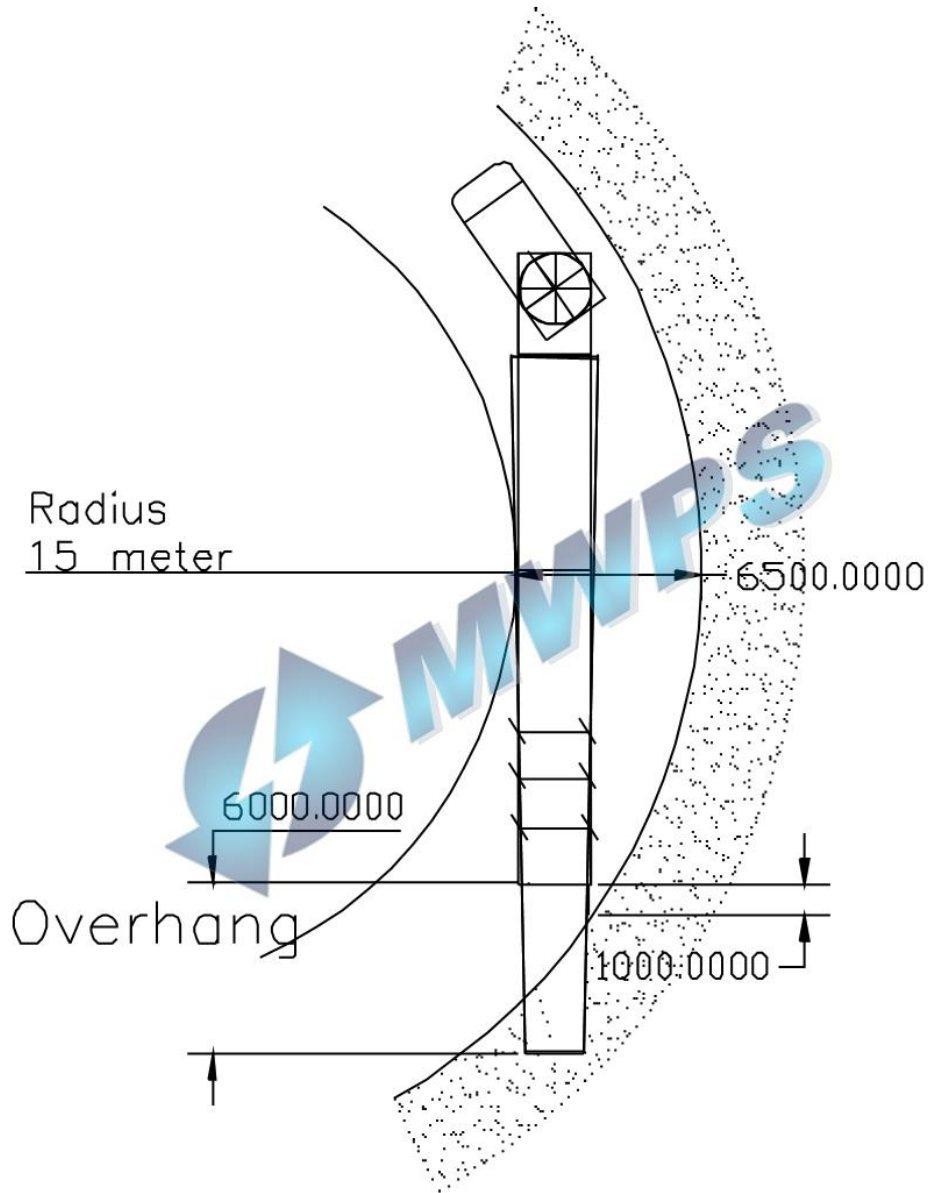
Radius required for 18 m extendable trailer with turnable rear wheels

Loaded with bottom section V52



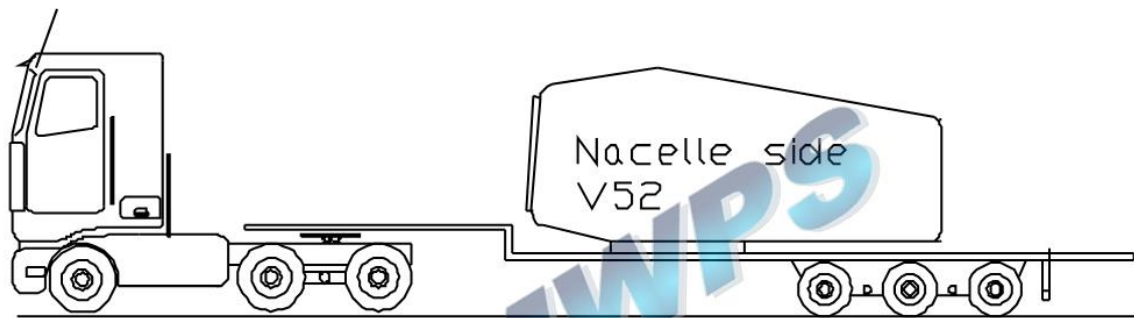
Radius required for 22 m extendable trailer with turnable rear wheels.

Loaded with 24.4 m top tower section V52.



Low bed trailer

If nacelles are transported in 40ft. OT containers to site, the height of the transport will be container height (see page 29) plus height of container trailer, typically 1200 – 1500 mm. Parts are loaded into separate trailers or containers.

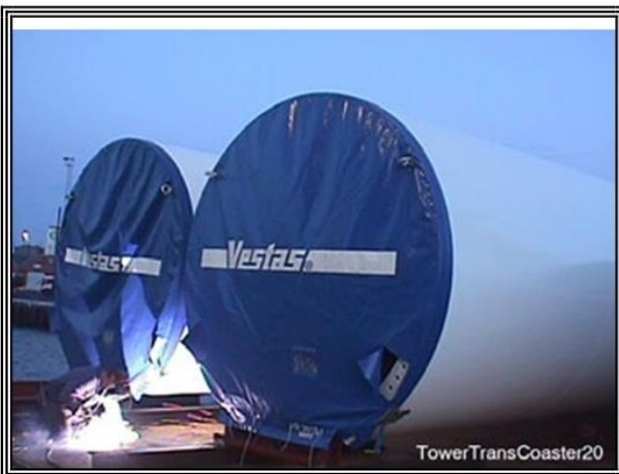


Tower transport (if arranged / provided by Vestas)

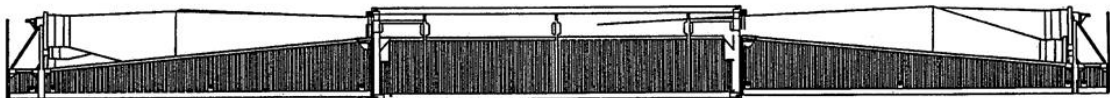
Please note, soft lifting slings are not supplied by Vestas.



Tarpaulins, eyebolt brackets, lifting brackets and flange brackets are supplied by Vestas, chains for securing towers on deck are not supplied by Vestas, (check with Shipping Agent or Carrier) Any extra support brackets on deck and welding (if required) are not provided by Vestas, (check with Shipping Agent or Carrier).



Blade transport - SEA
for 3 or 6 blades



Blade transport - Land
For 3 or 6 blades

