

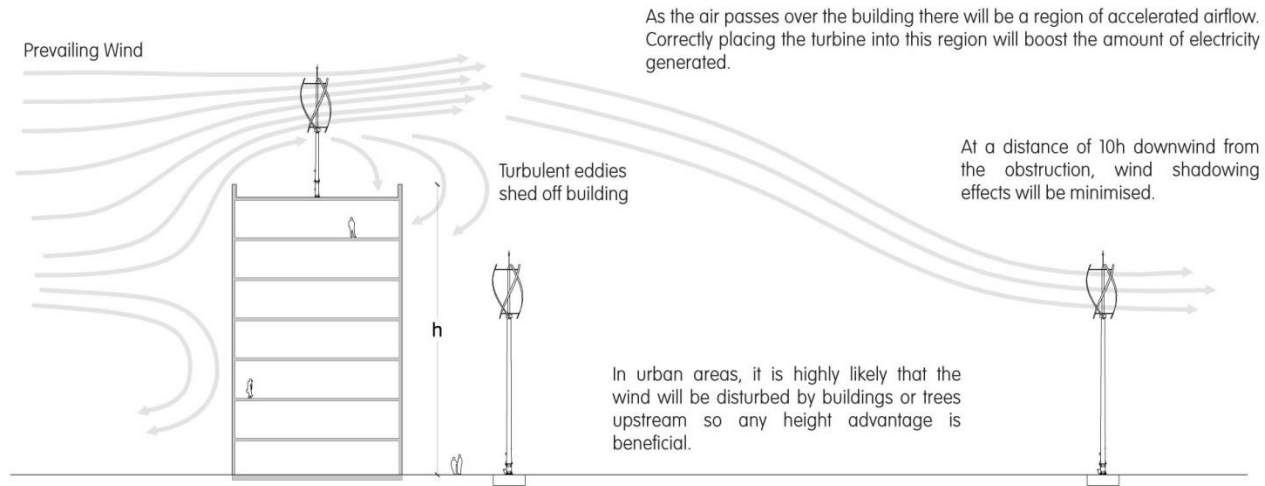
QR6 Vertical Axis Wind Turbine

- Elegant aesthetically pleasing swept blade design
- Compact and easy to integrate
- Revolutionary blade tip designed to shed noise
- Unique aero-elastic blade design captures turbulent wind and absorbs vibration
- Power regulation
- In built safety mechanisms – auto emergency shutdown
- Operating wind speeds: start up 4.5 m/s – safety cutout > 25 m/s
- Design life 30 years +
- 7.5 KW

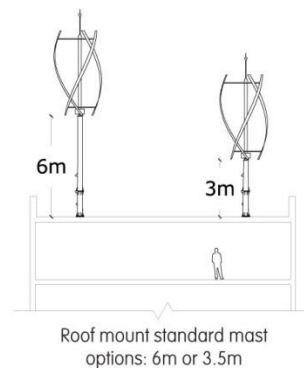
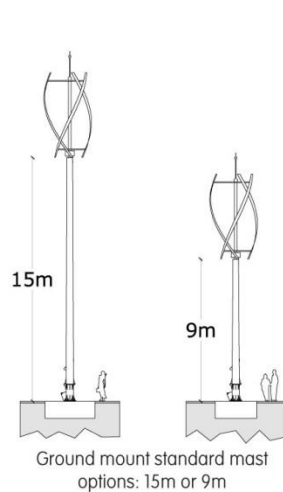


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Optimising Wind Energy in the Urban Environment

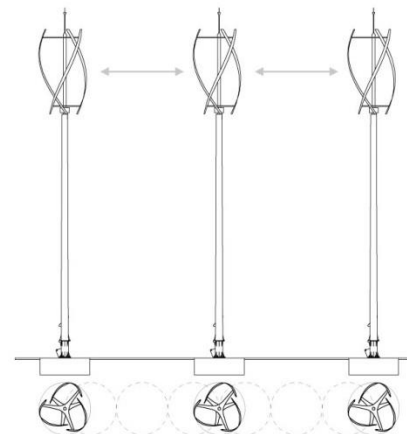


Installation Options



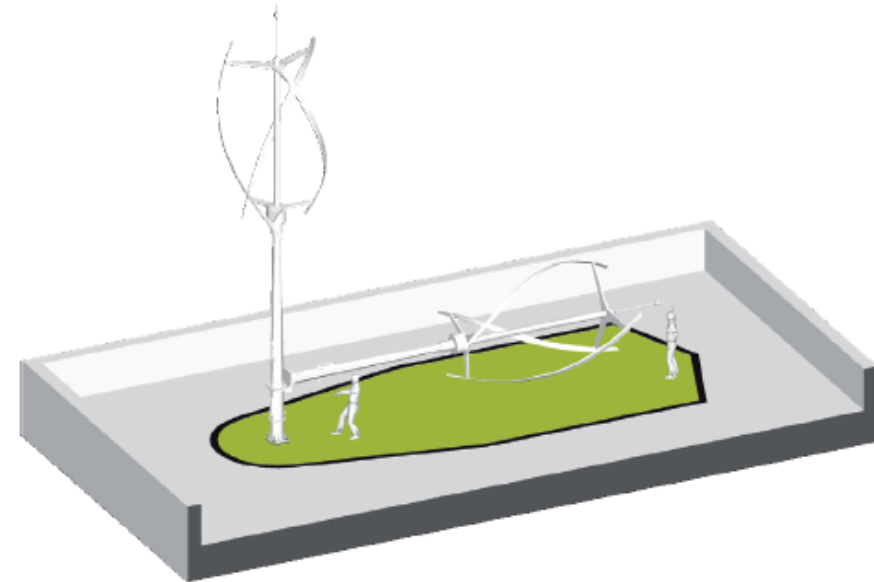
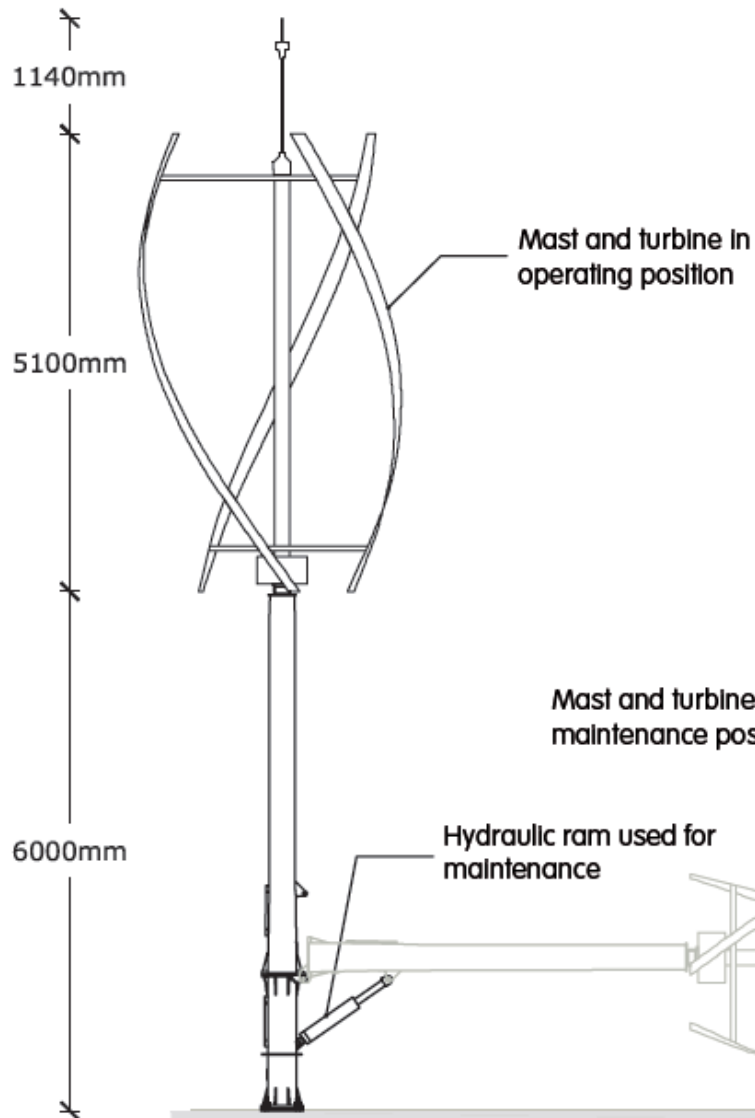
Note: masts come galvanised, other finishes are available on application.

Turbine Spacing



Multiple turbines should be placed at least 3 rotor diameters (9.3m) apart to minimise interference.

WORKING AREAS



Highlighted area denotes working area for installation and maintenance. 6m mast shown (see table for dimensions for other mast sizes).

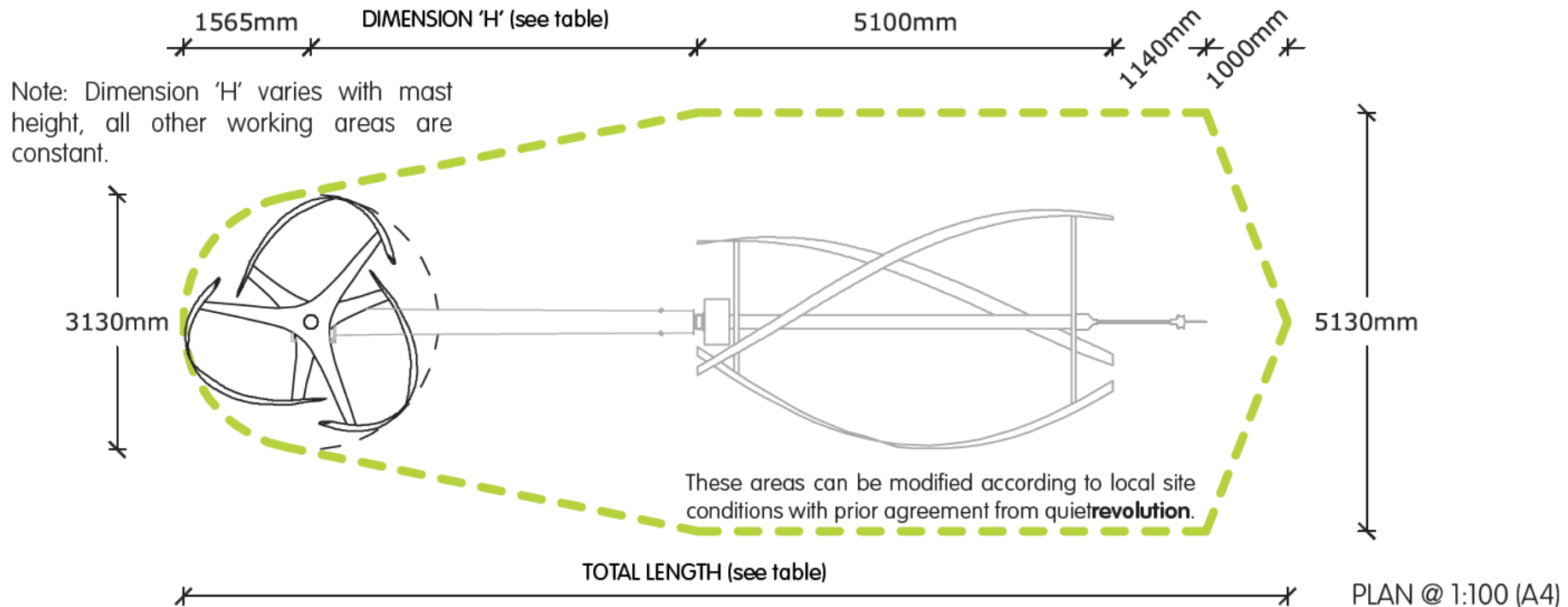
Mast Height	Dimension 'H'	Total Length
6m	5015mm	14185mm
15m	13885mm	23055mm
18m	16910mm	26080mm

ELEVATION @ 1:100 (A4)



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Maintenance Requirements



MAINTENANCE: It is essential that due consideration is given to maintenance access. In most instances a minimum request is stair access due to heavy trolley mounted equipment used during maintenance. In addition mansafe systems should be avoided wherever possible.



The qr6 Vertical Axis Wind Turbine was designed as the next generation of helical VAWT offering improved power generation, increased swept area whilst retaining the intrinsic beauty of the original design

The blades, spokes and torque tube are made of advanced composite materials including carbon fibre for weight, reduction, stiffness and longevity

The brakes modified with enhanced anti – corrosive properties, increased power despite decreased energy consumption.

Military grade marine rating for aggressive environments



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Average Mean Wind Speed – Annual Energy Production

AMWS [m/s]	AEP [kWhr]
4	1277
5	4197
6	8179
7	12729
8	17371
9	21744
10	25597
11	28776

Table 1: The “Extrapolated AEP” results using the IEC standard for the prescribed range of AMWS.



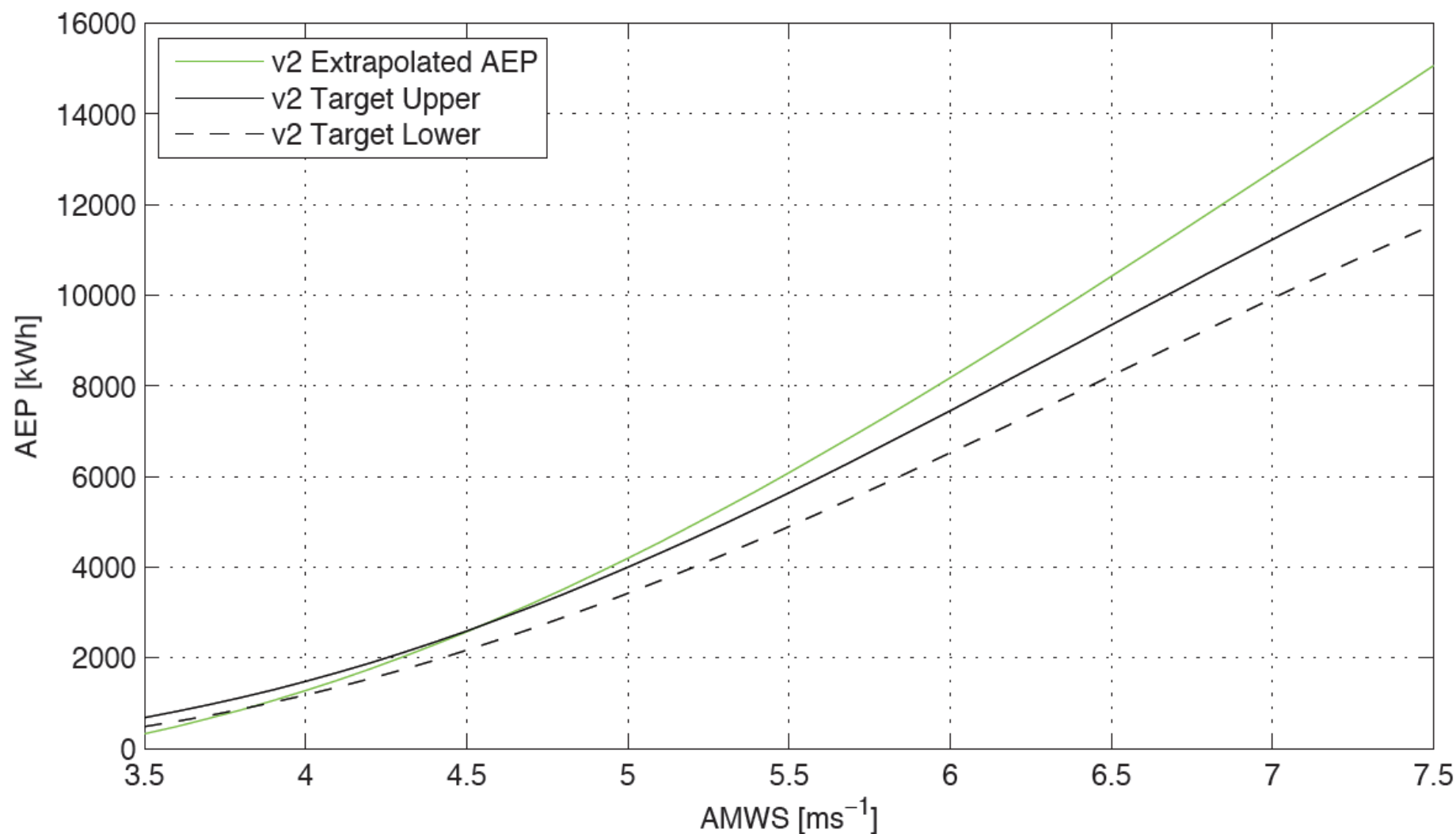


Figure 11: The extrapolated AEP forecast for v2 according to the IEC method, compared to the v2 “upper” and “lower” targets. The turbine beat the upper target from an AMWS of 4.55 m/s onwards.

Test Site Data

Derived Noise Emission and Noise Immission for a wind speed of 8 m/s at rotor centre height

PARAMETER	SYMBOL	VALUE
Apparent Emission Sound Power Level (dB(A) re 10^{-12} W)	$L_{Wd,8m/s}$	86.5
Combined Uncertainty (68% confidence level) (dB)	σ	1.9
95% Confidence Limit (dB)	1.645σ	3.1
Noise Slope at 8 m/s (dB/m/s)	S_{dB}	2.38
Declared Apparent Emission Sound Power Level, (dB(A) re 10^{-12} W)	$L_{Wd,8m/s}$	90
Immission Sound Pressure Level at 60 m at 8 m/s (dB(A) re 20 μ Pa)	$L_{p,60m}$	47
Immission Sound Pressure Level at 25 m at 8 m/s (dB(A) re 20 μ Pa)	$L_{p,25m}$	54



Unlike traditional horizontal axis wind turbines, the vertical axis helical VAWT will maintain its power curve in turbulent winds



The qr turbine is a recognised, iconic design with strong aerodynamic performance



Queen Elizabeth Olympic Park



UK Designed & Manufactured

