


ZONE	REV	DESCRIPTION	REVISIONS	DATE	APPROVED				
	-	-		-	-	 <p>© Proven Engineering Products Ltd, Wardhead Park, Stewarton, KA3 5LH, UK, Tel +44 1560 485 570 info@provenenergy.com All rights reserved</p> <p>WT6000 wind turbine with 15m TM1500 tower</p>			
	-	-		-	-				
	-	-		-	-				
						PREPARED BY BR	FSCM NO.	DWG NO. 6000 FO 010.dwg	REV 1
						CHECKED BY	SCALE 1:100 © A4	Date 24/10/03	SHEET

PROVEN WT6000/TM1500 MAST

FOUNDATION PREPARATIONS



The main foundation consists of a large block of high-strength concrete. Fifteen M30 foundation rods are set into the concrete and are attached to the Foundation Base Plate. The Base Plate includes the hinge-pin attachment, which is used to raise and lower the turbine (see diagrams). Preferably, the concrete should be prepared and the foundation prepared with one load of concrete. Where this is not possible, the top layer should be added before the bottom one has had time to set.

Important
Before setting the Base Plate and foundations into the concrete foundation consider which way your WT will be lowered/raised and position the hinge-pin accordingly

Don't 'Shutter & Backfill'

When preparing house foundations a mould is prepared into which the concrete is poured. Earth/rocks are then filled around the foundation after the concrete has set.

For WT foundations it is better to have an irregular shaped foundation than to have a perfect cube and then surround it with loose earth - just dig a hole and then fill it! This will produce a foundation with good stability.

Preparing the Base Foundation

The base foundation consists of 10m³ of strong-mix concrete. Normally this is prepared as a rough 3 x 3 x 1.2m cube, but where ground conditions dictate, a shallower wider foundation of the same volume may be used. As and when required soil analysis can be conducted to identify exactly what type and dimension of foundations are to be used in certain ground-types. Proven Energy Ltd. can provide basic information to give an idea as to what is required, however professional advice should be sought when an exact soil analysis is required.

Screw the 10 M30x100mm bolts into the foundation rod extension bosses through the 10 holes in a circular pattern in the middle of the base plate. These bolts will later be withdrawn and used to bolt the WT tower to the base plate, once concrete has cured. It is therefore necessary to place a 25mm spacer tube under the head of each bolt. (Please refer to diagram). Tighten bolts till the bosses are tight against the underside of the base plate.

Through the remaining 5 holes on the outer edge of the plate screw the 5 M30x60mm bolts into the foundation rod extension bosses, again till the bosses are tight against the underside of the base plate. No spacers are required for the outer 5 bolts.

Insert reinforcing mesh into hole and suspend foundation rod/base plate assembly into the hole **making sure that base plate is completely level**. Insert conduit or soil pipe used for wind turbine power cable from edge of hole up through centre of base plate. Add concrete (Readimix supplier is usually easiest for this type of volume) and use vibrating concrete poker as necessary to remove air bubbles. **Make sure that base plate is fully supported underneath by concrete.**

Clean the base plate of any excess concrete.

Winch Anchor Foundation

Refer to foundation diagrams for positioning. The anchor consists of a 1.5m x 1.5m x 1m cube or equivalent. It should be located on the opposite side of the base plate to the hinge pin attachment. **N.B. It is important that the anchor is placed exactly in line with the centre of the base plate and perpendicular to the line of the hinge brackets.** The pull on the anchor point for the WT6000/TM1500 during raising and lowering is approximately 2500kg.

Concrete Specification

If using a Readimix supplier, ask for 35 Newton concrete. If mixing the concrete yourself, you should use the following proportions by volume

1:2:4
cement:sand:gravel

Approximate volumes and weights for a 1m³ foundation are

Cement:	310kg or 6.2 bags	(1 bag = 50kg)
Sand:	0.43m ³	(967 kg or approx 1.0 tonnes)
Gravel:	0.86m ³	(2150kg or approx 2.2 tonnes)

Hardening Time

You should allow plenty of time for the foundation to set and harden fully before erecting the turbine. We recommend a hardening period of approximately 2 weeks. For this reason, foundations are normally prepared in advance of the main installation. Note that the hardening time may be lengthened by poor weather conditions and shortened by the use of a quick-setting concrete additive.



M30 x 60 High Tensile Base Bolts.
5 Bolts around the outside of the foundation plate.

M30 x 100 High Tensile Base Bolts.
10 Bolts with a PCD of 584mm
These bolts secure the tower to the foundation plate.

15mm Thick Foundation BasePlate

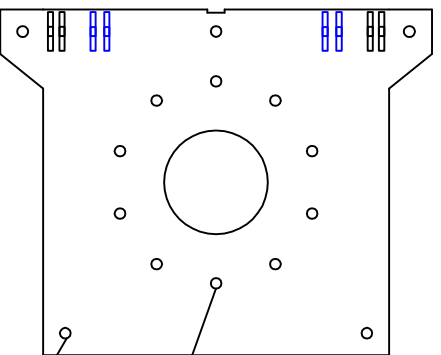
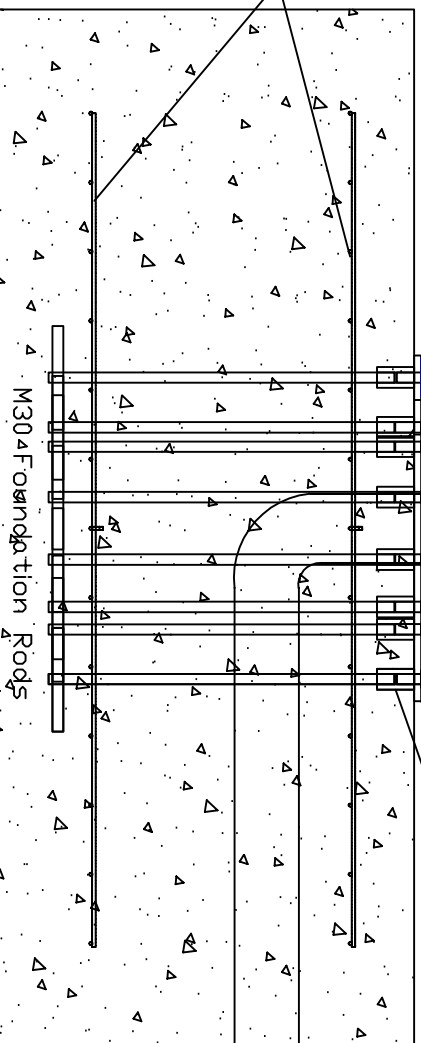
Threaded Bosses

Plastic Pipe for cable duct
cast into concrete.

Hole 3 Metres Square
By 1.2 Metres Deep

Two layers of reinforcing mesh
6mm or heavier A142 grade with
approx 200mm sq holes.
Mesh should be 2.8m square.

CONCRETE
35 NEWTON OR
BETTER

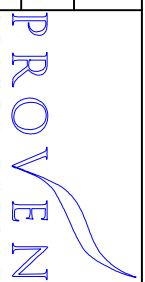


WT6000 15m Proven Mast
Foundation Baseplate

10 OFF DRILLED HOLES CLEARANCE
FOR M30 BASE BOLTS
(32mm DIAMETER) PCD 584mm

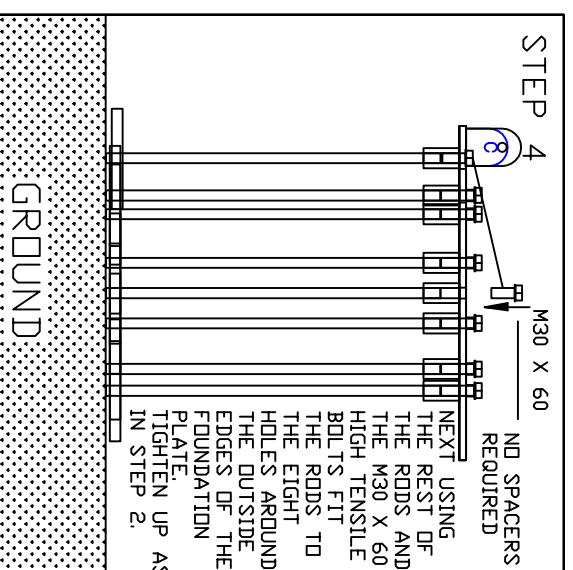
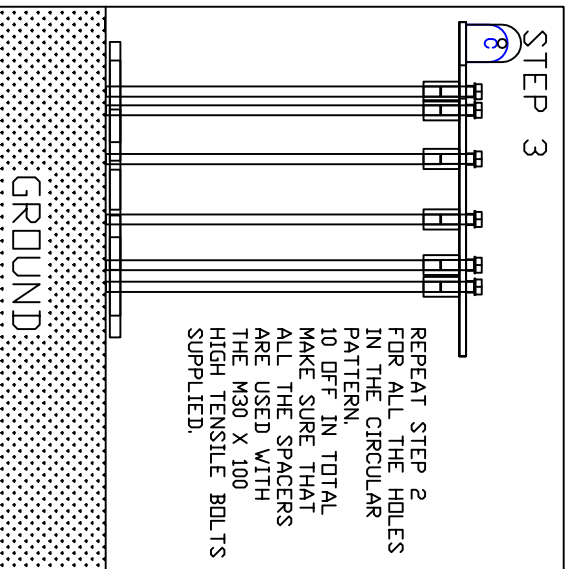
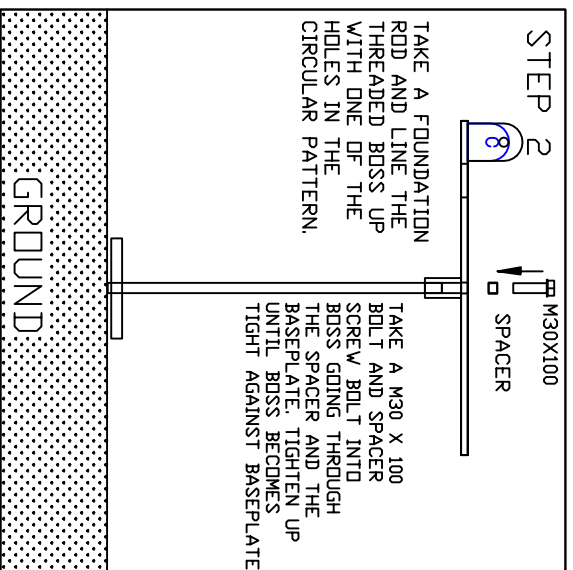
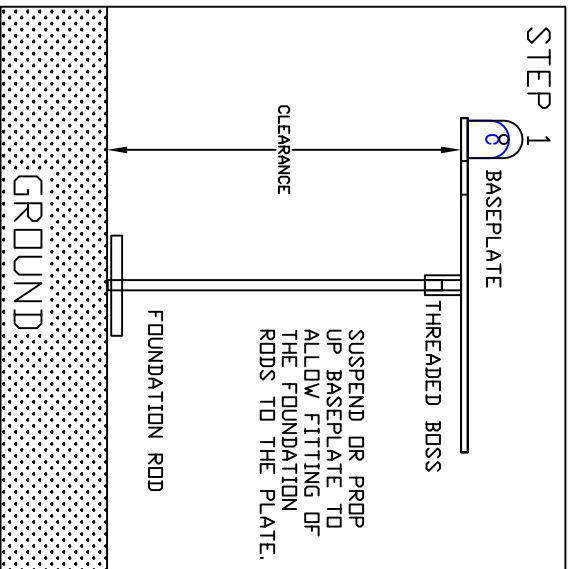
5 OFF DRILLED HOLES
FOR M30 FOUNDATION
RODS. (32mm DIAMETER)

ZONE	REV	DESCRIPTION	REVISIONS	DATE	APPROVED	PREPARED BY	PH	CHECKED BY	RC
	1	MODIFICATION TO SHOW NEW BOSS ARRANGEMENT		15/01/03	-	FSCM NO.		DWG NO.	6000 FO 012.dwg
	2	MODIFICATION TO SHOW NEW SHAPE AND LUGS		15/01/04	-	SCALE		DATE	15/01/04
	3	MODIFICATION - REMOVAL OF 3 OUTSIDE HOLES		04/04/05	-			SHEET	N/A
								REV	2

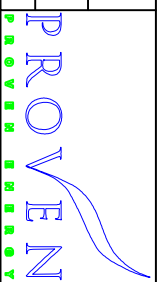


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Drawing Title
6kW 15m TOWER FOUNDATION DIAGRAM

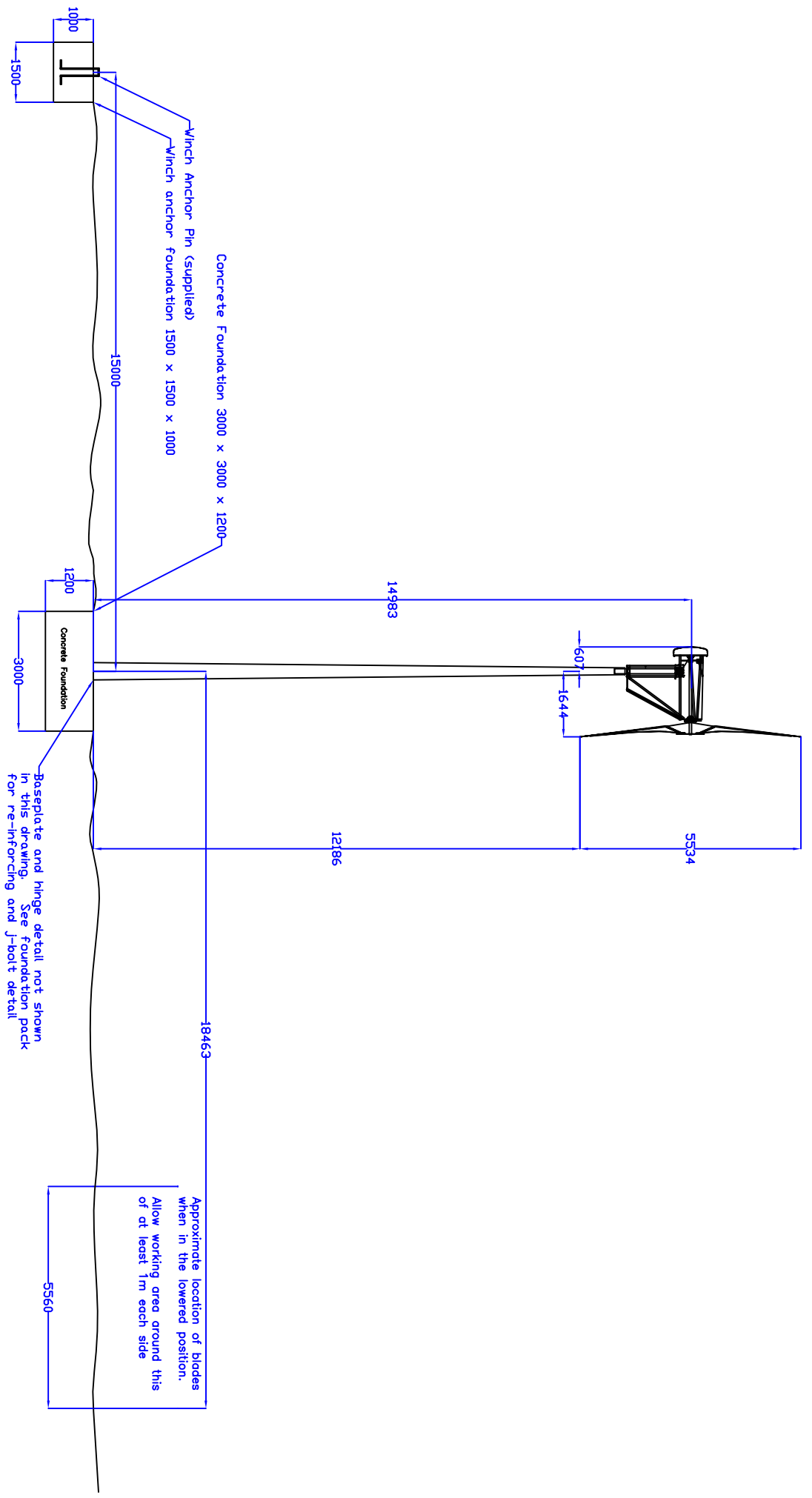


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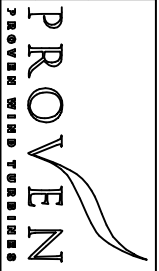


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Drawing Title
6kW 15m TOWER FOUNDATION ASSEMBLY STEPS

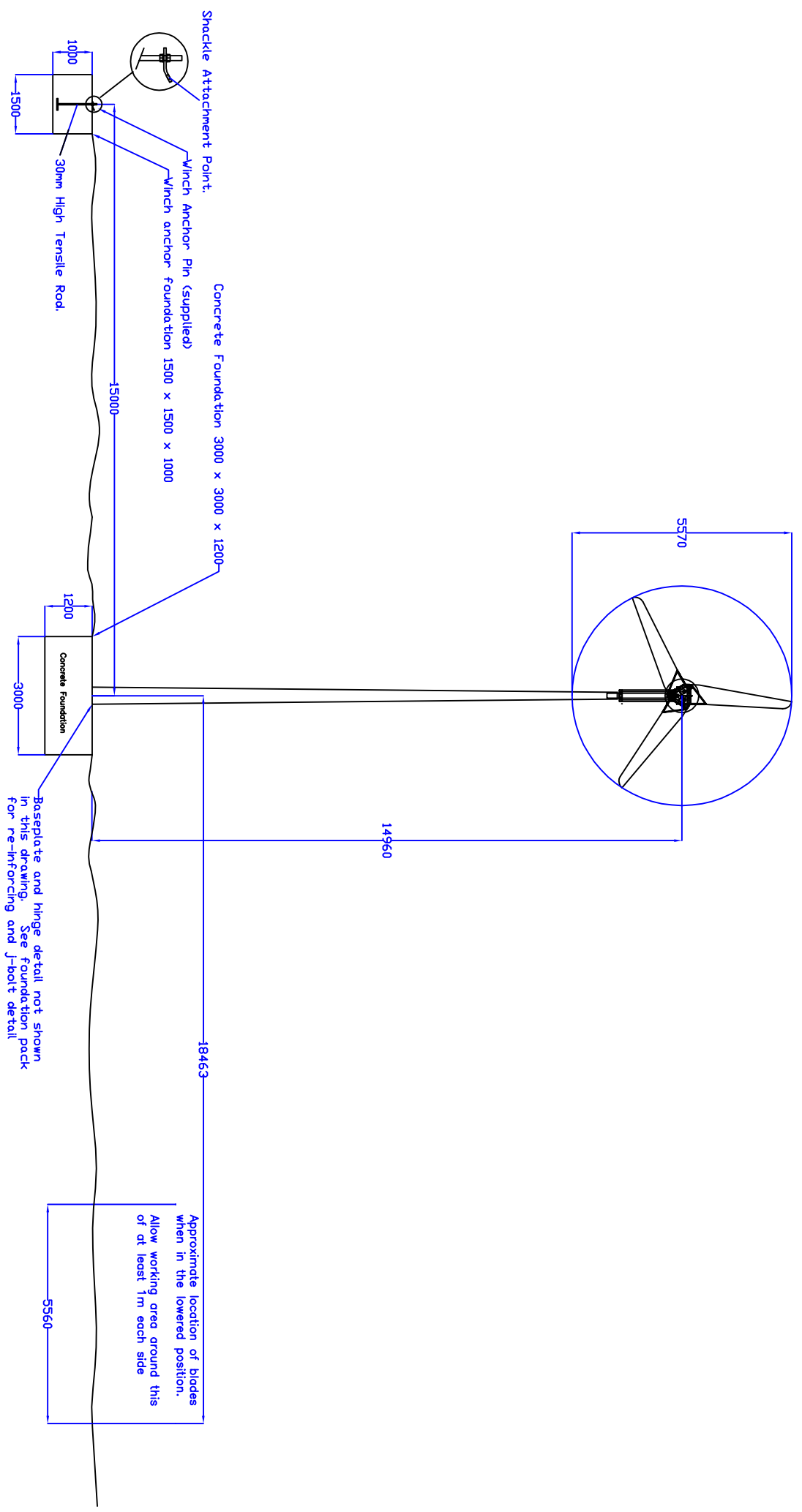


ZONE	REV	DESCRIPTION	REVISIONS	DATE	APPROVED	PREPARED BY	CHECKED BY	SCALE	DATE	SHEET	REV
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-	-	-	-	-	-	6000 FO 026.dwg					
-	-	-	-	-	-						



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WT6000 Side Elevation with TM15000 Tilt up Tower

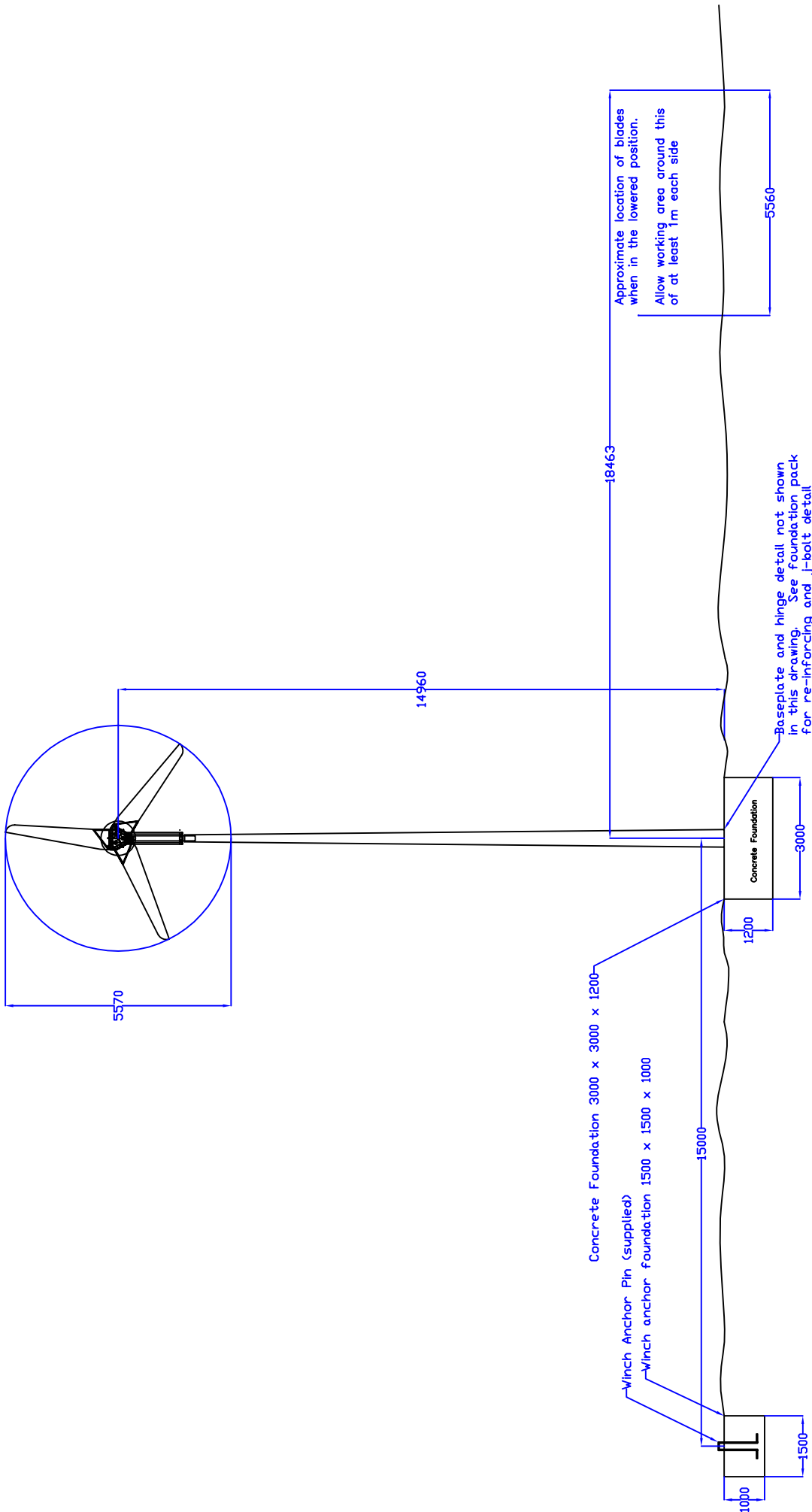


ZONE	REV	DESCRIPTION	REVISIONS	DATE	APPROVED	PREPARED BY	CHECKED BY	REV
	2	Converted to A4/dims changed		5/3/02	BR	FSCM NO.	DWG NO.	3
	-					6000 FO 017 rev 3.dwg		
	-					DATE REV OCT '03	SHEET	1

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PROVEN WIND TURBINES

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WT6000 Wind Turbine with TM15000 Tilt up Tower



ZONE	REV	DESCRIPTION	REVISIONS	DATE	APPROVED	PREPARED BY	CHECKED BY
	2	Converted to A4/dims changed		5/3/02	BR	FSCM NO. 6000 FO 017 rev 2.dwg	REV 2
	-					DWG NO. 6000 FO 017 rev 2.dwg	
	-					DATE	SHEET 1

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WT6000 Wind Turbine with TM15000 Tilt up Tower



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Foundation Pack for WT6000/TM1500

LIST OF PARTS TO BE SENT WITH BASE PLATE

- 1 - GALVANISED STEEL BASE PLATE
- 18 - M30 FOUNDATION RODS WITH EXTENSION BOSSES FITTED
- 10 – M30x100 HIGH TENSILE BOLTS AND 10 WASHERS
- 10 – SPACER TUBE PIECES FOR INITIAL USE WITH M30X100 HT BOLTS
(25mm IN LENGTH)
- 8 – M30x60 HIGH TENSILE BOLTS AND 8 WASHERS
- 1 – 30 mm DIAMETER ANCHOR PIN
- 1 set Foundation Pack
 - 1 Pack Description (this page)
 - 1 Standard foundation diagram
 - 1 Anchor foundation diagram
 - 1 Alignment/Access diagram
 - 1 Foundation description (incl. concrete mixing details)

N.B. REINFORCING STEEL MESH SHEET IS ALSO REQUIRED FOR THE FOUNDATION WORK BUT IS NOT INCLUDED IN THE KIT SUPPLIED BY PROVEN

PROVEN WT6000/TM1500 MAST

FOUNDATION PREPARATIONS



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15mm Thick Foundation BasePlate

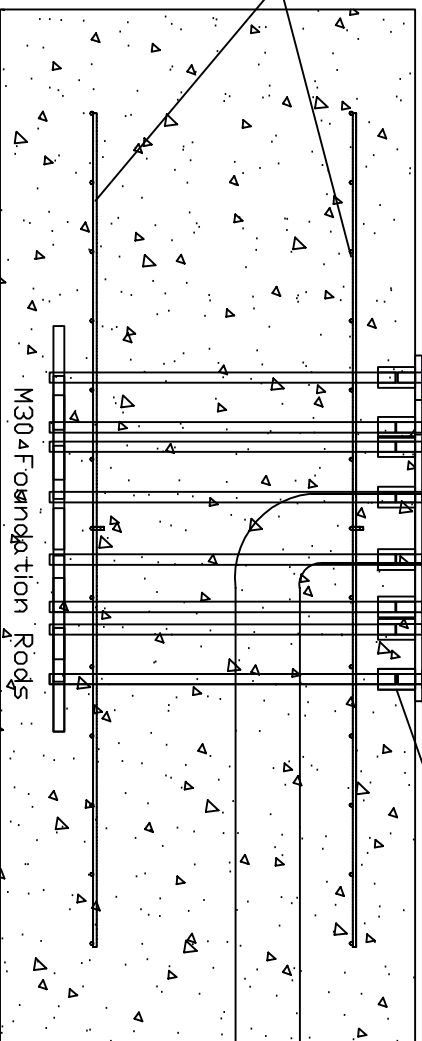
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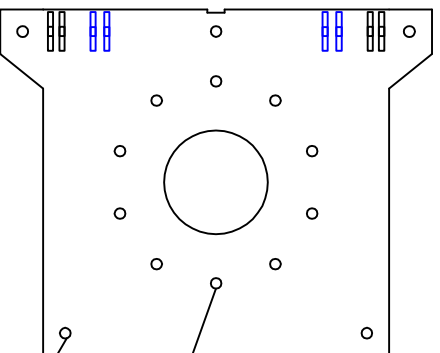
CONCRETE
35 NEWTON OR
BETTER



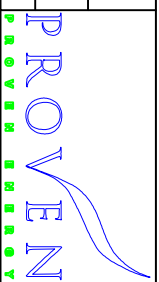
WT6000 15m Proven Mast
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10 OFF DRILLED HOLES CLEARANCE
FOR M30 BASE BOLTS
(32mm DIAMETER) PCD 584mm

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FOR M30 FOUNDATION
RODS. (32mm DIAMETER)

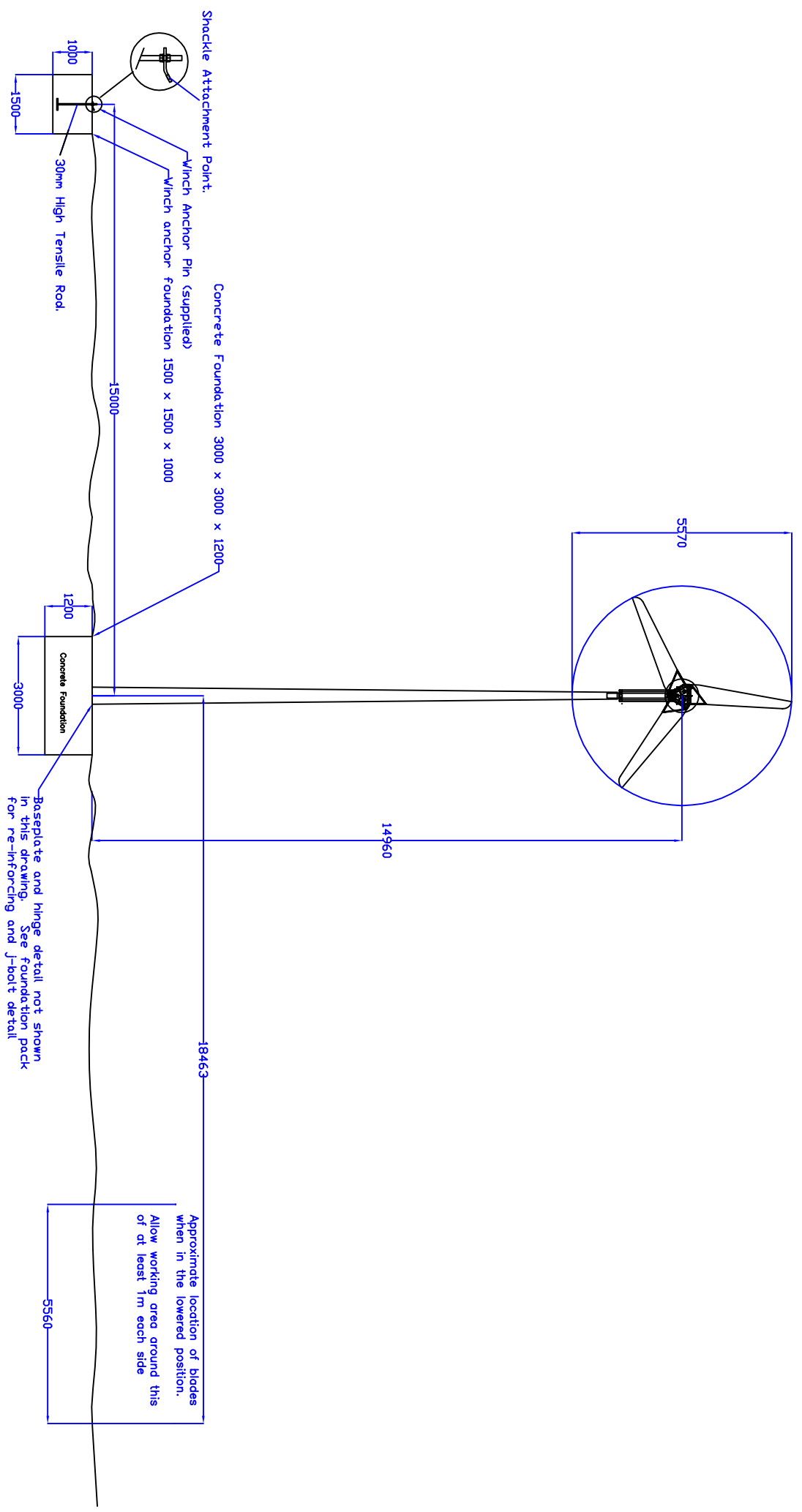


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6kW 15m TOWER FOUNDATION DIAGRAM

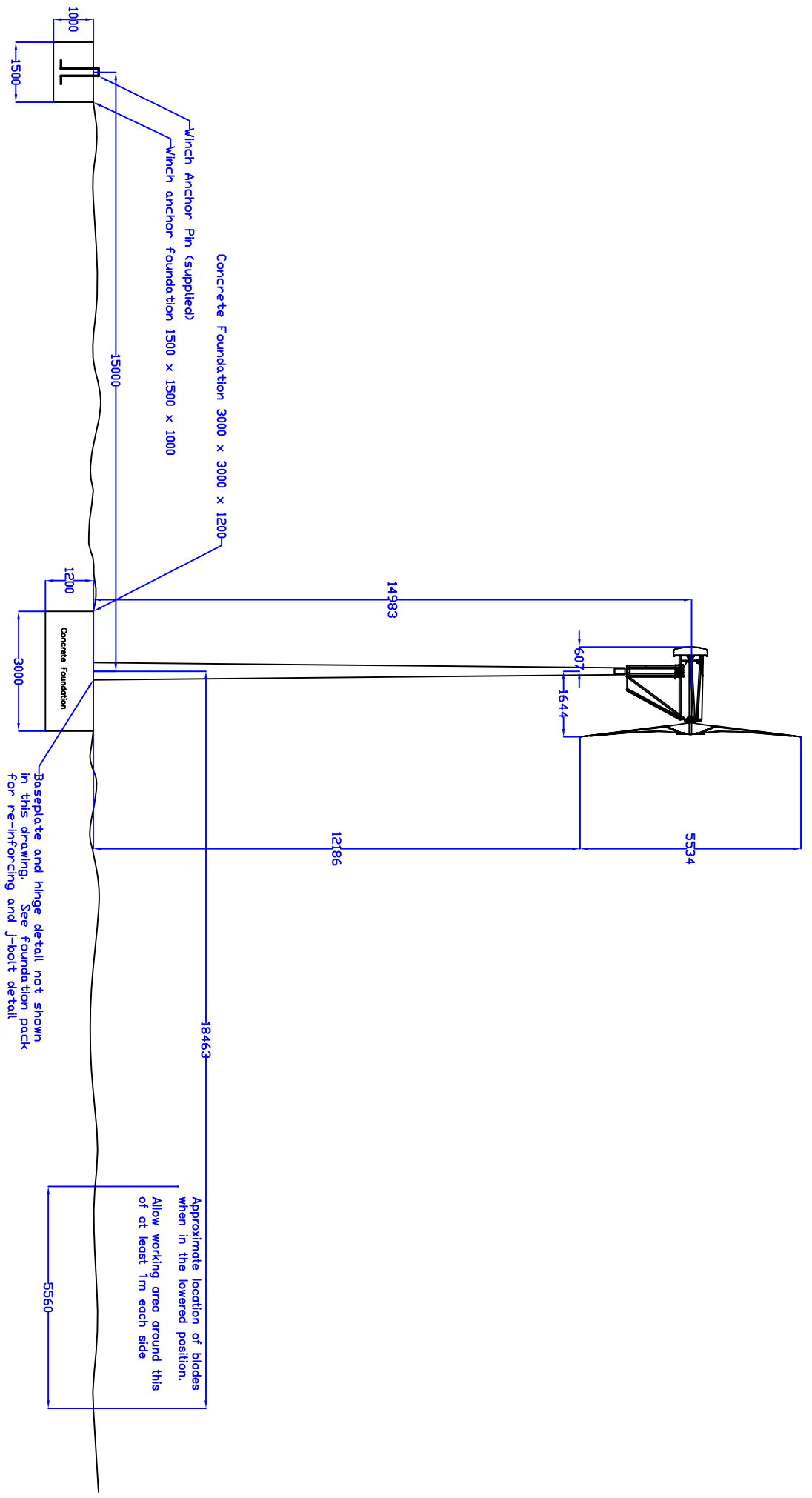


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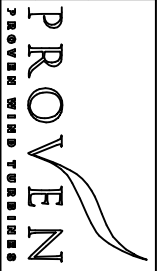
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PROVEN WIND TURBINES

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WT6000 Wind Turbine with TM15000 Tilt up Tower



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-	-	-	-	-	-	FSCM NO.	DWG NO.	1:40: 1004	05/07/02	1	1
-	-	-	-	-	-	6000 FO 026.dwg					
-	-	-	-	-	-						



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WT6000 Side Elevation with TM15000 Tilt up Tower



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