



PROVEN 2.5/TM650

**FOUNDATION
INSTRUCTIONS**



Foundation Pack for Proven 2.5/TM650

PACKING LIST

LIST OF PARTS TO BE SENT WITH BASE PLATE

- 1 - GALVANISED BASE PLATE
- 4 – M20 HIGH TENSILE FOUNDATION RODS,
- 8 – M20 HIGH TENSILE BZP NUTS
- 4 – M20 BZP WASHERS
- 4 - M20 x 60 HIGH TENSILE BZP BOLTS AND 4 WASHERS
- 1 – M30 HIGH TENSILE ANCHOR ROD
- 1 – ANCHOR PLATE WITH M30 NUT AND WASHER
- 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)

FOUNDATION PREPARATIONS

The main foundation consists of a large block of high-strength concrete. Four one metre lengths of M20 high tensile screwed rod 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 foundation should be 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 2.5m³ of strong-mix concrete. Normally this is prepared as a rough 1.6 x 1.6 x 1m 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 4 large (M20) bolts supplied with the base-plate in to their full extent (not transported this way to protect the end thread). The ends of the bolts are factory greased. These bolts will later be withdrawn and used to bolt the WT tower to the base plate. **Inserting them at this stage makes sure there is the necessary clearance in the concrete.**

Attach the M20 screwed rod with nuts provided to the base plate before pouring concrete. Jack up the base plate assembly to approximately the right height. 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.

Use a spirit level and the nuts on the M20 screwed rod to get the base plate level. **Make sure the M20 foundation rods are perpendicular to the level base plate and that the base plate is fully supported by the concrete.**

Leave the final tightening of the M20 foundation rods until the hardening period is over.

Clean the base plate of any excess concrete.

Winch Anchor Foundation

Refer to foundation diagrams for positioning. The anchor consists of a 0.65m 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 WT2500/TM650 during raising and lowering is approximately 1000kg.

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 depending on weather conditions. 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.

Poor Foundation Preparations

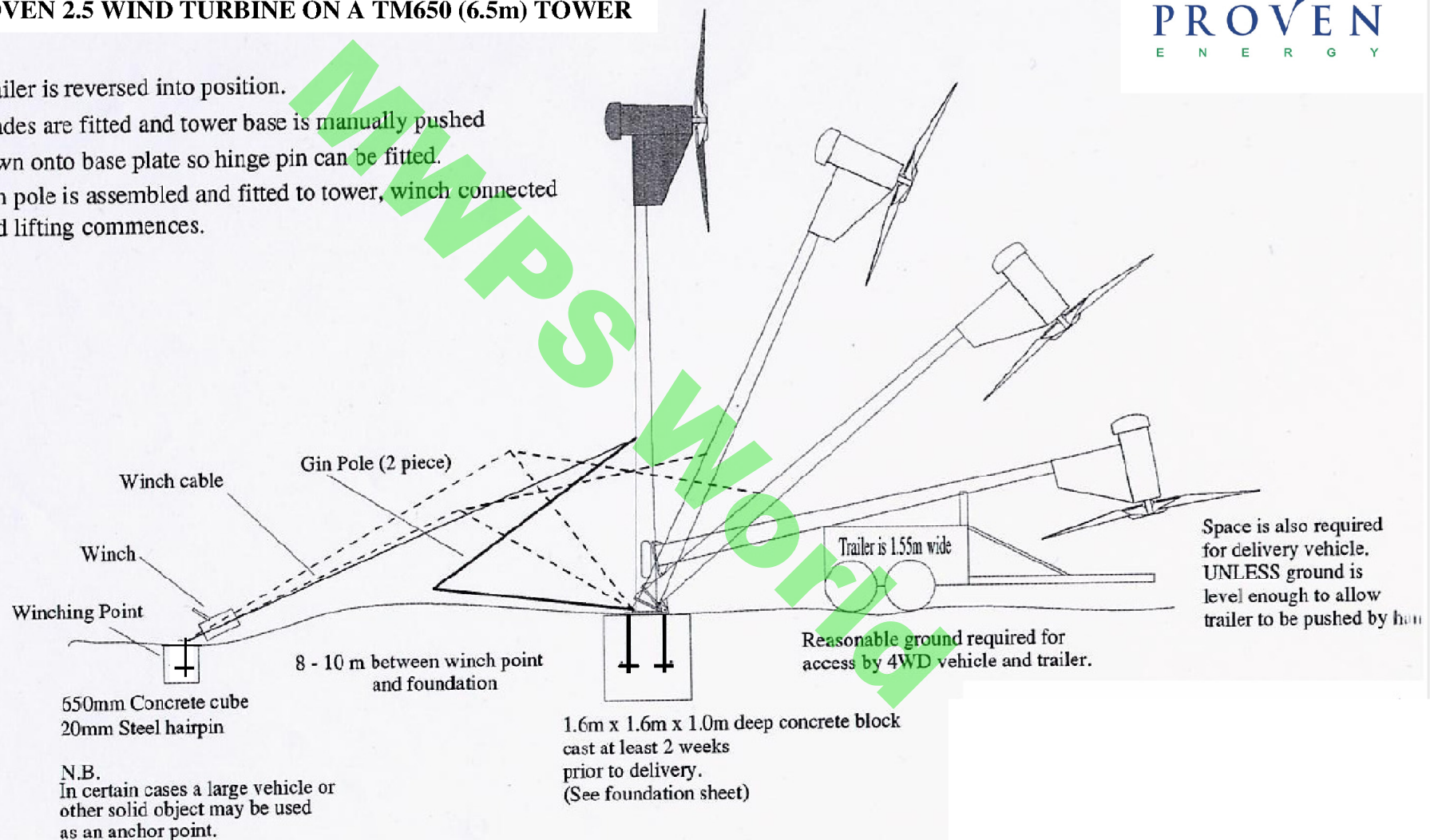
Proven reserve the right to cancel an installation of a turbine if it is thought the foundations are of a poor quality. Subsequent costs in repairing the foundation and any further site visits will be met by the customer.

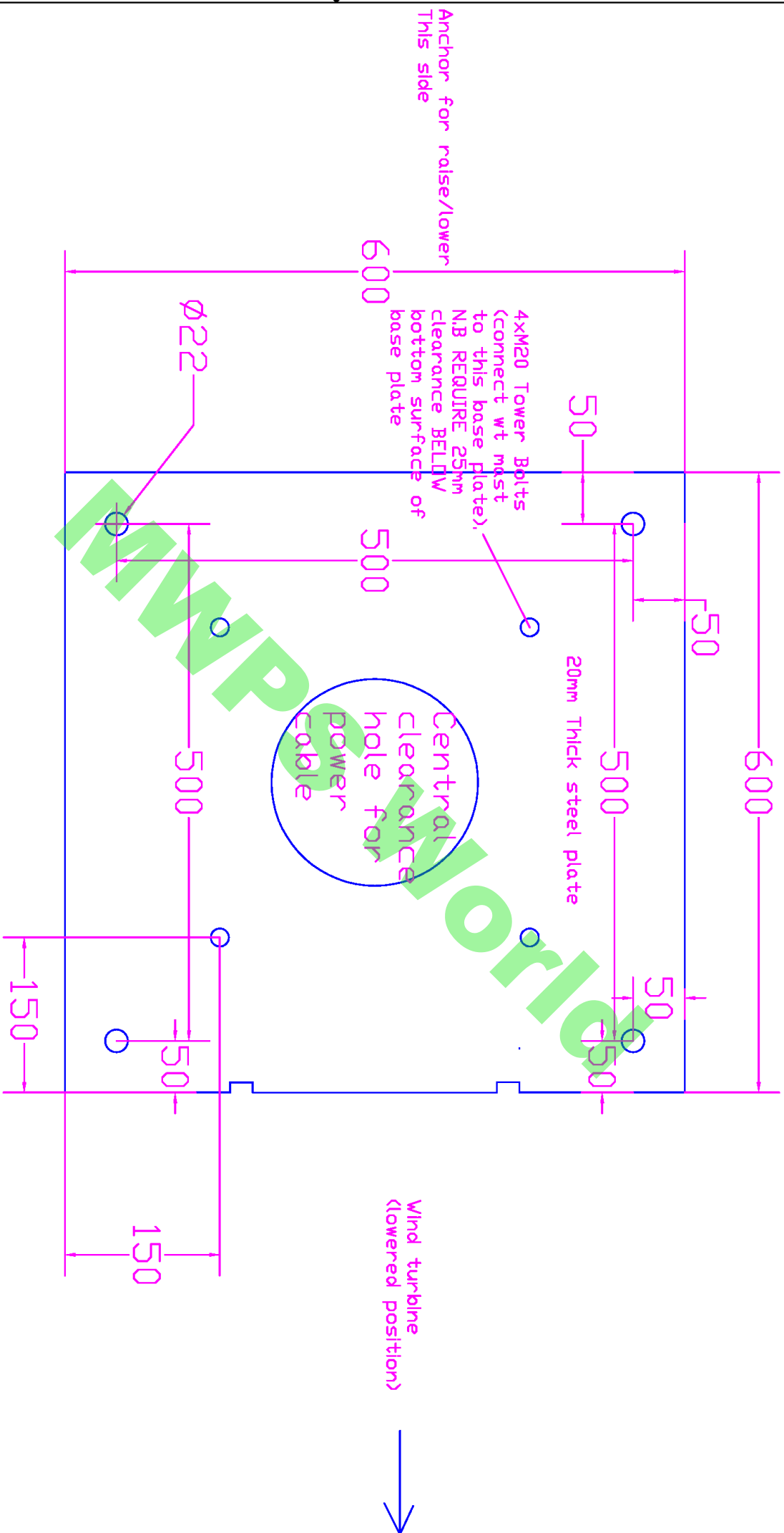
Wind Turbine Delivery and Installation Details

PROVEN 2.5 WIND TURBINE ON A TM650 (6.5m) TOWER



Trailer is reversed into position.
Blades are fitted and tower base is manually pushed down onto base plate so hinge pin can be fitted.
Gin pole is assembled and fitted to tower, winch connected and lifting commences.





ZONE	REV	DESCRIPTION	REVISIONS	DATE	APPROVED	PREPARED BY GP			CHECKED BY RC			PROVEN ENERGY			© Proven Energy Ltd, Warrhead Park Stamerton, KAS 5LH, UK, Tel +44 1560 485 570 info@provenenergy.com All rights reserved		
-	-	-	-	-	-	FSCM NO.			DWC NO.			2500 FO 022.dwg			REV 1		
-	-	-	-	-	-	SCALE			DATE			8-Sep-2003			SHEET sheet		
-	-	-	-	-	-	Drawing Title			Proven 2.5/ TM650 BASEPLATE DRAWING								

SCREW GREASED MAST BOLTS
FULLY INTO BASE PLATE
TO GIVE CLEARANCE
IN CONCRETE

Cast concrete direct into
hole - DO NOT SHUTTER
AND BACKFILL.

HOLE 1.6 METRES SQUARE
BY 1 METRE DEEP
MINIMUM.

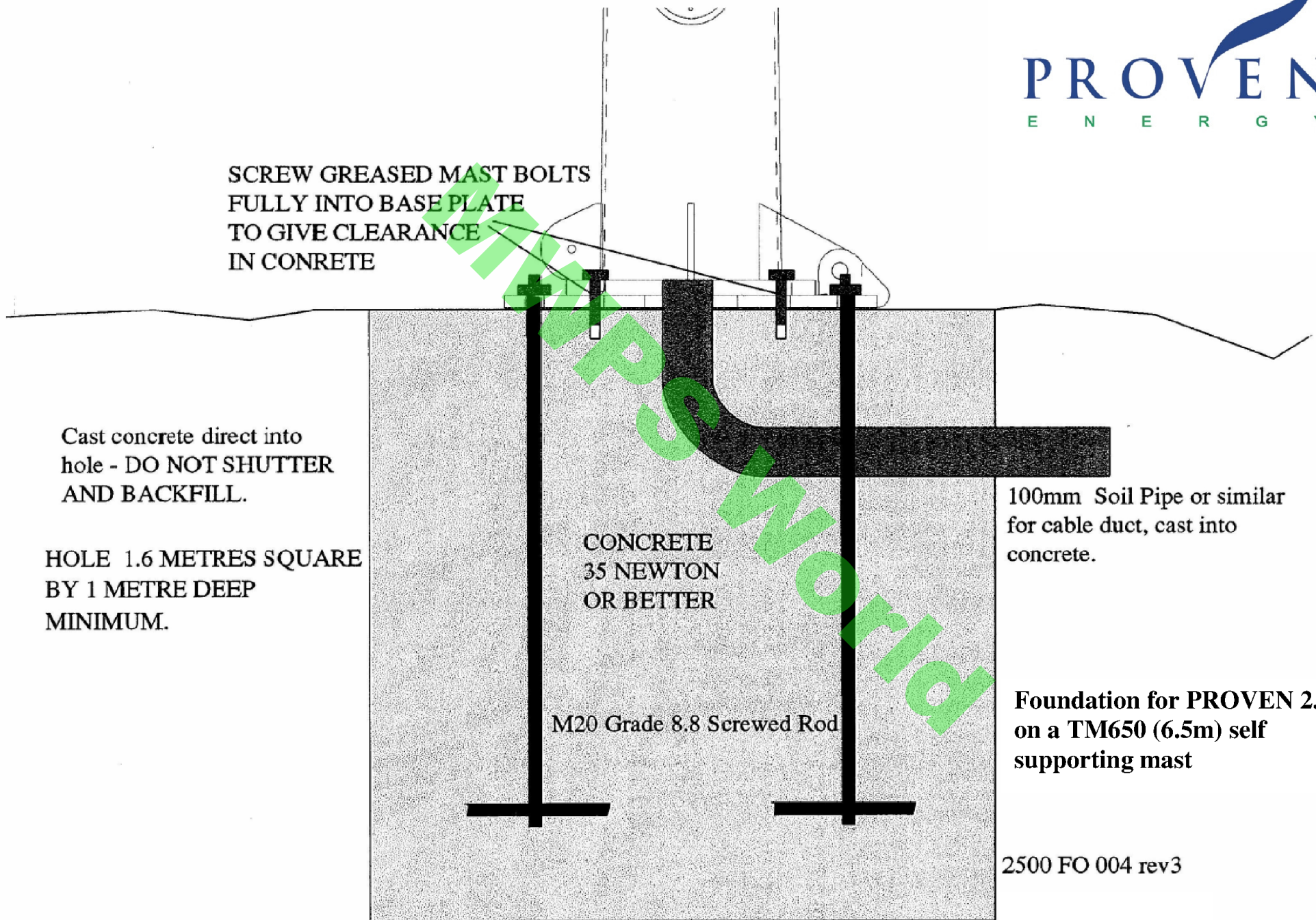
CONCRETE
35 NEWTON
OR BETTER

M20 Grade 8.8 Screwed Rod

100mm Soil Pipe or similar
for cable duct, cast into
concrete.

Foundation for PROVEN 2.5
on a TM650 (6.5m) self
supporting mast

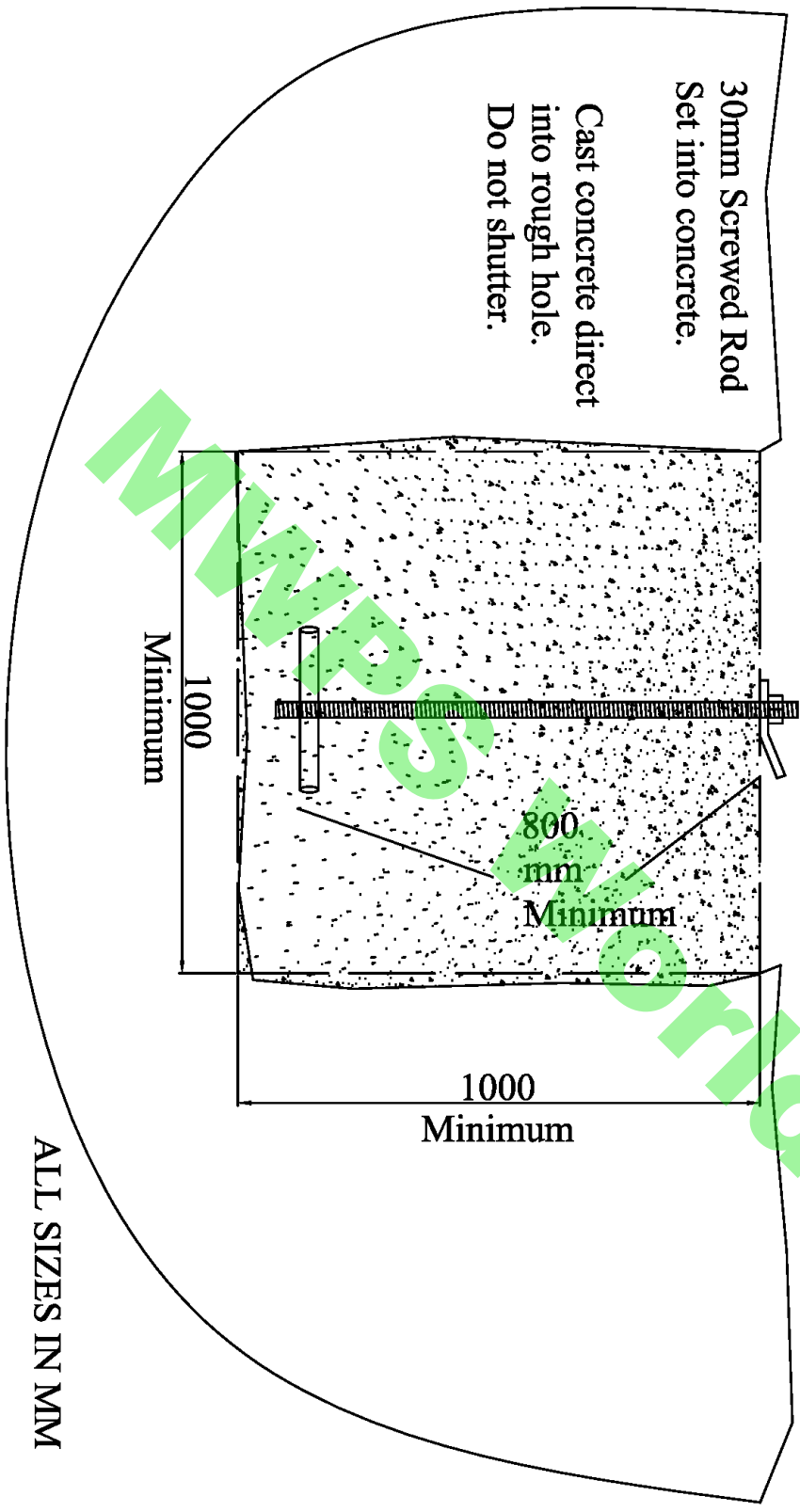
2500 FO 004 rev3





ANCHOR BLOCK LAYOUT FOR PROVEN 2.5 WITH TM650 MAST

Secure winch attachment plate once the concrete has cured.



ALL SIZES IN MM

ZONE	REV	DESCRIPTION	REVISIONS	DATE	APPROVED	PREPARED BY	PH	CHECKED BY	KA	PROVEN ENERGY	© Proven Energy Ltd, Wathead Park Shefferson, KAS 5LH, UK, Tel +44 1560 485 570 info@provenenergy.com All rights reserved
-	-	-	-	-	-	FSM NO.	DWG NO.	REV	1		
-	-	-	-	-	-	DATE	23/11/2006	SHEET			
-	-	-	-	-	-	SCALE					



Dear Sir/Madam,

PROVEN CUSTOMER FOUNDATION CONFIRMATION

Please read the following statement. On completion of your foundation work please sign the statement and return to Proven Energy Ltd, at the above below.

I CERTIFY THAT THE FOUNDATIONS FOR THE WIND TURBINE AND TOWER (TO BE INSTALLED AT THE ADDRESS BELOW) ARE COMPLETED AS PER PROVEN INSTRUCTIONS*. I UNDERSTAND THAT I MAY BE CHARGED FOR ADDITIONAL INSTALLATION WORK IF REQUIRED DUE TO ANY DEVIATION FROM THE PROVEN SPECIFICATION**.

SIGNED:

DATE:

NAME (CAPITALS):

SITE ADDRESS:

.....

.....

* Foundation specification for each wind turbine model is available from Proven Energy Ltd. Please check that you have the current Proven Foundation Pack for your particular wind turbine and tower combination.

** e.g. lack of anchor block, wrong hinge orientation etc.

N.B. This form need only be completed and returned if your system is being installed by Proven Engineers. If your system is being installed by others e.g. Proven Authorised Distributor, consult them directly regarding foundation requirements.

Proven Energy Ltd, Wardhead Park, Stewarton, KA3 5LH, Scotland, UK

Tel: +44(0) 1560 485 570 Fax: +44(0) 1560 485 580 Web: www.provenenergy.com Email: info@provenenergy.com

Reg. in Scotland No. 71400