

## GROUND ANCHORS

Also when a tilt up tower has been chosen guy wires are needed to support the tower. These wires take away the force from the top of the tower and put them into the ground. To achieve this there needs to be some sort of anchors such as the one below which is glued into solid rock.



These types of ground anchors are easy to make as they are simple glued into the ground. At Mr Bigins location there is soft soil so a ground anchor called a 'dead man' will have to be used basically there is a weight under the ground which is pulled on to when the tower starts to move in strong winds etc.

As Mr Bigin wants as much of his wind turbine system to be made from re-used and re-cycled products and materials. I have come up with a simple way of using three cosmetically undesirable concrete posts that would have been thrown away into landfill if I had not used them. These concrete posts are from a landscape designer.

To start with I have made some metal brackets from more re-used metal that I got from a local scrap merchant. These pieces of metal have come from the moving parts of a combine harvester and they have square holes in them every 15cm apart.

I cut the metal into four equal parts that I will clamp around two of the sides of the concrete post with M10 1m threaded rod that will be berried under ground about 50cm down.



The below photos show how the concrete anchors have been installed at Mr Bigins location. The three anchor points have been installed 5.5 meters away from the base of the tower at 120 deg between each other. At the top of the threaded rod there is a piece of cast iron pipe that has had two holes drilled in it to which the threaded rod is past through and bolt on to.

The substantial advantage with using the threaded rod in these anchors there is a large amount of adjustment on the guy ropes. The rope will be tied to the tower and then to the guy anchors as tight as possible then the bolts on the pipe will be tightened up on the large amount of threaded rod that protrudes form the ground.



Also I have been able to increase the surface area of the concrete posts by wrapping rubble sacks which are filled with soil that came out of the hole they are placed in. This increases the surface area which means the forces from the tower are spread over a larger area which makes it harder for the tower to pull the anchors out of the ground.

