

## **OBSERVATORY BASE REQUIREMENTS**

*For best results your observatory should be bolted to a concrete hard standing. This can be prepared by yourself or you can employ a local builder / tradesman to do the work for you.*

*We always recommend using one of our Astro Engineering steel piers for mounting your telescope. This will not only give you a rock solid permanent alignment for your telescope mount, but also will allow you to dispense with the tripod, which takes up valuable floor space, and prevents you from accidentally kicking one of the legs!*

*Your concrete base will need a substantial central block of concrete to take the weight of your telescope setup, and provide a really solid footing.*

*This block needs to be 1000mm x 1000mm square, with a minimum depth of 600mm, and in an ideal situation it can be isolated from the surrounding floor, but at the same height level.*

*Alternatively, the block can be cast with the surrounding floor at the same time – see pictures below.*



*The dimensions and specifications for concrete hard standing base are as follows:*

*2.2M OBSERVATORY – 2400mm square or circular.*

*2.7M OBSERVATORY – 3000mm square or circular.*

*The base is best raised above ground level by at least 50mm to assist drainage, and needs to be as flat and level as possible to ensure good dome performance. Also, as stated above, can be square or circular in shape.*

*Obviously, the square base is easier to produce, using straight lengths of timber shuttering.*

*The overall depth of the base should be a minimum depth of 150mm.*

- **BUYING CONCRETE**

Concrete is bought by metric volume. To calculate the required amount, simply multiply length in metres by width in metres by depth in metres to calculate a volume in cubic metres. Ready mixed concrete companies usually deliver in multiples of half-cubic metres, so "round-up" your calculated quantity accordingly. There is often an excess haulage charge on part-loads, so check with the supplier.

The concrete should be reasonably wet to make handling and leveling as easy as possible. Use at least strength C20 mixture (20N/mm<sup>2</sup> cured strength after 28 days) with a 50mm slump (a measure of 'sloppiness'). This is roughly equivalent to the old 4:2:1 mix. The ready mixed concrete supplier will understand these references, and the delivery wagon usually carries extra water that can be mixed into the concrete before pouring, if the mixture is too stiff. However, bear in mind that adding further water to the prepared mix can affect the cured strength of the finished concrete and may invalidate the strength guarantee of the supplier, leaving the contractor responsible for any remedial work.

- **SOURCES**

There are two sources of ready mixed concrete. Firstly, the national concrete companies with local depots that deliver and discharge, these companies will supply a given quantity of concrete of guaranteed strength, and leave you to do the hard work. They will deliver any quantity you require, from 1 m<sup>3</sup> upwards, in multiples of half cubic metres. Many will offer free, technical advice - look in Yellow Pages for local companies.

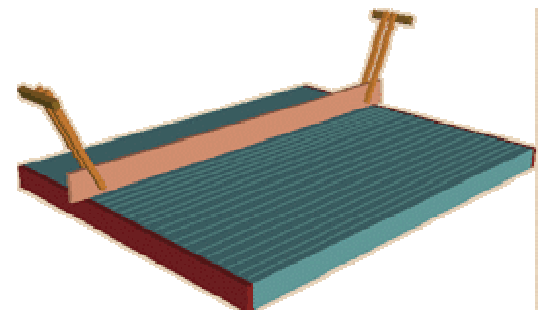


Note that ready-mixed concrete is sold by volume (m<sup>3</sup>) and not by weight. The concrete wagons usually carry 6m<sup>3</sup>, or sometimes 8m<sup>3</sup>, and you may be charged £15-£20 for each cubic metre not carried.

There are also 'mix and move' contractors, who mix the quantity of concrete you require on their specially adapted wagons, and then barrow, or pump, the concrete to exactly where you require it. This concrete may not meet the quality standards required of the larger national contractors, but it is usually adequate for domestic use. Expect to pay more per m<sup>3</sup> than the delivered ready-mix, but then, they are doing a lot of the hard work for you! These contractors can also be found in Yellow Pages or the Thomson Local.

- **WORKING THE CONCRETE**

A shovel or a strong rake is used to roughly level out the wet concrete, and then a straight-edged timber can be used to tamp down the concrete to the correct level. Tamping helps eliminate air pockets being trapped in the body of the concrete and also helps to push the hard aggregate into the concrete, bringing sufficient of the matrix to the surface to make smoothing (floating) easier.



Tamper made from straight-edge timber

- **FINISHING THE CONCRETE**

A reasonably smooth surface can be obtained by repeatedly tamping wet concrete, but for a finer finish, the surface should be smoothed using a steel float trowel. This is best done when the concrete has started to stiffen as part of the hardening process, as the float trowel leaves fewer trowel marks. Hand floats, also known as Bull Floats, are fine for small areas where a near-perfect finish is not essential.

Judging exactly when to commence floating, either with hand tools or with a power float, is an art in itself, and is gauged from years of experience; too soon and the trowel marks will never disappear, too late and the concrete might not 'rub-up' to a close finish.

- **TIMBER SHUTTERING**

The picture here shows an example of the timber shuttering in place, showing the hole for the pier block. The shuttering should be checked for being square and level. In this example, ready mixed concrete was poured into the pier hole first, and then levelled off, being pouring the remaining concrete into the base.



- **ELECTRICAL SUPPLY**

If you wish to run power into the observatory, it may be an idea to run a conduit into the base to allow cables to be pulled through. A simple calculation will give you the position where the conduit needs to lay in the concrete (see above pictures). We recommend a power socket be mounted to the inside of the observatory wall. This should be done a qualified electrician. Also, you may need to run additional cables for PC networking, etc. Another conduit from the main feed to the pier area may also be useful.

- **ADDITIONAL NOTES**

As an alternative, you can attach your observatory to a wooden decking base, but you will still require the central concrete block to provide the stability for your telescope set up.

Your concrete base will be almost fully cured around a month after laying, however, after 1 week; the base will be strong enough to allow observatory installation, and drilling to take place.

We recommend purchasing one of our high quality impact resistant interlocking rubber tiled flooring systems. The tiles, in conjunction with the supplied plastic membrane, provide a flooring surface that is not only waterproof, but also shock resistant, protects falling eyepieces etc! Also reduces noise and vibration, and provides good insulation from the concrete.



**FOR TECHNICAL SUPPORT CALL +44(0) 1353 886128**