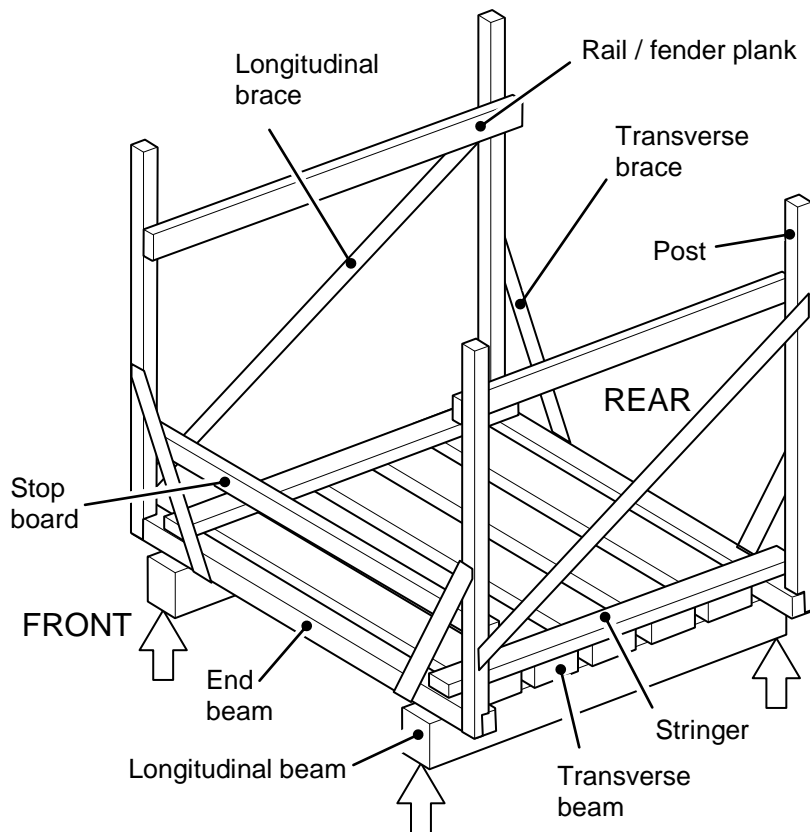


CRADLES FOR USE WITH THE CLUB'S FLAT-BED TRAILERS



This diagram shows a typical arrangement of a timber cradle for a twin-keel boat.

The posts act as berthing guides and are supported by transverse and longitudinal braces. The rails connect the posts on each side and may also be used for fendering (see below).

The arrows denote the normal jacking points, for lifting the cradle on or off a club flat-bed trailer. When the boat is moved into its lay-up space, the cradle is jacked up and supported on blocks – working one end at a time, so that it is never supported by jacks alone.

The longitudinal beams are 2400 long, or 2700 long for large boats. The clear width between them should be 2250mm, to fit the club trailer with a 100mm margin on each side for manoeuvring the trailer between the beams. The transverse beams should be 2700 long, at least 100 deep, and closely spaced because a boat may tilt forward if the toes of its keels are unsupported and crew members are on the foredeck.

The clear width between the posts and rails must be greater than the boat's beam. Therefore the end beams that support the posts may have to be longer than the other transverse beams.

When a boat floats into the cradle, it is moored with ropes leading forward from each quarter, to pull the keels hard against the stop board. It will often slip back a little when the tractor starts pulling, so the bed of sleepers must have 'spare length' so that the keels do not end up overhanging the rear edge. The length between the stop board and the rear of the platform should be at least 600mm greater than the length of the keels.

For longitudinal beams, standard timber sizes have been suitable for boat displacements as follows.

For longitudinal beams 2400 long:

100 x 200 flat: 1.2 tonnes	100 x 200 on edge: 2.3 tonnes	150 x 150: 2.0 tonnes
125 x 225 flat: 2.3 tonnes	150 x 225 flat: 3.0 tonnes	150 x 225 on edge: 4.4 tonnes

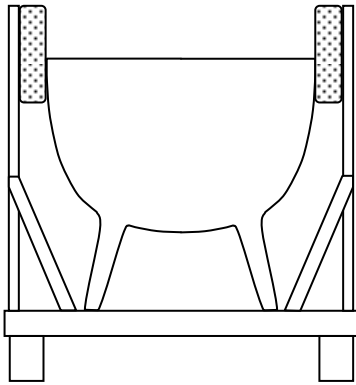
For longitudinal beams 2700long:

150 x 225 on edge: 3.9 tonnes.	150 x 300 on edge: 4.5 tonnes (max displacement for trailer).
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If twin timbers on edge are used in place of single timbers, they should be bolted together.

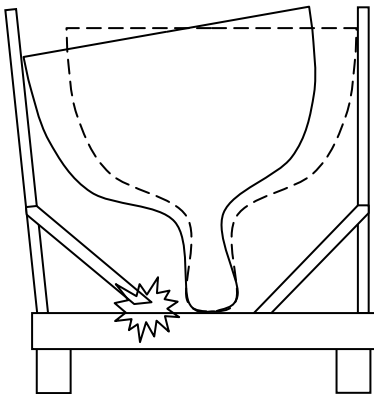
At each end of each longitudinal beam there should be at least one strong connection (eg. by a long bolt or threaded rod passing down through stringer, transverse and longitudinal beams). The other transverse beams may be retained by coach screws down through the stringer.

The posts and braces must be strong enough to withstand impacts from a boat weighing several tons, in choppy water and with a stiff cross-wind. Owing to leverage, the forces in the transverse braces are much higher than the actual impact forces. Bolts should be used for all connections between posts, braces, rails and end beams, ideally supplemented by timber shear connectors (available from builders' merchants).



A cradle for a twin-keel boat must have enough clearance between the rear transverse braces for the keels to float between them (the front transverse braces may be closer together).

The boat's widest beam must pass between the rear posts. To hold the boat in the middle of the cradle there should be fender pads on the posts, as shown here, or fender planks between the posts on each side (see below).

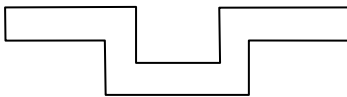


A single-keeled boat imposes a concentrated load at mid-span and may require stronger transverse beams.

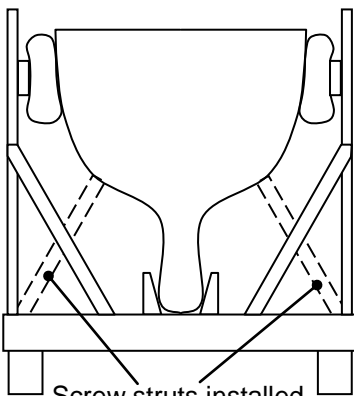
On a cradle for a single-keeled boat, the posts must hold the boat DEAD CENTRAL and DEAD UPRIGHT. If there is any slack, the boat may settle off-centre and then lean back the other way, as shown here. THIS WOULD BE VERY DANGEROUS.

For single-keel boats, the dimensions of the hull and keel must be measured with particular care before designing the cradle. The posts, braces and connections must all be substantial.

For boats with shallow hulls and fully-retracting keels, keel stop boards cannot be used to ensure correct fore-and-aft positioning. Alternative methods include pre-measured mooring warps and hull markers carefully aligned with the guide posts.



For single-keeled boats with a draught greater than 1.25m, the transverse beams should be of steel, cranked downward in the middle to permit launching/recovery on Mean Spring tides.



Screw struts installed as soon as the boat is clear of the water

This cradle has rails serving as fender planks. With this arrangement, the fenders should not become dislodged if the hull moves forward or aft. Fenders are packed in tightly on both sides, to keep the hull in the centre of the cradle.

With a single-keel boat, guide boards form a central 'slot' for the keel. They must be high enough to ensure that the keel does not float over them and miss the slot.

For a single keel, the transverse braces can be positioned well inboard, providing better support for the posts. Screw struts should be fitted as additional shores before towing the boat to its lay-up space (use at least 2 on each side).

Timber must be sound and reasonably free from imperfections (eg. Strength Class C16). Preservative-treated timber (often described as 'tanalised') is readily available at a cost premium of around 5-10%.

Some cradles are made partly or wholly from steel. Welded joints are more rigid than bolts but light steel sections, such as thin angles, may bend unless they are properly braced.

Before buying materials, measure the boat and sketch the cradle to check dimensions & quantities.

These notes are for guidance but each member / boat owner is responsible for the strength and suitability of his or her own cradle. The club accepts no responsibility for design or construction.