

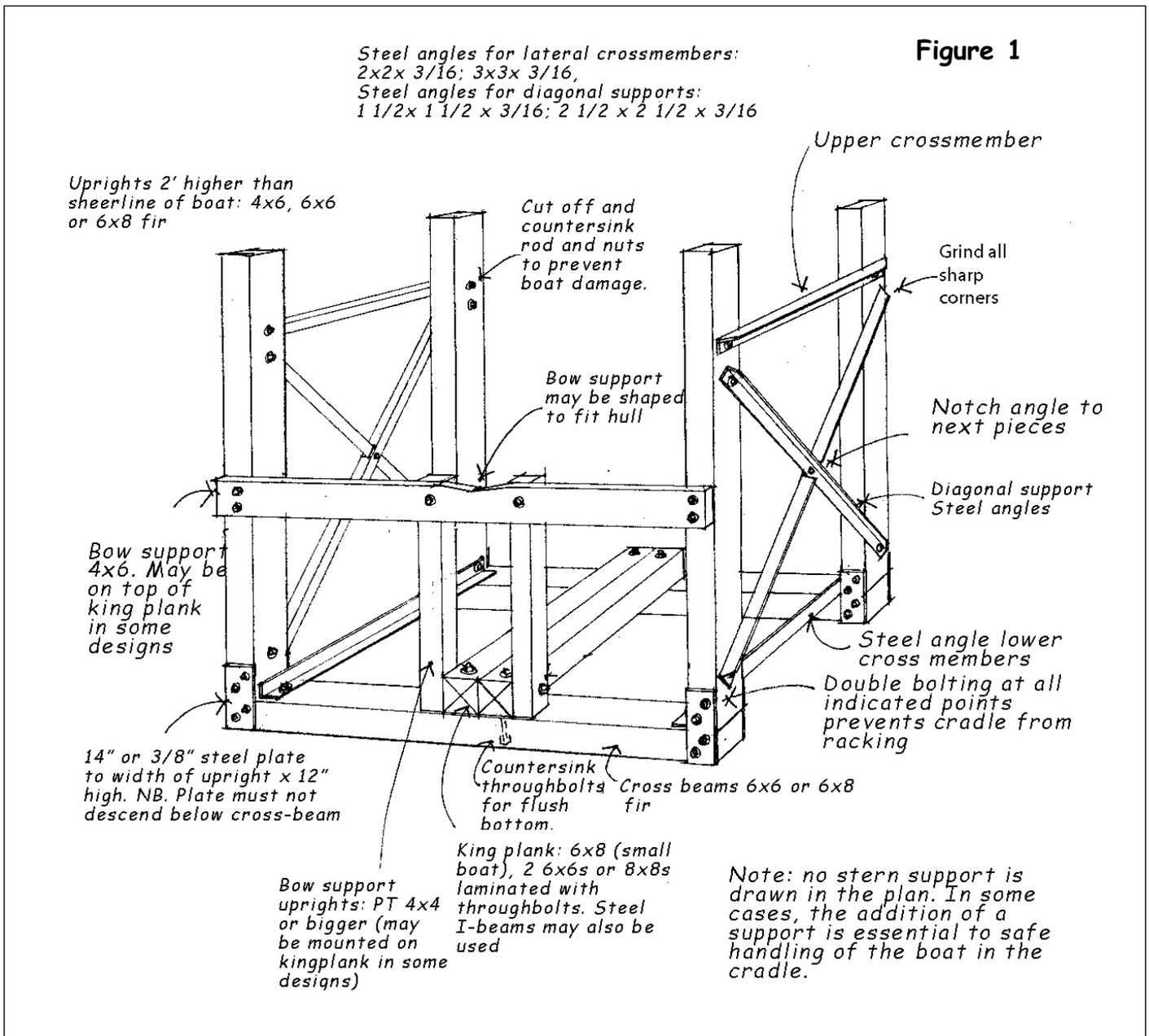
## Welcome to the Yard pages

Queen City's marine railroad system works well and permits QCYC to haul and store boats safely and economically in terms of both space use and cost. There is an ongoing initiative to reduce the physical effort required to move boats between the rail car and the ways. This will further add to the railway's efficiency.

A key element of the railway operation is the design of cradles that hold boats. While there is no single, right way to design and construct a cradle, there are some fundamental methods that are time-proven for safely hauling, storing and launching boats.

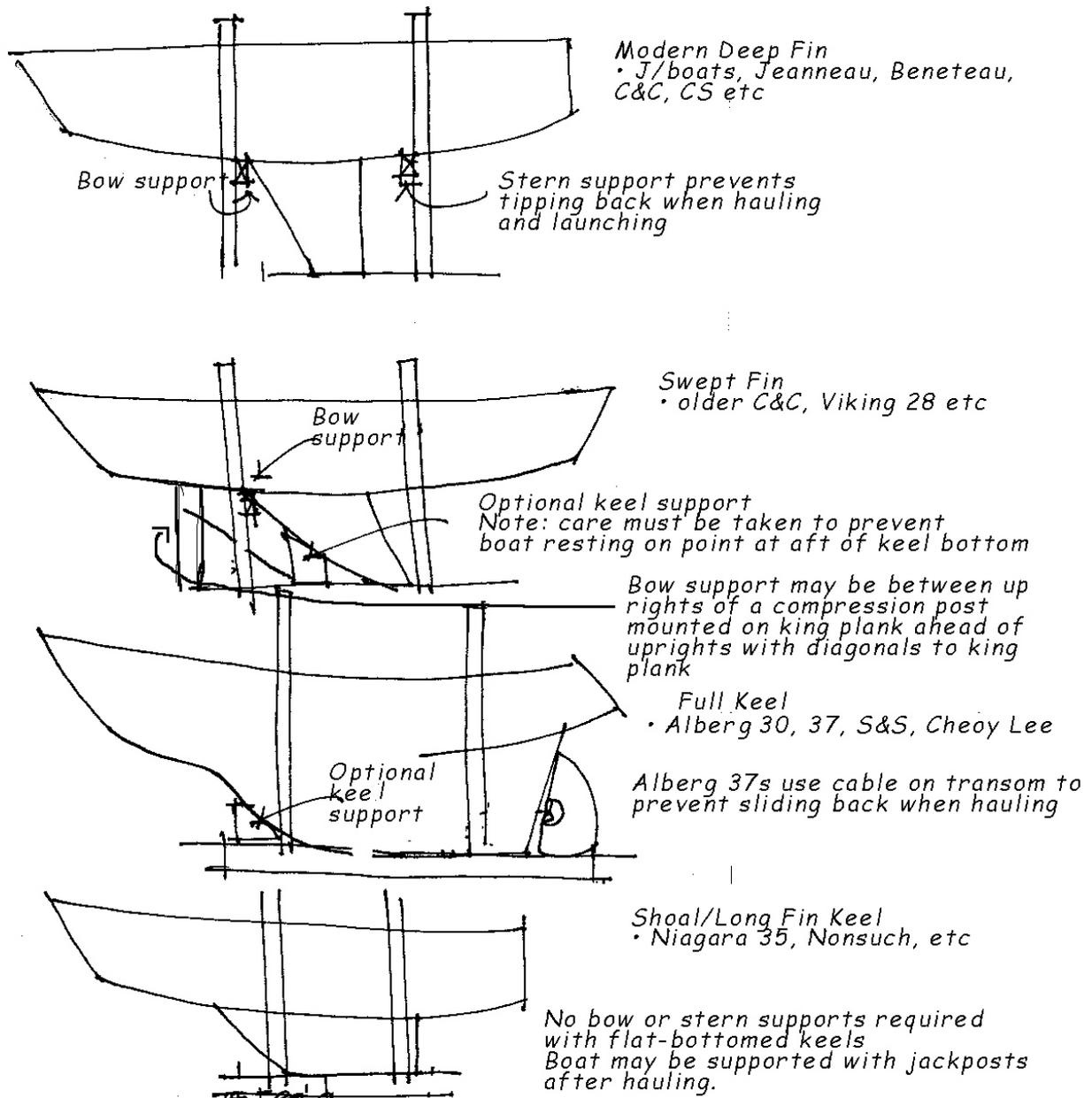
The diagrams in this section, courtesy Don Ferguson, are intended as a guideline. There is no substitute for accurate measurements of your boat to enable building the cradle to the right size. In many instances, there will already be a boat similar to yours whose cradle can be used as a pattern.

In any case, you should submit your plans to the yard chairman prior to beginning to ensure that the cradle you intend to build will work on QCYC's railway system. As well, by getting together with others who are building cradles, you can save money on the delivery of materials to the club.



**Figure 2**

**SAMPLE KEEL CONFIGURATIONS AND CRADLES**



**Figure 1** (opposite) shows a standard cradle. Most cradles will be a variation on the standard. For instance, king planks often extend ahead of the forward crossbeam and a post is used to support the bow. However, it is important that the boat not be on a cradle that is too narrow; while the boat might fit well in the cradle, long overhangs can result in tipping the cradle *and* boat off the way. Make sure the gauge (i.e. fore and aft width) of the cradle you build is suitable for your boat.

**Figure 2** (above) illustrates in side view how various keels sit on their cradles. Although a boat may seem secure and stable once in its storage place, extra supports at the bow and stern can provide a margin of safety.

## Metal and Wood

Although some QCYC members have elected to build cradles out of metal, wood is still considered by most to be easier to work with, if not as long lasting. Longevity can be improved considerably by thoroughly coating a wooden cradle with creosote.

But even wooden cradles can benefit from a metal king plank. Typically an I-beam with wood added as a resting place for the boat's keel weighs about the same as timbers required for a king plank. It is recommended that before installation, you should see how other owners have installed I-beams.

When building a cradle, keep in mind that all bolts that protrude through the bottom must be counter-sunk so that the bottom of the cradle is flat. This includes steel plates used to join uprights to cross-beams.

## Measuring

When measuring the height of bow and stern supports, beware using your boat's draft. Draft is the distance between the waterline and the bottom of the keel. When hauled the bottom of the boat will rest on on the bow support at a point forward of the keel. usually six or eight inches — or more — below on the waterline. The measurement you need is the height of the keel, up to the point at which it meets the bottom of the hull where it will rest on the bow and stern support.

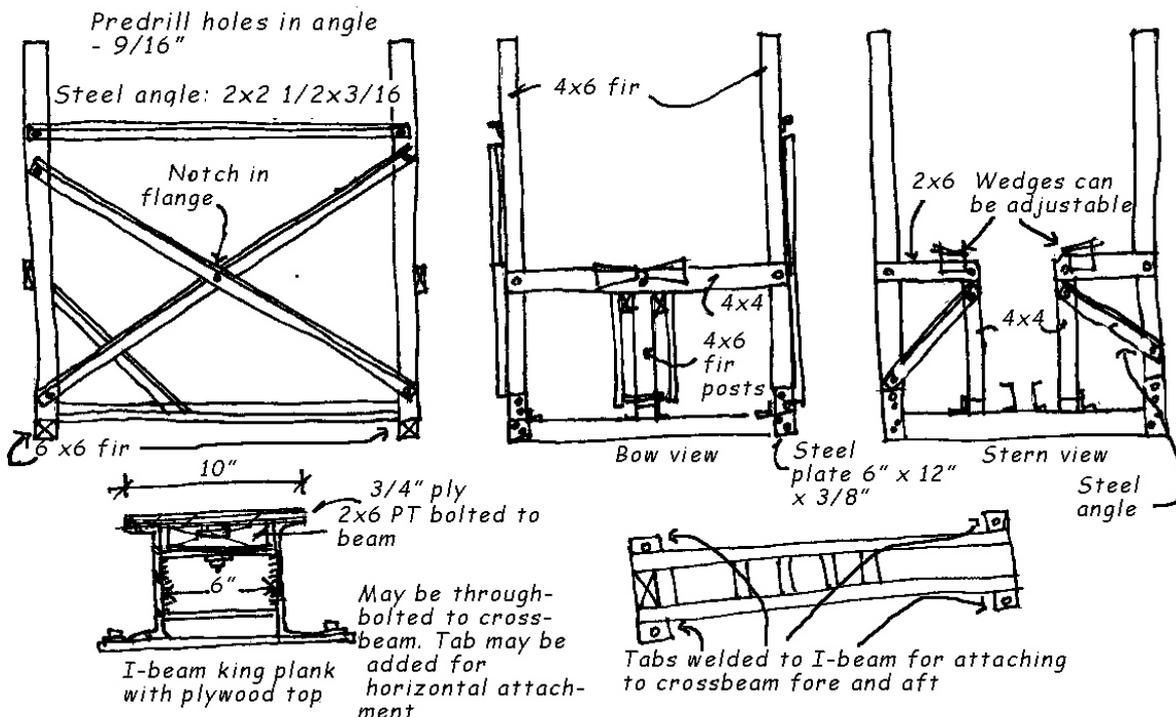
If the supports are built a few inches lower than necessary, shims can be used to steady the boat; if the supports are built too high, however, the bottom of the keel won't rest on the king plank and the boat will "hang" in the cradle. (This isn't the end of the world as shims can be added to the king plank below the keel, but the job requires considerable effort. It's better to get the measurement right the first time.)

When measuring the beam of your boat, keep in mind that the the maximum beam is usually amidships and will only have to pass between the aft uprights, not through the forward ones. Accordingly, by building the cradle with forward uprights that are slightly closer together than the aft ones, you can create a more stable cradle.

Alternatively, you can make blocks that fit between the uprights and the gunwales of the boat to stabilize it in the cradle after it is hauled. In fact, blocks aren't a bad idea for all four uprights since most boats are narrower aft of amidships and the aft uprights often don't fit tightly.

### Horizontal Views

Figure 3



# Bow Section

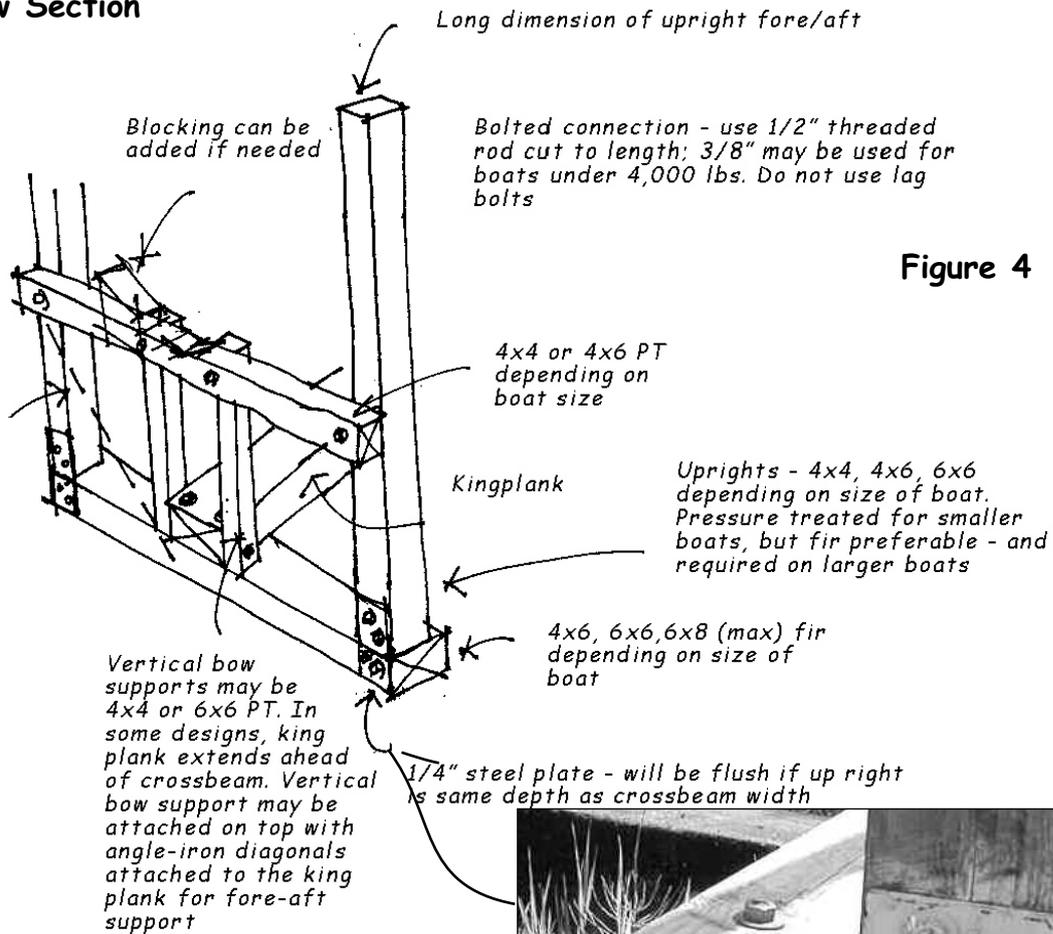
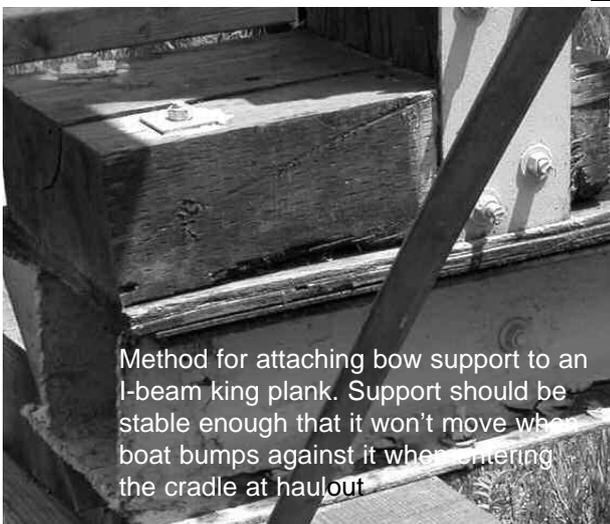


Figure 4

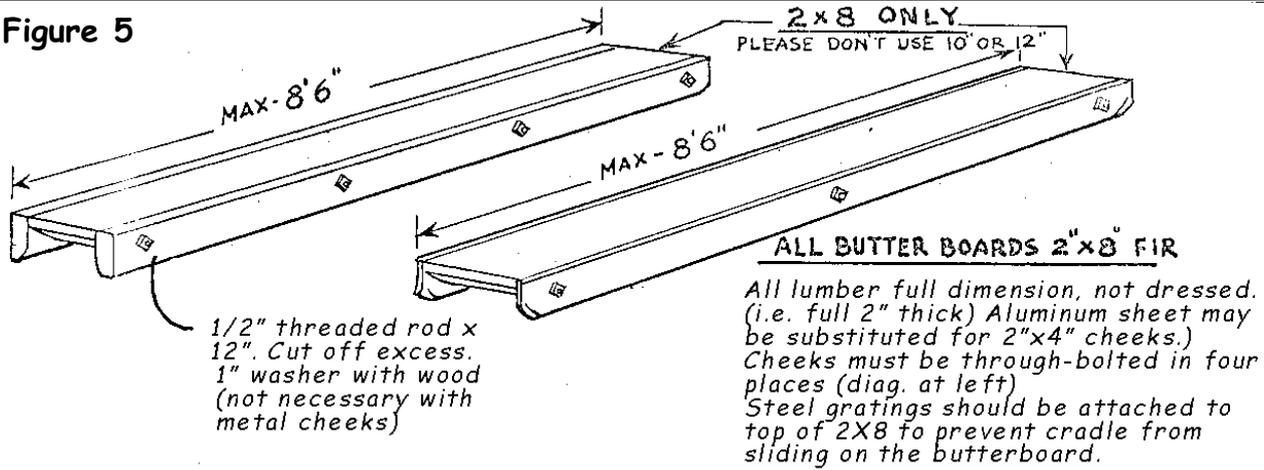
Figure 4 above shows a simple bow support system. Picture at right illustrates how to employ a metal plate to attach uprights to crossbeams.

Note that the plate doesn't hang below the crossbeam — essential to smooth handling of the cradle. In the picture, the upright is the flush with the crossbeam.

Threaded rod rather than bolts are used to attach steel plate.



**Figure 5**



**Butterboards**

Butterboards are the bearing surfaces on which cradles rest when being sidehauled on ways in the yard. The cheeks ensure the cradle stays aligned.

It is essential that the 2x8 that forms the broad, flat surface of the butterboard be unmilled (i.e. a true 2" thick) in order to keep the cradle 2" above the ways. This permits a bar to be placed behind the butterboards so the boat and cradle can be crosshauled mechanically.

Fir is the preferred material for butterboards. It may be used for cheeks as well as for the main surface. However, cheeks may also be made of steel or aluminum plate, both of which are more durable than wood. Aluminum is preferred as it is lighter and hence easier handled in the yard. But metal must be at least 3/16" thick; remember, the cheeks keep the butterboard lined up on the ways

Also, when metal cheeks are used, ensure that they flare outwards only enough that they don't catch on the ways or the rail car.

Steel cheeks can be fashioned as two pieces at each end of the butterboard to eliminate extra weight.

**Dimensions of some Common Sailboats**

	Displacement*	LOA	Beam	Draft**
Alberg 30	9000	30' 3"	8' 9"	4' 3"
Alberg 37	16,800	37'	10' 2"	5' 6"
C&C 27	1984 5500	26' 6"	9' 3"	4' 5"
C&C 29	1983 6700	28' 6"	9' 5"	5' 3"
C&C 30	1988 8275	30'	10' 8"	5' 10"
C&C 33	1976 9800	32' 10"	10' 7"	5' 5"
C&C 33	9450	33'	10' 6"	6' 4"
C&C 35	Mk I 10500	35' 7"	10' 7"	5' 3"
C&C 35	Mk II 14000	35' 7"	10' 7"	5' 3"
C&C 35	Mk III 10825	34' 8"	11' 2"	6' 5"
C&C 34	10100	33' 6"	11'	5' 11"
Viking 28	4755	28'	8' 4"	4' 6"
Niagara 35	14000	35'	11' 5"	5' 2"
Niagara 31	8500	31'	10' 3"	5'
CS 33	10000	33'	10' 8"	5' 9"
CS 30	8000	30'	10' 3"	5' 6"
CS 27	6500	27'	9' 4"	(3' 11") 5' 2"

\* Displacements can vary +/- 1000-1500 lbs. Depending on model variant, keel, optional equipment and personal effects

\*\* Draft can vary depending on model variant (i.e., Mk I, Mk II, etc.) and whether shoal or full depth

**Right:** Method of attaching uprights of stern support to rear crossbeam in a cradle using an I-beam as the king plank. Note the tab on the bottom of the king plank that prevents it from shifting fore and aft..



### Materials

**If you're not used to working with materials of the scale required in cradle making, the following sources might come in handy:**

**Metal Supermarkets ([www.metalsupermarkets.com](http://www.metalsupermarkets.com))**

Company has a wide range of metal (steel, aluminum, stainless, etc) in different configurations (tube, box tube, plate, rod, sheet grate, etc.) Guys are very helpful will do minor fabrication (holes, cutting etc.) on the spot. Will also deliver. Good source of cradle angle-iron, plates and butterboard cheeks (of aluminum or steel). A number of different locations around town.

20 Jutland, Unit C in Etobicoke — 416.201.9242

73 Railside, Don Mills – 416.441.2012

Dixie Rd at Bonhill in Mississauga — 905.670.9555

**Princess Auto ([www.princessauto.com](http://www.princessauto.com))**

Not exactly handy unless you live in Mississauga or Whitby. Not cut-rate, either. But good for big stuff. And unlike Canadian Tire, the help actually knows where things are and how there stuff works.

Download/view catalog online.

Also, 550 Victoria Street, Whitby —905.665.8581

**Hanford Lumber ([www.hanfordlumber.com](http://www.hanfordlumber.com))**

Longtime source of timbers for cradle construction. (Unmilled fir for kingplanks, uprights, butterboards, etc.) The company is used to delivering to the dock for pickup by the Robbins.

Etobicoke – 35 Bethridge Rd., Etobicoke, ON — 416.743.5384

**Pacific Fasteners ([www.pacificfasteners.com](http://www.pacificfasteners.com))**

All kinds of fasteners, threaded rod, bolts etc. for cradle construction. Also good for stainless fasteners for use on the boat. Download/view catalog online

West end. 7 Chauncey Ave., Toronto, — 416.231.7295

**H. Paulin & Co. Fasteners**

Threaded rod, nuts, bolts, etc. These guys supply Home Depot but also sell (for less) at the factory door.

55 Milne (off Danforth Rd.) Scarborough —416.694.3351