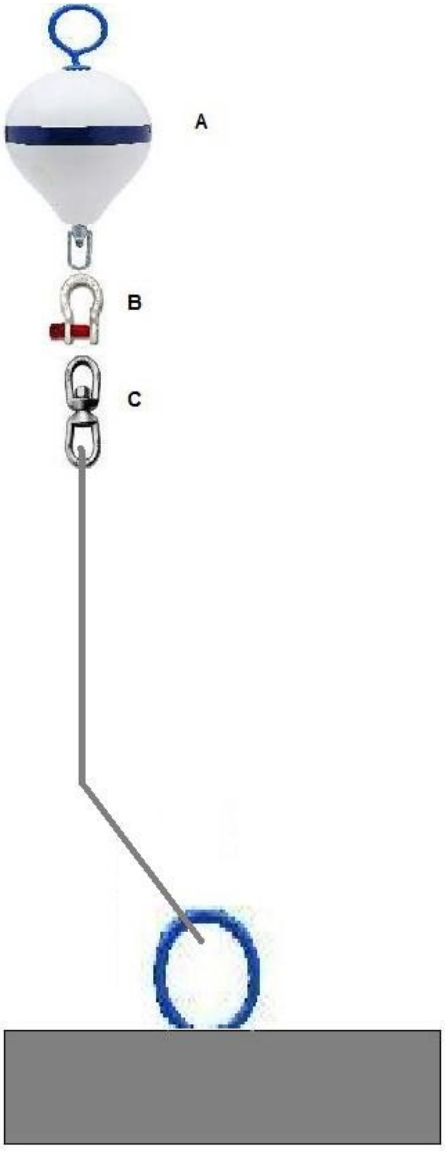
How to make a mooring the FYC way.

After years of fighting corrosion and boats breaking free from rusted chains the yacht club decided to try using nylon line instead of chain and to eliminate all of the metal possible at the bottom of the mooring. This document is a description of the history of the moorings as well as how to make the current standardized moorings.

In March of 2008 Michael MacDonald gave a presentation to the membership to present the pros and cons of nylon moorings and to ask the membership to approve the use of nylon moorings for the new moorings being installed as well as using nylon on a go forward basis. Appendix A is an outline view of the presentation made to the membership.

It should be noted that in 1995 when Jeff Boyd was Rear Commodore there were 60 moorings, 10 in each of our six strings of moorings.



At the end of the 2007 season there were 33 moorings left, the others had been lost over the years. The lack of moorings was causing considerable crowding in the fall.

Mooring system 5 was investigated and it seemed to have the most promise so we went forward on that basis. Mooring system 5 was a mooring ball connected to a very large swivel (¾ inch galvanized) by a ½ inch anchor mooring shackle. The mooring line was tied directly to the ring of the mooring block.

The 1 inch line was fed through the swivel end that does not have the nut, up over the top of the swivel and down over the top the swivel locking the rope onto the swivel without the use of a shackle. See photos below. This has to be done before attaching the ball.

The mooring loop in the concrete block is a 1 inch rolled steel ring provided by L and A Machine works. We priced the mooring rings at York Steel and another place and they came back at over $2600 for 15 rings. We purchased 15 rings at $40/ring. ($600 + tax)

We made a cement form and left it at Lafarge who filled it as they had concrete available. We had to breakdown and rebuild the form each time. The concrete block was 4ft x 4ft x 18 inches.

We were able to use Capitol Towing to move the mooring blocks two at a time from Lafarge to FYC. Moving four blocks cost $89.

The cement form made 15 moorings and is at the end of it's life. We used wood fillers inside the form to chamfer the top edge and corners to reduce the sharp edges to cause chafe and used hand grinders to smooth the chambered edges further.

Construction of the Mooring Line

The line from the mooring ball to the block of concrete we will call “the Mooring Line” from now on.

This type of mooring line is used at the Exuma Cays Land and Sea Park. The experience at the park shows that most of the wear and tear comes from the mooring ball and the boat chafing on the line next to the mooring ball. To counteract this chafe they put in a short tether between the main line and the ball to take the chafe. This way they could replace a short (6ft) piece of rope easily without the need for a diver or the cost of replacing the full line. The short piece of rope is the same size as the main rope. Thus the Mooring line is composed of two pieces the longer “main” mooring line and the shorter “sacrificial” top end.

We wanted to protect our mooring lines from the cement blocks as much as possible so we installed a small section of used fire hose, approximately 18 to 24 inches, and made an eye splice around it.

We also slid another piece of fire hose approximately 10 to 12 feet long over the hose from the other end. We slit the hose coming down over so that it would overlap the splice and reach down onto the fire hose in the eye splice, as shown in the picture above.

When the splices are being done. Obviously, the section of fire hose for the eye splice must be placed before the eye splice can be done, before the second eye splice can be done the second piece of fire hose must be slipped over the line as the fire hose is too small to put a fire hose over after the eye splice is made (even without the additional fire hose on the bottom end of the line) The top end of the rope does not require a section of fire hose to prevent chafe. The two main section of mooring line and the sacrificial short section need not protected by fire hose as they will lock together extremely tightly and will not chafe.

Another larger diameter and much more rugged fire hose approximately 6 ft long was slipped over both to cover the splice and a large cable time was used to bind the three together to make sure the fire hose wouldn't float up and become useless. See the picture below.

Cinch it up tight and cut off any excess of the cable tie.

Once the chafe protection is in place we can work on the top end of the main mooring line.

It was suggested that if we attached a small float to the top of the larger fire hose this would keep the line from becoming snagged or tangled around the bottom of the mooring. Interesting idea but not implemented to this point.

The top end of the main line is then attached to the bottom end of the sacrificial line. Attaching the line is done by puting the bottom loop of the sacrificial line over the eye of the main line and letting it fall down the main line until the top loop of the sacrificial line can fit through the top loop of the main line. Pull the top loop of the sacrificial line though the middle of the top eye spice of the main line and pull it tight and it should look like the picture below.

Neither end of the sacrificial line needs to be covered in fire hose. It will lock down tight enough that if you have to remove the two lines the easiest way to get them apart is to beat them with a rubber hammer. The top end of sacrificial line is then connected to the large swivel. This swivel should be checked for any ridges made in the manufacturing process, if there are any remove them with a small file.

Once the swivel is smooth the eye spice is fed though the end without the nut and the eye splice is rolled over the top of the swivel and pulled down on itself like the picture below.

The mooring ball is attached by the anchor shackle shown in the top loop of the swivel. There is lots of space in the top of the large swivel for a member to attach their mooring pennant. They can attach their pennant directly to the top ring or to the anchor shackle. Using the top ring is the preferred choice but if their shackle is too small to fit over the swivel then the anchor shack opposite to the cotter pin in the anchor shackle is a poor second choice. They must not use the lower ring of the large swivel as this negates the purpose of the swivel and can unlay or knot the nylon line given a long enough time.

Attaching the mooring line to the block

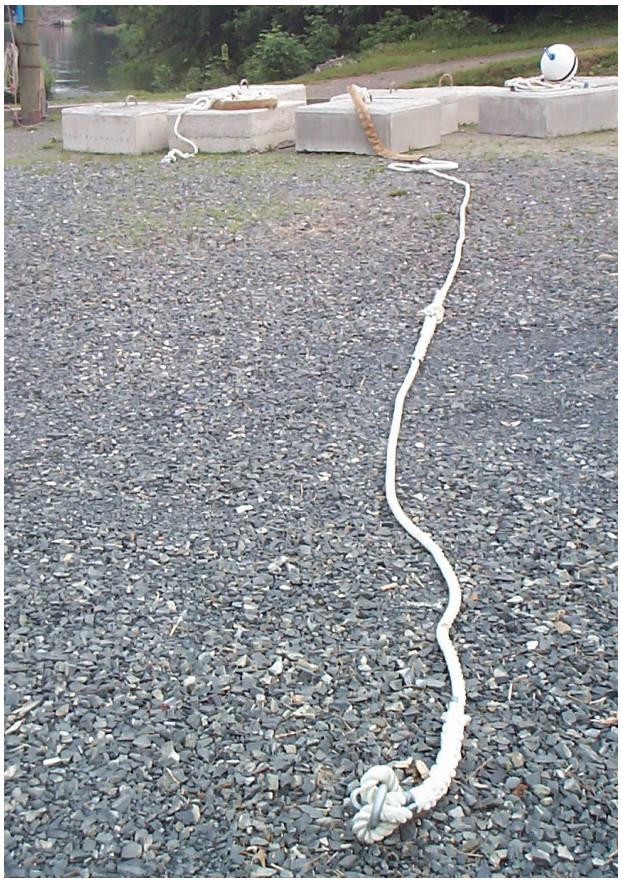
The mooring line is attached to the block in a similar manner to how the sacrificial line is attached to the main line. The mooring ring should be submerged far enough into the concrete that it cannot create a place where the mooring line can bind on the ring.

The chafe protected end of the main line is pushed through the ring in the concrete.

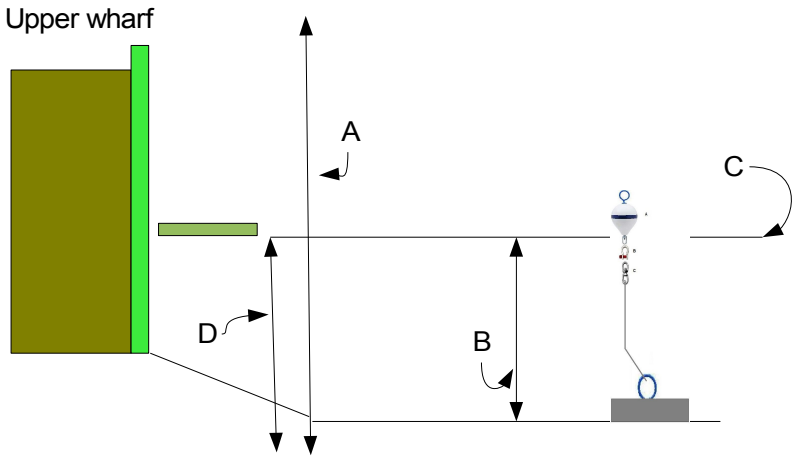
Place the top of the sacrificial end with the swivel through the eye splice on the other side of the mooring ring, as in the following picture.

And pull it tight until it is locked on the ring as in the picture below

once it is locked on measure the line, attach a mooring ball, an ID tag and record in the spreadsheet of new moorings.



How long should the mooring line be?



In the diagram above, the line “A” is the height of a point 1 foot higher than the upper wharf above datum. Since the wall goes under at approximately 14.75 feet above datum (4.5 meters) 1 foot above that is about 16ft.

To get an accurate number you need to do two things. Calculate a position where you want to put the mooring and go get it's depth. It's depth is represented by “B” above. At this point you need to go to the government web site and get the height of the water at the time you took the depth reading. The number given to you on the government web site is represented by “D” above. It's metric and will need to be converted to feet or you can do it in metric if that's your favorite.

“C” is the level of the water in the river at the time of the observation. “A” - “D” is the height of the point above the level of the water. “B” is the depth of the water at the time of the observation so “A” - “D” + “B” is the length of the mooring line needed.

For example: On October 18, 2008 the depth at a mooring was 18.6 ft at 3 p.m. the government web site reported a depth of 1.775 meters or (1.775*3.28839895 = ~5.8ft) so 16(“A”) - 5.8(“D”)+18.6 = 28.8 ft. If you can make a mooring as close to 29ft long as you can that's close enough.