

Longhorn Council, Boy Scouts of America, Viking Long Ship Restoration

Prepared by David Kanally, Wooden Boat Association, March 24, 2018

Background: The staff at Sid Richardson Scout Ranch in Bridgeport has approached the WBA to help with restoration of a hand-built 35-foot Viking style war canoe that is used each summer for rowing and sailing instruction. The boat is nine years old and is taking on significant water, has several broken seats and oar locks, and in general, needs a complete restoration. The ship is stored on its trailer in a warehouse in the off-season, and remains in the lake throughout the summer months.

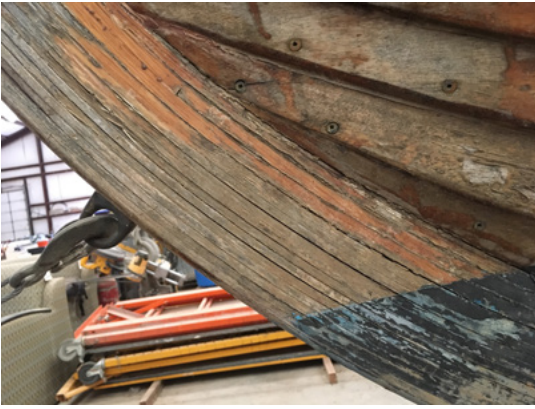
This outline provides a work breakdown to use as a guide for the restoration. Following the work breakdown are photos and detailed description of key restoration elements.

Work Breakdown

- Disassembly (two man hours)
 - Remove all oar locks
 - Remove all seats except the center seat which provides lateral stability to the craft
 - Remove all floorboards
- Parts repair and replacement (8 man hours)
 - Glue all loose seams in oars and steering oar using Gorilla Glue or Tite-Bond III. Clamp until dry.
 - Repair/refasten seat braces
 - Repair mast step
 - Include all repaired parts in sanding/varnishing steps below
 - Remove and replace the screws, one at a time, that attach the planks to the bottom frames. Replace with slightly longer, heavier gauge screws.
- Parts fabrication (16 man hours)
 - Fabricate 8 oar locks
 - Fabricate 1 seat knee
 - Fabricate new handle for steering oar
 - Fabricate new steering oar mount
 - Fabricate mast seat brace (U-shaped plate)
 - Include new parts in sealing and varnishing steps below.
- Stripping (20 man hours)
 - Using random orbital sanders with 100 grit sandpaper, remove all traces of varnish and paint from the hull, inside and out. Remove varnish from masts and yardarm. Use gel stripper only where necessary (mostly the hull bottom)
 - Scrape/reef any reachable caulking or impurities from the outside seams, leaving some space for new caulking to enter the seam and seal.
 - Using an awl, mark the waterline between the bottom paint and varnish before all traces of bottom paint are removed.
- Sanding (20 man hours)

- Using random orbital sanders with 120 grit sandpaper to sand all exterior and interior surfaces, paying particular attention not to gouge or create unevenness in the planks.
 - Sand all parts, including oars, mast and yardarm.
- Sealing (10 man hours)
 - Seal all surfaces with a coat of CPES (Smith Brothers Clear Penetrating Epoxy Sealant, 2-part). Be sure the doors and windows are open on this day! Lots of fumes!
- Caulking (8 man hours)
 - Fill visible gaps in laminated stem and keel with thickened epoxy
 - Run a bead of Sikaflex polysulfide caulk along each underwater seam, working caulking into the seams. Suggest black colored Sikaflex since bottom paint is dark. (note, Sikaflex is slow curing, so allow drying time before bottom painting).
- Varnishing (4 man hours per coat x 6 coats = 24 man hours over seven days to allow for drying time)
 - Apply first coat of marine spar varnish (ie Interlux Gold, Captain's, or Epifanes), diluted 50/50 with paint thinner, to all surfaces, except the painted part of the bottom
 - Apply at least 5 additional coats of marine spar varnish to all surfaces, following manufacturer instructions, allowing sufficient drying time between coats. (6 qt. estimated total)
- Bottom painting (four man hours x 3 coats = 12 man hours over four days to allow for drying time.
 - Tape off above the original bottom paint waterline
 - Apply 1 coat of marine primer
 - Apply 2 or three coats of bottom paint (1 gallon estimated total)
- Reassembly (10 man hours)
 - Reassemble steering oar mount
 - Reassemble seats
 - Reassemble floorboards
 - Reassemble mast step and test mast placement and seat bracket
- Water test (4 man hours)
 - Launch ship and test for water-tightness and function

Viking Long Ship restoration details



Stem and Keel Lamination: The keel and stem are laminated, and many of the seams have opened up between the layers. These should be filled and sealed with West System Epoxy thickened with low-density filler, stained with oak colored stain (do not use caulk for this step).



Bottom lapstrake seams: Do a thorough job of reefing out the seams so the new caulk has a place to enter the seam and seal. Use a reefing hook (you can make one by bending the tip of an awl into a hook shape).



Oar locks: The oar locks are made of oak and are traditionally short-lived due to the pressure they endure. Consider using purple heart or other hardwood in the place of oak, and creating more of a hump on the top of the lock to give more strength to the piece.



Mast step location. This spot in the floor is where the mast step goes (see first two photos on next page) There are two trim planks that drop into the spaces on each side of the mast step.



Mast step assembly. The mast step log is in good shape, but should be sanded and sealed with CPES and varnished.



The plates on the top of the mast step with the round hole to accommodate the mast should be remade in marine plywood to avoid the chronic split-out problem.



The seat braces themselves are in good shape. There is one broken knee (top brace). All should be removed and refastened more securely. Consider moving the knee to a supporting position under the bracket.



The seat brace and knee on the starboard side of the mast support seat are completely detached. They need to be removed and refastened more securely. Consider moving the knee to a supporting position under the bracket.



The clinker nails holding all the planks together have exposed heads, so be careful while stripping, scraping or sanding the planks so as not to damage the nail heads



There is a U-shaped bracket missing that is designed to hold the mast in the notch in the middle seat. The bottom of the “U” holds the back side of the mast and the top members of the “U” are secured to the seat by driving pegs through holes into the holes in the seat. Suggest using 1” thick marine mahogany plywood to make the new bracket to avoid splitting problem (WBA may have a piece of plywood in stock for this.)



The steering oar (rudder) requires regluing of seams and the fabrication of a new handle. It is otherwise in good shape, but needs to be stripped, sanded, sealed and varnished.





The eight oars are glue-ups with three pieces laminated together. Seams need to be re-glued and clamped, then the oars should be sanded (lots of splinters here!), sealed and varnished.



The masts are approximately 25 feet in length and are of hollow construction. The masts should first be stripped. Then, the seams need to be filled with thickened, stained epoxy, then the masts need to be sanded, sealed and varnished. There is also a yardarm (boom) of solid construction requiring similar treatment.



Mast seam closeup.

Top photo: Looking forward from stern. Lower photo: Looking aft from bow.

