

Scheherazade

A look at the latest Hodgdon Yacht/Bruce King project

By Tom Pawlak

On a break from the Maine Boatbuilders Show in March, we visited Hodgdon Yachts, Inc. and found significant progress on their latest build, a 155' Bruce King designed wood/epoxy ketch, named *Scheherazade*. This is Hodgdon Yachts' largest wood/epoxy vessel to date. The project is roughly 60% larger than *Antonisa*, the 124' sailing yacht they launched last year.

The new Hodgdon Yacht facility has a 164' × 50' center bay, large enough to accommodate rollovers of large vessels with a 400-ton overhead crane. 100' × 20' wings on each side are three levels high.

Scheherazade is being built in Hodgdon's new 20,000 square foot facility located at the water's edge in East Boothbay, Maine. A project this size would not have been possible in their old shop, but the new building has a 164' × 50' center bay that is large enough to accommodate rollovers of large vessels and includes 100' × 20' wings on each side that are three levels high. A 400-ton overhead crane traverses the length of the main bay, allowing quick placement of large components. The overhead crane capability will play an important role in maintaining the tight three and a half-year project schedule. Many of *Scheherazade's* sub assemblies are being fabricated off-site. Some are quite large and will require precise positioning.

Just minutes away, the original boat shop where *Antonisa*, *Liberty* and many other fine vessels were built is now being used as a cabinet shop. Full size mock sections of *Scheherazade's* interior have been laid out there so craftsmen can build the furniture "in place" without actually being in the hull. Tim Hodgdon, president of Hodgdon Yachts, Inc., says building the interior while the hull is still under construction will greatly increase efficiency. Cleating and stick building inside an actual vessel takes additional time and can be a nightmare near the end of the project because of all the joiners required inside the vessel. Installing furniture that is completely finished will dramatically minimize the time required inside the boat.

During our visit to the cabinet shop, we saw exquisite cabinets being built from fiddle backed sycamore and burl walnut. The contrast between the dark walnut accents and the light colored and beautifully grained sycamore brought smiles to our faces. There were barrel-backed doors under construction with joints and grain matching that would rival the best furniture found anywhere.

Tim Hodgdon is proud of his company and their tremendous growth, especially the cooperation and new responsibilities undertaken by employees. They have used extensive advanced planning to compress the amount of time required to complete *Scheherazade*. Computers and 3D modeling have allowed them to increase man-hours earlier in the project than would normally be possible. To achieve maximum benefits from Computer Aided Design (CAD), Hodgdon sent key employees to CAD operators school. Since Hodgdon's CAD operators are experienced boatbuilders, they can produce effective drawings which the cabinetmakers and joiners can use to build interior components with a minimum of direction.

Hodgdon had subcontracted other boatyards such as Goetz Marine Technologies and French & Webb to build components for *Antonisa*. With the expanded facility and crew, however, they plan to build more of *Scheherazade's* components inhouse.

Hull materials

Scheherazade's hull is made of multiple layers of Douglas fir, western red cedar and WEST SYSTEM® epoxy. Total hull thickness is 3-1/2". The first layer glued to the frames is vertical grain Douglas fir, 7/8" thick and oriented longitudinally. The next four are 7/16" thick and oriented diagonally, primarily western red cedar with occasional substitutions of Douglas fir in highly loaded sections of the hull. The last layer will be another layer of 7/8" thick Douglas fir oriented longitudinally. The hull will be encapsulated with two layers of fiberglass cloth and epoxy before it is faired and finally rolled over.

A crew applies one of four, diagonally oriented inner layers of 7/16" thick western red cedar, The first and last layers are 7/8" thick vertical grain Douglas fir, oriented longitudinally. Total hull thickness is 3-1/2".

The hull reinforcing members, frames and floors are made of multiple layers of vertical grain Douglas fir laminated with WEST SYSTEM epoxy. Carbon fiber is used between layers on some of the highly loaded members.

Using salvaged lumber

For the hull and frames of *Scheherazade*, Hodgdon decided to use only lumber that had been processed from trees that had fallen from natural causes. He purchased through a firm specializing in processing windfall. Trees that met project specifications were found on the Olympic Peninsula.

The quality of this salvaged old growth lumber is very high. The Douglas fir trees used to produce the lumber for the frames and hull planking were over 600 years old. The western red cedar trees used for the diagonal planking were mined from the forest floor. Hodgdon was told that the trees had fallen at least 300 years ago; roots from full-grown trees surrounded sections of the cedar trees that were chosen. The trees settled into the forest floor and the forest had literally grown over them. Logs were cut to length from the well-preserved deadfalls and removed via helicopter. The steep mountain slopes on which the trees were found and the limited access made any other removal method impossible.

Constructing the deadwood laminate

During our visit, the deadwood laminate under construction was formed by gluing multiple layers of 2" thick Douglas fir lumber over a temporary forming jig. The deadwood will be created in 12" thick segments with a layer of plastic being placed every 6 layers to act as a boundary layer to keep the glue from sticking. These 12" thick layers will later be removed by driving wedges between the layers where the plastic was placed. Each layer will then receive the forty 2-1/2" diameter holes that are required to allow it to be positioned over the keel bolts and glued into position. Once the deadwood laminate is complete and has been glued in place over the ballast keel, the ballast and deadwood assembly will be moved into position under the hull and eventually epoxy bonded to the hull. Once the two are joined, *Scheherazade's* deck will be even with the second mezzanine of Hodgdon's new facility, some 24' above the main shop floor.

Project plans call for the deck to be built in place after the hull is rolled over and after some of the larger subassemblies have been positioned and secured inside the hull.

The 38' long, 153,000 lb ballast keel will be attached to the hull by forty, 2" diameter stainless steel keel bolts. The deadwood laminate, built to be separated into 12" layers, will be bonded, layer by layer, onto the ballast keel.

The impressive scale of the project

Length over all is 154'7" with a beam of 28'6". The draft will be 13'0". Imagine the surface area that this works out to be. It all needs to be planked, faired, fiberglassed, faired again and painted. This would be about equivalent to planking, fiberglassing and fairing the side of the local library.

The main mast stands 174' above the deck and the mizzen about 110' above deck. The rig will be delivered by ship and/or barge. Sail area for the ketch rig will be 9,940 sq ft.

The ballast keel is about 38' long and weighs 153,000 lb. (*Antonisa's* keel was 41' long and 106,000 lb.) It will be attached to the vessel with forty, stainless steel keel bolts and potted in with WEST SYSTEM® epoxy. (For more information on glued-in fasteners, see hardware bonding article in *Epoxyworks* 13). The 2" diameter keel bolts range in length up to 8'6" long. The lead keel was poured at Mars Metal in Burlington, Ontario, Canada. The keel was cast in a continuous pour. We were told it was the largest ever poured in North America if not the world.

The keel was shipped on the road via a specially built truck. The Hodgdon crew was surprised it could be delivered by road because of the winding two lane roads that lead into East Boothbay. The 135' long highway transport must have had some challenging moments along the way.

Epoxyworks 17 / Spring 2001