

**Report over important  
Structural Problems and Construction Faults  
Found on Hermina3**

After the purchase ,the sailing yacht Hermina3 was delivered to Viareggio, Nw Italy,where it was planned to undergo to a restoration program in order to bring her back to private yacht shape,as she was originaly designed,from the actual destination of charter vessel.

Hermina 3 arrived in Viareggio harbour on july 28<sup>th</sup> 2001

On the 6<sup>th</sup> of August the boat was hauled out of the water and the 8<sup>th</sup> ,after burning the old paint from the whole hull,and sanding the planking to begin the maintenance works, the shipyard discovered that a remarkable part of the planking of the boat was made of short planks ,despite the normal size of the rest, sign of an incorrect replacement ,done in a way that the Italian Naval Registry could not approve.

I inspected the hull on August 9<sup>th</sup> and realized that the worries shown by the shipyard were true and the state of the hull was not as described and stated by mr. Takis and Spyros Galanakis

As surveyor of the yacht, before the transaction I inspected the yacht 3 times in Athens: First time on November 17<sup>th</sup> 2000 , the yacht was moored in the marina Glifada .the second time ,again at Glifada, on April 19—20<sup>th</sup> 2001 I have been helped for a deeper structural visit by Mr. Guido Del Carlo, shipwright and owner of shipyard in Viareggio, and the third time I saw the boat hauled out of the water on July 15<sup>th</sup> in the Chalkitis shipyard in Perama, Pireus. This third visit was required as final evaluation before the purchase, to confirm my previous estimate and the validity of the agreed sale price.

The boat was always well painted and I have not been able to detect this serious problem ,even scraping locally the paint, and even if I was helped by a skilled shipwright and boatbuilder in my second analysis . This structural fault have been detected only after burning the paint and sanding and grinding the wooden surface.

To write my estimate I had to rely on the declarations of the greek owners on several subjects. I accepted the words of the sellers believing in their honesty ,as proving the contrary could have been a destroying test or an expensive one for them or for the purchaser. Unfortunately the declarations of the Galanakys about the situation of the planking showed to be not true and it contains errors and omissions, deceitfully done to obtain an higher selling value.

In the following paragraph I copy the part of my estimate written after my second visit to the yacht in Athens on April 19/20 2001 that contains the fake statements of the seller about the hull and the deck .In the next paragraph I will describe the real situation of the Hull and the Deck of Hermina 3

## **The Hull**

Hermina 3 underwent an important rebuilding in 1989 by the actual owners, who, since then used her as a successful charter yacht. These works have been made mostly to obtain wider and smarter volumes for the charter needs, as well as to make the boat safer and stronger. Thanks to them and to the care and love they lavished, the boat is still in generally good health, even if some of the changes do not respect the original design.

The planking was originally of Oregon Pine, 50 mm thick, 140 mm wide, and I was told of an amazing length of 15 m. It was fastened with iron nails and bolts, and after 40 years the oxidation and the degradation were important, and this has been the major reason for the replacement of the whole planking. The actual planking is made of Oregon Pine planks, 50 mm thick, with the same original width, but of a length of 7 meters. The planks are said to be fastened to the wooden ribs with stainless steel screws (owners' declaration), and result bolted to the steel frames with galvanized bolts.

The planks are not caulked, as originally, but glued each one to the next with a water-resistant one-component wood adhesive called Ballytan 100. This choice has been approved by the Greek Naval Register.

We found out that the sheer strake has not been changed and it is still the original plank. In fact we could notice few spots of this plank where the wood suffered for the rusted screws and it is locally rotten. The owners assured us that this is the only plank left original from the rebuilding. This first plank of the side of a boat is a very critical one, being the connection between deck and hull, and it is impossible to change it if you do not remove completely the deck. We assume that it will not be compulsory for the new owner to change it and the few rotten parts would be replaced scarfing new patches.

## **The Deck**

Hermina's deck was rebuilt in 1999. It is a Teak deck, with planks of 20 mm thick and 70 mm wide bent and glued with epoxy resin, and fastened with stainless steel screws every 2 meters to the original inner deck built of Oregon Pine planks 60 mm wide and declared of a thickness of 50 mm., which is fastened to the beams.

The new deck is strong looking, well caulked and declared completely water tight.

The yards specialized in classic yachts refitting would have taken different aesthetic solutions laying a new deck on an important boat like this one: like using longer and less wide planks, with well designed staggered ends, and trying to avoid screws; but from a mechanical and structural point of view, the deck is sturdy.

All the superstructures have been built at the time of the rebuilding of the hull in 1989, except for one single skylight, still original, actually overhung by an imposing and comfortable deck table.

Once the boat will not be used anymore for charter, and the space for paying guests will not be a must anymore, the big superstructures will have to be replaced in order to give the boat the harmony of the lines the architect thought for her.

**Report on the conditions  
of the Hull and Deck structures  
of Hermina3  
after more inspections to the yacht on hard in Viareggio  
from September 10<sup>th</sup> to October 5<sup>th</sup> 2001**

Hermina 3 is resting on a cradle inside a large shed in Viareggio.

The part of the planking that is not in conformity with the rules of the correct boat building and not acceptable by the Italian Naval Registry (RINA) is not concentrated in a single area, but show a rather symmetric distribution : on the right and on the left part of the hull a little astern and ahead the main section. Not all the planks are of the same length ,but all of them are far shorter of what has been declared by the sellers with reference to the dimensions of the planks: Their statement was (pls check with paragraph “The Hull”) Oregon Pine planks, Length : 7 m,fastened with Stainless Steel screws, glued with Ballytan 100 glue. All the planking was said to be changed in an important rebuilding done in 1989.

We can divide these planks in 3 different groups:

- 1) Those to be absolutely taken away because too short,
- 2) those to be changed for the wrong way of building,
- 3) the part of the good planks to be taken away to allow the shipwright to give a correct length to all the new planks that will replace the wrong ones.

1)All the planks of the hull to be absolutely replaced, shorter than 2,80meters have been marked with a chalk,and pictures were taken. The total length of these planks is about 98 meters.The attached pictures show that the major part of these planks are shorter than 2 meters, with 13 patches less than 1 meter long The shortest piece is 50 cm long.

2) Some other plank within the group, longer than 2,80 but far shorter than the declared length of 7 meters ,for a total length of about 50 meters have to be removed too ,even if they could have been accepted for the dimensions ,because they are lined out and placed in a wrong manner. The construction rules for wooden crafts of the Italian Naval Registry, as all the major classification company of the world provide for, and impose that in the section where a plank ends up (butt end of planks) and a new plank begin ,the continuity of the longitudinal strength of the building has to be given by the neighbouring planks. At least the lower 2 planks and the upper 2 have to be continuous and not end before at least 2 meters astern or ahead of that butt end .In the case of Hermina3, in the wrongly built area this rule was not applied (see pictures 14A—15A—16A) . In the worst case (picture 16 A) 5 planks end up in the same section, alternated with only a continuous one, (and not always long enough). This create a very weak section of the boat.

3)In order to provide a state of the art reconstruction, in line with the rules of the Registry, the shipwrights have to plan carefully the planking operation. This essential part of the boat building is called “lining out “ and it is the process of deciding on the length, width, and location of each plank before planking commences ,to avoid short planks and/or wrong butt end distribution and to provide the maximum strength of the construction. During this operation the shipwrights decide how many meters of the good planks have to be taken out to permit the correct reconstruction.

In the case of Hermina 3,it will be necessary to take out about an extra linear length of “good”planking of 120—150 linear meters , to be able to rebuild correctly the bad part.

## **Taking away the planks Observations and Ipotesys**

On October 5<sup>th</sup> the shipyard had already provided to remove a great part of the planking to be replaced. Therefore I had the possibility of comparing the construction characteristics, visible after removing the planks, with the description of the Galanakys. Nearly all the planks are of the same kind of wood of the rest of the hull: Oregon pine, except few short patches out of random pieces of wood. The thickness of the planks is about 48 mm., against the 50mm declared, which is acceptable. But some intriguing difference is shown among the “good planks” and the “bad planks” that make me seriously doubtful about the whole declaration of the Galanakys. The bad planks were not glued, but caulked. The caulking does not show to be done long time ago. I think less than 10 years. The screws that fasten these planks to the wooden ribs are of brass, not stainless steel as declared, of a size of 10 mm of diameter X 65mm of length. They are in very good shape. The brass is not a metal to be used in structural parts, specially in marine environment, due to poor resistance to corrosion and poor mechanical characteristics. Those screws could not be older than 6—7 years, because they are too good and too new. The bolts fastening the planks to the steel ribs are of galvanized steel, of a diameter of 12 mm, with exagonal nut. The good part of planking is fastened with galvanized bolts of a diameter of 10 mm, with square nuts, out of date and obsolete articles, but generally in better condition (because of better metal). On the wooden frames the good planks are fastened with 10x60 bronze screws, and 8x80 where the planks are tapered, both types older than the brass ones. The planking is glued and not caulked as the other part..

All these differences, of kind of construction, materials, skill, make me think that the boat was never completely rebuilt, as declared by the former owners, but she has been partially patched after an accident difficult to identify.

## **Reconstruction procedure**

Once all the above described planks will be taken out, the shipyard will begin the repair work.

This consist of 3 stages:

- 1) Check all the frames and ribs where the planks have to be fastened. Hermina 3 was built with composite framing, a set of wooden frames alternating with steel ones. The steel frames show locally a deep corrosion, and predictably some of these should be replaced. The others have to be chipped out from the rust scales and deeply ground and sanded to take out the traces of oxidation. They will be cold galvanized and painted before fastening to the planks. The wooden ribs too have to be thoroughly checked. The old paint has to be scraped out, small weak points will be fixed with epoxy resin filler, wider areas of rot, or local damages will be fixed with wooden scarves, before applying the new protective paint
- 2) It could be necessary to replace some wooden frames.
- 3) Cut the planks, line out the individual planks, fair them to fit them nicely, glue them to the neighbour ones, (as the planking has to be glued, as in the rest of the

hull),and fix them to the structures . With Silicon bronze screws of right size to the wooden ribs, with galvanized carriage bolts to the steel frames.

### **Checking the deck**

Whilst the planks of the hull to be changed were taken out, the program of the general restoration of the yacht was going on. The big superstructures built by the former owner ,to provide more space for their charter business has pulled away to give the yacht the pure line of its original design . Doing this, the deck construction and structures have been brought to light ,and also here ,the reality is far different from the declarations of the Galanakys. And realizing that the deck was not as declared, and it was not well glued,it has been decided to replace it.

Removing this deck I can remark the following:

The actual deck is not laid over the original deck as stated ,but on a second teak deck put between the two before this last one . It is fastened with stainless steel screws,as stated ,even if of various sizes and features, like if they were of a second choice. The deck is only partially glued with epoxy resin, but mainly attached to the second layer with a black rubber compound which was not holding well. The thickness of the deck is not 20 mm, but it is between 13 and 15 mm.

## **Documents and Proves**

Enclosed to this report there is :

From the so called “bad planking”:

Few brass screws , some caulking cotton, few bolts , some pieces of wood

From the good planking :

Few bronze screws, few bolts, some pieces of wood, showing the glued joints

From the deck:

Some piece of deck planking showing the thickness of deck ,and the elastometer used to attach the deck planks;some screws

Pictures to the “bad parts”before removing the planks, showing the length of each plank to be removed.

Pictures after the planks have been taken out.

Pictures of the deck.

## **Estimated Cost of reconstruction of the Hull**

To take out all the wrong planking from the hull, as above described ,and rebuild such a boat,in the correct way to provide the hull integrity and the structural strength promised by the seller, it will be necessary to fit at least 270—320 linear meters of new planks of Oregon Pine wood or other timber of similar features,of 50 mm of thickness (about 3 cubic meters of planking).

The cost of this operation will be in the range of 90.000---120.000 Euro.

To remove the actual teak deck (the third put on top of the other existing two) and to lay a proper teak deck with the required characteristics of strength and impermeability,it will cost about 50.000---60.000 Euro.

**In Faith  
Enrico Zaccagni**