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Inspection of Bottom Plating Damage & Repair Proposal

Report date:	23rd April 2020
Report no.:	172-01-Rev 00
Survey date:	First Visit 26th November 2019 Final Visit 4th March 2020
Location of Survey:	Estepona Marina Hardstanding, Spain
In water/Ashore/At Sea:	Ashore, supported on hardstanding
Client:	[redacted] John Tiernan, Ireland

Vessel Information

Vessel Name:	ZAMBA
OFF Number:	390309
Port of Registry:	Jersey
Date of build:	1986

Introduction:

We were instructed by above client to inspect the bottom of the subject vessel ashore. We were requested to investigate:

a) the condition of the hull,

b) inspect the existing leak,

c) issue finding in relation to the condition of the hull,

d) issue finding into the cause of the leak,

e) issue findings into the overall condition of the hull

Findings:

We inspected the boat on the 26th November 2019, the vessel had been found to be leaking and this was found to be a crack in the bottom plating; this was temporarily patched with epoxy patch and the vessel towed to Estepona and lifted onto hardstanding.

Picture of crack in Hull from inside prior to Temp Repair taken in Sept 2019.. supplied by Client

Areas that have been examined are:

- externally outside shell plating.
- internally areas where cracks were noted and access during the inspections were accessible.

Original inspection indicated patches on the hull had been fitted over hull damage, these look to have been fitted more than ten years ago. These patches are marine aluminium alloy plates that are bonded to the hull with marine flexible adhesive and riveted in position.

Thickness of hull plating was measured in areas of damage using Cygnus UTM giving results of 4.8 to 5.2 mm using an Aluminium Conversion factor 1.068 from Steel to Aluminium. This would be the expected design thinkness. Given this thickness it is considered that the damage was caused by an external force as opposed to wear.

The crack that was the cause of the initial leak was Temporary repaired with a patch ;
The temporary repair was by way of epoxy patch covered with an aluminium plate braced with timber struts . Please find above photograph of the impact damage prior to the temporary repair having been carried out.

The damage appears to have been caused by a local vertical impact at mid panel between the stiffeners identified in September 2019 . The outside fairing compund (appears to be polyester type resin) was damaged locally only at said crack.

The type of damage to cause this type of crack is considered to be of a type of punch through the bottom plating possibly from bottoming out due to low tide or badly positioned support props or possibly hit by another craft s under hull in the tuning circle in the marina adjacent to the moored Boat which is on the same side as the impact damage.

At the conclusion of the first visit, it was agreed to carry out a welded type repair and at the same time (while not leaking) check the other "patched" areas that all rivetted patches are removed and any areas where fairing compound is damaged the filler will be removed to allow inspection as the boat was in Dry Dock

Second visit 20th December 2019

All existing patches had been removed and fairing compound removed.

A check of all plating externally and internal plating and structure where accessible was made. The hull plating and structure is well fabricated with little or no apparent degradation of the aluminium alloy for the age of vessel.

The location of the crack on the vessel indicates that the plate crack was caused by local punch type impact damage so we consider that this has been caused by local grounding/ or similar to bad propping of the vessel ashore. This type of damage appears to have occurred with the vessel stationary, otherwise we would expect to see damage in way of the longitudinal and transverse supports or a more continuous damage longitudinally (raking damage), this is not the case. In addition, if the vessel structure was not robust for the vessel operation it would be expected to find the damage to be of a more uniform pattern on the shell.

After the inspection of the bottom after removal of the fairing as required, a repair procedure to clean and grind flush damage and weld 6mm marine grade (5086 H111) doubler plates with radiused corners in way of the damage was agreed to ensure a suitable semi-permanent repair.

In addition, to ensure the longevity of the repair, the internal surface in way of the damaged shell plating should be cleaned and after the external plates are welded in place a suitable marine grade epoxy resin shall be poured into the bays between longitudinal and transverse stiffening to ensure no ingress of water into the area between external plate and existing shell plate would be possible.

Based on the limited operation of the vessel; **marina based with occasional coastal transfers at < 10 knots in favourable weather conditions**, this repair would be considered acceptable and ensure the structural and watertight integrity of the hull.

Conclusion:
In general the hull appears to be in good condition and no obvious deterioration appears to have occurred since the previous report carried out in 2015. Save the localised area resulting from impact from an external force protruding against the hull.

The works that has been directed and proposed and subsequently carried out by Mint Yachts are to a good standard and based on the limited operation.

Picture of Hull during Antifouling .. supplied by Client

For additional information and/or clarification please contact us.

Without prejudice.

Surveyor: Paul Shannon 23rd April 2020

Signed ……

on behalf of Consult Shannon (Gibraltar) Ltd Reg. No. 111946

**********end of report**********

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Date 23/02/20

[redacted]

As requested I am writing to you in relation to the boat known as ZAMBA, my inspection of the boat, the works I carried out on the boat and my observations in relation to same.

By way of background, our company Mint Yachts carries out specialist welding and repairs of all aluminium boats and in later years has specialised in fabricating aluminium hulls. We have been in business for the past 20 years and have a wealth of knowledge of everything to do with aluminium boats and hulls.

Inspection

Further to your query and invitation to inspect the works I met with your representative at Estepona to inspect ZAMBA. During my visit I also met with your appointed engineer, Mr. Paul Shannon of Consult Shannon (Gibraltar) Ltd.

On inspecting the entire hull I found same to be in good condition with the normal wear and tear that would be expected of a craft of its age. I gave particular attention to the crack on the site of the boat which appears to be as a result of a punching force with two similar cracks (which I understand were not leaking) adjacent to same – see ***photo 1***.

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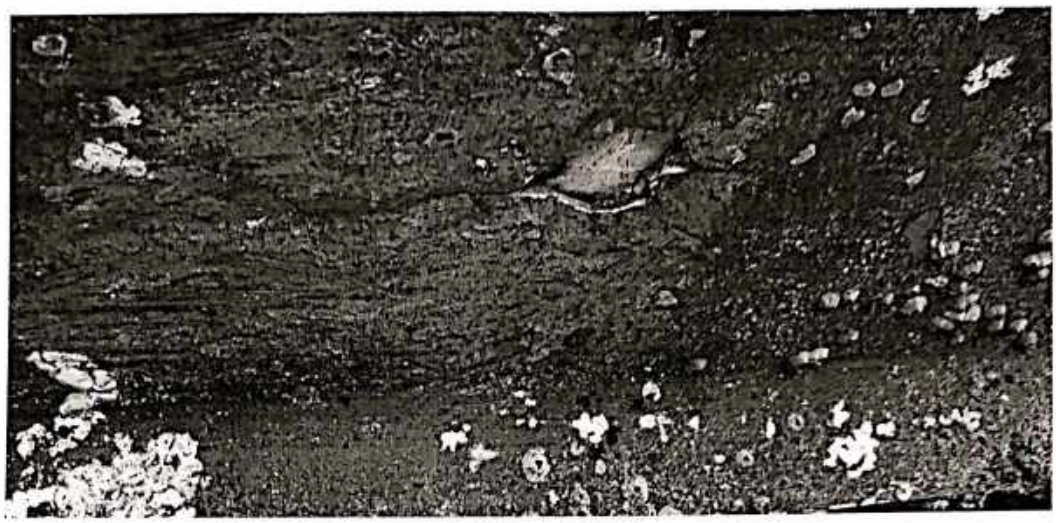
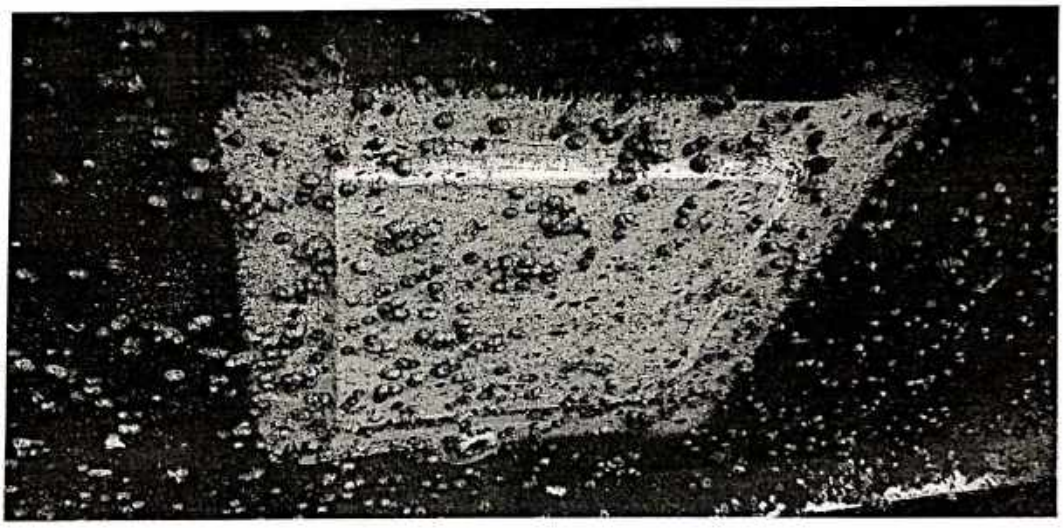


I also noticed some patching that appeared to have been carried out a number of years ago and I note it was highlighted in the previous boat survey carried out in 2015.

These plates were in a single area and had been riveted to the boat – see ***photo 2***.



I carried out some measurements of the aluminium in selected locations and found same to be in varying depths of 5mm – 6mm and to be, in general, structurally sound.

MILT YACHTS SL
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Repairs

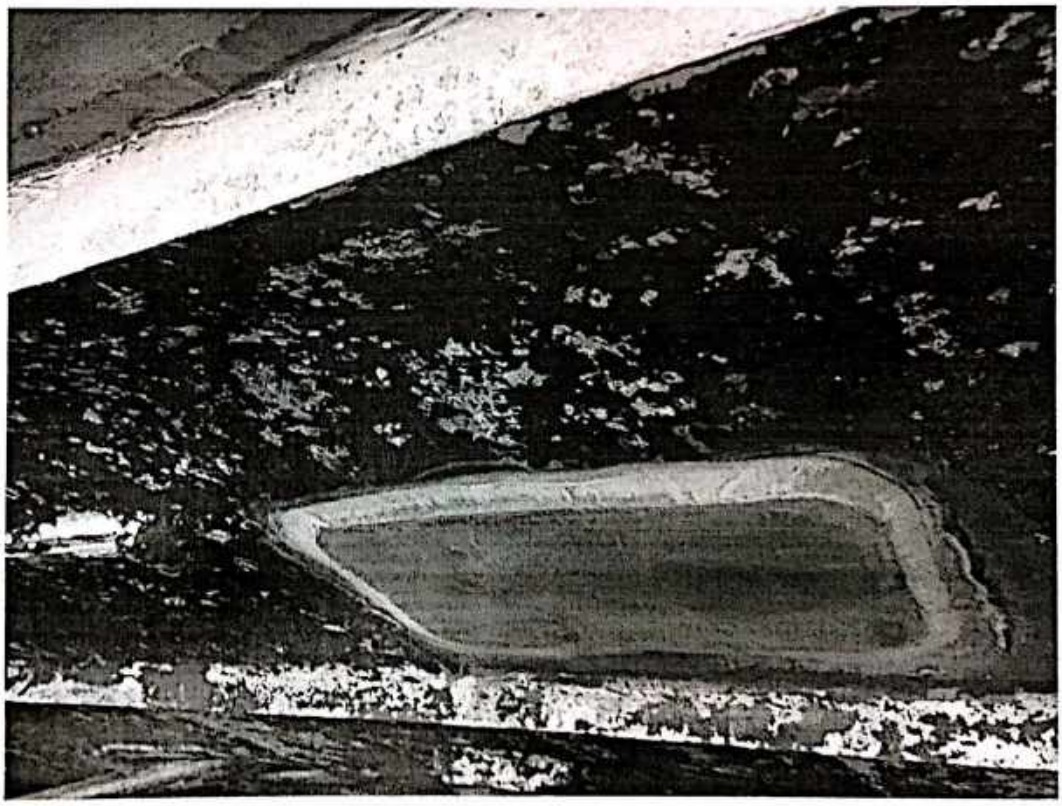
My proposed repairs comprised the welding of plates as opposed to the riveting of same in the location of the leak from the impact force.

I also proposed the removal of the existing plates (although they were not leaking) in favour of welded plates as same were a superior job and would look better.

Following the placement of said plates I applied an epoxy resin sealer on the welded joints and covered same with a marine grade aluminium primer

On one location we opted to replace with a bolted on plate and applied therafter with marine grade sealant. Welding would have been hazardous because of the proxmity of the Aft Fuel tank.
I have discussed this method with Paul Shannon and he has agreed that this was preferable

– see ***photo's 3***



The works are now finished and I confirm that the hull is in good condition and the repairs have been made to the localised impact damage. I understand Paul Shannon is advising you in relation to the works.

Yours sincerely,

Gregory Arnold