



## **MVF *Sanu***



## **Mitigation Survey and Timber Recovery**

[Maritime Archaeology Sea Trust](#)

MAST is a company limited by guarantee in England and Wales number 07455580 and registered charity 1140497.  
Website: [www.thisismast.org](http://www.thisismast.org)

## **MVF *Sanu***

### **Mitigation Survey and Timber Recovery**

#### **Acknowledgements**

MAST would like to thank the Ian Kemp, National Trust General Manager for North Cornwall and Jim Parry, National Trust archaeologist for Devon and Cornwall for their assistance during the project, and their team who assisted with the recovery on the day. Special thanks also to the demolition team from DRS Demolition National Ltd who facilitated the recovery of the material in such a good condition.

MAST acknowledges the important contribution from Bournemouth University students for their recordings of the timbers and thanks to Bournemouth University researcher Tom Cousins who created the 3D modelling imagery.

## **MVF *Sanu***

### **Mitigation Survey and Timber Recovery**

#### **Introduction**

MAST was commissioned by the National Trust to conduct a mitigation survey prior to the removal of the vessel MVF *Sanu* from the Gannel estuary in Newquay Cornwall. On October 17, 2013 MAST attended the demolition of the MVF *Sanu* in order to assess the remains whilst also preserving a few interesting timbers for use in student educational programmes in Maritime Archaeology at Bournemouth University. This document reports on a survey conducted by Bournemouth University students of the timbers retrieved by MAST.

#### **Methodology**

The methodology adopted reflects best practice in carrying out archaeological field evaluations, as set out by the Chartered Institute for Archaeologists (CIfA) Standard and guidance for archaeological field evaluation (CIfA 2014).

The mitigation survey was conducted during a spring low tide allowing for maximum time on the exposed timbers. The team consisted of MAST archaeologists (Jessica Berry and Kevin Stratford)

#### **Site Position**

The site position was recorded using a hand held Garmin 76Cx with an accuracy of +/- 3 metres.

<b>Latitude</b>	55 36.625N
<b>Longitude</b>	001 42.063W
<b>Datum: WGS84</b>	

#### **The Site Environment**

The site was in the intertidal zone on the River Gannel in Cornwall on the south west coast of England. The river is made up of fine mud that is wet and deep in sections. The site was only accessible at certain periods of the tide. The vessel itself sat within its own scour which, along with the tidal conditions, means that it never completely dried out.

## **Assessment of the Wreck**

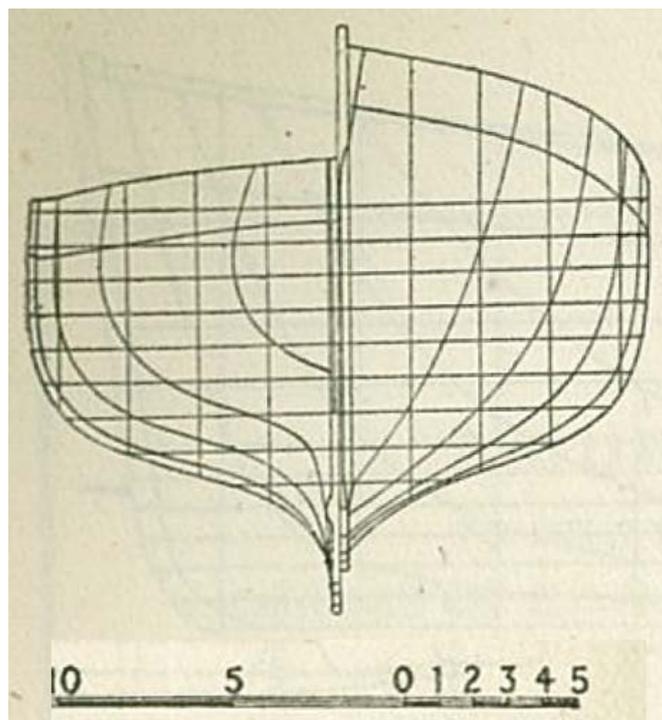
The site consisted of the remains of the hull of the MVF *Sanu* that was lying on its starboard side in the Gannel estuary in Cornwall.

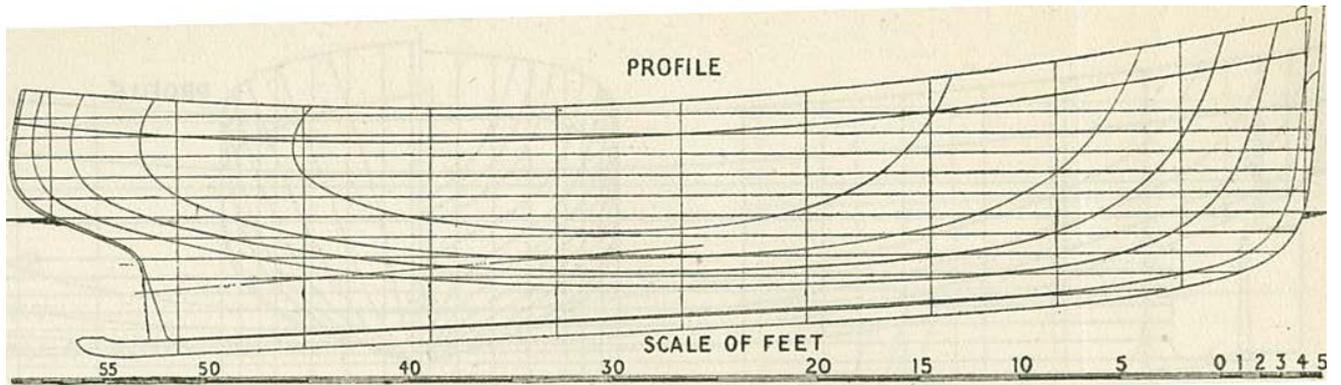
The *Sanu*, formerly MFV 29 of the MFV 1 class, was built by Frank Curtis in Looe in August 1942 for the Admiralty and remained in service until 1955. The vessel had two previous owners before its most illustrious one. They were Dorrien D. Saqui of Buckinghamshire and then in 1960 Roger Pirie D.S.C from Hampshire. Baker bought the vessel in 1964 (Mercantile Navy List; Lloyds Register).

Before the *Sanu* was broken up on October 17, 2013, sections of the vessel were removed by Kevin McCloud's Channel 4 programme, *Man Made Home* to build a beach hut. This was aired in September 2013.

The MFV construction was the last major phase of wooden boat construction in the United Kingdom, part of a programme of building small craft suitable for the Admiralty. As such they were motor fishing vessels modified for Admiralty needs. It was further acknowledged that the vessels would help reduce a shortage of fishing vessels after the war (Holt 1946). They were built of wood principally because both steel and steel workers were scarce.

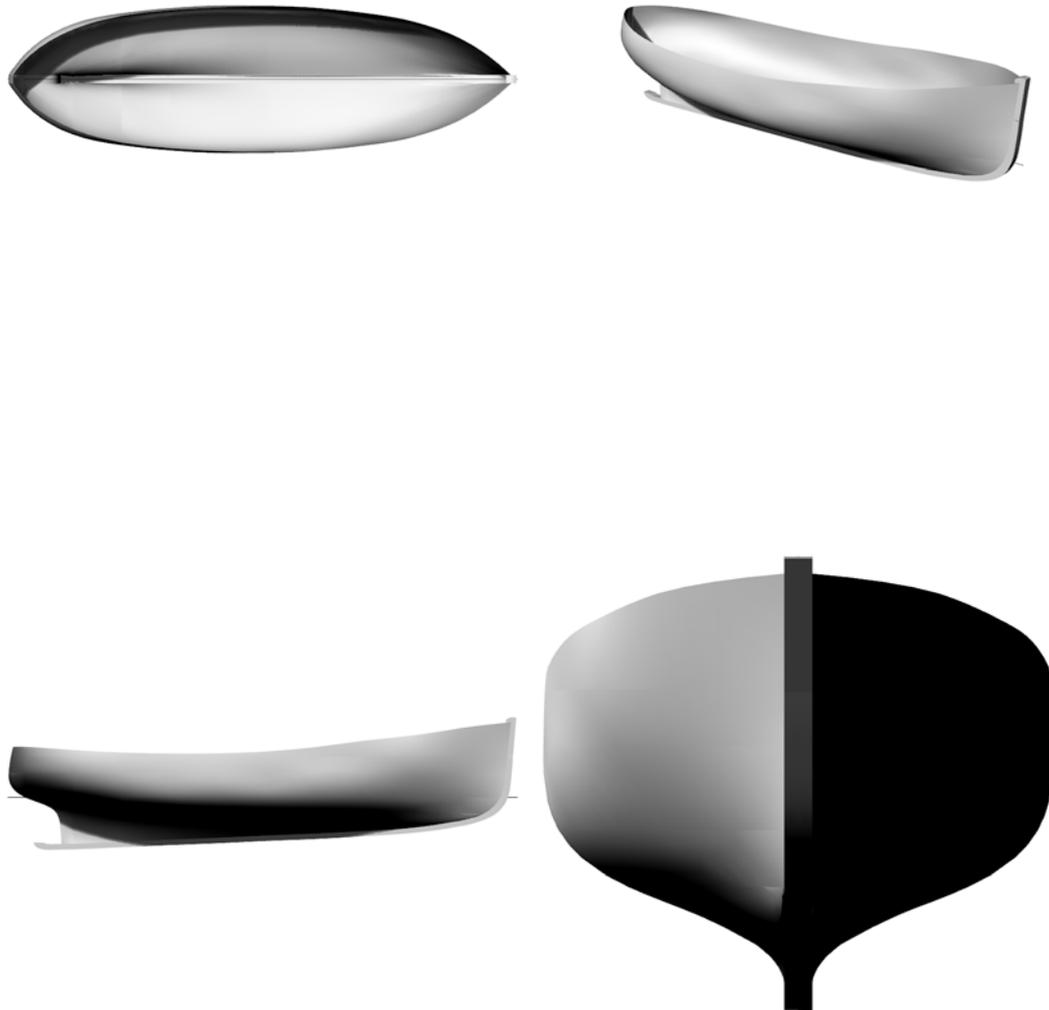
The *Sanu* underwent many upgrades over the years most notably from the deck line upwards. Here, the original wooden decking was replaced by a fiberglass skin and along with many of the internal fixtures and fittings that created a living space inside the vessel. The only original sections of the vessel from its construction is the hull made up of ceiling (inside) planking, frames and outer hull planking. The original line drawings for the MVFs of this order were sourced.





**Image 1: original line drawings of MVF class (Holt 1946)**

From these line drawings a 3D model was created of how the original sections of the *Sanu* that survived should have looked like. A comparison of the two shows that the hull structure was still rigid and very little damage had occurred as a result of sitting under its own weight.



***Image 2: 3D model of hull from line drawings (courtesy of Tom Cousins)***

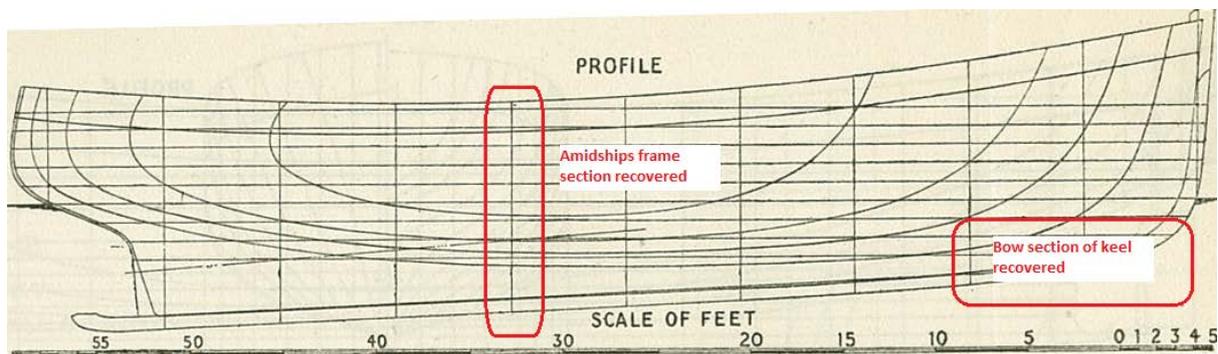
The general condition of the hulk wood was good. However the hull did lose stability following the removal of several framing timbers from the port side by the Channel 4 presenter Kevin McCloud's *Man Made Home*.

## **Timber Recovery**

The recovery operation was a success and MAST was able to recover a number of timbers. These included a complete section of portside amidships frames from keel to deck and the bow section of the keel.

The section of the amidships frames consists of five individual timbers connected together and measures over 4 metres in length.

The section of the keel consists of a number of partial timbers including the keel, keelson, breast hook and outer hull planking (cut during recovery) and measures over 1.5 metres in length.



**Image 3: location of recovered sections (after Holt 1946)**

Other material was initially recovered. However on closer inspection these were found to be modern fixtures and fittings from the internal hull structure which being used as a living space. These were therefore of no archaeological interest were excluded from the assessment.

## **Timber Assessment**

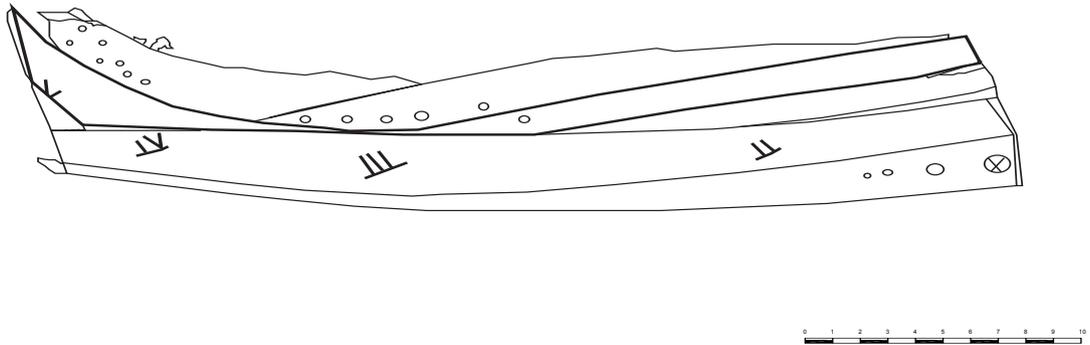
The recovered timbers were transported to Bournemouth University for study by its marine archaeology students. Bournemouth students Renée Malliaros and Orestes Manousos produced a series of scaled drawings (below) that have been digitally traced which MAST has used to assess the remains. The two individual sections were left intact and recorded complete so that each drawing contains a number of individual timbers. The other associated timbers were recorded but not drawn. The timber record sheets are in Appendix I. The original drawings are in Appendix II.

**Images 4** and **5** below show the scaled drawings of the bow section of the keel from side view and plan view respectively.

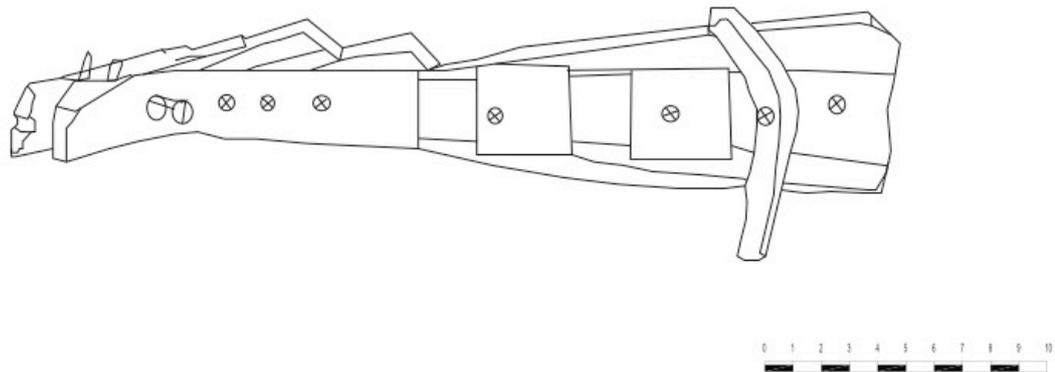
**Image 4** shows where the keel meets the stempost forming the rigid structure capable of taking the bulk of the forces of the waves. The condition of the timber and the structural bolts was solid and required a lot of force during demolition. This along with the survival of surface etchings (the Roman numerals underlined in drawing) marking water lines shows how little damage occurred to the *Sanu* where it lay.

Another aspect of the good timber condition is the high quality of materials used and the quality of construction.

**Image 5** shows the plan view of the keelson timber with the boxed notches cut out. These notches are where the frames are attached to the keelson and keel below and show why the structure was so strong. By notching the timbers, when joined they form a single rigid structure. Another aspect of this section provides a fine example of carvel construction and shows the different construction techniques used to fasten the planking and other thicker framing timbers. The planking is attached by iron nails every few inches along each side of the plank whereas the frames are attached by multiple large iron bolts at joints.



**Image 4: 1:10 (1cm=10cm) digitised scaled drawing of side view of bow section of keel**

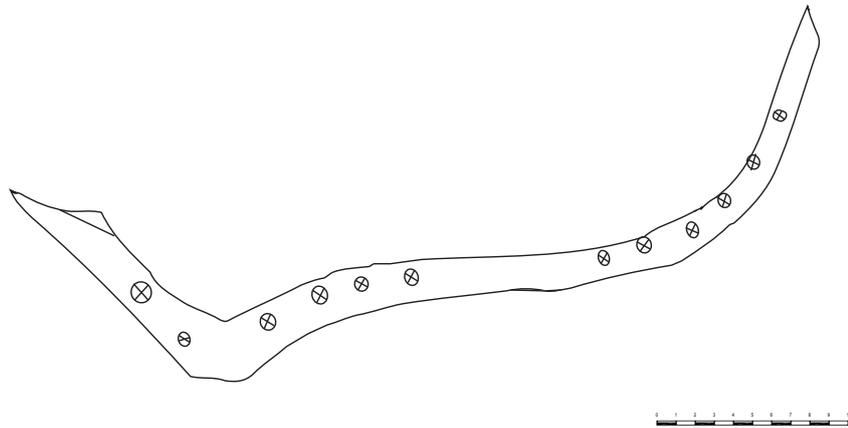


**Image 5: 1:10 (1cm=10cm) digitised scaled drawing of plan view of bow section of keel**

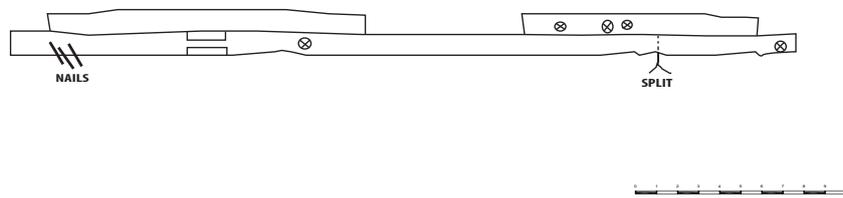
**Images 6 and 7** below show the side view and plan view of the amidships frame section respectively.

**Image 6** below shows the port side amidships frame section with the first frame on the starboard side also. The bolts where one frame is joined to another can be clearly seen by the crossed circles. This is where the vessel draws its structural strength and is why the vessel remained in good condition for so long. The joint between portside and starboard side first futtocks seen at the bottom left of this image is what would be placed in the notches seen in **Image 5** but at the amidships section of the keelson.

**Image 7** below of the plan view of the frame section shows how the section is made up of five separate timbers. The port side shows the first and second futtock which is joined by the bracing timber heavily bolted between the two. This technique provided a stronger joint than scarfing which was used prior to the invention of the bolt. It was also a quicker technique, therefore of vital importance during wartime with the urgent requirement for shipping.



**Image 6: 1:20 (1cm=20cm) digitised scaled drawing of side view of amidships frame section**



**Image 7: 1:20 (1cm=20cm) digitised scaled drawing of plan view of amidships frame section**

## **Photogrammetry**

Photogrammetry is a new survey technique within the discipline of archaeology where an interactive 3D model of an object can be made from photographs using specialised software. MAST completed a photographic survey of the amidships frame section testing different data gathering options: use of different backdrops and tripods or handheld. This frame section was achieved using a plain backdrop and a tripod.

The results can be seen in the here:

<https://sketchfab.com/models/ca7a00ab1b2c49db910fc705cdcca952>

## **Conclusions**

The general condition of the timbers was remarkably good considering the conditions in which the *Sanu* had lain for 11 years since 2002. The mixture of wet and dry environment caused by the tide appeared to do little damage to condition of the timber. This can be seen most clearly in the survival of etched water level markers seen on the bow section of the keel. The structure of the hull, though weakened by the removal of the port side frames in 2013, was still good and the condition of the hull timbers could be seen during dismantling.

## **REFERENCES**

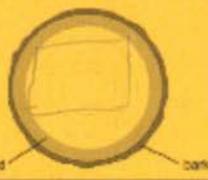
- Chartered Institute for Archaeologists, 2014, *Standard and guidance for archaeological field evaluation*
- Holt, W.J., 1946, *Admiralty Type Motor Fishing Vessels*, Institute of Naval Architects, London
- Lloyds Register of Yachts, 1955-1975, Lloyds Register, UK
- Mercantile Navy List, 1955-1972, Registrar General of Shipping and Seamen, UK

# Appendix I

## Timber record sheets.

Type:		Cross Section:	
Condition:			

<b>CA Dimensions m/mm:</b> Length <u>2750mm</u> Width <u>220mm</u> Thickness <u>95mm</u> Diameter	<b>Cross Section Sketch:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">No</td> </tr> <tr> <td>Bark</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Sapwood</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Knotty</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Straight Grained</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>		Yes	No	Bark	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sapwood	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Knotty	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Straight Grained	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<b>Further Research Potential:</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">No</td> </tr> <tr> <td>Dendrochronology</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Tree ring Study</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>14C</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Display</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>		Yes	No	Dendrochronology	<input type="checkbox"/>	<input type="checkbox"/>	Tree ring Study	<input type="checkbox"/>	<input type="checkbox"/>	14C	<input type="checkbox"/>	<input type="checkbox"/>	Display	<input type="checkbox"/>	<input type="checkbox"/>
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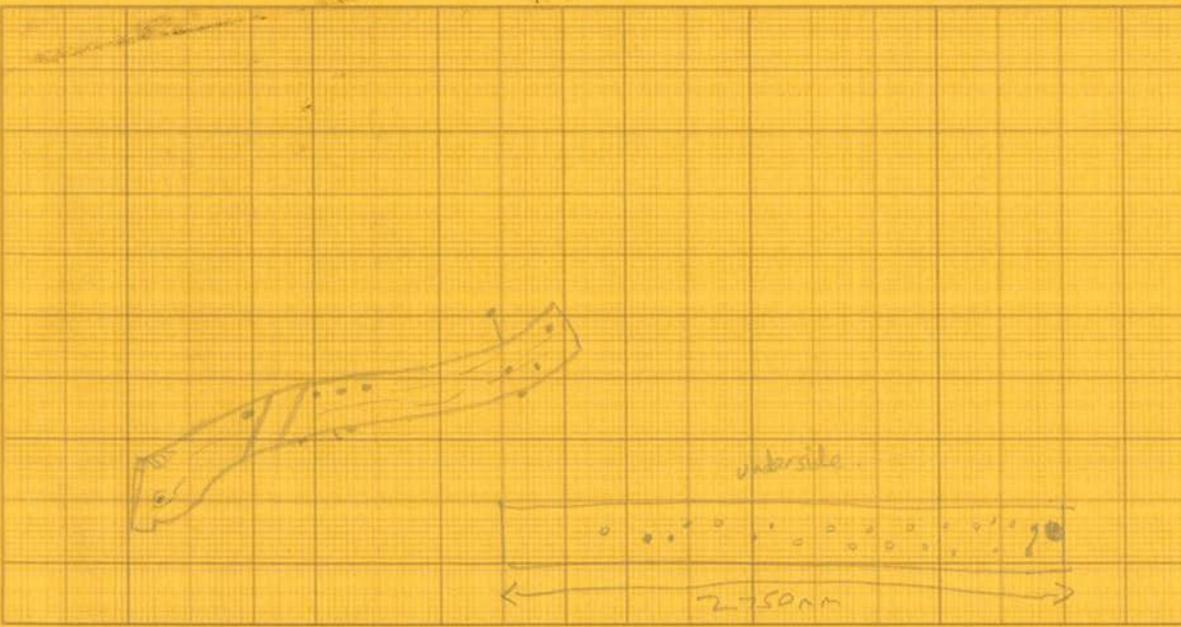
  

<b>Woodworking technology:</b>	
Tool Marks	<u>Saw marks</u>
Joints	<u>Join to timber D with 4 bolts.</u> <u>Join to timber B with 3 bolts.</u>
Fixings and Fittings	<u>nails + nail holes on exterior, for plank?</u> <u>larger bolts/nails on interior, for internal structure.</u>
Intentional Marks	<u>groove cut similar to timber E</u>
Surface Treatment	<u>blue paint.</u>
Other	
Reused: Y <input type="checkbox"/> N <input type="checkbox"/> Not Known <input type="checkbox"/>	

Recommendation:	Discard? <input type="checkbox"/>	Discard after further research/sampling? <input type="checkbox"/>	Retain and Conserve <input type="checkbox"/>	Checked:
Measured Sketch:				Date:



Type:	Cross Section:
Condition:	

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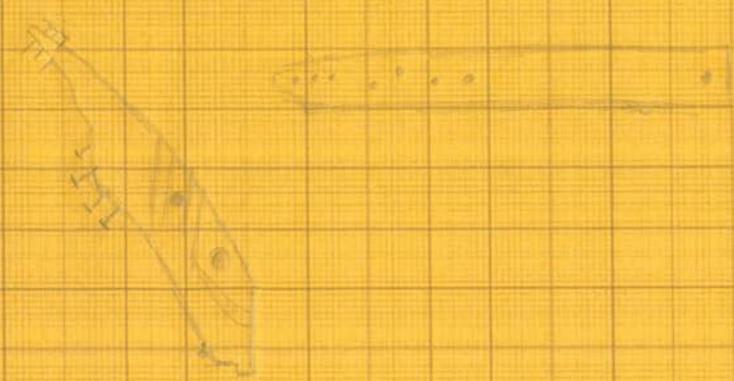
  

<b>Woodworking technology:</b>	
Tool Marks	Makers marks in forms of a 'X' Saw marks in opposing directions.
Joints	Double bolts to timber D 2 bolts to timber G 5 smaller bolts to timber F
Fixings and Fittings	Iron bats + nails Iron plate connects timber E to F
Intentional Marks	2 Grooves half way either side of bolt for additional fasteners
Surface Treatment	paint / treatment flakes.
Other	
Reused: Y <input type="checkbox"/> N <input type="checkbox"/> Not Known <input type="checkbox"/>	

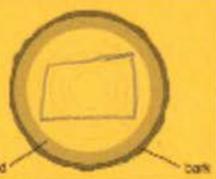
  

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Type:		Cross Section:	
Condition:			

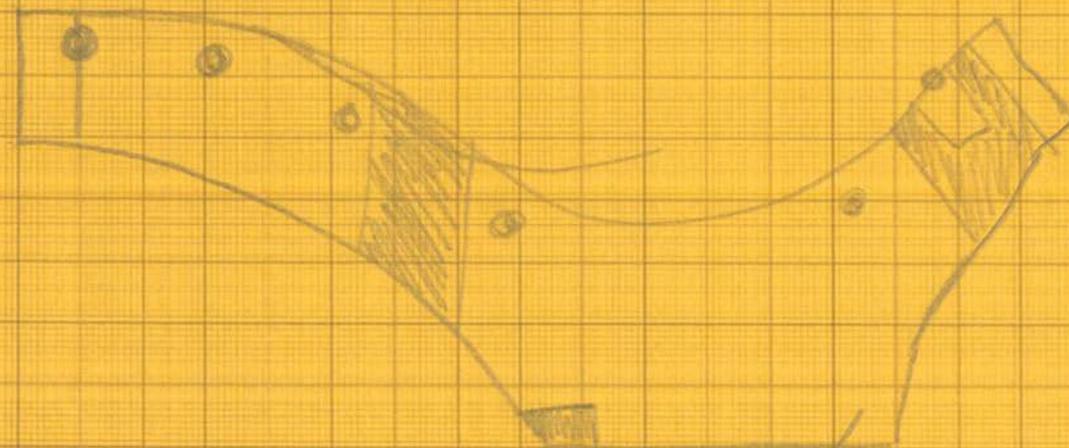
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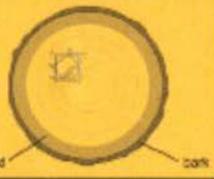
Species Identification:	Conversion:
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**Woodworking technology:**  
 Tool Marks *saw/axe marks*  
 Joints \_\_\_\_\_  
 Fixings and Fittings *6x bolts*  
 Intentional Marks *Fitting marks*  
 Surface Treatment *antifoul paint*  
 Other \_\_\_\_\_

Reused: Y  N  Not Known

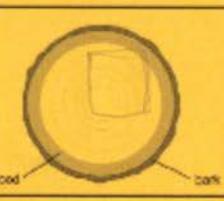
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Measured Sketch:	Date:



Type:		Cross Section:	
Condition:			
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Species Identification:		Conversion:	
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Reused: Y <input type="checkbox"/> N <input type="checkbox"/> Not Known <input type="checkbox"/>			
Recommendation: Discard? <input type="checkbox"/> Discard after further research/sampling? <input type="checkbox"/> Retain and Conserve <input type="checkbox"/>			Checked: _____ Date: _____
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Display	<input type="checkbox"/>	<input type="checkbox"/>																															

Species Identification:	Conversion:
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**Woodworking technology:**  
 Tool Marks \_\_\_\_\_  
 Joints *3 bolts join to timber A*  
           *3 bolts join to timber C*  
 Fixings and Fittings *6 large bolts for connecting components*  
                           *small nails on exterior for planking + interior bolts for internal fittings*  
 Intentional Marks \_\_\_\_\_  
 Surface Treatment *paint/treatment*  
 Other \_\_\_\_\_

Reused: Y <input type="checkbox"/> N <input type="checkbox"/> Not Known <input type="checkbox"/>
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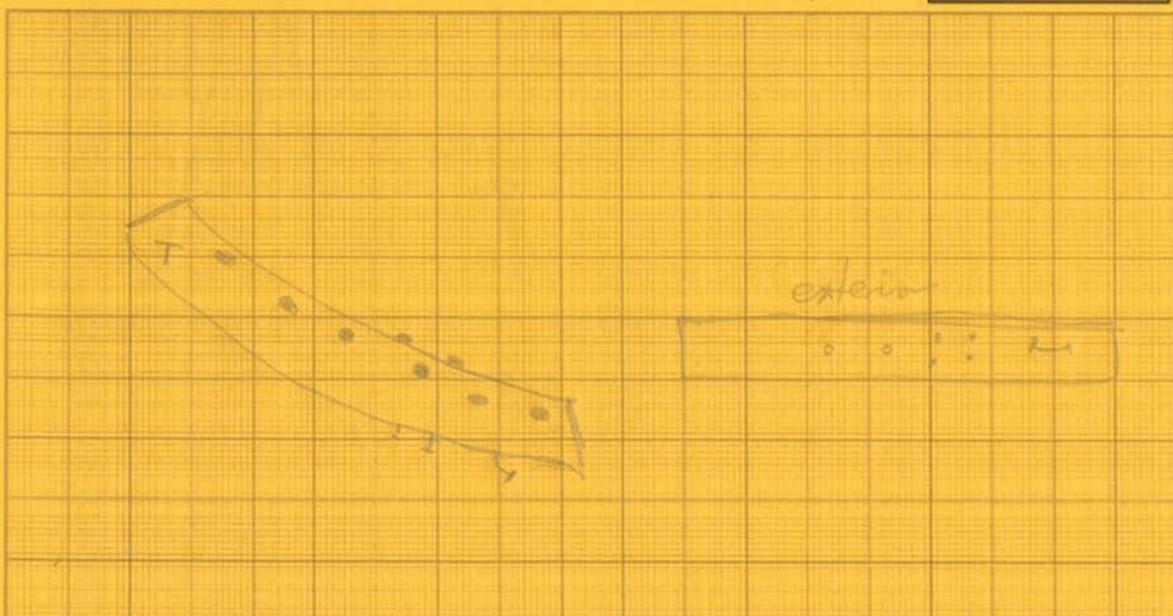
  

Recommendation: Discard? <input type="checkbox"/> Discard after further research/sampling? <input type="checkbox"/> Retain and Conserve <input type="checkbox"/>	Checked: <input type="checkbox"/>
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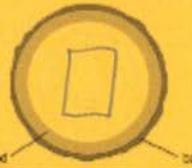
Measured Sketch:	Date:
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Type:		Cross Section:	
Condition:			

<b>CA Dimensions (mm):</b> Length <u>335mm</u> Width <u>110mm</u> Thickness <u>77mm</u> Diameter	<b>Cross Section Sketch:</b> <table style="width:100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">No</td> </tr> <tr> <td>Bark</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Sapwood</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Knotty</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Straight Grained</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>		Yes	No	Bark	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sapwood	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Knotty	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Straight Grained	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<b>Further Research Potential:</b> <table style="width:100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">Yes</td> <td style="text-align: center;">No</td> </tr> <tr> <td>Dendrochronology</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Tree ring Study</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td><sup>14</sup>C</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Display</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table>		Yes	No	Dendrochronology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Tree ring Study	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<sup>14</sup> C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Display	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Yes	No																															
Bark	<input type="checkbox"/>	<input checked="" type="checkbox"/>																															
Sapwood	<input type="checkbox"/>	<input checked="" type="checkbox"/>																															
Knotty	<input type="checkbox"/>	<input checked="" type="checkbox"/>																															
Straight Grained	<input checked="" type="checkbox"/>	<input type="checkbox"/>																															
	Yes	No																															
Dendrochronology	<input type="checkbox"/>	<input checked="" type="checkbox"/>																															
Tree ring Study	<input type="checkbox"/>	<input checked="" type="checkbox"/>																															
<sup>14</sup> C	<input type="checkbox"/>	<input checked="" type="checkbox"/>																															
Display	<input type="checkbox"/>	<input checked="" type="checkbox"/>																															

Species Identification:	Conversion:
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**Woodworking technology:**

Tool Marks saw marks

Joints

Fixings and Fittings 1x nail, 5x screws holding iron plate, 1x electrical wire

Intentional Marks

Surface Treatment none

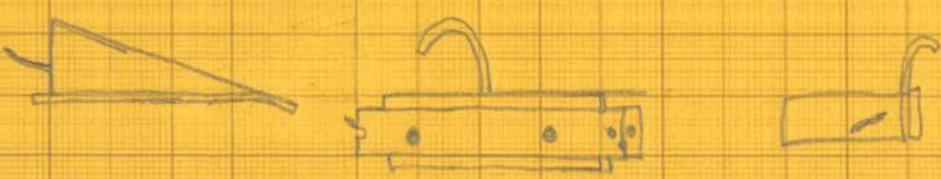
Other

Reused: Y  N  Not Known

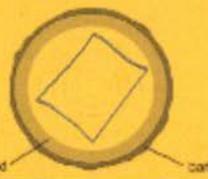
Recommendation: Discard? <input type="checkbox"/>	Discard after further research/sampling? <input checked="" type="checkbox"/>	Retain and Conserve <input type="checkbox"/>	Checked:
Measured Sketch:			Date:



Type:	Cross Section:
Condition:	

<b>QA Dimensions m/mm:</b> Length <i>1180mm</i> Width <i>145mm</i> Thickness <i>11mm 90mm</i> Diameter	<b>Cross Section Sketch:</b> Yes No Bark <input type="checkbox"/> <input checked="" type="checkbox"/> Sapwood <input type="checkbox"/> <input checked="" type="checkbox"/> Knotty <input type="checkbox"/> <input checked="" type="checkbox"/> Straight Grained <input checked="" type="checkbox"/> <input type="checkbox"/>		<b>Further Research Potential:</b> Yes No Dendrochronology <input checked="" type="checkbox"/> <input type="checkbox"/> Tree ring Study <input type="checkbox"/> <input checked="" type="checkbox"/> 14C <input type="checkbox"/> <input checked="" type="checkbox"/> Display <input type="checkbox"/> <input checked="" type="checkbox"/>
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Species Identification:	Conversion:
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**Woodworking technology:**  
 Tool Marks \_\_\_\_\_  
 Joints \_\_\_\_\_  
 Fixings and Fittings *3x bolts on top surface, 2x bolts on side facing keel  
1x nail on end facing out*  
 Intentional Marks \_\_\_\_\_  
 Surface Treatment *gray & yellow anti-fouling paint*  
 Other *some surface wear along bottom edge*

Reused: Y  N  Not Known

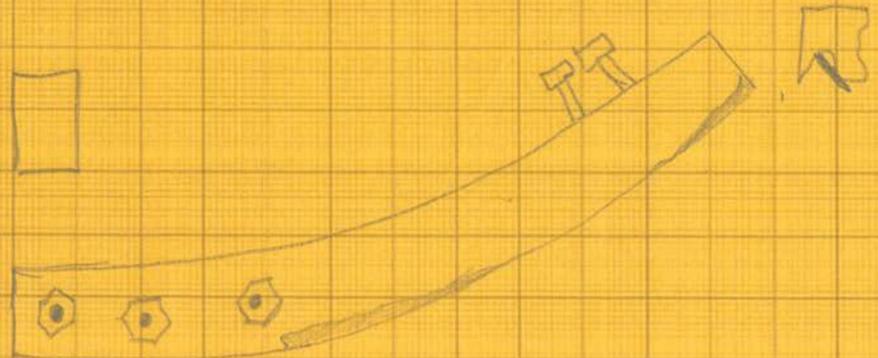
  

Recommendation:	Discard? <input type="checkbox"/>	Discard after further research/sampling? <input checked="" type="checkbox"/>	Retain and Conserve <input type="checkbox"/>	Checked
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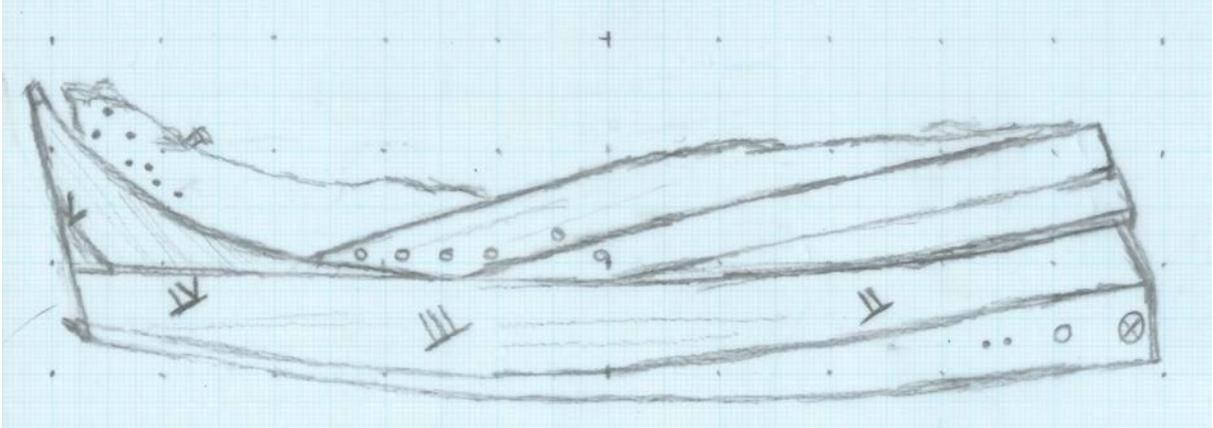
Measured Sketch:	Date:
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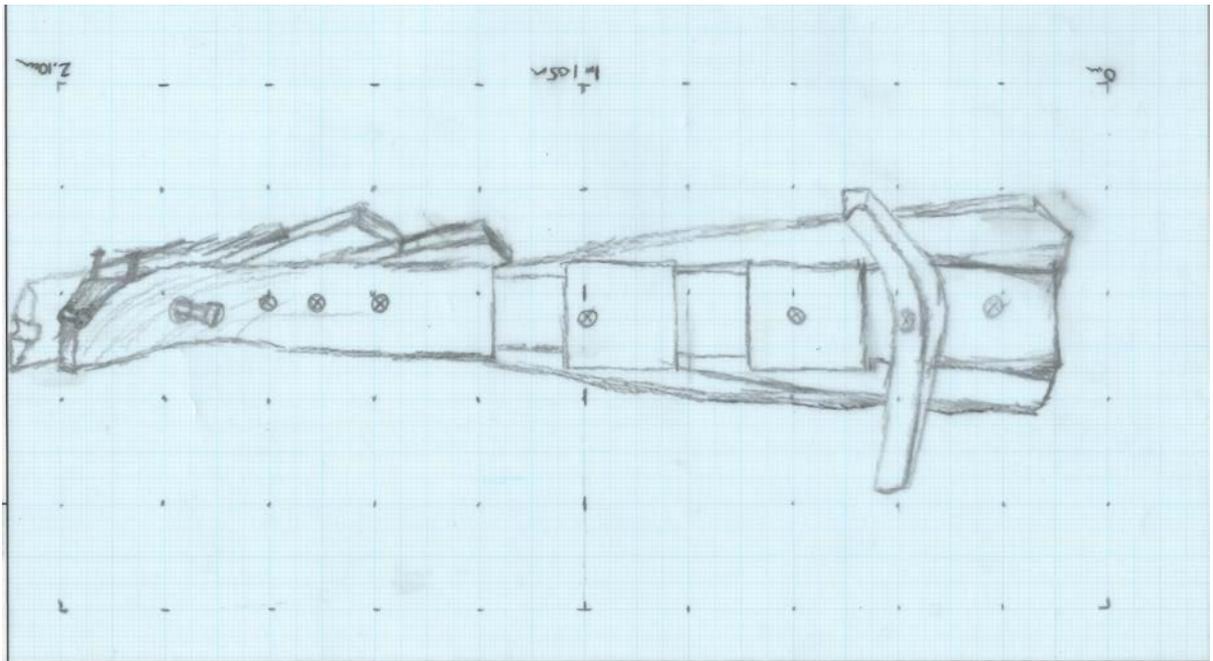


## **Appendix II**

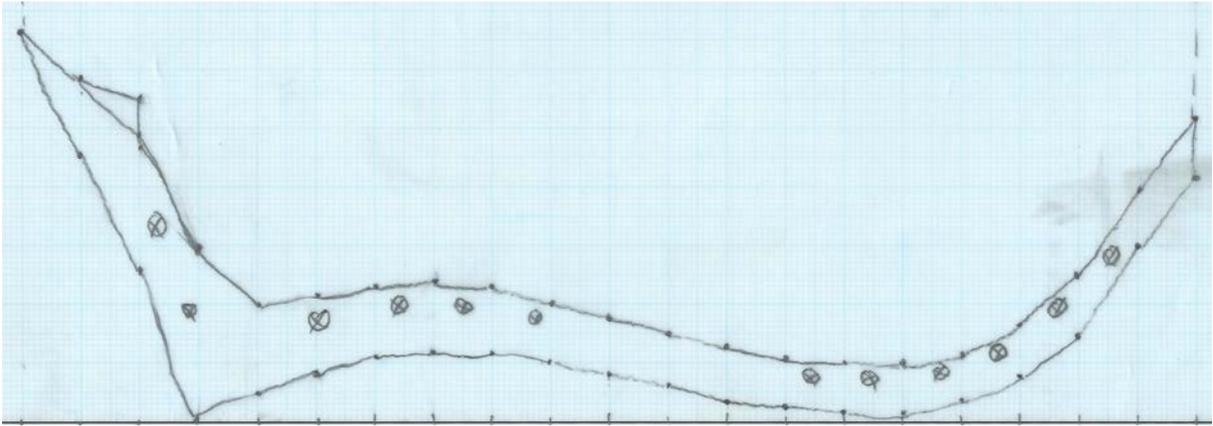
Bournemouth University students' scaled drawings



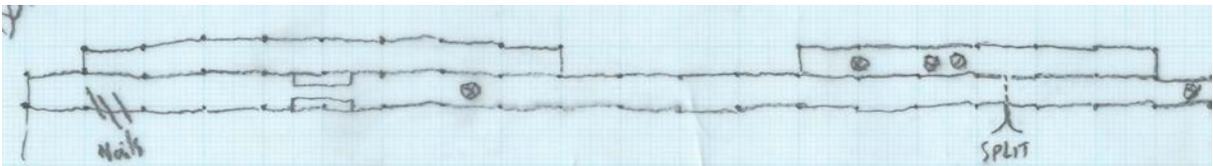
*Image 4: 1:10 scaled drawing of side view of bow section of keel*



*Image 5: 1:10 scaled drawing of plan view of bow section of keel*



*Image 6: 1:10 scaled drawing of side view of amidships frame section*



*Image 7: 1:10 scaled drawing of plan view of amidships frame section*