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‘Dutch Barge’

Pre-Purchase Survey

Report Date:
Survey Date:
Place of Survey:
Vessel name: Dutch Barge
Vessel Type: Dutch Barge
Builder: Unknown

Client

Contents

Terms & Conditions

This Survey was carried out under the Yacht Designers and Surveyors Association current Terms of business which were e-mailed to the client prior to the survey.

Limitations

- We have not inspected woodwork or any other parts of the structure which were covered, unexposed or inaccessible and we are, therefore, unable to report that any such part of the structure is free from defect.
- In some cases it is not possible to detect latent and hidden defects without destructive testing, which is not possible without the owner's consent.
- Where repairs, further opening up, or dismantling are required, additional decay, damage or necessary work may be uncovered.
- The engine, tanks and other normally installed mechanical equipment were in situ which limited inspection and examination in these areas.
- A Cygnus 4 multiple echo ultrasonic thickness gauge was used to determine plating thickness. This instrument uses repeat echoes to differentiate between coatings and metal. It is used to assess point thickness at regular intervals and more frequently where corrosion is suspected in conjunction with a visual examination. However, it is unlikely that localised pitting will be found by this method if it is otherwise concealed.
- The vessel was out of the water during the survey. This survey was not able to ascertain the water tightness of the vessel.
- The vessel was not surveyed with respect to any particular code or standard or navigation body's rules or bylaws (eg: TRIWV - Technical Requirements for Inland Waterway Vessels Directive 2006/87/EC) unless specifically stated.
- No documentation or compliance with any regulations has been checked as part of this survey. No guarantees or warrantees are given or implied with respect to the vessels suitability or fitness for purpose.
- This report has been prepared for the use of the commissioning client and no liability is extended to others who may see it.
- The vessel had not been sand or grit blasted prior to survey and no comment can be made on parts of the vessel which were covered by bitumen, marine grass or growth.
- The vessel was found resting on steel frames and no comment can made of the hull where she rested, as visual and physical inspection was not possible at these points.

Scope of Survey

- This is a pre-purchase survey and its purpose is to establish the structural and general condition of the vessel. Where items of equipment have been tested this will be stated in the text.
- The survey is not a parts and labour guarantee and it should be noted that defects may exist in the vessel that the survey could not detect due to limitations of time, vessel presentation and the range of tests acceptable to the owner.
- Please note that where reference is made to condition in all cases this must be considered in relation to the vessels's age, for example: very good condition should not be taken to mean new condition.
- A general inspection of the engine, installation and systems will be made, but this is a visual inspection only and an item has only been operated if stated. It should be appreciated that some components may appear serviceable but be found defective when run under load and for a prolonged period.

Recommendations

- Recommendations will be restricted to those defects which should be rectified before the vessel is used, (or within a given time span if specified, and items which may affect insurability.)

Note: Recommendations are labelled in order of prefaced with its priority, as defined below:

- **Dangerous:** Items which must be repaired prior to the vessel being re-floated or used for habitation/navigation. Vessel deemed uninsurable with this issue.
- **Urgent:** Items which are not classed as dangerous, however, should be repaired preferably prior to the vessel being re-floated or used for habitation/navigation. Vessel deemed an increased risk for insurers with this issue.
- **Priority:** Items of repair should be carried out as soon as possible. Repair should be carried out no later than within six months. Vessel only insurable with restrictions or safety precautions.
- **Caution:** Items would require monitoring and further investigation. Repair may be required within the next twelve months.
- **Advisory:** Items are advised for safety or maintenance. These do not pose an insurance risk to the vessel.

- Recommendations will be printed in blue, for quick reference. The recommendations are contained in the body of the report in order that they may be read in context.

- *Suggestions* will be printed in italics as they do not constitute a requirement. Suggestions are this surveyors opinion only, and can be looked on as 'helpful advice' to preserve the craft for the long term or improve handling and comfort.

II. Details of Subject Vessel

'Dutch Barge' was reported as having been built circa 1906 in the Netherlands. She was found on the hard in London.

She was a Dutch Barge believed to have been a former commercial sailing barge, now converted for pleasure and domestic use. She was steel riveted originally with subsequent modifications and repairs. The internal fit out is of timber & plywood construction.

Length Overall: 17.25m (56' 70")
Hull Length: 15.60m (51' 18")
Beam: 3.35m (10' 90") excluding leeboards frames
Beam: 3.55m (11' 64") including leeboards frames
Draft: ~700mm (2' 29") forward
Draft: ~890mm (2' 91") aft
Engine: Ajax Marine diesel
Year of construction: circa 1906
CRT number: Not seen
SSR: Not seen
Boat Safety Scheme number: Not seen
HIN: Not seen
Builders number: Not seen
Owners manual: Not seen
Certificate of conformity: Not seen

III. Legislation & Ownership

Note: The inspection is not undertaken with any intention to ascertain that the vessel would comply with any rule or code of practice, as may be required by any authority under whose jurisdiction the vessel may be operated. It carries no warranty regarding ownership of the

vessel or any warranty regarding outstanding mortgages, charges or other debt there may be on the vessel.

No documentation was seen onboard the vessel at the time of survey.

Boat Safety Scheme
A BSS certificate was not found onboard the vessel at the time of survey. Please be aware that the existence of a Boat Safety Scheme certificate does not imply that the craft is safe. A BSS certificate only indicates that, on the day of the inspection, the craft had met the requirements for the licensing with the Navigational Authority concerned. With a view to minimising the risk of fire & pollution and its effect on other vessels. BSS inspections are required every 4 years.

Suggestion: Inland waterways boat owners are advised to download a full copy of the Boat Safety Scheme guide from www.boatsafetyscheme.com and keep it on the vessel for reference.

Note: Alterations and improvements should be made to the manufacturers installation guidelines, but should also comply with the Boat Safety Scheme essential guide.

V.A.T Status & Proof of Ownership
The original invoice for the vessel was not found onboard therefore there was no evidence that United Kingdom V.A.T had been paid. There was no proof of ownership found on the vessel.

Small Ships Register/British Waterways Registration
A British Waterways licence number was not found displayed. The Canal & River Trust registration will require updating and formal display with any change of ownership.

Inland Waterway Vessels Directive
In mainland Europe vessels may need to comply with (TRIWV) Technical Regulations for Inland Waterway Vessel. 'Vrouwe Lucie Neeltje' was not surveyed with respect to the TRIWV regulations, which maybe required on the Inland Waterway of mainland Europe.

Recommendation - Advisory: Purchaser to satisfy him/herself prior to purchase of the requirements of the TRIWV Technical Regulations for Inland Waterway Vessel, as alterations to the vessel may be required if the intended purpose is for the vessel to cruise the European Inland waterways.

Recreational Craft Directive
The vessel was reported to have been built prior to the 16th June 1998 and therefore the vessel does not need to comply with the requirements of the Recreational Craft Directive (RCD).

Recommendations - Advisory: Request all additional paperwork be produced prior to purchase of the vessel, especially in regards to VAT status & proof of ownership.

IV. Condition Report

1. Hull Deck, Deck Structure
The Hull, Deck, Cabin Structure and associated equipment were visually inspected, the hull under the waterline was sample hammer sounded & thickness gauged and reported below. Any defects found are noted below, along with advice or recommendations.

Hull Thickness Measurements
A Cygnus 4 multi echo ultrasonic thickness meter was used to measure sample plate thickness. The meter was calibrated before use.

Thickness testing was of a sample nature targeting suspect locations around the hull. Over 250 readings were achieved and these showed an acceptable consistency.

Pitting testing was of a sample nature targeting suspect areas of pitting around the hull. A digital veneer caliper which measures down to 0.01mm was used. The meter was calibrated before use.

General Construction
Vrouwe Lucie Neeltje was constructed in a traditional Dutch Barge style with a central keel plate, garboard strakes, rounded bilge strakes and vertical sheer strakes. These were all lap riveted longitudinally and transversely on frames.

The vessel was visually inspected, hammer sounded and thickness gauged in a matrix across the entire hull. Due to the heavy and multiple coatings of bitumen and tar the use of an angle grinder with flap disc was employed to remove thick coatings so that measurements could be taken.

Previous Over Plating
The vessel had in the past had a significant number of areas below the waterline (doubled) over plated, with a number of smaller sections above the waterline also noted. These were visually inspected, hammer sounded & thickness gauged. The over plating was of various nominal thickness ranging from 4.0mm to 6.0mm. The plating was found to be in sound condition.

Port

1) Port: 1.58M - 2.30M mark. Plate size 660mm x 440mm. Plate thickness 4.7mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

2) Port: 1.55M - 2.35M mark. Plate size 700mm x 550mm. Plate thickness 4.8mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

3) Port: 1.55M - 2.35M mark. Plate size 600mm x 450mm. Plate thickness 5.4mm with nominal thickness considered to be 6.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

4) Port: 1.50M - 1.60M mark. Plate size 100mm x 100mm. Plate thickness 4.5mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

5) Port: 2.25M - 2.40M mark. Plate size 140mm x 320mm. Plate thickness 5.0mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

6) Port: 2.40M - 3.80M mark. Plate size 1400mm x 1500mm. Plate thickness 4.9mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be cracked and percolating water through the centre of the plate. It was not possible to accurately assess welds behind bitumen layers.

7) Port: 2.30M - 3.53M mark. Plate size 1260mm x 270mm. Plate thickness 3.6mm with nominal thickness considered to be 4.0mm or 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

8) Port: 3.55M - 13.45M mark. Plate size 9900mm x 200mm. Plate thickness 3.8mm with nominal thickness considered to be 4.0mm or 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

9) Port: 2.80M - 8.67M mark. Plate size 6800mm x 500mm. Plate thickness 4.7mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

10) Port: 7.90M - 9.10M mark. Plate size 1170mm x 100mm. Plate thickness 4.5mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

11) Port: 7.90M - 9.75M mark. Plate size 1900mm x 1100mm. Plate thickness 4.9mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

12) Port: 9.78M - 9.83M mark. Plate size 60mm x 120mm. Plate thickness 4.1mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

13) Port: 10.00M - 10.10M mark. Plate size 100mm x 100mm. Plate thickness 4.9mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

14) Port: 11.90M - 12.00M mark. Plate size 100mm x 100mm. Plate thickness 4.9mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

15) Port: 12.00M - 12.65M mark. Plate size 650mm x 200mm. Plate thickness 5.9mm with nominal thickness considered to be 6.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

16) Port: 13.45M - 14.35M mark. Plate size 1000mm x 550mm. Plate thickness 4.7mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

17) Port: 13.60M - 14.40M mark. Plate size 800mm x 800mm. Plate thickness 4.8mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

Starboard

18) Starboard: 1.40M - 1.50M mark. Plate size 100mm x 240mm. Plate thickness 3.4mm with nominal thickness considered to be 4.0mm or 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

19) Starboard: 1.50M - 2.00M mark. Plate size 500mm x 500mm. Plate thickness 3.8mm with nominal thickness considered to be 4.0mm or 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

20) Starboard: 1.00M - 1.55M mark. Plate size 550mm x 450mm. Plate thickness 4.8mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

21) Starboard: 1.55M - 2.77M mark. Plate size 1170mm x 200mm. Plate thickness 5.9mm with nominal thickness considered to be 6.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

22) Starboard: 2.38M - 2.53M mark. Plate size 140mm x 100mm. Plate thickness 4.5mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

23) Starboard: 2.65M - 7.65M mark. Plate size 5000mm x 500mm. Plate thickness 3.5mm with nominal thickness considered to be 4.0mm or 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

24) Starboard: 3.50M - 3.73M mark. Plate size 230mm x 170mm. Plate thickness 5.8mm with nominal thickness considered to be 6.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

25) Starboard: 6.10M - 6.50M mark. Plate size 400mm x 600mm. Plate thickness 4.8mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

26) Starboard: 6.17M - 11.17M mark. Plate size 5000mm x 350mm. Plate thickness 3.9mm with nominal thickness considered to be 4.0mm or 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

27) Starboard: 8.10M - 9.40M mark. Plate size 1300mm x 100mm. Plate thickness 4.8mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer

sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

28) Starboard: 8.15M - 9.50M mark. Plate size 1300mm x 250mm. Plate thickness 3.8mm with nominal thickness considered to be 4.0mm or 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

29) Starboard: 11.13M - 12.60M mark. Plate size 1500mm x 350mm. Plate thickness 3.7mm with nominal thickness considered to be 4.0mm or 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

30) Starboard: 11.55M - 11.70M mark. Plate size 200mm x 200mm. Plate thickness 4.7mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

31) Starboard: 11.90M - 12.00M mark. Plate size 100mm x 100mm. Plate thickness 4.9mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

32) Starboard: 12.40M - 12.50M mark. Plate size 100mm x 100mm. Plate thickness 4.9mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

33) Starboard: 13.00M - 13.90M mark. Plate size 900mm x 200mm. Plate thickness 3.6mm with nominal thickness considered to be 4.0mm or 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

34) Starboard: 13.85M - 14.00M mark. Plate size 150mm x 250mm. Plate thickness 4.8mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

35) Starboard: 14.55M - 15.20M mark. Plate size 650mm x 400mm. Plate thickness 4.9mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

36) Starboard: 13.90M - 14.20M mark. Plate size 300mm x 200mm. Plate thickness 4.6mm with nominal thickness considered to be 5.0mm. The plate was visually inspected, hammer sounded, and found to be in sound condition. It was not possible to accurately assess welds behind bitumen layers.

Keel and Garboard Strakes

The keel and garboard strakes were visually inspected externally, hammer sounded and thickness gauged. Areas where internal corrosion mostly occurs, in areas such as the bilge and bulkhead between the accommodation and engine compartment were given particular attention. Visual inspection was limited by thick layers of bitumen coatings, and residual marine growth. Internally visual inspection was limited to a number of inspection hatches,

within the galley/saloon and and a small opening in the heads and forward cabin, and to a limited area within the engine compartment.

The use of a flap disc grinder was employed to remove layers of bitumen to allow accurate thickness measurements to be taken across the grid at 1M intervals from bow to stern at multiple sample locations across the beam. Thickness readings were gauged to be between 2.9mm and 5.6mm. Hammer soundings found most areas of the keel strake and garboard strake to be consistent and robust, however, a numbers of areas of thinner readings and returns were measured and sounded, with a number of readings of below 4.0mm noted. As shown on the table of Appendix I)

A large piece of over plate, noted as OP plate no. 6 above, welded across the forward section of the keel and garboard strakes, was noted to be consistently percolating water throughout the first day of survey, indicating the over plate has become corroded from the inside and penetrated, especially considering the over plate had been added since the recommendation of the last survey report.

Visual inspection of pitting was limited due to bitumen coatings, however, where measured these were less than -1.0mm in areas where plate thickness was still of adequate thickness.

Recommendation - Dangerous: The large over plate noted at the 2.40M - 3.80M mark, measuring size 1400mm - 1500mm, plate thickness measuring 4.9mm, which was noted to be percolating water through the plate, should be removed. Given the additional thin readings, to port and aft of this large plate, the area from the 2.40M mark back to the 4.40M mark and 1000mm either side of the centre line should be over plated, preferably in 4 sections of at least 5.0mm primed mild steel; (As indicated on the vessel in chalk; shown in schematic Appendix II, and photograph blue #1)

Recommendation - Urgent: Over plating the area of the port garboard strake from the 8.60M mark back to the 9.35M mark, into the centre line with 650mm plate of at least 5.0mm primed mild steel. (As indicated on the vessel in chalk; shown in schematic Appendix II, and photograph blue #2)

Recommendation - Urgent: Over plating the area of the port garboard strake & keel strake from the 10.70M mark back to the 12.00M mark into the centre line preferable in 4 sections of at least 5.0mm primed mild steel. (As indicated on the vessel in chalk; shown in schematic Appendix II, and photograph blue #3)

Bilge Strakes

The turn of the bilge was visually inspected, hammer sounded and thickness gauged. Visual inspection was limited by thick layers of bitumen coatings, and residual marine growth. Internally, visual inspection was not possible due to fixtures and fittings, and fastened down floorboards.

The use of a flap disc grinder was employed to remove layers of bitumen to allow accurate thickness measurements to be taken at 1M intervals from bow to stern at multiple sample locations along the bilge strakes. Thickness readings were gauged between 3.6mm and 5.7mm. Hammer soundings found the bilge strakes to be consistent and robust.

Where readings of 3.7mm were taken these were on extensive over plated sections welded along the length of both port and starboard sides of the vessel. Reference to the previous survey, indicated diminution of the over plate in these area to be be limited to ~ -0.2mm which is not considered significant over 10 yrs since the last survey.

Visual inspection of pitting was limited due to bitumen coatings, however, where measured these were less than -1.0mm in areas where plate thickness was still of adequate thickness, except for one pit measured at the 11.25M mark. This has been marked for over plating.

Recommendation - Urgent: Over plating the pit noted at the starboard bilge strake at the 11.25M mark back to the 11.40M mark with a 150mm x 150mm, 5.0mm primed mild steel. (As indicated on the vessel in chalk; shown in schematic Appendix II, and photograph blue #4)

Sheer Strakes
The topsides were visually inspected, hammer sounded and thickness gauged. Visual inspection was limited by thick layers of bitumen coatings. Internally, visual inspection was not possible due to fixtures and fittings. Pitting was visually inspected and measured in sample locations. Where measured these were less than 1.0mm in areas where plate thickness was still of adequate thickness.

The use of a flap disc grinder was employed to remove layers of bitumen to allow accurate thickness measurements to be taken across the grid at sample locations. Where readings of 3.6 & 3.8mm were taken these were on over plated sections welded along the length of both port and starboard sides of the vessel. Reference to the previous survey, indicated diminution of the over plate in these area to be be limited to ~ -0.2mm which is not considered significant over 10 yrs since the last survey.

Ultrasound Survey and Pit Inspection
Thickness readings were taken every 1M on both sides of the hull, above and below the waterline, at the turn of the bilge and where accessible on the bottom strakes. At the bow and stern, additional readings were taken, as well as on and around the stern gear. Additional measurements were sampled where corrosion was evident and accessible. Similarly, a sample of accessible pits were measured using a digital depth gauge. Prior to the survey both instruments were zeroed.

Ultrasonic Measurements
The nominal thickness of plates are assumed to be:
- Keel and garboard plates - 6.0mm
- Bilge plates 6.0mm
- Topsides, at and below waterline - 6.0mm
- Topsides, above the waterline - 5.0mm

Hull Section	Thickness Readings Range
Keel plate	3.4mm to 5.6mm
Garboard plate	2.9mm to 5.5mm
Bilge plate	3.7mm to 5.7mm
Topsides - At and below W/L	3.6mm to 5.5mm
Topsides - Above W/L	4.6mm to 5.5mm
Bow & Stern	4.8mm to 5.5mm

Exterior Hull Coatings
The hull above and below the water line was blacked with historical layers of bituminous paint. These were significantly worn in a number places, in particular on the wind and waterline.

Recommendation - Advisory: Paint underwater and topsides with at least three coats of modern marine bitumen paint.

Hull Interior framing & Bulkheads
There were a number of access points to view the hull interior, these were small inspection holes in the forward cabin and heads, and via large lifting floor panels in the saloon and galley area, and visually within the engine compartment

Seen through the access in the bilges, the original hull was riveted mild steel plating of 6.0mm nominal thickness. The body of the hull is made up of a number of strakes: sheer, bilge, garboard and keel.

- Internally the engine compartment was reasonably clean and free from detritus.
- Topsides seen in the engine room were clean with limited amounts of corrosion, with surfaces protected by good coatings of grey primer.
- Bilges in the accommodation were noted to be wet and noted to not be covered in good coatings. Signs of corrosion were seen from within the vessel, however, framing was not significantly affected.
- No internal ballast was seen.
- Riveted framing seen in the engine room and through accommodation bilges. These were visually inspected and hammer sounded and found robust where seen with rivet heads noted to be tight where seen.
- Where seen, internal rivet heads were in good order, with no signs of corrosion, movement or 'rivet sickness' noted.
- Topsides in the accommodation were covered with panelling and not accessible for inspection.
- Mild steel bulkheads where seen between the engine room and accommodation, and forward accommodation and bow. Hammer sounding returned robust soundings.

Deck and Hull/Deck Joint
The decks forward, sides and aft were visually inspected, hammer sounded and thickness gauged. All gave good results with good coatings of protective paint noted with no areas of surface corrosion noted. Side decks were noted to be exhibiting some signs of historic pitting.

The gunwale was in good serviceable condition when hammer tested and under the weight of the surveyor and found to be secure with no signs of corrosion noted.

Within the cockpit, two large mild steel engine compartment hatches were found. These were found to be secure and rested upon a central support over the engine compartment. The hatches were both found to be serviceable. Neither opened or closed via hinges. Painted surfaces were covered in good coatings of grey protective paint the same as the side decks.

Recommendation - Advisory: Attaching a handle or rope with which the engine bay hatch may be opened, and fastening mechanisms when open.

Through Hull & Skin Fittings
The following above & below water line through hull apertures were noted. Where access allowed these were visually inspected and physically tested. Externally, all through hulls were hammer tested.

The canal boat association guideline recommends 150mm of freeboard under any opening in the side of the vessel to prevent down flooding.

Bow -> Stern (m)					
Port	**AWL/ BWL**	**Type**	**Fitting**	**Function**	**Condition**
3.76	150mm	Skin fitting	Not seen	Shower/Sink drain	Serviceable
10.00	BWL	Welded pipe	Ball Valve to spigot connection. Single jubilee clipped.	Galley Sink drain	Access to the base of internal spigot made for inspection.
12.32	470mm	Skin fitting	Affixed to the hull	Webasto Exhaust	Serviceable
12.32	AWL	Skin fitting	Not seen	Gas Locker	Serviceable
13.20	170mm	Welded pipe	Ball Valve, Single Clamped	Cockpit drain	Serviceable
13.55	BWL	Welded pipe	Spigot raised 750mm within the engine compartment, not capped at the top	Engine RW Inlet & Bilge Pump Outlet	Cap spigot within the engine compartment
15.44	450mm	Welded pipe	Fully lagged, not visible	Engine Exhaust Dry	Serviceable

Bow -> Stern (m)					
Star	**AWL/BWL**	**Type**	**Fitting**	**Function**	**Condition**
14.30	350mm	Welded pipe	Double jubilee clipped hose	Engine water out	Serviceable

Recommendation - Priority: Where through hull apertures are below the 150mm freeboard, looping the hoses up to deck level to prevent down flooding is recommended.

Recommendation - Priority: All through hull fittings onto hoses should have two hose clamps fitted at each end.

Recommendation - Priority: Access to inspect galley sink spigot be made for internal inspection and maintenance.

Recommendation - Priority: The engine raw water spigot should have a cap applied within the engine compartment

2. Steering, Stern Gear, Cathodic Protection

Rudder & Steering
The rudder was visually inspected, hammer sounded and thickness gauged and found to be fabricated from 8.0mm mild steel plate. This was found hung on three external steel hinges, which rested on pintles.

The black painted rudder with alloy tiller arm was visually inspected and found to be serviceable. The tiller arm exhibited no play between the tiller arm and the rudder. The rudder exhibited full and free movement from ‘stop to stop’ when turned.

The rudder was assessed by weight testing the rudder blade and was found to be secure. At the wind and waterline the rudder blade exhibited no signs of wear.

No emergency steering mechanism was noted.

Stern Gear
One unmarked 550mm, three bladed, fixed pitch, yellow metal propeller was seen fitted. This has hammer sounded and heard to ring true. Where scraped back, a yellow metal was seen to shine through, with no signs of dezincification noted. No impact damage was noted to the tips of the blades. The propeller was held by a substantial locking nut.

The propeller shaft was visually inspected and measured using digital veneer callipers and found to have a nominal 38mm shaft. The shaft was found in good serviceable condition with no signs of pitting noted. On turning, the shaft alignment was found to be straight and true. There was limited play noted in the cutlass bearing when weight tested, and within an acceptable tolerance.

Internally, the shaft alignment was found to be straight and true. The stern gland was of the conventional grease lubricated type, with excess grease noted around the shaft. The greaser was noted mounted within the aft section of the engine compartment and was serviceable when turned by hand.

The coupling was visually inspected and hammer tested and found secure.

Recommendation - Advisory: The greaser should always be primed prior too and following passage, and during passage if a longer distance is travelled.

Cathodic Protection
The vessel was noted to have been carrying 24 x 2.5kg anodes on welded straps and bolted on the sides of the bilge strakes side. Two pairs of 12 on each side as noted below:

Bow -> Stern (m)			
Port	**Weight (kg)**	**Wasted %**	**Recommendation**
0.80	2.5	100	Replace immediately prior to relaunch
2.50	2.5	100	Replace immediately prior to relaunch
2.80	2.5	100	Replace immediately prior to relaunch
5.00	2.5	100	Replace immediately prior to relaunch
6.50	2.5	100	Replace immediately prior to relaunch
8.30	2.5	100	Replace immediately prior to relaunch
10.80	2.5	100	Replace immediately prior to relaunch
11.50	2.5	100	Replace immediately prior to relaunch
13.80	2.5	100	Replace immediately prior to relaunch
14.00	2.5	100	Replace immediately prior to relaunch
15.40	2.5	100	Replace immediately prior to relaunch
15.40	2.5	100	Replace immediately prior to relaunch

Bow -> Stern (m)			
Starboard	**Weight (kg)**	**Wasted %**	**Recommendation**
0.80	2.5	100	Replace immediately prior to relaunch
2.50	2.5	100	Replace immediately prior to relaunch
2.80	2.5	100	Replace immediately prior to relaunch
5.00	2.5	100	Replace immediately prior to relaunch
6.50	2.5	100	Replace immediately prior to relaunch
8.30	2.5	100	Replace immediately prior to relaunch
10.80	2.5	100	Replace immediately prior to relaunch
11.50	2.5	100	Replace immediately prior to relaunch
13.80	2.5	100	Replace immediately prior to relaunch
14.00	2.5	100	Replace immediately prior to relaunch
15.40	2.5	100	Replace immediately prior to relaunch
15.40	2.5	100	Replace immediately prior to relaunch

Recommendation - Advisory: The anodes should be replaced with a minimum of 7 pairs of aluminium anodes each side if the vessel is to spend most of her near term intended time in brackish water. This may only be assessed by the new owners *(Please see note below).* An additional anode should be affixed at the skeg. The rudder should also be monitored for signs of galvanic corrosion if the vessel is to spend extended time within a marina.

Note: Sacrificial anodes on steel barges in fresh water help to protect only a limited area around each anode, with little or no benefit to the majority of the underwater hull. Care should be taken to use anodes of the appropriate material for the mooring location; zinc for salt water, magnesium for fresh water & aluminium for brackish water.

Suggestion: Hanging anodes over the sides can be helpful in areas where permanent anodes would normally be damaged during locking or docking

3. Deck Structures

Cabin, Wheelhouse and Access to Accommodation

The cabin and access to the accommodation was visually inspected and thickness gauged where possible. The cabin tops and sides were noted to be in good condition with no damage or deflections noted. The cabin side and top were noted to be covered with good coatings of grey protective paint noted. The forward cabin top and sides were noted to have been altered to extend the accommodation space, these also had good coatings applied.

Access to the vessel cabin was by way of double doors forward of the cockpit. Both the double doors and sliding hatch were noted to be in good serviceable condition. No forward doors were noted and the only means of escape was through the skylight over the forward cabin.

There were no obvious signs of water ingress around doors or hatches.

Recommendation - Urgent: A defined means of escape incase of fire from the forward part of the vessel should be defined prior to habitation.

Recommendation - Advisory: Hose testing doors & hatches to determine water tightness.

Ports and Windows
Windows were seen in the cabin sides. These were visually inspected and found to be flush serviceable. No signs of corrosion or water ingress were noted when inspected. The glass in the portholes and windows were visually inspected and found to be sound and secure.

Recommendation - Advisory: Hose testing ports & windows to determine water tightness.

Pulpit, Stanchions, Pushpit & Lifelines
A short section of handrail was noted running both port and starboard of the cockpit, however, not the full length of the vessel. This was tested and was secure and in good serviceable condition.

No hand rail was noted running along the length of the cabin top.

Recommendation - Advisory: Consider affixing a hand rail either side of the cabin top.

Ground Tackle and Mooring Arrangements
An anchor and chain were seen attached at the bow of the vessel at the time of survey. The windlass was visually inspected, however, not tested under load and was not serviceable at the time of survey.

Two pairs of mild steel mooring bollards were noted on the bow and stern of the vessel. These were visually inspected and hammer tested and found to be secure.

Various mooring cleats and ropes were noted onboard the vessel at the time of survey. These were visually inspected, and found to be serviceable.

A number of fenders were seen onboard the vessel at the time of survey and were serviceable.

Recommendation - Priority: It is recommended that the anchor, chain and windlass be seen to be serviceable prior to the vessel being used for extended navigation in tidal waters.

4. Engine & Fuel System

Engine Installation
The vessel was fitted with a Ajax Marine, 4 cylinder diesel engine. The engine was visually inspected and the following checks carried out.

Part	Results
Engine Type	Ajax Marine 4 cylinder
Engine Hours	Not seen
Engine Mountings	Visually inspected & hammer tested and several found to be loose
Exhaust	Partially seen, serviceable. Aft section not fully seen. Seen to be fully lagged
Sump Pump	Serviceable

Fluid Levels	Serviceable
All Drive Belts	Serviceable
Alternator	Secure & Serviceable
Hose condition	Serviceable - Raw water intake only single hose clamped
Engine Cooling	Serviceable

The installation was to a professional standard with a good level of cleanliness and maintenance. The engine compartment was clean and tidy. The engine was not seen or heard running as part of the survey, and no comment can made regarding the serviceability of the engine.

Note: The inspection of the engine is limited to those tests and inspections listed above. It is recommended that the services of a diesel marine engineer are sought for a full and detailed engine inspection and analysis.

Recommendation - Priority: The engine to be seen running under load as part of an extended sea/river trial, where the engine and controls can be seen to be serviceable.

Recommendation - Priority: Engine mounts be tightened up prior to relaunch and running of the engine.

Recommendation - Priority: Raw water spigot pipe be fitted with a topping cap, and an additional through hull be fitted for the bilge pump at the side of the vessel.

Running and Service checks

Controls & Indicators
The engine controls were located to port of the tiller and was a single leaver control, with level linkage onto the transmission which worked smoothly, when tested and was seen connected onto the transmission. The engine control indicators were visually inspected with temperature gauge and voltage gauge visually inspected and seen to be visually serviceable.

Exhaust System
The exhaust pipe was only visually inspected from within the engine compartment, and found to be in a serviceable condition. The exhaust exited on the port aft quarter and was visually inspected at a distance and was fully lagged and serviceable.

Fuel System
A mild steel diesel tank was noted situated to port within the engine compartment, and was secured. Access was limited, however, visual inspection of the tank found it to be of a good standard and visually serviceable.

Pipework was visually inspected where accessible and no signs of leakage found. Flexible hoses were marked, properly clipped and visually serviceable. Copper pipe work was well secured and free from visible damage.

A fuel filler but no breather were located on the starboard side deck. The fuel filler was visually inspected and found to be in a serviceable condition and of a marine grade. A shut off valve in the draw pipe was noted within reasonable accessibility, situated close to the

tank. The valve was tested and operated freely. All the pipe work was inspected where accessible, and found to be serviceable.

5. Safety
Navigation Lights & Aids
No navigation lights were seen on board the vessel at the time of survey.

No electric horn was seen on board the vessel at the time of survey.

Recommendation - Caution: Navigation lights should be be fitted prior to the vessel being used for navigation at night.

Recommendation - Caution: An electric horn should be fitted or a hand held horn procured prior to the vessel being used for navigation.

Bilge Pumping Arrangements
A Whale Super Sub electric bilge pump noted at the aft inner bulkhead within the accommodation. This was visually inspected and heard running. No comment can be made on its serviceability as there was no water in the bilge to test the pump.

It was noted that the bilge pump hose had not been double hose clamped to a dedicated through hull but instead run to the top of the engine compartment spigot.

No manual bilge pump was seen.

Recommendation - Priority: The bilge pump should be tested prior to the vessel being re-floated, and satisfied that it is serviceable with water seen expelled over the side.

Recommendation - Priority: Bilge pump hose should be run to a dedicated through hull mounted on the side of there vessel.

Recommendation - Advisory: An electric second bilge pump be fitted further forward beneath the forward cabin / saloon bilge.

Recommendation - Advisory: A manual back up bilge pump might be fitted in case of electrical failure.

Firefighting Equipment
The following firefighting equipment was found onboard at the time of survey:

Position	Fire Fighting item	Weight (kg)	Code	Condition
Galley	Fire Blanket	-	-	Not seen
Galley	CO2 - Fire Extinguisher	2 Kg	13A 34B C	Serviceable not confirmed
Engine compartment	Foam - Fire Extinguisher	6 Kg	21A 144B C	Serviceable not confirmed
Saloon	Fire Extinguisher			Not seen
Forward Cabin	Fire Extinguisher			Not seen
Saloon	Smoke Alarm			Not seen
Saloon	Carbon Monoxide Alarm			Not seen
Forward Cabin	Carbon Monoxide Alarm			Not seen

Recommendation - Urgent: Smoke alarms should be fitted prior to the vessel being used for habitation. One should be fitted in every living space. These should be checked annually as part of a regular service program.

Recommendation - Urgent: A carbon monoxide alarm should be fitted prior to the vessel being used for habitation. This should be checked annually as part of a regular service program.

Recommendation - Urgent: New fire extinguishers should be procured for each cabin and should be checked annually as part of a regular service program.

Recommendation - Advisory: Fire escape plan made from the forward cabin incase of fire further aft, as there are no doors, and only the hatch to escape from.

Carbon monoxide poisoning is a considerable hazard and there have been a number of accidents caused by faulty gas appliances, inadequate alarm system and inefficient flues or lack of ventilation.

Lifesaving & Emergency Equipment
Lifesaving and emergency equipment was limited only to one life jacket and no additional life saving equipment was noted onboard the vessel at the time of survey.

Recommendation - Advisory: The BSS (Boat Safety Scheme), RYA or RNLI can advise on appropriate safety equipment. Recommend checking the websites below and adding additional equipment as appropriate.

www.rnli.org.uk
www.boatsafetyscheme.org
www.rya.org.uk

6. Accommodation & Onboard Systems

General Accommodation
The layout and general accommodation arrangement of the vessel was as follows, from bow to stern:

- Forward Cabin
- Heads, Shower and Basin
- Saloon
- Galley
- Aft Deck

The accommodation was finished in a solid hard wood and some soft wood panels. The sub floor was accessible in a number of areas and found in good condition. No informed comment can be made of timber, which was either covered or inaccessible.

Recommendation - Advisory: Inspection hatches and cabin sole floor should be left open when the boat is left unattended to allow some ventilation through the vessel. Water ingress which is left to stand in bilge can cause significant damage to the surrounding timber and base plates.

Suggestion: Monitoring the seals within the shower/bath cubicle to ensure no moisture escapes from the shower as this can cause significant damage to the surrounding timber and base plate.

Gas Installation
A full gas installation inspection can only be carried out by a suitably qualified gas operative registered with Gas Safe. Please note this survey is not any kind of gas safety certificate. This is only obtainable in the UK after comprehensive pressure testing and assessment by a qualified person listed on the Gas Safe Register www.gassaferegister.co.uk

Note: The following is a visual inspection only, however, any serious deficiencies that affect safety will be noted.

A mild steel self draining bottle storage was noted to port of the aft cockpit with engine compartments lids also acting as gas locker lid. One 13kg Butane propane gas tank was found within the locker. The existing gas hose which was noted to be out of date, which was connected to a visually serviceable regulator.

The gas hose was connected to copper gas pipework which was led back into the galley. A gas shut off valve was noted in the pipework and was serviceable when tested. Where seen copper pipework was well supported.

Down stream, the gas pipework was connected to a three burner hob in the galley.

Recommendation - Advisory: The existing flexible gas hoses be replaced immediately, and a new regulator also be fitting at the same time, as these should be replaced every 4-5 years.

Fresh Water Tanks & Delivery
A mild steel water tank was located beneath the port side deck and was not available for visible inspection, due to fixtures and fitting obstructing inspection.

A filler cap was located the side deck and was visually inspected and found to be serviceable and of a marine grade. The pump, some of the piping, and accumulator tank were visually inspected and found to be serviceable.

The pipe work was generally of 15mm, plastic push-fit type, running via a demand activated water pump to the accumulator tank and onto the services.

The majority of the plumbing lay behind liners and floorboards and was not accessible. Where seen the plumbing was in good condition with no leaks seen around accessible pipe work. It was seen to be properly clipped where accessible.

Outlets were found in the galley, heads sinks and shower, and were seen to be serviceable at the time fo survey.

Heads & Holding Tank
A composting toilet was found on board and was visually inspected, however, no comment can be made on its serviceability.

A shower & bath were also found onboard and were visually serviceable.

Electrical Installation
DC:
The vessel was fitted with 3x 105Ah 12v sealed domestic batteries. 1x 90Ah 12v sealed starting battery. These were located sitting on a dedicated shelf within the engine compartment. All the batteries were securly strapped down using webbed strapping, however, no lid or caps were noted protecting terminals from accidental shorting.

Two isolation switches were noted securely affixed to the aft bulk head aside the galley. One for domestic, one for engine starting. Both were switch tested and found to be serviceable.

There was a DC fuse distribution panel with switches for the 12V circuits mounted below the companionway steps and were seen to be serviceable.

A Sterling battery charger was noted securely mounted within the engine compartment and was visually serviceable.

Recommendation - Priority: The batteries and terminals should be protected from accidental shorting.

AC:
An RCD (Residual Current Device) was fitted with circuit breakers. It could not be confirmed if the 230v circuits were protected as the vessel was not connected to shore power. A standard marine plug fitting was seen securely fastened within the cockpit locker.

Various 230v plugs and domestic appliances were seen onboard. None of these were tested or seen in service.

Electronic & Navigation Equipment
There was no electronic navigation equipment installed.

No compass was seen fitted.

Note: The current set up may be suitable for a stationary live aboard vessel that navigates very infrequently in daylight on the inland waterways, but not for extended navigation to the BWW canal system

Heating & Refrigeration
There was a 230v fridge seen in position in the galley. This was not seen in service at the time of survey, as the vessel was not connected to shore power.

A solid wood burning stove was noted securly affixed to a hearth in the saloon. This was 350mm from the nearest combustible material. The hearth was noted to only extend 90mm out from the front of the stove, there was, however, no evidence of scorching around the heater or to the wooden floor in front of the stove.

A Webasto diesel heater was noted securley affixed within the engine compartment, with controller noted aside the companionway steps. This was switch tested and seen to fire up with pipework leading to a radiator noted to become warm.

Recommendation - Priority: A diesel shut off valve be fitted to the feed of the diesel heater in the engine compartment.

7. Conclusion
'Dutch Barge' was a Dutch Barge built circa 1906. She was found resting on steel beams in London. A Pre-Purchase survey was conducted at the request of the purchaser. Overall the vessel was set up as a live aboard houseboat and for limited cruising on the UK inland waterways.

Her below waterline hull was found to be in a generally fair condition given her age, and having been extensively over plated. The hull overall was of a satisfactory thickness, however, a number of areas have been highlighted where remedial action should be taken prior to being re-floated. This involves the removal of the now defective doubling plate as

mentioned in the recommendations, as well as the new additional doubling plates to be added, also noted in the recommendations.

Above the waterline, along the wind and waterline and topsides, the hull was in serviceable condition. Where seen, surface corrosion and pitting was manageable, and not considered active, however, further corrosion should be prevented by the application of new bitumastic coatings to prevent future corrosion.

There are number of additional significant recommendations mentioned in the body of the report which are concerned with health and safety which should be actioned prior to the vessel being used for habitation.

Rolf Thunecke

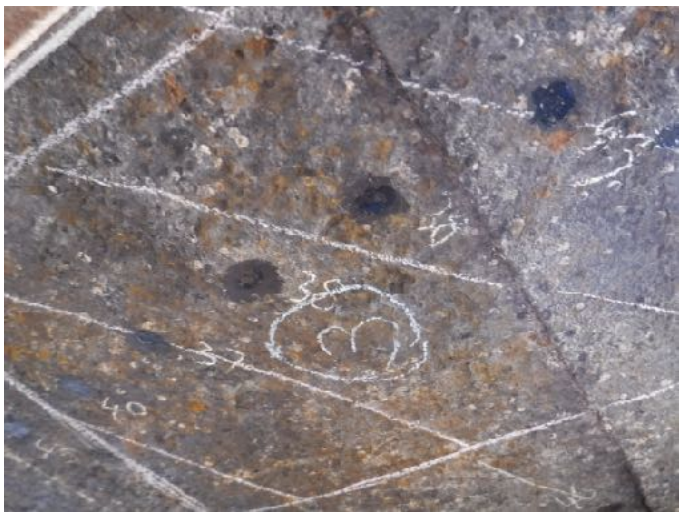
DipMarSur, MBMSE, AffilYDSA, AffilIIMS, AssocRINA,

London Barge Surveys
23/3/2021

APPENDIX I : Table of Ultrasonic Thickness Measurements

M		Port mm thickness			Centre	Starboard mm thickness			
	Above WL	Side @ WL	Bilge Strake	Garboard Strake	Keel Strake	Garboard Strake	Bilge Strake	Side @ WL	Above WL
0	na	na	na	na	na	na	na	na	na
1	5.0-5.1	5.2	5.0	4.4-5.2	na	4.3-4.7	4.7	4.8-5.1	4.8-5.1
2	4.8-5.3	5.1-5.3	4.6-4.7	4.8-4.9	3.8-5.6	4.4	4.6-5.7	5.0	4.9-5.3
3	4.7-5.2	3.6-5.0	4.3-4.7	3.9-4.5	4.9	4.9	3.9-5.1	4.9	4.9-5.3
4	4.8-5.2	3.8-4.9	4.9-5.5	3.2-3.4	2.9-4.2	3.8-4.9	3.6-4.1	4.9-5.2	5.0-5.4
5	4.8-4.9	3.8-4.5	4.1-4.7	4.2-4.5	3.9-4.2	3.8-4.2	4.3	4.7-5.2	4.9
6	4.8-4.9	3.8-4.0	4.9-5.5	4.4-4.5	4.1-4.9	3.3-4.5	4.7-5.0	4.0-5.0	4.9-5.0
7	4.7-5.4	3.8-4.4	3.9-4.9	3.9-4.5	4.3-4.5	4.3-4.6	3.5-3.9	3.8-4.8	4.9-5.3
8	4.6-5.3	3.8-4.4	4.9-5.1	4.1-4.5	4.8-4.9	4.1-4.9	3.8	3.8	4.9-5.3
9	4.7-5.3	3.8-4.5	4.5-4.6	3.7-4.2	4.8-4.9	3.8-4.8	3.8-3.9	4.8-5.0	4.8-5.4
10	5.3-5.4	3.8-5.2	4.6-4.9	4.3-4.6	4.0-4.5	5.1-5.2	3.7-4.5	4.9-5.2	5.3
11	5.2-5.4	3.9-5.4	3.9	3.8-4.5	3.7-4.5	4.5-4.8	3.8	5.2	4.9-5.3
12	5.1-5.4	3.8-5.3	3.8-3.9	3.8-4.9	4.6-5.0	4.6-4.9	3.7-3.8	5.1-5.5	5.1-5.4
13	5.3-5.4	3.9-5.2	3.9-4.5	4.7-4.8	4.9-5.2	4.7-4.8	4.7-5.2	5.0	5.0-5.2
14	4.7-5.0	4.8-5.2	4.4-4.7	4.5-4.8	4.1-4.9	4.7-5.0	4.6-4.9	5.0-5.2	4.6-4.7
15	4.7-5.3	4.8-5.5	4.7-5.0	5.3-5.5	4.3-5.0	4.9-5.5	4.6-4.8	4.8-5.1	4.6-5.1

APPENDIX II : Photographs



APPENDIX III: Plot