



**BMSUK (Oxon) Limited**  
*Marine Surveyors & Consultants*

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**Traditional Stern Narrowboat 18.2 m**  
**"Noahs Ark"**



# **BMS Marine Survey**

Pre Purchase Survey Of the Vessel [:Vessel Name:]

**"Noahs Ark"**

**Traditional Stern Narrowboat 18.2 m**

**CONDUCTED BY**

MJ Wiater AMYDSA MIIMS

BMSUK (OXON) LIMITED

**PREPARED FOR**

BMS

\*\*/\*\*/\*\*\*\*\*

## 2 INTRODUCTION

### PURPOSE & SCOPE:

The attending Surveyor attended aboard the 1990 Hull: R & D Fabrications. Traditional Stern Narrowboat "Noahs Ark", at the request of BMS, beginning \*\*/\*\*/\*\*\*\*. The Survey was requested to determine the physical condition of the vessel. No reference or information should be construed to indicate evaluation of the internal condition of engines, transmissions, drives or generators, nor the propulsion system's or the auxiliary power system's operating capacities. Electrical and electronic equipment was powered up and some electrical equipment may have been tested for basic and/or limited function only. The wiring was inspected where accessible and was found to be in generally serviceable condition, unless otherwise noted. A significant amount of wiring could not be observed due to the wiring looms and conduits that transit areas which would require dismantling and removals for their inspection. If a detailed report as to the condition and capacities of the wiring and electrical components is desired, it is recommended that a qualified and Certified Marine Electrical Engineer be engaged. Vessel tankage was visually inspected where accessible. No obvious leakage was observed, unless otherwise noted; however, the tanks were not confirmed to be full at the time of inspection. If a more thorough assessment is desired, the tanks should be filled and checked under full tank status or pressure tested to attest to their condition.

The vessel was Surveyed without the removal of any parts, including fixed partitions, fastened panels, fittings, headliners & wall-liners, heavy furniture, tacked carpeting or other fixed flooring material, appliances, electrical equipment or electronics, instruments, anchors line & chain, spare parts, personal gear, clothing, miscellaneous items in the bilges, cabinets, lockers or other storage spaces, or other fixed or semi-fixed items. Only installed items were inspected, including but not limited to enclosures, covers and tops. Locked compartments or otherwise inaccessible areas would also preclude inspection. The client is advised to open up all such areas for further inspection. A visual inspection was conducted only on accessible structures and no destructive testing was performed. Naval architecture and engineering analysis were not a part of this Survey. Furthermore, no determination of stability characteristics or inherent structural integrity has been made, and no opinion is expressed with respect thereto. Complete compliance with, identification of, and reporting on all standards, codes and regulations is not guaranteed. This signed report represents the findings of the Survey and supersedes any and all conversations, statements and representations, whether verbal or in writing. This Survey Report represents the condition of the vessel on the above date or dates and is the unbiased opinion of the undersigned, but it is not to be considered an inventory, warranty or guarantee, either specified or implied. The Survey Report is for the exclusive use of the client and those lenders and underwriters that will finance and insure the vessel for this client only, and is not assignable to any other parties for any purpose.

Completed by Mark Wiater on behalf of BMSUK (Oxon) Ltd. No unusual limitations affected the survey apart from those mentioned in the text. The weather was fine. The vessel was found in the dry dock, sitting on bostocks, which partially restricted access to the vessel.

### CONDUCT OF SURVEY:

This survey was carried out under BMSUK (Oxon) Limited standard terms of business (TOB) 2020.

The survey was commissioned by the above for the purpose of establishing the

condition of the vessel for purchase purposes on the date of survey. Unless otherwise stated, the vessel was not surveyed for compliance with any build standards or operational codes of practice or local licenses. The vessel has also not been surveyed for suitability for any particular purpose or location. This survey report is a factual statement of the surveyor's examination as carried out and his opinion given in good faith as to the relevance of disclosed facts and defects so far as seen. It implies no guarantee against faulty design or latent defects.

### LIMITATIONS

Areas inspected were limited to openings and access available during normal operations and maintenance of the vessel. No fastenings or skin fittings were pulled, or joinery and head linings removed. Materials used in the construction were tested as far as was possible by industry standard Non-Destructive Test (NDT) equipment as stated within report.

The vessel was initially examined afloat and then ashore at Lea valley Marina. The narrow boat was supported at ground level on wooden supports making any inspection of the base (bottom) plate impossible.

No opinion could be made or responsibility undertaken for condition or defect of those aspects of the vessel not accessible or evident due to the above limitations.

### Methods

Visual examination and hammer sounding are utilised for initial inspection and to determine the construction of the vessel and the vulnerable areas which require more detailed and dense sampling. The thickness of the steel is measured with a Tritex 5600 multigauge 2.25 MHz, 13 mm 10mm twin crystal probe. Pit depth is measured with a digital depth gauge. All instruments are zeroed prior to taking readings.

**DEFINITION OF TERMS:** The terms and words used in this report have the following meanings as used in this Report of Survey:

### APPEARED:

Indicates that a very close inspection of the related item was not possible due to constraints imposed upon the Surveyor (e.g. no power available, inability to remove panels or requirements not to conduct destructive testing, etc.).

### SERVICEABLE:

Fulfilling its function adequately (usable at the time of Survey).

### READILY ACCESSIBLE

Means capable of being reached for operation, inspection or maintenance without removal of any vessel structure or use of any tools or removal of any item of portable equipment stowed in places intended for storage such as lockers, drawers or shelving. {Source: ISO 10088 E}.

### ACCESSIBLE

Means capable of being reached for operation, inspection or maintenance without removal of any vessel structure (Note hatches-are not regarded as permanent vessel structures in this sense even if tools such as wrenches or screwdrivers are needed to open them. Hatches for inspection or maintenance of fuel tanks may be covered by uncut carpet , provided that all tank fittings can be inspected and maintained via other openings. {Source: ISO 10088 E}.

### POWERED UP:

Power was applied only. This does not refer to the operation of any system or component, unless specifically indicated.

### USE OF "A", "B" or "C":

Use of the letters "A", "B" or "C" in the body of this report will indicate that a finding will be listed in the "Findings and Recommendations" Section pertaining to the lettered item. PLEASE BE ADVISED THAT SOME DEFICIENCIES, OBSERVATIONS AND SUGGESTIONS MAY ALSO BE CONTAINED IN THE BODY OF THE REPORT.

The number of asterisks in this General Information section refers to the source of related information as follows:

- \* Owners/Bookers Information.
- \*\* Per Manufacturer's Documentation
- \*\*\* Per Registration Documentation
- \*\*\*\* Information found onboard

Unless specifically noted otherwise, there were no measurements or calculations performed during the Survey. The specifications listed within the report are believed to be correct; however, accuracy is not guaranteed. Recommend obtaining accurate measurements and performing calculations as desired, or verifying all vessel specifications and capacities with the vessel's builder.

## ***SURVEYOR NOTES***

- TRIAL RUN COMMENTS:** A short trial run under power was performed during the Survey inspection. Gear box operated ahead and astern
- OUT OF WATER SURVEY:** The underwater hull was not pressure cleaned prior to inspection so my conclusions are based on the evidence presented by selected and random sample areas scraped clean for inspection and measurement.
- ELECTRICAL SURVEY:** AC and DC power was used to power up the electrical systems specified in this report only, unless otherwise noted.
- HIN:** The vessel's HIN (Hull Identification Number) was not verified during the Survey inspection (see HIN Compliance).
- ENGINE SURVEY:** The engine was inspected visually only. It is highly recommended and understood that all propulsion & auxiliary power systems (engines, transmissions, gears, drives, generators) be inspected by their respective Manufacturer's Certified Technician to determine their condition.
- ULTRASONIC TESTING:** An Ultrasonic Metal Thickness Audio Gauging was performed on the vessel's hull bottom below the waterline, decks, cabin and keel, using a Tramex 560 Ultrasonic Thickness Meter. All readings obtained, verified the steel plating thicknesses to be of

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their original milled thickness in the areas measured. No recommendations have been made to perform any service to the vessel's steel structures.

### 3 GENERAL VESSEL INFORMATION

TYPE OF SURVEY REQUESTED: Pre-Purchase for Buyer  
DATE AND TIME OF SURVEY: \*\*/\*\*/\*\*\*\*  
VESSEL TYPE: Traditional Stern style narrow boat.  
VESSEL BUILDER: A, N. Other  
CRT NUMBER: \*\*\*\*\*  
RCD PLATE DETAILS: Cat,:D  
YEAR BUILT: 1990  
VESSEL MATERIAL: Steel  
LENGTH OVERALL (LOA): Measured approximately 18.2 m 62 ft  
BEAM: 6' 10"  
DRAFT: Measured approximately 2'8  
DESIGNED MAXIMUM PASSENGERS: RCD Six Pax  
LOCATION OF BOTTOM INSPECTION: A Dry Dock

### GLOSSARY

### DEFINITION OF TERMS

**Accessible** Capable of being reached for operation, inspection or maintenance without removal of permanent boat structure.

**Anti-cavitation plate** A plate fitted flush or almost flush to the counter plate to cover the weedhatch aperture.

**At Risk** An installation which, if operated, may lead to a situation which could create a risk to life or property.

**Average plate thickness** The calculated steel plate thickness as a mean of a number of readings.

**Chine** The joint between the hull side and hull bottom. There may be several chines, depending upon the hull design.

**Cratch board** A vertical frame, normally triangular, fitted to the fore deck to provide support for covers.

**Counter** The stern section of a vessel, where the underwater section reduces in beam to allow water to flow to the propeller or rudder

**Counter plate** Flat plates, extending outboard of the swim. Also known as uxtter plates

**Dolly** A round bollard used for mooring.

**Extending heel** An extension to the bottom below the propeller to support the rudder. Often known as a skeg.

**Galvanic corrosion. Pitting** caused by stray electric currents.

**Gunwale** The top edge to the hull top side.

**Knee** Internal support framing for the hull side, generally vertical. In some craft it may extend to also support the bottom plate.

**Nominal** The basic manufactured dimension. Due to manufacturing techniques, the actual dimension may be larger or smaller, within appropriate tolerances.

**Overplate** Plating fitted on top of the hull plate.

**Readily accessible** Capable of being reached for operation, inspection or maintenance without the use of tools.

**Residual plate thickness** The calculated steel plate thickness, after considering the deepest pit measured and the average plate thickness.

**Rudder Post** A steel bar connecting the rudder blade to the tiller.

**Rudder post tube** A tube fitted between the counter plate and deck for the rudder post to pass through

**Sacrificial strip** An extension of the bottom plate to provide protection and a wear edge for the bottom weld.

**Scantling** The size and location of structural members and plating.

**Swim** The section of the hull side to the stern of a narrow boat that reduces in beam to allow water to flow to the propeller.

**Skin tank** A steel tank fitted to the internal hull, with at least one face being the hull plating. The tank contents are cooled by the external water via the hull plating.

**Stringer** Internal support framing for the hull side or bottom, generally running fore & aft.

**Tiller** A steel bar used for steering.

**Taff rail** A safety rail round the back of the steering deck.

**Topsides** The upper section of the hull side.

**Turn of the swim** The position on the hull where the side plating starts to bend towards to centre of the craft to form the swim.

**Turn of the bow** The position on the hull where the side plating turns in to the bow.

**Transom.** Flat plate extending across the back of the boat.

**Ultrasonic meter** A hand-held electronic device with a small probe that indicates material thickness by recording the speed of sound through the material.

**Weedhatch** An aperture directly above a propeller, enabling removal of debris from the propeller.

### 4 HULL INSPECTION & UNDERWATER EQUIPMENT

HULL COATINGS:	The hull has been previously coated with a coal tar or bitumen coating.
ANODES:	<p>The vessel featured 4 pairs of cast magnesium sacrificial anodes fitted to the hull side shell by way of welded straps which hammer tested serviceable. One set of anodes were estimated at 80% worn so should be replaced.</p> <p>Note: Cast magnesium sacrificial anodes on steel narrowboats 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.</p>
WEED BOX:	The weedhatch extended through the counter plate above the propeller. The weed hatch top was barely an acceptable height above the waterline. (150mm above the counter plates.) The weedhatch top and mechanism were visually acceptable with a substantial rubber gasket and a well maintained clamping system. Note the weed hatch top and gasket are keeping the vessel afloat so should be removed at least once a year to keep the mechanism serviceable and inspect the gasket. There was an adequate cavitation plate in place.
SHAFT BEARINGS:	The water lubricated cutless bearings showed no signs of significant wear.
THRUSTERS:	The unmarked bow thruster was set into a 5mm steel tube welded to the hull. The bow thruster was situated behind a watertight bulkhead so any problems with the bow thruster or pitting in the tube will not flood the entire boat. The bow thruster tube grills were in the process of being altered to be easily removable which is good practice. All visually serviceable but could not be tested. The bow thruster battery terminals and the leisure battery terminals, were not covered which is a BSS requirement.
UNDERWATER SURFACES:	The bottom plate had not been painted which is standard industry practice which in my opinion is due to economic and access factors more than practical consideration. Rust 'pustules' present would attest that the bottom plate is not regularly scoured by contact with the bottom and consideration to painting the bottom plate could be considered for the future.
THROUGH HULL FITTINGS:	Welded spigots and yellow metal through hull fittings.
HULL FITTINGS:	Topside hull fittings were found to be well attached.
PROPELLER PROTECTION:	Provided partially by the skeg.

### 5 VESSEL CONSTRUCTION

#### ***HULL ARRANGEMENT***

VESSEL DESCRIPTION: 'Noahs Ark' is a traditional commercial butty narrowboat, which has been converted into a steel bottomed pleasure cruiser and motorised. The hull has been constructed in riveted iron with a steel lower strake and base plate. The original Bantock boats were built to a unique design, of composite construction and having a wooden lower strake of oak and an elm bottom bottom and lower sides. Flat bottom with a slight rise at the bow from the fwd. quarters. The steel accommodation has slab sides with slight tumblehome from the side deck.

Built from the welding of mild steel plate to a riveted iron hull. Steel decks and superstructure. In its parallel middle section, the hull bottom is constructed by butt welding flat bottom plates. On both sides of the flat base vertical side plates are fillet welded to the base plate thus forming a narrow sacrificial chine (Wear plate). Above the steel plating the iron side plating has been welded to the steel

superstructure forming a tumblehome sheer strake and narrow side decks. For impact and rubbing protection 'whisker' rubbing strakes protects the bow, formed by attaching a D-section bar to the side plating.

The bow is a classic narrow boat style with a substantial stem post. The elliptical type stern is in traditional butty style. A steel splash plate welded to the stern supports the lower rudder cup bearing.

The accommodation from fwd.:

Foredeck cants and hatch. Well deck. Port side door with step and substantial cill to bathroom. One double berth cabin. Open plan saloon and walk through galley. Aft traditional style boatmans cabin. Steps over engine to short aft deck.

### SURVEY DETAILS

#### HULL

Hull construction is of welded steel and riveted iron. Sample thickness measurements taken from locations where corrosion is unlikely to be present, indicated an original nominal build plate thickness as:

Superstructure: 5 mm  
Topsides: 7 mm  
Lower topside plating: 6.3 mm  
Bottom (Base) Plate: 6 mm

HULL DESIGN TYPE:

Traditional Steel Narrowboat

HULL MATERIAL:

Hull construction is of welded and folded steel. Sample thickness ultrasound measurements taken from locations where corrosion is unlikely to be present, indicated an original nominal build plate thickness as noted previously.

TOPSIDES:

The side plates above the water line were clean and fair. The paintwork above the waterline was in fair condition.

There was rust corrosion along the waterline. Waterline corrosion was not considered serious at this time but should be cleaned off and repainted.

There was no visible evidence of significant impact damage or indentation.

The side plates were coated in a very thick layer of bitumen blacking which hindered inspection. In places this thick blacking chipped off under aggressive hammer testing. One section midships to starboard was cleared of all blacking to inspect the steel below with very little pitting or corrosion found.

The welding to the hull was a little uneven but believed to be serviceable. Welded butt joints were externally inspected, were tidy and unobtrusive and hammer tested serviceable. Waterline pitting was minimal. Aggressive hammer testing below the waterline produced no evidence of weakness in the steelwork. Sample hammer testing carried out around welds gave no indication of weakness.

The rubbing strakes were welded top and bottom, which was considered good practice.

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- RUBBING STRAKES: D-Section steel section rubbing strakes protected the stem and stern. The strakes were attached to the hull plating with continuous seam welds top and stitch welded bottom. Attention to 'forcing' blacking into the lower margins is strongly recommended to prevent corrosion forming behind the strakes.
- HULL BELOW WATERLINE: Underwater plating which had been pressure washed prior to blacking, was inspected visually, by general hammer sounding and by ultrasonic thickness measurements taken at selected and random points. Ultrasonic thickness measurements are taken 'over planes' and therefore represent the maximum thickness of the plating at that point only, with a deduction to be allowed in respect of the depth of any pitting present. In evaluating the overall condition of the plating the pitting depth found is taken into account but as thickness measurements are recorded over planes with a deduction to be allowed in respect to estimated pitting depth. These thickness recordings are strictly point thickness and there is no warranty that adjoining areas of plating share the same thickness reading.

### Hull Thickness Measurement:

A CTritex 5080 multi echo ultrasonic thickness meter was used to measure sample plate thickness. Being multi echo the meter discounts the paint thickness. The meter was calibrated before use. Thickness testing is of a sample nature targeting suspect locations around the hull. Over 100 readings were achieved which showed an acceptable consistency. Enough sample readings were achieved to confirm the plating remained in good condition, which was backed up by aggressive sample hammer testing with a 16lb ball peen hammer. To complete a comprehensive thickness test it would be necessary to blast the hull clean first and complete many more readings, which would not be practical, or considered necessary at this time.

### Thickness readings:

Side plate original nominal thickness 6mm. Range of readings 5.2mm to 5.8mm  
Pitting < 0.5mm where seen.

Base plate original nominal thickness 12mm. Range of readings 9.7mm to 11.7mm  
Pitting < 0.5 mm

The readings taken were consistent and show little diminution. The virtual lack of pitting confirmed that the vessel had been originally built out of a high quality steel. There was little evidence of serious corrosion internally in the few areas where the base plate could be accessed, namely the engine bay and the small inspection hatch aft in the cabin.

We were led to believe there had been some rusty areas internally but this always looks worse than it is. The owner has cleaned off the rust and painted these areas and there was no evidence of any fault on this survey. The hull was therefore believed to be in good condition at the present time so long as further corrosion is minimised. There was no evidence of any paint on the base plate externally.

### Base Plate

The 12 mm base plate was found fairly clean and was visually fair with no evidence of serious indentation or damage.

The base plate was cleaned off in sample areas around the outer edges and on the centreline. In the cleaned off areas the underlying plate was found in good

condition with only minimal pitting found. The base plate was not coated in canal crud as normally seen so inspection was reasonably easy.

There was no evidence of any protective paint coating, which is disappointingly usually the case with narrowboats. Paint coating is the only way to prevent electrolytic pitting.

A 20mm sacrificial strip where the chine extends outside the side shell of the vessel to minimise wear to the weld was found in serviceable condition.

Welding joining the swim plate to the counter plate, side plate to bottom plate and weedhatch assembly were also externally inspected, sample hammer tested and found continuous and fair.

EXTERIOR FINISH:	The counter plates were of 12mm plating and in good condition on both sides. Painted superstructure and upper topsides.
EXTERIOR CONDITION:	The exterior of the vessel appeared to be generally well kept.
TRANSOM:	Steel counter stern over elliptical swim plates.
STEM:	Raked stem with substantial stem post. Bow plates without any defomation.
BALLAST:	Believed to be loose concrete paving slabs but could not be accessed.
STRUCTURAL FRAMES:	Not accessible for inspection.
BILGES:	Fitted carpet prevented inspection of the main cabin bilge space.
COMMENTS:	Suggest: The use of two-part epoxy paint protection for side shells and base plates is becoming more common on narrowboats for long-term protection. This is the best defence against future corrosion. This is more important if shore power and a 230v battery charger are to be used regularly.

In discussions with the Insured we mentioned Hot Zinc spraying at Debdale in Leicester . Alternatively the use of epoxy primer under epoxy blacking will protect the hull. In both cases the hull needs to be grit blasted clean prior to painting. It would be advisable to complete a quality paint coating in the next two or three years and as with all paint coatings the quality of the coating depends on the quality of the preparation and the conditions in which the paint is applied.

### ***DECK ARRANGEMENT***

DECK MATERIAL:	Welded steel plating.
DECKING OVERLAY:	The narrow side decks were coated with a non-slip material.
RUB-RAILS:	Continuoue upper rubbing strake. Whisker style rubbing strakes protected the bow. Waterline rubbing strake at stern.

### ***SUPERSTRUCTURE ARRANGEMENT***

MATERIAL: 4 mm welded steel superstructure and cambered coachroof. Integral hand rails.

## **6 STERN GEAR**

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### PROPELLERS

Propeller: 700mm three bladed right hand phosphor bronze propeller. Tips serviceable with only minor impact damage. Propeller secure.

Shaft: 48mm magnetic shaft. Visually serviceable and believed straight. Turned easily by hand.

Bearings: Little movement in stern gland.

Rudder Operation: Adequate. Bearings serviceable but it was understood the top bearing was to be changed.

### HULL SKEGS

Steel U-section bar skeg with cup bearing welded to bottom plate. Not closely inspected.

### RUDDER MATERIAL

Steel flat blade rudder mounted on rudder stock.

### THROUGH HULLS

There were no underwater skin fittings which is considered good practice. Most overboard drains were above the Canal Boat Association recommendation of a minimum 250mm freeboard. The kitchen sink discharge was in very poor condition and was seen to have a smaller discharge set in to the normal 2" discharge and secured with silicone. This is not safe practice and the discharge should be replaced by one that fits the hull securely. Unsafe.

#### FINDING B-2

## 7 EXTERIOR EQUIPMENT

### CABIN VENTILATION

Screw down mushroom vents. Louvered vents in bow and stern doors which must be kept clear.

### DECK HATCHES

Steel hinged gas locker hatch. Hatch on aft deck to access weedhatch and stern gland greaser.

### PORTHOLES/PORTLIGHTS

Windows were brass ringed portholes, all lying tight and fair to the cabin side. No visible corrosion behind.

### EXTERIOR DOORS

The aft entrance door was by way of twin steel doors and a steel sliding hatch, solidly constructed. Forward doors were twin timber lined steel doors. Twin steel side doors to the engine room were serviceable.

### WINDOWS

Hopper style alloy glazed windows in accommodation sides. Locking device. No visible internal leakage.

#### FINDING C-1

### HAND RAILS/GRAB RAILS

Steel integral hand rails run along the coach roof sides.

### MOORING ARRANGEMENT

T-stud mooring point on bow. Centre line attachment point on coach roof midships. Two mooring posts on stern.

### EXTERIOR STORAGE

Coach roof mounted holders for boarding plank and boat hooks.

### MOORING LINES

NOTE: General wear & tear was observed on some of the lines.

### FENDERS

Tubular tube type rubber fenders attached to side deck mounting points. Rope stem and stern fenders in serviceable condition.

### 8 CABIN ARRANGEMENT

#### **INTERIOR**

##### MAIN CABIN ARRANGEMENT

Open plan saloon with galley and companioway with door to bathroom. Aft cabin.

##### GALLEY ARRANGEMENT

The Galley was located port forward amidships in the main cabin.

##### ACCOMMODATION ARRANGEMENT

Two aft and two on convertible dinnette arrangement. Sofa bed forward.

##### HEAD ARRANGEMENT

Porta Potti cassette type portable toilet. Spare cassettes not were observed.

##### SHOWER ARRANGEMENT

Small bath with shower.

##### INTERIOR CABINETRY & TRIM

No significant wear & tear was observed on the interior cabinetry and trim.

##### INTERIOR DOORS

Recommend confirming that the door lock's key is onboard and that the lock mechanism is operational.

##### CEILING HEADLINERS

The deck head linings were in light oak veneered plywood.

##### WALL-LINERS

The cabin is lined with oak faced panels.

##### FLOORING

Laid plastic wood flooring. carpet in saloon and aft cabin. Lino in bathroom. NOTE: the carpet runners were stained in some areas and required steam cleaning.

##### CABIN SOLE FOUNDATION

Plywood cabin sole foundation. Felt firm underfoot. Not accessible.

##### INTERIOR MIRRORS

No significant de-silvering was observed on the interior mirror's reflective coatings.

##### GENERAL INTERIOR & SOFTGOODS CONDITION

The general maintenance of the interior soft-goods appeared serviceable.

##### WATER INTRUSION COMMENTS

No significant signs of water intrusion were observed at the vessel's interior.

#### **INTERIOR SYSTEMS & EQUIPMENT**

##### LIGHTING

12 Volt DC lighting fixtures. Some LED fittings. All lights illuminated.

##### CABIN HEATING SYSTEM

Webasto Thermo Top C 12 Volt DC powered diesel boiler with radiators in all cabins. Webasto control panel in aft cabin and thermostat in saloon. The header tank is accessed from the locker below the main electrical panels. The system was run during the inspection.

##### UNIDENTIFIED SWITCHES

An unidentified switch was observed in the Head.

#### **AUDIO/VISUAL EQUIPMENT**

##### STEREO SYSTEM

Stereo/CD car type player, with speakers. Switched on.

### ***GALLEY EQUIPMENT***

#### REFRIGERATION

Domestic AC mains refrigerator. Not tested.

#### OVEN

Vanette LPG fitted oven and grill. Not operated.

#### STOVE BURNER HEAT PROTECTION

Hinged burner cover. Tiles behind hob with no apparent scorch marks.

### ***CABIN HEATING***

#### STOVE

Solid Fuel Stove manufactured by Stova and sitting on a tiled hearth. Distance from nearest flammable surface was visually adequate. Flue condition good with no evidence of scorching. No evidence of scorching where the flue passed through the headlining.

Epping Stove in the Boatman's cabin:

These stoves are well known for not being safe as there is no room to form safe clearances between the stove and flue and the surrounding woodwork. The flue to this stove is almost touching the panel behind so constitutes a serious fire risk, but there was no evidence of scorching in this example. These stoves have a historical value to retain authenticity of the back cabin but if they have to be used should be used with great care and always supervised. This example had the flue baffle removed so there was an open hole in the flue.

#### **FINDING A-1**

## **9 PROPULSION & MACHINERY SPACE**

### ***PROPULSION SYSTEM***

#### ENGINE MODEL

Engine Type: Russell Newbery 18hp Diesel engine.

Paintwork: Good

Engine number: 22E1473 Hours: 6419

Engine run on water: No Ashore: No

Oil Checked: Yes at correct level . Leaks: None noted.

Fuel Checked No Leaks: None noted

Pipes and belts checked: All visually serviceable

Exhaust: Secure with a large silencer and extending out of the boat through the roof.

Controls: Visually Serviceable

Gear box and coupling: PRM Hydraulic gear box. Mechanical couplings extending the shaft good.

Engine mounts and beds: Solid engine mounts to timber engine beds.

Engine drip tray: Separate from bilge pump.

#### STARTER VOLTAGE

12 Volt.

#### ENGINE EXHAUST SYSTEM

Lagged dry exhaust with silencer.

#### ENGINE DRIVE BELTS

Serpentine belt condition appeared serviceable, except where noted.

#### ENGINE BED MOTOR MOUNTS

Bolted directly to steel engine bearers.

#### ENGINE BED SUMPS

Integrated drip sump under the engines.

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### MAIN ENGINE OIL LEVEL

Normal level was observed on the engine sump dipstick.

### ***TRIAL RUN INFORMATION***

#### ENGINE STARTUP

The engines started without excessive cranking or excessive exhaust smoke.

#### ENGINE SPACE COMBUSTION AIR VOLUME

The engines appeared to have adequate air flow and combustion during the trial run.

### ***MACHINERY & BILGE SPACE EQUIPMENT***

#### HOSES

Appeared serviceable, where sighted. Monitor frequently for dry cracking, degradation, damage or chafing.

#### HOSE CLAMPS

Always recommend installing corrosion resistant marine grade stainless steel T-bolt type hose clamps and/or solid banded (non-open slotted) hose clamps where appropriate.

#### TOOL BOX

No tools or spares observed onboard.

### ***TRANSMISSIONS / GEARS / DRIVES***

#### DRIVE SYSTEM TYPE

Direct Drive.

#### TRANSMISSIONS/GEARS

Marine reduction gear bolted directly to the engine.

#### PROPELLER SHAFT PACKING GLANDS

Flange & bolt stuffing box type packing glands. Monitor frequently.

## **10 FUEL SYSTEMS**

#### FUEL SYSTEM TYPE

Diesel.

#### FUEL TANK MATERIAL

Steel, built in fuel tank, aft under the boatman's cabin floor. Copper pipe supply with isolation taps. All visually serviceable subject to cleaning. The cleanliness of the fuel in the tank could not be confirmed and dirty fuel is a common cause of engine failure.

#### NUMBER OF FUEL TANKS

One (1).

#### FUEL TANKAGE CAPACITY

Recommend verifying the fuel tankage capacity.

#### FUEL TANKAGE LOCATION

Under aft deck.

#### FUEL FILL LOCATION

On aft deck cant with overboard drain.

#### FUEL FILL MARKING

The fuel fill fittings were marked "fuel".

#### FUEL TANK VENTILATION

Fuel air vent with gauze flame arrestor on transom.

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### FUEL FILL HOSE/PIPE

Flexible hose marked ISO 7840

### FUEL LINES/HOSES

Copper fuel lines, with flexible hose to engine connections.

### FUEL SHUT-OFF VALVES

Ball valves at the fuel tank.

### FUEL FILTER CONDITION

Unknown, due to enclosed filter design type. Monitor/service often.

## 11 ELECTRICAL SYSTEMS

### ***DC ELECTRICAL SYSTEMS***

DC SYSTEMS VOLTAGE: 12 Volt systems.

BATTERIES: 12V DC System. Four 110ah leisure batteries reading 12.72V and a separate 75ah bow thruster battery reading 12.72V. Batteries found in acceptable battery trays but neither sets of batteries had the terminals covered. Battery wiring was visually serviceable but was disconnected due to the welding work being completed. Batteries were secure in their trays but not strapped down. All battery voltages were at a serviceable level. There was a main battery, isolating switch which tested serviceable  
Battery charging from alternators and a 230 volt battery charger There was a 230V shore power socket fitted which could not be tested. The mains power source was selected by moving the socket between the mains shore power and the generator output. The circuit was then protected by an RCD.

ENGINE ALTERNATORS: Reportedly, 12 volt / 70 amp, engine mounted and belt driven.

SOLAR PANELS: There was a large GB Sol solar panel on the roof with a solar power regulator in the boatman's cabin.

### ***AC ELECTRICAL SYSTEMS***

GALVANIC ISOLATION: Highly recommended if not installed.

INVERTER: Victron Multiplus Combined 12/3000/120 amp battery charger and 3000 watt inverter.

## 12 GENERATORS/AUXILIARY POWER

### ***GENERATORS***

GENERATOR MODEL: There was a small Yanmar Cereda 2.8kw generator installed in the engine bay with a separate exhaust and fuel feed. All visually serviceable but not tested.

GENERATOR FUEL TYPE: Diesel.

GENERATOR KILOWATT RATING: 2.5

STARTER VOLTAGE: 12 Volt.

## 13 WATER SYSTEMS

### ***FRESHWATER SYSTEM***

WATER TANKAGE MATERIAL: Stainless Steel.

NUMBER OF FRESHWATER TANKS: One (1).

WATER TANKAGE CAPACITY: Recommend verifying the water tankage capacity.

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WATER FILL LOCATION:	On the fwd. well deck port side.
WATER FILL MARKING:	Properly marked for water.
TANK BREATHER:	Vents installed above the fill pipes.
FRESHWATER PUMPS:	12 volt Dc demand type with integral pressure switch. Demonstrated.
ACCUMULATOR TANK:	Integral Accumulator Tank installed by the freshwater pump.
FRESHWATER PIPING:	Mixture of white plastic PEX type (Cross-linked Polyethylene) speed fit fittings and pipe, colour coded , copper tubing and flexible hoses.
WATER LEVEL MONITORING:	Recommend verifying the water tankage level gauge's accuracy.
COMMENTS:	The hot and cold water system was not tested. Hot water from a calorifier in the kitchen with an immersion heater. There was a Porta Pottie cassette toilet in adequate condition which is considered good practice. The shower , bath and washbasin were not tested but the tiling and sealing was visually serviceable.

### **GREYWATER SYSTEM**

GREYWATER DISCHARGE: Shower sump discharged directly overboard by an electric 12 volt DC pump located . Switched from shower.

## **14 STEERING SYSTEMS**

STEERING SYSTEM TYPE:	Direct tillers steering at the stern counter.
RUDDER SKEG:	Solid steel skeg welded to base plate with secondary supporting strut.
UPPER BEARING:	Sleeved upper rudder shaft bearing mounted on deck.
LOWER RUDDER BEARING:	Cup bearing welded to skeg.
RUDDER STOCKS:	Steel solid tube stock. Not observed where it passed through the diesel tank in the rudder stock tube.
RUDDER:	Solid steel plate rudder.

## **15.1 GROUND TACKLE**

ANCHORS: No anchor was observed onboard. Ground tackle is important safety equipment. Properly sized, rigged, stowed and ready for use. Rig properly sized anchor, as necessary.

COMMENTS: For river use a suitably sized anchor, 5 kg and length of chain, min 10m of 8mm and 20m nylon rode is recommended. This is mandatory on most river Authorities including the Thames. The bow fitting should be suitably mounted and sized to accommodate the anchor rode and

## **16.1 ELECTRONICS & NAVIGATION EQUIPMENT**

NAV LIGHTS: Tnnel light switch from helm. Operational. The Navigation Lights, Port & Starboard.

## **17 AUXILIARY GAS SYSTEMS**

GAS TYPE:	LPG (Liquified Petroleum Gas/Propane).
GAS TANKAGE LOCATION:	Foredeck integral steel gas locker with external overboard drains.
GAS LOCKER VENT:	Appeared adequate (keep drainage hole clear).
GAS LINES & FITTINGS:	Seamless copper pipe, with flexible hose at the tank connection.
GAS REGULATOR:	A Gas Regulator was installed inline by the bottles.
COMMENTS:	Two gas canisters in the forwards gas locker with acceptable overboard drainage. Locker floor visually serviceable subject to painting. Gas canisters were not secured.

Other hard items were stored in the gas locker. No Bubble tester fitted. Age of flexible pipe was dated as 2011 Gas Appliances: This is a simple gas system supplying a hob, oven and Morco boiler. The hob and oven were both in good visual condition as was the Morco boiler and flue. None were tested. There were no isolation taps to the appliances.

### 18 SAFETY EQUIPMENT

#### ***SAFETY EQUIPMENT***

LIFEBOUYS: One life bouy mounted on roof.

SOUND PRODUCING DEVICES: 12 Volt DC Electric Tone Horn. Operated.

COMMENTS: 2 Off 1kg fire extinguishers and a fire blanket found. Guages all indicating an acceptable pressure. Fire blanket in the galley.  
Carbon monoxide alarm noted and powered up from the main batteries.  
There was an acceptable alternative method of escape.

#### ***AUXILIARY SAFETY EQUIPMENT***

SMOKE DETECTORS: None sighted. Install Smoke Detectors inside the accommodation spaces.

#### ***BILGE PUMPING SYSTEMS***

ELECTRIC BILGE PUMPING SYSTEMS: A small submersible bilge pump was observed in the aft engine bilge. Switch below DC electric panel. It was not operating.

## 19 SUMMARY

### VESSEL CONDITION:

This vessel has been in the ownership of the insured for 11 years. Little of the history of the vessel was known but the owner is a retired engineer who has the ability and time to maintain the vessel well. "Noahs Ark" was a tug style vessel which was an open barge with just a boatman's cabin originally but has been converted with the addition of a lengthened cabin with a saloon and an enclosed tug deck forwards with a pull out bed beneath.

The vessel has a historic Russel Newbury slow revving engine in the central engine room with side doors. It was understood the vessel had been issued with a Boat Safety Certificate but this was not seen. The Hull Identification number and CE plate were not found but the vessel was built in 1990, prior to the introduction of the Recreational Craft Directive.

### STATEMENT OF VALUATION:

#### STATEMENT OF VALUATION

The "FAIR MARKET VALUE" is the most probable price a vessel should achieve in a competitive and open market under all conditions requisite to a fair sale. In a "willing buyer - willing seller" situation the purchase price is set for a particular day and a set location, following a reasonable time allowed for exposure on the open market. The current economic situation and availability of credit also has an effect on value.

The Fair Market Value is not a replacement cost of the vessel, which will usually be considerably higher. Vessels are often sold under a "Distressed Sale" situation. To obtain a quick sale the sales price may be considerably less than the Fair Market Value.

#### "SURVEYORS VALUATION"

Valuations are the surveyors opinion based on partial information and experience and are produced for the use of the survey client only.

Surveyors valuations are based on:

- Past surveys completed which may include sold prices.
- Asking prices of other vessels on the market at the time (comparitors)
- The condition of the vessel and work required following the survey.
- General care and servicing of the vessel and the way it has been presented for sale.

On the instruction of xxxxx I have found four reasonable comparitors for sale on the open market, the details of which have been retained for future reference.

After consideration of the reliability of the information available at this time, it is my opinion that at : R.W.Davis yard, Saul Junction , on \*\*/\*\*/\*\*\*\*

a "FAIR PURCHASE PRICE" for the subject vessel xxxxxxxxxx would lie between

**SURVEYOR'S CERTIFICATION:** I certify that, to the best of my knowledge and belief:

The statements of fact contained in this report are true and correct.

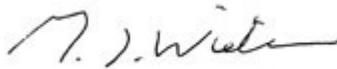
The reported analyses, opinions and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, unbiased professional analyses, opinions and conclusions.

I have no present or prospective interest in the vessel that is the subject of this report and I have no personal interest or bias with respect to the parties involved.

My compensation is not contingent upon the reporting of a predetermined value or direction in value or direction in value that favours the cause of the client, the amount of the value estimate, the attainment of a stipulated result or the occurrence of a subsequent event.

I have made a personal inspection of the vessel that is the subject of this report.

This report is submitted without prejudice and for the benefit of whom it may concern.



Mark J. Wiater AMYDSA MIIMS

Principal Surveyor

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## BOAT OWNERS TIPS

### TIPS

#### Boat Ownership Advice:

After taking ownership of your new vessel there will be some maintenance and safety issues that should be addressed immediately.

The following checklist should help you to undertake these improvements and comply with current legislation. It is the responsibility of the skipper to ensure the vessel is of suitable dimensions for intended cruising grounds.

When you first get your boat.

Pick a good weather weekend and remove all of the soft furnishings.

Open all cupboards and lift floor panels. Understand where all the pipe runs and electrical runs are installed.

Understanding where everything is and how systems work, makes repairs a lot easier.

Once you have purchased your boat you are largely on your own and completing basic repairs and servicing yourself will save you a lot of money.

Learn to steer your vessel by practicing manoeuvring in tight spaces. Learn how the wind effects your vessel.

For inland users River Canal Rescue offer a comprehensive breakdown and recovery service.

Security: Change the locks on all exterior entrances and hatches to improve security. Check that all windows and doors are secure: Improve window hardware as necessary. Security rods can be added to windows, hatches and

## BMS Marine Survey

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doors. Consideration could also be given to an alarm system.

**Mooring:** Boats can be left for long periods in exposed and sometimes undesirable locations. Vandalism, arson and theft are all problems to be considered. Be aware that water levels can change and the effect of this must be considered.

**Fire Safety:** Create a plan of action in case of fire in your boat. Check fire extinguishers are fully charged and in the correct place on a monthly basis. Smoke detectors should be installed in each room. Carbon Monoxide and gas detectors should be fitted in suitable locations. In case of fire get everyone off, and well away from the boat as soon as possible.

**Suggest:** Install all necessary alarms and test on a monthly basis: Inspect fire extinguishers monthly.

**Narrowboat Corrosion:** To minimise steel corrosion it is now widely agreed that the use of epoxy primers and epoxy blacking is the best protective method under the waterline. Older boats can only be painted properly after they have been grit blasted clean. This is now becoming normal practice for quality boat builders. Epoxy fillers can be used on existing corrosion and pitting. Plug welding is also acceptable for pitting. It is important that pits are cleaned out well prior to filling or welding and are painted over afterwards.

**Ventilate your boat well:** The importance of continuous ventilation can not be stressed too highly to avoid condensation and to keep the internal plating as dry as possible. It is also vital for the prevention of Carbon Monoxide poisoning. The use of several floor ventilation hatches will help to ventilate under a wooden floor. **Suggest:** Remove floor inspection hatches and open access cupboards when the boat is not in use to improve ventilation to the hull and reduce the risk of damage to the sub floor from damp.

**Bilge Pumping Arrangements:** There is no requirement for bilge pumping on recreational vessels. They are however the last line of defence against sinking.

Automatic 12v bilge pumps rely on a continuous power supply and should not be switched off when the vessel is left unattended. They also rely on cleanliness. One bilge pump is never enough. A back up, manual, high capacity bilge pump that can be operated by a passer by may save the vessel. Test all bilge pumps prior to leaving the vessel.

**Winterise your engine and water systems:**

Engines should be winterised to the engine manual, and drain all water systems before leaving the boat for the winter.

Check your boat at least once a month.

**Docking:** It is advisable to dock your vessel every 12 months on a lift and hold basis to inspect the underbody and the stern gear. Use this opportunity to pressure wash the vessel to aid inspection.

**Safety Equipment:**

It is important that safety equipment is relevant to the cruising area envisaged. Safety Equipment must be kept in good condition and serviced according to manufacturers instructions. Each crew member should wear a life jacket at all times when on the water.

**Marine Coastguard Agency coding:**

Only applicable if the vessel is to be used for commercial work.

**V.A.T. Status and proof of ownership:**

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The original purchase invoice confirms that V.A.T. has been paid so long as the vessel is properly identified. This invoice should be kept in the owners manual. This is only important if the vessel is to be taken abroad. If you do not have proof of V.A.T payment and take your vessel abroad you may be charged V.A.T again.

### Boat Safety Scheme:

A Boat Safety Scheme Certificate should be provided with the vessel rather like a car M.o.T.

Please be aware that the existence of a Boat Safety Scheme certificate does not imply that the craft is safe. It only indicates that, on the day of the inspection, the craft has met the requirements for licensing with the Navigational Authority, concerned with minimising the risk of fire and pollution and its effect on other vessels. Boat Safety Certificates have little value in a Pre Purchase Situation. BSS inspections are required every 4 years.

Suggest: Inland waterways boat owners are advised to download a full copy of the Boat Safety Scheme guide from [www.boatsafetyscheme.com](http://www.boatsafetyscheme.com) and keep it on the vessel for reference. Alterations and improvements should be made to manufacturers instructions and the BSS.

### Small Ships Register:

Some vessels are registered with the Marine Coastguard Agency on the Small Ships Register for proof of ownership and finance reasons. We can help with this registration if required.

### Canal and River Trust Registration:

Inland vessels should be registered with the Canal and River Trust. The license should be displayed on the vessel. A Canal and River Trust Number should be correctly displayed on both sides of the vessel for identification. Registration with the Canal and River Trust will require updating with a change of ownership. A combined CRT and EA 'Gold' licence is available for use on rivers and canals.

### Recreational Craft Directive:

If the vessel was built after July 1998 the requirements of the Recreational Craft Directive apply. The vessel should have an acceptable builders plate with CE mark.

An owners manual should be available which included a Certificate of Conformity for the vessel. A Hull Identification Number should be correctly marked on the starboard side of the transom. It is generally accepted that the requirements of the Recreational Craft Directive have little effect once the vessel is over 5 years old. Suggest: An owners manual should be kept up to date and all paperwork for the vessel added to it. This is particularly important for receipts

## Findings & Recommendations

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The Findings & Recommendations section is only one section of the "Noahs Ark" Survey Report. If received on its own, this section should not be mistaken as this vessel's full Survey Report.

Deficiencies noted under "FIRST PRIORITY/SAFETY AND COMPLIANCE FINDINGS" should be addressed before the vessel is next underway. These findings could represent an endangerment to personnel and/or the vessel's safe operating condition. Findings may also be in violation of UK Licensing Authority Regulations, RYA/MCA Voluntary Safety Standards & Recommended Practices or Codes & Standards.

Deficiencies noted under "SECONDARY PRIORITY/FINDINGS REQUIRING TIMELY ATTENTION" should be corrected in the near future, so as to maintain and adhere to certain codes, regulations, standards or recommended practices (and safety in some cases) and to help the vessel to retain its value.

Deficiencies noted under "SURVEYOR'S GENERAL FINDINGS AND OBSERVATIONS" are lower priority or cosmetic findings, which should be addressed in keeping with good marine maintenance practices and in some cases as a desired upgrade.

Deficiencies will be listed under the appropriate heading:

- A. FIRST PRIORITY/SAFETY AND COMPLIANCE FINDINGS
- B. SECOND PRIORITY/FINDINGS REQUIRING TIMELY ATTENTION
- C. SURVEYOR'S GENERAL FINDINGS AND OBSERVATIONS

### A: URGENT RECCOMENDATION

#### STOVE

Solid Fuel Stove manufactured by Stova and sitting on a tiled hearth. Distance from nearest flammable surface was visually adequate. Flue condition good with no evidence of scorching. No evidence of scorching where the flue passed through the headlining.

Epping Stove in the Boatman's cabin:

These stoves are well known for not being safe as there is no room to form safe clearances between the stove and flue and the surrounding woodwork. The flue to this stove is almost touching the panel behind so constitutes a serious fire risk, but there was no evidence of scorching in this example. These stoves have a historical value to retain authenticity of the back cabin but if they have to be used should be used with great care and always supervised. This example had the flue baffle removed so there was an open hole in the flue.

#### **FINDING A-1**

Boatmans cabin stove.

#### **RECOMMENDATION**

Do not use Epping stove until the flue has been repaired and then it should only be used with great care and supervision. Do not leave the stove unattended or sleep in the cabin with the stove alight.

### B: RECCOMENDATION

## Findings & Recommendations

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### THRUSTERS

The unmarked bow thruster was set into a 5mm steel tube welded to the hull. The bow thruster was situated behind a watertight bulkhead so any problems with the bow thruster or pitting in the tube will not flood the entire boat. The bow thruster tube grills were in the process of being altered to be easily removable which is good practice. All visually serviceable but could not be tested. The bow thruster battery terminals and the leisure battery terminals, were not covered which is a BSS requirement.

#### **FINDING B-1**

Exposed bow thruster battery terminals.

#### **RECOMMENDATION**

Cover the bow thruster and leisure battery terminals.

### THROUGH HULLS

There were no underwater skin fittings which is considered good practice. Most overboard drains were above the Canal Boat Association recommendation of a minimum 250mm freeboard. The kitchen sink discharge was in very poor condition and was seen to have a smaller discharge set in to the normal 2" discharge and secured with silicone. This is not safe practice and the discharge should be replaced by one that fits the hull securely. Unsafe.

#### **FINDING B-2**

Unsafe sink overboard discharge.

#### **RECOMMENDATION**

Recommend: Replace the sink drain overboard discharge skin fitting. Any discharge pipes connected to skin fittings, below the industry standard 250mm above the laden waterline should be securely clipped at both ends and loop up to deck level where possible. All hull fittings should be secure and sealed. All open holes in the side shell should be welded up securely in case the vessel tips on the bank or in floods. Any redundant discharges should be welded up permanently.

### SMOKE DETECTORS

None sighted. Install Smoke Detectors inside the accommodation spaces.

#### **FINDING B-3**

Smoke Detectors were not observed onboard the vessel.

#### **RECOMMENDATION**

Install and test regularly.

### ELECTRIC BILGE PUMPING SYSTEMS

A small submersible bilge pump was observed in the aft engine bilge. Switch below DC electric panel. It was not operating.

#### **FINDING B-4**

The engine room's bilge pump did not power up when tested.

#### **RECOMMENDATION**

Service, repair, or replace as necessary.

## Findings & Recommendations

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### C: SURVEYOR'S SUGGESTION & OBSERVATIONS

#### WINDOWS

Hopper style alloy glazed windows in accommodation sides. Locking device. No visible internal leakage.

#### **FINDING C-1**

Window drains.

#### **RECOMMENDATION**

It is important to clean out window drip channels and drains on a regular basis to prevent moisture ingress on to the internal timber. Stop all window leaks.