

8th February.

21.

REPORT ON
REINFORCED CONCRETE MOTOR SHIP "VIOLETTE"

This vessel is stated to have struck the Southend Pier on 18/1/21 while on a voyage from Antwerp to London. It appears that she immediately became stranded but was ultimately got clear of the pier, beached, and brought into the Britania Drydock at Millwall (For particulars see Log Book).

A letter was received from Messrs. Pollock Sons & Co. on 24/1/21 stating that the vessel had crashed into the Southend Pier and that in view of the fractures in the hull they feared the steel reinforcement had been stressed beyond their elastic limit. They requested that this Society should send a Surveyor for Reinforced Concrete work to inspect the vessel at low water.

Accordingly Mr. Robson inspected the vessel as she was lying stranded at Southend on the 25th ultimo - see Mr. Robson's Report attached.

The vessel was next seen in dry dock on 1/2/21, and subsequently on 4/2/21 after the silt had been removed from the hold, the ceiling lifted, and the vessel generally prepared for examination.

She has been sighted, on deck over a distance of 63 ft. and over a distance of 115 ft. of the outer bottom, and appears to be hogged $1\frac{3}{8}$ " & $1\frac{5}{8}$ " over these distances in the deck and bottom respectively.



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In the shell slab on both sides of the vessel a great number of cracks have appeared, of these many are pronounced and of a very serious character, indicating generally that the vessel has been subject to very severe straining action.

The cracking may be said to extend over some $2/3$ L. of vessel. at the ends the cracks take a direction inclined upwards towards the bow and stern while amidships the direction is more or less vertical and extend generally from the gunwale to the bilge. Amidships some of the cracks extend through the bilge and along the bottom slab towards the centre line, and through the upper chine into the deck slab towards the line of fore and after deck girders.

Horizontal cracks some 2ft. below the deck level extend more or less over the length of the affected areas in the side slabs and apparently coincides with the position of the construction joints in the concrete. These cracks are continued beyond the bulkhead at the fore end of the hold, just above the forecastle deck flat, and at approximately the same vertical position a continuous crack extends from side to side of this bulkhead.

The bulkhead at the after end of the hold is cracked for about half its breadth on the port side just above the top of floors, and the after peak bulkhead has also some (perhaps minor) cracks in one panel between the buttresses.

Except for the severe damage where the vessel has been holed, and the cracks, extending from the sides into the bottom slab referred to above - the bottom, floors, and keelsons appear to have sustained little damage.

The frames, however, are more or less broken at the upper ends throughout on both sides of the vessel, and at the same positions the beams are cracked or broken at the knees.

The deck is badly cracked at the gunwale - chiefly amidships - and in line with the hatch ends, and these cracks extend for the most part through the deck chine or stringer. Some of the cracks extend across the deck to the hatch coamings, others extend for a shorter distance across the deck slab and in the neighbourhood of the hatch corners. The fore and aft deck girders situated in line with the side coamings of the hatchways are cracked right through in several places, principally at the position of the hatch ends and where they join the bulkheads at the ends of the hold.

The pillars are more or less broken or cracked at their upper ends and the hatchway side coamings are cracked.

The general appearance of the fracture to the concrete structure of the vessel is illustrated in the accompanying sketches.

In a great many instances the cracks are so pronounced in character as to leave no doubt as to the severe straining to which the vessel has been subject.

The vessel while lying stranded was partly held by the pier on the starboard side, while the after end was entirely unsupported, and under the circumstances was subject to severe torsional and shear forces.

The probability is that with the cracking of the concrete, the reinforcement has been severely stressed and in places overstressed, and the bond or adhesion between the concrete and the steel seriously affected especially at those places where cracks are the more prominent and have accumulated in the neighbourhood of the reinforcement.

It is considered that the effectiveness of the concrete, and probably that of the reinforcement, comprised in the side slabs and frames, in the deck stringer or chine and fore and after girders, has been destroyed for the length of the vessel indicated above, and would require to be

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rebuilt.

Together with this the concrete in the deck slab, the shell of bottom and the bulkheads and hatchway coamings has been so affected as to necessitate extensive repairs if not actual rebuilding of these parts.

If such repairs were economically possible it is doubtful whether the work could be so effected as to place the vessel in a condition equivalent to that which existed prior to the damage in question.

The vessel is at present classed A1. "For English Channel & Coasting Service from Thames to Milford Haven", "Subject to Annual Survey" "Experimental", and in all the circumstances it is considered that the Committee cannot be advised to continue her classification.

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