

# **PARTICULARS OF BOILERS** **SURVEY: - LLOYDS**

SHIPBUILDERS FURNESS SHIPBUILDING CO LTD

YARD NO 281

ENGINEERS - N.E.M.E. CO LTD

CONTRACT NO 2896

DESCRIPTION  
OF  
MATERIAL

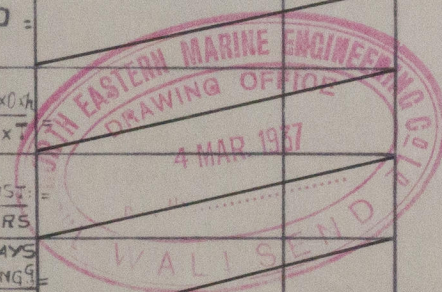
PLATES STEEL  
MAIN STAYS  
SCREWED STAYS  
RIVETS  
TUBES SEAMLESS

TENSILE RANGE

SHELL 29 TONS TO 33 TONS  
MAIN STAYS 28 TONS TO 32 TONS  
SCREWED STAYS 26 TONS TO 30 TONS  
GIRDER STAYS 29 TONS TO 33 TONS

TOTAL HEATING SURFACE EACH BLR: 2850  
LLOYD'S 2815  
WORKING PRESSURE 220 LBS  
NO & DESCRIPTION OF BOILERS 2 SINGLE ENDED MAIN BLRS  
EXT. DIAMETER 16'-1"  
LENGTH 12'-4 1/2"  
NO OF FURNACES PER BOILER 3  
GRATE AREA  
SAFETY VALVES

LONGITUDINAL SEAMS MAX PITCH	$(C \times T) + 1.625 =$	$(6 \times 1.53125) + 1.625 =$	$10 \frac{13}{16}$	COMPRESS TUBE PLATE	$875(D-d) \times \frac{t}{8} =$	$875(3.75 - 2.18) \times \frac{28}{8} =$	220 LBS	STAY TUBES W.W. SPACE	$\frac{2 \frac{1}{2} \text{ DIA} \times \frac{7}{16} \text{ THK}}{A \times C} =$	$\frac{2 \times 29 \times 7500}{(11 \times 7 \frac{1}{2}) \text{ LESS 3 TUBES 678}} =$	252 LBS
PLATE %	$\frac{P-d}{P} \times 100 =$	$\frac{(10 \frac{13}{16} - 1 \frac{9}{16})}{10 \frac{13}{16}} \times 100 =$	85.5 %	C.C. PLATE TOP	$\frac{C \times (t-l)^2}{a^2 + b^2} =$	$\frac{75(25-1)^2}{(10 \frac{3}{4}^2 + 8 \frac{1}{2}^2)} =$	230 LBS	STAY TUBES IN NESTS	$\frac{A \times C \times \frac{3}{8} \text{ THK}}{\text{SURF SUPPORTED}} =$	$\frac{1.96 \times 7500}{(14 \times 7 \frac{1}{2}) \text{ LESS 6 TUBES 55}} =$	267 LBS
RIVET %	$\frac{100 \times S \times d \times a \times c}{S \times P \times T} =$	$\frac{100 \times 23 \times 1.9175 \times 5 \times 1.875}{29 \times 10.8125 \times 1.53125} =$	86 %	C.C. PLATE SIDES	$\frac{C \times (t-l)^2}{a^2 + b^2} =$	$\frac{75(25-1)^2}{(10 \frac{3}{4}^2 + 8 \frac{1}{2}^2)} =$	222 LBS	PLAIN TUBES		Nº 8 W.G.	300
COMBINED %	$\frac{100(P-d) + 100 \frac{S \times d \times a \times c}{S \times P \times T}}{P} =$	$\frac{100(10 \frac{13}{16} - 1 \frac{9}{16}) + 86}{10 \frac{13}{16}} =$	88.2 %	C.C. PLATE BACK	$\frac{C \times (t-l)^2}{a^2 + b^2} =$	$\frac{75(24-1)^2}{(10 \frac{1}{2}^2 + 7 \frac{3}{4}^2)} =$	232 LBS	MANHOLE RING	EQUIVALENT SECTIONAL AREA OF RING		
SHELL W.P.	$\frac{C \times (P-d)}{C \times D} \times \frac{S \times J}{132} =$	$\frac{(49-2) \times 29 \times 85.5 \%}{2.75 \times 189.9375} =$	223 LBS	BACK BOTTOM PLATE	$\frac{C \times (t-l)^2}{a^2 + b^2} =$	$\frac{86 \times (32-1)^2}{(17 \frac{1}{2}^2 + 8^2)} =$	223 LBS	MANHOLE RING	AREA OF PLATE CUT AWAY		
BUTT STRAPS (OUTER)	$\frac{S \times (P-d)}{8 \times P - 2d} \times T =$	$\frac{5 \times (10.8125 - 1.5625)}{8 \times (10.8125 - 3.125)} \times 1.158 =$	1.158 SAY 1 3/16"	GIRDERS	$\frac{11 \frac{1}{2} \times 11 \text{ DOUBLE}}{C \times d^2 \times t \times \frac{5}{28}} =$	$\frac{371 \times 11.5 \times 64 \times 29}{(46.5 - 10.75) 35.75 \times 8.5 \times 46.5 \times 28} =$	230 LBS	MANHOLE RING	AREA OF RIVETS		
BUTT STRAPS (INNER) t =	$t + \frac{1}{8} =$	$1 \frac{3}{16} + \frac{1}{8} =$	1 5/16"	PATENT FURNACE	$\frac{C(t-l)}{D} =$	$\frac{480 \times (23-1)}{47.6875} =$	221 LBS	MANHOLE DEPTH (TOP)	$\sqrt{t \times w} =$		
MID CIRCUM SEAM RIVET %	$\frac{100 \times 23 \times d \times a}{S \times P \times T} =$	$\frac{100 \times 23 \times 1.9175 \times 5}{29 \times 4.125 \times 1.51} =$	62.1 %	PLAIN FURNACE	$\frac{C(t-l)^2}{L + 24 \times D} =$			MANHOLE DEPTH (BOTTOM)	$\sqrt{t \times w} =$		
END CIRCUM SEAM RIVET %	$\frac{100 \times 23 \times d \times a}{S \times P \times T} =$	$\frac{100 \times 23 \times 1.9175 \times 2}{29 \times 4.125 \times 1.51} =$	48.8 %	PLAIN C.C. BOTTOM FURNACE	$\frac{C \times (10(t-l) - L)}{D} =$	$\frac{50 [10(28-1) - 43]}{51.25} =$	221 LBS	% SHELL IN WAY OF RING END PITCH	$\frac{(P-d)}{P} \times 100 =$		
TOP END PLATES (WITHOUT WASHERS)	$\frac{96(t-l)^2}{a^2 + b^2} =$	$\frac{96(48-1)^2}{23^2 + 20 \frac{13}{16}^2} =$	962.7	BACK BOTTOM PLATE IN WAY OF MANHOLE	$\frac{C(t-l)^2}{a^2} =$		220 LBS	INNER ROW OF RIVETS	$\frac{100 \times (P-d)}{P \times S \times P \times T} =$		
TOP END PLATE (WITH WASHERS 3/8 D)	$\frac{100[(t-l)^2 + 0.15(t-l)]}{a^2 + b^2} =$			1" MARGIN SCREWED STAYS BACK END	$\frac{(d-267)^2 \times 8250}{a} =$	$\frac{28480}{(11 \frac{7}{16} \times 10 \frac{1}{2})} =$	237 LBS	HANGING STAYS IN D.E. BOILER	$\frac{A \times F}{2 \times \text{WIDTH C.C. DIS.}} =$		
MAIN STAYS (SWELLED ENDS)	$\frac{(d-125)^2 \times 9500 \times S}{a \times \frac{1}{32} \text{ BODY } 28} =$	$\frac{108205}{(23 \times 20 \frac{13}{16})} =$	478.6	1 7/8" SCREWED STAYS	$\frac{C.C. SIDES}{(d-267)^2 \times 8250} =$	$\frac{21331}{(10 \frac{3}{4} \times 8 \frac{7}{8})} =$	223 LBS	NO OF BOLTS AT C.C. BOTTOM	$\frac{\text{TOTAL AREA OF HANG. STAYS}}{17854 \times 1.75} =$		
TUBE PLATE (IN NEST)	$\frac{C(t-l)^2}{a^2} =$	$\frac{38 \times (28-1)^2}{34 \frac{3}{4}^2} =$	8.72	1 3/4" SCREWED STAYS	$\frac{C.C. BACK}{(d-267)^2 \times 8250} =$	$\frac{18144}{(10 \frac{1}{2} \times 7 \frac{3}{4})} =$	223 LBS	END SEAM RIVETING	$.33h + .67d =$	$(.33 \times 4.125) + (.67 \times 1.5625) =$	2.4 SAY 2 1/2"
FRONT TUBE PL. (W.W. SPACE)	$\frac{C(t-l)^2}{a^2 + b^2} =$	$\frac{72(30-1)^2}{(14 \frac{1}{2}^2 + 7 \frac{1}{2}^2)} =$	266.5	1 5/8" SCREWED STAYS	$\frac{(d-267)^2 \times 8250}{a} =$		227 LBS	BUTT STRAP RIVETING	$.2h + 1.15d =$	$(.2 \times 10.625) + (1.15 \times 1.5625) =$	3.9 SAY 4"





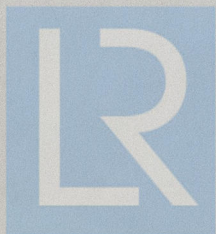
W1184-0023

Iran

2896 Boilers

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Pumps sent London 5/3/37



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