

WELDING METHOD

EXPERIMENT CARRIED OUT

1. EXPERIMENT CARRIED OUT

THE FOLLOWING EXPERIMENT HAVE BEEN DONE BEFORE BEING CARRIED WELDING FOR STERN FRAME ACCORDING TO LLOYD'S RECOMMENDATION.

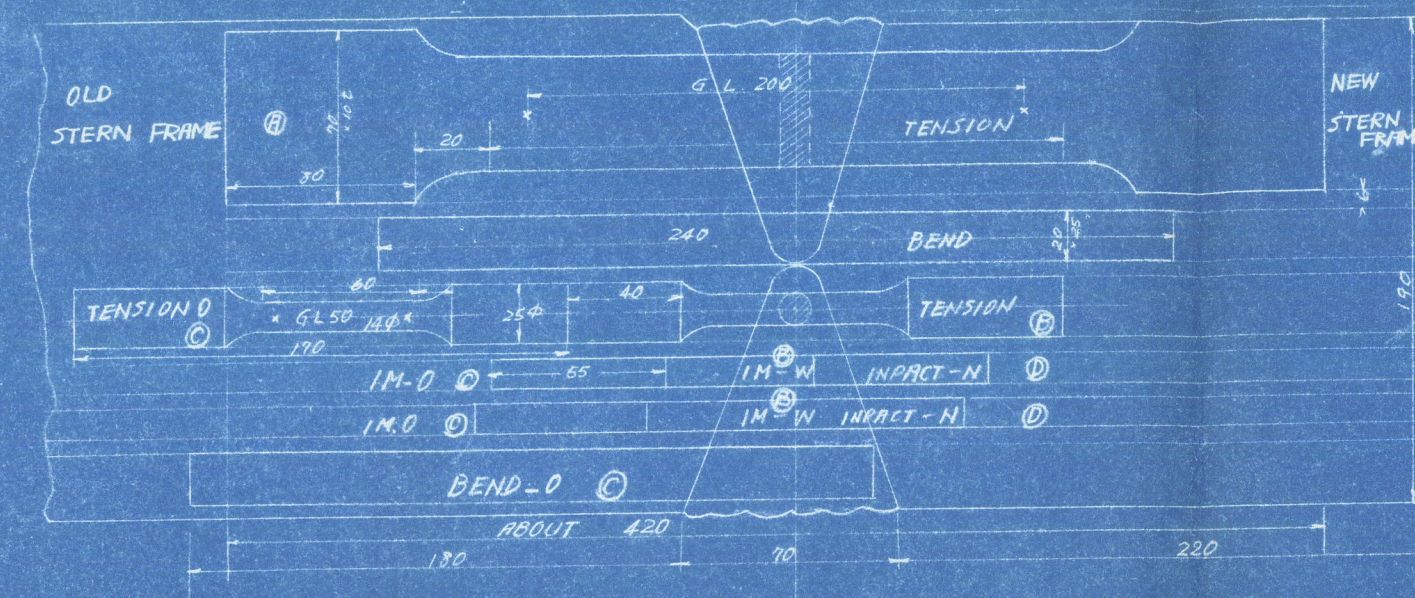
AT FIRST, A SUITABLE SIZE OF BLOCKS HAVE BEEN CUT FROM THE STERN FRAME TOGETHER OLD AND NEW ONE, AND WELDED THESE BLOCKS WITH SAME BEVEL AND ALMOST SAME SIZE AS PER SHOWING IN THIS PLAN IN ORDER TO GET SAME CONDITION AS WELDING IN PRACTICE, AND APPLIED SUPERSONIC TESTING AFTER BEING FINISHED WELDING FOR THESE BLOCKS.

IT WOULD NOT BE APPLIED WELDING FOR STERN FRAME IF THESE SUPERSONIC TESTING FAILED, BUT FOLLOWING METHOD HAVE BEEN DECIDED IN THIS CASE BECAUSE SUPERSONIC TESTING FOUND TO BE SATISFACTORY.

TO CHECK THE MECHANICAL PROPERTY, FOR ANNEALING TEMPERATURE AT 650°C, 850°C AND AS WELD, AND THEN

TO PREPARE THE TEST SPECIMEN FOR TENSION, BEND AND IMPACT FOR EACH TEMPERATURE, CUTTING THE BLOCK AS FOLLOWS.

(A) CUTTING AND MACHINING DETAIL AFTER HAVING BEEN WELDED FOR EXPERIMENT.



(B) TEST RESULTS OF EXPERIMENT AND NEW STERN FRAME

TEST MARK	DESCRIPTION	SIZE OF TEST PIECE IN INCHES LONG x WIDE x THICK	TENSILE TEST			BENDING TEST	IMPACT TEST	BEND RADIUS	ANGLE DEGREE	CHEMICAL COMPOSITION					
			LOAD BREAKING TONS	STRENGTH YIELDING K _g /mm ²	STRENGTH BREAKING K _g /mm ²					ELONGATION PER CENT	C	SI	MA	P	
	TEST PIECE AS WELD	200 100 25	22.7	—	45.9	11	—								
6	ANNEALED AT 650°C	200 100 25	22.8	—	45.6	16	—								
8	ANNEALED AT 850°C	200 100 25	20.4	—	41.6	14	—								
WT	TEST PIECE AS WELD	50 14 15.8	8.1	—	52.6	11	—	6.9	25	BROKEN AT 90°					
WT	ANNEALED AT 650°C	50 14 15.8	7.4	—	48.1	28.6	—	7.5	25	GOOD					
WT	ANNEALED AT 850°C	50 14 15.8	6.4	—	41.6	29.6	—	2.7	25	GOOD					
0	TEST PIECE AS WELD	50 14 15.8	7.3	—	53.9	14.4	—	4.0	25	BROKEN AT 100°	0.36	0.38	0.44	0.43	0.010
0.6	ANNEALED AT 650°C	50 14 15.8	7.9	—	51.3	17.4	—	4.2	25	BROKEN AT 90°					
0.8	ANNEALED AT 850°C	50 14 15.8	7.4	—	51.3	29.0	—	2.5	25	GOOD					
N	TEST PIECE AS WELD	—	7.8	32.5	50.7	36	54.9	6.4	25	GOOD	10.23	0.21	0.65	0.025	0.010
N.6	ANNEALED AT 650°C	—	—	—	—	—	—	7.1							
N.8	ANNEALED AT 850°C	—	—	—	—	—	—	7.5							

2. WELDING METHOD IN PRACTICE

ACCORDING TO EXPERIMENT MENTIONED-ABOVE, LLOYD RECOMMENDED IT HAD BETTER TO ANNEAL THE STERN FRAME IN PRACTICE AFTER BEING COMPLETED WELDING, AND CARRIED JOBS AS FOLLOWS.

① QUALITY OF ELECTRODE
LOW HYDROGEN ELECTRODE.

② NAME OF ELECTRODE
LB-26 MADE IN KORE STEEL WORKS.
(ALL ELECTRODES TO BE DRIED)

③ PREHEATING
WELD PARTS ARE TO BE HEATED TO 200°C OF TEMPERATURE BY INDUCTION COIL.

④ WELDING SEQUENCE
a) WELDING PERFORMED BOTH SIDES, SIMULTANEOUSLY.
b) WELDING DIRECTION CHANGED ALTERNATELY FOR EVERY LAYER.

c) PREPARED SUITABLE METHOD OF CONSTRAIN ON WELD OF STERN FRAME, DURING PROCEDURE OF WELDING. (SEE PHOTOGRAPH)
d) ARRANGED SHEATHING TO PREVENT FROM COLD WIND.
e) FITTED RUNNING TABS AT FORE AND AFT ENDS.
f) CARRIED OUT WELDING DAY THROUGH NIGHT.
g) UPON COMPLETION OF WELDING, WELDED PARTS TEMPERED BY HEATING TO 300°C OF TEMPERATURE AND COOLING DOWN SLOWLY.

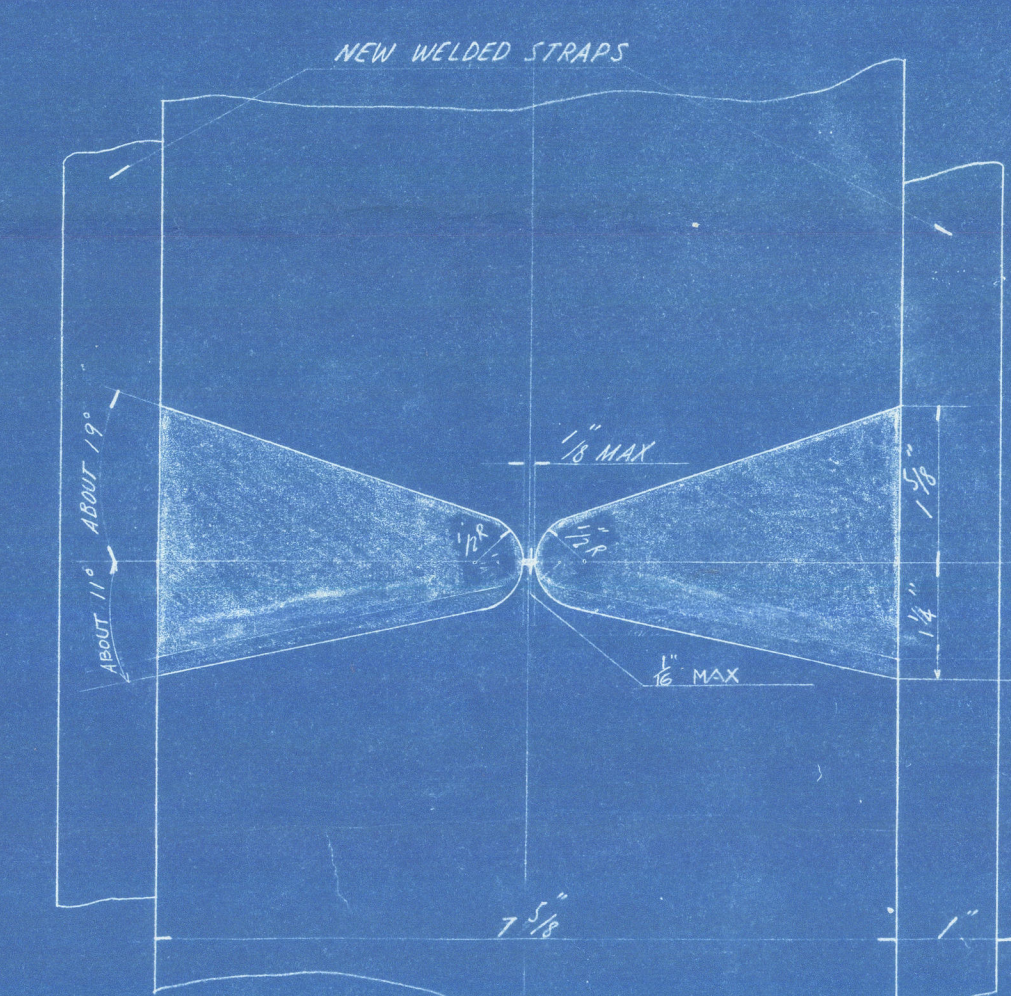
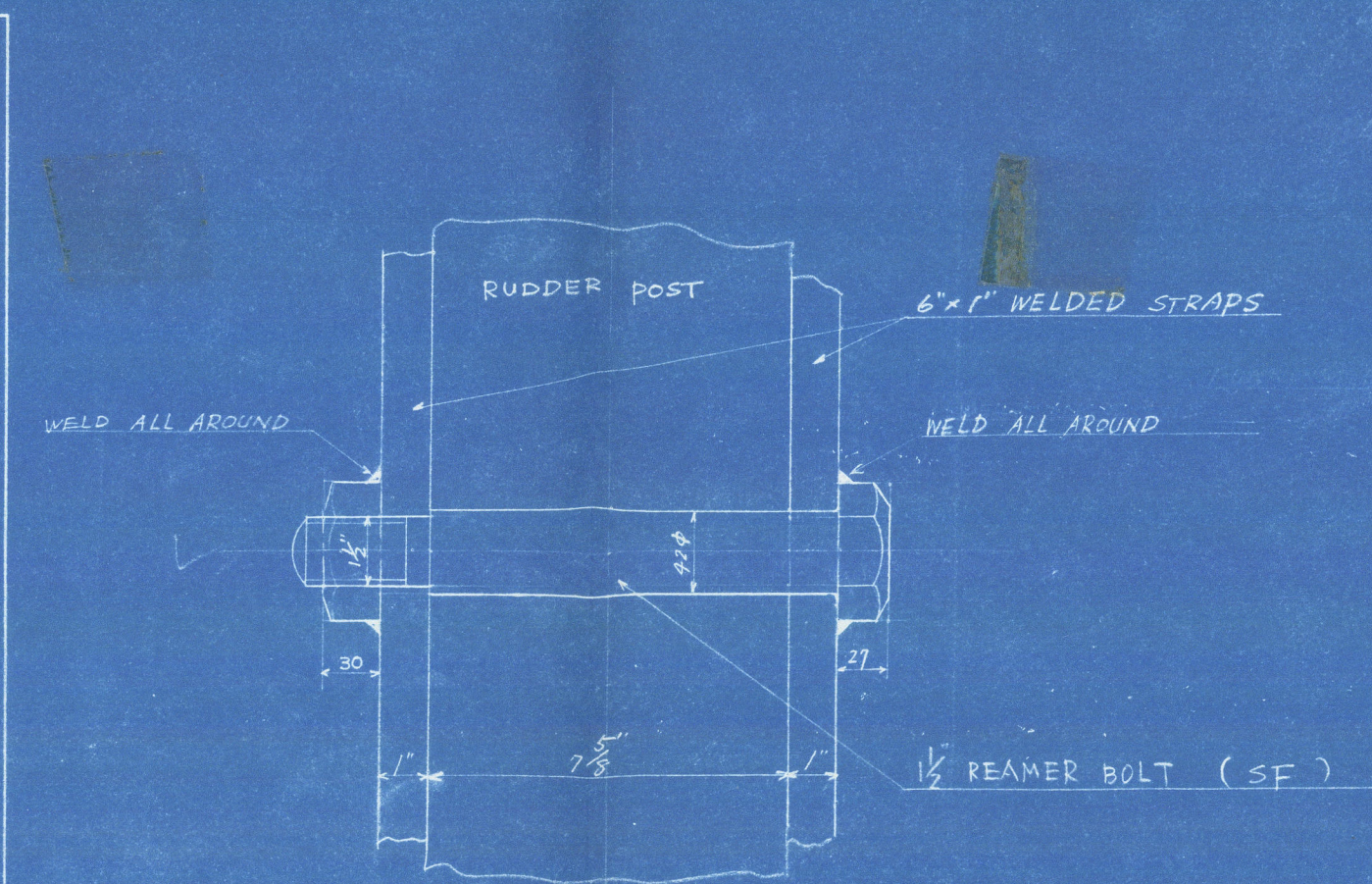
3. RESULTS OF WELDING

① SUPERSONIC TESTING
FOUND TO BE SATISFACTORY.

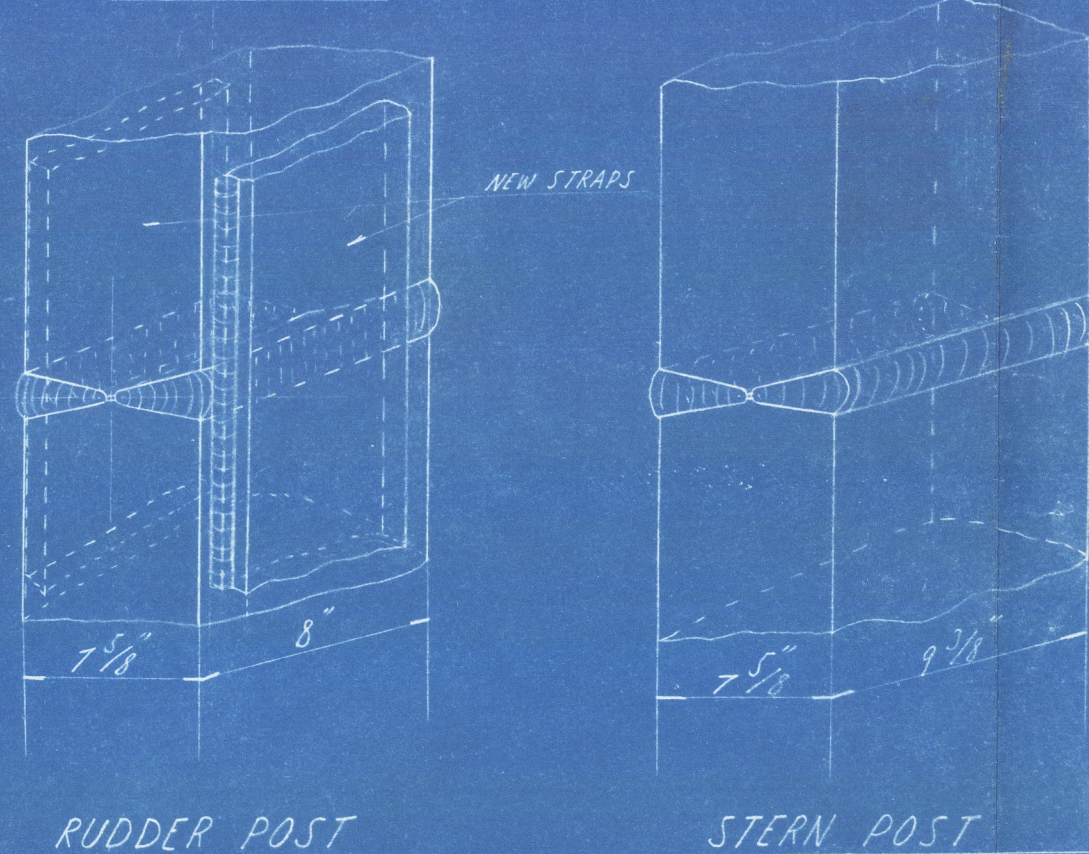
② BUILT STRAP
FINALLY WELDING SIDE STRAPS ON BOTH SIDE.

NOTE: W. SHOWN TEST PIECE CUT FROM WELDED PART
O. SHOWN TEST PIECE CUT FROM OLD PART
N. SHOWN TEST PIECE CUT FROM NEW PART

REAMER BOLT DETAIL
SCALE: 1/2" = 1" INCH



DETAIL OF STERN FRAME JOINT
SCALE: 1/2" = 1" INCH



S.S. FIROZA

DETAIL OF JOINT
OF STERN FRAME

SCALE: 1/2" = 1" INCH
HITACHI SHIPBUILDING
& ENGINEERING CO. LTD.
CHUGOKU SHIP YARD
OSAKA JAPAN

CHECK BY: [Signature]
DRAW BY: [Signature]
DATE: APR 19 1957

MS	<i>Furga</i>	
ACCOUNTANY	<i>H.K.P.</i>	Rpt. No <i>13694</i>
	Dated <i>757</i>	
BJECT:-		



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