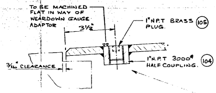
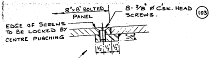
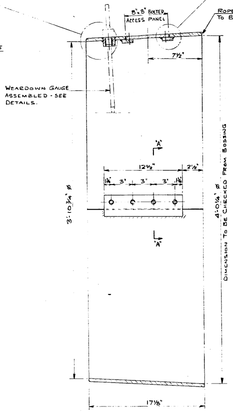

TO BE MACHINED FLAT IN WAY OF WEARDOWN GAUGE ADAPTOR
3½"
1" N.P.T BRASS PLUG. (105)
3/16" CLEARANCE
1" N.P.T 3000# HALF COUPLING. (104)

WEARDOWN GAUGE CONNECTION

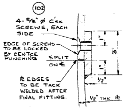
SCALE :- HALF FULL SIZE


8"x8" BOLTED PANEL
8 - 3/8" ø C'SK. HEAD SCREWS. (103)
EDGE OF SCREWS TO BE LOCKED BY CENTRE PUNCHING
½" ½" ½"
½"


8"x8" BOLTED ACCESS PANEL
ROPE GUARD TO BE WELDED, ALL AROUND, TO BOSSING AFTER FINAL FITTING.
7½"
WEARDOWN GAUGE ASSEMBLED - SEE DETAILS.
"A"
"A"
12½"
2½"
1¾" 3" 3" 3" 1¾"
3'-10¾" ø
4'-0¼" ø
DIMENSION TO BE CHECKED FROM BOSSING
17⅛"

DETAIL OF ROPE GUARD (101)

(IN HALVES)

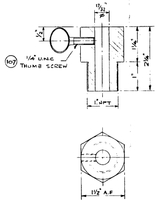

(102)
4 - 5/8" ø C'SK SCREWS, EACH SIDE
EDGE OF SCREWS TO BE LOCKED BY CENTRE PUNCHING
SPLIT ON ℄
℗ EDGES TO BE TACK WELDED AFTER FINAL FITTING.
1"
3"
1"
½"
½" THK ℗

SECTION THRO' "A-A"

SCALE :- HALF FULL SIZE

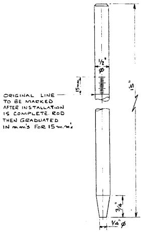
(109)

18 - 11/16" ø HOLES FOR 5/8" HEX. HEAD CAP SCREWS, EQUALLY SPACED. TO BE LOCKED WITH


17/32" ø
½"
(107) ¼" U.N.C THUMB SCREW
1¼"
2¼"
1"
1" NPT
1½" A.F

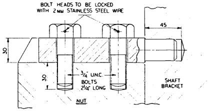
ADAPTER FOR WEARDOWN GAUGE (106)

SCALE :- FULL SIZE


½" ø
15mm
15"
ORIGINAL LINE TO BE MARKED AFTER INSTALLATION IS COMPLETE. ROD THEN GRADUATED IN mm's FOR 15 mm's
¾"
¼" ø

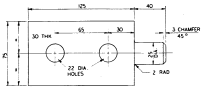
WEARDOWN GAUGE (108)

SCALE :- FULL SIZE

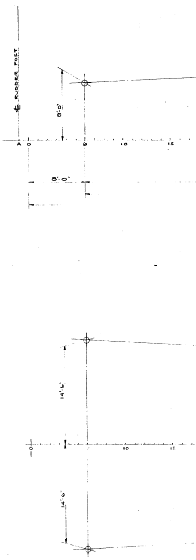

BOLT HEADS TO BE LOCKED WITH 2MM STAINLESS STEEL WIRE
45
30
30
¾" U.N.C. BOLTS 2¼" LONG
NUT
SHAFT BRACKET

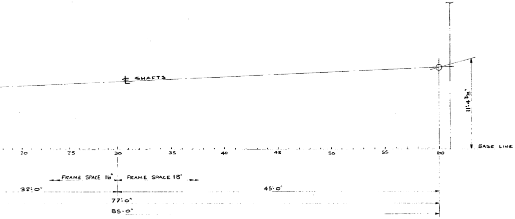
ARRGT OF LOCKING PLATE

NOTE : LOCKING ℗S FITTED OPPOSITE EACH OTHER

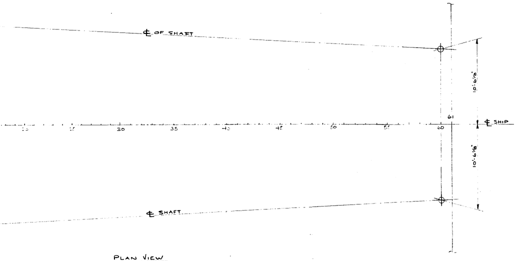

125
40
30 THK
65
30
3 CHAMFER 45°
75
25 DIA.
22 DIA. HOLES
2 RAD

DETAIL OF LOCKING PLATE (112)


℄ RUDDER POST
8'-0"
A 0 6 10 15
8'-0"
14'-6"
0 10 15
14'-6"


℄ SHAFTS
11'-4 3/8"
BASE LINE
20
25
30
35
40
45
50
55
60
FRAME SPACE 16"
FRAME SPACE 18"
32'-0"
45'-0"
77'-0"
85-0"

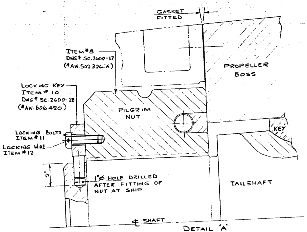
ELEVATION


℄ OF SHAFT
10'-6 1/8"
61
℄ SHIP
30
35
40
45
50
60
10'-6 1/8"
℄ SHAFT

PLAN VIEW

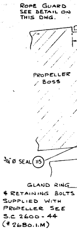
SHAFT CENTRE CALCULATIONS

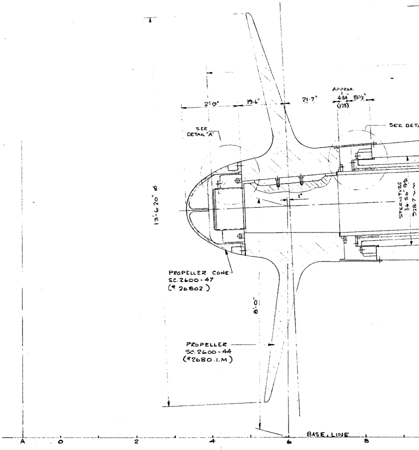
SCALE:- 1/4" = 1'-0"


GASKET FITTED
ITEM #8
DWG # Sc.2600-17
(#AW.502326.'A')
PROPELLER BOSS
LOCKING KEY
ITEM # 10
DWG # Sc.2600-28
(#AW.606420)
PILGRIM NUT
LOCKING BOLTS
ITEM # 11
LOCKING WIRE
ITEM # 12
KEY
2"
1"Ø HOLE DRILLED
AFTER FITTING OF
NUT AT SHIP
TAILSHAFT
℄ SHAFT

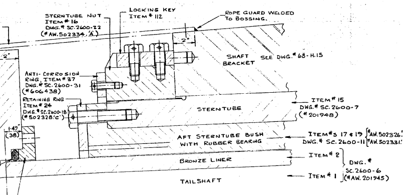
DETAIL "A"

FOR ALL OTHER INFORMATION REFER
TO DETAIL "A" ON DWG.# 68-Sc.2600-4 SHT.2
(# AW.201941 SHT.2 REV.'B')


ROPE GUARD
SEE DETAIL ON
THIS DWG.
PROPELLER
BOSS
3/4" Ø SEAL
115
GLAND RING
& RETAINING BOLTS
SUPPLIED WITH
PROPELLER SEE
S.C 2600-44
(#2680.1.M)


APPROX.
2'-0"
19.6"
21.7"
4.84"
(123)
8 1/2"
SEE DETAIL "A"
SEE DET
13'-6.20" Ø
1"
STERNTUBE
36.56" Ø
928.7 mm
PROPELLER CONE
SC.2600-47
(# 26802)
8'-0"
PROPELLER
Sc.2600-44
(#2680.1.M)
BASE LINE
A
0
2
4
6
8

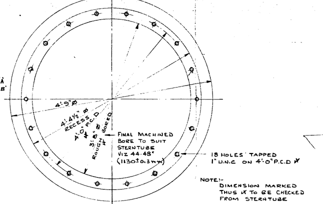
0 1 2 3 4 ℄ 6 7 8 9 10


STERNTUBE NUT
ITEM # 16
DWG.# SC.2600-22
(#AW.502334.'A')
LOCKING KEY
ITEM # 112
ROPE GUARD WELDED
TO BOSSING.
2"
2"
SHAFT BRACKET
SEE DWG.# 68-H.15
ANTI-CORROSION RING, ITEM # 37
DWG.# SC.2600-31
(#606438)
RETAINING RING
ITEM # 24
DWG.# SC.2600-18
(#502328.'C')
1.49"
(38)
STERNTUBE
ITEM # 15
DWG.# SC.2600-7
(#201948)
AFT STERNTUBE BUSH
WITH RUBBER BEARING
ITEM#S 17 & 19
DWG.# SC.2600-11
#AW.502326.'A'
#AW.502331.'B'
BRONZE LINER
ITEM # 2
ITEM # 1
DWG.#
SC.2600-6
(#AW.201945)
TAILSHAFT

DETAIL 'B'

FOR ALL OTHER INFORMATION REFER TO
DETAIL 'B' ON DWG.# SC.2600-4 SHT.#1
(#AW.201941 SHT#1 REV.'A')

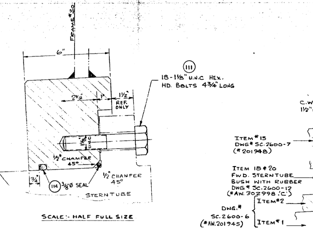
℄ SHAFT


4'.9"Ø
4'.4½"Ø RECESS
4'.0" P.C.D ✱
3'.8"Ø ROUGH BORED ✱
FINAL MACHINED
BORE TO SUIT
STERNTUBE
VIZ 44.48"
(1130±0.3mm)
18 HOLES TAPPED
1" U.N.C ON 4'.0" P.C.D ✱

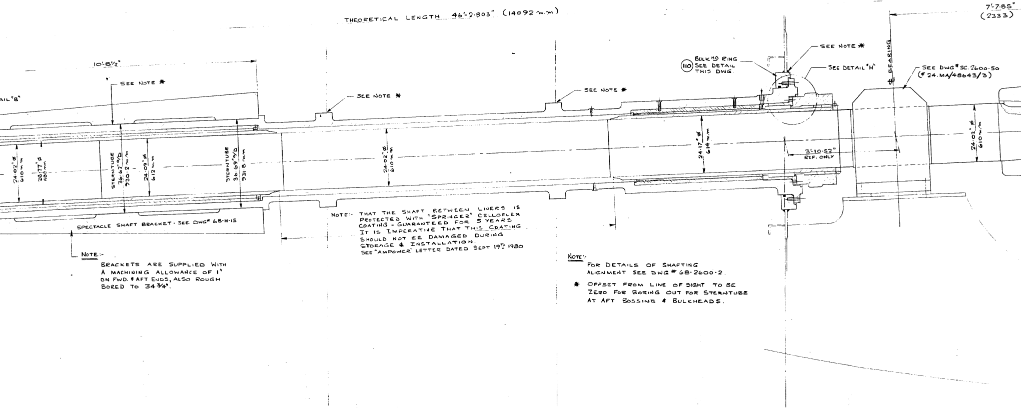
NOTE:-
DIMENSION MARKED
THUS ✱ TO BE CHECKED
FROM STERNTUBE

SCALE :- 1½" = 1'-0"

BULKHEAD RING (110)


FRAME # 30
6"
(111)
18-1⅛" U.N.C HEX.
HD. BOLTS 4¾" LONG
2½"
1"
1½"
REF. ONLY
1⅛" U.N.C
½" CHAMFER
45°
½" CHANFER
45°
¾"
(114) ⅜"Ø SEAL
STERNTUBE
C.W
1½"
ITEM # 15
DWG# SC.2600-7
(#201948)
ITEM 18 & 20
FWD. STERNTUBE
BUSH WITH RUBBER
DWG# SC.2600-12
(#AW.302998.'C')
ITEM#2
ITEM#1
DWG.#
SC.2600-6
(#AW.201945)

SCALE:- HALF FULL SIZE


THEORETICAL LENGTH 46'-2.803" (14092 mm)
7'-7.85"
(2333)
10'-8½"
SEE NOTE ✱
AIL "B"
SEE NOTE ✱
SEE NOTE ✱
(110) BULK HD RING
SEE DETAIL
THIS DWG.
SEE NOTE ✱
SEE DETAIL "H"
℄ BEARING
SEE DWG# SC.2600-50
(# 24.MA/48643/3)
24.02"Ø
610mm
26.77"Ø
680mm
STERNTUBE
36.62" O/D
930.2mm
24.09"Ø
612mm
STERNTUBE
36.69" O/D
931.8mm
24.02"Ø
610mm
24.17"Ø
614mm
3'-10.52"
REF. ONLY
24.02"Ø
610mm
SPECTACLE SHAFT BRACKET - SEE DWG# 68-H-15
10
12
14
16
18
20
22
24
26
28
30
32
34
16" FRAME SPACING
18" FRAME SPACING

NOTE:-
BRACKETS ARE SUPPLIED WITH
A MACHINING ALLOWANCE OF 1"
ON FWD. & AFT ENDS, ALSO ROUGH
BORED TO 34¾".

NOTE:- THAT THE SHAFT BETWEEN LINERS IS
PROTECTED WITH "SPRINGER" CELLOFLEX
COATING - GUARANTEED FOR 5 YEARS
IT IS IMPERATIVE THAT THIS COATING
SHOULD NOT BE DAMAGED DURING
STORAGE & INSTALLATION.
SEE "AMPOWER" LETTER DATED SEPT 19TH 1980

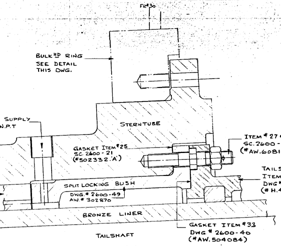
NOTE:-
FOR DETAILS OF SHAFTING
ALIGNMENT SEE DWG # 68-2600-2.

✱ OFFSET FROM LINE OF SIGHT TO BE
ZERO FOR BORING OUT FOR STERNTUBE
AT AFT BOSSING & BULKHEADS.

ELEVATION @ SHAFT ℄'S

SCALE :- 1" = 1'-0"

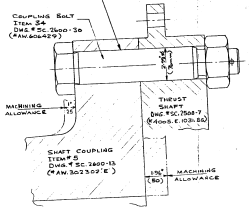
℄


FR#30
BULKHD RING
SEE DETAIL
THIS DWG.
SUPPLY
N.P.T
STERNTUBE
GASKET ITEM #25
SC. 2600 - 21
(#502332.'A')
ITEM #27 & 46
SC.2600 - 39
(#AW.608198)
SPLIT LOCKING BUSH
DWG.# 2600-49
AW.# 302870
TAILSHAFT SEAL
ITEM #31
DWG# SC.2600-38
(# H.44046)
BRONZE LINER
TAILSHAFT
GASKET ITEM #33
DWG # 2600-40
(#AW.504084)

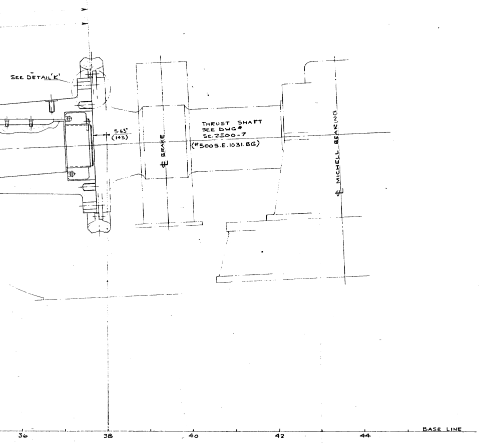
DETAIL "H"

FOR ALL OTHER INFORMATION REFER TO
DETAIL 'H' ON DWG.# SC.2600-4 SHT.# 2
(#AW.201941 SHT. 2 REV. 'B')

NOTE:-
BOLT HOLES IN SHAFT COUPLING
TO BE PRE-DRILLED BY MAKERS,
2·91"ø (74 m.m).
FINAL DRILLING & REAMING TO BE
DONE BY P.W.D.D TO SUIT THRUST SHAFT.
COUPLING BOLTS SUPPLIED
PRE-MACHINED & FINISH MACHINED
BY P.W.D.D


COUPLING BOLT
ITEM 34
DWG.# SC.2600-30
(#AW.606429)
2·93"ø
(76mm)
MACHINING
ALLOWANCE
1"
25
THRUST
SHAFT
DWG.# SC.2500-7
(#4005.E.1031.BG)
SHAFT COUPLING
ITEM # 5
DWG.# SC.2600-13
(#AW.302302.'E')
1·96"
(50)
MACHINING
ALLOWANCE

DETAIL 'K'


SEE DETAIL 'K'
5.63"
(143)
℄ BRAKE
THRUST SHAFT
SEE DWG#
SC.2500-7
(#5005.E.1031.BG)
℄ MICHELL BEARING
BASE LINE
36
38
40
42
44

LIST OF PARTS

QUANTITIES GIVEN ARE FOR 2 SHAFT ASSEMBLIES.

FOR ITEM NOS 1 TO 64 SEE MAKERS PARTS LIST
DWG.# A.W 608197, P.W.D.D # 68.SC.2600-43
THESE ITEMS ARE SHOWN ON MAKERS DWG.#
AW.201941 (2 SHEETS), P.W.D.D DWG.# 68.SC 2600-4

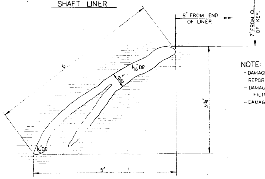
SHAFTING ASSEMBLY SUPPLIED THRO' "AMPOWER
CANADA LTD." - P.O # B.32367

PROPELLER ASSEMBLY SUPPLIED BY "CANADIAN
STONE MARINE LTD." - P.O # B.32565 - SEE DWG.#
SC.2600-44 (#26801.M) & SC.2600-47 (#26802)

NOTE:- ONLY THE FOLLOWING ITEMS, SHOWN IN CIRCLES ON
THIS DWG., ARE TO BE SUPPLIED BY P.W.D.D TO
COMPLETE THE SHAFTING ARRGT

ITEM NO	QTY.	DESCRIPTION	MATERIAL	SUPPLIER	REMARKS	P.O NO	S.C DWG. REF.
101	2	ROPE GUARD (IN HALVES)	STEEL	P.W.D.D			
102	16	5/8" U.N.C x 1" LG. CSK. HD SCREWS FOR (101)	STAINLESS STEEL	"		B35565	
103	16	3/8" U.N.C x 1" LG. " " " " "	"	"		.	
104	2	1" N.P.T 3000# HALF COUPLING " "	FORGED STEEL	"			
105	2	1" N.P.T PLUG FOR (104)	BRASS	"			
106	2	ADAPTER FOR WEARDOWN GAUGE	STEEL	"			
107	2	1/4" U.N.C x 1" LG. THUMB SCREWS FOR (106)	"	"			
108	2	WEARDOWN GAUGE 1/2" ø x 15" LG.	"	"			
109	36	5/8" U.N.C x 1 1/2" LG. HEX. HEAD BOLTS FOR (101)	STAINLESS STEEL	"		B35565	
110	2	BULKHEAD RING	STEEL	"	MATL O.O RINGS CUT BY P.W.D.D	B.34706	
111	36	1 1/8" U.N.C x 4 3/8" LG. HEX. HEAD BOLTS FOR (110)	"	"		B35565	
112	4	LOCKING PLATE	"	"			
113	8	3/4" U.N.C. HEX. HD BOLTS 2 1/4" LONG	STAINLESS STEEL	"		B35700	
114	2	3/8" Ø SEAL	NEOPRENE	"		B.35732	
115	1	3/4" Ø SEAL	"	"		B.35868	

LOCATION & DETAILS OF DAMAGE TO PORT
SHAFT LINER


8" FROM END
OF LINER
7" FROM CL.
OF KEY.
6
1/16" DP
7/16"
3 3/4"
1/8" DP
5"

NOTE:
- DAMAGE TO PORT SHAFT LINER
REPORTED JAN. 12, 82.
- DAMAGED AREA DRESSED UP BY
FILING AND HONING.
- DAMAGE INSPECTED BY: D. DUNBAR
D. ARMSTRONG-AMPOWER
D. COCRAN "
L. KRYGSMAN
C. STEVENSON
A. URQUHART
J. SPENCE

LLOYD'S PART 5, CHAPTER 6, SECTION 3

INTERMEDIATE SHAFT

$d = 100\sqrt[3]{\dfrac{P\,(560)}{R\,(\sigma_u + 160)}}$ mm

$= 100\sqrt[3]{\dfrac{5578\,(560)}{141\,(442+160)}}$

$= 100\sqrt[3]{39.56 \times 0.93}$

$= 100\sqrt[3]{36.8}$

$= 100 \times 3.326$

$= 332.6$ mm $= \underline{13.0944"}$

ICE CLASS 1* + 12 %
$= 372.5$ mm $= \underline{14.6653"}$

BOLLARD CONDITION

P = 5578 kw
R = 141 PM
$\sigma_u = 45\text{-}55$ kgf/mm^2
$= 442\text{-}540$ N/mm^2

LLOYD'S PART 5, CHAPTER 6, SECTION 3,6 (C)

SCREW SHAFT

$= 1.26 \times 332.6$ mm
$= 419.076$ mm $= 16.4990"$

ICE CLASS 1* + 20%
$= 502.89$ mm $= 19.7988"$

ARCTIC POLLUTION REQUIREMENTS

SCREW SHAFT

$\text{Diam} = 1.15\sqrt[3]{\dfrac{SU \times WT^2}{SY}}$

$= 1.15\sqrt[3]{\dfrac{70.11 \times 29{,}509}{27}}$

$= 1.15\sqrt[3]{76625}$

$= 1.15 \times 42.474$

$= 48.845$ cm $= 19.23$ inch

SU = 100,000 lbs/sq in
(70.11 kg/mm^2)
SY = 38,403 lbs/sq in
(27 kgf/mm^2)
$WT^2 = 1807$ inch^3
(29,509 cm^3)

THRUST SHAFT

Diam at collar
= 1.1 × intermediate diam.
$= 1.1 \times 372.5$
$= 409.75$ mm $= 16.13"$

Diam Thrust Shaft
(1 Thrust Shaft diam
clear of collar)
$= \underline{372.5\text{ mm} = 14.6653"}$

BRONZE LINER

$t = \dfrac{D + 230\text{ mm}}{32}$

$= \dfrac{612 + 230}{32}$

$= 26.3125$ MM $= 1.0359$ INCH (AFT)

D = Diam of Screw Shaft (PROPOSED)
Under Liner

$= \dfrac{614 + 230}{32}$

$= 26.375$ MM $= 1.0384$ INCH (FWD)

M.O.T. REQUIREMENTS

Screw Shaft + 65% Over Strength
$d_b = 502.89$ MM $= 19.7988"$
$I/y = 0.098\,d_b^3$
$= 0.098 \times 19.7988^3$
$= 760.58$ INCH^3
$+65\% = 1254.95$ INCH^3
$d_b = \underline{23.735}$ INCH

Thrust and Motor Shaft + 10% in Diam over Diam of Propeller Shaft
Screw Shaft $= 23.395" + 2.3395"$
$= \underline{25.735}$ INCH

BRONZE LINER

Lloyd's + 1/8"
$= 1.0359 + 0.125$ $\quad = 1.0384 + 0.125$
$= \underline{1.1609"}$ (AFT) $\quad = \underline{1.1634"}$ (FWD)

MATERIALS TO LLOYDS TESTING AND REQUIREMENTS
ANTI-ROTATION SECURING ARRGT FOR BEARING TO
SURVEYORS SATISFACTION

ALTERATIONS

REV.	ZONE	DESCRIPTION	DATE	APP.	OWNER DATE	OWNER APP.
A		OWNERS EXAMINED - LETTER DATED 24/11/81	25/1/81	J		
B		AS FITTED	16-9-82			

REFERENCES

No.	TITLE

RESERVATIONS

No.	RESERVATIONS

PRINT ISSUE

GROUP	REVISIO				
	0	0	0	A	A
OWNERS	3		4	4	
LLOYDS					4
A.B.S.					
C.S.I.					4
DWG. OFFICE (STEEL)					
DWG. OFFICE (OUTFIT)					
DWG. OFFICE (ENG.)				1	
PROD. MGR.				1	
ASST. PROD. MGR.				1	
STEEL SUPT.					
OUTFIT SUPT.				1	
ENG. SUPT.				1	
PROD. PLANNING			1	1	
LOFT	1			1	
MACHINE SHOP				1	
ENG. FITTER					
CARPENTER					
PAINTER					
RIGGER					
PREFAB				3	
WELDER					
STEEL ERECTION				2	
PIPEFITTER					
ELECT. SUB CONT.					
SHT. MET. SUB CONT.					
PIPE SUB CONT.					
CANAL E (P.W.D.D.)					
INSUL. SUB CONT.					
QUALITY CONTROL					
PIPE SUPT.					
DET NORSKE VERITAS		1			
R MILNE				1	
J CARR				1	
TOTAL	4	1	5	19	8
DATE OF ISSUE	16 Nov 81	Sept 30/9/81	13/10/81	25/11/81	7 Dec 81

APPROVALS

OWNER	LLOYDS	A.B.S.	C
LETTER 24/11/81	30/12/81		11/1

DRG. No. 68-2600-1

ARRGT. OF SHAFTIN
& DETAILS - ROPEGUAR
BHD RING & WEARD
GAUGE

SCALE: 1"=1'0" & AS SHOWN | A/C #: 260

HULL No. 68

DRAWN BY: A. GRAHAM
DAT
APPROVED BY: J. CAMERON

PORT WELLER DRY DOCKS
AS FITTED DRAWING

PORT WELLER
A D
UPPER LA
ES ONT