DP1- B-201-2- SUR025

-> MCR

ELF NORGE A/S
DRILLING PLATFORM NO.1
FLOTATION STUDY

APRIL 23 1975

PROJECT 2181

INTRODUCTION

This report investigates the re-flotation of the jacket of Drilling Platform No.1 after the installation of eight pairs of 62"Ø buoyancy tanks, four pairs on A side and four pairs on B side.

The new tanks are each 110 ft in length and are supplementary to the existing damaged 62"Ø and 100"Ø buoyancy tanks. The length of 110 ft was necessary to achieve a minimum mudline clearance of 2m in a water depth of 96m.

Two conditions have been considered, namely:-

i) With the above mentioned new tanks, and legs B2 and B3 each containing 200 kips of water.

ii) With the above mentioned tanks, and legs B2 and B3 each containing 125 kips of water (i.e. deballast 75 kips from each leg).

An intermediate condition has also been investigated i.e. the deballasting of all new buoyancy tanks, corner legs and 100"Ø tanks but only partially deballasting the existing 62"Ø tanks.

The purpose of this was to establish a condition in which it would be possible to work on the jacket without being in the splash zone.

The appendix contains the computer print-outs for the conditions investigated.

1.0 DERIVATION OF INITIAL CONDITIONS

Certain assumptions were made about the condition of the jacket during the upend sequence.

1.1 That the following legs were ballasted:

(i) A1 - 240 kips
(ii) A4 - 300 kips
(iii) B4 - 200 kips

1.2 That the following members were damaged:

(i) B3 - containing 200 kips of water
(ii) 62" Ø buoyancy tanks were collapsed from 130 ft down to the bottom and that the remaining intact portion of the tanks was the top 55 ft.
(iii) 100"Ø buoyancy tanks were collapsed and the remaining intact portion was the top 60 ft.

1.3 That the jacket had an angle of heel in the long axis of approximately 11° (column line 1 low).

This was only from visual observations and could be anywhere from 0° - 11°.

During the initial attempts at re-flotation the jacket became buoyant after 15 of the 62"Ø tanks had been evacuated to the 130 ft level, the last one being full of water. From this observation the approximate weight of the jacket was derived.

	Jacket intact - displacement		=	19211 kips
-	B3 leg		=	200 kips
-	100" Ø buoyancy tanks		=	980 kips
-	62" Ø buoyancy tanks	(15)	=	1233 kips
		(1)	=	260 kips
				2673 kips
	Resultant displacement		=	16538 kips

When in this condition some of the jacket was clear of the water, say approximately 70 kips.

Weight of jacket and ballast	=	16460 kips
Weight of ballast	=	740 kips
Weight of jacket	=	15720 kips say 15700 kips

On the basis of these foregoing assumptions the attitude of the jacket during re-flotation was considered for an initial angle of transverse trim of 11°.

Consider the condition when the jacket just becomes submerged.

Vertical centre of buoyancy

Item		ZCB.	Xmmt
Jacket intact	19211	192.94	3706570
B3	200	127.00	25400
62"Ø	2960	230.00	680800
100"Ø	980	222.00	217560
	15071	184.70	2782810

Centre of gravity in the X and Z directions

Item	Wt	ZCG	Zmmt	XCG	Xmmt
Jacket	15700	178.0	2794600	5.0 (1)	78500
A1	240	42.38	12714	100.0 (1)	24000
A4	300	35.0	8400	100.0 (4)	30000
B4	200	30.0	6000	100.0 (4)	20000
	16440	171.60	2821714	3.19(1)	52500

Vertical separation of B & G in this condition (i.e. just as jacket becomes submerged) = 13.10 ft.

Horizontal separation of B & G causing a transverse angle of heel is therefore 13.10 tan 11° = 2.55 ft.

In this initial condition the centre of buoyancy in the X direction is 3.19 - 2.55 = 0.64 ft. off the centre line towards column line 1.

2.0 WEIGHT AND BUOYANCY DURING THE DE-BALLASTING OPERATION

2.1 New tanks installed, B2 and B3 each containing 200 kips of water.

1.1 Jacket Weight

The damaged portions of the existing 62"Ø buoyancy tanks have been removed giving a weight saving of $864 \times \frac{50}{190} = 230$ kips.

The new tanks have a total weight of 602 kips therefore the new weight of the jacket is

$$15700 - 230 + 602 = 16072 \text{ kips}$$

2-1.2 Jacket buoyancy

Intact	Lost	
Jacket intact = 19211 kips	62"Ø tanks	=4166
	100"Ø tanks	= 980
	Total lost	= 5146 kips

Net available buoyancy = 14065 kips.

2-1.3

The operation should begin with the deballasting of the four corner legs to leave 750 kips in side A and 150 kips in side B.

At this stage the total jacket weight is made up as follows.

Steel	=	16072
Ballast in A1 & A4	=	750
Ballast in B1 & B4	=	150
Water in B2 & B3	=	400
Total jacket weight	=	17372 kips

Resultant weight on the bottom is 3307 kips.

2-1.4 Evacuate all the new 62"Ø buoyancy tanks.

Buoyancy available from the structure	= 14065
Buoyancy available from the new tanks	= 2362
Total available buoyancy	= 16427 kips

Resultant weight on the bottom is 945 kips.

2-1.5 Evacuate the two 100"Ø buoyancy tanks on side A.

Total available buoyancy from 1.4	= 16427
Buoyancy from 100"Ø tanks	= 766
Total available buoyancy	= 17193 kips

Resultant weight on the bottom is 179 kips.

2-1.6 Introduce a pressure of 3 bars into each of the existing 62"Ø buoyancy tanks.

Total available buoyancy from 1.5	= 17193
Buoyancy from existing 62"Ø tanks	= 2100
Total available buoyancy	= 19293 kips

Resultant excess of buoyancy is 1921 kips.

At this stage the jacket will be floating with a draft of 325 ft i.e. a mudline clearance in 104m water depth of approximately 16 ft.

2-1.7 Evacuate the existing 62"Ø buoyancy tanks completel;

Recent data from divers has indicated that the available buoyancy of the existing 62"Ø tanks is in excess of 3000 kips.

Total available buoyancy from 1.6	= 19293
Remaining buoyancy from existing 62"Ø tanks	= 918
Total available buoyancy	= 20211 kips

Resultant excess of buoyancy is 2839 kips.

At this stage the jacket will be floating with a draft of 307.4 ft i.e. a mudline clearance on final location (96m W.D.) of approximately 7.50 ft.

2.2 New tanks installed, B2 and B3 each containing 125 kips of water

The whole de-ballasting sequence will be as case 1 but on completion of de-ballasting the B2 and B3 legs will be de-ballasted to leave only 125 kips in each.

Total available buoyancy from 1.7	=	20211
Buoyancy gained from B2 & B3	=	150
Total available buoyancy	=	20361 kips

Resultant excess of buoyancy is 2989 kips.

At this stage the jacket will be floating at a draft of 300 ft. i.e. a mudline clearance on final location (96m W.D.) of approximately 14 ft.

3.0 BALLAST DISTRIBUTION

In order to achieve a zero, or near zero, angle of the jacket in the long axis, the jacket legs must be unevenly ballasted.

The new buoyancy tanks are to be distributed evenly about the centre of the jacket.

$$\text{CG in X direction} = \frac{15700 \times 5.0}{17372} = 4.52 \text{ ft towards}$$

CB in X direction = 0.64 ft towards col. line 1
Separation BG = 3.88 ft

$$\text{Ballast to be re-distributed} = \frac{3.88 \times 17372}{200}$$
$$= 337 \text{ kips}$$

Therefore the ballast distribution in each of the two cases considered should be as follows.

A 1	= 75 kips	A 4	= 700 kips
B 1	= 75 kips	B 4	= 75 kips

This ballast distribution will result in the jacket floating approximately level in the long axis.

4.0 SUMMARY

4.1 Final Flotation

Attached are two computer printouts showing the results of a flotation analysis for the two cases under consideration. The results of these flotation analyses are summarised below.

Run 1

Angle of flotation	=	3.40° (A side high)
Draft of jacket	=	307.4 ft
Mudline clearance	=	7.50 ft(in 96 m water depth)
Vertical separation of centres of buoyancy and gravity.	=	5.37 ft.

Run 2

Angle of flotation	=	0.50° (A side high)
Draft of jacket	=	300 ft.
Mudline clearance	=	14.0 ft(in 96m water depth)
Vertical separation of centres of buoyancy and gravity.	=	4.74ft.

The angle of flotation has a large effect on the final mudline clearance (1° angle reduces the mudline clearance by approximately 1.20 ft) and it is therefore desirable to evacuate the B2 and B3 legs if possible to reduce the angle of flotation to a minimum.

4.2 Intermediate Flotation

In this case the corner legs, 100"Ø buoyancy tanks and new 62"Ø buoyancy tanks have been evacuated. In addition the existing 62"Ø buoyancy tanks have been pressurised to 3 bars each.

The computer printout of the flotation analysis for this intermediate condition is attached and the results are summarised below.

4.2 Intermediate Flotation

Run 3

Angle of flotation	=	4.0° (A side high)
Draft of jacket	=	307.4 ft
Mudline Clearance	=	16.0 ft (on present location)
Vertical separation of centres of buoyancy and gravity.	=	9.18 ft

APPENDIX

CALCULATION OF HOOKLOAD OR RIGHTING MOMENTS

REMARKS:
ELF NORGE A/S DP1 SERIES M REFLOTATION ANALYSIS
16 62" DIA BUOYANCY TANKS 110FT LONG ADDED
RUN 1 B2 & B3 EACH CONTAINING 200 KIPS WATER

JACKET PROPERTIES

DISPL.	=	20212.43	(KIPS)
YCB	=	86.29	(FT)
ZCB	=	199.85	(FT)
EXCESS	=	14	(%)

WEIGHT=		17372.00	(KIPS)
YCG	=	85.63	(FT)
ZCG	=	172.19	(FT)
YH(1)	=	39.48	(FT)
ZH(1)	=	351.50	(FT)
YH(2)	=	81.83	(FT)
ZH(2)	=	407.50	(FT)
YH(3)	=	124.17	(FT)
ZH(3)	=	351.50	(FT)

COORDINATES OF POINT THROUGH WHICH INITIAL WATERLINE GOES ARE.

Y-DIRECTION:	160.00	(FT)
Z-DIRECTION:	360.00	(FT)
INITIAL W.L. SPACING D =	10.00	(FT)

NOTE: IF HOOKLOAD = 0.0, AND DISPLACEMENT > 0.0, LINE OF ACTION OF CENTER OF GRAVITY IS WITHIN 0.5 FEET OF HOOK POINT

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ELF NORGE A/S
K.R.SEWELL 2181

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ANGLE (DEGREES)	HOOKLOAD (KIPS)	DISPLACEMENT (KIPS)	LOCATION OF WATERLINE	YCB (FT)	ZCB (FT)		LIFTING POINT #	CHECK (KIPS)
84.00	-570.8	17958.9	331.25	85.77	182.15		2	16.2
85.00	-388.7	17754.3	326.25	85.83	180.53		2	-6.4
86.60 86.00	-189.8	17555.9	317.4 321.25	85.89	178.98	177.56	2	-5.9
88.00	458.1	16919.6	306.12	86.02	174.14		2	5.7
89.90	2365.9	15011.9	285.00	86.27	196.73		2	5.8

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ELF NORGE A/S
W.R.SEWELL 2181

CALCULATION OF HOOKLOAD OR RIGHTING MOMENTS

REMARKS:
ELF NORGE A/S DP1 SERIES M REFLOTATION ANALYSIS
16 62" DIA BUOYANCY TANKS 110FT LONG ADDED
RUN 2 B2 & B3 EACH CONTAINING 125 KIPS WATER

JACKET PROPERTIES

DISPL.	=	20212.43	(KIPS)
YCB	=	86.29	(FT)
ZCB	=	199.85	(FT)
EXCESS	=	14	(%)

WEIGHT=		17222.00	(KIPS)
YCG	=	86.14	(FT)
ZCG	=	171.86	(FT)
YH(1)	=	39.48	(FT)
ZH(1)	=	351.50	(FT)
YH(2)	=	81.83	(FT)
ZH(2)	=	407.50	(FT)
YH(3)	=	124.17	(FT)
ZH(3)	=	351.50	(FT)

COORDINATES OF POINT THROUGH WHICH INITIAL WATERLINE GOES ARE:

Y-DIRECTION:	160.00	(FT)
Z-DIRECTION:	380.00	(FT)

INITIAL W.L.
SPACING D = 10.00 (FT)

NOTE: IF HOOKLOAD = 0.0, AND DISPLACEMENT > 0.0, LINE OF ACTION OF CENTER OF GRAVITY IS WITHIN 0.5 FEET OF HOOK POINT

ANGLE (DEGREES)	HOOKLOAD (KIPS)	DISPLACEMENT (KIPS)	LOCATION OF WATERLINE	YCB (FT)	ZCB (FT)	LIFTING POINT #	CHECK (KIPS)
88.00	-494.3	17714.3	321.87	86.08	180.20	2	-2.0
88.50	-369.4	17590.3	313.75	86.11	179.23	2	-1.1
89.00	-216.5	17436.0	313.00	86.14	178.03	2	-2.5
89.50	-23.9	17251.3	313.62	86.17	176.60	2	5.4
89.99	331.1	16896.3	304.99	86.23	173.95	2	5.4

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Run 8

ELF NORGE A/S
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CALCULATION OF HOOKLOAD OR RIGHTING MOMENTS

REMARKS:
ELF NORGE A/S DP1 SERIES M REFLOTATION ANALYSIS
16 62" DIA BUOYANCY TANKS 110FT LONG ADDED
RUN 3 - INTERMEDIATE FLOTATION POSITION

JACKET PROPERTIES

DISPL.	=	19294.43	(KIPS)
YCb	=	86.56	(FT)
ZCb	=	197.63	(FT)
EXCESS	=	9	(%)

WEIGHT=		17372.00	(KIPS)
YCG	=	85.63	(FT)
ZCG	=	172.19	(FT)
YH(1)	=	39.48	(FT)
ZH(1)	=	351.50	(FT)
YH(2)	=	81.83	(FT)
ZH(2)	=	407.50	(FT)
YH(3)	=	124.17	(FT)
ZH(3)	=	351.50	(FT)

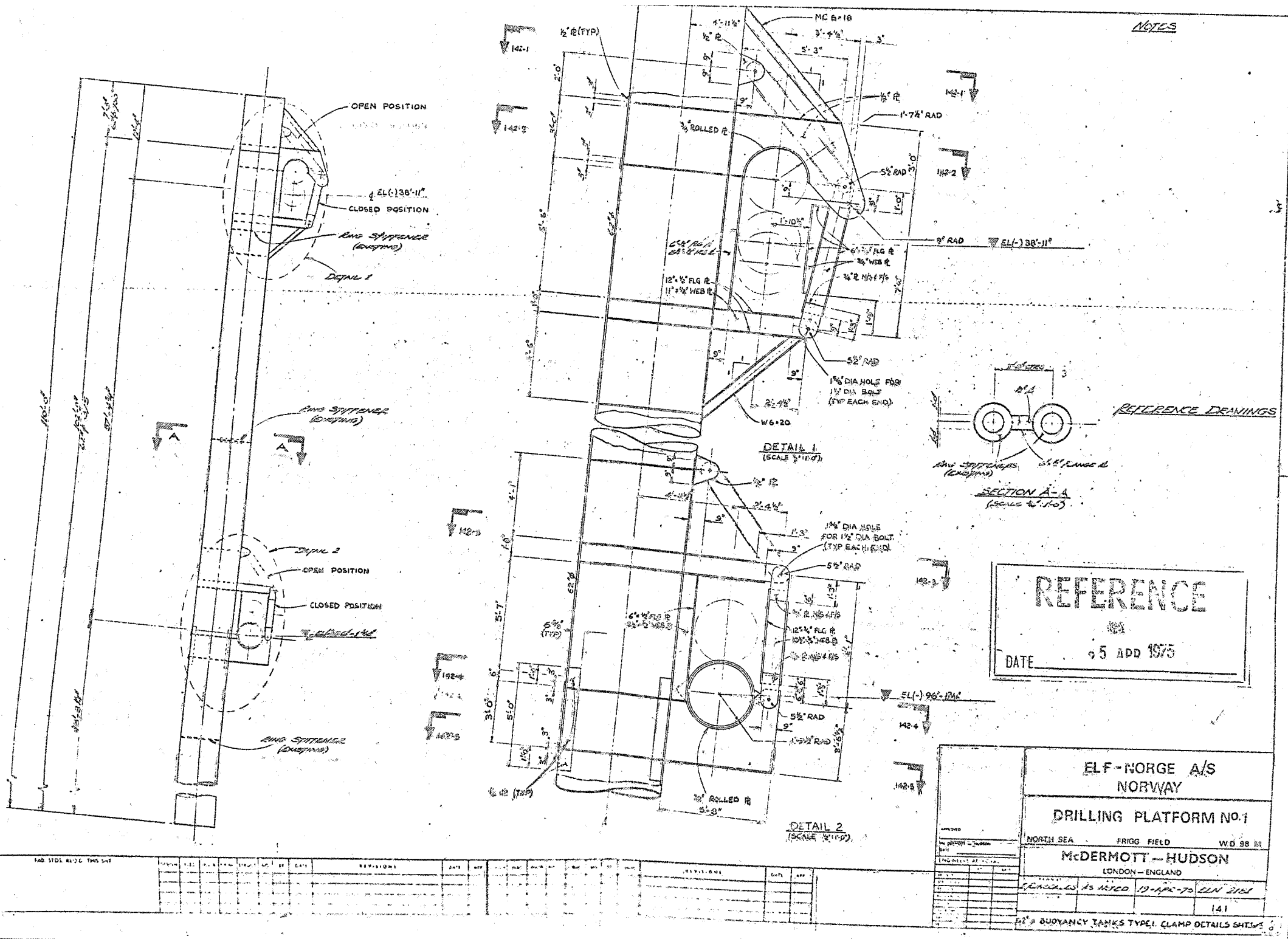
COORDINATES OF POINT THROUGH WHICH INITIAL WATERLINE GOES ARE,

Y-DIRECTION:	160.00	(FT)
Z-DIRECTION:	380.00	(FT)

INITIAL W.L.
SPACING D = 10.00 (FT)

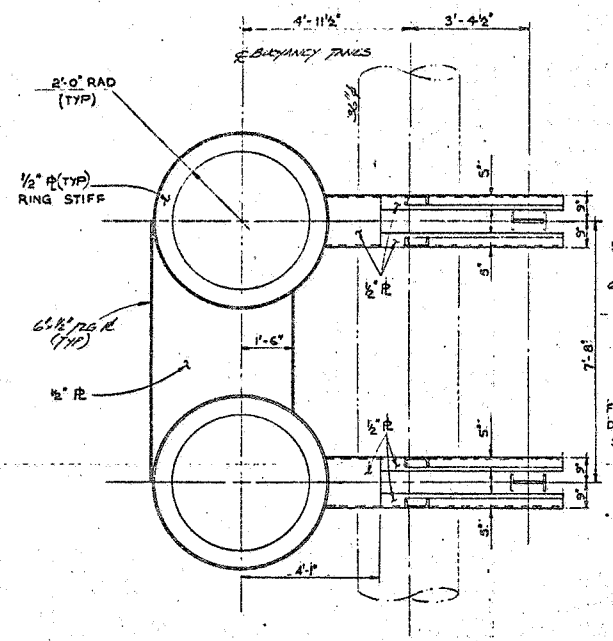
NOTE: IF HOOKLOAD = 0.0, AND DISPLACEMENT > 0.0, LINE OF ACTION OF CENTER OF GRAVITY IS WITHIN 0.5 FEET OF HOOK POINT

ANGLE (DEGREES)	HOOKLOAD (KIPS)	DISPLACEMENT (KIPS)	LOCATION OF WATERLINE	YCB (FT)	ZCB (FT)	LIFTING POINT #	CHECK (KIPS)
80.00	-1562.2	18939.3	366.25	85.89	194.64	2	5.0
84.00	-1185.3	18561.8	357.50	85.86	191.69	2	4.5
86.00	-0.9	17366.5	335.00	86.27	181.57	2	-6.4
88.00	916.2	16456.5	314.37	86.35	173.69	2	2.7
89.00	1773.8	15609.6	300.78	86.43	166.67	2	11.3


NOTES
OPEN POSITION
CLOSED POSITION
℄ EL(-)38'-11"
Ring Stiffener (Existing)
Detail 1
Detail 2
Ring Stiffener (Existing)
OPEN POSITION
CLOSED POSITION
℄ EL(-)96'-1"
Ring Stiffener (Existing)
MC 6x18
½" PL (TYP)
3½" ROLLED PL
5½" RAD
9" RAD
EL(-)38'-11"
W6x20
1⅝" DIA HOLE FOR 1½" DIA BOLT (TYP EACH END)
DETAIL 1
(SCALE ½"=1'-0")
1⅝" DIA HOLE FOR 1½" DIA BOLT (TYP EACH END)
EL(-)96'-1"
DETAIL 2
(SCALE ½"=1'-0")
REFERENCE DRAWINGS
Ring Stiffeners (Existing)
SECTION A-A
(SCALE ½"=1'-0")
REFERENCE
DATE 05 APR 1975
ELF-NORGE A/S
NORWAY
DRILLING PLATFORM NO.1
NORTH SEA FRIGG FIELD W.O. 88 M
McDERMOTT — HUDSON
LONDON — ENGLAND
AS NOTED 19-APR-75 ELN 2184
141
52' BUOYANCY TANKS TYPE I CLAMP DETAILS SHT 1 OF

DWG NO. ELN 2181 SHEET NO. 142

NOTES



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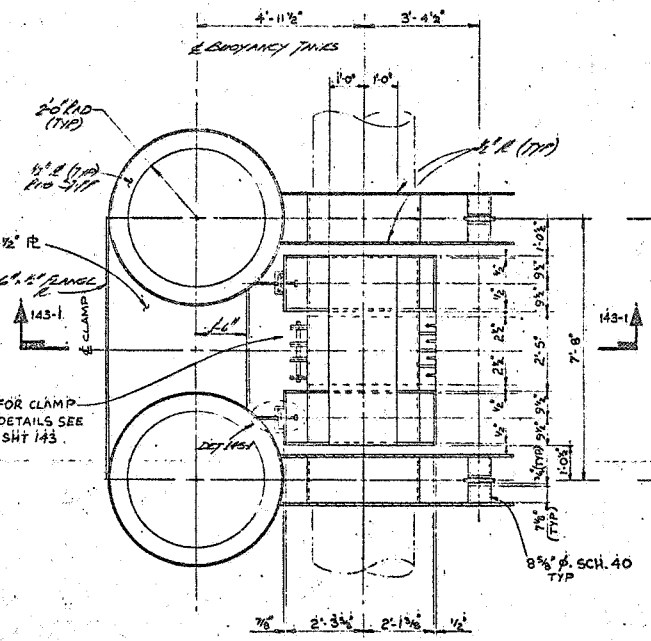

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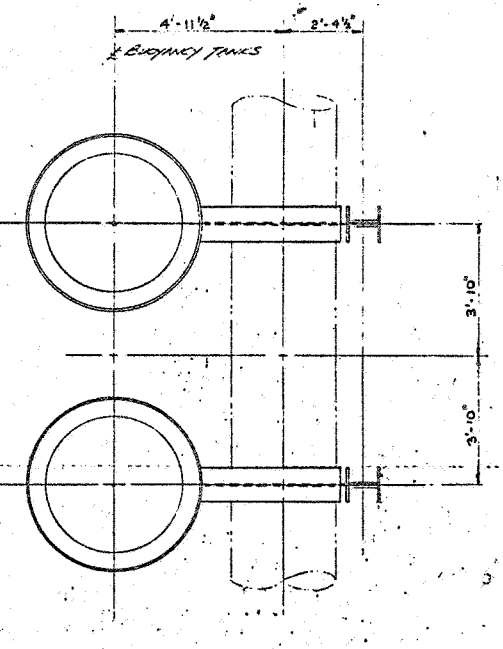

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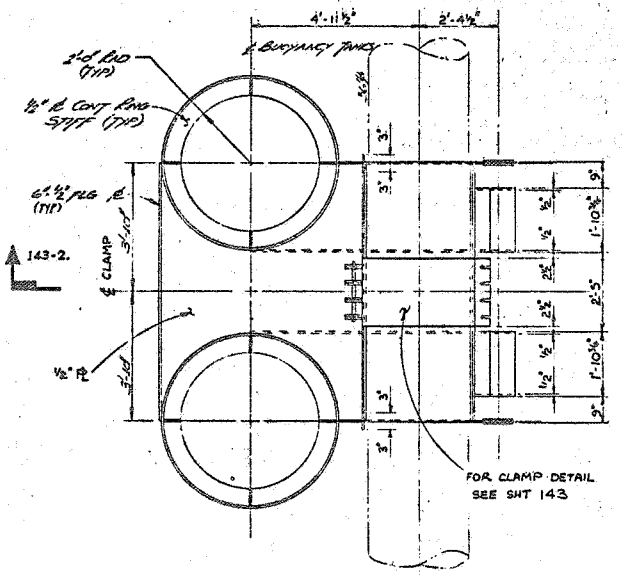

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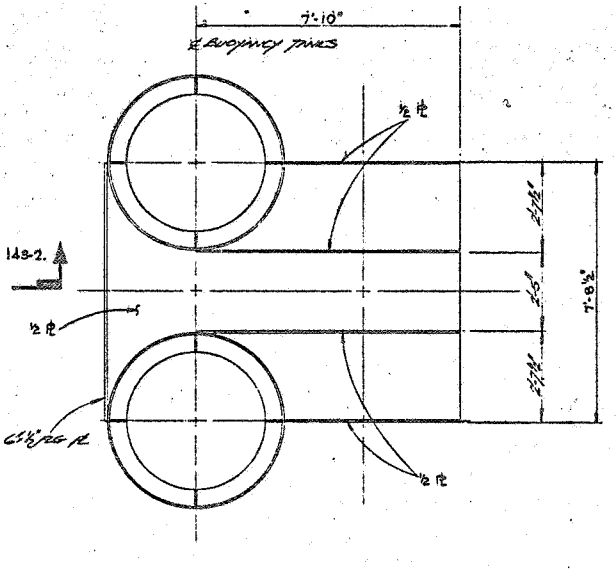

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APPROVED
Mc DERMOTT — HUDSON
DATE
ENGINEERS APPROVAL

	BY	DATE

ELF-NORGE A/S
NORWAY

DRILLING PLATFORM No.1

NORTH SEA FRIGG FIELD W.D. 98 M

McDERMOTT — HUDSON
LONDON — ENGLAND

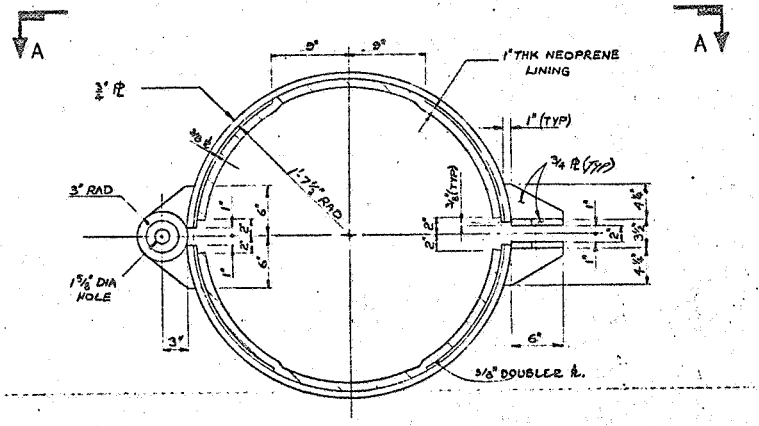
DRAWN	SCALE	DATE	DWG NO.
R.T. Moss	½" : 1'-0"	20 APRIL 75	ELN 2181
SUPERSEDES			142

62' ϕ BOUYANCY TANKS TYPE I CLAMP DETAILS - SHT 2 OF 3

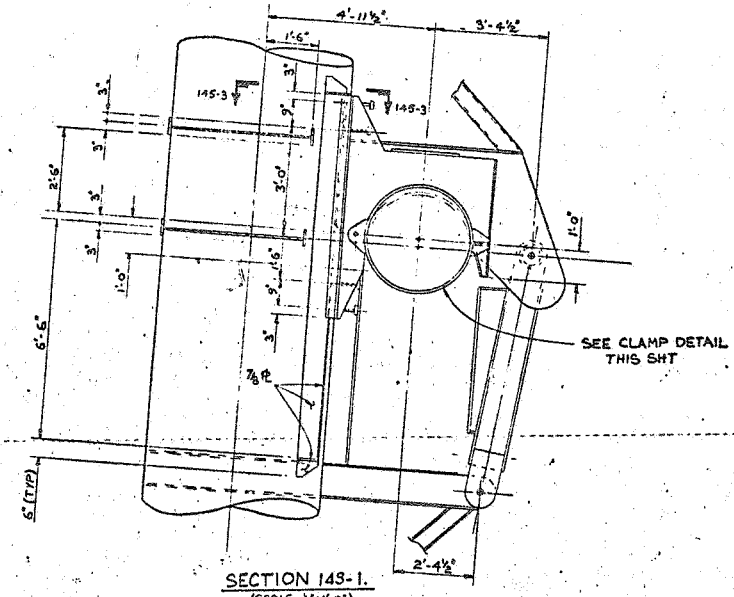
SHEET NO 143

DWG NO ELN 2181

NOTES



CLAMP DETAIL
(SCALE 1½" : 1'-0")



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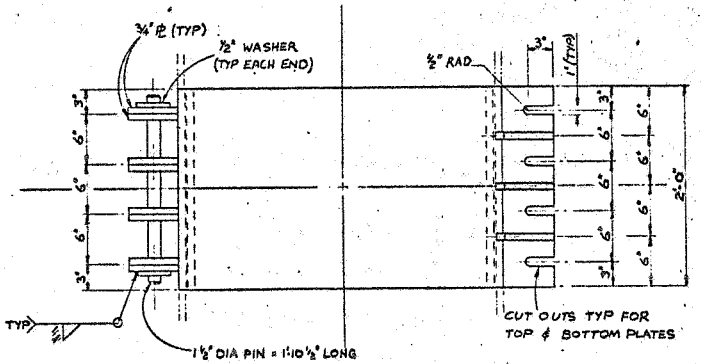
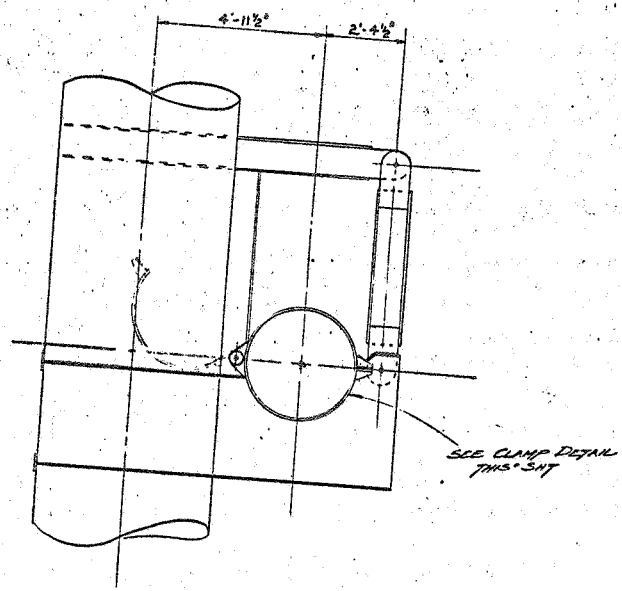


VIEW A-A
(SCALE 1½" : 1'-0")



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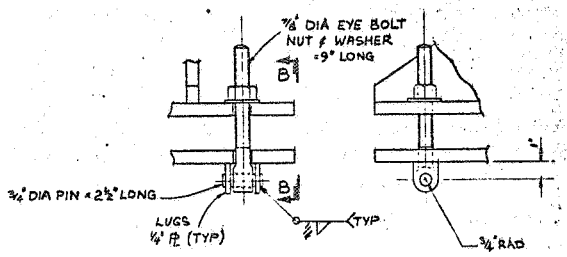


CLAMP BOLT DETAIL
(4-REQD PER CLAMP)
(SCALE 3" : 1'-0")

VIEW B-B
(SCALE 3" : 1'-0")

REFERENCE DRAWINGS

REFERENCE
DATE 25 APR 1975

APPROVED
Mc DERMOTT — HUDSON
DATE
ENGINEERS APPROVAL

BY	DATE

ELF-NORGE A/S
NORWAY

DRILLING PLATFORM NO.1

NORTH SEA | FRIGG FIELD | W.D. 98 M

McDERMOTT — HUDSON
LONDON — ENGLAND

DRAWN BY	SCALE	DATE	DWG NO
R.T. Moss	AS NOTED	20 APRIL 75	ELN 2181
ENGINEER BY			143

62'ø BOUYANCY TANKS TYPE I CLAMP DETAILS - SHT 3 of 3

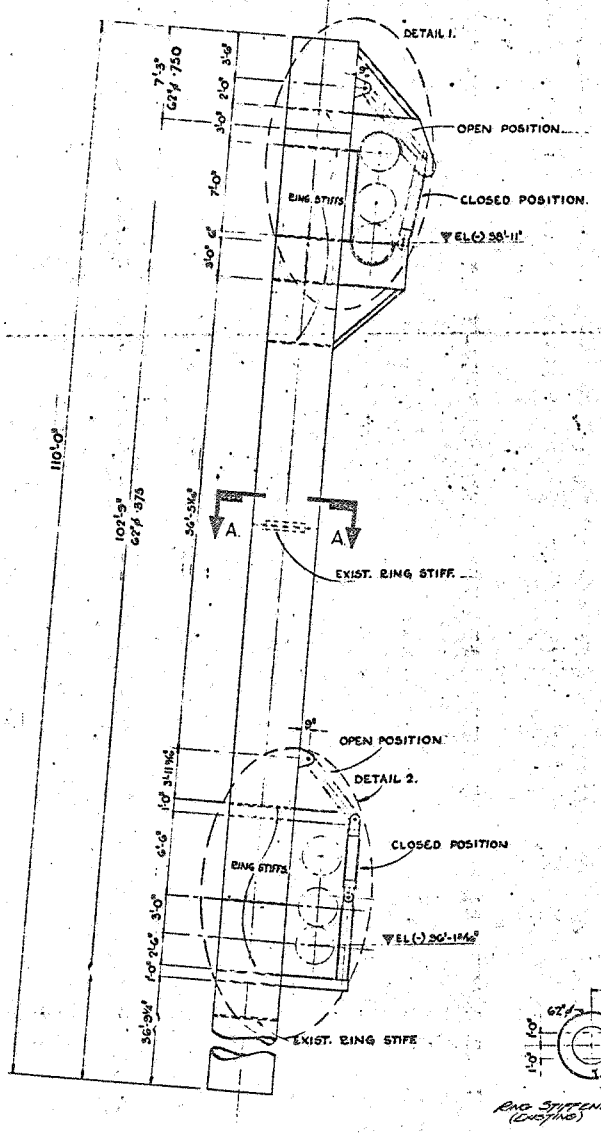
FAB. STDS. REQ'D. THIS SHT

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

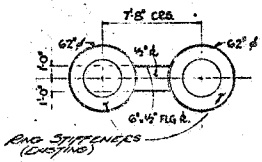
DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

SHEET NO 144
DWG. NO ELN 2181

NOTES



62" ø BUOYANCY TANK TYPE 2.
(SCALE 3/16" = 1'-0")



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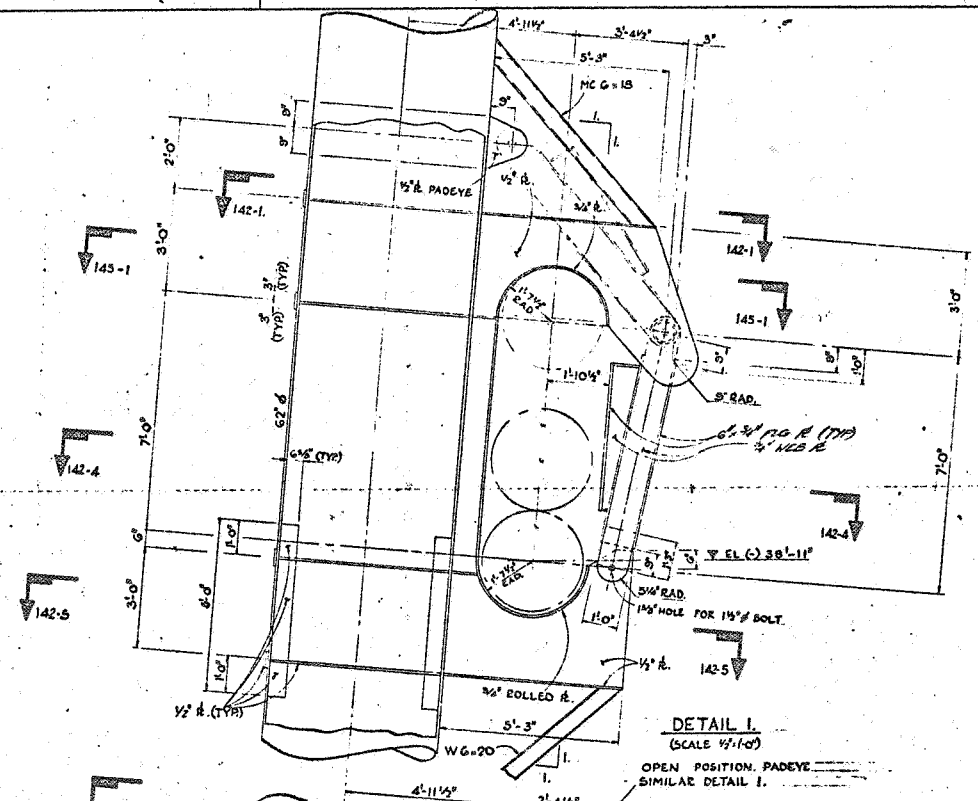

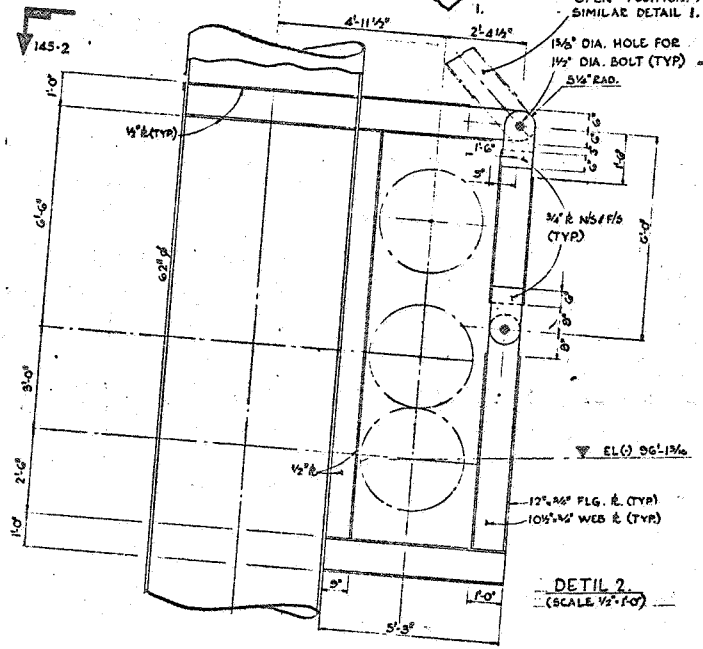

REFERENCE DRAWINGS

REFERENCE
DATE 25 APR 1975

ELF-NORGE A/S
NORWAY

DRILLING PLATFORM No.1

NORTH SEA | FRIGG FIELD | W.D. 98 M

McDERMOTT — HUDSON
LONDON — ENGLAND

P BROWN	AS NOTED	19-APRIL-75	ELN 2181
			144

62" ø BUOYANCY TANKS TYPE 2. CLAMP DETAILS SHT. 1 of 2

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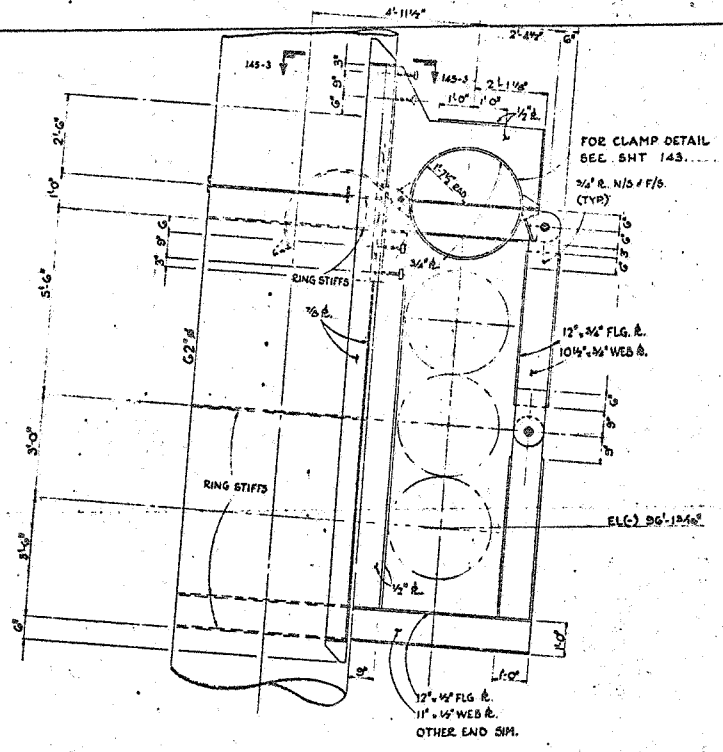
DATE
ENGINEER'S APPROVAL

FAB. STDS. REQ'D THIS SHT

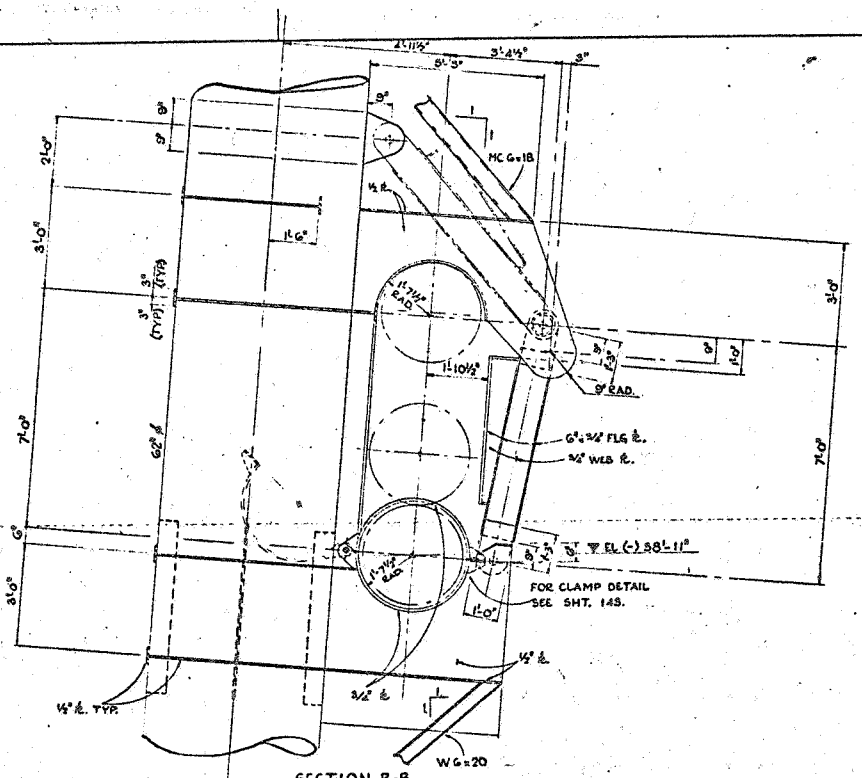
DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

SHEET NO 145

DWG NO ELN 2181



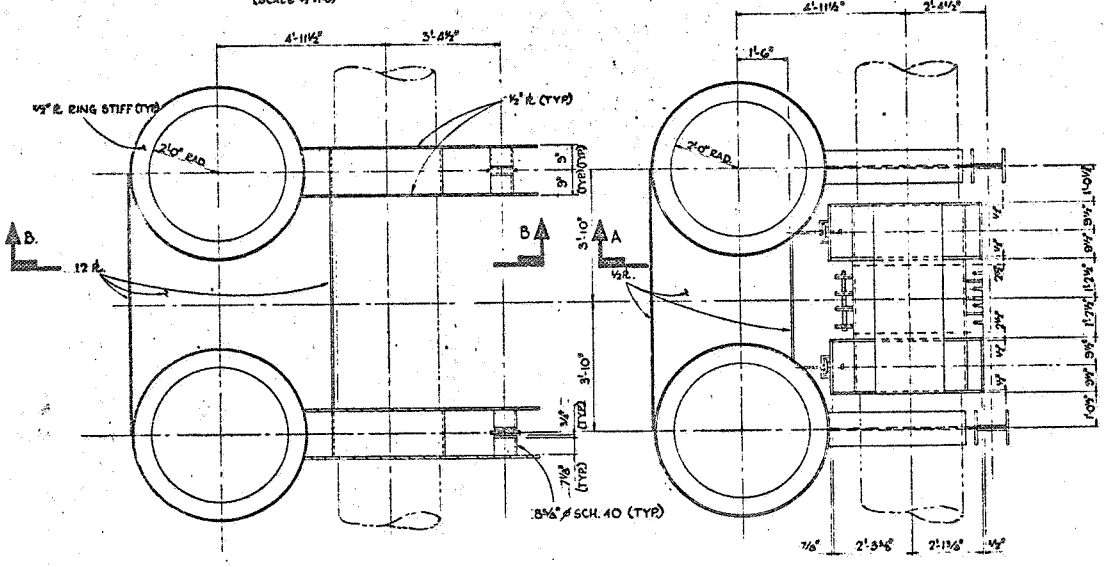
SECTION A-A.
(SCALE ½"=1'-0")



SECTION B-B.
(SCALE ½"=1'-0")

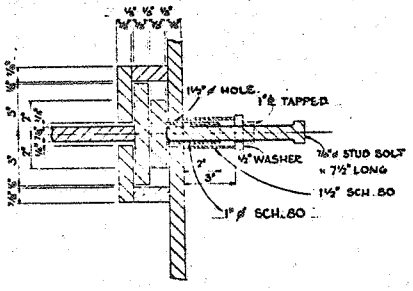
REFERENCE

DATE 25 APR 1975



SECTION 145-1.
(SCALE ½"=1'-0")

SECTION 145-2.
(SCALE ½"=1'-0")



SECTION 145-3
(SCALE 3"=1'-0")

ELF-NORGE A/S
NORWAY

DRILLING PLATFORM NO.1

NORTH SEA FRIGG FIELD W.D. 98 M

McDERMOTT — HUDSON
LONDON — ENGLAND

DRAWN	CHECKED	DATE	DWG NO
P BROWN	AS NOTED	20-APRIL-75	ELN 2181
			145

G2"ø BUOYANCY TANKS TYPE 2. CLAMP DETAILS SHT 2 OF 2

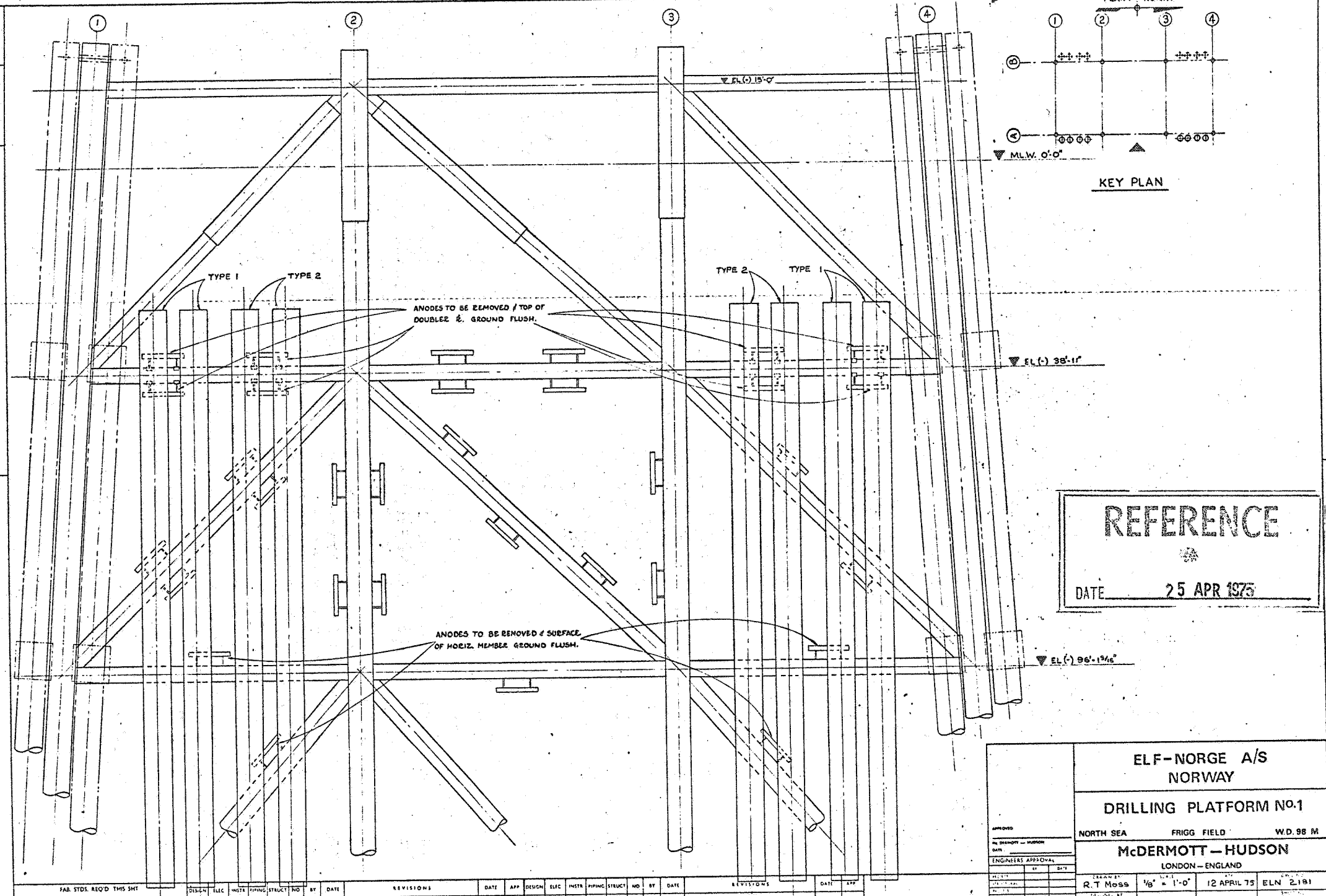
APPROVED
Mc DERMOTT — HUDSON
DATE
ENGINEERS APPROVAL

FAB. STDS. REQ'D THIS SHT

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

DWG. NO ELN 2181 SHEET NO 146



KEY PLAN

REFERENCE

DATE 25 APR 1975

FAB. STDS. REQ'D THIS SHT

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

APPROVED
FOR McDERMOTT — HUDSON
DATE

ENGINEERS APPROVAL	BY	DATE

ELF-NORGE A/S
NORWAY

DRILLING PLATFORM No.1

NORTH SEA FRIGG FIELD W.D. 98 M

McDERMOTT — HUDSON
LONDON — ENGLAND

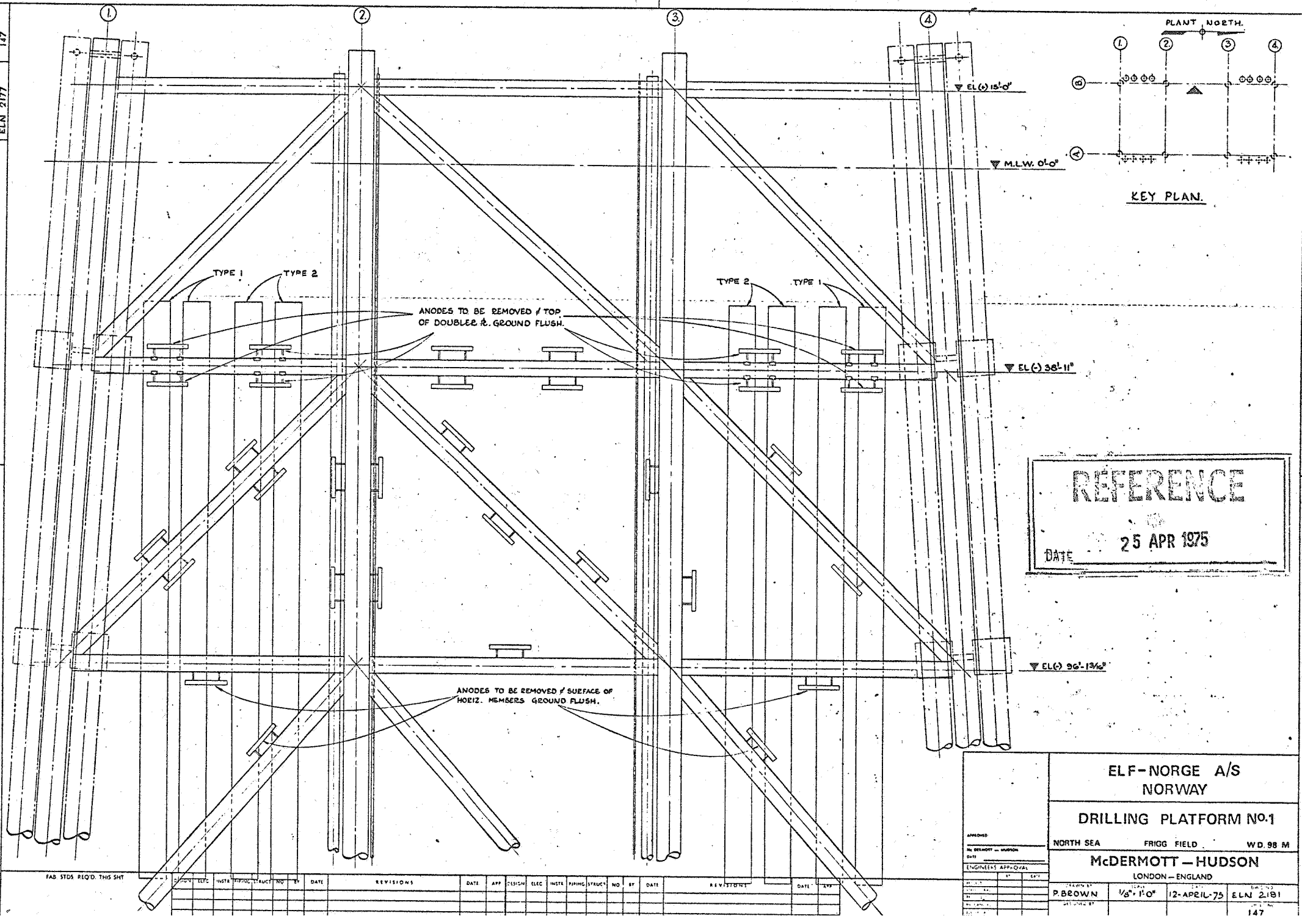
DRAWN BY	SCALE	DATE	JOB NO.
R.T Moss	1/8" = 1'-0"	12 APRIL 75	ELN 2181
DESIGNED BY			DWG. NO. 146

ELEVATION ON GRID LINE 'A' G2"ø BUOYANCY TANKS

A

SHEET NO 147

DWG NO ELN 2177



KEY PLAN.

REFERENCE

DATE 25 APR 1975

FAB STDS REQ'D. THIS SHT — 1

	DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS

DATE	APP	DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS

DATE	APP

APPROVED
Mc DERMOTT — HUDSON
DATE

ENGINEERS APPROVAL

	BY	DATE

ELF-NORGE A/S
NORWAY

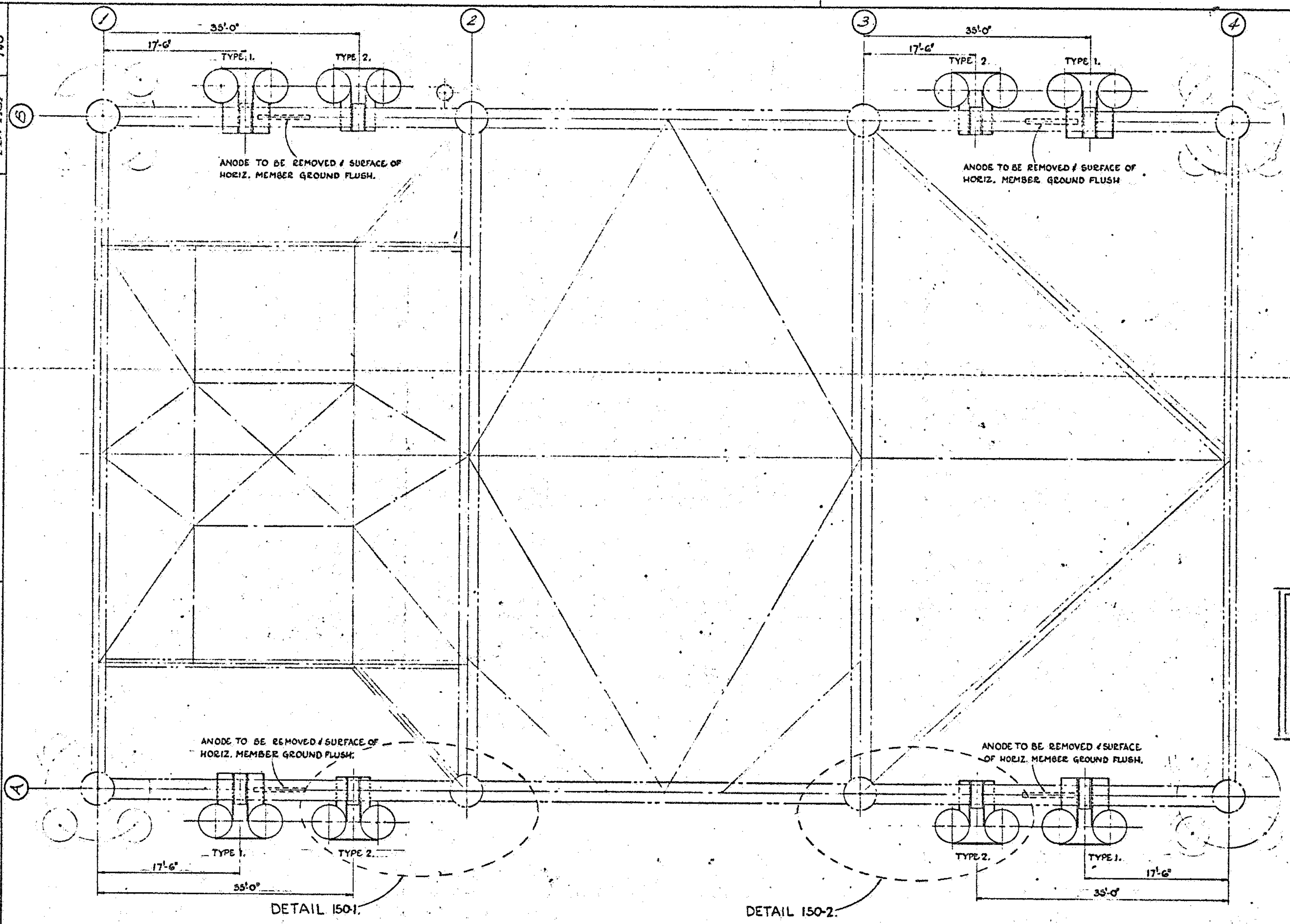
DRILLING PLATFORM No.1

NORTH SEA FRIGG FIELD W.D. 98 M

McDERMOTT — HUDSON
LONDON — ENGLAND

DRAWN BY	SCALE	DATE	DWG. NO.
P. BROWN	1/8" = 1'-0"	12-APRIL-75	ELN 2181

SHEET No. 147



HORIZONTAL FRAMING PLAN @ EL(-)96'-1 3/16"(29291)

DWG NO ELN 2181
SHEET NO 148

REFERENCE
DATE 25 APR 1975

ELF-NORGE A/S
NORWAY

DRILLING PLATFORM No.1

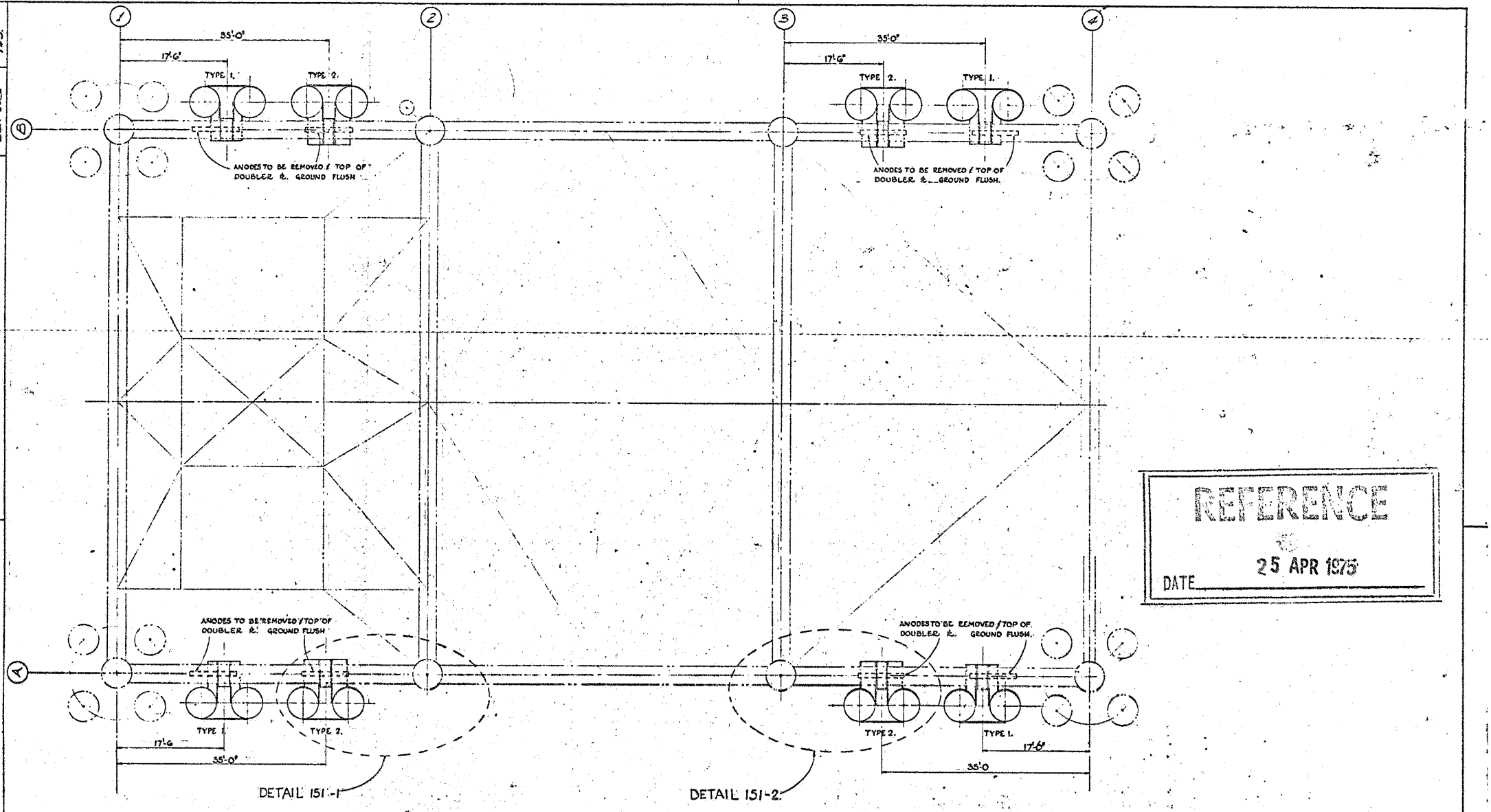
NORTH SEA FRIGG FIELD W.D. 98 M

McDERMOTT – HUDSON
LONDON – ENGLAND

FAB. STDS. REQ'D. THIS SHT

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP	DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

DWG NO ELN 2131 SHEET NO 149



REFERENCE

DATE 25 APR 1975

HORIZONTAL FRAMING PLAN @ EL(-)38'-11" (11861)
(SCALE 3/8" : 1'-0")

FAB. STDS. REQ'D. THIS SHT

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

APPROVED
Mc DERMOTT — HUDSON
DATE
ENGINEERS APPROVAL

	BY	DATE

ELF-NORGE A/S
NORWAY

DRILLING PLATFORM No.1

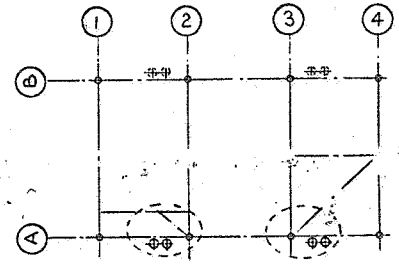
NORTH SEA FRIGG FIELD W.D. 98 M

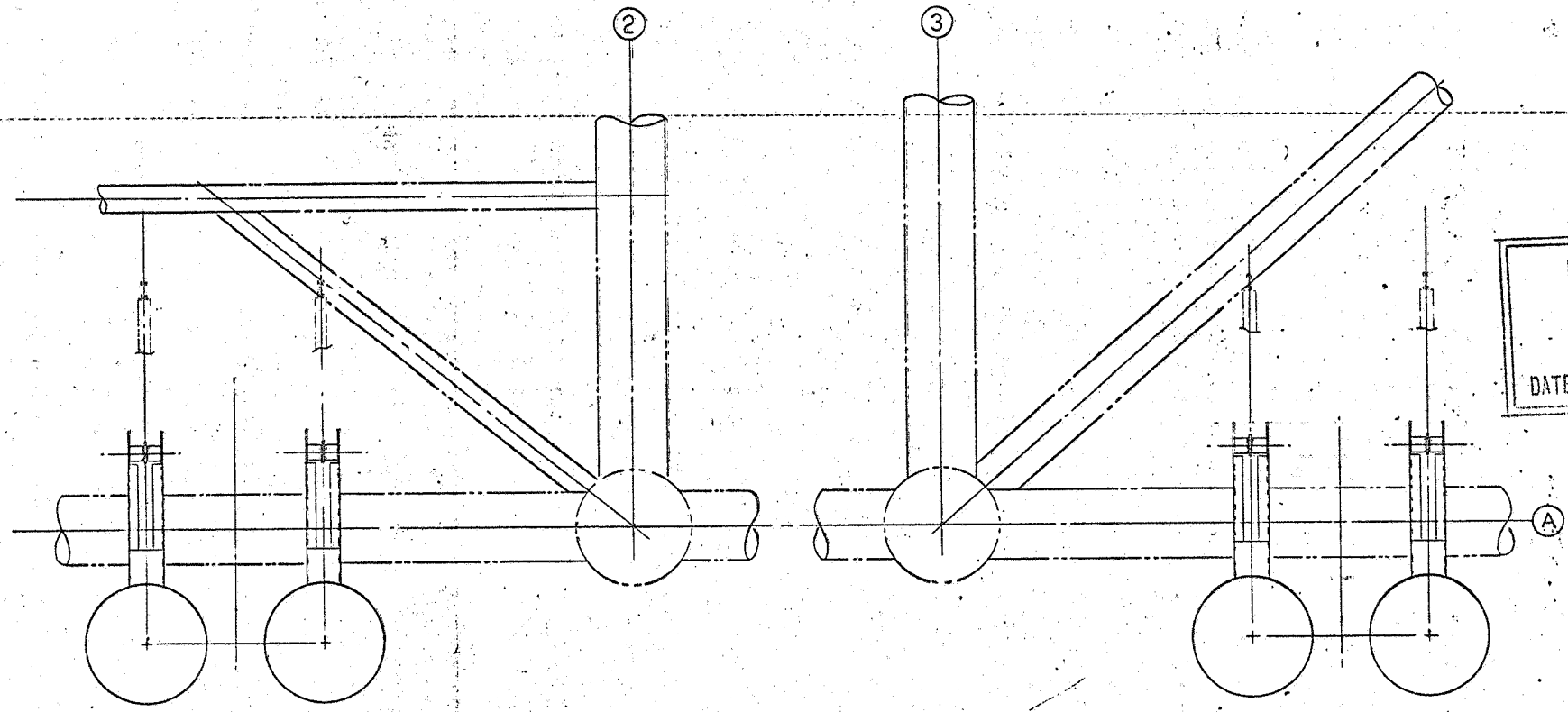
McDERMOTT — HUDSON
LONDON — ENGLAND

DRAWN BY	SCALE	DATE	DWG NO
R. REMEDIOS	3/8" : 1'-0"		ELN 2131
DESIGNED BY			149

SHEET NO 150

DWG NO ELN 2181





REFERENCE

DATE 25 APR 1975

DETAIL 150-1

DETAIL 150-2.

APPROVED

Mc DERMOTT — HUDSON

DATE

ENGINEERS APPROVAL

	BY	DATE
PROJECT		
PROCESS		
MECHANICAL		
ELECTRICAL		
INSTRUMENTS		
PIPING		

ELF-NORGE A/S
NORWAY

DRILLING PLATFORM No.1

NORTH SEA FRIGG FIELD W.D. 98 M

McDERMOTT — HUDSON
LONDON — ENGLAND

DRAWN BY	SCALE	DATE	DWG. NO.
R.T. MOSS	3/8" : 1'-0"	16 APRIL 75	ELN 2181
DESIGNED BY			SHT. NO. 150

62" ϕ TYPE 2 BUOYANCY TANK CLAMPS AT EL -(-) 38'-11"

A

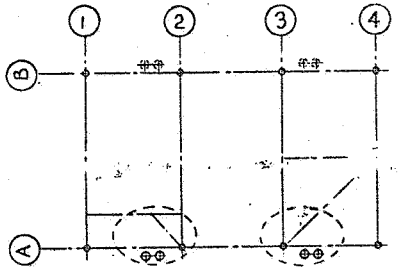
FAB. STDS. REQ'D. THIS SHT

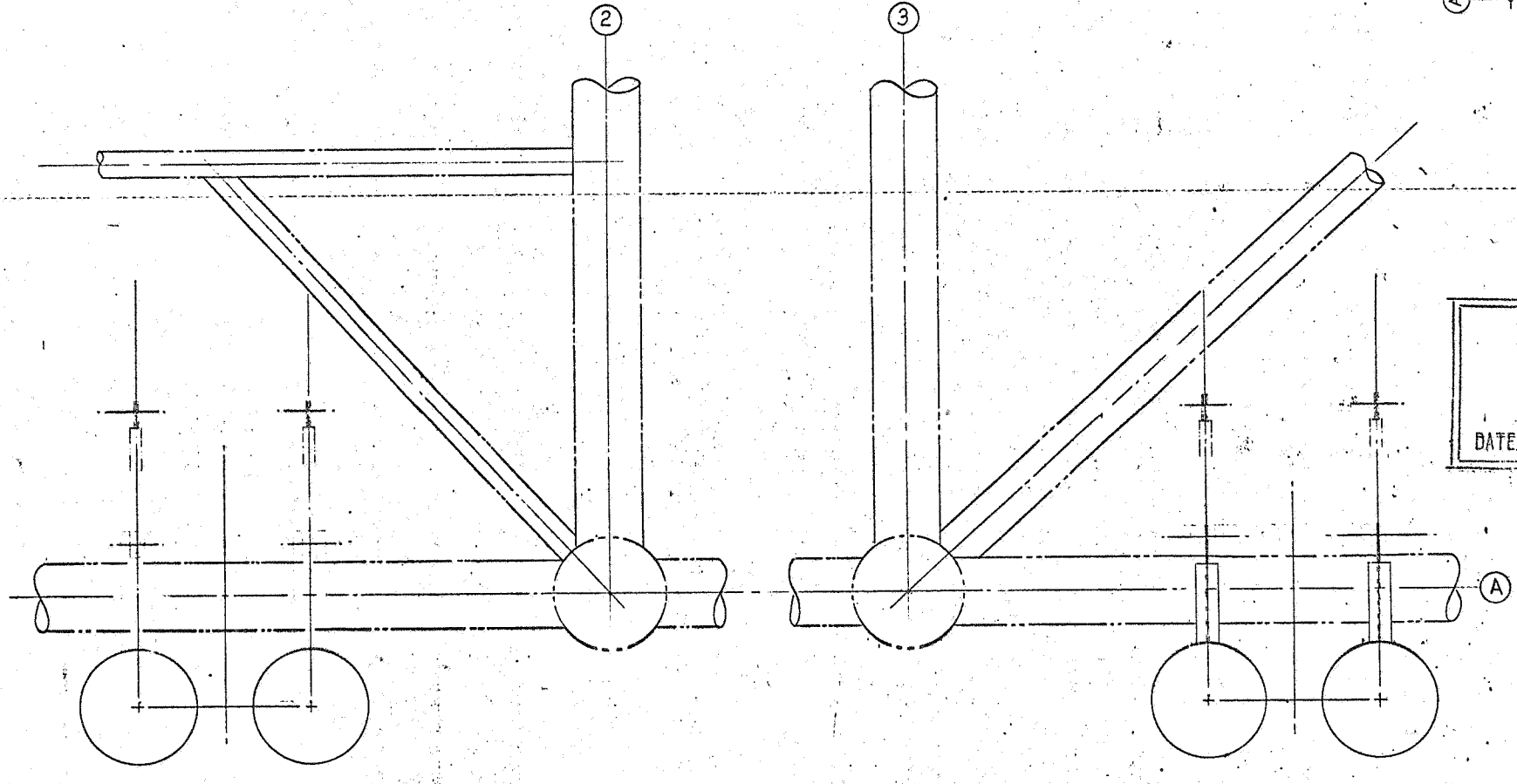
DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

SHEET NO 151

DWG NO ELN 2181





REFERENCE

DATE 25 APR 1975

DETAIL 151 -1.

DETAIL 151.-2.

FAB. STDS. REQ'D. THIS SHT	DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP	DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

APPROVED
Mc DERMOTT — HUDSON
DATE:
ENGINEERS APPROVAL

	BY	DATE
PROJECT		
PROCESS		
MECHANICAL		
ELECTRICAL		
INSTRUMENT		
PIPING		

ELF-NORGE A/S
NORWAY

DRILLING PLATFORM NO.1

NORTH SEA FRIGG FIELD W.D. 98 M

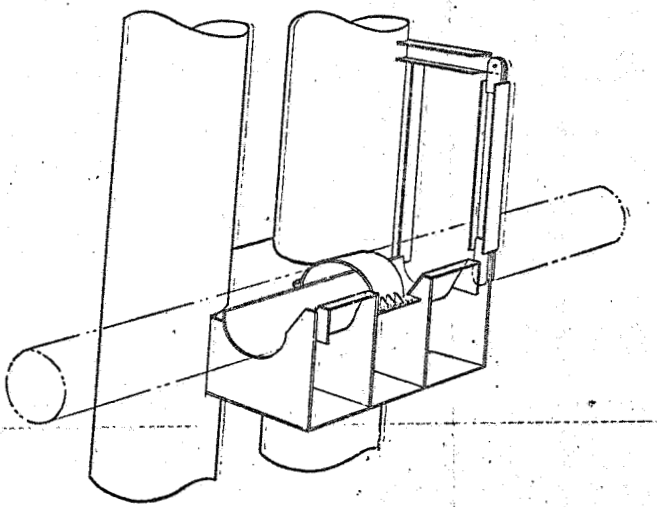
McDERMOTT — HUDSON
LONDON — ENGLAND

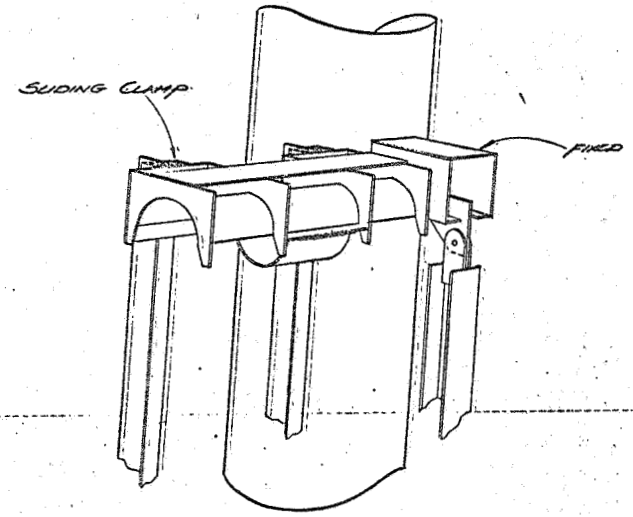
DRAWN BY	SCALE	DATE	DWG NO
R.T MOSS	3/8" = 1'-0"	16 APRIL 75	ELN 2181
DESIGNED BY			SHEET NO 151

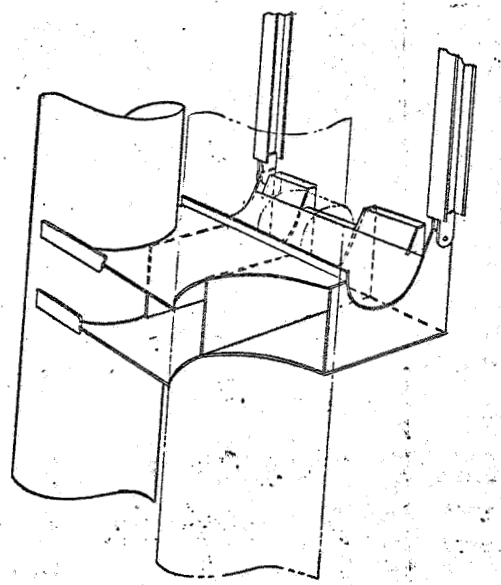
42" ø TYPE 2 BUOYANCY TANK CLAMPS AT EL(-) 96'-1"

SHEET NO 152

DWG NO ELN 2181







FAB. STDS. REQ'D. THIS SHT

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

APPROVED
McDERMOTT — HUDSON
DATE
ENGINEERS APPROVAL

	BY	DATE
PIPING		
STRUCTURAL		
ELECTRICAL		
INSTRUMENTATION		
PLANT LAYOUT		
MATERIALS		

ELF-NORGE A/S
NORWAY

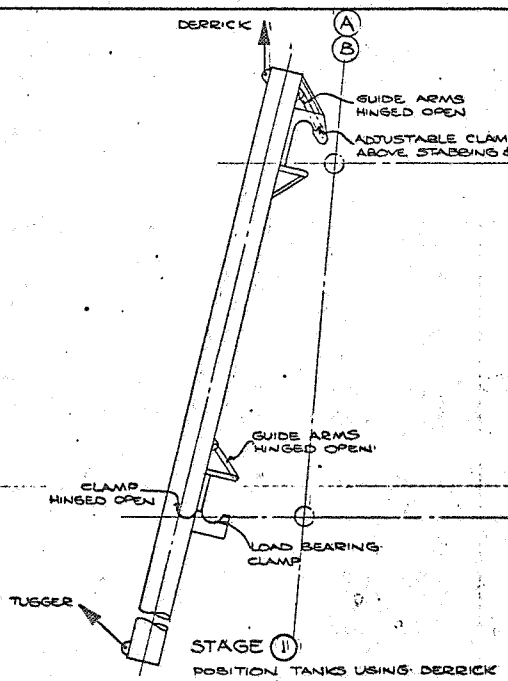
DRILLING PLATFORM No.1

NORTH SEA FRIGG FIELD W.D. 98 M

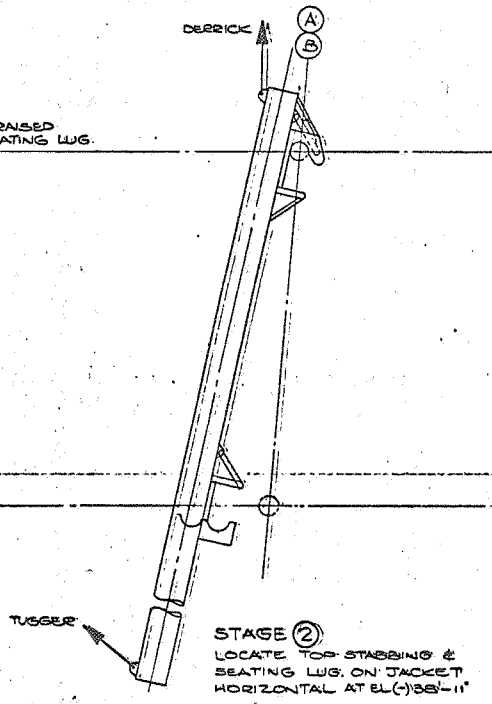
McDERMOTT — HUDSON
LONDON — ENGLAND

DRAWN BY	SCALE	DATE	DWG NO
I. Rancelles	N.T.S.	21-APR-75	ELN 2181.
DESIGNED BY			SHEET NO 152

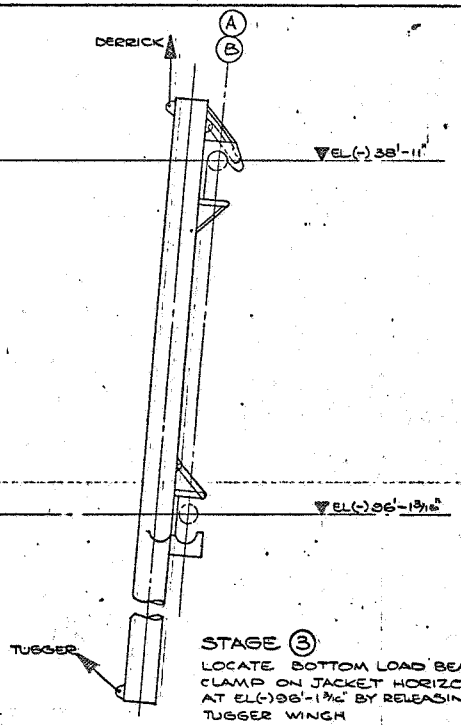
DWG. NO ELN 2181 | SHEET NO 153



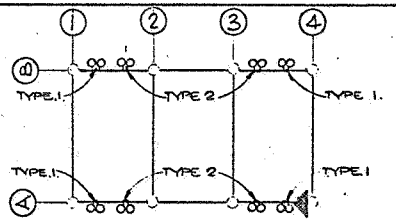
STAGE (1)
POSITION TANKS USING DERRICK BARGE & TUGGER WINCH.



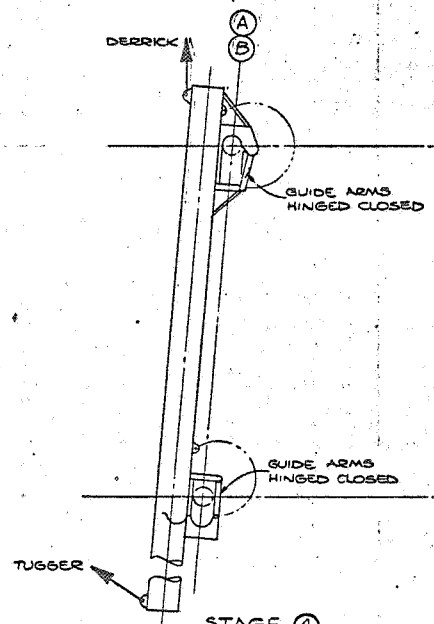
STAGE (2)
LOCATE TOP STABBING & SEATING LUG. ON JACKET HORIZONTAL AT EL(-)38'-11"



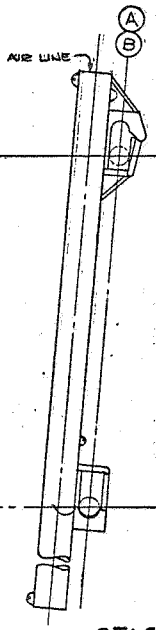
STAGE (3)
LOCATE BOTTOM LOAD BEARING CLAMP ON JACKET HORIZONTAL AT EL(-)96'-1 3/16" BY RELEASING TUGGER WINCH



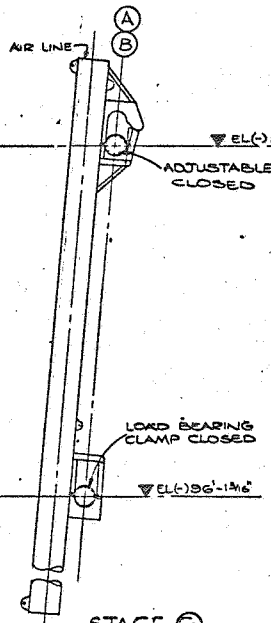
KEY PLAN



STAGE (4)
CLOSE CLAMP GUIDE ARMS & RELEASE TANKS FROM DERRICK & TUGGER.



STAGE (5)
PART FILL WITH AIR UNTIL TANK IS SEATED IN BOTTOM LOAD BEARING CLAMP (FASTEN BOTTOM CLAMP.



STAGE (6)
LOCATE & FASTEN TOP ADJUSTABLE CLAMP.

STAGE (7) FILL TANKS WITH AIR.

REFERENCE
DATE 25 APR 1975

DRAFTING STILL IN PROGRESS

FAB. STDS. REQ'D. THIS SHT

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

APPROVED
for McDERMOTT — HUDSON
DATE:

ENGINEERS APPROVAL

	BY	DATE

ELF-NORGE A/S
NORWAY

DRILLING PLATFORM NO.1

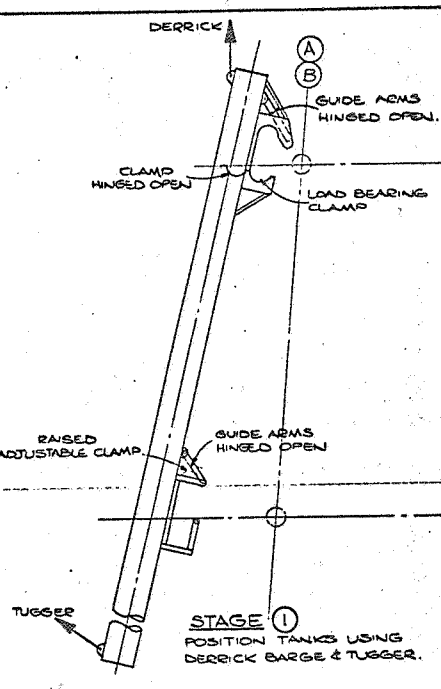
NORTH SEA FRIGG FIELD W.D. 98 M

McDERMOTT — HUDSON
LONDON — ENGLAND

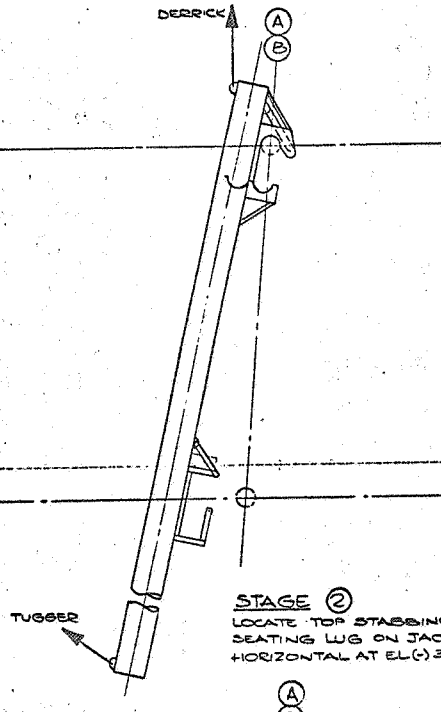
DRAWN BY	SCALE	DATE	DWG. NO.
G. HALL	3/32" - 1'-0"	21 APR. 75	ELN 2181
DESIGNED BY			SHEET NO. 153

SHEET NO 154.

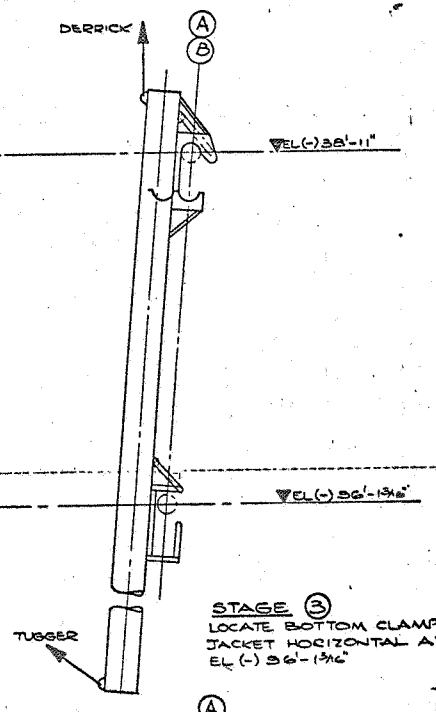
DWG NO ELN 2181



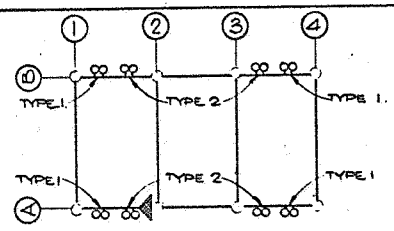
STAGE (1)
POSITION TANKS USING DERRICK BARGE & TUGGER.



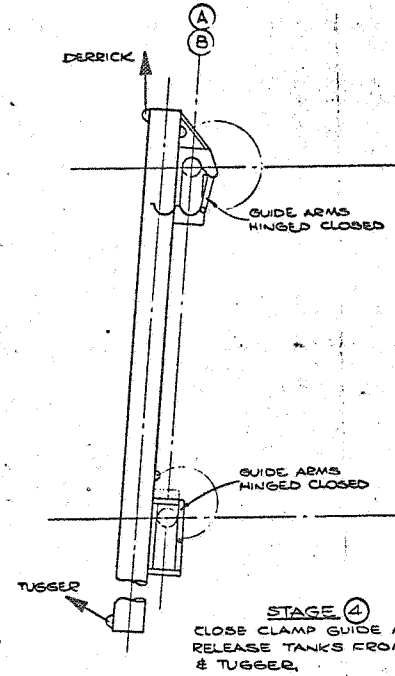
STAGE (2)
LOCATE TOP STABBING & SEATING LUG ON JACKET HORIZONTAL AT EL(-) 38'-11"



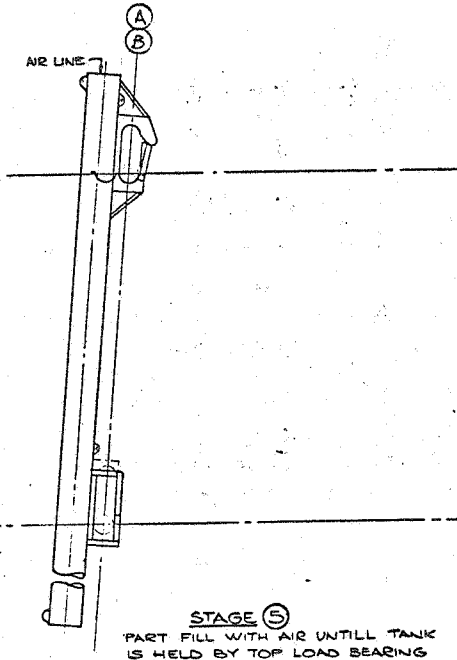
STAGE (3)
LOCATE BOTTOM CLAMP ON JACKET HORIZONTAL AT EL (-) 56'-1⅜"



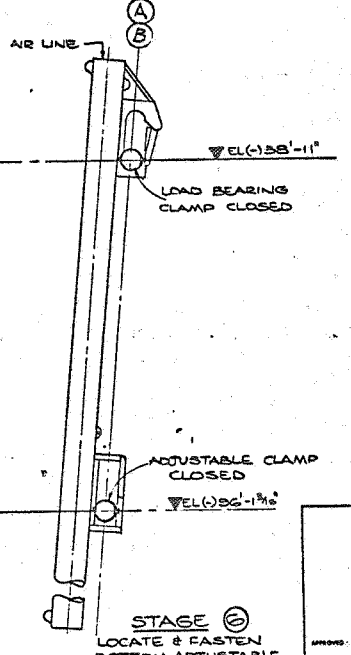
KEY PLAN



STAGE (4)
CLOSE CLAMP GUIDE ARMS & RELEASE TANKS FROM DERRICK & TUGGER.



STAGE (5)
PART FILL WITH AIR UNTILL TANK IS HELD BY TOP LOAD BEARING CLAMP (FASTEN TOP CLAMP)



STAGE (6)
LOCATE & FASTEN BOTTOM ADJUSTABLE CLAMP.

STAGE (7) FILL TANKS WITH AIR

DRAFTING STILL IN PROGRESS

ELF-NORGE A/S
NORWAY

DRILLING PLATFORM No.1

NORTH SEA FRIGG FIELD W.D. 98 M

McDERMOTT — HUDSON
LONDON — ENGLAND

DRAWN BY	SCALE	DATE	DWG NO
G.HALL	3/32" - 1'-0"	21 APR 75	ELN 2181
CHECKED BY			SHEET NO 154

62' ø BUOYANCY TANK TYPE 2 INST. SEQUENCE A

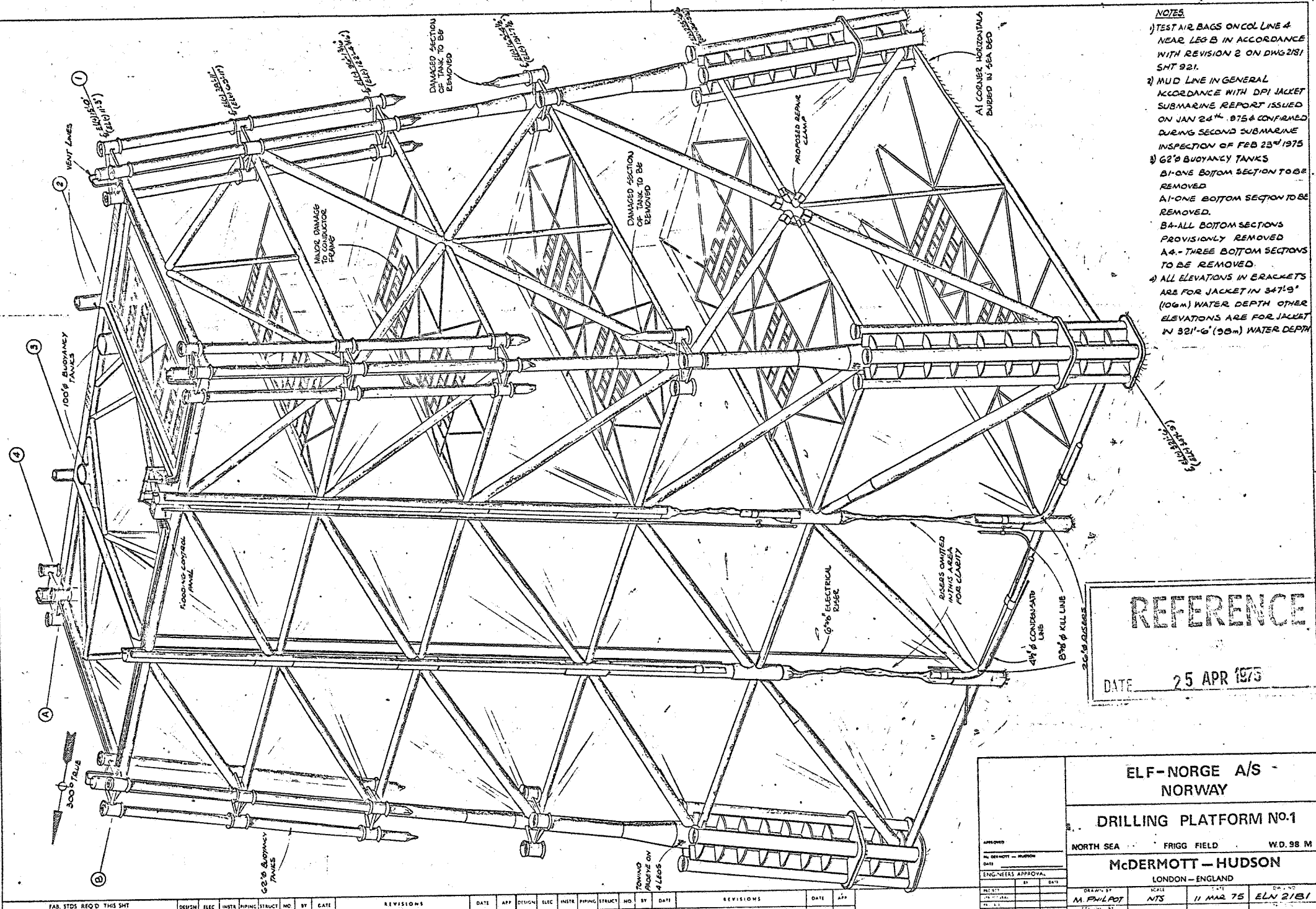
APPROVED
Mc DERMOTT — HUDSON
DATE
ENGINEERS APPROVAL

FAB. STDS. REQ'D. THIS SHT

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

DWG NO ELN 2181 | SHEET NO 340



NOTES

1) TEST AIR BAGS ON COL LINE 4 NEAR LEG B IN ACCORDANCE WITH REVISION 2 ON DWG 2181 SHT 921.
2) MUD LINE IN GENERAL ACCORDANCE WITH DPI JACKET SUBMARINE REPORT ISSUED ON JAN 24TH 1975 & CONFIRMED DURING SECOND SUBMARINE INSPECTION OF FEB 23RD 1975
3) 62'ø BUOYANCY TANKS
   B1-ONE BOTTOM SECTION TO BE REMOVED
   A1-ONE BOTTOM SECTION TO BE REMOVED.
   B4-ALL BOTTOM SECTIONS PROVISIONLY REMOVED
   A4-THREE BOTTOM SECTIONS TO BE REMOVED.
4) ALL ELEVATIONS IN BRACKETS ARE FOR JACKET IN 347'-9" (106m) WATER DEPTH OTHER ELEVATIONS ARE FOR JACKET IN 321'-6" (98m) WATER DEPTH

REFERENCE

DATE 25 APR 1975

FAB. STDS REQ'D THIS SHT

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

APPROVED
Mc DERMOTT — HUDSON
DATE

ENG. NEERS APPROVAL

	BY	DATE

ELF-NORGE A/S
NORWAY

DRILLING PLATFORM No.1

NORTH SEA · FRIGG FIELD · W.D. 98 M

McDERMOTT — HUDSON
LONDON — ENGLAND

DRAWN BY	SCALE	DATE	DWG NO
M. PHILPOT	NTS	11 MAR 75	ELN 2181
DES. APPR. BY			340

JACKET PERSPECTIVE