ELF-NORGE A/S

FRIGG FIELD, NORTH SEA

TREATMENT PLATFORM No.1

INSTALLATION PROCEDURE

TP1-F-201-O-FRF002

PRELIMINARY PRINT

Prepared By :

McDermott Hudson
Ramsey House
Central Square
Wembley
Middlesex HA9 7DE

March 17, 1975

TABLE OF CONTENTS

1.0 INTRODUCTION

ELF-NORGE A/S are developing their concessions in Frigg Field of the North Sea. One of the facilities in their Frigg complex is a concrete gravity type structure designated Treatment Platform No.1. This structure has a base 72 metres square by about 40 metres high and is topped by two concrete columns 8 metres in diameter and 36.77 metres centerline to centerline. On top of these columns will be a steel support frame which will support the treatment modules and equipment. The structure is designed for 104 metres water depth. Sea Tank/McAlpine is fabricating the concrete gravity foundation and is currently scheduled to tow the structure to a Scottish Loch on 15 November 1975.

This installation procedure covers only the erection of the steel portion of the structure (Sea Tank will place and level the gravity foundation) and is intended to serve as a guide to the equipment proposed for use and the proposed sequence of operations.

It should be realised that any construction procedure is subject to change as equipment and procedure development is updated prior to job initiation and during the actual event of construction offshore. This procedure should be regarded as a general guide to operations and not as a rigid definitive text on the step-by-step procedure which will be followed offshore.

2.0 SUPPORT FRAME INSTALLATION

The gravity foundation, fabricated by Sea Tank/McAlpine, will be completed and ready for tow by 15 November 1975. The foundation will be towed to a Loch on the Scottish Coast, submerged to at least design depth and firmly anchored by Sea Tank. TP1 proposed anchor patterns of the gravity foundation should be submitted at an early date such that anchoring patterns for the D.B.22 and the structure may be coordinated to be as compatible as possible. Anchoring two floating vessels in such close proximity involves an inherent risk of losing anchors due to crossed anchor wires.

CMP in Dunkerque, France will load out and sea fasten the following components onto two Puget Sound Barges, the PS 258 and the Titan 7, for towing to the same Scottish Loch.

1. 2 each tie-in cans, approximately 33 ft. diameter by 10 ft., 100 tons each (Drawing ELN 2124, Sheet 150)

2. Support frame consisting of 4 separate sections (Drawing ELN 2124, Sheets 101, and 902)

   a. 2 each half support frames with transverse deck tubes
      760 tons, 150 ft. by 76 ft.

   b. 2 each cantilever deck support trusses (shipped in 3 pieces each, Drawing ELN 2124, Sheet 106)
      160 tons, 124 ft. by 39 ft.

Skal være 80 T på hver?

3. One central tank, approximately 18 ft. diameter by 55 ft., 75 tons (Drawing ELN 2124, Sheet 103)

4. Shipped-loose items

2.0 SUPPORT FRAME INSTALLATION Continued ...

2.1 Tie-in Cans

Reference Drawing ELN 2124, Sheets 150 and 156. After the structure is ballasted and anchored, tie-in cans will be placed. With the D.B.22 in position on the East side of the structure, stern to, and the material barge tied alongside, the North tie-in can will be lifted from the material barge with 70 ft. slings and $2\frac{1}{2}$ in. shackles and the No.2 block. The lift will be swung into position and utilising the stabbing/line-up guides provided (Sheet 156), will be set in place. A scaffold on the concrete column should be provided by the fabricator for positioning the tie-in cans and for Sea Tank to work from.

Sea Tank will ballast the structure back to level, and the South tie-in can will be placed in a similar manner.

Sea Tank will level, grout and bolt down the two tie-in cans and assure that the top of each can is at the same elevation. Sea Tank will provide an accurate measurement of the center-to-center distance between the two erected cans. A temporary bridge between columns A and B has been installed by the fabricator. D.B.22 will remove this temporary bridge at a time directed by Elf/Sea Tank (prior to installing the support frame) and place it on a vessel provided by Elf/Sea Tank for transportation to shore.

After the bridge is removed, any personnel access ways which could not be installed due to the bridge will be placed and welded out.

2.0 SUPPORT FRAME INSTALLATION Continued ...

2.2 Support Frame

Reference Drawing ELN 2124, Sheets 101, 157, 171, 112
Drawing ELN 2197, Sheets 901, 902

With Derrick Barge 22 still on the East side of the structure, stern to, and with the material barge on the stern of D.B. 22 between the derrick and the structure, the North half support frame will be lifted from the material barge. The material barge will be towed out of the way and the D.B.22 will move back to the structure on anchors to the position shown on ELN 2197, Sheet 901.

The support frame has padeyes for 4 each 70 ft. slings with 400 ton greenpin shackles. The centre of gravity is about 7 ft. outboard of the centre of the central can on the transverse deck tubes, pre-fabricated sister plates will be used to level the lift (Sheet 157). Two line-up guides are fabricated for installation on the tie-in cans and double as external stabbing guides (Sheet 171). Scaffold brackets and board are pre-installed (Sheets 170-173).

As the load (760 tons) is placed on the floating gravity foundation, considerable additional displacement will occur with resulting tilting of the foundation. This will necessarily have to be countered with concurrent ballasting/deballasting of the foundation by Sea Tank as the lift is being placed to keep the foundation reasonably level as the load is being placed on the tie-in can.

After setting the first half support frame, Sea Tank will level the structure by selective ballasting. Eight jacking seats are provided around the can to bring the half support frame into level with the tie-in can.

2.0 SUPPORT FRAME INSTALLATION Continued ...

2.2 Support Frame Continued ...

The North half support frame will be levelled using a water level and Simplex Re-Mo-Trol 1110A jacks and checked for alignment using a transit on the other column. The frame will then be welded out.

This procedure will be repeated for the South half support frame.

After second half of the support frame is set, levelled and aligned with the first half, the erector splice pieces are to be fitted and welded out (Sheet 112). At this time, final measurements will be made between central tank abutments and the central tank will be cut to fit and prepared for installation. The line-up guide at the North splice line is shipped loose and will be installed at this time (ELN 2124, Sheet 117). Deck support trusses between truss rows SA and SB and between SC and SD are shipped loose for final assembly on the material barge after field measurements confirm dimensions (Sheet 106). These may also be prepared for installation at this time.

2.3 Central Tank

Reference Drawing ELN 2124, Sheets 116 and 119
Drawing ELN 2197, Sheet 903

The central tank is approximately 18 ft. in diameter, 53 ft. long and weighs about 75 tons (Sheet 116). Padeyes are installed for 4-70 ft. slings and 100 ton swl shackles.

With the D.B.22 still on the East side of the structure as before and the material barge alongside, the central tank will be lifted with the auxiliary No.2 block and set in place into fabricator installed splice plates and welded out (ELN 2124, Sheet 119, ELN 2197, Sheet 903).

2.0 SUPPORT FRAME INSTALLATION Continued ...

2.4 Cantilever Deck Support Trusses

Reference Drawing ELN 2124, Sheets 106, 136, 137, 126, 135

Drawing ELN 2197, Sheets 904, 905

After the cantilever sections are fitted and welded out and a temporary erection brace installed between the short sections (ELN 2197, Sheet 904), and with D.B.22 in the same position, the West cantilever section will be lifted and set into place. Stabbing guides are provided as shown on Drawing ELN 2124, Sheets 136 and 137. Levelling and alignment will be accomplished using 100 ton jacks with a 10 inch stroke as shown on Sheet 136, temporary erection aids will be removed and the truss will be welded out (Sheets 126, 136, 137).

The East truss will be set in a similar manner as shown on ELN 2197, Sheet 905.

2.5 Miscellaneous Shipped-Loose Items

Reference Drawing ELN 2124, Sheets 141-143, 279, 130, 140, 120

Ten pump casings (Sheets 141, 142, 279) will be installed, each piece 25' $3\frac{1}{8}$" long, diameters range from 14" to 32" and 4 external stabbing guides are provided on the circumference of each fabricator installed casing segment. Bar grating with hand rail should be pre-fabricated on casing guide support which is roughly 5 ft. below splice to be welded.

A segment of the sump caisson, see Sheet 143, (36"Ø x 0.75 wall x 25'11" long) will now be installed - six external stabbing guides are installed on the lower (existing) segment. This sump has four internal pipes ranging in diameter from 2.$\frac{3}{8}$" to 12.$\frac{3}{4}$" that

2.0 SUPPORT FRAME INSTALLATION Continued ...

2.5 Miscellaneous Shipped-Loose Items Continued ...

must be lined up and spliced. Pups will be provided and a window is cut for welding and fitting. Line-up guides need to be installed on this segment. Connection of existing to new caisson will be provided by an oversized (39") tie-in piece.

Fit and weld all loose cellar deck sheeting and walkways (Sheets 130, 140) and cover plates on the central columns (Sheet 120).

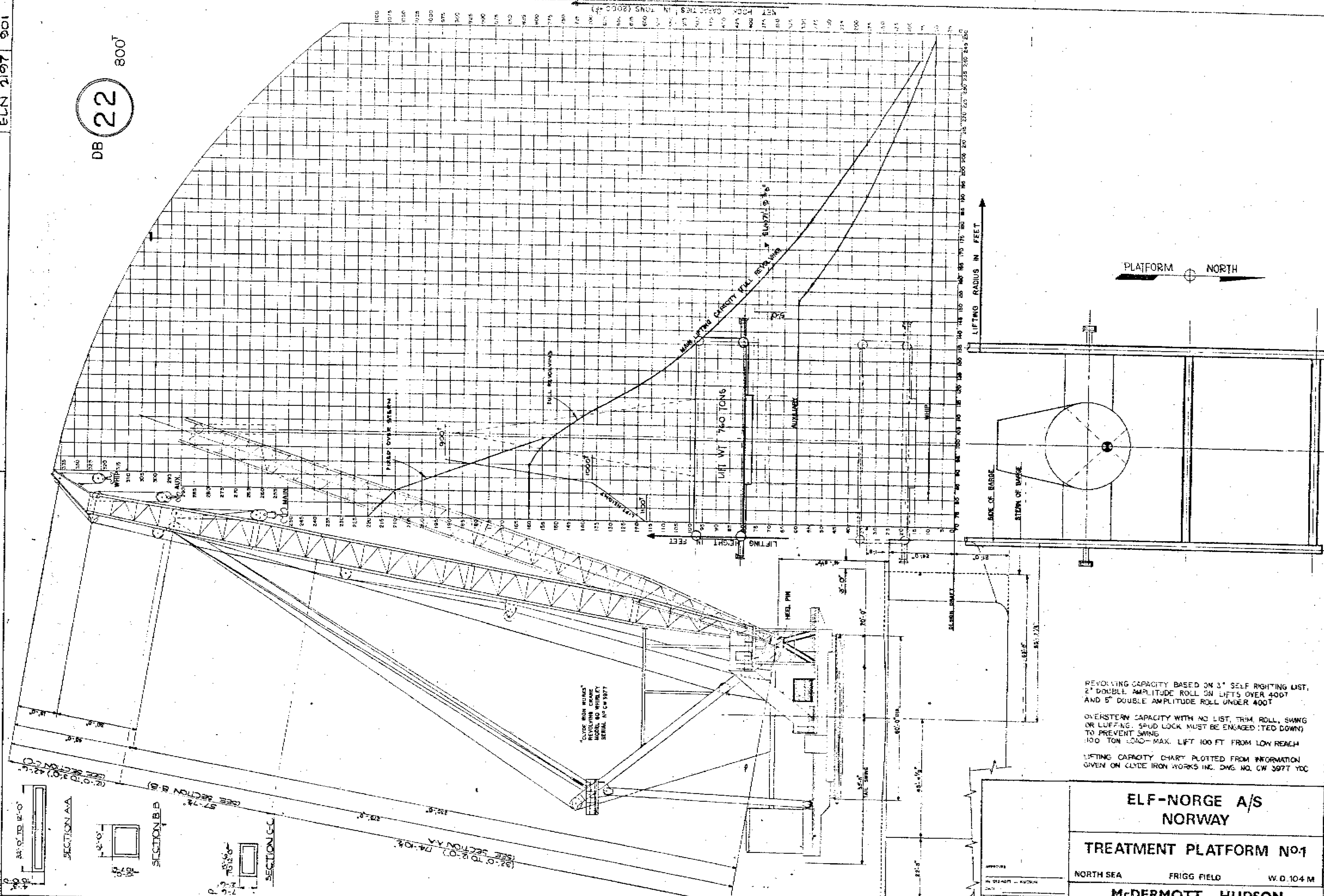
DRAWING REGISTER

SECTION STRUCTURAL SHT. 1 OF 1

COMPANY :- ELF NORGE
SUBJECT :- TRANSPORTATION & LOADOUT
PROJECT ENGINEER :-

PROJECT TITLE :- TREATMENT PLATFORM Nº 1
PROJECT Nº :- ELN 2197
CONTROL TO W/E :-

DRG. Nº	TITLE	ACTUAL START	IN CHECK	BACK DRAFT	REVISION											REMARKS
					A.F.C.	0	1	2	3	4	5	6	7	8	9	
901	NORTH UNIT LIFT CHART															
902	SOUTH UNIT LIFT CHART															
903	CENTRAL TANK LIFT CHART															
904	TRUSSES SD, S3 & S4 LIFT CHART															
905	TRUSSES SA, S3 & S4 LIFT CHART															
951	NORTH UNIT ASSEMBLY SEQUENCE															
952	SOUTH UNIT ASSEMBLY SEQUENCE															
953	CENTRAL TANK ASSEMBLY SEQUENCE															
954	TRUSSES SD, S3 & S4 ASSY SEQUENCE															
954	TRUSSES SA, S3 & S4 ASSY SEQUENCE															



REVOLVING CAPACITY BASED ON 3° SELF RIGHTING LIST, 2° DOUBLE AMPLITUDE ROLL ON LIFTS OVER 400T AND 5° DOUBLE AMPLITUDE ROLL UNDER 400T

OVERSTERN CAPACITY WITH NO LIST, TRIM, ROLL, SWING OR LUFFING. SPUD LOCK MUST BE ENGAGED (TED DOWN) TO PREVENT SWING
100 TON LOAD – MAX. LIFT 100 FT FROM LOW REACH

LIFTING CAPACITY CHART PLOTTED FROM INFORMATION GIVEN ON CLYDE IRON WORKS INC. DWG. NO. CW 3977 YOC

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
															#W-E	1	RN	[illegible]	REDRAWN		

ELF-NORGE A/S
NORWAY

TREATMENT PLATFORM No1

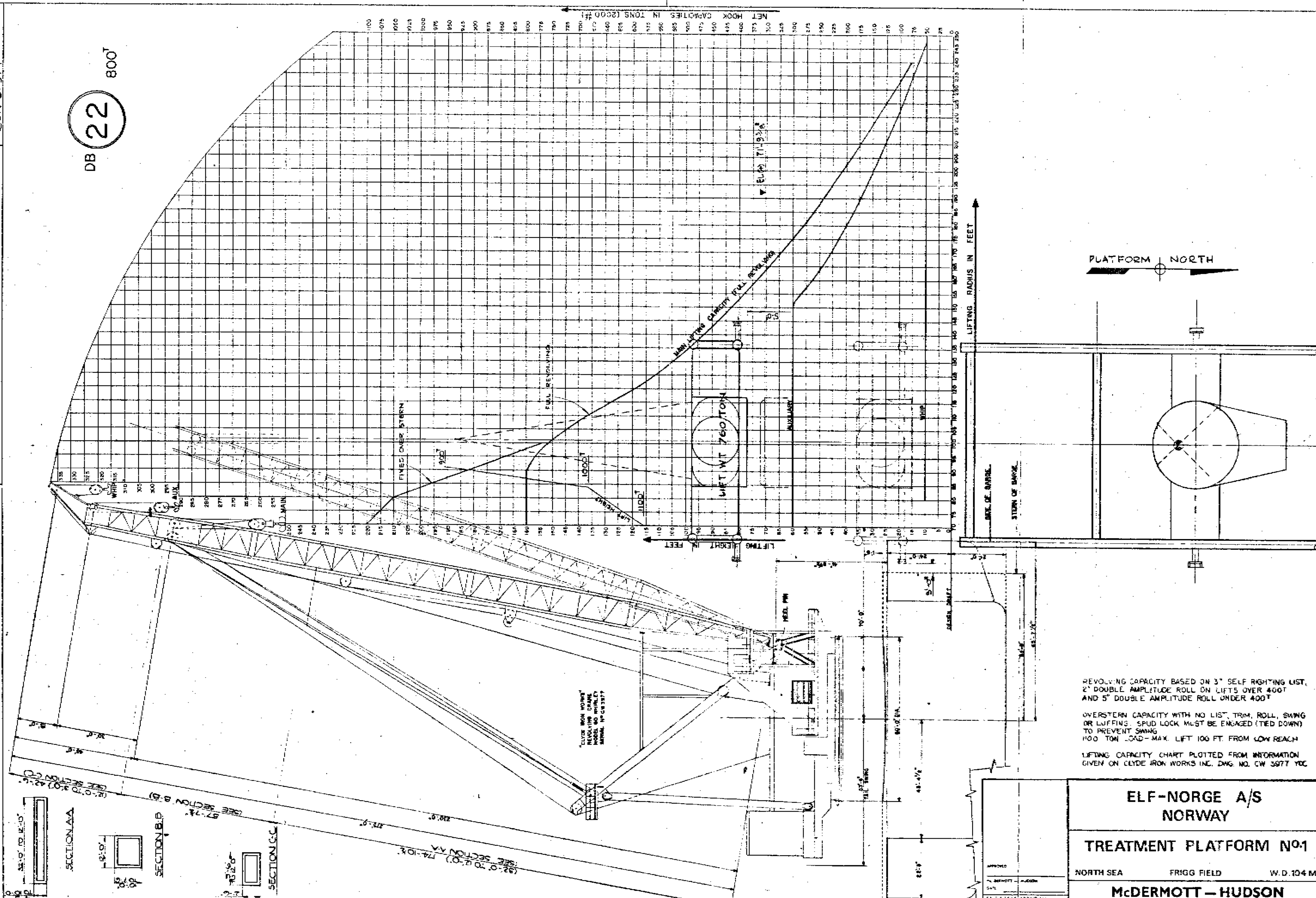
NORTH SEA — FRIGG FIELD — W.O. 104 M

McDERMOTT – HUDSON
LONDON – ENGLAND

DRAWN BY	SCALE	DATE	DWG NO
K.SNOWDON	1/16" = 1'-0"	23rd JAN 75	ELN 2197
CHECKED BY			SHEET NO 901

NORTH UNIT LIFTING CHART

DWG. NO. ELN 2197 SHEET NO. 902



REVOLVING CAPACITY BASED ON 3° SELF RIGHTING LIST, 2° DOUBLE AMPLITUDE ROLL ON LIFTS OVER 400T AND 5° DOUBLE AMPLITUDE ROLL UNDER 400T

OVERSTERN CAPACITY WITH NO LIST, TRIM, ROLL, SWING OR LUFFING. SPUD LOCK MUST BE ENGAGED (TIED DOWN) TO PREVENT SWING
1100 TON LOAD - MAX. LIFT 100 FT. FROM LOW REACH

LIFTING CAPACITY CHART PLOTTED FROM INFORMATION GIVEN ON CLYDE IRON WORKS INC. DWG. NO. CW 3977 YOC

ELF-NORGE A/S
NORWAY

TREATMENT PLATFORM No 1

NORTH SEA — FRIGG FIELD — W.D. 104 M

McDERMOTT — HUDSON
LONDON — ENGLAND

DRAWN BY	SCALE	DATE	DWG. NO.
K.W. SNOWDON	1/16" = 1'-0"	23rd JAN. 75	ELN 2197
			SHEET NO. 902

SOUTH UNIT LIFT CHART

FAB. STDS. REQ'D. THIS SHT

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO.	BY	DATE	REVISIONS	DATE	APP
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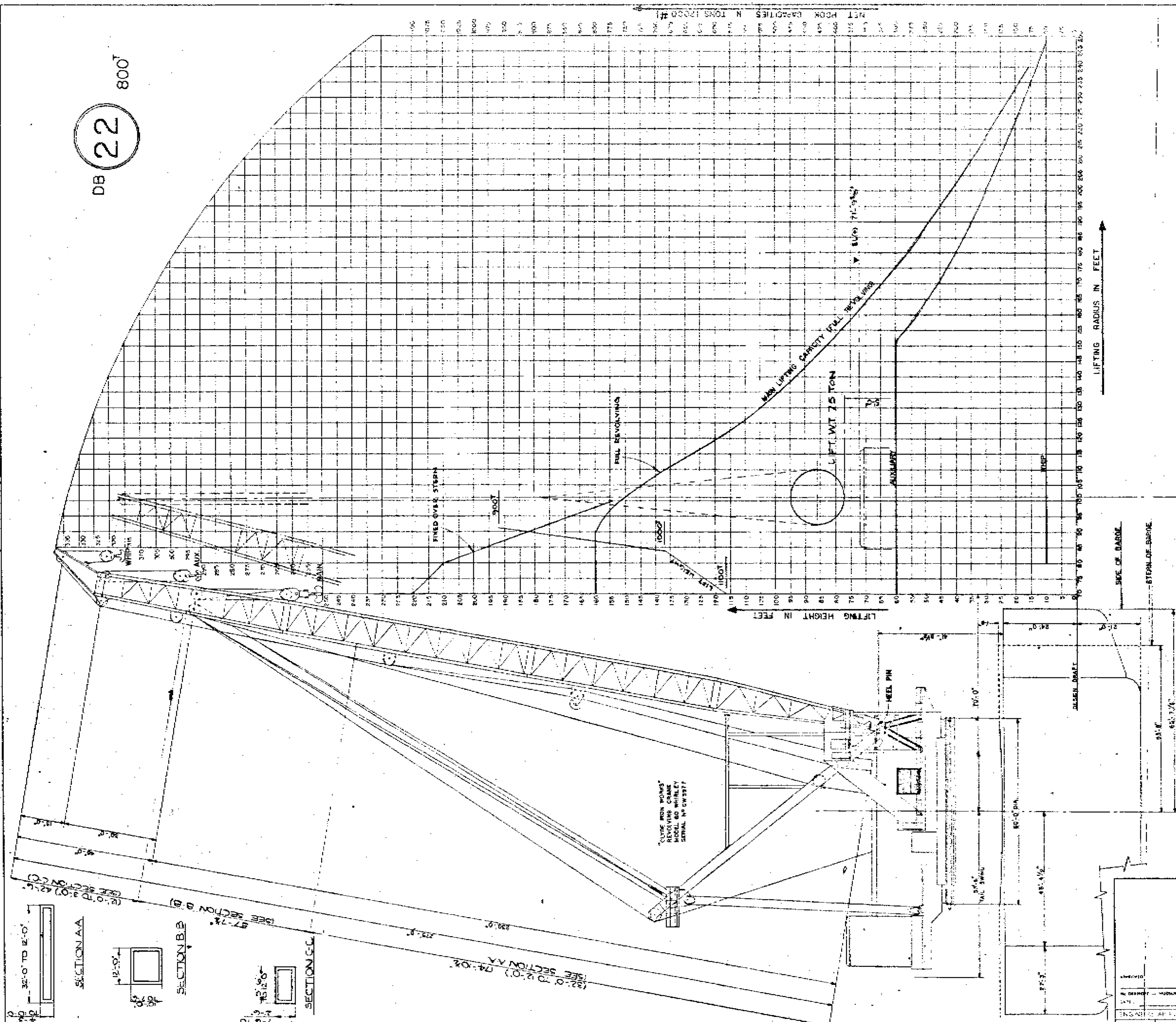
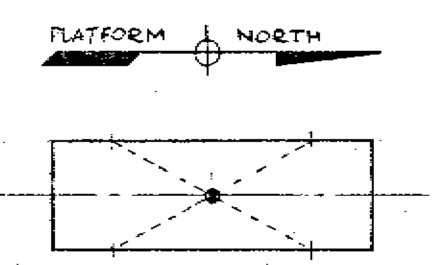
DWG NO ELN 2197 SHEET NO 903

DB 22 800T





REVOLVING CAPACITY BASED ON 3° SELF RIGHTING LIST, 2° DOUBLE AMPLITUDE ROLL ON LIFTS OVER 400T AND 5° DOUBLE AMPLITUDE ROLL UNDER 400T

OVERSTERN CAPACITY WITH NO LIST, TRIM, ROLL, SWING OR LUFFING. SPUD LOCK MUST BE ENGAGED (TIED DOWN) TO PREVENT SWING.
1100 TON LOAD - MAX. LIFT 100 FT. FROM LOW REACH

LIFTING CAPACITY CHART PLOTTED FROM INFORMATION GIVEN ON CLYDE IRON WORKS INC. DWG NO. CW 3977 YCC

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
																1	RN		REDRAWN		

ELF-NORGE A/S
NORWAY

TREATMENT PLATFORM No.1

NORTH SEA | FRIGG FIELD | W.D.104 M

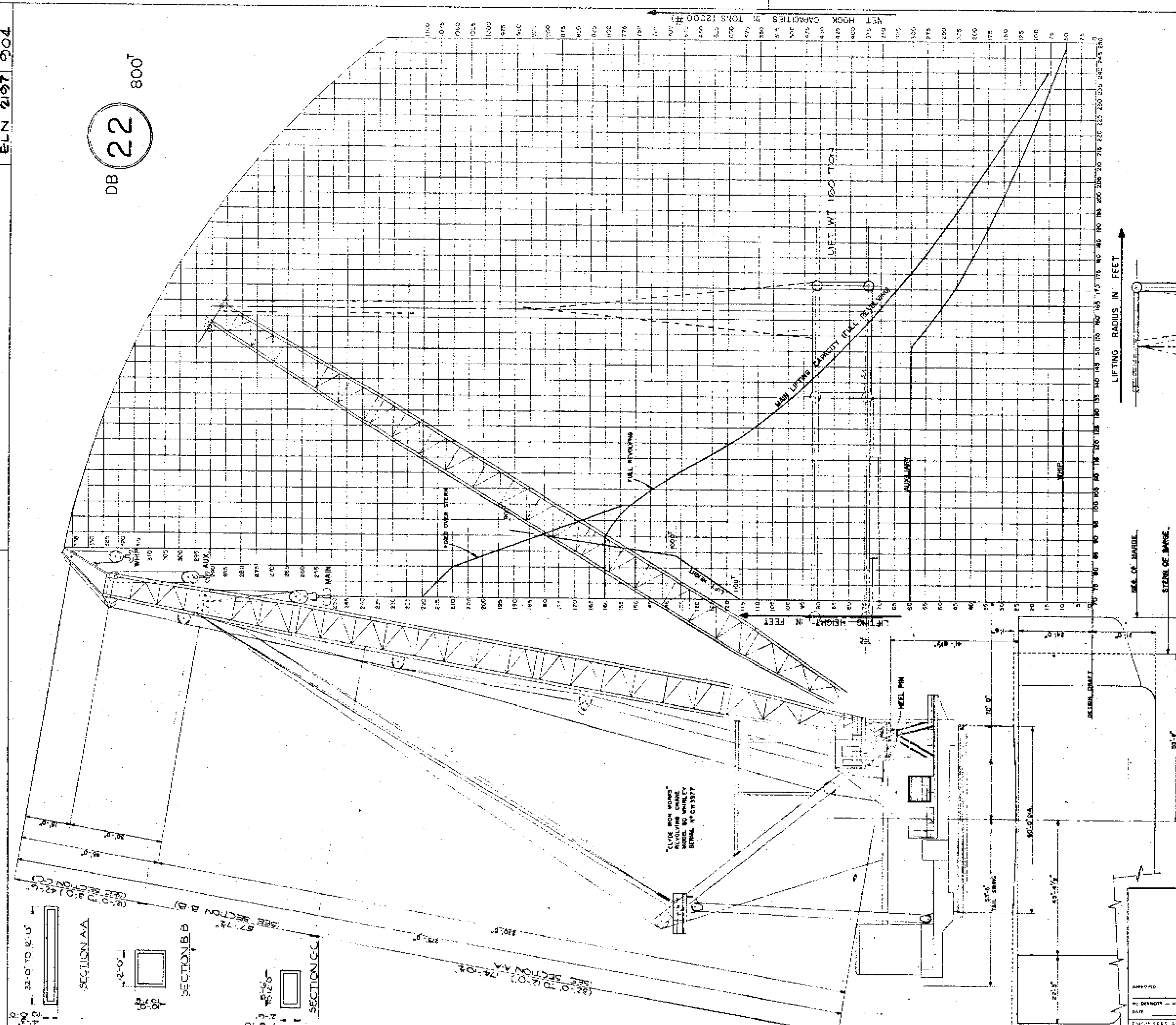
McDERMOTT — HUDSON
LONDON — ENGLAND

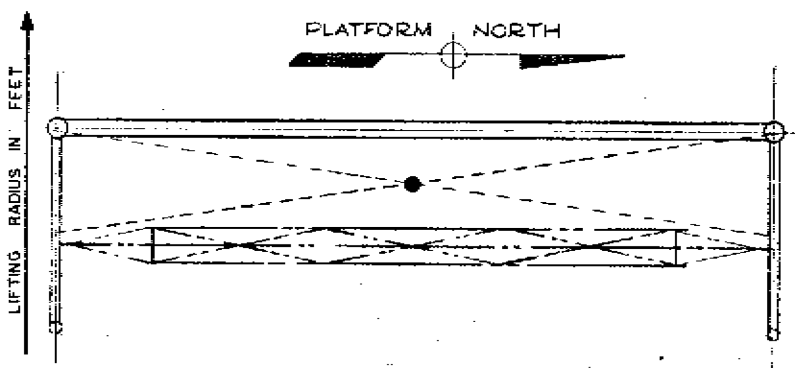
DRAWN BY	SCALE	DATE	DWG NO
K.W. SNOWDON	1/8" = 1'-0"	23rd JAN 75	ELN 2197
			SHEET NO 903

CENTRAL TANK LIFT CHART

DWG NO ELN 2197 SHEET NO 904

DB 22 800T





REVOLVING CAPACITY BASED ON 3° SELF RIGHTING LIST, 2° DOUBLE AMPLITUDE ROLL ON LIFTS OVER 400T AND 5° DOUBLE AMPLITUDE ROLL UNDER 400T

OVERSTERN CAPACITY WITH NO LIST, TRIM, ROLL, SWING OR LUFFING. SPUD LOCK MUST BE ENGAGED (TIED DOWN) TO PREVENT SWING.
1100 TON LOAD–MAX. LIFT 100 FT. FROM LOW REACH

LIFTING CAPACITY CHART PLOTTED FROM INFORMATION GIVEN ON CLYDE IRON WORKS INC. DWG NO. CW 3977 YOC

FAB. STDS. REQD. THIS SHT

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP	DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP
																KWS	1	RN 25	REDRAWN		

ELF-NORGE A/S
NORWAY

TREATMENT PLATFORM Nº1

NORTH SEA FRIGG FIELD W.D.104 M

McDERMOTT–HUDSON

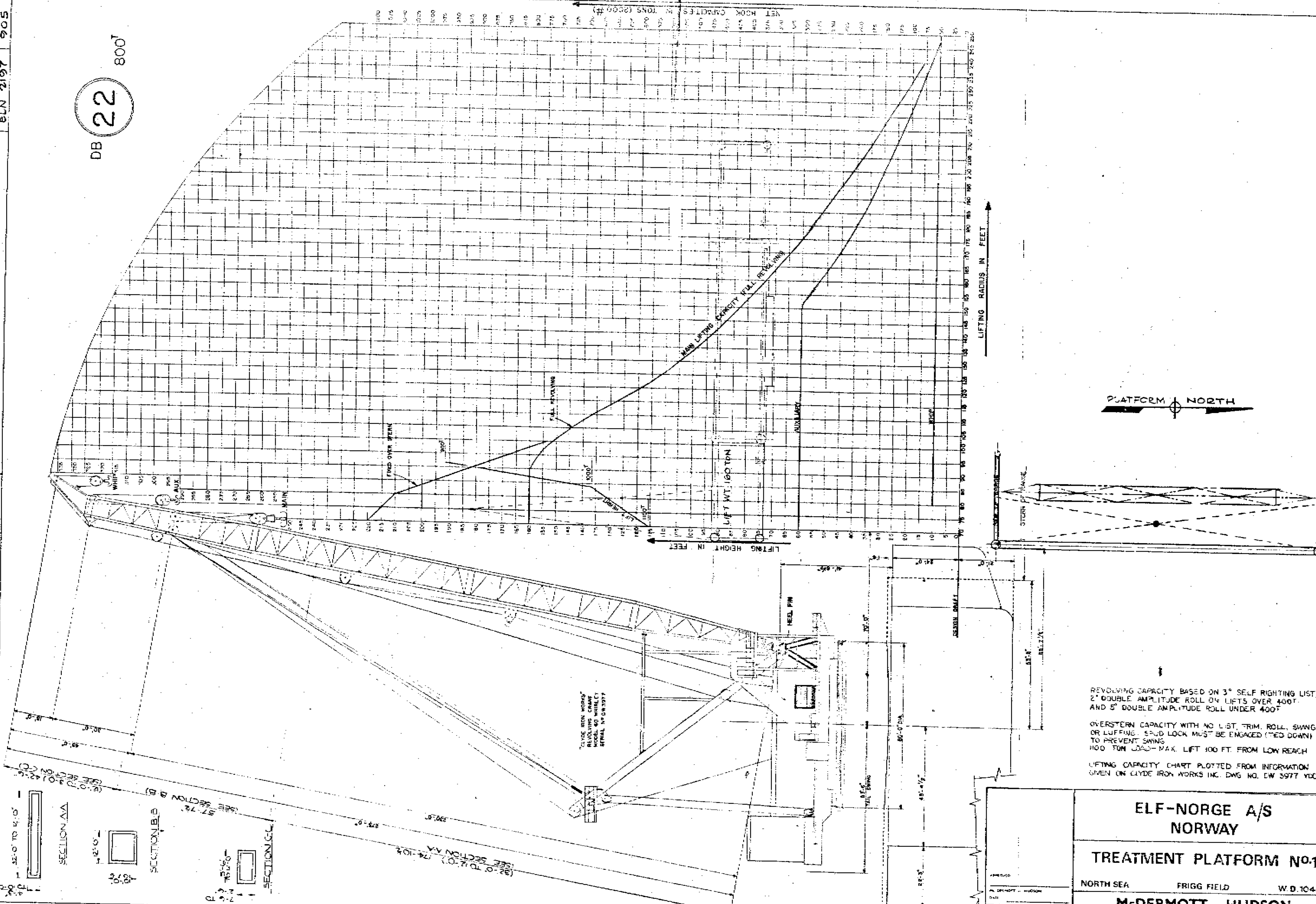
LONDON–ENGLAND

DRAWN BY	SCALE	DATE	DRAWING NO
K.W. SNOWDON	1/16" = 1'-0"	23rd JAN. 75	ELN 2197
CHECKED BY			SHEET NO 904

TRUSSES SD S3 & S4 LIFT CHART

DWG NO ELN 2197 SHEET NO 905

DB 22 800T



REVOLVING CAPACITY BASED ON 3° SELF RIGHTING LIST, 2° DOUBLE AMPLITUDE ROLL ON LIFTS OVER 400T AND 5° DOUBLE AMPLITUDE ROLL UNDER 400T

OVERSTERN CAPACITY WITH NO LIST, TRIM, ROLL, SWING OR LUFFING. SPUD LOCK MUST BE ENGAGED (TIED DOWN) TO PREVENT SWING
1100 TON LOAD – MAX. LIFT 100 FT. FROM LOW REACH

LIFTING CAPACITY CHART PLOTTED FROM INFORMATION GIVEN ON CLYDE IRON WORKS INC. DWG NO. CW 3977 YDC

FAB. STDS REQ'D THIS SHT

DESIGN	ELEC	INSTR	PIPING	STRUCT	NO	BY	DATE	REVISIONS	DATE	APP

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				Ø	1	RN	[illegible]	REDRAWN		

ELF-NORGE A/S
NORWAY

TREATMENT PLATFORM No.1

NORTH SEA FRIGG FIELD W.D.104 M

McDERMOTT – HUDSON
LONDON – ENGLAND

K.W.SNOWDON	⅛" = 1'-0"	23rd JAN 75	ELN 2197
			905

TRUSSES GA S3 & S4 LIFTING CHART

FABRICATION

FABRICATOR. C.M.P

PLACE OF DELIVERY. DUNKIRK

EXPECTED DATE OF DELIVERY.

EXPECTED DATE OF LOADOUT.

TRANSPORTATION

TYPE OF BARGE TO BE USED. PUGET SOUND 858/ TITAN N°7

CONTRACTOR. OCEANIC

SAME TRIP USED FOR PACKAGES No.

LOADOUT PLAN SEE DRAWING.

SET UP

TYPE OF DERRICK BARGE TO BE USED. DB 22

CONTRACTOR. OCEANIC CONTRACTORS INC

BOOM CLEARANCE. GREATER THAN 10'-0"

REFERENCE OF SOURCES OF INFORMATION

ELN 2124 SHT Nos 102
104
105
107-111
120-122

ELN 2197 SHT N° 901

LIFTING WEIGHT. 760 TON

OPERATING WEIGHT.

MAXIMUM WEIGHT.

NORTH UNIT ASSEMBLY SEQUENCE

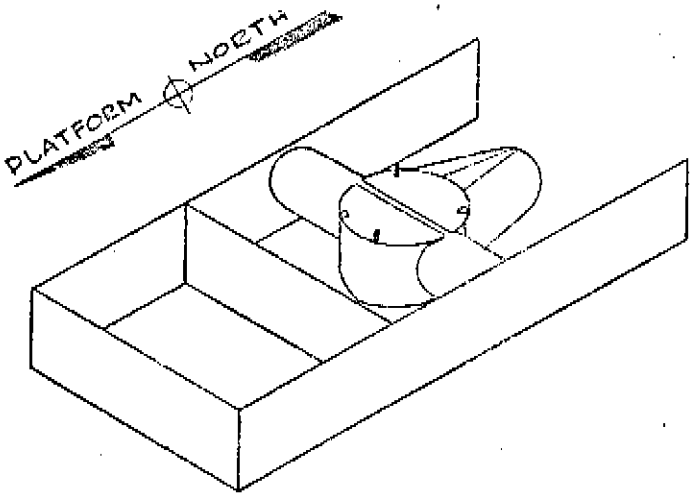
ELF NORGE A/S
NORWAY

ELN 2197
901

McDERMOTT — HUDSON

SKETCH SCALE: N.T.S SHOW PLATFORM NORTH; SHOW PADEYES & SLINGS

REF. DRAWINGS:



PLATFORM	PACKAGE DESCRIPTION	PACKAGE IDENTIFICATION

FABRICATION

FABRICATOR. C.M.P

PLACE OF DELIVERY. DUNKIRK

EXPECTED DATE OF DELIVERY. *

EXPECTED DATE OF LOADOUT.

TRANSPORTATION

TYPE OF BARGE TO BE USED. PUGET SOUND 258/TITAN N°7

CONTRACTOR. OCEANIC

SAME TRIP USED FOR PACKAGES No.

LOADOUT PLAN SEE DRAWING.

SET UP

TYPE OF DERRICK BARGE TO BE USED. DB 22

CONTRACTOR. OCEANIC CONTRACTORS INC

BOOM CLEARANCE. GREATER THAN 10'-0"

REFERENCE OF SOURCES OF INFORMATION

ELN 2124 SHT N°S 102
104
105
107-111
120-122

ELN 2197 SHT N° 902

LIFTING WEIGHT. 760 TON

OPERATING WEIGHT.

MAXIMUM WEIGHT.

SOUTH UNIT ASSEMBLY SEQUENCE

ELF NORGE A/S
NORWAY

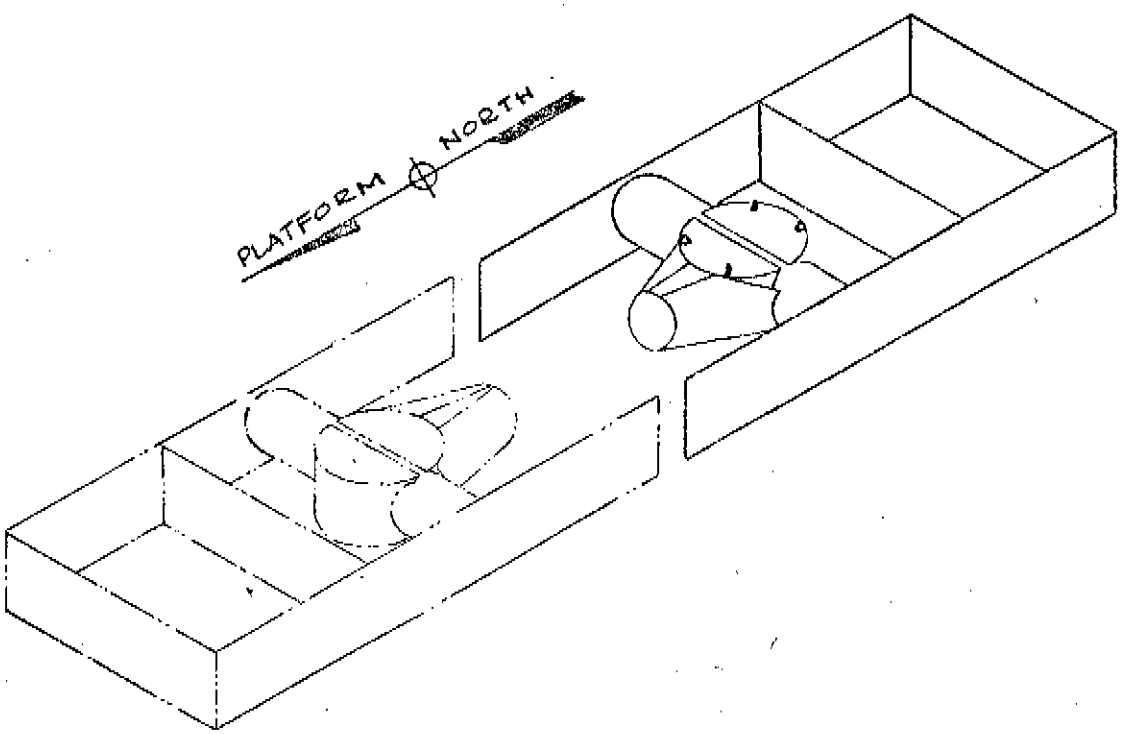
ELN 2197
902

McDERMOTT — HUDSON

SKETCH

SCALE: NTS SHOW PLATFORM NORTH; SHOW PADEYES & SLINGS

REF. DRAWINGS:



PLATFORM	PACKAGE DESCRIPTION	PACKAGE IDENTIFICATION

ON ITEMS ON

FABRICATION

FABRICATOR. CMP

PLACE OF DELIVERY. DUNKIRK

EXPECTED DATE OF DELIVERY.

EXPECTED DATE OF LOADOUT.

TRANSPORTATION

TYPE OF BARGE TO BE USED. PUGET SOUND 258/TITAN No 7

CONTRACTOR. OCEANIC

SAME TRIP USED FOR PACKAGES No.

LOADOUT PLAN SEE DRAWING.

SET UP

TYPE OF DERRICK BARGE TO BE USED. DB 22

CONTRACTOR. OCEANIC CONTRACTORS INC

BOOM CLEARANCE. GREATER THAN 10'-0"

REFERENCE OF SOURCES OF INFORMATION

ELN 2124 SHT Nos 103
115 - 119

ELN 2197 SHT No 903

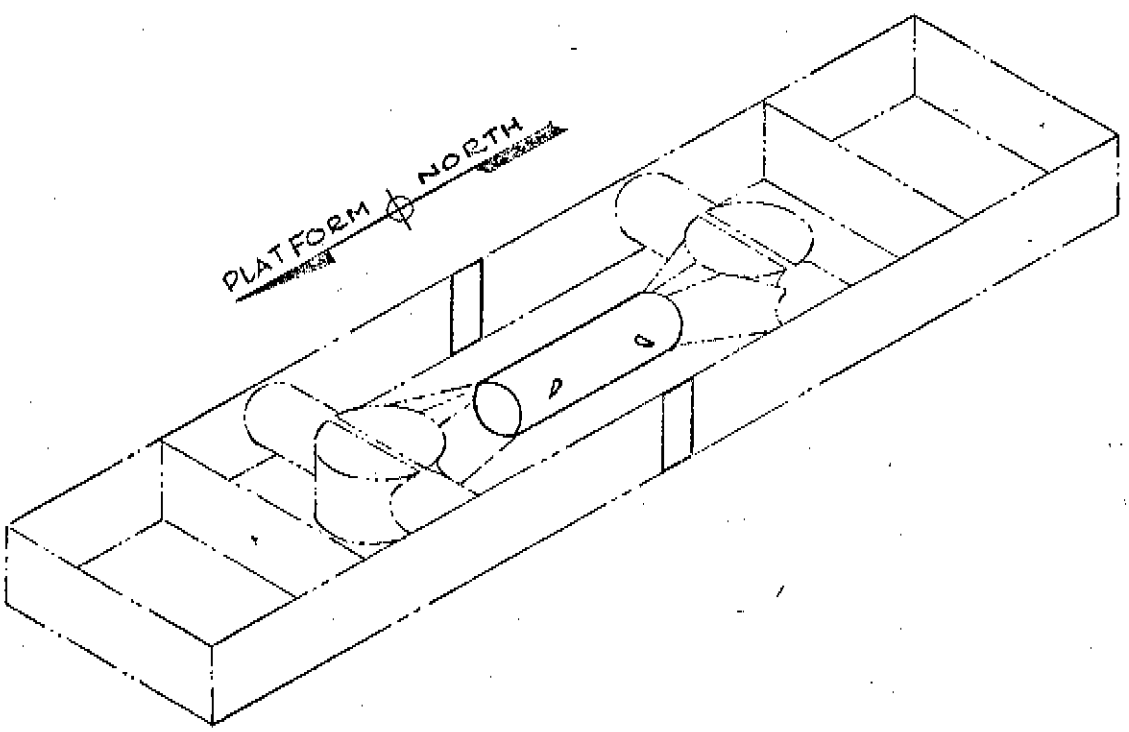
LIFTING WEIGHT. 75 TON

OPERATING WEIGHT.

MAXIMUM WEIGHT.

SKETCH

SCALE: N.T.S SHOW PLATFORM NORTH; SHOW PADEYES & SLINGS REF DRAWINGS'



CENTRAL TANK ASSEMBLY SECTION

ELF NORGE A/S
NORWAY

ELN 2197
903

McDERMOTT — HUDSON
LONDON ENGLAND

PLATFORM	PACKAGE DESCRIPTION	PACKAGE IDENTIFICATION

SHEET NO

DWG NO

FABRICATION

FABRICATOR. C.M.P.
PLACE OF DELIVERY. DUNKIRK
EXPECTED DATE OF DELIVERY.
EXPECTED DATE OF LOADOUT.

TRANSPORTATION

TYPE OF BARGE TO BE USED. PUGET SOUND 258/ TITAN N°7
CONTRACTOR. OCEANIC
SAME TRIP USED FOR PACKAGES No.
LOADOUT PLAN SEE DRAWING.

SET UP

TYPE OF DERRICK BARGE TO BE USED. DB 22
CONTRACTOR. OCEANIC CONTRACTORS INC
BOOM CLEARANCE. GREATER THAN 10'-0"

REFERENCE OF SOURCES OF INFORMATION

ELN 2124 SHT Nos 106
126

ELN 2197 SHT N° 904

LIFTING WEIGHT. 160 TON
OPERATING WEIGHT.
MAXIMUM WEIGHT.

TRUSSES CA, SS & S4 ASSEMBLY SEQUENCE

ELF NORGE A/S
NORWAY

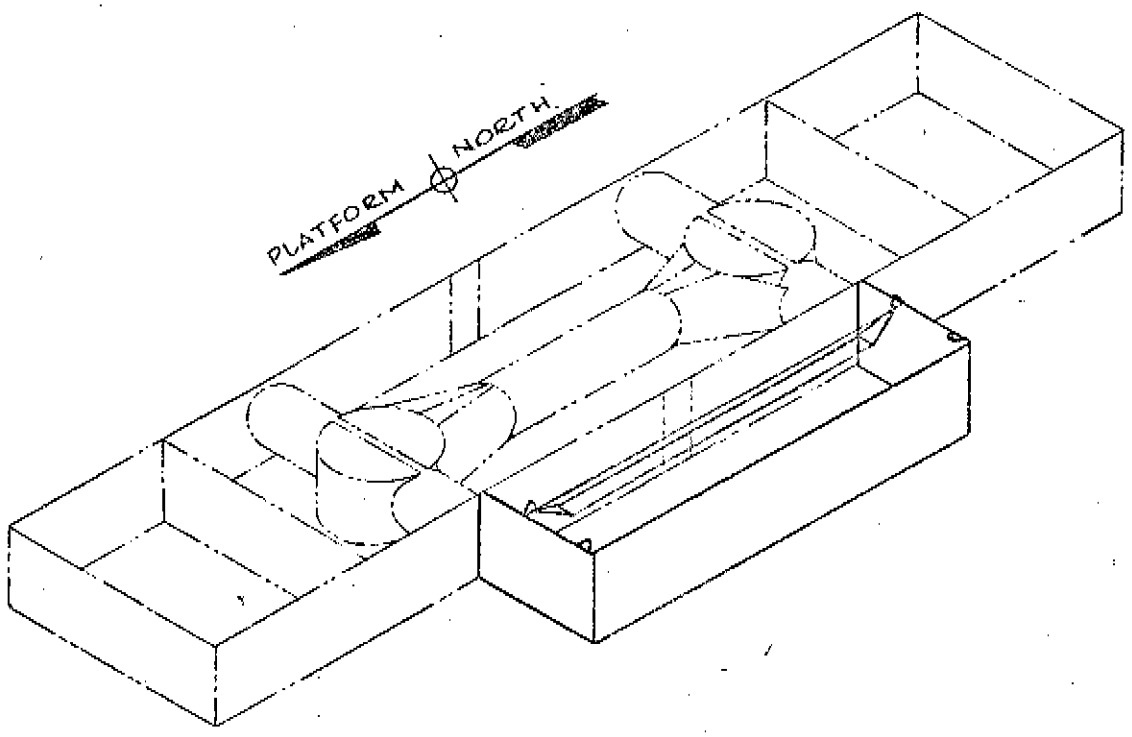
ELN 2197
954

McDERMOTT — HUDSON

SKETCH

SCALE: NTS SHOW PLATFORM NORTH; SHOW PADEYES & SLINGS

REF DRAWINGS:



PLATFORM	PACKAGE DESCRIPTION	PACKAGE IDENTIFICATION

ON ITEMS

FABRICATION

FABRICATOR. C.M.P

PLACE OF DELIVERY. DUNKIRK

EXPECTED DATE OF DELIVERY.

EXPECTED DATE OF LOADOUT.

TRANSPORTATION

TYPE OF BARGE TO BE USED. PUGET SOUND 259/TITAN N° 7

CONTRACTOR. OCEANIC

SAME TRIP USED FOR PACKAGES No.

LOADOUT PLAN SEE DRAWING.

SET UP

TYPE OF DERRICK BARGE TO BE USED. DB 22

CONTRACTOR. OCEANIC CONTRACTORS INC

BOOM CLEARANCE. GREATER THAN 10'-0"

REFERENCE OF SOURCES OF INFORMATION

ELN 2124 SHT N°S 106
126

ELN 2197 SHT N° 905

LIFTING WEIGHT. 160 TON

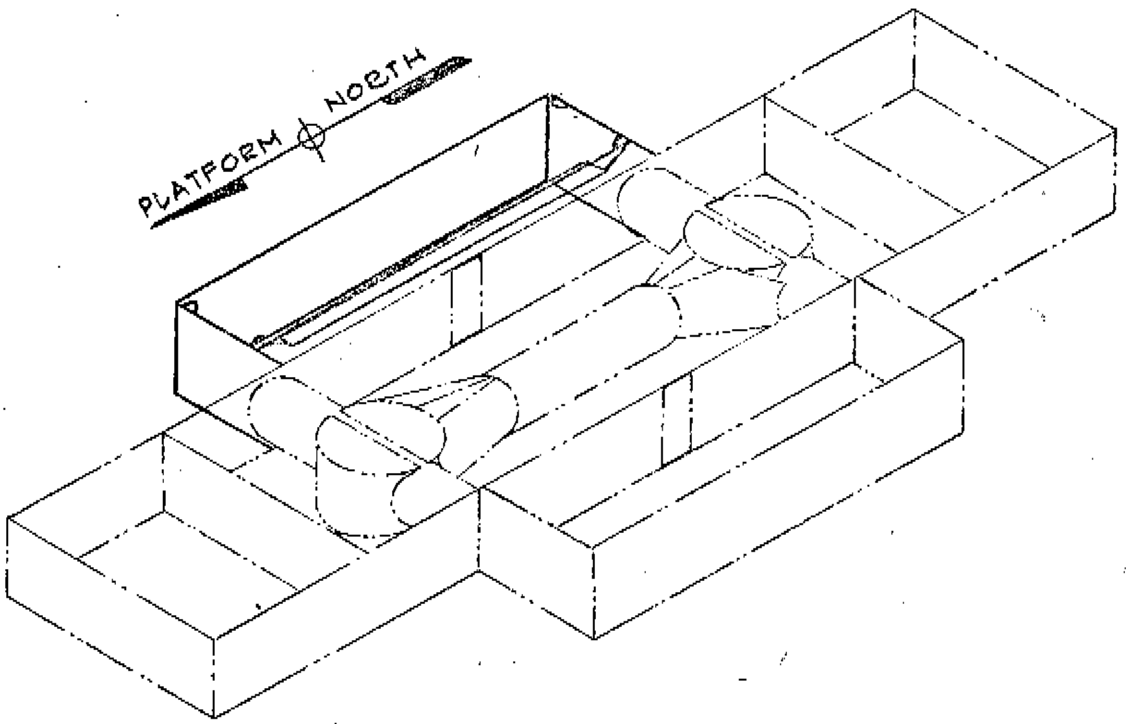
OPERATING WEIGHT.

MAXIMUM WEIGHT.

SKETCH

SCALE: N.T.S SHOW PLATFORM NORTH; SHOW PADEYES & SLINGS

REF DRAWINGS:



PLATFORM	PACKAGE DESCRIPTION	PACKAGE IDENTIFICATION

SHEET NO | DWG NO

McDERMOTT — HUDSON

QUISSES SD, S3 & S4 ASSEMBLY SLINGS

ELF NORGE A/S
NORWAY