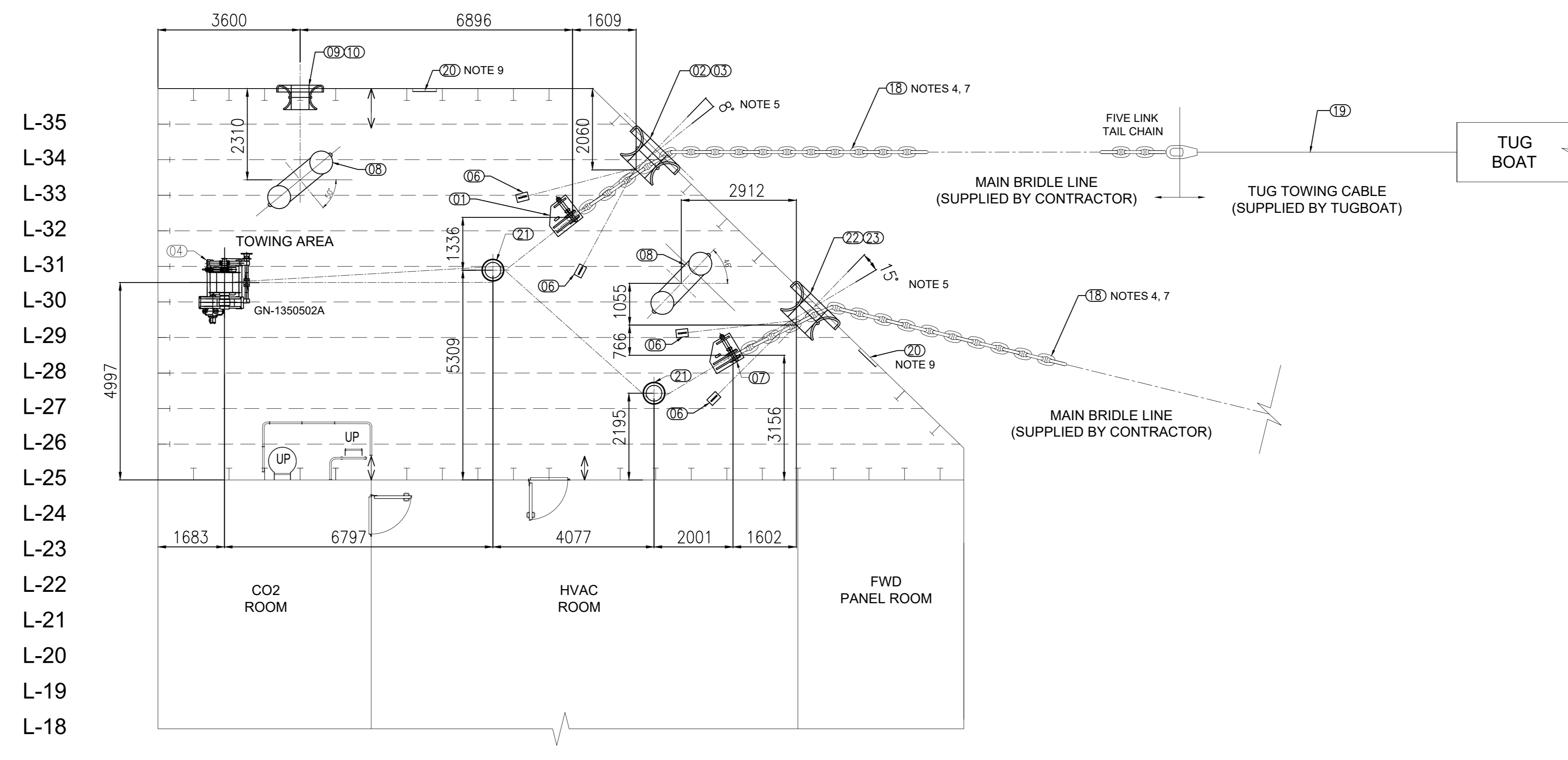


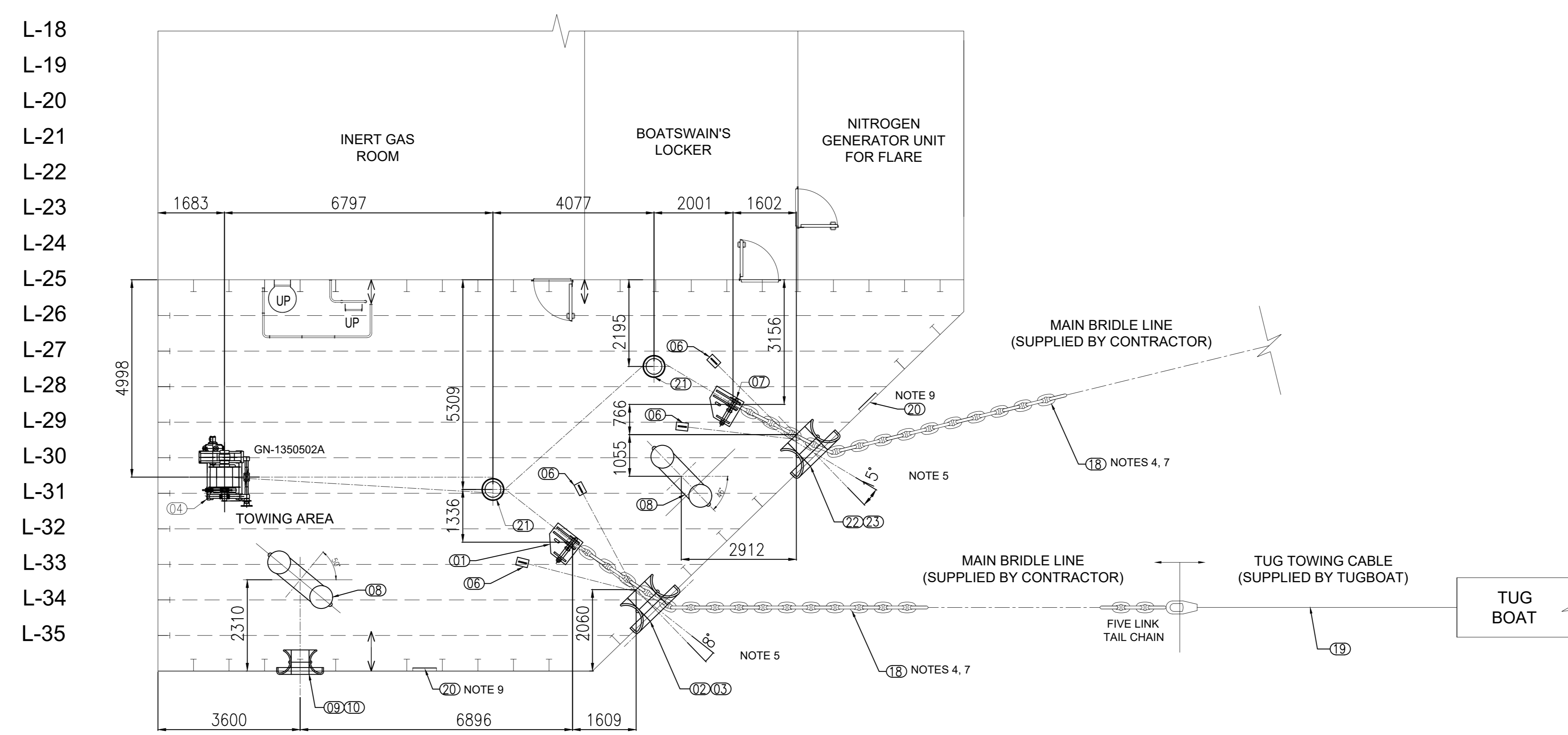
FR.0 FR.03 FR.06 FR.09 FR.12 FR.15 FR.18 FR.21 FR.24

TOWING ARRANGEMENT - MAIN DECK AFT (EL. 34300)



FR.96 FR.97 FR.98 FR.99 FR.100

TOWING ARRANGEMENT - FORECASTLE (EL. 34300)



L-18  
L-19  
L-20  
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NO.	EQUIPEMENT DESCRIPTION	CAPACITY	QTY	REMARK
1	SMIT BRACKET	TOW 320t	4	TO BE COMPATIBLE WITH CHAFE CHAIN END LINK
2	TOWING FAIRLEAD	TOW 320t	2	BULKWARK MOUNTED, OPENING 600MM X 450MM ±90 DEG OP ANGLE
3	WATERTIGHT SEALING HATCH	--	2	BOLT TYPE IN FWD
4	TOWING RETRIEVAL WINCH	--	4	MIN12T PULL, SEE NOTE 8
5	RECOVERY SHACKLE	--	8	COMPATIBLE WITH RECOVERY WINCH SWL AND CABLE TERMINATION
6	PADEYE	10t	10	
7	SMIT BRACKET	TOW 250t	2	TO BE COMPATIBLE WITH CHAFE CHAIN END LINK
8	DOUBLE BOLLARD	SWL 115t	6	ISO 13795 TYPE A, DN=550A
9	PANAMA CHOCK	SWL 115t	2	BULKWARK MOUNTED ±90 DEG OP ANGLE
10	WATERTIGHT SEALING HATCH	--	2	BOLT TYPE IN TOWING AREA ROOM
11	FAIRLEAD	TOW 320t	2	DECK MOUNTED, OPENING 600MM X 450MM ±90 DEG OP ANGLE
12	PANAMA CHOCK	SWL 115t	4	DECK MOUNTED ±90 DEG OP ANGLE
13	SLING WIRE ROPE	7t	12	LENGTH = 2M WITH CERTIFICATE
14	SYNTHETIC LIFTING SLING	7t	16	LENGTH = 2M WITH CERTIFICATE
15	36MM POLYPROPYLENE ROPE	--	8	36MM DIAMETER X 220 METER LONG, ORANGE COLOUR
16	12MM POLYPROPYLENE ROPE	--	8	12MM DIAMETER X 220 METER LONG, ORANGE COLOUR
17	8MM POLYESTER ROPE	--	8	8MM DIAMETER X 150 METER LONG
18	MAIN BRIDLE LINE (NOTES 4, 7)	--	6	TO BE DEFINED IN THE TOWING PROCEDURE REPORT ALL ITEMS SUPPLIED BY CONTRACTOR
19	TUG TOWING CABLE	--	--	SUPPLIED BY TUGBOAT
20	WATERTIGHT HATCH	--	4	BOLT TYPE
21	STAND ROLLER	--	4	HOLD
22	TOWING FAIRLEAD	TOW 250t	2	BULKWARK MOUNTED, OPENING 600MM X 450MM ±90 DEG OP ANGLE
23	WATERTIGHT SEALING HATCH	--	2	BOLT TYPE IN TOWING AREA ROOM

TOWING EQUIPEMENT LIST

- REFERENCE DOCUMENTS**
- I-DE-3010-20-1300-964-P4X-002 - GENERAL ARRANGEMENT
  - I-DE-3010-2E-1351-140-P4X-011 - FORECASTLE
  - I-DE-3010-20-1351-140-P4X-004 - MAIN DECK
  - I-RL-3010-20-1350-964-P4X-001 - TOWING & BOLLARD PULL CALCULATION
- GENERAL NOTES**
- ALL EQUIPMENT DETAILS AND DIMENSIONS ARE ESTIMATED ONLY. TO BE UPDATED IN THE ACTUAL ENGINEERING PHASE, ACCORDING TO MANUFACTURER DATA.
  - ALL DIMENSIONS ARE IN MILLIMETERS.
  - MAIN BRIDLE COMPONENTS SHALL COMPLY WITH APPLICABLE CLASSIFICATION SOCIETY RULES.
  - MAIN BRIDLE LINE INCLUDES ALL ITEMS FROM SMIT BRACKET TO TUG TOWING CABLE, INCLUDING, BUT NOT LIMITED TO, CHAFE CHAIN, SHACKLES AND PINNANT LINE.
  - MISALIGNMENT BETWEEN FAIRLEAD AND SMIT BRACKET CENTER LINE.
  - PADEYES TO BE SYMMETRICAL WITH SMIT BRACKET CENTER LINE. MIN DISTANCE FROM FAIRLEAD = 150MM.
  - CHAFE CHAIN LENGTH TO BE APPROX. 10M TO FACILITATE ITS RECOVERY BY TOWING RETRIEVAL WINCH.
  - TOWING RETRIEVAL WINCH SPECIFICATION IS DETAILED ON I-ET-10012E-5139-36X-P4X-004 - MOORING SYSTEM.
  - OPENINGS WITH WATERTIGHT HATCH TO PERMIT WATCHING THE TUGBOATS FROM INSIDE TOWING ROOM DURING OPERATIONS.
  - ALL PADEYES, PANAMA CHOCKS, SMIT BRACKETS, FAIRLEADS, BOLLARDS AND THE RETRIEVAL WINCHES SHALL HAVE THEIR RESPECTIVE SWL/TOW LOADS BEAR WELDED ON THEIR FOUNDATIONS.
  - TOWING LINES LIMIT ANGLES AND ARRANGEMENTS OF LINES PASSING THROUGH DOUBLE BOLLARD AND PANAMA CHOCKS SHALL BE DEFINED IN THE DETAILED DESIGN PHASE.
  - DOUBLE BOLLARD AND PANAMA CHOCKS WILL BE USED ONLY FOR MOORING AT QUAY.
  - TOWING FAIRLEADS SHALL BE ASSEMBLED SO THAT THEY DO NOT FORM ANY EXTERNAL SHARP EDGE ON THE WAY OF CHAFE CHAIN RECOVERY. THIS IS TO PREVENT SHACKLE PINS TO GET ENTANGLED DURING TOW LINE RECOVERY BY FPSO.

REV	DESCRIPTION	DATE	EXEC	CHECK	APPROV
0	ORIGINAL ISSUE	2023.02.19	CMRR	UPD7	CJB

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<b>BR</b> PETROBRAS	SRGE						
CLIENT:	SRGE						
JOB:	REFERENCE HULL 01						
AREA:							
TITLE:	TOWING ARRANGEMENT						
DESIGN	ESUP	EXEC	CMRR	CHECK	UPD7	APPROV	CJB
SCALE	1:75	SHEET	01	of	01		
DATE:	02.19.2023	INTERNAL	ENG				
			I-RL-3010-20-1350-964-P4X-001				