Base Load Power Hub (BLPH)

TP & BLPH – Load Out Manual including Ballasting Sequences

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Table of contents

1 INTRODUCTION 8
1.1 PROJECT OVERVIEW 8
1.1.1 Project Location 8
1.1.2 Project Concept 9
2 SCOPE 11
2.1 PURPOSE 11
2.2 GENERAL 11
3 REFERENCES 12
3.1 CODES AND STANDARDS 12
3.2 COMPANY SPECIFICATIONS 12
3.3 PROJECT DOCUMENTS 13
3.4 SOFTWARE 13
4 DEFINITIONS AND ABBREVIATIONS 14
5 ITEMS DESCRIPTION 16
5.1 BLPH 16
5.1.1 COG position 16
5.2 TRANSITION PIECE 18
5.2.1 COG Position 18
6 SITE MAIN DATA 20
6.1 YARD GENERAL DATA 20
6.2 ITEMS LOCATION IN YARD 21
6.3 YARD BOLLARDS LOCATION AND DETAILS 22
6.4 HYDROGRAPHICAL SURVEY AND TIDE DATA 22
6.5 BARGE MOORED PARALLEL TO QUAY – AFTER LOADOUT 23
6.6 BARGE MOORED PERPENDICULAR TO QUAY – LOADOUT CONDITION 23
6.7 WEATHER FORECASTING ARRANGMENT FOR THE YARD 24
7 ENVIRONMENTAL LIMITS 25

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7.1 TIDE 25
7.2 WAVE 25
7.3 WIND 25
8 MOORING SYSTEM 26
8.1 WINCHES MAIN FEATURES 26
8.2 WIND EXPOSED AREAS 26
8.2.1 Lateral View 26
8.2.2 Front View 27
9 LOADOUT PROCEDURE 29
9.1 GENERAL 29
9.2 MAIN LOADOUT TIMELINE 29
9.3 TOPSIDE, QUAY AND BARGE PREPARATION 30
9.3.1 TP and TOPSIDE 30
9.3.2 Quay side 31
9.3.3 Barge Preparation 31
9.3.4 Personnel preparation 31
9.3.5 Fenders 32
9.3.6 Bridge Plates 33
9.4 BALLAST SYSTEM 34
9.5 UPPER GRILLAGE SET DOWN ON LOWER GRILLAGE & SHIMMING PROCEDURE 34
9.6 MINIMUM SEAFASTENING WELDS 35
9.7 DIMENSIONAL CONTROL DURING LOADOUT 35
10 LOADOUT ORGANIZATION 36
10.1 ROLES AND RESPONSIBILITY 36
10.1.1 Contact details of key personnel 37
10.2 COMMUNICATIONS 38
10.3 HSE REQUIREMENTS 38
10.4 CONTINGENCY PROCEDURE 39
ATTACHMENT A – TP & BLPH GENERAL ARRANGEMENT ON VERVECE 40
ATTACHMENT B – TOPSIDE & TP LOCATION ON YARD PIOMBONI 41

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ATTACHMENT C – CARGO BARGE VERVECE - SPECIFICATIONS 42
ATTACHMENT D – PBY NORTH QUAY.....43
ATTACHMENT E – MOORING SCHEMES, FENDERS & BRIDGE PLATES.....45
ATTACHMENT F – MOORING EQUIPMENTS 46
ATTACHMENT G – MOORING ANALYSIS.....47
ATTACHMENT H – SPMT METHOD STATEMENT FOR TP 48
ATTACHMENT I – SPMT METHOD STATEMENT FOR BLPH.....49
ATTACHMENT L – HYDROGRAPHICAL SURVEY 50
ATTACHMENT M – TIDE TABLE.....51
ATTACHMENT N – PORTABLE BALLASTING PUMPS & GENERAL ARRANGEMENT ON BARGE.....52
ATTACHMENT O – BALLAST SEQUENCE FOR TP 53
ATTACHMENT P – BALLAST SEQUENCE FOR BLPH 54
ATTACHMENT Q – SAFETY CHECKLIST.....55
ATTACHMENT R – MINIMUM SEAFASTENING 56
ATTACHMENT S – MOC 57

List of Figures

Figure 1.1 HOLLANDSE KUST NOORD WIND PARK Location Map 8
Figure 1.2 - Wind Park Details 9
Figure 1.3 – BLPH Concept 9
Figure 5.1 - Base Load Power Hub Plot Plan 16
Figure 5.2 – BLPH SPMTs arrangement 17
Figure 5.3 – Transition Piece – 3D 18
Figure 5.4 – TP SPMTs arrangement 19
Figure 6.1 – Yard Piomboni Location 20
Figure 6.2 – TP position on PBY 21
Figure 6.3 – Topside position on PBY 22
Figure 6.4 – Post-Loadout Area Minimum Seabed Depth 23
Figure 6.5 – Loadout Area Minimum Seabed Depth 24
Figure 8.1 – Wind Lateral Exposed Area 27
Figure 8.2 – Wind Front Exposed Area 28
Figure 9.1 – Fender Typical Section 32
Figure 9.2 – Bridge Plates Arrangement 33
Figure 9.3 – Barge dimensional control system - Typical 35

List of tables

Table 4.1 - Definitions and Abbreviations 15
Table 7.1 – Wind Speed Design – Post Loadout Condition 25
Table 7.2 – Wind Speed Design – Post Loadout Condition 25
Table 9.1 – Main Loadout steps 30
Table 9.2 – Bridge Plate Calculation 34
Table 10.1 –contingency plan 39

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List of Attachments

ATTACHMENT A – TP & BLPH GENERAL ARRANGEMENT ON VERVECE

ATTACHMENT B – TOPSIDE & TP LOCATION ON YARD PIOMBONI

ATTACHMENT C – CARGO BARGE VERVECE - SPECIFICATIONS

ATTACHMENT D – PBY NORTH QUAY

ATTACHMENT E – MOORING SCHEMES, FENDERS & BRIDGE PLATES

ATTACHMENT F – MOORING EQUIPMENTS

ATTACHMENT G – MOORING ANALYSIS

ATTACHMENT H – SPMT METHOD STATEMENT FOR TP

ATTACHMENT I – SPMT METHOD STATEMENT FOR BLPH

ATTACHMENT L – HYDROGRAPHICAL SURVEY

ATTACHMENT M – TIDE TABLE

ATTACHMENT N – PORTABLE BALLASTING PUMPS & GENERAL ARRANGEMENT ON BARGE

ATTACHMENT O – BALLAST SEQUENCE FOR TP

ATTACHMENT P – BALLAST SEQUENCE FOR BLPH

ATTACHMENT Q – SAFETY CHECKLIST

ATTACHMENT R – MINIMUM SEA FASTENING

ATTACHMENT S – MOC

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

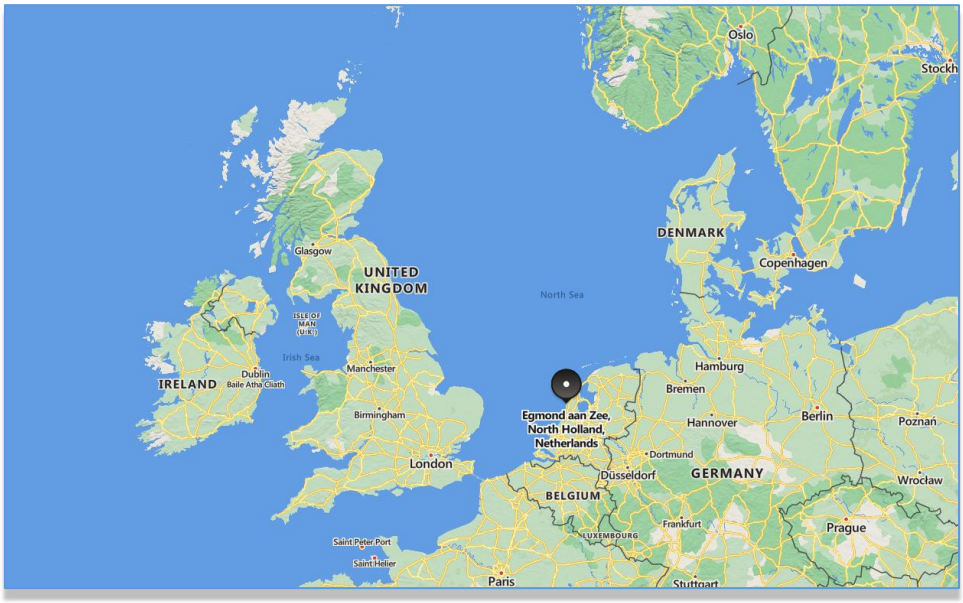


Figure 1.1 HOLLANDSE KUST NOORD WIND PARK Location Map

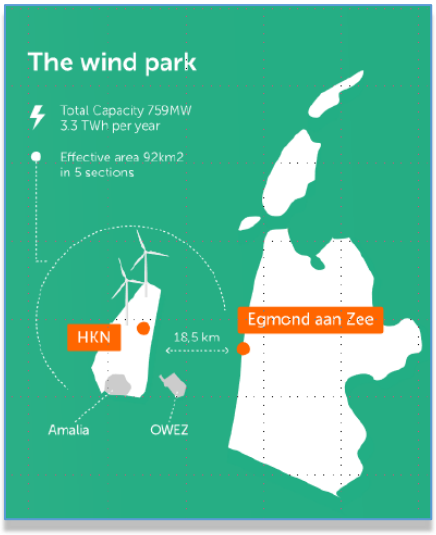


Figure 1.2 - Wind Park Details

The wind farm consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

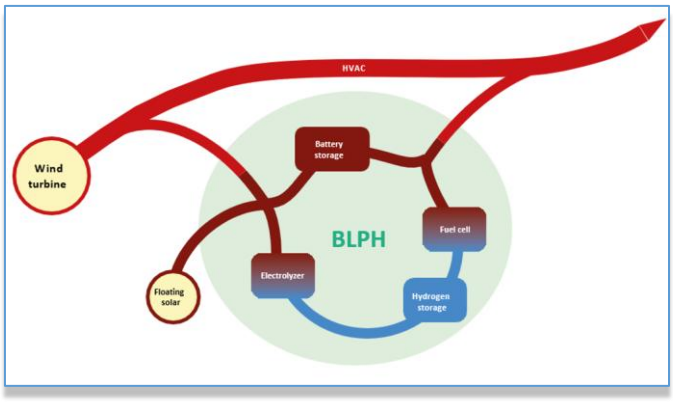


Figure 1.3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 SCOPE

2.1 PURPOSE

This document deals with the loadout procedure to be followed relevant to the CW BLPH topside and Transition piece.

The loadout operations have been scheduled for July-August 2025.

The document focuses on the main aspects of the activities: procedures, methods, responsibilities, safety criteria, site characteristics, mooring calculations and description of all the equipment's involved.

A dedicated HIRA (Hazard Identification and Risk Assessment) will be held to ensure a correct evaluation of the risks together with all parties involved (Rosetti, CW, MWS, SPMT owner, BARGE owner).

This document, along with the associated documents, is intended to provide the procedure and guideline for the execution of the operations. The Loadout operation will be under the command of the Loadout Manager but, however, Loadout Manager may make amendments on site or exercise his best judgment, in consultation with the Marine Warranty Surveyor and Company representative, as the case may require, dealing with situations that may be encountered during the operation.

2.2 GENERAL

The site where the operation will take place is the Piomboni Yard, located in Via del Marchesato n°37 - 48122 Marina di Ravenna - Ravenna, Italy.

BLPH Topside and TP, after construction completion, will be moved to the barge by means of suitable number of SPMTs positioned under the steel beams (BLPH) or upper grillage beams (TP); for details about Trailer configuration see Appendix "H".

During the movement of the structure from yard to the barge final location, the barge will be ballasted / deballasted to compensate the weight and moment transferring so as to maintain the barge deck leveled with yard capping beam.

Loading of the TP will be performed moving the structure with 2 rows of SPMT positioned under the grillage beams, for details about hydraulic configuration of SPMT and acting loads see Appendix "H".

Loading of the Topside will be performed moving the structure with 3 rows of SPMT positioned under the BLPH main beams, for details about hydraulic configuration of SPMT and acting loads see Attachment "I".

The whole operation shall be considered subdivided in several steps, corresponding to different positions of the SPMT compared to barge stern: for each step of the sequence the proper ballast plan shall be calculated so that the stern will be maintained at same level of capping beam, where the moving structure weight is considered as a set concentrated forces corresponding to the SPMT axle loads.

3 REFERENCES

3.1 CODES AND STANDARDS

Doc. No.	Description
/1/ BS EN ISO 19900	General requirements for offshore structures - 2019
/2/ BS EN ISO 19901-1	Specific requirements for offshore structures - Part 1: Metocean design and operating considerations - 2015
/3/ BS EN ISO 19901-2	Seismic design procedures and criteria
/4/ BS EN ISO 19901-3	Specific requirements for offshore structures – Part 3: Topsides structure - 2014
/5/ BS EN ISO 19901-5	Specific requirements for offshore structures – Part 5: Weight Management - 2021
/6/ BS EN ISO 19901-6	Specific requirements for offshore structures – Part 6: Marine Operations – 2009
/7/ BS EN ISO 19902	Petroleum and natural gas industries - Fixed steel offshore structures – 2020
/8/ API RP 2A-WSD	Recommended practice for planning, designing and constructing fixed offshore platforms – Working stress design – 22nd edition – 2014
/9/ DNV-ST-N001	DNV - Marine operation and marine warranty - 2023
/10/ DNV-ST-0145	DNV, Offshore substations, 2021

3.2 COMPANY SPECIFICATIONS

Doc. No.	Description
/11/ DEP 37.19.00.12	Gen - Offshore Topsides Structures
/12/ DEP 37.19.00.30	Gen - Fixed Steel Offshore Structures (Adoption of IOGP S-631-11, Amendments / Supplements to ISO 19902:2020).
/13/ DEP 37.81.10.19	Gen - Marine Operations Requirements – Loadout, Transportation and Installation of Offshore Structures (Amendments / Supplements to ISO 19901-6)
/14/ DEP 37.91.10.11	Mobile Mooring Systems (Amendments / Supplements to API RP 2SK, API RP 2SM AND API RP 2I)

3.3 PROJECT DOCUMENTS

Doc. No.	Description
/15/ 123A90-DDL-MD-RE-01006	Monthly Weight Report
/16/ 123A90-DDL-ST-SP-90017	Structural Design Basis
/17/ 123A90-DDL-ST-SP-90018	Structural Material Specification for Topside & TP
/18/ 123A90-DDL-ST-SP-90118	Structural Material Specification for Flange & Bolts
/19/ 123A90-DDL-ST-TN-90119	Evaluating ISO and DNV approaches
/20/ 123A90-DDL-TI-SP-99014	Specification for TP, Topside and Caissons Transportation and Installation
/21/ 123A90-DDL-ST-RE-90001	Topside loadout analysis
/22/ 123A90-DDL-TI-RE-99001	Topside Gr&SF report
/23/ 123A90-DDL-TI-DD-99021	Topside – Grillage Assembly
/24/ 123A90-DDL-TI-DD-99023	Topside – Grillage – Plan and Section
/25/ 123A90-DDL-TI-RE-99012	Topside – Yard Checklist
/26/ 123A90-PML-QHSE-PRO-00127	Topside – internal seafastening report
/27/ 123A90-DDL-ST-RE-90008	TP loadout analysis
/28/ 123A90-DDL-TI-RE-99003	Technical note – validation of TP grillage and SF design on barge Vervece
/29/ 123A90-DDL-TI-RE-99004	TP Gr&SF report
/30/ 123A90-DDL-TI-DD-99036	TP – Upper Grillage plan view
/31/ 123A90-DDL-TI-DD-99037	TP upper grillage sections
/32/ 123A90-DDL-TI-DD-99038	TP upper grillage section and details
/33/ 123A90-DDL-TI-DD-99039	TP – Lower Grillage Assembly
/34/ 123A90-DDL-TI-DD-99040	TP – Lower Grillage – Plan and Section
/35/ 123A90-DDL-TI-RE-99013	TP & CF – Yard Checklist

3.4 SOFTWARE

Doc. No.	Description
/36/ MOSES	Hydrostatic and Hydrodynamic Analysis Software for Offshore Installation and Platform Design– BENTLEY Inc, v.12

4 DEFINITIONS AND ABBREVIATIONS

COMPANY or Client (CPY)	Crosswind
CONTRACTOR (CTR)	ROSETTI MARINO S.p.A.
PROJECT	HOLLANDSE KUST NOORD WIND PARK Project
TRANSPORT CONTRACTOR	OCEAN
ALS	Accidental Limit State
BESS	BATTERY ENERGY STORAGE SYSTEM
BG	Box Girder
BLPH	Base Load Power Hub
CF	Caisson Frame
CL	Concentrated Load
CoG	Centre of Gravity
CTV	Crew Transfer Vessel
CW	CrossWind
DAF	Dynamic Amplification Factor
DFF	Damage Fatigue Factors
DLB	Ductility Level Blast
DNV	Det Norske Veritas
DOP	Dropped Object Protection
El.	Elevation
EPCI	Engineering Procurement Construction and Installation
FEED	Front End Engineering Design
HAT	Highest Astronomical Tide
HKN	Hollandse Kust Noord
ICCP	Impressed Current Corrosion Protection
LAT	Lowest Astronomical Tide
LRFD	Load and Resistance Factor Design
MSL	Mean Sea Level
NTE	Not-to-Exceed

OD	Outside Diameter
PAU	Pre-Assembled Unit (H2 Vessels)
PBY	Piomboni Yard Ravenna
PG	Plate Girder
SCE	Safety Critical Equipment
SHL	Static Hook Load
T&I	Transport & Installation
ToS	Top of Steel
TP	Transition Piece
UC	Unity Check
UDL	Uniformly Distributed Load
VIV	Vortex Induced Vibration
VOOW	Van Oord Offshore Wind
WTG	Wind Turbine Generator
W2W	Walk to Work

Table 4.1 - Definitions and Abbreviations

5 ITEMS DESCRIPTION

5.1 BLPH

The BLPH comprises of two main deck levels with overall deck plan dimensions of 40 m x 16 m, excluding external walkways, laydown areas and stairs, with an overall deck height of 7 m between decks. There are currently 6 hydrogen storage vessels which lie horizontally, aligned North - South, within the PAU structure located above the upper deck.

The Topsides layout is shown in Figure 5.1.

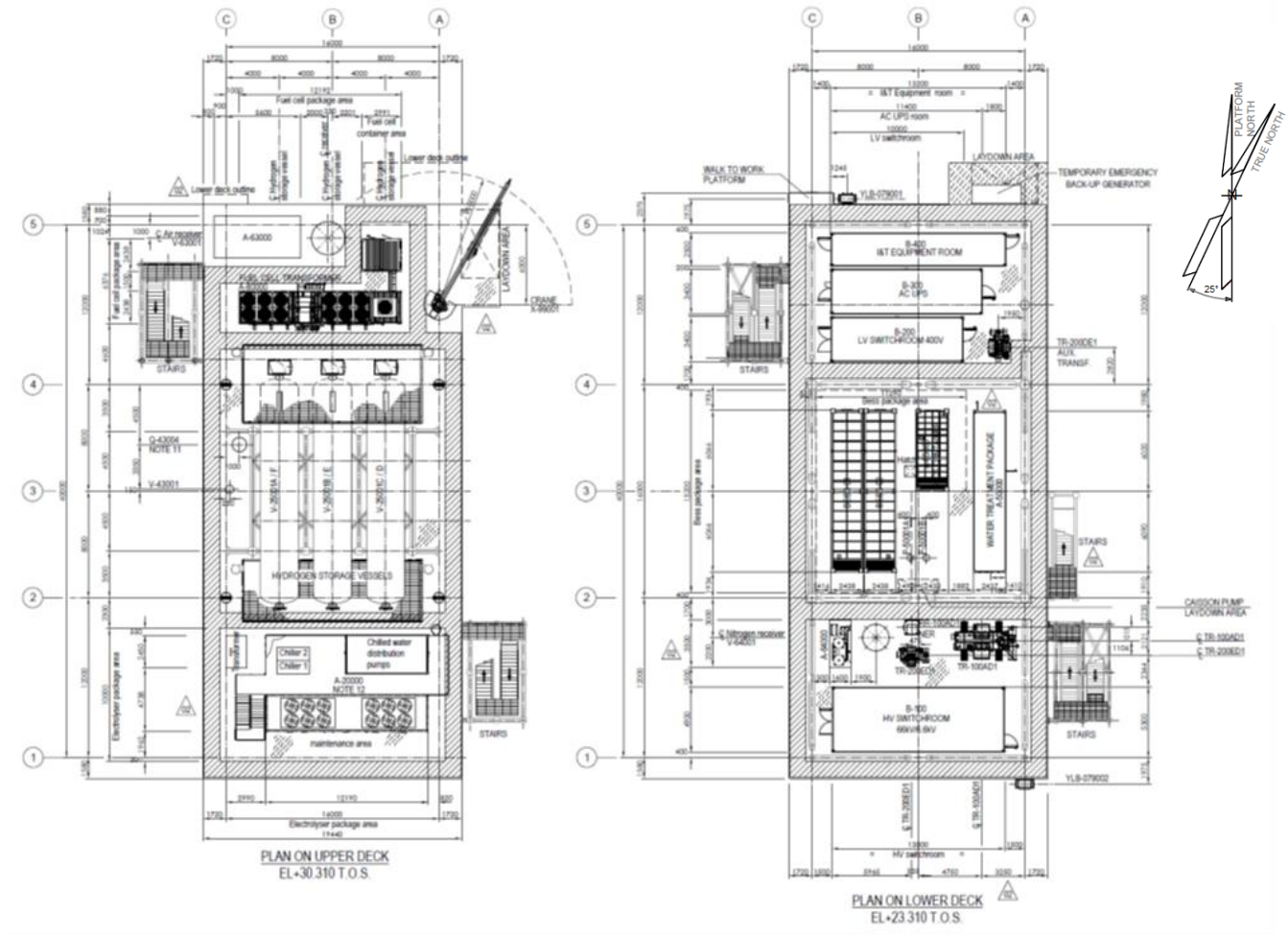


Figure 5.1 - Base Load Power Hub Plot Plan

5.1.1 COG position

CoG position is taken from ref. /15/,. According to the last issued WCR revision, Topside has the following CoG and weight position (from A1 and LAT) relevant to loadout condition:

- Loadout Expected Weight 2282 ton (including SPMTs dead weight and equipment weight);
- X_G = 19.70 m;
- Y_G = 7.90 m;
- Z_G = 29.30 m.

BLPH loadout scheme with CoG position is shown in the next figure. Refer to Appendix N for details about the load application.

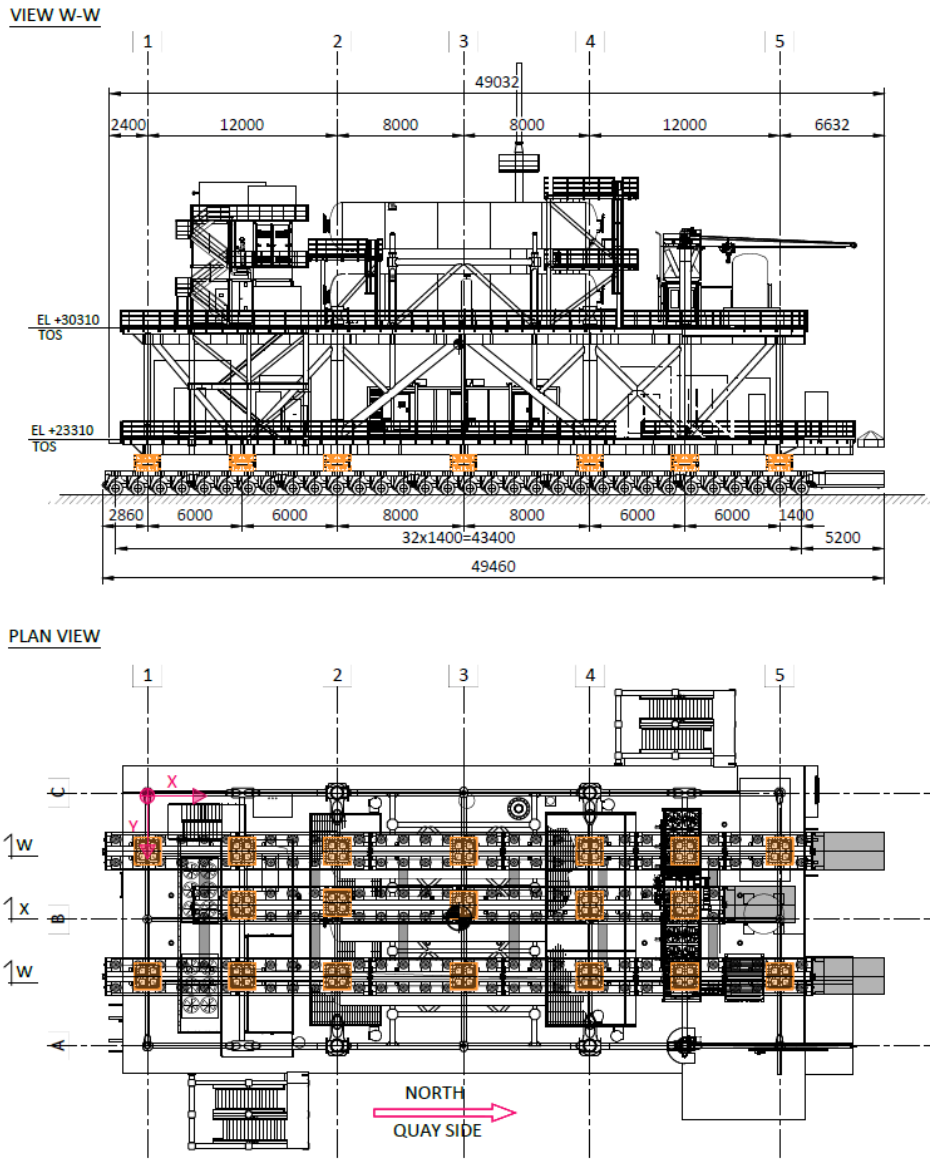


Figure 5.2 – BLPH SPMTs arrangement

Before loadout operation, the final physical weighing operation will be performed in order to confirm the expected Weight and CoG. In case of the discrepancy in terms of weight and CoG position will be significant, the SPMT loads and ballasting sequence will be updated accordingly.

5.2 TRANSITION PIECE

The connection of Topside with Monopile is realized through a Transition Piece (TP) structure. TP is composed by a central column with an outer diameter of 7m and Four (4) boxed girders with height ranging from 2.5 m to 1.4 m, oriented along the main diagonals of the TP.

TP main dimensions are 16m x 16m with height 7.9m.

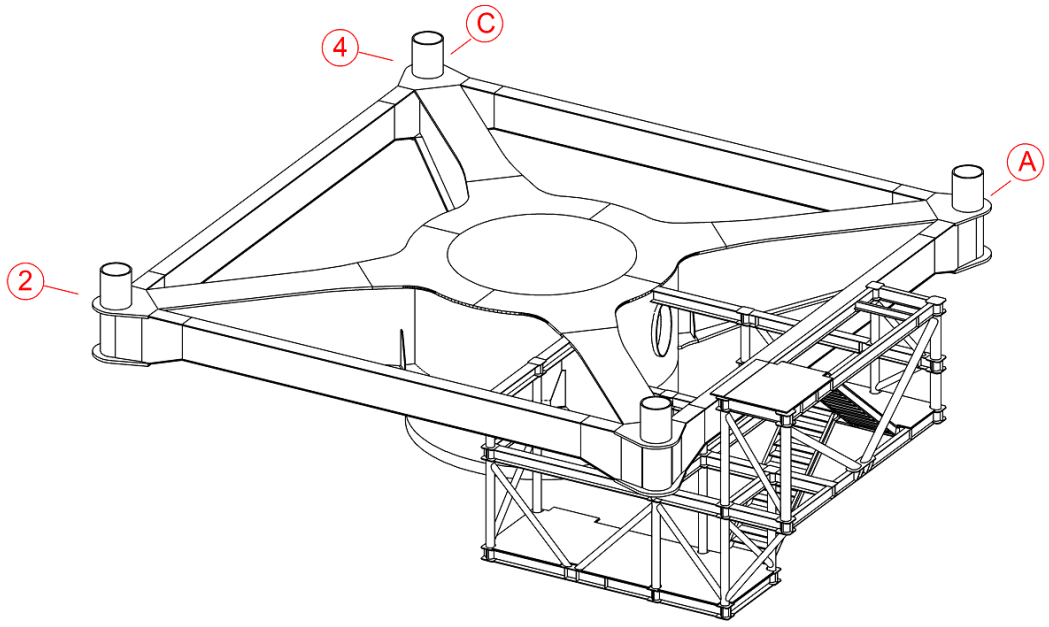


Figure 5.3 – Transition Piece – 3D

5.2.1 COG Position

CoG position is taken from ref. /15/,. According to the last issued WCR revision, TP has the following CoG and weight position (from A1 and LAT) relevant to loadout condition:

- Loadout expected weight 361.5 ton (-55.5 ton compared with WCR) including SPMTs;
  TP weighed weight +3% cont. = 254.5 ton
  SPMTs and spacers = 99+8 ton
- X_G = 19.663 m;

- Y_G = 8.774 m;
- Z_G = 20.10 m.

TP loadout scheme with CoG position is shown in the next figure.

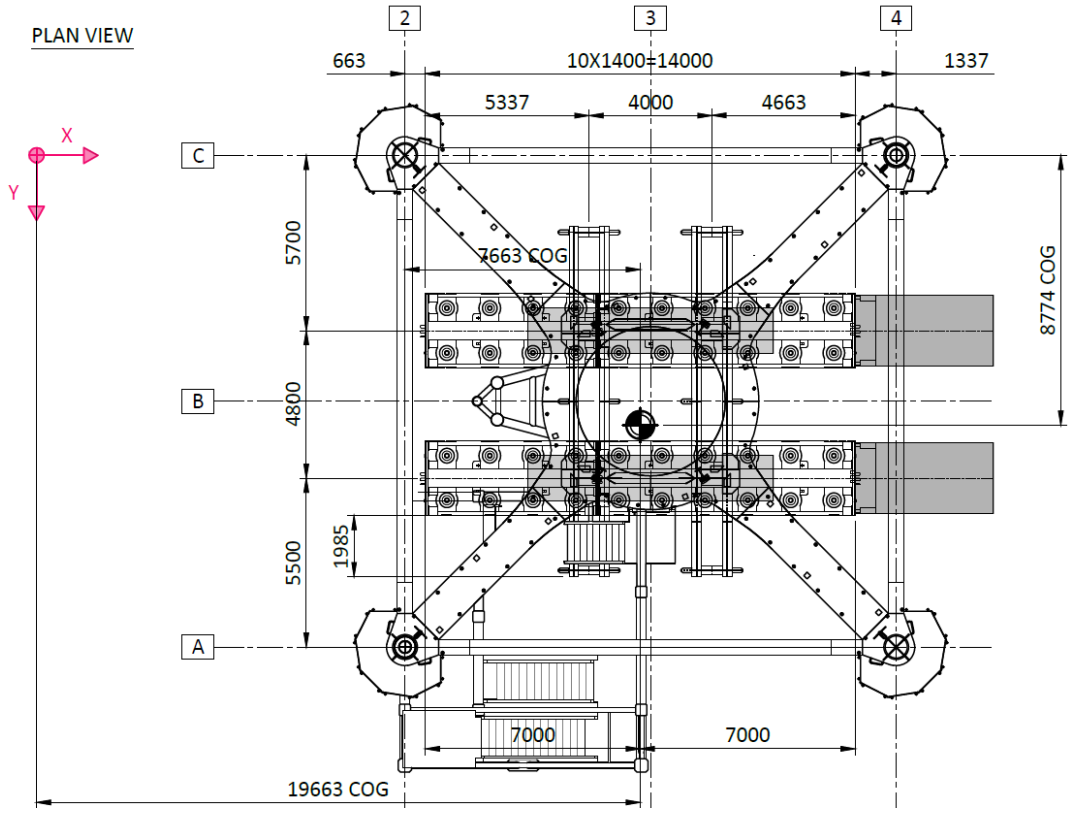


Figure 5.4 – TP SPMTs arrangement

Physical weighing was performed on 19th of July and confirmed the position of cog well within the envelope and the weight lower than expected.

6 SITE MAIN DATA

6.1 YARD GENERAL DATA

For the detailed plan view of YPB, refer to Appendix "B", where significant drawing is shown.

The area dedicated to erection and loadout activities of the Topside is located in the North side of YPB and the waterfront overlooks an internal harbour area of Marina di Ravenna.

The location is free from the influence of waves and currents and the main variations in terms of water level are only dependent on tide variation. Before loadout operation, Rosetti Marino will inform Ravenna Harbor Authority to avoid traffic near loadout involved area during loadout operation.

The elevation of quay capping beam above M.S.L. is 1,75 m, tide tables relevant to Ravenna Harbor (see Appendix "L" for details) show that maximum water level excursion is less than +/- 0,4 m around M.S.L.

The following Picture shows YPB location:



Figure 6.1 – Yard Piomboni Location

6.2 ITEMS LOCATION IN YARD

The area dedicated to the loadout activities of the Topside and TP is located in YPB as shown in Fig. 6.2. For detailed drawings, refer to Appendix "B".

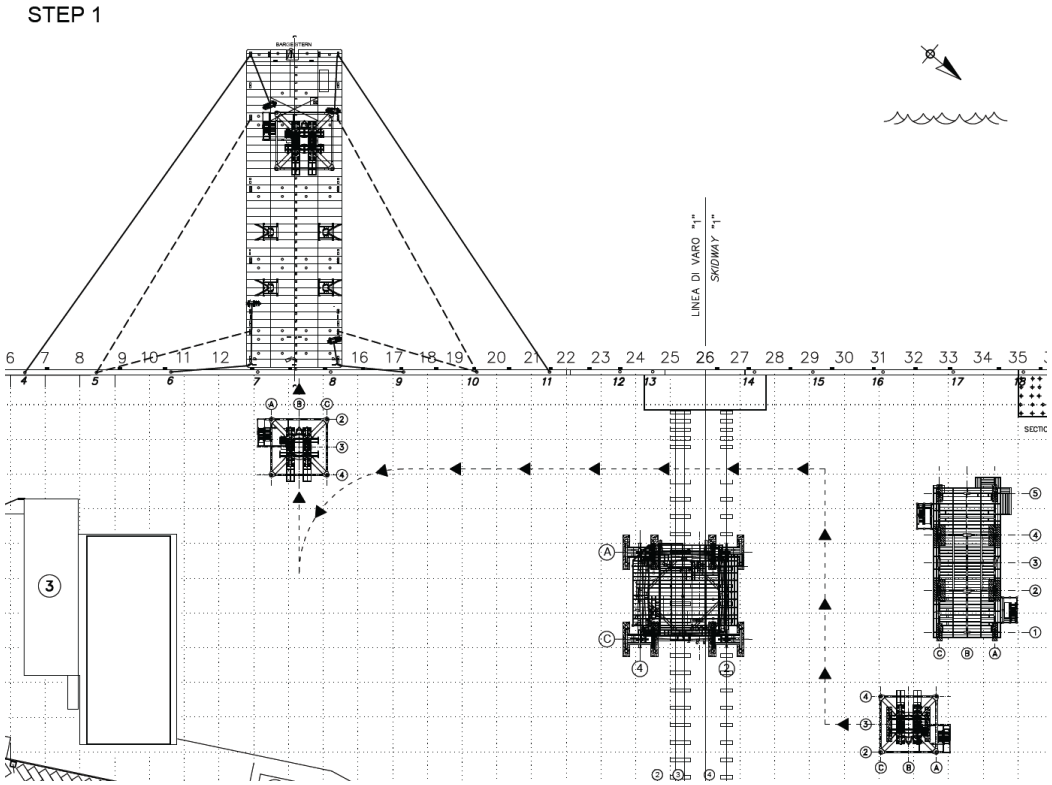


Figure 6.2 – TP position on PBY

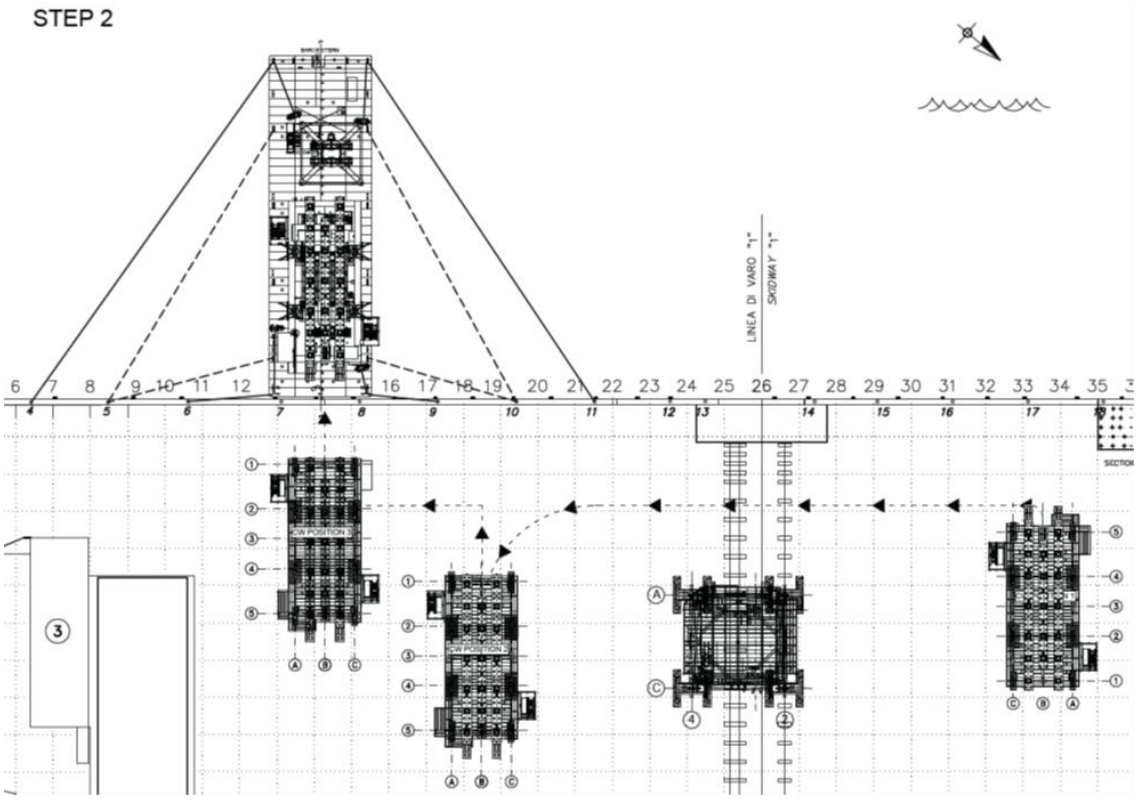


Figure 6.3 – Topside position on PBY

6.3 YARD BOLLARDS LOCATION AND DETAILS

Bollards position along quayside is shown in Appendix "B".

Bollards Capacity and a summary of Yard Piomboni Technical Report are shown in Appendix "D".

6.4 HYDROGRAPHICAL SURVEY AND TIDE DATA

The elevation of Quay Capping Beam above Mean Sea level (M.S.L.) is 1,75 m., tide tables relevant to Ravenna Harbor (see Appendix "M" for details) show that maximum water level excursion is less than +/- 0,4 m around M.S.L. However, during the week prior loadout, tide readings will be taken at yard quay in order to calibrate tide table.

A Seabed survey has been updated on February 2019, this survey shows the water depth in front of YPB reported to M.S.L. See Appendix "L" and water depth data.

6.5 BARGE MOORED PARALLEL TO QUAY – AFTER LOADOUT

After Loadout operation VERVECE (with towing ballast arrangement) will be moored along YPB quay in a dedicated zone defined by Quay Lines "6" and "22" (about 130 m long).

As per seabed Survey, in this area the minimum water depth is 6m; this value is relevant to a little area located near Line 13. The barge max draft during loadout will be approx. 4.35m so that the minimum clearance between keel and seabed will be approx. 1.25m (= 6,00 – 4.35 – 0,4) considering low tide condition in correspondence of the above-described little area.

According to Ref. /03/ this value is allowable since the minimum required value under keel clearance is 1m.

The following figure shows a zoom of the minimum seabed depth zone relevant to YPB quay dedicated to post loadout mooring operations:

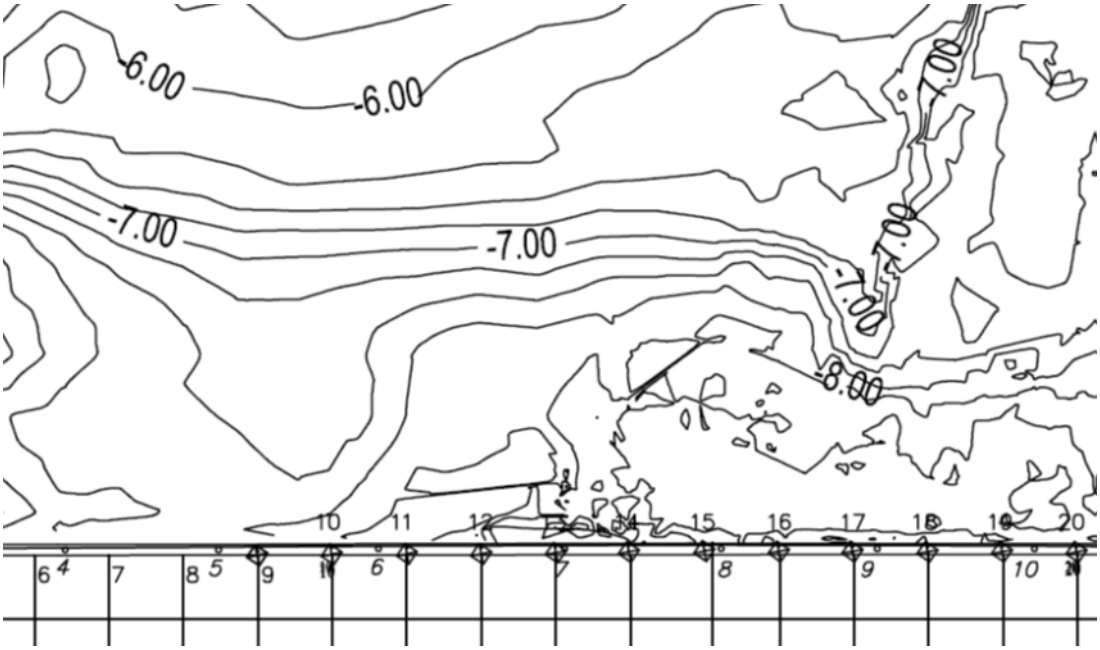


Figure 6.4 – Post-Loadout Area Minimum Seabed Depth

6.6 BARGE MOORED PERPENDICULAR TO QUAY – LOADOUT CONDITION

During loadout operation the barge deck and the yard capping beam shall be aligned independently of tide level variation and/or loadout phase. To ensure the alignment described above, the ballasting operations will be performed consequently.

The Cargo Barge will be moored perpendicular to Quay (stern at quay side) during loadout operation with a draft of about 4,35 m considering the M.S.L (-1,75 m from Yard Level).

During load out, the barge should be even.

The barge max draft during loadout will be approx. 4.35m so that the minimum clearance with seabed will be approx. 1.25m (= 6,00 – 4.35 – 0,4) considering low tide condition in correspondence of the above-described little area.

According to Ref. /9/ this value is widely allowable since the minimum required value under keel clearance is 1m.

The following picture shows a detail of bathymetry and minimum seabed depth in the loadout involved area). For detailed bathymetric plan see Appendix "L".

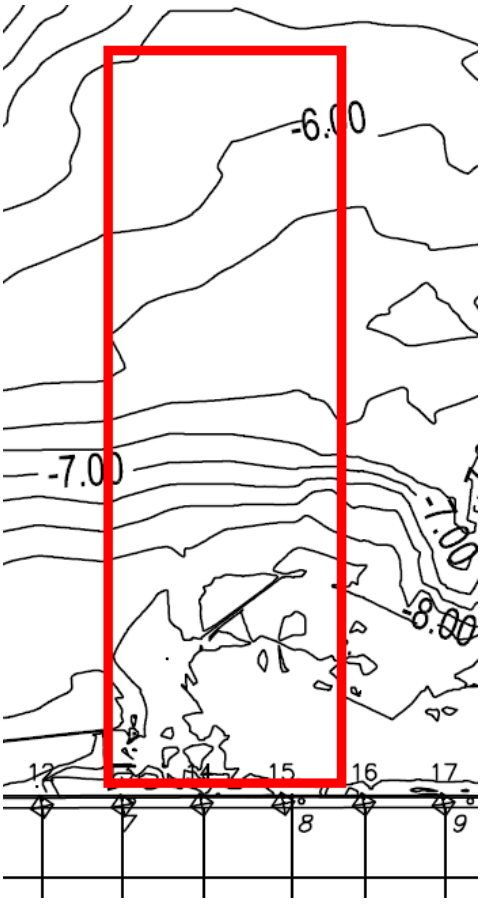


Figure 6.5 – Loadout Area Minimum Seabed Depth

6.7 WEATHER FORECASTING ARRANGMENT FOR THE YARD

Weather forecast for load out operation will be obtained from website www.windy.com and www.windfinder.com, during the week prior loadout operation weather forecast will be checked.

7 ENVIRONMENTAL LIMITS

7.1 TIDE

See section 6.5. max excursion +40cm/-40cm considered.

7.2 WAVE

Not present being in a closed basin. Marine traffic will be limited and wind wave negligible having limitation on max wind speed.

7.3 WIND

The loadout activities will be performed with good weather conditions and favorable weather forecast. The maximum wind speed should not exceed 10 m/s during loadout. Prior to start the load out the wind speed will be checked by means of an anemometer (hand anemometer available on yard).

The maximum wind speed assumed for mooring design is:

- 22.6 m/s for mooring after loadout (barge moored parallel to quay); The wind Speed of 22.6 m/s is the reference wind for 10 years return period storm (1-minute) according to Italian Code, the following table shows the main input and output data:

UNRESTRICTED MOORING OPERATION -DESIGN WIND SPEED			
References	**#1 - 0013/ND Guidelines for Loadouts Rev.6** **#2 - NTC 2008** **#3 - Circolare Esplicativa 02-02-2009**		
INPUT DATA			
Return Period Storm	$Tr=$	10 years	Ref. 1 - Chapter 10.8
Reference Wind Speed (50 year	$v_{ref0}=$	25 m/s	Ref. 2 - Table 3.3.1
Coefficient α_R	$\alpha_R=$	0,90 -	Ref. 3 - Chapter C3.3.2
OUTPUT DATA			
Design Wind Speed (T_r years)	$v_{ref10}=$	**22,6** m/s	

Table 7.1 – Wind Speed Design – Post Loadout Condition

- 10 m/s for mooring during load out (barge moored perpendicular to Quay).

LOADOUT OPERATION -DESIGN WIND SPEED			
References	**DNV-GL-N001**		
INPUT DATA			
Max Forecast / operational Wind Speed	$v_{ope}=$	10 m/s	
Planned Operation Period	$T=$	48 h	
Wind speed 10 return period	$v_{10}=$	22.6 m/s	
Alpha Factor	$Alfa=$	0.67 -	Table 2-15
OUTPUT DATA			
Design Wind Speed	$v_{des}=$	**14.9** m/s	

Table 7.2 – Wind Speed Design – Post Loadout Condition

For details relevant to Mooring Design see Chapter 8 and Attachment G.

8 MOORING SYSTEM

The mooring system consists of the following items:

- Barge winches;
- Polypropylene Mooring Lines;
- Connection Devices (link plate, tackles, shackles …)

The scope of mooring is to secure the Cargo Barge to the YPB Quay during loadout and post loadout activities. The mooring analysis has been performed considering two different barge conditions:

1. Barge Moored Perpendicular to Quay with Bow at Quay Side (Loadout Condition);
2. Barge Moored Parallel to Quay with Starboard at Quay Side (Post Loadout Condition).

8.1 WINCHES MAIN FEATURES

N.4 winches will be installed on barge deck and be employed to stretch mooring ropes. Each winch will be 35t capacity in pulling and 50t capacity in brake.

8.2 WIND EXPOSED AREAS

An analysis relevant to wind exposed areas is necessary in order to evaluate the acting loads on mooring lines due to wind pressure applied on barge, loaded out items and Grillage.

8.2.1 Lateral View

The following picture shows the Lateral Exposed areas for the main items relevant to loadout condition and post loadout condition.

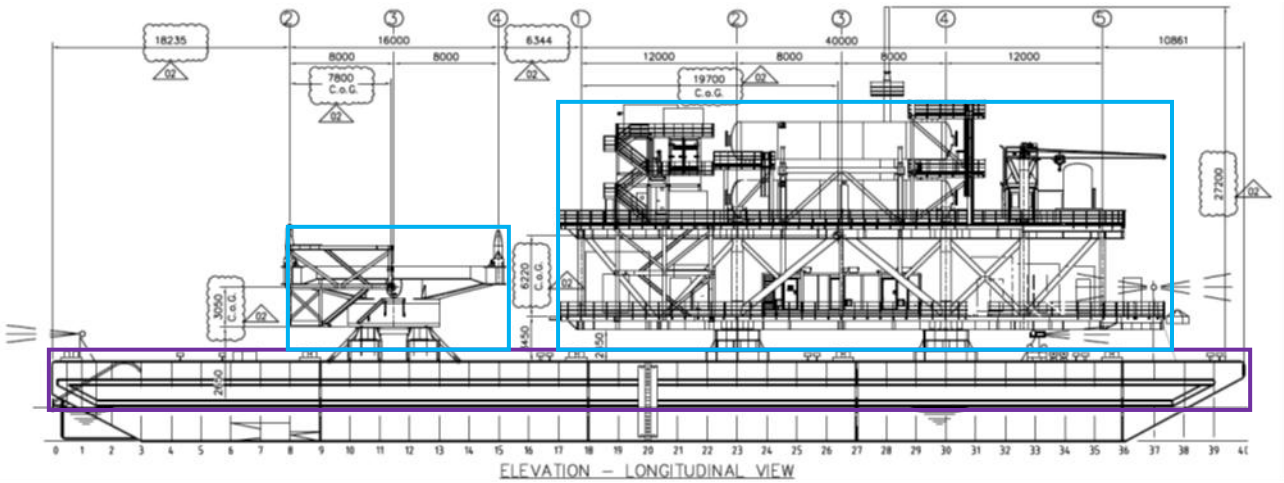


Figure 8.1 – Wind Lateral Exposed Area

The following list summarizes the main data relevant to Exposed Areas shown above:

1. Cargo Barge (Violet) : Exposed area equal to 190 m^2 (considering Low Tide Condition) with a Center of Exposed Area located at 45.7 m from Barge Stern;
2. TP, Topside & Grillages (Blue): BLPH Exposed Area equal to 650 m^2 with a Center of Exposed Area located at 60.5 m from Barge Stern, TP Exposed Area equal to 140 m^2 with a Center of Exposed Area located at 25 m from Barge Stern, CF covered by the above numbers.

8.2.2 Front View

The following picture shows the Exposed areas for the main items relevant to loadout condition and post loadout condition:

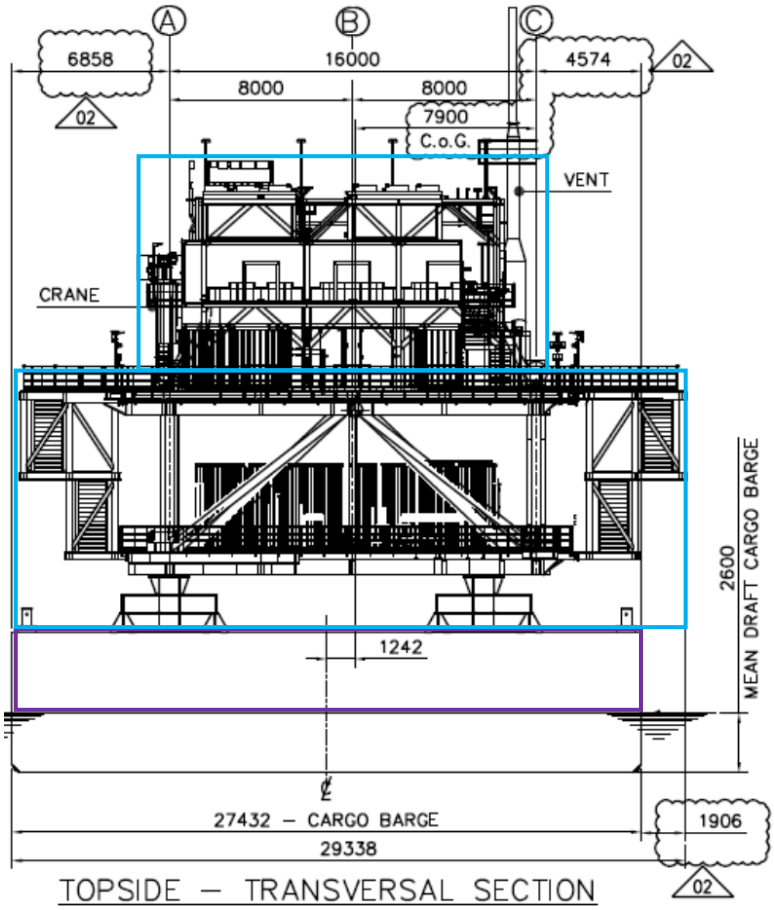


Figure 8.2 – Wind Front Exposed Area

The following list summarizes the main data relevant to Exposed Areas considered for this condition:

1. Cargo barge (Violet): Exposed area equal to 80 m^2 (considering towing ballast arrangement) with a Center of Exposed Area located on Barge Centre Line;
2. Topside (Blue): Exposed Area equal to 340 m^2 with a Center of Exposed Area located on Barge Centre Line;

See attachment G for mooring analysis.

9 LOADOUT PROCEDURE

9.1 GENERAL

The basic principles of the operation consist of moving the items by means of SPMT until the edge of the bridge plate over the quay is reached, then, after a first set of proper alignment check and compliance of values of tide and water into the ballast tanks, the items will be moved on board of the cargo barge.

- Topside Row 1 will be the first to be transferred to the barge bow and the structure weight will be transferred to barge by SPMT tires. Three suitable bridge plates (one for each SMPT line) will be provided to ensure the connection between yard capping beam and barge bow, for details and structural checks of these bridge plates see Appendix E.
- TP Row 2 will be the first to be transferred to the barge and the structure weight will be transferred to barge by SPMT tires. Two suitable bridge plates (one for each SMPT line) will be provided to ensure the connection between yard capping beam and barge bow, for details and structural checks of these bridge plates see Appendix E.

The transportation barge VERVECE will be ballasted / deballasted to compensate the load transferred by the SPMT and during the progress of the loadout a monitoring system consisting of optical levels measurement set will be adopted to monitor the barge trim and roll.

During Topside loading on, barge will be moored with bow at quay side; yard capping beam and barge deck will be kept at the same level during all loadout phases however little vertical barge movements are allowed considering the arrangement of bridge system composed by steel plates simply supported on barge stern and quay. During topside loading-on, the alignment between barge bow and quay will be continuously checked.

Bridge plates arrangement will accommodate vertical gap from 0 to 10cm, with barge deck lower than quay operation will be stopped and ballast manouvred.

During operations, a system of fenders will be arranged to keep unchanged the distance between barge and quay, their details are in Appendix E.

9.2 MAIN LOADOUT TIMELINE

The following table summarizes the main steps necessary to carry out Topside Loadout:

STEP	ACTION	REFERENCE
01	SPMT (and spacers) position under the item	Attach. "H"or "I"
02	Perform Ballast Plan as per Phase 0 of Ballasting Sequence	Attach. "O" or "P"
03	Positioning of Bridge Plates	Attach. "E"
04	Lift item by means of SMPT	Attach. "H"or "I"

05	Movements necessary to remove Yard Supports and approach to Quay	Attach. "H"or "I"
06	Start Loadout Operation	-
07	Start Ballasting Operations	Attach. "O" or "P"
08	Reaching item final position	Attach. "A"
09	Set down and shimming of Upper Grillage on Lower Grillage	Section 9.5
10	Start Grillage & Seafastening Welding Operation and remove SPMT	-
-	Start ballasting to reach Towing Ballast Condition	-
-	Barge Rotation After Minimum Seafastening Welding Completion	Attach. "R"
-	Barge Mooring Parallel to Quay	Attach. "E"
-	Completion of Topside Grillage and SF welds	

Table 9.1 – Main Loadout steps

9.3 TOPSIDE, QUAY AND BARGE PREPARATION

9.3.1 TP and TOPSIDE

At the time of the loadout, item will be completed in terms of structural works and concerning all accessories. A check of the status of completion will be performed prior the loadout and loose items (if any) considered critical for the activity will be properly secured.

All the activities listed below will be carried out prior the loadout:

1. Removal of scaffolding and items not necessary for the loadout;
2. Check that no loose items will be on the item during the activity;
3. Check that no clashes will occur between item and quay site facilities and no obstacles will be present along the route;
4. Check the SPMT arrangement;
5. Check that item weighed weight is within loadout boundaries;
6. loading operation shall not commence until MWS CoA has been issued.

9.3.2 Quay side

Activities required before the loadout listed as follows:

1. Clean off all material and equipment not strictly required for the loadout;
2. Check that no sharp objects will be present along SPMT route;
3. Check that no obstacles will be present between the fenders and the barge;
4. Perform safety inspection;
5. Cordon off the area involved for the operation;
6. Disposal of all the mooring equipment close to the designated bollards and check of compliance of the equipment itself;
7. Check and preparation of bollards and anchor points on-shore;
8. Arrangement of all reference points necessary for the barge level monitoring during the loadout (an optical level and stadia system will be employed for the scope).
9. Painting of the SPMTs path in yard and on the barge.

9.3.3 Barge Preparation

List of activities to be carried out before starting the loadout:

1. Check that grillage beams are properly welded and positioned on the barge deck and welding adjustments/intervention to be performed if necessary;
2. Check dimensional compliance concerning grillage height on barge deck;
3. Check all barge appurtenances have been removed/installed (bollard/closure frame);
4. Check of the ballast system arrangement and perform function test of ballast system prior to load out operation;
5. Check arrangement of bridge plates;
6. Check that no clashes will occur between topside and barge appurtenances and / or grillages , if any remove;
7. Check if deck manholes are accessible for the using of ballasting portable pumps (ullage level will be monitored through open man holes);
8. Preparation of seafastening materials and welding equipment nearby seafastening installation point to support work immediately after topside set-down;
9.

9.3.4 Personnel preparation

List of activities to be carried out before starting the loadout:

1. Tool box with all personnel involved into loadout operation (as per loadout organization chart) carried out;
2. Check radio communications (walkie-talkie and spare batteries tested);
3. Check first aids availability;
4. Check harbor authority has been informed of imminent start of loadout operation (Loadout Manager responsible for communication with Harbor Authority).

9.3.5 Fenders

During loadout operation two quay fenders (one for each barge side) will be placed between barge bow and the concrete capping beam of the quay in order to keep unchanged the distance between barge bow and quay.

Considering the reduced height of the flat surface at barge bow the selected fenders are made by a steel frame and wood, to ensure the possibility of vertical movement prior to the loadout operation.

The following picture shows a typical section of the fenders employed for loadout operation:

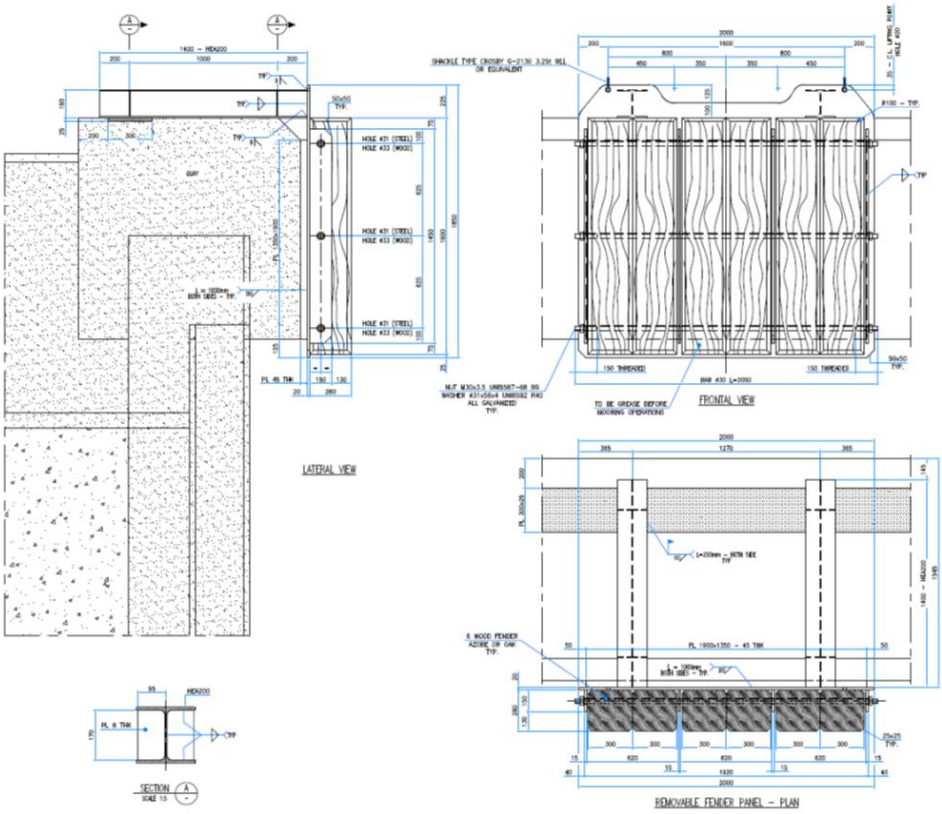


Figure 9.1 – Fender Typical Section

9.3.6 Bridge Plates

In correspondence of each SMPT line a dedicated bridge plate will be positioned to allow the transfer from capping beam to barge stern. According to Rosetti experiences with loadout by means of SPMT the bridge plates will be simple supported (without welding or restrains on to quay / barge side) in order to avoid fixed connection from barge and quay, however the correct alignment from barge and quay will be assured by winches action and will be constantly monitored during loadout operation.

In order to monitor the bridge plates, their position will be marked on barge deck.

The following picture shows a layout of the barge / quay during loadout and the position of three bridge plates has been pointed out for BLPH and two for TP:

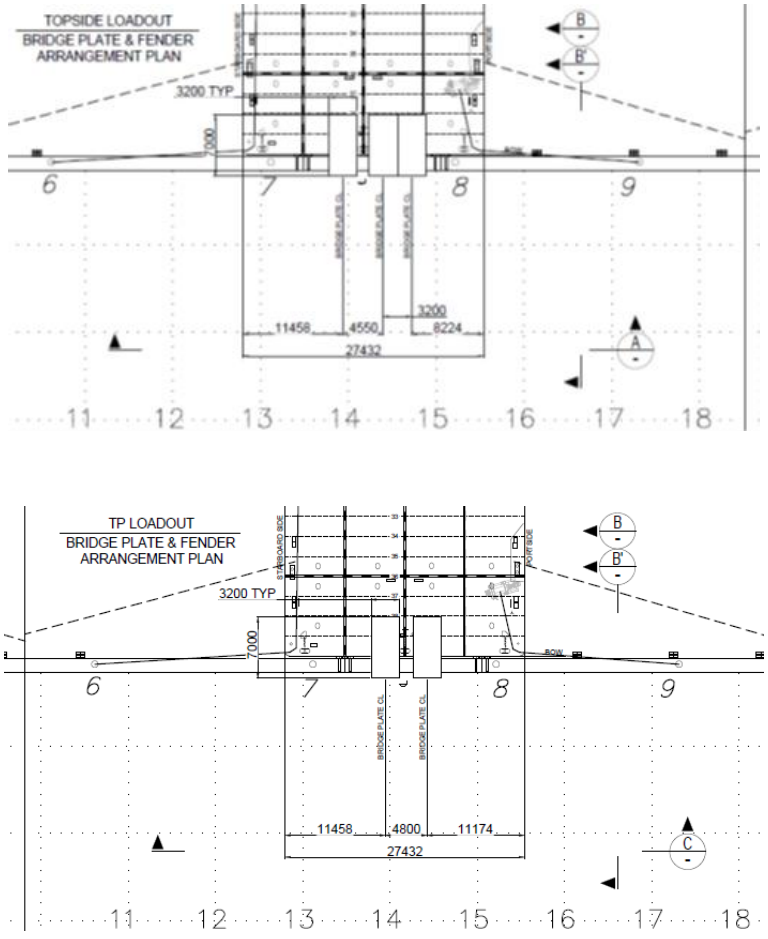


Figure 9.2 – Bridge Plates Arrangement

The following table shows the calculation check relevant to bridge plate considering the worst load condition (max SPMT axle capacity) and considering a bridge plate width equal to 3.000 mm:

BRIDGE PLATE CHECK					
Ref:	**AISC - Allowable Stress Design 89 - Manual of Steel Construction**				
INPUT DATA					
Yield Strength	F_y	=	355	MPa	
Young Modulus	E	=	205.000	MPa	
Bridge Plate Width	b	=	3.000	mm	
Bridge Plate Thickness	t	=	35	mm	
Bridge span	L	=	1.000	mm	
Inertia	J_x	=	1,07E+07	mm^4	
Area Section	A	=	105.000	mm^2	
Modulus	W_x	=	6,13E+05	mm^3	
LOAD DATA					
Load	F	=	360	kN	
AUX OUTPUT DATA					
Allowable Bending Stress	F_b	=	213	MPa	
Allowable Shear Stress	F_v	=	142	MPa	
Max Bending Moment	M_b	=	90.000	kNmm	Considered as Simple supported Beam
Max Deflection	u_z	=	3	mm	Located at Bridge Middle Point
OUTPUT					
Bending Stress	f_b	=	147	MPa	
Shear Stress	f_v	=	5	MPa	Max Shear
Bending Unity Check	U.C.	=	0,69	-	Bending Stress Check
Shear Unity Check	U.C.	=	0,04	-	Shear Stress Check
CHECK					**ALLOWABLE STRESS**

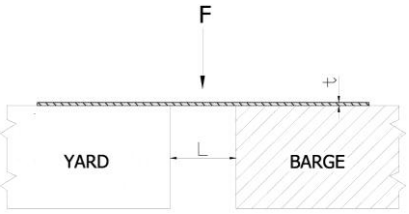


Table 9.2 – Bridge Plate Calculation

9.4 BALLAST SYSTEM

Ballasting sequence is included in Appendix "O" for TP and "P" for BLPH.

The ballasting system consists of a 2 x 600 m3/h centrifugal internal pumps + 8 diesel pumps (with a min. nominal capacity of 300 m^3/h) for a total nominal capacity equal to 3600 m^3/h.

Loadout ballast sequence considers max 4 tanks contemporaneously manoeuvred at each loadout phase.

Barge pumps have been dedicated to load transfer, external pumps to tide compensation and load transfer However, the pumps are portable so it is possible to shift a pump from a ballast tank to another one in case of necessity, therefore the capacity of back-up system can be easily increased simply connecting a spare pump or a pump that is not used in that phase.

The details relevant to pumps characteristics and general layout has been included in Appendix "N".

9.5 UPPER GRILLAGE SET DOWN ON LOWER GRILLAGE & SHIMMING PROCEDURE

At the end of load out, when item is in its final position on barge, the following main actions will take place:

- Final position of item over lower grillage agreement between all involved parties (Rosetti, CW , MWS);
- 50% weight download on grillage;
- Check of gap on each support point;

- item weight resuming on SPMT system;
- Shimming insertion on support points, if any;
- Complete item weight download on grillage.

9.6 MINIMUM SEAFASTENING WELDS

The minimum seafastening welding operation will start as soon as lowering and shimming has been completed. After completion of minimum seafastening the welding activities will proceed in order to complete all seafastening welds with barge in towing condition.

Refer to Attachment R for minimum seafastening calculation and drawings.

9.7 DIMENSIONAL CONTROL DURING LOADOUT

As described before the barge deck will be continuously monitored during loadout in order to keep under control the stern level (compared to quay elevation) and the barge trim, the following picture shows the typical arrangement employed for barge level monitoring system:

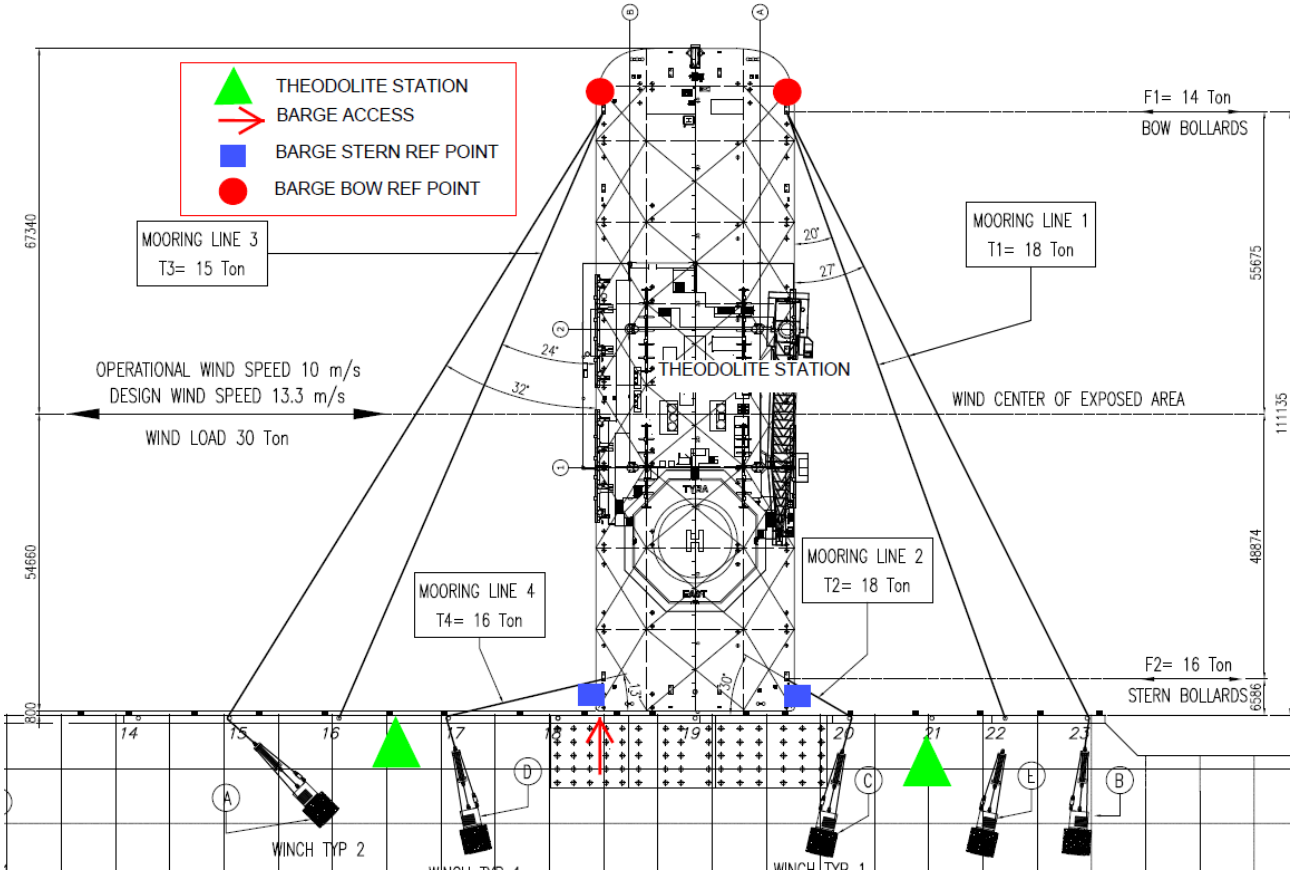


Figure 9.3 – Barge dimensional control system - Typical

10 LOADOUT ORGANIZATION

10.1 ROLES AND RESPONSIBILITY

A description of the functions and responsibilities of the key personnel involved in the operation is given here below:

- *Loadout Manager* is responsible for the whole loadout operations. Client, Certifying Authority and Marine Warranty surveyor representatives liaise only and directly with Loadout Manager. Loadout Manager is also responsible for external parties interface / communication (harbor tugs, port authority and emergency services).
- *Ballast Engineer* is responsible for the operations of the primary ballast system and eventually for the emergency systems, in accordance with the loadout procedure and the instructions of the loadout manager.
- *Mooring System Superintendent* is responsible for mooring the barge onto the quay and for adjusting the barge alignment throughout the load out operation.
- *Surveyors Superintendent* is responsible for the co-ordination of the surveyor teams who check the barge level and alignment during the operation.
- *Intervention Team Superintendent* is responsible for the intervention team equipped with cranes, welding machines, cutting gear etc. which will be ready to intervene throughout the operation.
- *HSE Manager* is responsible for all the aspects related to safety including control of access within the restricted area and the liaison with the first aid team.
- *SPMT Superintendent* is responsible for all the aspects related to correct preparation and execution of transport operation by means of self-propelled modular trailer.
- *CPY Representative* is responsible for interface with Rosetti project team, loadout manager and Marine Surveyor.
- *ABL Marine Surveyor* Issue Certificate of Approval to start the loadout. (A signed copy must be handed to CPY Site Rep prior to topside liftoff). Witness loadout operation. Interface with CPY and Rosetti as required.
- *Project Quality Manager* is responsible for providing all documentation and certification required by MWS and to ensure checklists are completed and signed off.
- *Construction Manager*, in collaboration with Loadout Manager is the responsible all barge / quay activities (bollard removal, double plate positioning, lower grillage installation...) necessary to perform loadout.

- *Tide Surveyor* is responsible for checking the tide variations during loadout operation, he will inform Loadout Manager about tide behavior by radio.

10.1.1 Contact details of key personnel

Here are the following contact details of key personnel:

- *Massimiliano Brunelli – Project Manager;*
  mobile: +39 334 6143049
  e-mail: massimiliano.brunelli@rosetti.it
- *Alessandro Balzarotti – Project Structural Engineer ;*
  mobile: +39 345 1449272
  e-mail: alessandro.balzarotti@teconsrl.it
- *Wolmer Borghi – Construction Manager;*
  mobile: +39 366 6497967
  e-mail: wolmer.borghi@rosetti.it
- *Daniele Ricci Picciloni –Project HSE Manager;*
  phone: +39 335 1225148
  e-mail: daniele.riccipicciloni@rosetti.it
- *Alessandro Berti –Yard Manager & Loadout Manager;*
  mobile: +39 338 5300679
  e-mail: alessandro.berti@rosetti.it
- *Kevin Sirski– ABL Marine Warranty Surveyor;*
  phone: +44 (0) 7442 786279
  e-mail: k.sirski@abl-group.com
- *Jan Duinhoven - Company Representative;*
  mobile +31 642048772
  e-mail: jan.duinhoven@crosswindhkn.nl
- *Jeroen van Loon - Floating Solar Lead & BLPH Construction Manager*
  mobile 31 (0)6 – 43103041
  e-mail: jeroen.vanloon@crosswindhkn.nl

10.2 COMMUNICATIONS

The Loadout Manager has overall responsibility and control of the operation. The Loadout Manager communicates with the Loadout team via walkie-talkie and is the only one entitled to give orders.

The Loadout Team is in constant communication with the Loadout Manager and follows his instructions. In case of any mismatch with expected data and conditions, each Loadout Team component must inform immediately the Load out Manager, who is the only entitled to decide relevant intervention.

In case of immediate danger to the Health and Safety of any operator each Loadout Team component must STOP the operation immediately and then inform the Loadout Manager.

In any case, the Loadout Manager is the only one entitled to restart the operation.

Communication among the load-out key personnel will be made via portable radio. Load-out Manager will be linked to the surveyor superintendent in charge of continuously monitoring the barge draft, trim and heel. The tank sounding will be read in by measuring the ullage through the manholes.

Prior to start the operations the correct functionality of the walkie-talkies (batteries, radio frequency...) will be checked. Each walkie-talkie will be provided with a spare battery ready in case of substitution. A dedicated RF Channel will be employed for loadout operation.

A toolbox talk will be carried out before the load out commences. All personnel involved in the loadout, as per the Operational Organizational Chart, should be present so that everybody understands the operation and is aware of their responsibilities.

Italian will be used throughout the operation. All communications with CPY and Marine Surveyor will be conducted in English.

In the event of the operation being stopped for unforeseen circumstances, as described in this section, the Loadout Manager will inform CPY and the MWS of the nature of the problem and the proposed corrective course of action.

10.3 HSE REQUIREMENTS

For general Safety Measures refer to Project HSE Plan applicable revision and Risk Assessment.

A dedicated HIRA will be held to ensure a correct risk assessment.

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10.4 CONTINGENCY PROCEDURE

The following table summarizes the main risks and relative actions.

RISK	INTERVENTION	TIME (min.)
Mooring line failure	- line reinstatement or substitution and back-up pre laid line in action - Tugs intervention (see Note 1)	0-10' 15-20'
Primary ballasting system failure	- Portable Pumps Ballasting System	10-15'
SPMT failure	See Appendix "H" and "I"	
Clashes removing Requirement	Scaffold items and cutting/burning gear on standby at location on barge	

Table 10.1 –contingency plan

Note 1: During critical phase (loadout operation) Ravenna Harbor guarantees a Tug intervention, on request.

ATTACHMENT A – TP & BLPH GENERAL ARRANGEMENT ON VERVECE

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ATTACHMENT B – TOPSIDE & TP LOCATION ON YARD PIOMBONI

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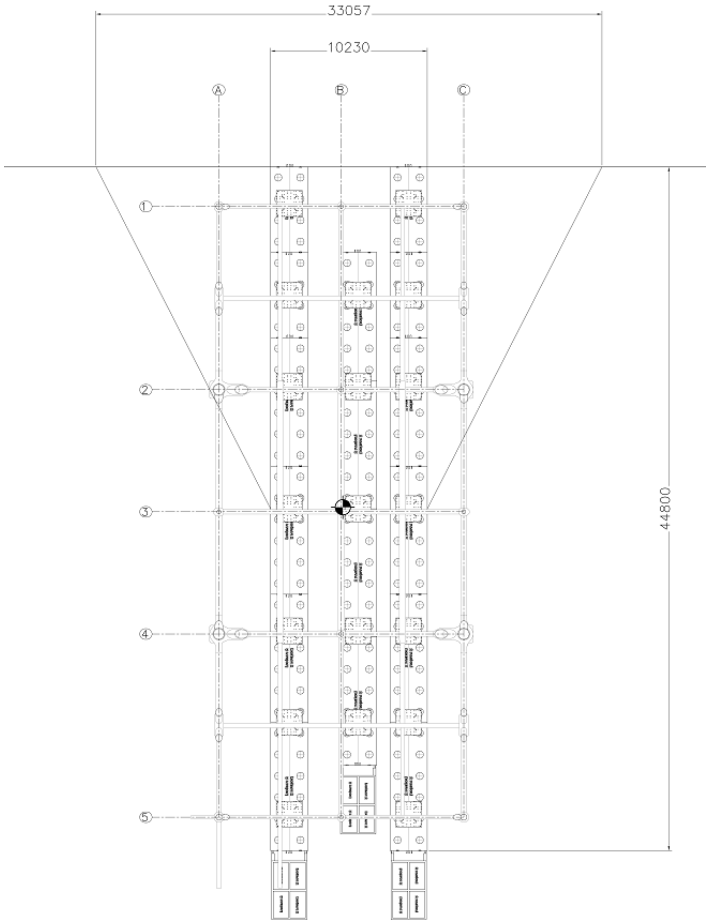
ATTACHMENT C – CARGO BARGE VERVECE - SPECIFICATIONS

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ATTACHMENT D – PBY NORTH QUAY

To calculate the equivalent uniform distributed load on quay, a distribution 1:2 of load is considered.

Next simplified scheme shows the load distribution:



The global load on the three trains of SPMTs is about 2300 tons.

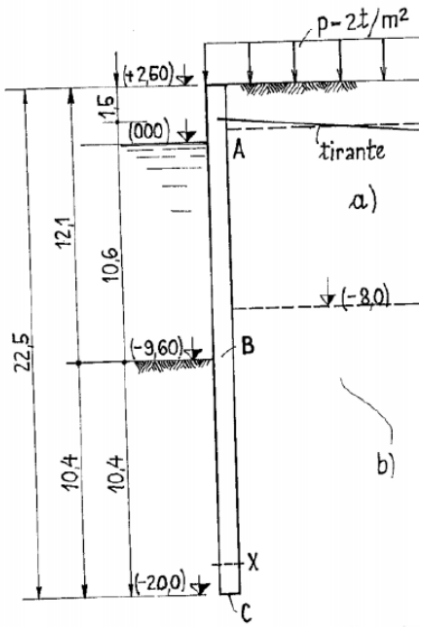
The distribution area according to the scheme results:

Area = 44.80 x 33.00 = 1450 m2

The average equivalent pressure results:

P = 2300 / 14550 = 1.58 ton/m2 < 2.0 t/m2

The quey capping beam is made of a concrete wall 0.95 m thickness with tendon spaced 4.0 m and a distribution capping beam 1.40m width x 2.0m height.



The calculation report, here after enclosed, considers a uniform distributed yard load of 2 ton/m2 but according to the following geometrical data:

- Water depth = 9.60 m
- Quay elevation = + 2.50 m:
- Total height above seabed = 9.60 + 2.50 = 12.10 m

Actually, the geometrical data are:

- Water depth = 8.50 m
- Quay elevation = + 1.75 m:
- Total bulkhead height above seabed = 8.50 + 1.75 = 10.25 m = 85% x 12.10 m

The capping beam is also designed for a uniform vertical load on the top of 20 ton/m (See report par. 2.2).

The maximum SPMT axle load is about 31 ton and SPMT width is 2.43m, therefore the vertical load on the capping beam the axle is on the top results:

Q = 31.0 / 2.43 = 12.8 t/m < 20 t/m, also his check is satisfied.

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ATTACHMENT E – MOORING SCHEMES, FENDERS & BRIDGE PLATES

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ATTACHMENT F – MOORING EQUIPMENTS

ATTACHMENT G – MOORING ANALYSIS

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ATTACHMENT H – SPMT METHOD STATEMENT FOR TP

ATTACHMENT I – SPMT METHOD STATEMENT FOR BLPH

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ATTACHMENT L – HYDROGRAPHICAL SURVEY

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ATTACHMENT M – TIDE TABLE

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ATTACHMENT N – PORTABLE BALLASTING PUMPS & GENERAL ARRANGEMENT ON BARGE

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ATTACHMENT O – BALLAST SEQUENCE FOR TP

ATTACHMENT P – BALLAST SEQUENCE FOR BLPH

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ATTACHMENT Q – SAFETY CHECKLIST

ATTACHMENT R – MINIMUM SEAFASTENING

According to case 12 , TABLE 11-4 of DNV-ST-N001, 0.1g acceleration in both directions have been assumed for the calculation of min. SF.

1) TP weight = 254.5 ton (weighed + contingency)

0.1g = 25 ton in both directions.

Aw = (2*11*0.7)*350 > 15*350 = 5250 mm^2

Fv = 0.4*355*5250/1000 = 745.5 kN / 9.81 = 76 ton each. N. 4 welded

2) Topside weight = 1802 ton

0.1g = 180 ton in both directions.

Aw = (2*30*0.7)*250 = 10500 mm^2

Min bearing surface = 150*40= 6000 mm^2

Fv = 0.4*355*10500/1000/9.81 = 152 ton each. N.2 min in each direction

Fb = 0.6*355*6000 / 1000 /9.81 = 130 ton each. N.2 min in each direction

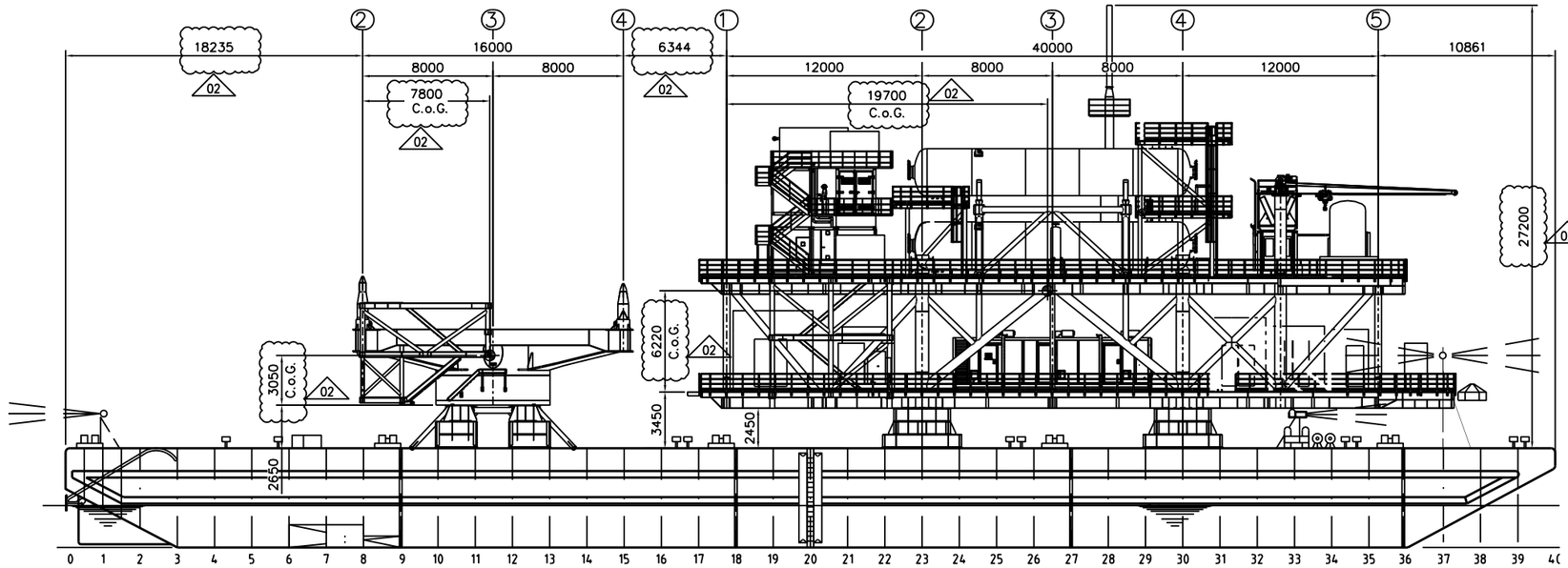
See drawings in Attach. R

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ATTACHMENT S – MOC

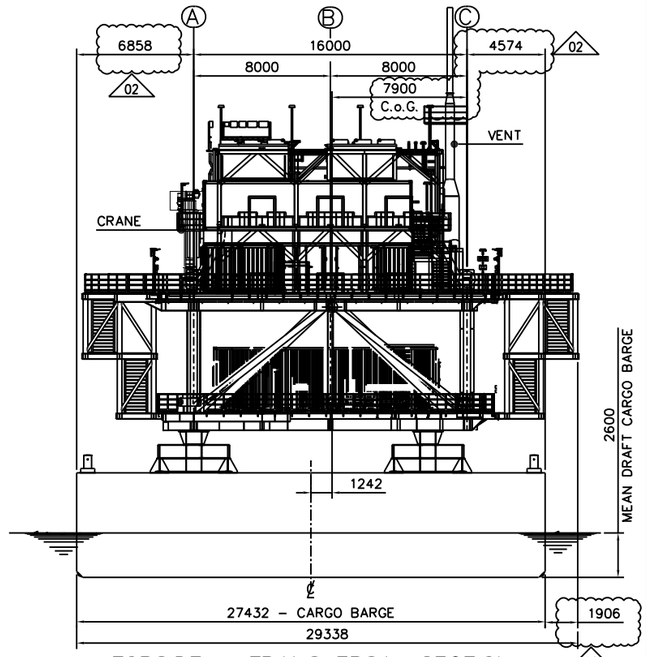
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REV. 02



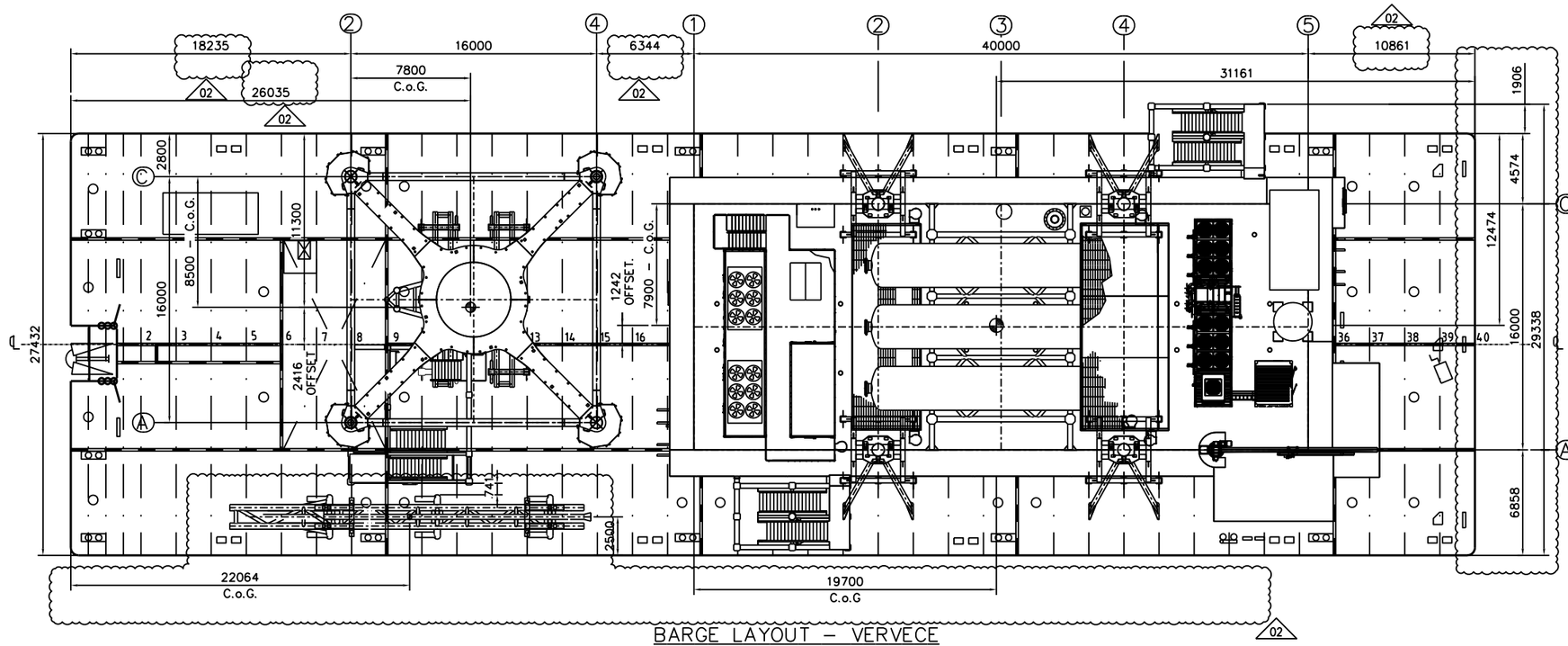
ELEVATION – LONGITUDINAL VIEW

SCALE 1:175



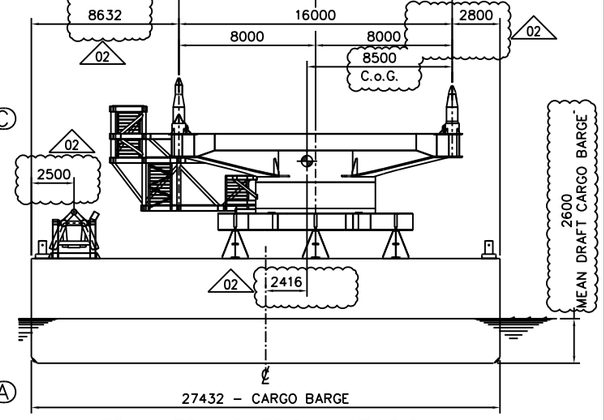
TOPSIDE – TRANSVERSAL SECTION

SCALE 1:175



BARGE LAYOUT – VERVECE

SCALE 1:175



TP – TRANSVERSAL SECTION

SCALE 1:175

VERVECE		
LENGTH	300' 0"	91.440 m
BREADTH	90' 0"	27.432 m
DEPTH	20' 0"	6.096 m

UNIFORM DECK LOAD = 25 T/sqm

CLASS LR+ 100 A1 PONTOON

WELDING WHERE NOT SHOWN : ◺3.5

WEIGHT LIST	
TOPSIDE	= 1802 t
TP	= 290 t
TOPSIDE L.GRILLAGE & SF	= 75 t
TP L.GRILLAGE & SF	= 45 t
CAISSON FRAME	= 26 t
CAISSON GRILLAGE & SF	= 0.5 t

NOTES	HOLDS
1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O. 2 – ALL ELEVATIONS ARE REFERED TO C.D.	

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/02/25	SGR	AB	DLS	ACCEPTED FOR CONSTRUCTION (AFC)
01	07/10/24	SGR	AB	DLS	ACCEPTED FOR CONSTRUCTION (AFC)
00	12/01/24	SGR	AB	DLS	ISSUE FOR REVIEW (IFR)

CROSSWIND

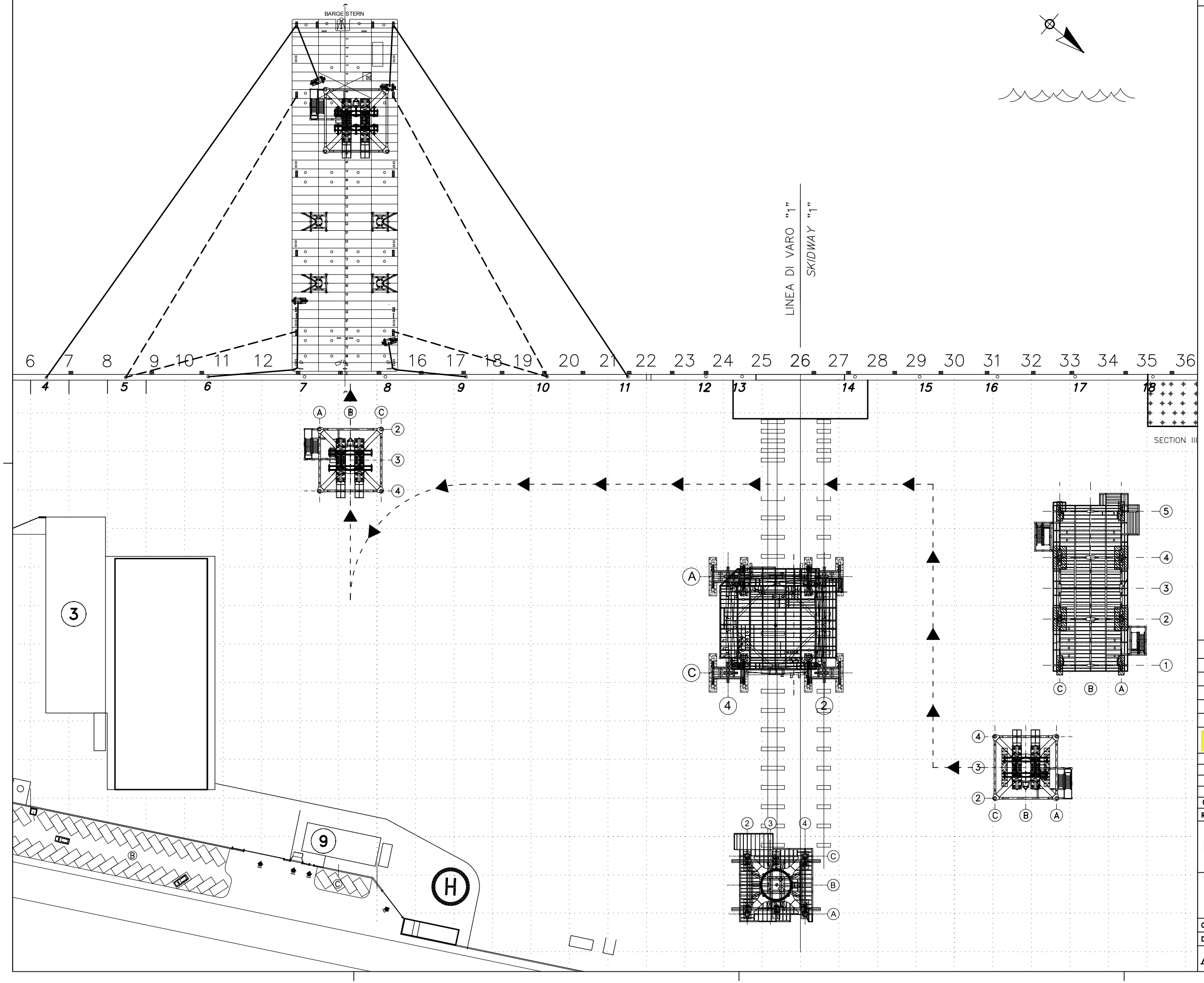
ROSETTI MARINO

TITLE : **BASE LOAD POWER HUB (BLPH)**
BARGE LAYOUT

CONTRACT NO./TITLE	CW-1-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK		SCALE 1:175
DRAWN S.GRIFFINI	CHECKED A.BALZAROTTI	APPROVED D.LO STERZO	DATE 26/02/25
A1	DRAWING NO. 123A90-DDL-TI-DD-99015	SHEET 001	REV. 02

File Name : 123A90-DDL-TI-DD-99015_02.dwg

STEP 1



NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.

REFERENCE DRAWINGS

DWG No.	DESCRIPTION

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
00	29/05/25	GS	FC	CA	ISSUED FOR CONSTRUCTION

CROSSWIND

ROSETTI MARINO

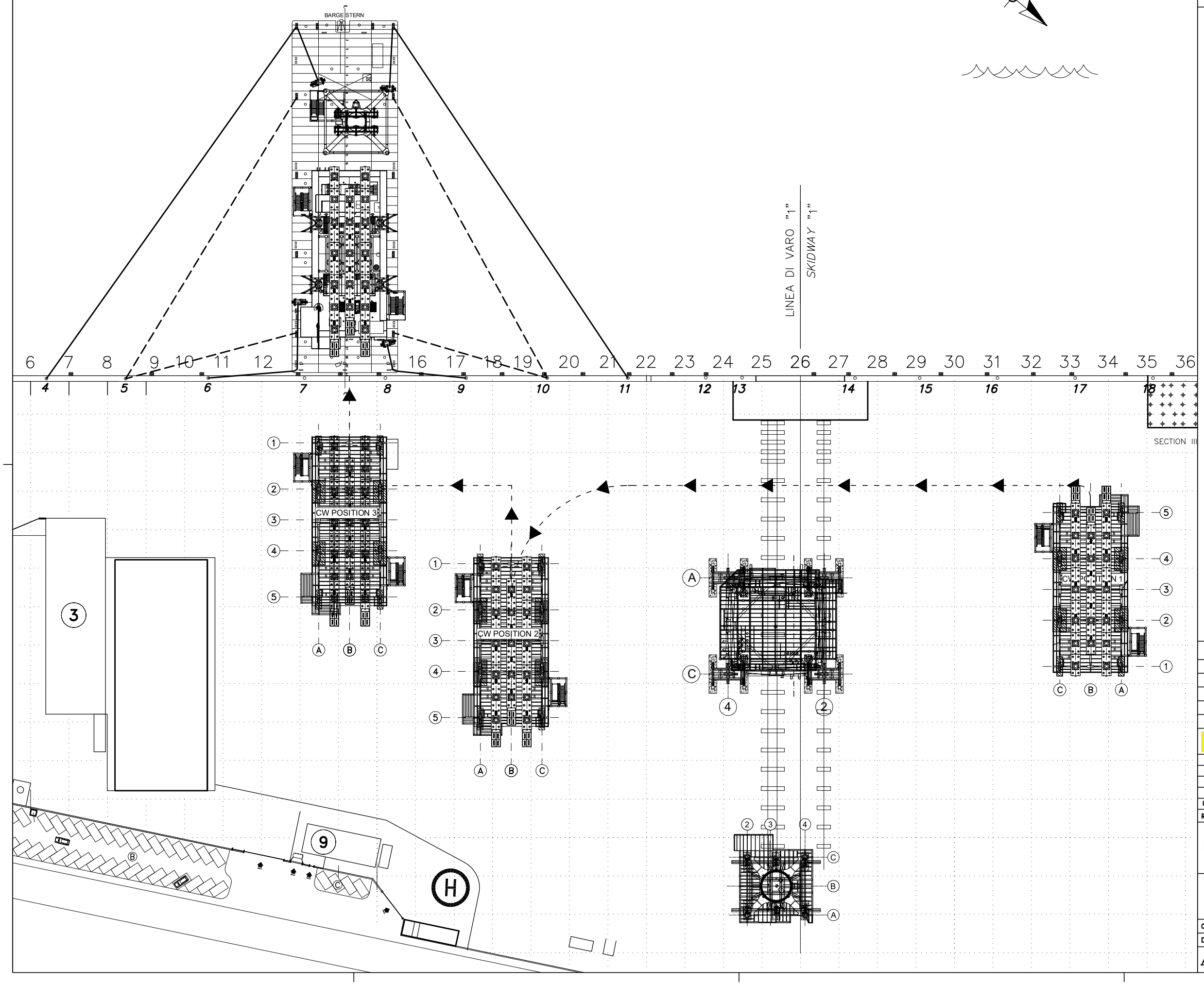
TITLE :

BASE LOAD POWER HUB (BLPH)
CROSSWIND LOADOUT
YARD LAYOUT – STEP 1

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE
DRAWN G.SEGURINI	CHECKED F.CERONI	APPROVED C.ANTONELLINI	DATE 29/05/25

A1	DRAWING NO.	SHEET	REV.
	123A90-FDL-MT-DD-00402-00	001	00

STEP 2



NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.

REFERENCE DRAWINGS

DWG No.	DESCRIPTION

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
00	27/05/25	GS	FC	CA	ISSUED FOR CONSTRUCTION

CROSSWIND

ROSETTI MARINO

TITLE :

BASE LOAD POWER HUB (BLPH)
CROSSWIND LOADOUT
YARD LAYOUT – STEP 2

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE
DRAWN G.SEGURINI	CHECKED F.CERONI	APPROVED C.ANTONELLINI	DATE 27/05/25

A1	DRAWING NO. 123A90-FDL-MT-DD-00403-00	SHEET 001	REV. 00

MARNAVI S.P.A.
TRASPORTI MARITTIMI



90 x 27m. 300 Feet - Flat deck cargo barge

"VERVECE"

• MAIN DESCRIPTION

Built	June 1996
Builder	SEVMASH – SMP Shipyard SEVERODVISNSK (Russia)
Owner	MARNAVI S.p.A. - Naples
Classification	**BV** - I ✠ Hull, Pontoon, No Propulsion, Unrestricted Navigation
Additional Class	**RINA** - C ✠ Pontoon, S, Unrestricted Navigation
IMO number	9088330
Port of Reg. / Flag	Naples / Italian
BV Number	20382G

• MAIN PARTICULARS

Loa	:	91,440 mt / 300 ft
Breath Moulded	:	27,432 mt / 90 ft
Depth Moulded	:	6,096 mt / 20 ft
Summer load line	:	4,842 mt
Deadweight	:	9700 tons (at Summer Draft)
Displacement	:	11573 tons
Light Weight	:	1850 tons
GRT	:	4066 tons
NET	:	1219 tons

• DECK CAPACITIES

Deck area	:	2508 m^2
Uniform Deck Load	:	25 tons / m^2
Point loads	:	200 – 160 – 100 tons
Bollards	:	For mooring 205 KN – For towing 540 KN
Hull and Structures	:	Raked bow and stern with skeg. Welding according to NS 6038
Material Protection	:	All steel shotblasted to Swedish standard SA 2,5 and primed according Jotum material protection. External and internal Cathodic protection. 5 years anode protect.

• BALLAST PUMP CAPACITIES

Tank Arrangement	:	20 ballast tank served from one pump room
Pump capacity	:	2 x 600m^3

• MACHINERY

Engine / Pumps	:	2 x Mitsubishi diesel driving 2 SPP centrifugal pumps
Submersible pump	:	1 portable electrical driven submersible pump for stripping etc.
Generator	:	One Busck 10 KW / 3 x 400 V / 50 Hz
Batteries	:	2 x 24 V / 115 AH

• DECK EQUIPMENT

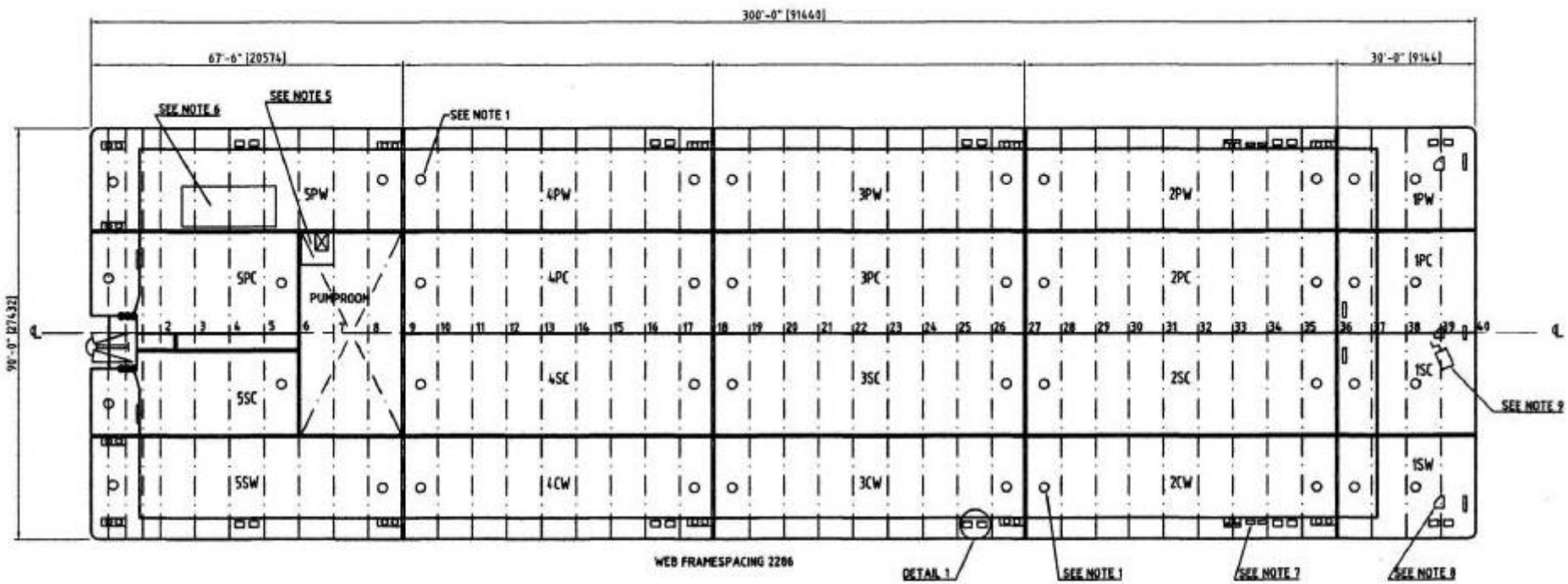
Navigation Light	:	Propane Gas lantern
Anchor	:	Type Stockless, weight 6300 Kg
Anchor Winch	:	Brattvaag / Hagglund hydraulic winch 18 tons pull 1000mt wire 32mm – BL 704 KN
Retriever winch	:	5 tons, manually operated
Towing arrangement	:	Smith's Brackets towing arrangement for main and emergency towing 100 tons SWL

and equipped with water treatment system (from 2023)

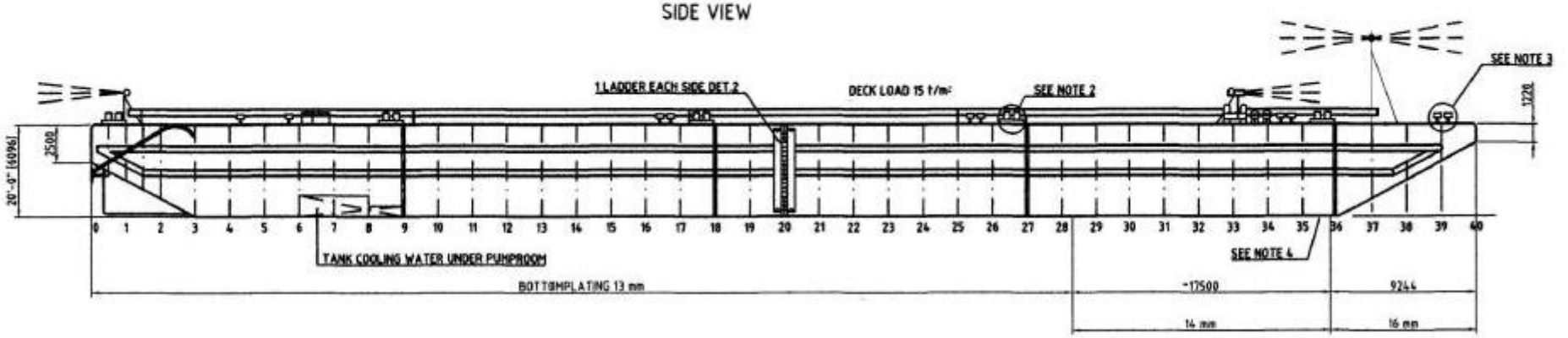
MARNAVI S.P.A. • Address: Via S. Brigida, 39 • 80133 NAPLES • ITALY • Phone: +39 081 251 33 00 • Fax: +39 081 251 33 57 • Email: offshore@marnavioffshore.it • Website: www.marnavi.it

C/B VERVECE – Flat deck cargo barge – 300 x 90 Feet / 90 x 27 m

DECK VIEW



SIDE VIEW



MARNAVI S.P.A.
TRASPORTI MARITTIMI

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PROGETTO DI BANCHINA NEL PORTO DI RAVENNA,
IN LOCALITA' "PIOMBONI", PER FONDALE DI 9,60 m

RELAZIONE DI CALCOLO

PROGETTO DELLE STRUTTURE:

Ing. Andrea Chiarugi, via Saragozza 135/3°, Bologna

Ing. Claudio Ceccoli, viale del Risorgimento 1, Bologna

MINISTERO DEI LAVORI PUBB.
UFFICIO DEL GENIO CIVILE DI

Proprietà: Rosetti Alberto

VISTO: SI ATTESTA L'AVVENUTO DEPOSITO, A SENSI
DELL'ART. 4 DELLA LEGGE 5-11-1971 N. 1086, DEL
PROGETTO RELATIVO AI LAVORI DI

9 MAR 1977

N. 2583 Ravenna lì

L'INGEGNERE DI SEZIONE
TINNIRELLO ERMETE

Bologna, 15 novembre 1976

I N D I C E

1. - Premessa..... pag. 1

2. - Dati di calcolo e ipotesi di carico..... " 4

3. - Calcolo dello stato di sollecitazione della paratia..... " 7

4. - Verifiche di stabilità per carichi verticali e orizzontali..... " 8

5. - Verifica delle tensioni; armature..... " 11

6. - Verifica dell'ampiezza delle fessure..... " 12

7. - Piastre e tiranti di ancoraggio..... " 14

8. - Presidî aggiuntivi in corrispondenza delle bitte..... " 17

9. - Trave di coronamento..... " 17

1. - PREMESSA

La banchina, lunga complessivamente 231 metri, è realizzata mediante pannelli di calcestruzzo gettati in opera con l'ausilio di fanghi bentonitici aventi larghezza di 2,50 m e spessore di 95 cm. Si infigge nel terreno per una profondità, riferita alla quota di scavo, di 10,40 m; l'altezza del fondale è di 9,60 m e il piano del piazzale è a +2,50 m rispetto al livello medio delle maree. Quindi, complessivamente, la paratia è lunga 22,50 m ed è ancorata in sommità a tiranti distanziati di 4 m. Ogni tirante è ancorato ad una piastra distante circa 23 m dal fronte della paratia, e trasmette ad essa l'azione pressochè orizzontale di 68,5 t; è realizzato mediante un cavo del tipo impiegato per le strutture precompresse, e la pretensione, che viene conferita a ciascun tirante prima di effettuare lo scavo, consente di eliminare i cedimenti della sommità delle paratie conseguenti alla deformazione istantanea dell'acciaio e del terreno.

Gli sforzi concentrati trasmessi alla paratia dai tiranti sono ripartiti mediante una trave di calcestruzzo gettata in opera larga circa 1,40 m e alta 2,00 m; su questa si ancorano anche le bitte il cui ancoraggio è calcolato per uno sforzo massimo orizzontale di 15 t.

Sul piazzale è previsto il sovraccarico di 2 t/m^2 uniformemente distribuito, sovraccarico che, come risulterà chiaro in seguito, equivale alla più gravosa situazione di carico prevista nell'area del cantiere.

Le caratteristiche del terreno, indicate nel par. 2.2,

sono state desunte mediante apposite indagini geognostiche.

I coefficienti di sicurezza che l'opera presenta nei confronti delle varie possibili crisi di resistenza sono i seguenti:

1. Rispetto al punto di applicazione del tirante, la spinta passiva fornisce il massimo momento sinistrogiro $M_1 \simeq 2986$ tm/m e la spinta attiva fornisce il massimo momento destrogiro $M_2 \simeq 1819$ tm/m; pertanto si ha il coefficiente di sicurezza:

$$s = \frac{2986}{1819} \simeq 1,65 \quad .$$

2. Sicurezza all'instabilità globale considerando la superficie di rottura piana (Kranz):

$$s \simeq 2,8 \quad .$$

3. Sicurezza alla rottura della sezione resistente della paratia

$$s \simeq 2,15 \quad .$$

4. Sicurezza allo stato limite di fessurazione in ambiente aggressivo ($W = 0,1$ mm)

$$s \simeq 1,3 \quad .$$

5. Sicurezza all'affondamento nei confronti dei carichi ver

ticali applicati:

- pesi propri e permanenti $s \simeq 2,5$,
- accidentali $s \simeq 4$.

Inoltre i materiali sono soggetti a tensioni inferiori alle massime previste dalle Norme vigenti (D.M. 30 maggio 1974 e D.M. 16 giugno 1976) per le strutture di calcestruzzo.

Per il calcestruzzo la tensione massima di 85 kg/cm^2 è assicurata dalla resistenza caratteristica $R'_{bk} = 250$ kg/cm^2.

L'acciaio in barre è del tipo FeB38K, controllato in stabilimento. Per i trefoli dei tiranti si prescrive $R_{ak} \geq 180$ kg/mm^2 .

2. - DATI DI CALCOLO E IPOTESI DI CARICO

2.1. Dati forniti dalla Committente

Posta uguale a zero la quota di riferimento del livello medio delle maree (L.M.M.), i dati forniti sono:

quota del fondale a -9,60 m,
quota del piazzale a +2,50 m,
sovraccarico sul piazzale: 2 t/m^2 ,
tiro per ogni bitta (interasse 25 m): 15 t.

Carichi concentrati trasmessi in sommità alla banchina: 200 t ogni 10 metri, oppure 20 t/m.

L'attuale piano di campagna è mediamente a +1,50 m rispetto al L.M.M.

Si prevede il dislivello massimo tra la falda e il livello del mare di 40 cm.

2.2. Caratteristiche del terreno

La stratigrafia è stata rilevata in base a sondaggi e le caratteristiche meccaniche del terreno sono state individuate mediante prove a taglio diretto ed edometriche eseguite su campioni indisturbati. Si è anche provveduto ad eseguire alcune prove penetrometriche.

Il rilievo stratigrafico, riportato in allegato, è stato effettuato dalla Pali Modena; le prove sui campioni indisturbati e quelle penetrometriche dal Laboratorio dell'Istituto di "Costruzioni di strade, ferrovie ed aeroporti" dell'Università di Bologna.

In base alle risultanze sperimentali e sulla scorta anche di precedenti esperienze in proposito si sono assunti i seguenti parametri per il calcolo delle spinte del terreno:

a) Formazione di sabbie debolmente limose, mediamente addensate, estesa circa fino alla profondità di -8 m:

γ (peso specifico terreno emerso) = 2,0 t/m^3 ,
γ' (peso specifico terreno immerso) = 1,1 t/m^3 ,
φ (angolo di attrito interno) = 35° ,
δ (angolo di attrito fra paratia e terreno) = $\varphi/3$,
c (coesione) = 0 .

Pertanto il coefficiente di spinta attiva vale (con $\alpha = 0$, $\beta = 90°$):

$$\lambda_a = \frac{\operatorname{sen}^2(\beta+\varphi)}{\operatorname{sen}^2\beta\,\operatorname{sen}(\beta-\delta)\left[1+\sqrt{\dfrac{\operatorname{sen}(\varphi+\delta)\operatorname{sen}(\varphi-\alpha)}{\operatorname{sen}(\beta-\delta)\operatorname{sen}(\beta+\alpha)}}\right]^2} \cong 0{,}25$$

b) Formazione di limi argillosi normalmente consolidati con basse resistenze R_p (2 ÷ 10 kg/cm^2), situata a partire circa dal piede della paratia:

γ' (peso specifico del terreno immerso): 1,0 t/m^3 ,

φ (angolo di attrito interno): 20° ,

δ_a (angolo di attrito fra paratie e terreno lato terra) = $= \varphi/3$,

δ_p (angolo di attrito fra paratia e terreno lato scavo) = $= \varphi/2$,

c (coesione) = 0,1 kg/cm^2 .

I coefficienti di spinta attiva e passiva valgono:

$$\lambda_a \simeq 0{,}46 \quad , \qquad \lambda_p \simeq 2{,}6 \quad .$$

La riduzione di spinta conseguente alla coesione vale:

$$2\,c\,\sqrt{\lambda_a} = 1{,}36 \text{ t/m}^2 \quad ,$$

mentre l'aumento di spinta passiva è:

$$2\,c\,\sqrt{\lambda_p} \simeq 3{,}22 \text{ t/m}^2 \quad .$$

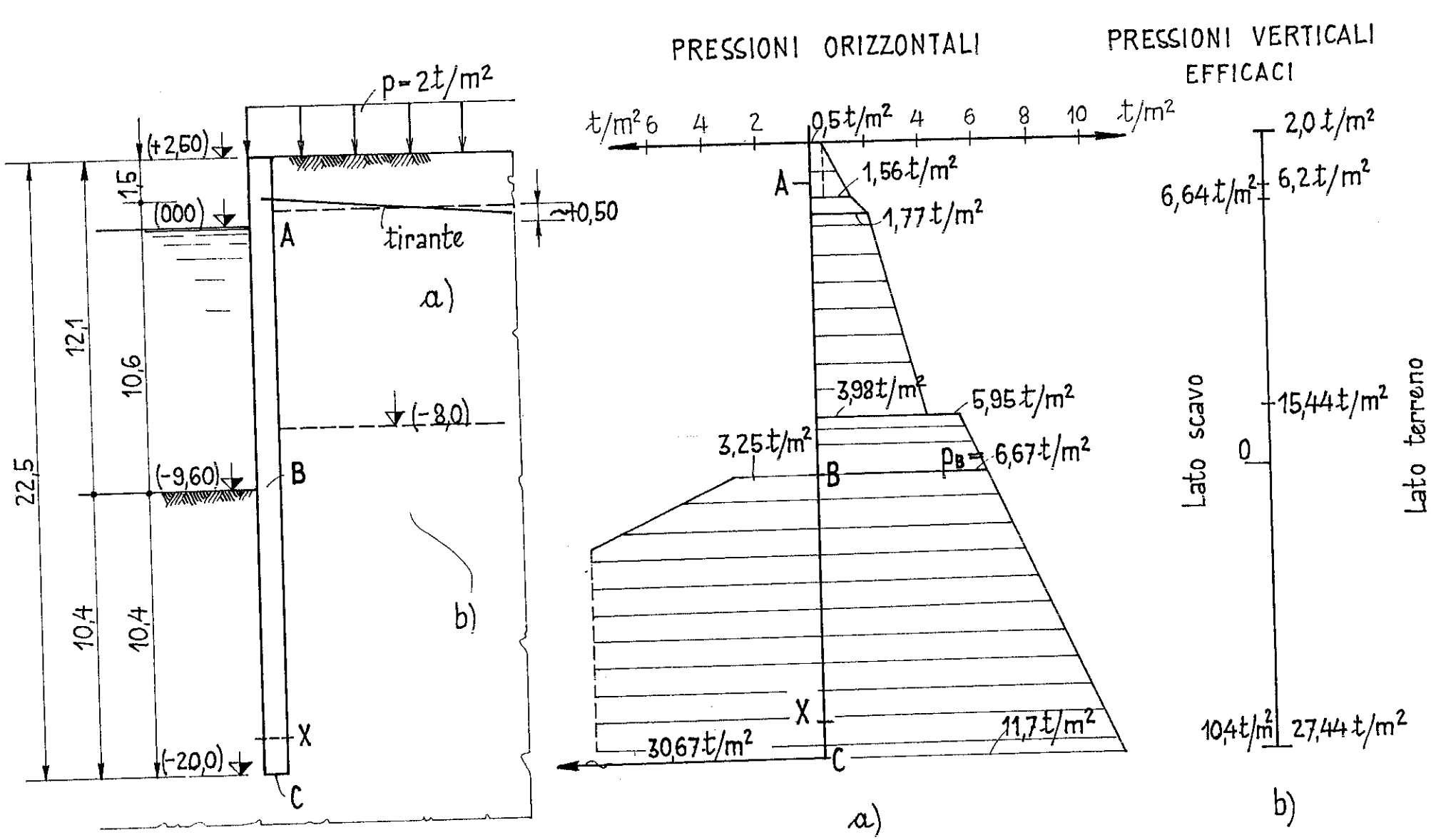

PRESSIONI ORIZZONTALI
PRESSIONI VERTICALI EFFICACI
p = 2 t/m²
(+2,60)
1,5
(000)
A
tirante
~0,50
a)
12,1
10,6
(-8,0)
22,5
(-9,60)
B
10,4
10,4
b)
X
(-20,0)
C
t/m² 6 4 2
0,5 t/m²
4 6 8 10 t/m²
1,56 t/m²
1,77 t/m²
3,98 t/m²
5,95 t/m²
3,25 t/m²
pB = 6,67 t/m²
30,67 t/m²
11,7 t/m²
a)
2,0 t/m²
6,64 t/m²
6,2 t/m²
Lato scavo
15,44 t/m²
0
Lato terreno
10,4 t/m²
27,44 t/m²
b)

Fig. 1

2.3. Diagrammi delle pressioni

I diagrammi delle pressioni assunti per il calcolo delle sollecitazioni sono riportati nella fig. 1; il diagramma a) fornisce le pressioni orizzontali somma di quelle fornite dal terreno e dalla pressione dell'acqua, mentre il diagramma b) rappresenta le pressioni verticali efficaci.

3. - CALCOLO DELLO STATO DI SOLLECITAZIONE DELLA PARATIA

Il calcolo della profondità di infissione e delle azioni interne di taglio e momento flettente viene svolto secondo il metodo di Blum. Assunto a destra della paratia il diagramma delle spinte attive e a sinistra quello delle spinte passive, si considera la sezione X, alla profondità x dal piede della paratia stessa, in corrispondenza della quale risulta, posto uguale a zero lo spostamento orizzontale v della sezione:

$$\frac{dv}{dx} = 0 \ , \quad M = 0 \ .$$

Svolgendo i calcoli per successive iterazioni si ottiene:

$$x \simeq 9{,}00 \text{ m} \ ,$$

e di conseguenza la profondità di infissione teorica i_t deve essere:

$$i_t \geq 1{,}17 \ x = 10{,}5 \text{ m} \ .$$

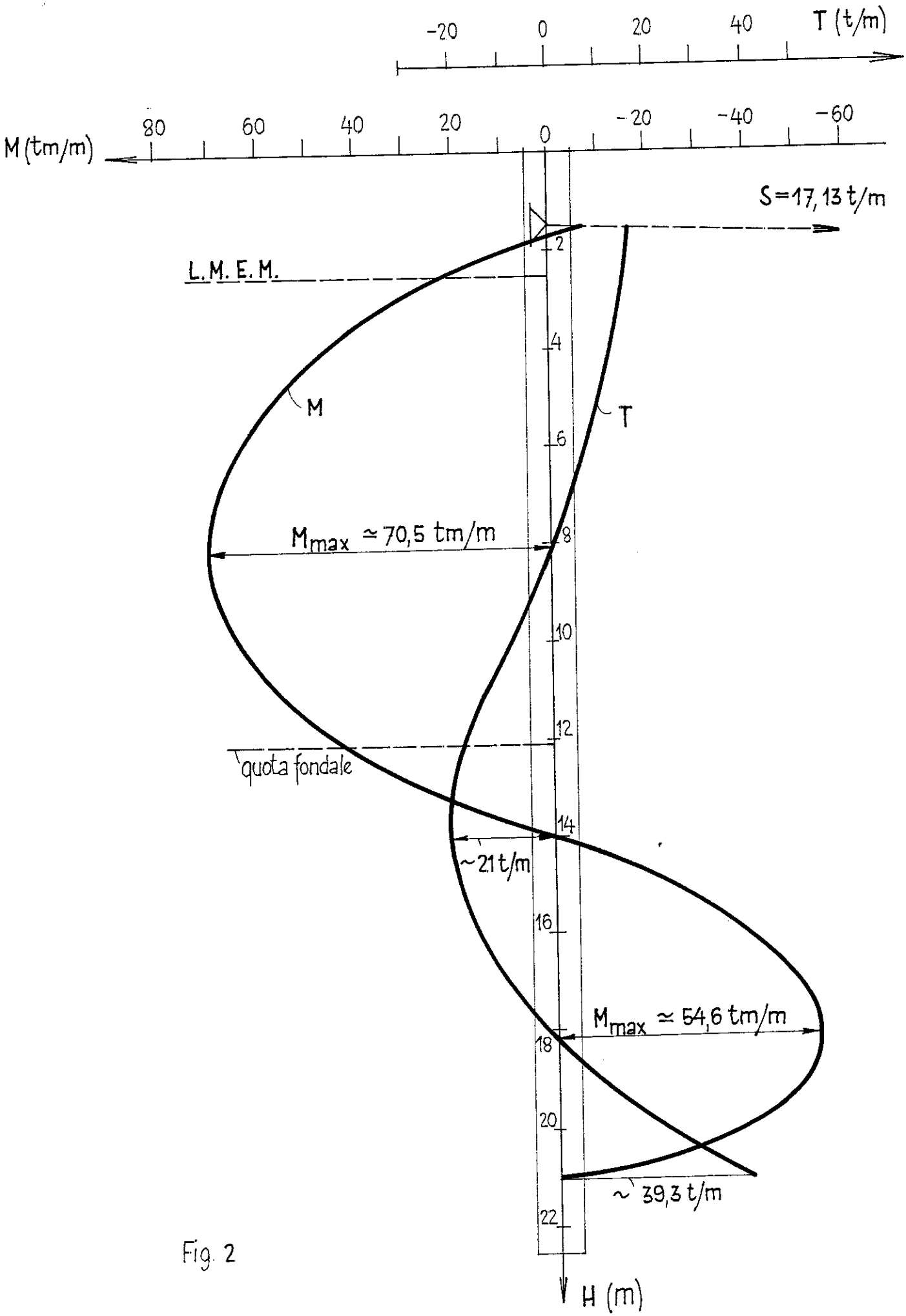

-20
0
20
40
T (t/m)
M (tm/m)
80
60
40
20
0
-20
-40
-60
S=17,13 t/m
L.M.E.M.
M
T
$M_{max} \simeq 70,5$ tm/m
quota fondale
~21 t/m
$M_{max} \simeq 54,6$ tm/m
~ 39,3 t/m
2
4
6
8
10
12
14
16
18
20
22
H (m)

Fig. 2

La lunghezza del tratto infisso è stata assunta pari a 10,4 m, leggermente inferiore a quella teorica minima, perchè si è tenuto in parte conto dell'attrito fra paratia e terreno lungo la superficie di base.

Dai calcoli è risultato:

M (massimo positivo) ≅ 70,5 tm/m a 8 metri circa della sommità,

M (massimo negativo) ≅ -54,6 tm/m a 18,2 metri circa dalla sommità.

Inoltre si ha:

T (sez. A) = 16,3 t/m ,

T_{max} (sez. a 21,13 m dalla sommità) = 39,3 t/m ;

S (sforzo massimo del tirante) = 17,4 t/m .

Nella fig. 2 sono riportati i diagrammi di M e T . I calcoli sono stati svolti impiegando un programma di calcolo per calcolatore SY76 ; i tabulati sono allegati alla presente relazione.

4. - VERIFICHE DI STABILITA' PER CARICHI VERTICALI E ORIZZONTALI

4.1. Carichi verticali

La paratia deve sopportare carichi pressochè concentrati di 200 t posti all'interasse di 10 m; tali carichi sono di breve durata.

E' quindi necessario verificare la portanza alla base e

per attrito laterale della paratia con riferimento a condizioni di carico non drenate. Per la presenza della trave di coronamento, avente funzione di ripartizione, e data anche la particolare tecnologia di esecuzione che rende i vari pannelli compenetrati, è lecito pensare il carico di 200 t ripartito sull'interasse di 10 m. Pertanto per ogni metro di paratia il carico di esercizio è la somma del carico accidentale (q_{acc} = 200/10 = 20 t/m) e del peso proprio, pari circa a 52 (peso paratia in aria) - 20 (sottospinta) = 32 t/m.

Si assume, tenuto conto delle prove penetrometriche, e con riferimento al tratto infisso B-C :

c_u (coesione non drenata) $\cong$ 0,2 kg/cm^2 ,

τ_{lim} (tensione limite di aderenza fra paratia e terreno) $\cong$ $\cong$ 0,16 kg/cm^2 .

La portanza in condizioni non drenate è ($Q = A_l \tau_{lim} + A_b 9 c_u$) :

$$Q = 2 \cdot 10{,}4 \cdot 1{,}6 + 0{,}95 \cdot 9 \cdot 2 = 33{,}2 + 17{,}1 = 50{,}3 \text{ t/m} \quad \left(s = \frac{50{,}3}{20} \simeq 2{,}5\right)$$

Con riferimento ad un angolo di attrito interno di 20° e con c = 0,1 kg/cm^2 la portanza alla base della paratia in condizioni drenate è [$Q = A_b(\gamma h N_q + 1{,}3\, c N_c)$]:

$$Q = 0{,}95(10{,}4 \cdot 7{,}5 + 1{,}3 \cdot 1 \cdot 5) \cong 80{,}3 \text{ t/m} \quad . \qquad (s \cong 4{,}0)$$

Stante l'elevato margine di sicurezza, la paratia può reggere carichi ripartiti (di breve durata) sulla trave di coronamento di intensità superiore a 20 t/ml. Assumendo s = 3

si trova $q_{max} \cong 27$ t/ml.

4.2. Carichi orizzontali

La stabilità di insieme del sistema paratia e terreno è svolta secondo il metodo di Kranz(*). A tal riguardo si considera, come mostra la fig. 3, piana la superficie di rottura e si impone l'equilibrio ($\sum \vec{F} = 0$) delle forze applicate al prisma di terreno di profondità unitaria rappresentato in tratteggio nella stessa figura. I simboli riportati hanno il significato seguente:

W = peso del terreno

S_a = spinta attiva trasmessa dalla paratia del terreno

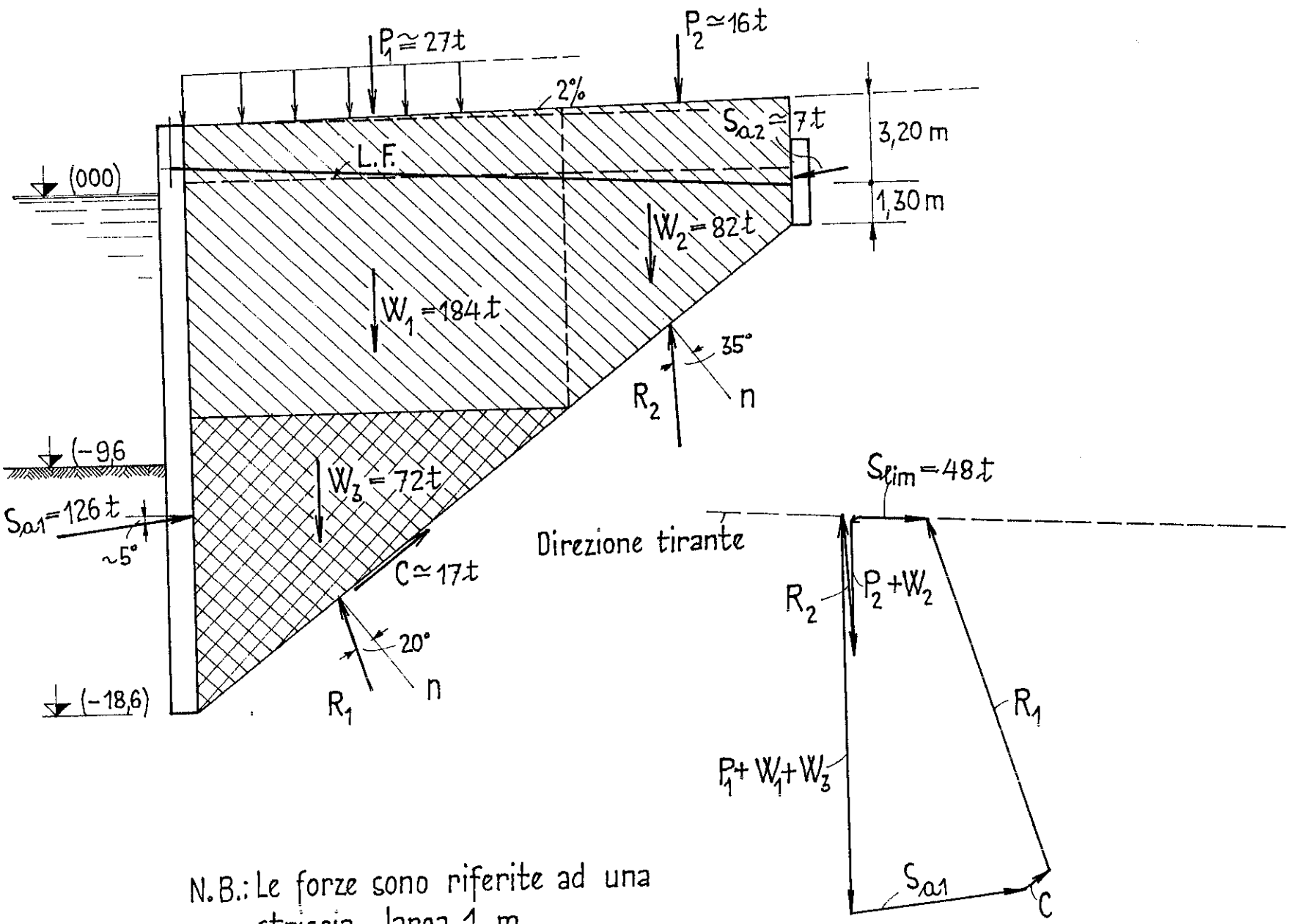
R = reazione limite del terreno, inclinata di φ rispetto ad n

S_{lim} = sforzo limite fornito dal tirante e trasmesso al terreno mediante le piastre di ancoraggio

Poichè risulta $S_{lim} = 48$ t/m mentre lo sforzo di calcolo è, come si è visto nel par. 3, di 17,13 t/m, il coefficiente di sicurezza risulta:

$$s = \frac{S_{lim}}{S_{calcolo}} \simeq 2,8 \quad .$$

(*) Si veda, ad esempio, in proposito: "Recommendations of the committee for waterfront structures", EAU 1970, W. Ernst and Sohn, Berlin, 1970.



N.B.: Le forze sono riferite ad una striscia larga 1 m.

Fig. 3

5. - VERIFICA DELLE TENSIONI; ARMATURE

a) Momenti flettenti positivi (fig. 4 a)

Si considera la sezione di larghezza B = 1 m, complessivamente alta 95 cm, armata con 28/2,5 = 11,2 barre di 24 mm di diametro ($A_a \cong 50{,}7$ cm^2/m); l'armatura compressa risultata (3,2ϕ24/m) $A'_a = 14{,}5$ cm^2/m. Trascurando lo sforzo normale e posto n = 10, si ottiene [h (altezza utile) $\simeq$ 87 cm] (*):

$$M = 70{,}5 \text{ tm/m}, \quad y \cong 24{,}1 \text{ cm}, \quad J_{ci} = 3{,}09 \cdot 10^6 \text{ cm}^4,$$

$$\sigma_c = 55 \text{ kg/cm}^2, \quad \sigma_a = 1435 \text{ kg/cm}^2 .$$

Sicurezza a rottura $\simeq$ 2,15 .

b) Momenti flettenti negativi (fig. 4 b)

L'armatura tesa è costituita da 20/2,5 = 8 barre ϕ 24/m ($A_a \simeq 36{,}2$ cm^2/m); $A'_a = 14{,}5$ cm^2/m. Quindi si ottiene:

$$M = 54{,}6 \text{ tm/m}, \quad y \simeq 22{,}1 \text{ cm}, \quad J_{ci} = 2{,}65 \cdot 10^6 \text{ cm}^4,$$

$$\sigma_c = 45{,}5 \text{ kg/cm}^2, \quad \sigma_a = 1374 \text{ kg/cm}^2 .$$

c) La massima tensione tangenziale vale ($\tau_{am} = 4 + \frac{250-150}{75} = 5{,}33$ kg/cm^2):

(*) Si prescrive il ricoprimento di 5 cm delle barre.

$$\tau_{max} = \frac{39300}{100 \cdot 88,8 \cdot 0,9} = 4,91 \text{ kg/cm}^2 < 5,33 \text{ kg/cm}^2 ,$$

quindi non occorre il calcolo delle armature a taglio.

d) Le armature sono state distribuite in modo tale da rendere in ogni sezione il loro momento resistente superiore al momento flettente effettivo.

6. - VERIFICA DELL'AMPIEZZA DELLE FESSURE(*)

In presenza dei massimi carichi le Norme prescrivono, per il caso in esame, che l'apertura massima delle fessure sia inferiore a 0,1 mm.

Per il calcolo dell'ampiezza W delle lesioni si adotta la nota formula del CEB:

$$W_{max} = (1,5\ c + \frac{16\ \phi}{\mu})(\sigma_a - \frac{3000}{\mu})10^{-6} \text{ (cm)} ,$$

dove:

(*) Si noti che, ammessa per il calcestruzzo la resistenza a trazione $\sigma_{br} = 7 \div 0,6\ R'_{bk} = 22$ kg/cm^2, il momento flettente che provoca la fessurazione è $M = 22\ \frac{100 \cdot 95^2}{6} = 33 \cdot 10^5$ kgcm/m. La condizione di non fragilità prescrive un'armatura minima di $A_a \cong \frac{33 \cdot 10^5}{0,9 \cdot 88,8 \cdot 2200} = 18,8$ cm^2/m. Lungo i lembi tesi l'armatura effettivamente disposta è sensibilmente superiore a quella minima dianzi calcolata.

c = ricoprimento delle armature,

ϕ = diametro massimo delle barre,

μ = percentuale d'armatura [l'area del calcestruzzo è assunta convenzionalmente uguale a $0,4\ B(h-y)$],

σ_a = tensione di esercizio dell'acciaio (in kg/cm^2).

Con riferimento al massimo momento flettente positivo si ha:

$$c = 5\ cm,\quad \phi = 24\ mm,\quad \mu = 100 \cdot 50,7 / 0,4 \cdot 100 (87-24,1) = 2,02\ .$$

Ricaviamo dalla relazione del CEB la tensione σ_a dell'acciaio cui corrisponde $W_{max} = 0,01$ cm . Dopo semplici passaggi si ottiene:

$$\sigma_a = \frac{W_{max} \cdot 10^6}{1,5\ c + \frac{16\ \phi}{\mu}} + \frac{3000}{\mu}\ ,$$

da cui sostituendo:

$$\sigma_a = \frac{1 \cdot 10^4}{1,5 \cdot 5 + \frac{16 \cdot 2,4}{2,02}} + \frac{3000}{2,02} = 1862\ kg/cm^2\ ,$$

e poichè la tensione di esercizio dell'acciaio è $1435\ kg/cm^2$, la sicurezza rispetto allo stato limite di fessurazione è:

$$s = 1862/1435 \simeq 1,3\ .$$

Sicurezza analoga si ha per le sezioni soggette a momento flettente negativo.

7. - PIASTRE E TIRANTI DI ANCORAGGIO

Le piastre hanno interasse di 4,0 m e di conseguenza a ciascuna di esse è applicato lo sforzo massimo $S = 17,13 \cdot 4 = 68,5$ t. Assumendo per il terreno a ridosso delle piastre le stesse caratteristiche del terreno dello strato a) (par. 2.2) e considerando, a favore della sicurezza il terreno stesso completamente immerso, si ha (fig. 5)($\lambda_a = 0,25$; $\lambda_p = 5,68$):

$$\Delta P_A = 1,1 \cdot 1,5(5,68-0,25) - 2 \cdot 0,25 \cong 8,5 \text{ t/m}^2 ,$$

$$\Delta P_B = 1,1 \cdot 4,5(5,68-0,25) - 2 \cdot 0,25 \cong 26,4 \text{ t/m}^2 ;$$

quindi (H = 3 m, B = 2,4 m):

$$S_{lim} = 2,4 \cdot 3 \left(\frac{8,5 + 26,4}{2}\right) \cong 126 \text{ t} ,$$

$$s = S_{lim}/S = 126/68,5 \cong 1,8 .$$

Per la soletta della piastra il momento flettente totale massimo (per il tratto AC) vale, in condizioni di esercizio e con riferimento allo schema statico della fig. 5:

$$M_t = \frac{68,5}{2} \frac{1,2}{2} - \frac{68,5}{2} = 14,6 \text{ tm} ,$$

mentre a filo della trave risulta:

$$M_t = \frac{68,5}{2,4} 0,85 \frac{0,85}{2} = 10,3 \text{ tm} .$$

La pressione media sul terreno in condizioni di esercizio vale $p_m = 9,51\ t/m^2$, pertanto le pressioni ai lembi della piastra in condizioni di esercizio valgono:

$$P_A = 9,51 - \frac{68,5 \cdot 0,2 \cdot 6}{2,4 \cdot 3^2} = 5,7\ t/m^2 \quad ,$$

$$P_B = 9,51 + 3,8 = 13,3\ t/m^2 \ .$$

Quindi per la prima striscia di soletta di 1 m di larghezza risulta:

$$m_1 = \frac{M_t}{H} \frac{1}{P_m} \left(p_m + 1 \frac{P_B - P_m}{1,5}\right) = 4,35\ tm/m \ .$$

Risulta ($h = 26$ cm, $n = 10$, $A_a = 12\ cm^2$):

$$y \simeq 6,79\ cm, \quad \sigma_c \simeq 54\ kg/cm^2, \quad \sigma_a = 1527\ kg/cm^2 \ .$$

Per la striscia centrale si ha:

$$m_2 = 10,6/3 = 3,43\ tm/m \quad ,$$

e si ottiene ($h = 26$ cm, $n = 10$, $A_a \simeq 10\ cm^2/m$):

$$y \simeq 6,28\ cm, \quad \sigma_c \cong 46\ kg/cm^2, \quad \sigma_a = 1435\ kg/cm^2 \ .$$

Superflua è la verifica per la restante striscia.

La massima tensione tangenziale per la striscia 1 va-

le (h_o = 23,6 cm):

$$\tau = \frac{1,26}{3}\,\frac{68,5\cdot 0,85\cdot 10^3}{2,4\cdot 100\cdot 23,6} = 4,3 \text{ kg/cm}^2 < \tau_{am} \ .$$

Per la nervatura si ottiene (q_A = 13,68 t/m, q_B = 31,92 t/m, q_m = 22,82 t/m, $q_c = \frac{31,92-13,68}{3}\,1,7 + 13,68 = 24$ t/m):

$$M_c = \frac{13,68\cdot 1,7^2}{2} + \frac{10,32\cdot 1,7}{2} \cong 25 \text{ tm} \ .$$

La verifica della sezione porge [h = 73, B ≅ 40, A_a = 25,13 cm^2 (8 ϕ 20)]:

y ≃ 25 cm, σ_c = 75 kg/cm^2, σ_a = 1450 kg/cm^2, h_o = 66,7 cm .

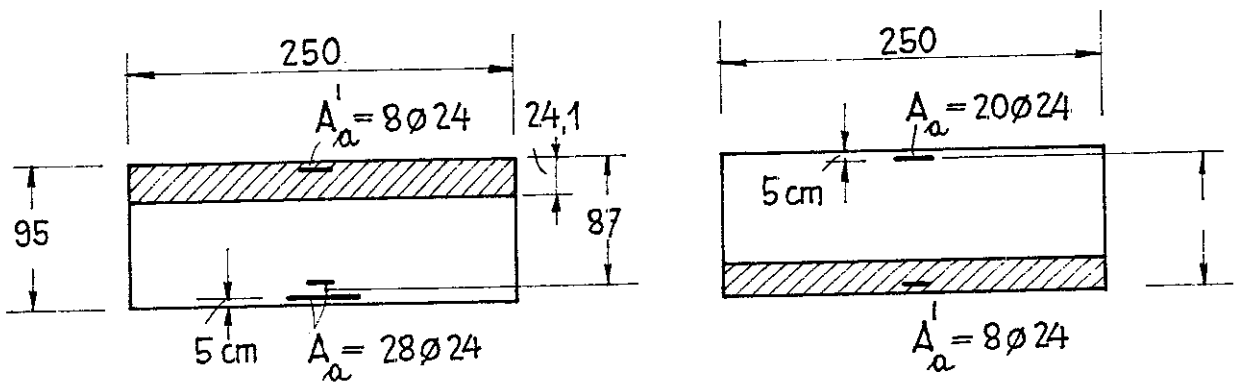
La massima tensione tangenziale a 40 cm dall'appoggio, ossia dal punto di applicazione dello sforzo del tirante risulta (T_{max} ≅ 26,3 t):

$$\tau = \frac{26300}{70\cdot 66,7} = 5,6 \text{ kg/cm}^2 \simeq \tau_{b_o} \ .$$

Il tirante è costituito da 5 trefoli da 0,6" (A_a = 5·1,388 cm^2 = 6,94 cm^2), per cui la tensione di esercizio è:

$$\sigma_a = 68500/6,94 = 9870 \text{ kg/cm}^2 < 0,6\ R_{ak} = 10800 \text{ kg/cm}^2 \ .$$

Si prescrive che la tensione iniziale di tiro debba essere di


250
$A'_a = 8\varnothing 24$
24,1
87
95
5 cm
$A_a = 28\varnothing 24$
250
$A_a = 20\varnothing 24$
5 cm
$A'_a = 8\varnothing 24$

a) b)

Fig. 4

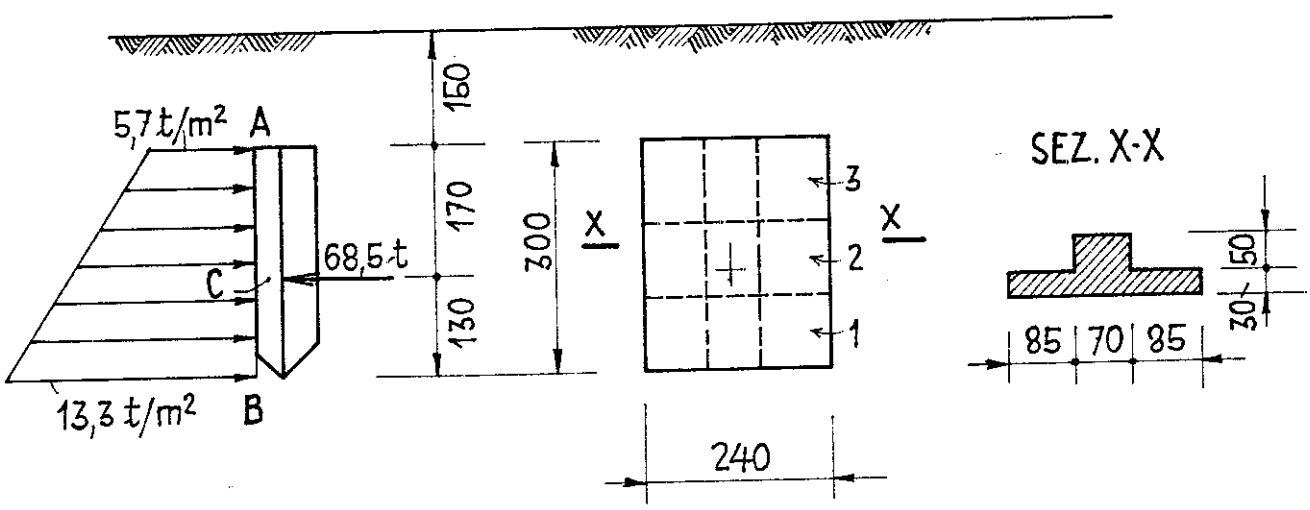

5,7 t/m² A
C
68,5 t
13,3 t/m² B
150
170
130
300
X
X
3
2
1
240
SEZ. X-X
50
30
85 70 85

Fig. 5

7500 kg/cm^2; dopo il tiro i trefoli devono essere allentati e portati alla tensione di 6000 kg/cm^2.

8. - PRESIDI AGGIUNTIVI IN CORRISPONDENZA DELLE BITTE

Le bitte hanno interasse di 25 metri e devono reggere ciascuna il tiro massimo di 15 t. In corrispondenza di ogni bitta sono disposti due tiranti di 4 trefoli da 0,6" ancorati a due piastre di 2,40 m di larghezza e 3 m di altezza.

Lo sforzo in ciascun tirante vale:

$$S = 17,13 \cdot 2,5 + 7,5 \cong 50 \text{ t} ,$$

per cui ($A_a = 4 \cdot 1,388 = 5,55$ cm^2):

$$\sigma_a = 9000 \text{ kg/cm}^2 < 0,6 \, R_{ak} .$$

Poichè ciascuna piastra sopporta il carico limite di 126 t, il coefficiente di sicurezza è:

$$s = 126/50 = 2,52 .$$

9. - TRAVE DI CORONAMENTO

Alla trave di coronamento è affidato principalmente il compito di ripartire le azioni concentrate trasmesse dai tiranti. Poichè l'interasse dei tiranti è di 4 m, il massimo

momento flettente vale:

$$M = 17,13 \cdot 4^2/12 = 22,8 \text{ tm} .$$

L'armatura, costituita da $6\phi 20 + 1\phi 16$, è esuberante. Durante la fase di costruzione i tiranti vengono pretesi conferendo ad essi lo sforzo $S_o = 52$ t. In tale situazione il massimo momento flettente può essere approssimativamente valutato considerando la trave di coronamento su suolo elastico. In via semplificata si può porre:

$$M = \frac{S_o}{4\alpha} ,$$

con $\alpha = \sqrt[4]{\frac{K \cdot B}{4EJ}}$. Posto $K = 5$ kg/cm^3, $B = 200$ cm, $E = 2,5 \cdot 10^5$ kg/cm^2, $y = 200 \cdot 140^3/12 = 4,57 \cdot 10^7$ cm^4 risulta $\alpha = 2,16 \cdot 10^{-3}$ cm^{-1} per cui:

$$M = \frac{52000}{4 \cdot 2,16 \cdot 10^{-3}} = 60 \cdot 10^5 \text{ kgcm} .$$

L'armatura è costituita da $6\phi 20 + 2\phi 16 = 22,9$ cm^2, per cui risulta:

$$y = 16,5 \text{ cm}, \quad \sigma_c = 28,6 \text{ kg/cm}^2, \quad \sigma_a = 2063 \text{ kg/cm}^2 .$$

La superficie di collegamento fra la trave e la paratia è inclinata per favorire la trasmissione del taglio.

Ing. Andrea Chiarugi

Ing. Claudio Ceccoli

TEST REPORT
RAPPORTO DI COLLAUDO

N° P002554-1-1-01.001

RINA file No.: *Pratica RINA N.*	P002554-1-1-01 P002554-2-1-01		
Purchaser: *Committente:*	Rosetti Marino S.p.A.		
Order No.: *Ordine N.:*	1721001190	Intended for: *Destinazione:*	Bollards at Piomboni Yard
Inspection date: *Data di ispezione:*	19th May 2021	Place of inspection: *Luogo di ispezione:*	Marina di Ravenna (RA)

Referenced standards and specifications:
Standard e specifiche di riferimento:
DNVGL-ST-N001 - Marine operations and marine warranty

Attendees:
Partecipanti:

- Mr. Dante Ranzi, *Rosetti Marino Yard Manager*
- Mr. Davide Depasquale, Rosetti Marino – *Quality Control Manager*
- Mr. Riccardo Cherotti – *RINA Inspector*

Tested material, components or equipment:
Materiali, componenti o apparecchi testati:

Item	Description	Qty	Dwgs	Rev.
5 ÷ 23	Bollards	19	79004/504	0

This report is ruled by the General Condition for service provision. As far as the nature of the activity and RINA liability are concerned, please find here below an abstract of the above mentioned General Condition.
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Il presente rapportoo è disciplinato dalle Condizioni Generali per la fornitura di servizi. Per quanto concerne la natura delle attività svolte e le responsabilità di RINA si riporta qui di seguito un estratto delle succitate Condizioni Generali.
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The calibration status and adequacy of the test measurements devices:

Lo stato di taratura e l'adeguatezza degli strumenti di misura utilizzati per il collaudo:

- Flexible tape meter 0÷5000mm, new and suitable for the purpose;
- Ultrasonic Flaw Detector "GE - USM35X LEMO", S.N.16859, calibrated before use;
- UT calibration Block "V1", Certificate No.162046 valid till May 2026.

Inspections and tests carried out, results and remark (if any):

Accertamenti e prove di collaudo effettuati, risultati ed eventuali prescrizioni:

Purpose of the visit was the inspection of the Bollards from No.5 to No.23 at Pier in Marino Rosetti SpA, Piomboni Yard.
The scope of the inspection was:

- visual inspection of the Bollards in order to verify their general conditions (integrity, concrete filling, coating);
- thickness check of the Bollards;
- visual inspection of the quay bulkhead in order to verify the integrity and general conditions.

Visual inspection of the Bollards in order to verify general their conditions (integrity, concrete filling, coating)

The Bollards have been 100% visual inspected in order to verify general conditions of the same.

Majority of the Bollards presented diffuse or localized areas affected by corrosion, concentrated at the ground level. In the below Table are reported the:

- location of the affected areas (North, South, West, East)
- elevation of the affected areas (considering the ground level as 0)
- extension of the affected areas (length and high)

Coating of the Bollards has been found damaged at the ground level, in correspondence of the normal position of mooring ropes.

Except for the Bollard No.19 (which is of different type compared to design drawings and, on the top, is of closed type), all the Bollards have been found filled with concrete as minimum till the top extremity. Some of the same were provided with concrete over-cap, other were damaged in some areas. In the below Table, the status of the concrete at the Bollards top level is reported.

Thickness check of the Bollards

Rosetti Marino presented the ultrasonic thickness check reports relevant to the Bollards No.5÷18, No.20, No.22 and No.23. The Report for the Bollard No.19 and No.21 has not yet been issued since, at the examination date, the same were engaged by mooring ropes and not accessible.

Thickness check of the Bollards has been repeated on the affected areas (by ISO 9712 Lev.2 qualified UT Operator Mr. Stefano Annese) in order to identify the minimum available value. For each Bollard, the measured minimum thickness was found matching with the one indicated in the relevant Reports.

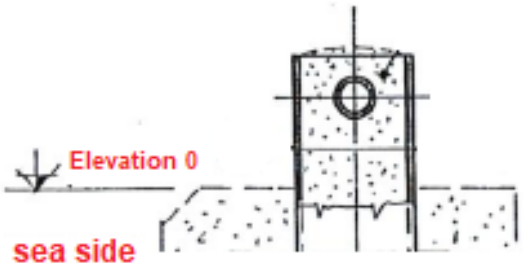
The Bollard No.19, of recent manufacturing, was found undamaged without traces of corrosion. For Bollard No. 21, the minimum measured thickness in the corrosion affected areas was 9,80 mm. Anyway, these two bollards are not included in the scope of this report, due to their partial inaccessibility at the time of inspection.

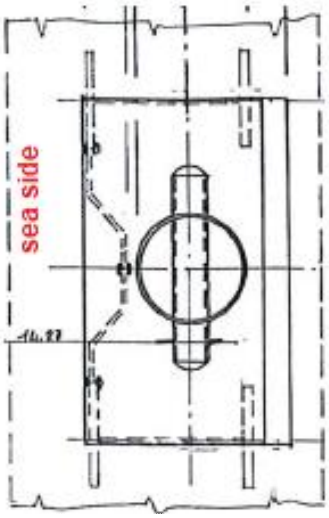
Visual inspection of the quay bulkhead in order to verify the integrity

The reinforced concrete bulkhead was found in general good conditions, intact and free of damage along the entire pier.

Bollard No.	Accessibility for inspection	Visual inspection observations (Bollard main pipe)	Elevation of the affected area (ground level 0)	Location of the affected area (N – S – W - E)	Extension of the affected area (L x H)	Coating	Concrete
5	90%	Localized corrosion	0	SW	50 x 50 mm	Acceptable except on damaged area	Acceptable
			0	NE	50 x 50 mm		
6	100%	Diffuse corrosion	0	360°	H 60 mm at 360°	Acceptable except on damaged area	Acceptable
7	100%	Localized corrosion	0	NE	100 x 70 mm	Acceptable except on damaged area	Acceptable
8	90%	Localized corrosion	0	NW	150 x 90 mm	Acceptable except on damaged area	Damages on top area

9	90%	Localized corrosion	0 0	NW SE	300 x 100 mm 300 x 60 mm	Acceptable except on damaged area	Acceptable
10	100%	• Localized corrosion • Damaged top side	0 + 430	NE S - SE	600 x 60 mm 90 x 60 mm	Acceptable except on damaged area	Damages on top area
11	100%	Localized corrosion	0	360°	H 60 mm	Acceptable except on damaged area	Damages on top area
12	90%	• Diffuse corrosion • Damaged transversal pipe	0 /	360° S	H 70 mm	Acceptable except on damaged area	Acceptable
13	90%	Localized corrosion	0	S	150 x 60 mm	Acceptable except on damaged area	Damages on top area
14	100%	Localized linear corrosion	+ 20 + 20	NW S	L 200 mm L 150 mm	Acceptable except on damaged area	Damages on top area
15	100%	Corrosion traces	0	360°	H 40 mm at 360°	Acceptable except on damaged area	Damages on top area
16	100%	Corrosion traces	0	360°	H 40 mm at 360°	Damaged on the bottom area	Damages on top area
17	100%	Localized corrosion	0 0	NE S	600 x 100 mm 400 x 60 mm	Acceptable except on damaged area	Damages on top area
18	100%	Localized corrosion	0	N	300 x 100 mm	Acceptable except on damaged area	Damages on top area
19	100%	Acceptable	/	/	/	Damaged on the bottom area	Not inspectable
20	100%	Diffuse corrosion	0	360°	H 100 mm at 360°	Acceptable except on damaged area	Damages on top area
21	100%	Diffuse corrosion	0	360°	H 100÷200 mm at 360°	Acceptable except on damaged area	Damages on top area
22	100%	Diffuse corrosion	0	360°	H 80 mm at 360°	Acceptable except on damaged area	Damages on top area
23	100%	Corrosion indication	0	360°	H 5 mm at 360°	Acceptable except on damaged area	Damages on top area

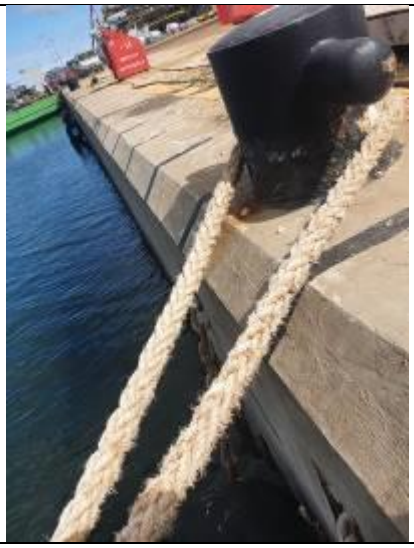






Pictures:
Foto:

BOLLARD No. 5	
	
Bollard visual inspection	***Bollard visual inspection***
	
Reinforced concrete Bulkhead integrity check	***Bollard corrosion affected area visual inspection***
BOLLARD No. 6	
	
Bollard visual inspection	***Bollard visual inspection***



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection



Bollard corrosion affected area visual inspection



Bollard corrosion affected area visual inspection

BOLLARD No. 7



Bollard visual inspection



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection and dimensional check

BOLLARD No. 8



Bollard visual inspection



Bollard visual inspection



Bollard corrosion affected area visual inspection



Bollard concrete filling visual inspection

BOLLARD No. 9



Bollard visual inspection



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection

BOLLARD No. 10



Bollard visual inspection



Bollard visual inspection

	
Bollard corrosion affected area visual inspection	***Bollard corrosion affected area visual inspection***
	
Bollard damaged are visual inspection	***Bollard damaged are visual inspection and dimensional check***
BOLLARD No. 11	
	
Bollard visual inspection	***Bollard visual inspection***

	
Reinforced concrete Bulkhead integrity check	***Bollard corrosion affected area visual inspection***
BOLLARD No. 12	
	
Bollard visual inspection	***Bollard visual inspection***
	
Reinforced concrete Bulkhead integrity check	***Bollard corrosion affected area visual inspection***



Description



Damaged transversal pipe

BOLLARD No. 13



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection



Bollard concrete filling visual inspection

BOLLARD No. 14



Bollard visual inspection



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection



Bollard corrosion affected area visual inspection



Bollard corrosion affected area visual inspection

BOLLARD No. 15



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection



Bollard concrete filling visual inspection

BOLLARD No. 16



Bollard visual inspection



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection

BOLLARD No. 17



Bollard visual inspection



Bollard corrosion affected area visual inspection



Bollard corrosion affected area visual inspection



Bollard concrete filling visual inspection

BOLLARD No. 18



Bollard visual inspection



Bollard corrosion affected area visual inspection



Bollard corrosion affected area visual inspection



Bollard concrete filling visual inspection

BOLLARD No. 19



Bollard visual inspection



Bollard visual inspection – coating damaged

BOLLARD No. 20



Bollard visual inspection



Bollard corrosion affected area visual inspection



Bollard corrosion affected area visual inspection and dimensional check

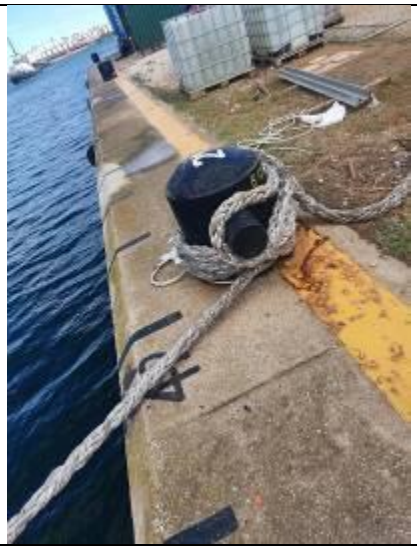


Bollard concrete filling visual inspection

BOLLARD No. 21



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection



Bollard concrete filling visual inspection

BOLLARD No. 22



Bollard visual inspection



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection

BOLLARD No. 23



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection



Bollard concrete filling visual inspection

	
Ultrasonic Flaw detector calibration	***Ultrasonic Flaw detector calibration***
	
Ultrasonic thickness check of corrosion affected areas	***Ultrasonic thickness check of corrosion affected areas***

Marking: ***Marcature apposte:***	Not Applicable for this visit

Bollard Design Verification
Verifica della progettazione delle bitte

RINA engineering staff (EOGOF) has examined the followings documents related to the structural check of the bollards and their foundation:

Doc No.	Titolo	Rev.
79004-42	Sezione tipo - casseratura ed armatura	3
79004-43	Particolari costruttivi	3
79004-73	Banchina con fondale -11.50 (-9.50) Pianta palancolato bitte e tiranti banchina - dettagli di bitte staffe e palancole	4
79004-73 A	Banchina con fondale -11.50 (-9.50) Pianta palancolato bitte e tiranti banchina - dettagli di bitte staffe e palancole	4
79004/54	Banchina con fondale -11.50 (-9.50)	0

	Tratto "36÷46" _ linea di varo "2" Trave di coronamento - planimetria 1:500 con posizione delle bitte di ormeggio	
79004/494	Banchina con fondale -11.50 (-9.50) Tratto "24÷36" _ linea di varo 1" Trave di coronamento - planimetria 1:500 con posizione delle bitte di ormeggio	0
-	Progetto di banchina nel porto di Ravenna in località "Piomboni", per fondale di 9,60 m - Relazione di calcolo	-
-	Realizzazione di un diaframma metallico e di una linea di varo in località Piomboni - Relazione di calcolo	1
-	Summary.pdf – RMI YPB BOLLARD FROM No 1 to No 12 & RMI YPB BOLLARD FROM No 13 to No 23	-
-	Addendum alla relazione di calcolo della banchina metallica del Cantiere Rosetti – Piomboni	2

The design reports have been developed according to the Rules in force at the time of the quay construction, they confirm the adequacy of the bollards, as described in the drawings, to withstand the design pull force.

In addition, the calculation demonstrates that, even considering a certain amount of corrosion (thickness reduction assumed), the bollards are still adequate for the maximum allowable pull force reported in the capacity diagrams (maximum pull vs. pull angle).

Results:
Risultati

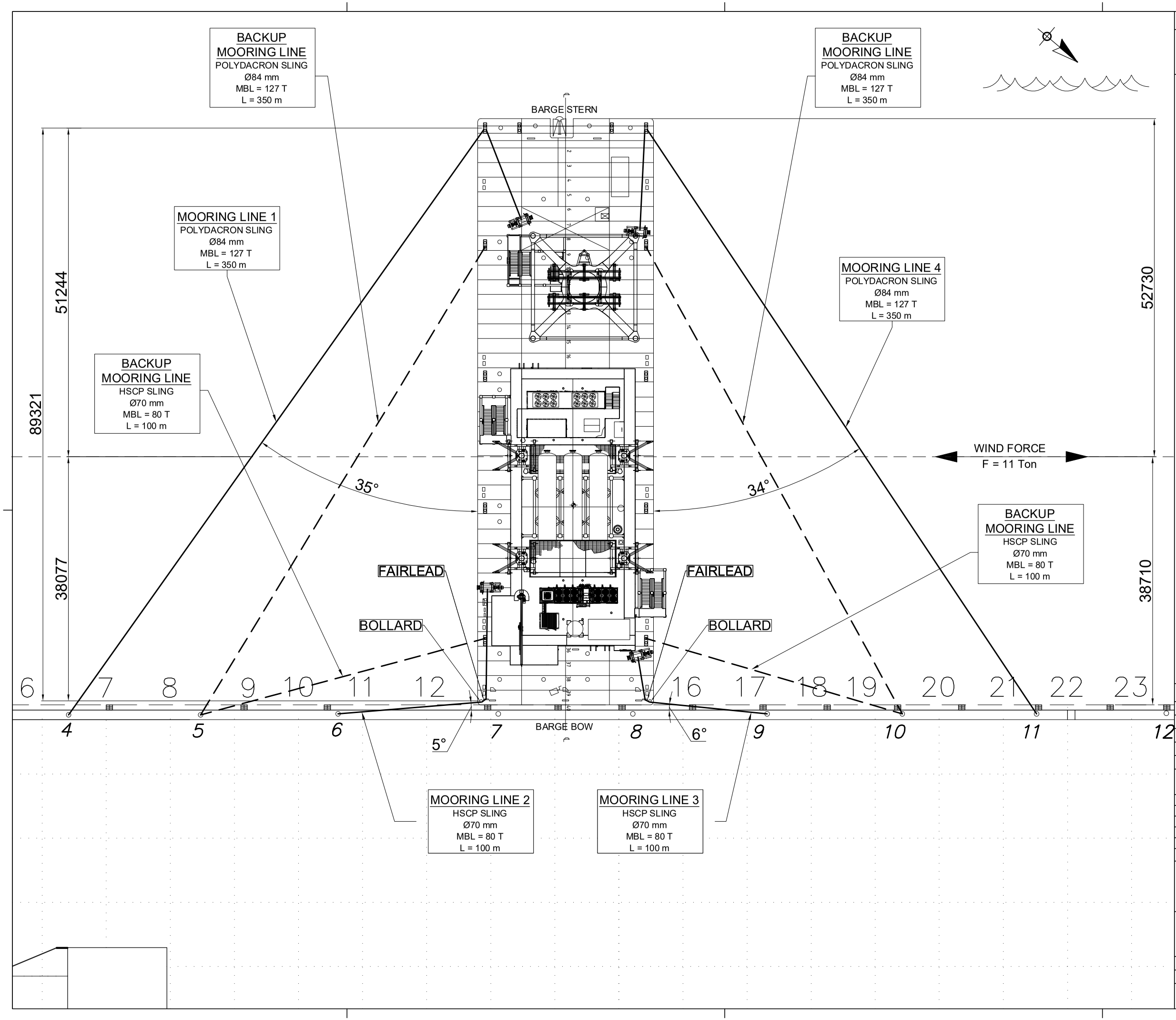
Inspection results are related to bollards No. from 5 to 18, 20, 22 and 23 only.
Examination of the bollards shows a certain level of thickness reduction due to corrosion and wear, anyway such reduction does not reach the limits assumed in the examined structural calculations and therefore does not affect the bollard capacity to withstand the nominal loads.

Enclosures: UT Thickness check Reports from No.001/2021 to 015/2021, from No.017/2021 to 018/2021
Allegati: Addendum alla relazione di calcolo della banchina metallica del Cantiere Rosetti – Piomboni

Issued at: Marina di Ravenna (RA) - Italy **on:** 19th May 2021
Rilasciato a: ***il:***

RINA W R IT 105 Date: 19 MAY 2021 Company:

RINA



NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.
2 – MAX OPERATIONAL WIND SPEED = 10 m/s
3 – MOORING DESIGN WIND SPEED = 14.9 m/s

REFERENCE DRAWINGS

DWG No.	DESCRIPTION

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	29/05/25	GS	FC	CA	GENERAL REVIEW
00	27/05/25	GS	FC	CA	ISSUED FOR CONSTRUCTION

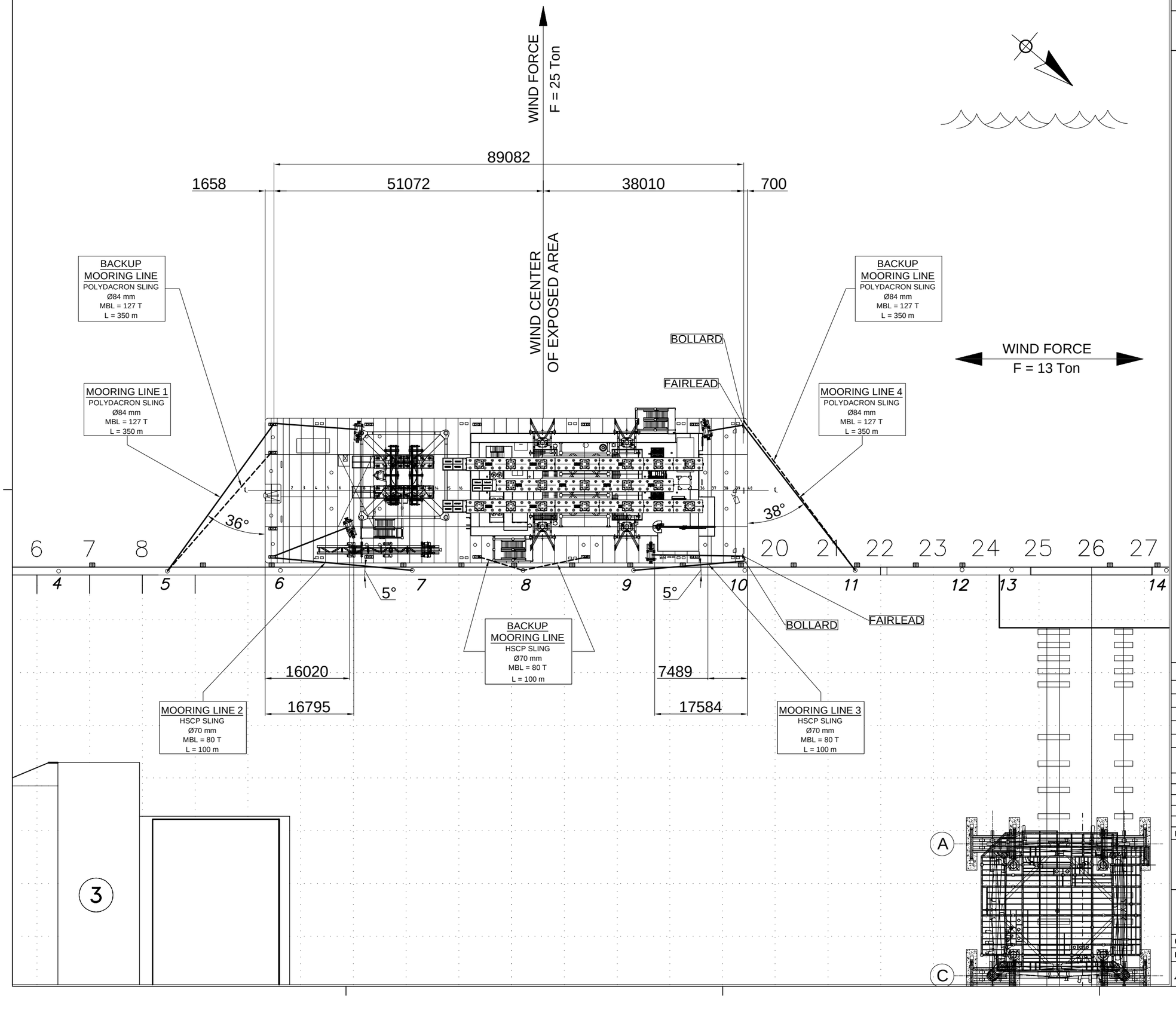
CROSSWIND

ROSETTI MARINO

TITLE :

BASE LOAD POWER HUB (BLPH)
MOORING SCHEME
PERPENDICULAR TO QUAY

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE
DRAWN G.SEGURINI	CHECKED F.CERONI	APPROVED C.ANTONELLINI	DATE 27/05/25
A1	DRAWING NO. 123A90-FDL-MT-DD-00405-01	SHEET 001	REV. 00



NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.
2 – WIND SPEED 22.6 m/s

REFERENCE DRAWINGS

DWG No.	DESCRIPTION

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	29/05/25	GS	FC	CA	GENERAL REVIEW
00	27/05/25	GS	FC	CA	ISSUED FOR CONSTRUCTION

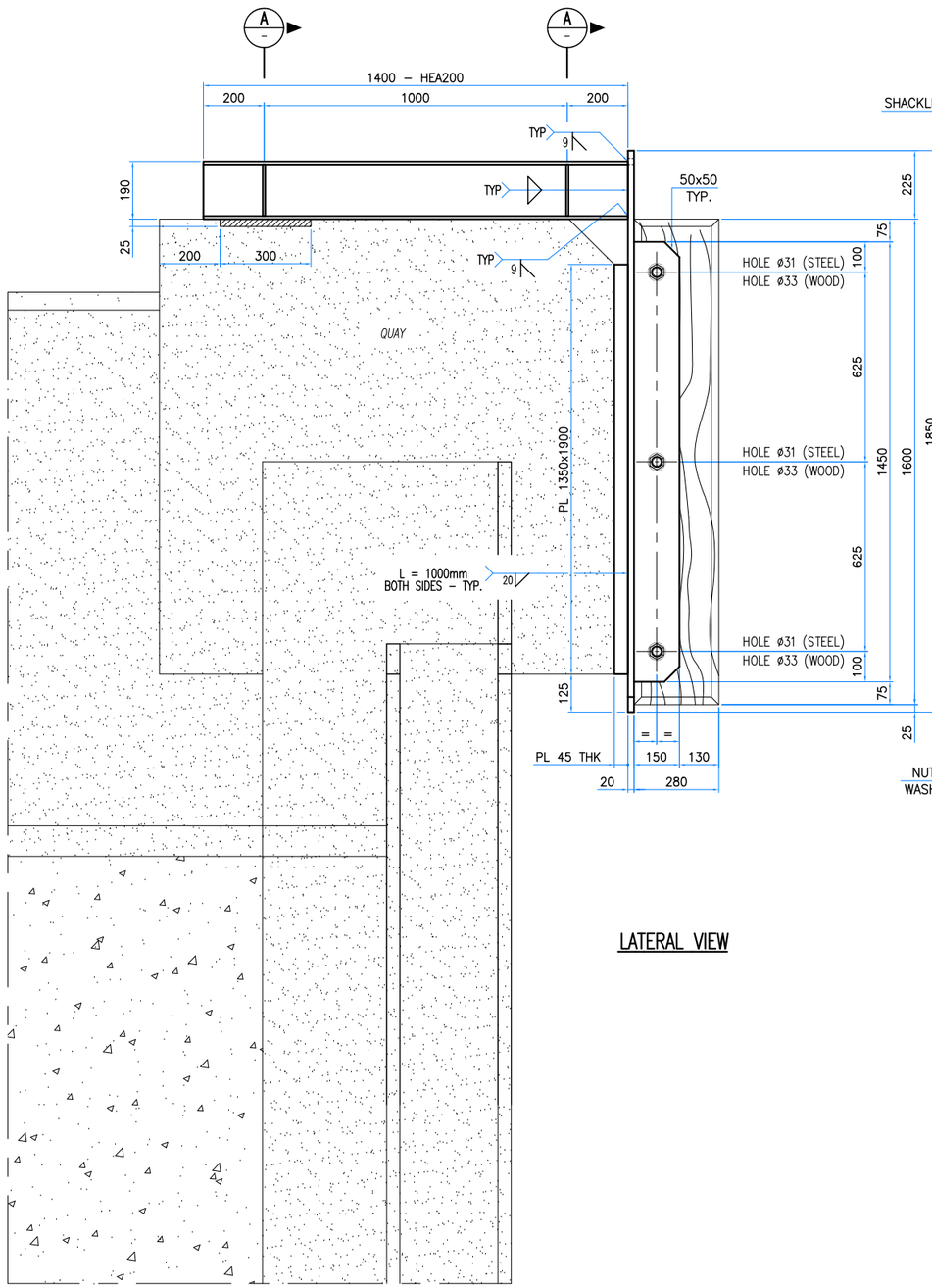
CROSSWIND

ROSETTI MARINO

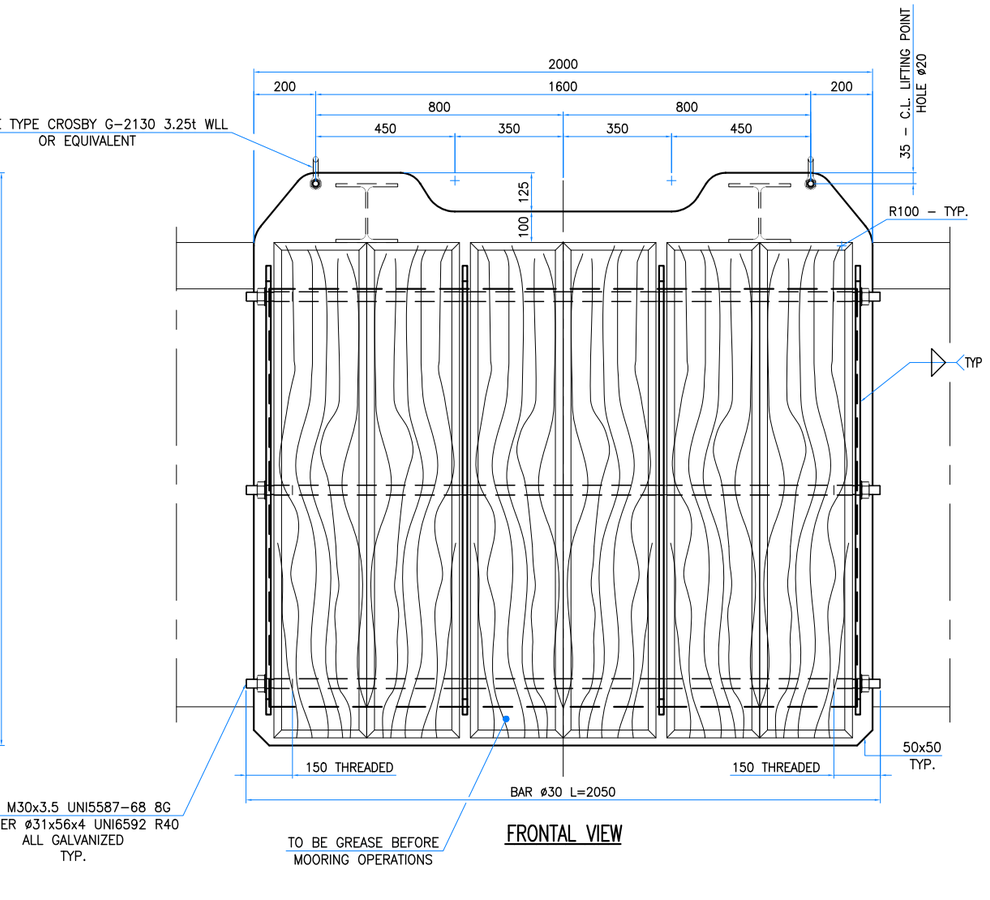
TITLE :
BASE LOAD POWER HUB (BLPH)
MOORING SCHEME
BARGE POST LOADOUT

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE
DRAWN G.SEGURINI	CHECKED F.CERONI	APPROVED C.ANTONELLINI	DATE 29/05/25

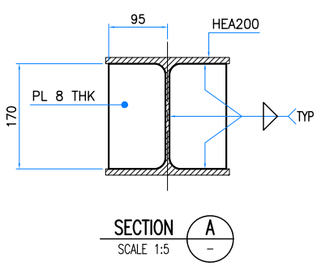
A1	DRAWING NO.	SHEET	REV.
	123A90-FDL-MT-DD-00406-01	001	01



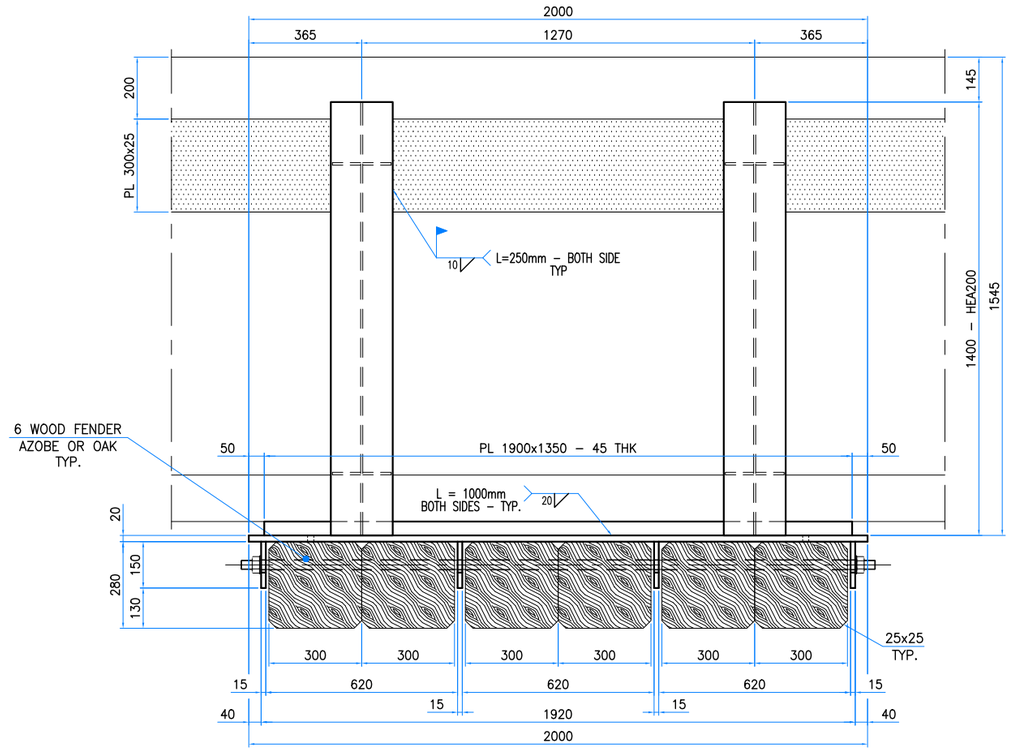
LATERAL VIEW



FRONTAL VIEW

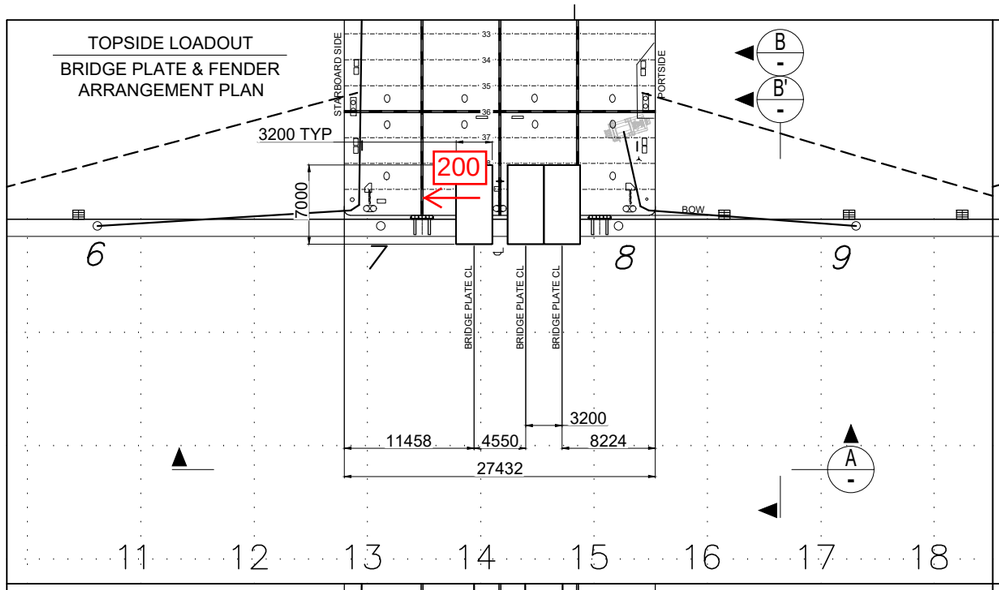


SECTION A
SCALE 1:5

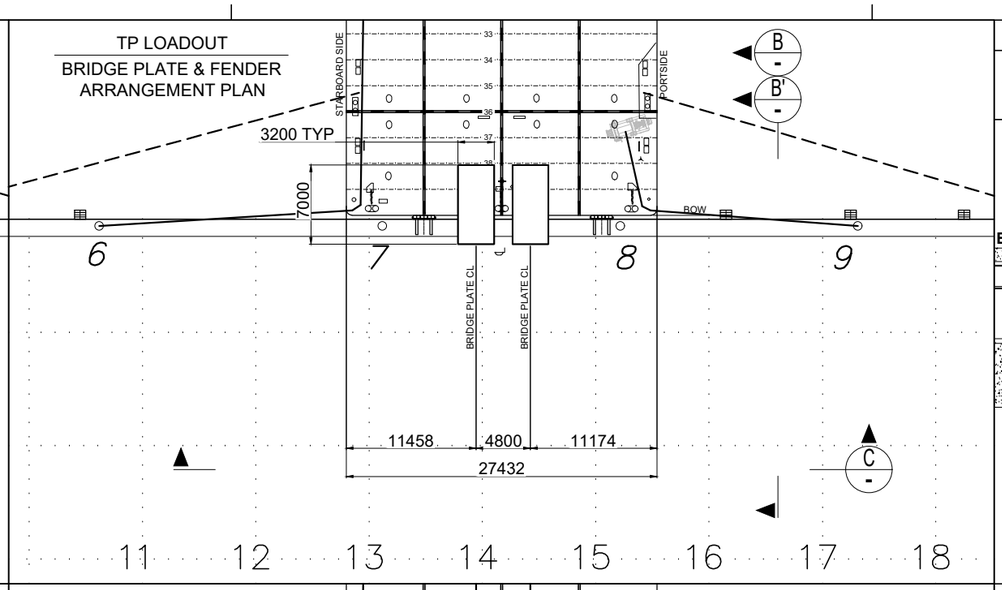


REMOVABLE FENDER PANEL – PLAN

TOPSIDE LOADOUT
BRIDGE PLATE & FENDER
ARRANGEMENT PLAN

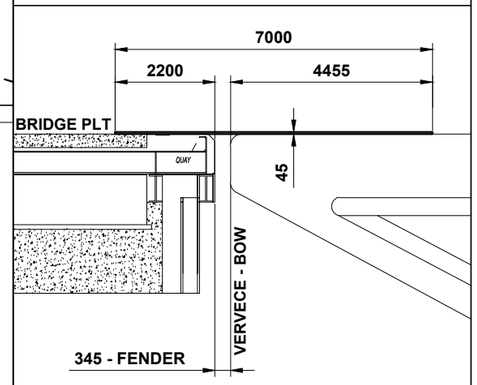


TP LOADOUT
BRIDGE PLATE & FENDER
ARRANGEMENT PLAN



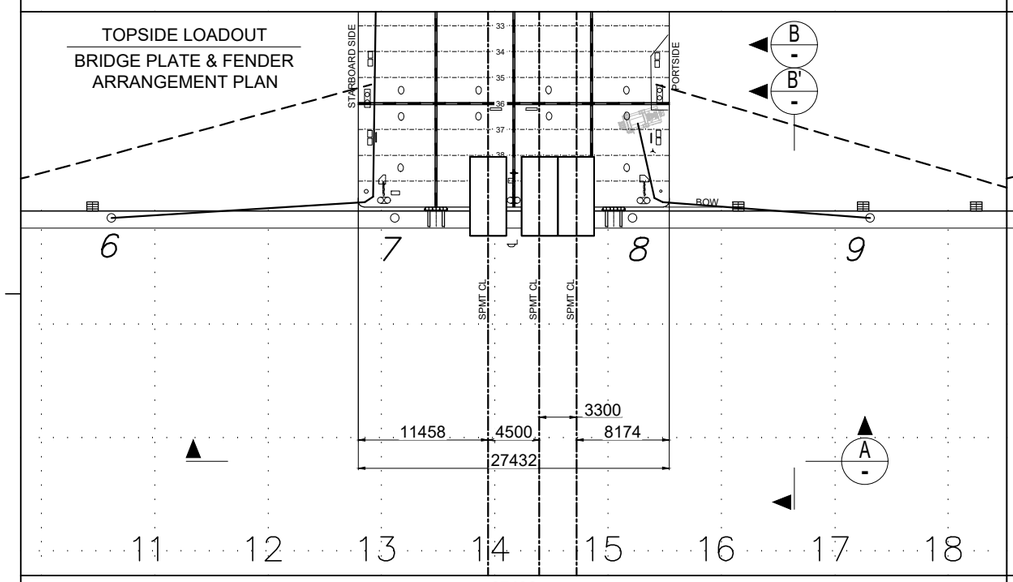
NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.
2 – PLATES FOR LOADOUT ARE 7000x3200x35 min

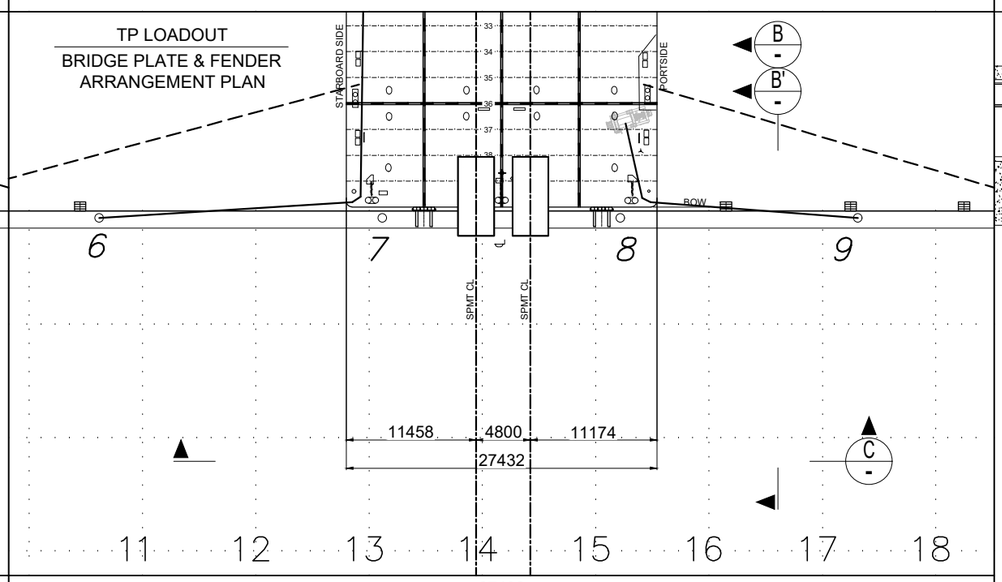


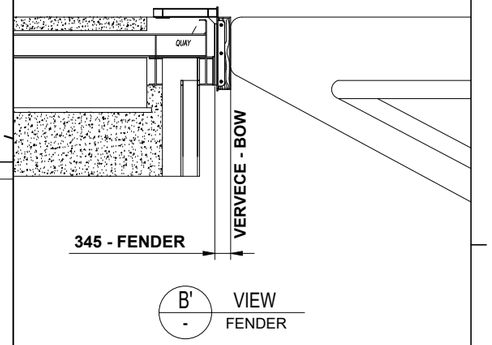
B / - VIEW
BRIDGE PL

TOPSIDE LOADOUT
BRIDGE PLATE & FENDER
ARRANGEMENT PLAN



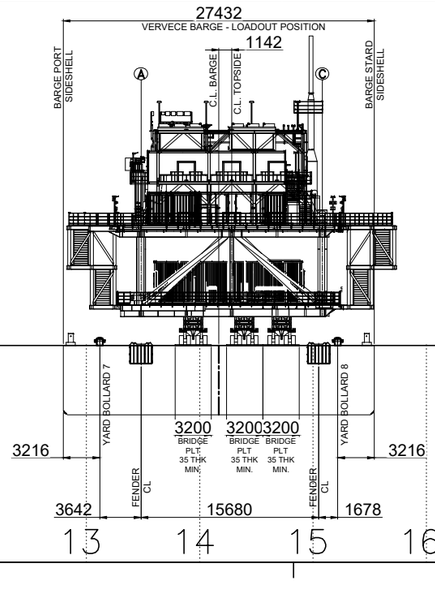
TP LOADOUT
BRIDGE PLATE & FENDER
ARRANGEMENT PLAN



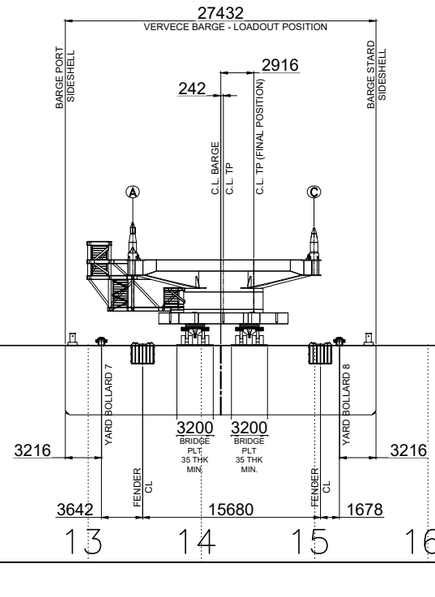


B' / - VIEW
FENDER

A / - VIEW
TOPSIDE LOADOUT
VIEW FROM BOW



C / - VIEW
TOPSIDE LOADOUT
VIEW FROM BOW



REFERENCE DRAWINGS

DWG No.	DESCRIPTION

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	25/06/25	SG	FC	CA	
01	12/06/25	SG	FC	CA	
00	03/03/25	CB	FC	CA	

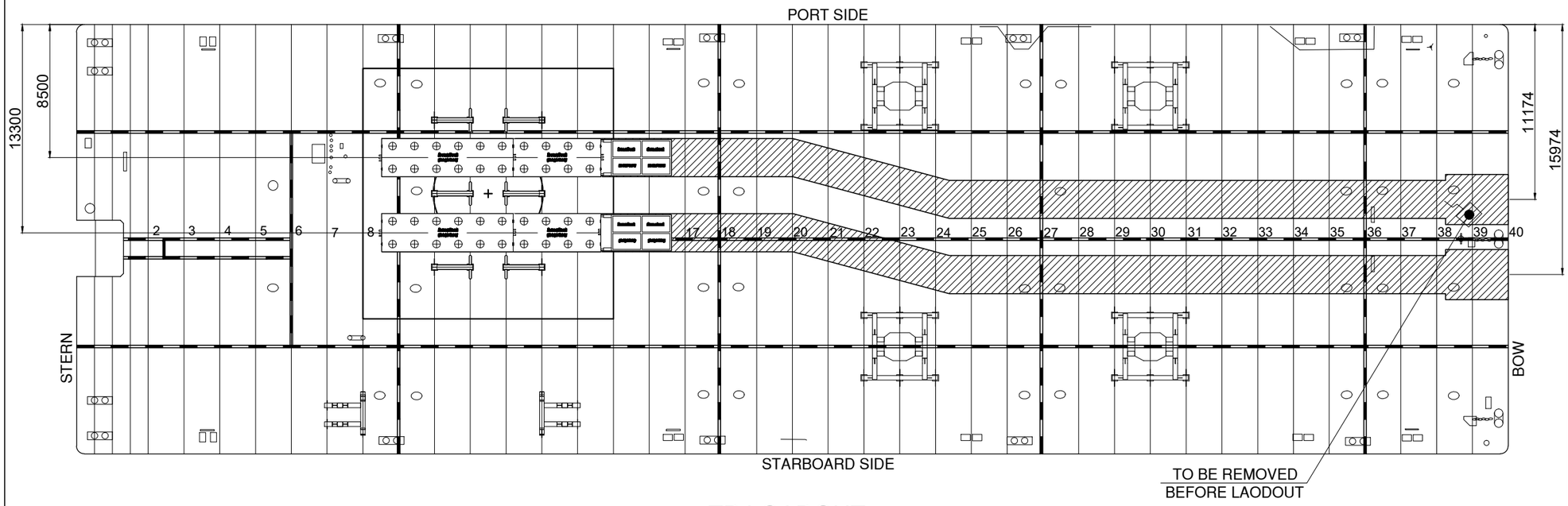
CROSSWIND

ROSETTI MARINO

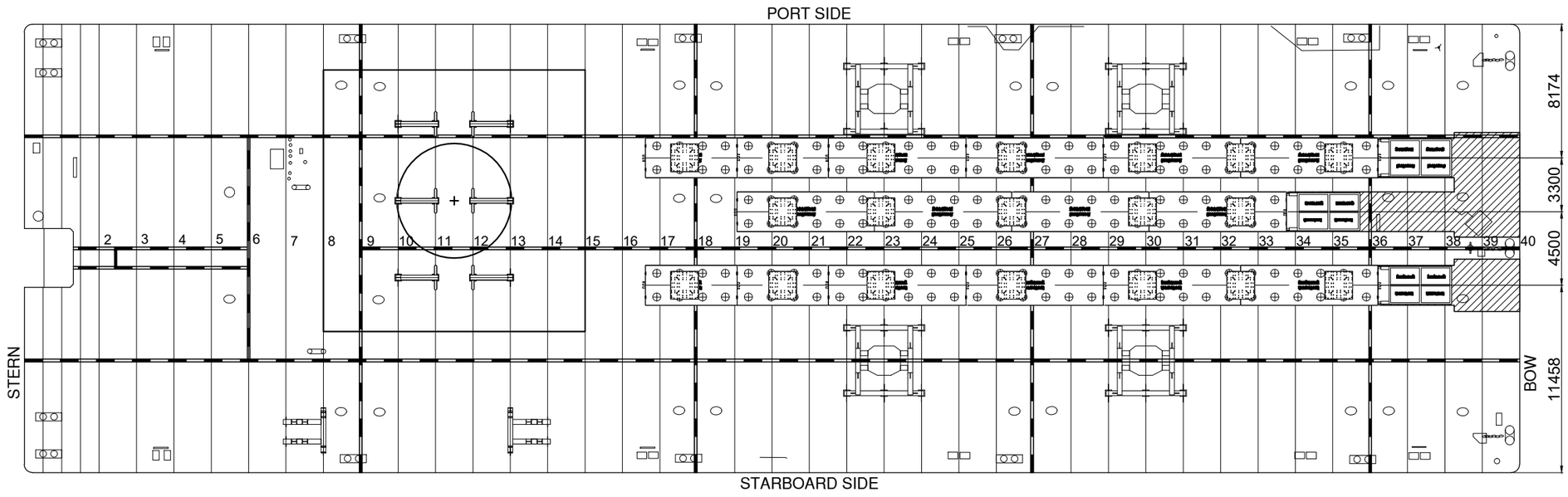
TITLE :
BASE LOAD POWER HUB (BLPH)
BRIDGE PLT & FENDERS
GENERAL ARRANGEMENT

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE
DRAWN C.BENZONI	CHECKED F.CERONI	APPROVED C.ANTONELLINI	DATE 25/06/25

A1	DRAWING NO. 123A90-FDL-MT-DD-00407-01	SHEET 001	REV. 02



TP LOADOUT



TOPSIDE LOADOUT

NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.

REFERENCE DRAWINGS

DWG No.	DESCRIPTION

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	12/06/25	SG	FC	CA	ISSUED FOR CONSTRUCTION
00	30/05/25	GS	FC	CA	ISSUED FOR CONSTRUCTION

CROSSWIND

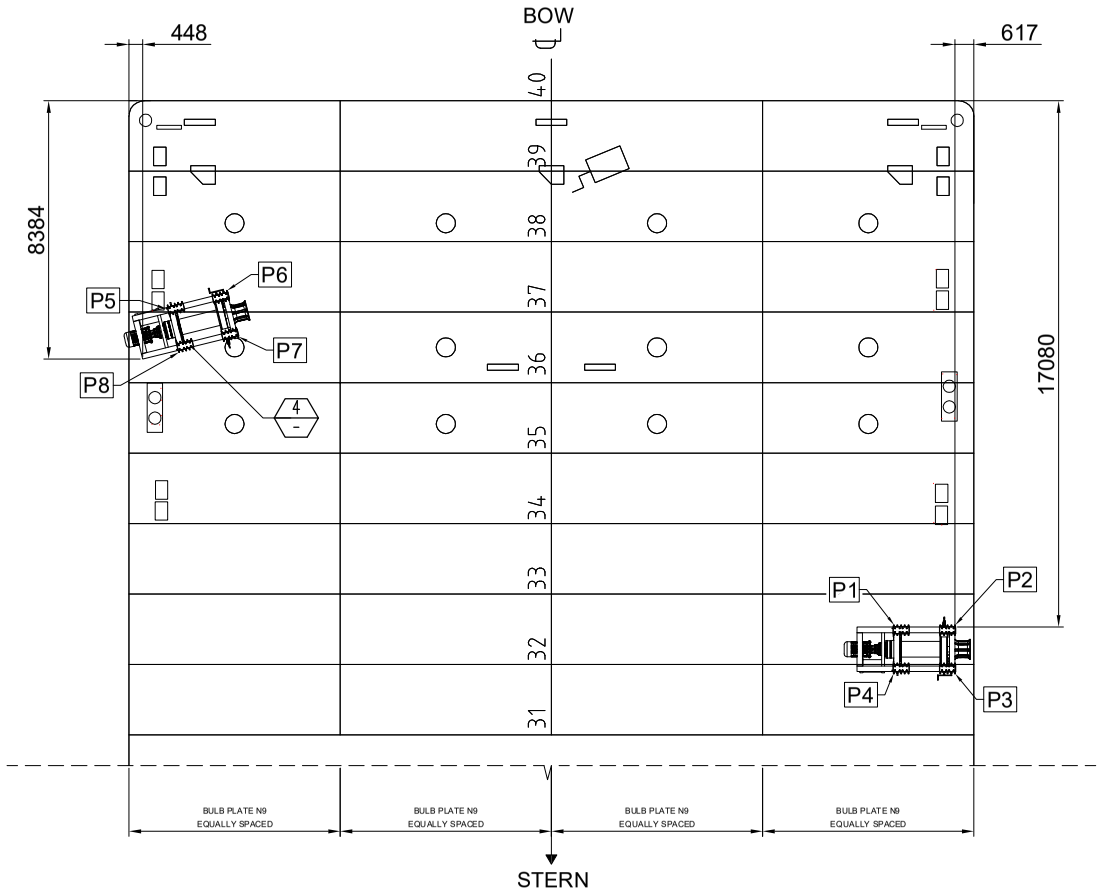
ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
LOADOUT TOPSIDE & TP
SPMT PATH ON BARGE

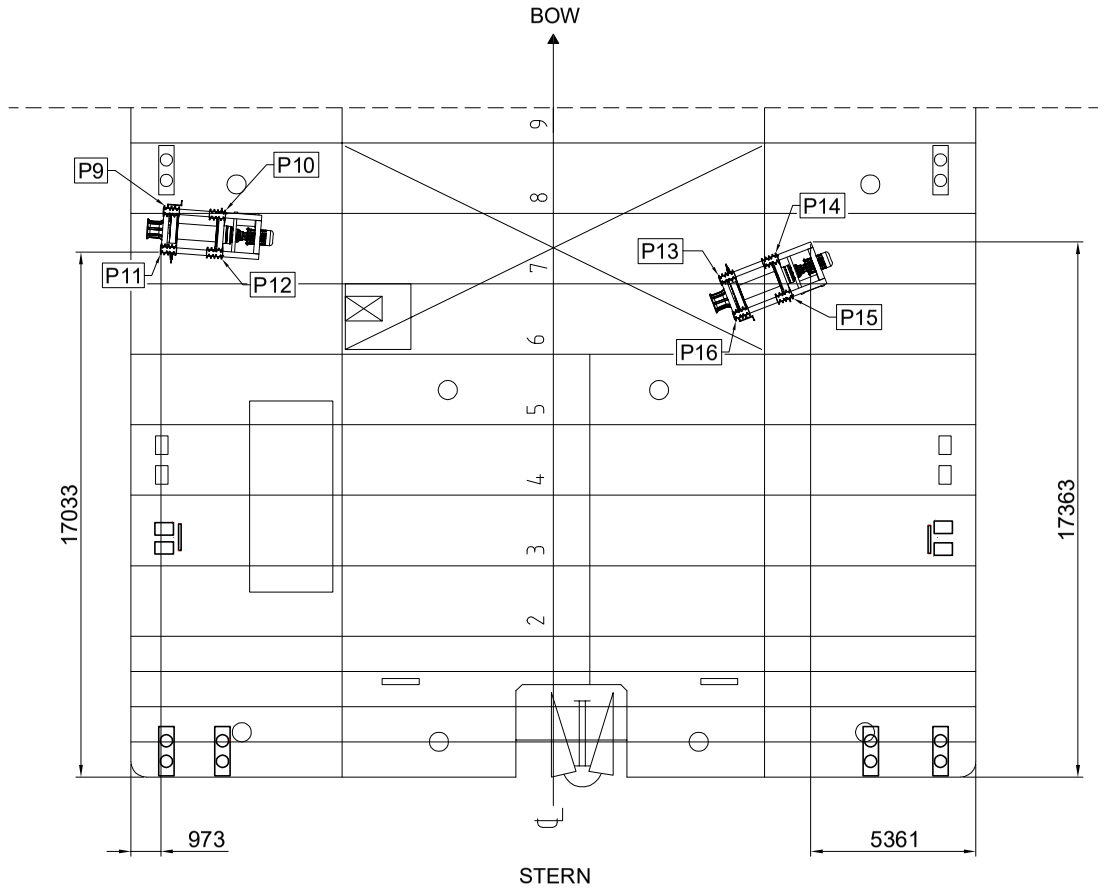
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK . | SCALE

DRAWN G.SEGURINI | CHECKED F.CERONI | APPROVED C.ANTONELLINI | DATE 12/06/25

A1 | DRAWING NO. 123A90-FDL-MT-DD-00409-00 | SHEET 001 | REV. 01



VERVECE PONTOON
PLAN VIEW (FRAMES 31 TO 40)



VERVECE PONTOON
PLAN VIEW (FRAMES 0 TO 9)

NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.

MATERIALS

TEMPORARY ELEMENT MATERIALS: EN 10025 S355 JO

NDT

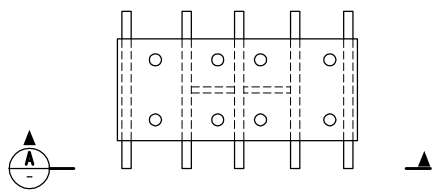
NDT CATEGORY AS PER EEMUA 158 ED.3

REFERENCES

1) 179-WIN03-DP-001 - WINCH MARK WIN 03 - SUPPORT FRAME - FABRICATION DRAWING - FAGIOLI EQUIPMENT

2) 179-WIN03-DP-010 - WINCH MARK WIN 03 - GENERAL BOLTED ARRANGEMENT TO FEET

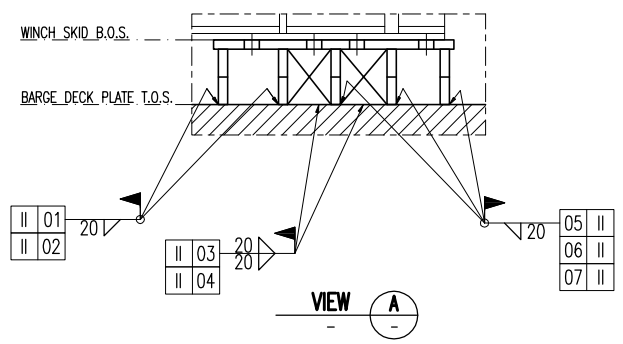
TYP. SUPPORT FRAME 4 - (SEE REF. 1 & REF.2)



PLAN VIEW
SUPPORT FRAME

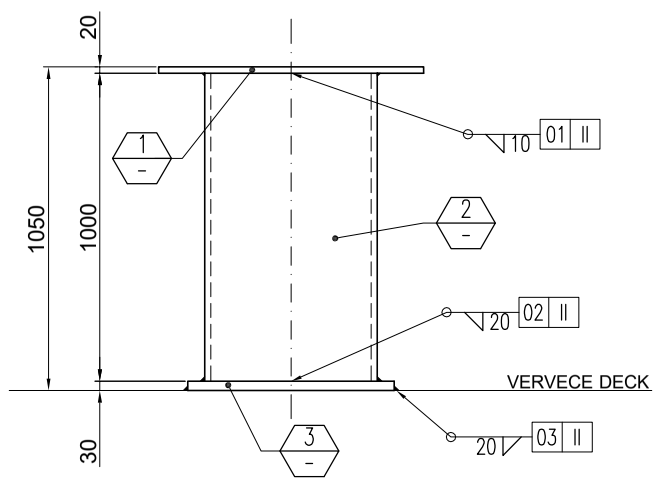
SUPPORT FRAME WELDS

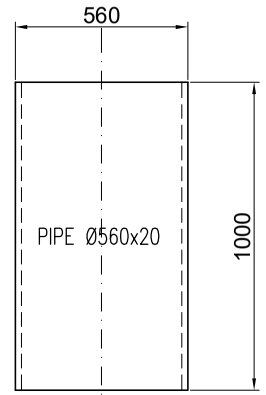
MARKS: P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12 P13 P14 P15 P16



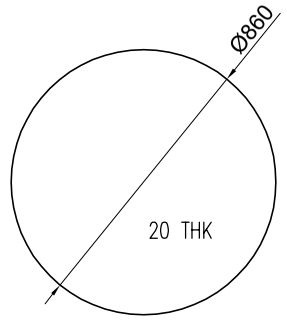
TEMPORARY BOLLARDS MARKS: TB-DX

N2 PIECE SPARE

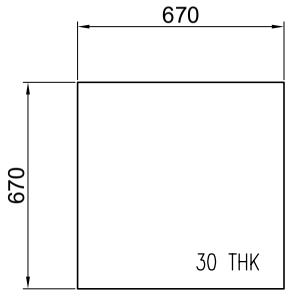




PIPE 2 -
N. 2 PCS REQ'D
(266kg each)



UPPER PLATE 1 -
N. 2 PCS REQ'D
(100kg each)



LOWER PLATE 3 -
N. 2 PCS REQ'D
(62kg each)

REFERENCE DRAWINGS

DWG No.	DESCRIPTION

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
00	30/05/25	GS	FC	CA	GENERAL REVIEW
00	27/05/25	GS	FC	CA	ISSUED FOR CONSTRUCTION

CROSSWIND

ROSETTI MARINO

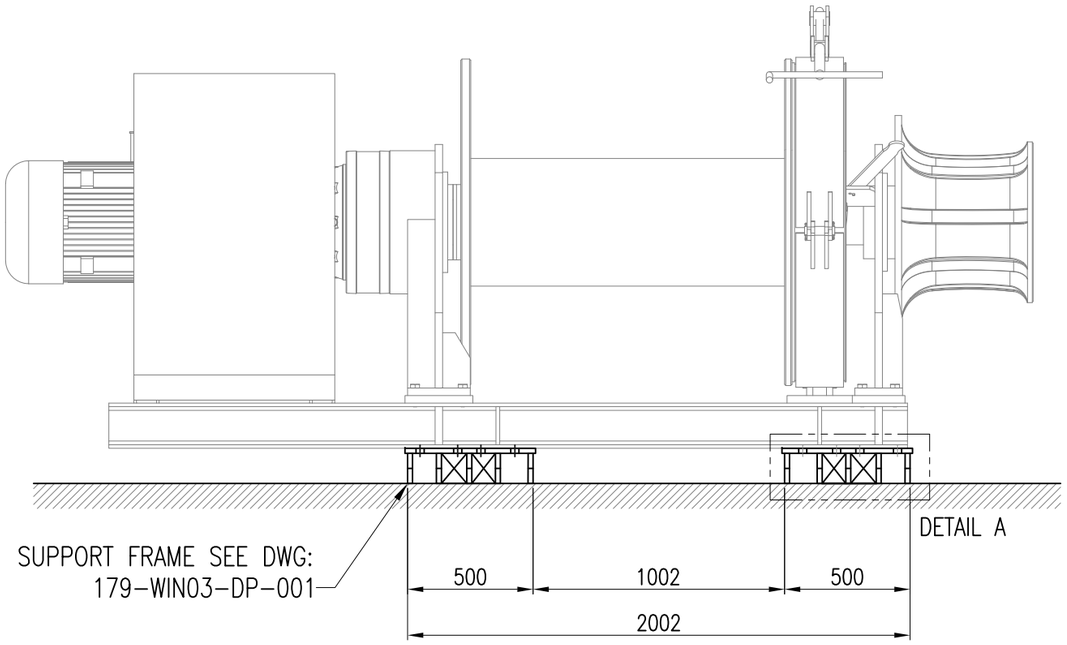
TITLE :
BASE LOAD POWER HUB (BLPH)
MOORING SCHEME
PERPENDICULAR TO QUAY

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE
DRAWN G.SEGURINI	CHECKED F.CERONI	APPROVED C.ANTONELLINI	DATE 30/05/25

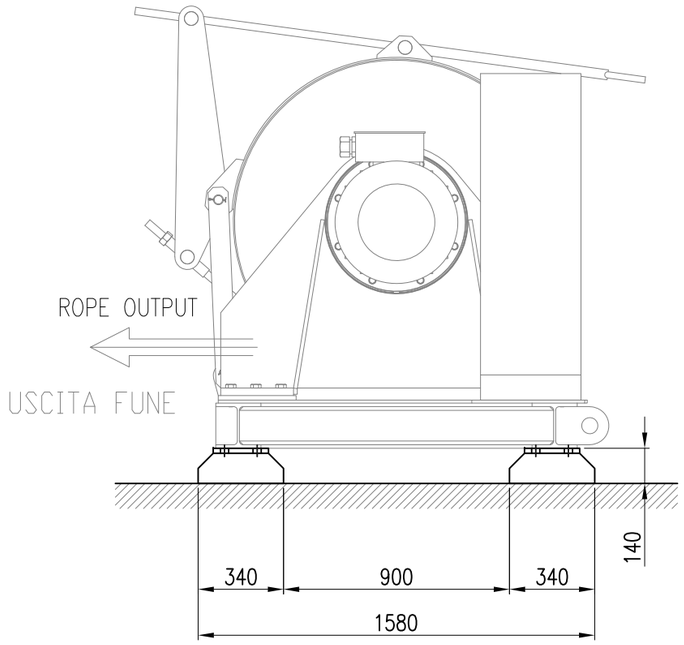
A1	DRAWING NO. 123A90-FDL-MT-DD-00410-01	SHEET 001	REV. 01

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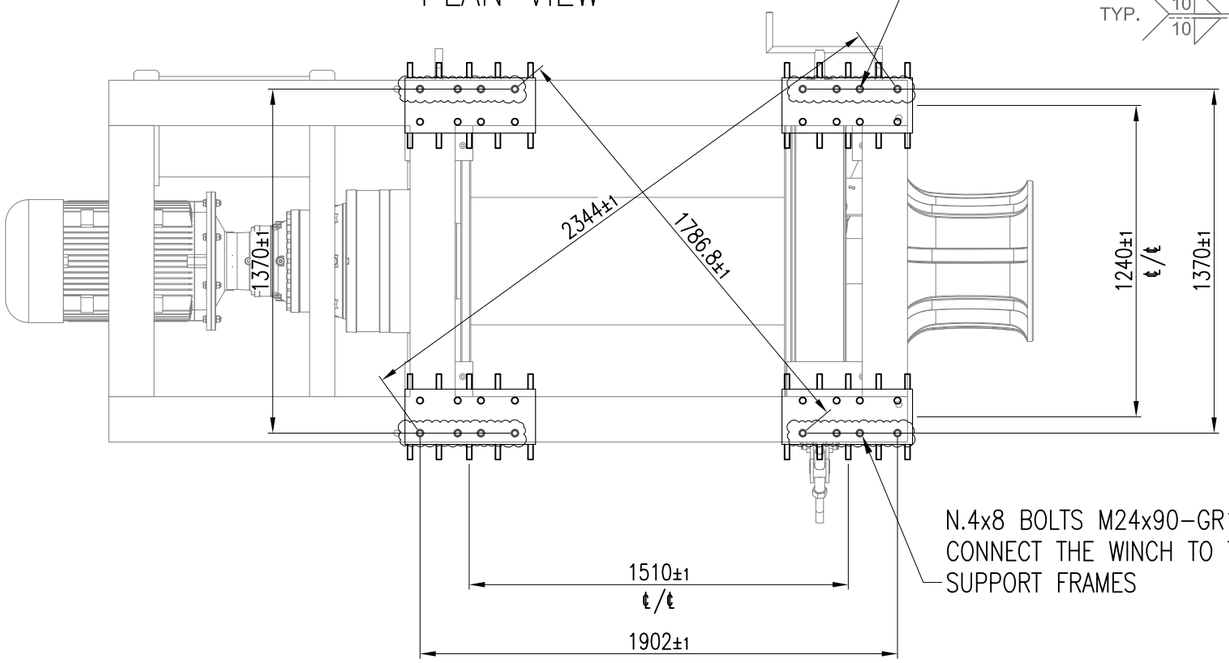
LATERAL VIEW



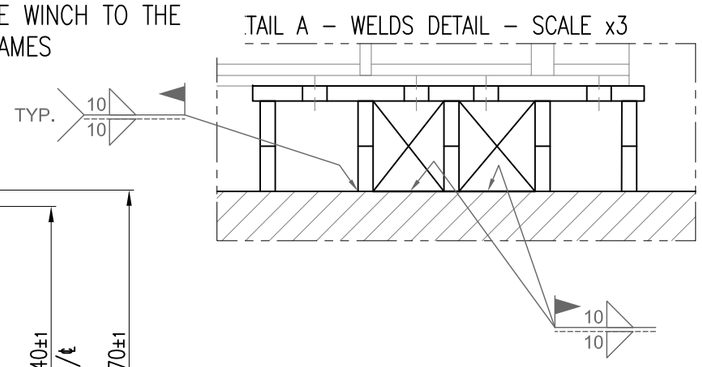
FRONT VIEW



PLAN VIEW



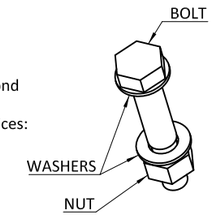
TAIL A – WELDS DETAIL – SCALE x3



NOTES:

1. BOLTS GRADE: 10.9 (U.O.N) EN 15048-1:2016;
2. NOTES FOR BOLTED CONNECTION:
   - Double washers shall be used for each bolt assembly;
   - Bolts shall be snug tightened (U.O.N);
   - Minimum of two thread pitches extend beyond the top surface of the nut shall be used;
   - Bolts shall be provided by antirotational devices:
     - ☒ NO
     - ☐ YES with PALNUT
     - ☐ YES with DOUBLE NUT
3. N.D.T. welds executed on site (unless otherwise noted):
   - visual: 100%
   - magnetic: 50%
   - UT for full penetration welds: -
4. REFERENCE DRAWINGS:
   - 179-WIN03-DP-001_REV0 (FABRICATION DRG OF THE FRAME)
   -
   -
5. ADDITIONAL NOTES:

TYPICAL BOLT ASSEMBLY EN 15048-1



Rev.	Descrizione revisione / Description of revision	Data / Date	Disegnato / Drawn by	Controllato / Checked by	Approvato / Approved by
0	FOR USE	19/11/19	LG	AC	LG

FAGIOLI

CLIENTE/CUSTOMER: FAGIOLI	FAGIOLI AREA: EMEA
DESCRIZIONE COMMESSA/JOB DESCRIPTION: GENERAL FAGIOLI EQUIPMENT	
DESCRIZIONE DISEGNO/DRAWING DESCRIPTION: WINCH MARK WIN 03 - GENERAL BOLTED ARRANGEMENT TO FEET	
NUM. DISEGNO/DRAWING NUMBER: 179-WIN03-DP-010	SCALA/SCALE:
FORMATO/SIZE: A3	COMMESSA/JOB:

ALIOTO GROUP SRL
Sede Legale, Stabilimento, Amministrazione, Sede e Deposito
19033 Castelnuovo Magra (SP) - Via Tavolara, 37
Tel. +39 0187 677711 r.a. - Fax. +39 0187 676063

e-mail : info@aliotogroup.com

www.aliotogroup.com Cod. Fisc. e P.Iva/VA/IT 01099210112

C.C.I.A.A. (SP) : Iscr.reg.impr.nr. 12301/2000 - R.E.A. nr. 10092

CERTIFICATO ISO 9001 - 2008

DOCUMENTO DI TRASPORTO

(D.d.T) D.P.R. 472 del 14 agosto 1996

Documento			
DOCUMENTO DI TRASPORTO			
Tipo	Nr.	Del	Pag.
BC	109	13/01/2016	1 di 1

Luogo di consegna	Destinatario
FAGIOLI SPA VIA FERRARIS 13 42049 SANT'ILARIO D'ENZA RE	FAGIOLI SPA VIA FERRARIS 13 42049 SANT'ILARIO D'ENZA RE

COD. CLI.	PARTITA IVA	ZONA	AGENTE
1858	00674300355	09 EMILIA ROMAGNA (ESCL. FO-CE-BO)	Rosi Rope

TRASPORTO A MEZZO	CAUSALE DI TRASPORTO	PORTO
MITTENTE	BOLLA VENDITA	FRANCO

RIF. ORDINE CLIENTE	PAGAMENTO
ODA N. PUR/RE 2015/00861 DEL 23-12-2015	AB27 / Bonifico Bancario 120 gg fm (A)

CODICE	DESCRIZIONE	U.M.	QUANTITA'	LUNG/SVIL	VAL. UNIT.
010300001045999	FUNE ACCIAIO 216 AM FORMING ZN. RES.220 DX Ø 30 mm CON REDANCIA PIENA 32 FORO REDANCIA IDONEO PER PERNO GRILLO DA 35 TON GIÀ EVASO SU ODL N° 72824	Nr	4,000	250	

ANNOTAZIONI
ODA N. PUR/RE 2015/00861 DEL 23-12-2015

N.COLLI	PESO KG.	ASPETTO ESTERIORE DEI BENI	DATA E ORA RITIRO MERCE	FIRMA CONDUCENTE
4	4380	PANCALI	13/01/16	

VETTORE 1	N.RO ALBO:	FIRMA VETTORE
AUTOTRASPORTI VANNINI SAS VIA ROMA 139 54012 BARBARASCO	ISCR. ALBO MS5051723/U P.IVA VETTORE 00699080453	

VETTORE 2	N.RO ALBO: P.IVA VETTORE 2	FIRMA DESTINATARIO

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DICHIARAZIONE DI CONFORMITA' EN 10204 2.1

DECLARATION OF CONFORMITY ACC.TO EN 10204 2.1

Alioto Group srl dichiara che le informazioni riporate di seguito sono conformi al certificato originale

Alioto Group srl declares that the information stated below is in conformity with the original factory test certificate

Cliente:	FAGIOLI SPA	**Destinazione**	
Customer:	VIA FERRARIS 13	**Ship to**	VIA FERRARIS 13
	42049 SANT'ILARIO D'ENZA RE IT		42049 SANT'ILARIO D'ENZA ITALIA

Rif. Cliente	ODA N. PUR/RE 2015/00861 DEL	**Rif. DDT**	BC 2016 109	**Certificato n:**	2015/OC.5727.0010.001
Ref. Customer	23-12-2015 23/12/2015	**Bill of Delivery**	13/01/2016	**Certificate n.:**	13/01/2016

CARATTERISTICHE GENERALI/GENERAL SPECIFICATION

Articolo: / **Item:** FUNE ACCIAIO 216 AM FORMING ZN. RES.220 DX Ø 30

Carico di rottura minimo (2160 N/mm2) kN **Minimum breaking load (2160 N/mm2) kN**	812	**Carico di rottura minimo (220 kgf/mm2) kgf** **Minimum breaking load (220 kgf/mm2) kgf**	82720
Numero di fili **Number of wires**	265	**Diametro nominale della fune (mm)** **Nominal rope diameter (mm)**	30
Diametro fili esterni (mm) **Outer wires diameter (mm)**	1,77	**Costruzione fune** **Rope construction**	6x K36+IWRC
Tipo di anima **Type of core**	IWRC	**Senso di avvolgimento** **Type of lay**	RHOL
Tipologia di finitura **Type of external surface**	GALV	**Lunghezza Effettiva di Impiego (mt)** **Effective Length (mt)**	250
Marcatura di tracciabilita' **Traceability Remark**	OC15.5727.010.1	**Quantità** **Quantity**	1

Note / **Note** PIOMB.REDANCIA PIENA AD UN LATO

Dichiarazione di Conformità

Con la presente certificazione di conformità si dichiara che il prodotto fornito è in accordo alle norme del D.Lgs. 17/2010 del 27/01/2010 relativo alla Direttiva Macchine 2006/42/CE. Qualunque modifica, cambiamento e/o variazione di questo accessorio non discussa con il produttore rende invalido questo certificato.

Declaration of Conformity

This Conformity Certificate declares that certified product is according to D.Lgs 17/2010 dated 27/01/2010 relatively to the Directive Machine 2006/42/CE. The present certification will become invalid in case of variations not agreed with the manufacturer.
Product manufactured in extra CEE Country.

Rappresentante Legale
Carlo Alioto

www.aliotogroup.com

NORME DI USO E MANUTENZIONE

(ATTENZIONE: FORNIRE COPIA AGLI UTILIZZATORI)

Ogni lunghezza di fune segue l'applicazione delle norme di cui al D.Lgs. 17/2010 del 27/01/2010 relativo alla Direttiva Macchine 2006/42/CE concernente il riavvicinamento delle legislazioni degli Stati membri relativi alle macchine.
Qualsiasi modifica apportata ad un qualsivoglia componente non discussa con il produttore rende invalide sia le presenti norme di uso e manutenzione che il certificato di conformità.

LE SEGUENTI INFORMAZIONI DEVONO ESSERE SEGUITE ED APPLICATE SOLO SE NON SONO PRESENTI DIVERSE INDICAZIONI DI USO E MANUTENZIONE DEL COSTRUTTORE DELLA MACCHINA SULLA QUALE LE FUNI SONO IMPIEGATE.

FUNI D'ACCIAIO

Le funi d'acciaio più comuni sono costituite da un'anima centrale e da un certo numero di trefoli cordati ad elica intorno ad essa. L'anima può essere tessile o metallica: si dice tessile quando quando è costituita da fibre sintetiche o naturali; metallica quando è costituita da un trefolo (WSC) o da una fune metallica più semplice (IWRC).
Il trefolo è l'insieme di più fili d'acciaio disposti ad elica attorno ad uno centrale.
I dati salienti che caratterizzano le funi d'acciaio sono i seguenti: DIAMETRO, FORMAZIONE, SENSO DI AVVOLGIMENTO, CARICO DI ROTTURA MINIMO, SEZIONE METALLICA, MASSA METRICA, RIVESTIMENTO PROTETTIVO DEI FILI, INGRASSATURA.
DIAMETRO (Ø): è quello della circonferenza circoscritta alla sua sezione normale e viene espresso in millimetri (mm). Il diametro nominale della fune è la dimensione che serve ad individuarla. Il diametro apparente della fune è il diametro misurato a fune completamente scarica. Il diametro effettivo della fune è il diametro che si misura con le seguenti modalità: a) si sottopone la fune ad un carico pari al 5% del carico di rottura minimo; b) vengono effettuate due doppie misurazioni ad una distanza di almeno 1 metro una dall'altra e a 90° tra loro; c) la media aritmetica dei quattro valori ottenuti è il diametro effettivo. Le tolleranze ammesse sul diametro effettivo sono riportate nella tabella sulla normativa UNI EN 12385-4:2008 al punto 5.4.1(prospetto 3).
FORMAZIONE: Le funi a trefoli vengono indicate in successione con: a) numero dei trefoli; b) numero dei fili componenti ciascun trefolo (se la fune è compattata davanti a questo valore viene aggiunta la lettera "K"); c) composizione dell'anima. Per esempio la dicitura 6x K36+WC indica una fune compattata a 6 trefoli con 36 fili ciascuno e un'anima metallica; la dicitura 6x19+FC indica una fune con 6 trefoli ognuno con 19 fili e un'anima tessile.
SENSO DI AVVOLGIMENTO: osservando una fune a trefoli vediamo che sia i trefoli rispetto alla fune, sia i fili rispetto ai trefoli, descrivono delle eliche. Si definisce con la lettera "Z" una rotazione dell'elica verso destra, mentre con la lettera "S" una rotazione dell'elica verso sinistra. Per convenzione si indica prima la rotazione del filo e poi quella del trefolo. Nel caso in cui si abbiano lettere diverse, la fune si chiama "CROCIATA" nel verso della lettera maiuscola, mentre se le lettere sono uguali si chiama "PARALLELA". Pertanto: "sZ"=CROCIATA DESTRA (RHOL); "zS"=CROCIATA SINISTRA (LHOL); "zZ"=PARALLELA DESTRA (RHLL); "sS"=PARALLELA SINISTRA (LHLL).
CARICHI DI ROTTURA: a) carico di rottura nominale: è quello minimo garantito che viene indicato in tabella, che viene riportatato sull'attestato di conformità e che serve per il calcolo delle portate; carico di rottura effettivo: è il carico reale a cui si rompe effettivamente la fune (deve sempre essere superiore a quello nominale); carico somma: è un valore puramente teorico che si riferisce alla somma dei carichi di rottura dei singoli fili (non serve per calcolare la portata delle funi).
SEZIONE METALLICA: è la somma delle aree dei singoli fili misurate sulla sezione normale all'asse degli stessi.
MASSA METRICA: indicato come valore per metro, è un valore teorico riportato nelle tabelle delle funi e che serve per calcolare con buona approssimazione il peso totale di una certa quantità di fune espressa in metri.
RIVESTIMENTO PROTETTIVO DEI FILI: i fili elementari delle funi sono di acciaio lucido. Essi vengono protetti pertanto da lubrificanti specifici. Se necessario possono anche essere ulteriormente protetti da zincatura a caldo, solitamente in tre versioni: A, AB, B secondo quanto riportato nella normativa UNI EN 10244-2:2009.
INGRASSATURA: tutte le funi d'acciaio devono essere ingrassate di tanto in tanto secondo quanto verrà stabilito da un addetto competente. In alcuni casi può risultare necessario pulire la fune prima di applicare il lubrificante, affinchè sia efficace. Il grasso della fune deve essere compatibile con il grasso originale applicato dal fabbricante e deve avere caratteristiche penetranti. Se il tipo di ingrassaggio della fune non è specificato nel manuale della macchina, l'utilizzatore deve cercare informazioni dal fornitore o dal fabbricante della fune.
LA MAUTENZIONE DELLA FUNE DEVE ESSERE GESTITA IN RELAZIONE AL TIPO DI FUNE, ALLA FREQUENZA D'USO E ALLE CONDIZIONI AMBIENTALI.
ISPEZIONE VISIVA GIORNALIERA: Almeno la sezione di fune operativa in quel particolare giorno deve essere osservata con l'obiettivo di scoprire qualsiasi deterioramento generale o danno meccanico. Questo deve includere i punti di attacco della fune alla macchina. Inoltre la fune dovrebbe essere controllata per assicurarsi che alloggi correttamente sul tamburo e sulle pulegge e che non si sia spostata dalla sua posizione normale operativa.
ISPEZIONE PERIODICA: Le ispezioni periodiche devono essere eseguite da un addetto competente, il quale dovrà stabilire se la fune può rimanere in servizio in sicurezza e dopo quanto tempo deve essere sottoposta alla prossima ispezione periodica oppure se deve essere necessario sostituirla immediatamente o entro uno specifico lasso di tempo.

PRINCIPALI CRITERI DI ROTTURA E SCARTO (UNI ISO 4309:2011)

ROTTURA DEI FILI: è la più frequente causa di scarto delle funi. La normativa sopra citata sancisce il numero massimo di rotture nei fili esterni oltre il quale la fune deve essere sostituita. Il numero di rotture di fili deve essere contato nel punto della fune in cui è presente la maggiore concentrazione di rotture. La lunghezza dell'areada considerare per il controllo può essere 6d oppure 30d ("d"=diametro nominale della fune). La fune deve essere scartata quando il numero di fili rotti contati nella porzione considerata sia maggiore o uguale a quello stabilito dalla tabella sulla normativa UNI ISO 4309:2011 al punto 6.2.4 (prospetto3) e al punto 6.2.5 (prospetto 4).
ROTTURA DEI TREFOLI: Nel caso in cui si verifichi una rottura dei trefoli, la fune deve essere scartata immediatamente.
RIDUZIONE DEL DIAMETRO DELLA FUNE (USURA INTERNA): Quando il diametro effettivo della fune si riduce del 15% rispetto al diametro nominal a causa dell'usura interna, la fune deve essere scartata. Se si verifica un' evidente diminuzione localizzata del diametro, come quella causata dalla rottura dell'anima, la stessa deve essere scartata.
Le funi con una sezione metallica molto elevata hanno un diametro effettivo più stabile.
ABRASIONE (USURA ESTERNA): Nel caso in cui si verifichi un decremento del diametro della fune del 10% rispetto al suo diametro nominale a causa dell'abrasione superficiale, la fune deve essere scartata immediatamente.
DEFORMAZIONE DELLA FUNE: Una distorsione visibile della fune rispetto alla sua forma normale è classificata come deformazione. Generalmente si risolve in una distribuzione non uniforme dello sforzo nella fune nell'area della deformazione, che spesso si rileva localizzata. Ogni fune considerata in condizioni pericolose deve essere scartata immediatamente. Le principali cause di deformazione sono: ONDULAZIONE: se in una parte diritta di fune, che non corre mai su una puleggia o viene avvolta su un tamburo, la differenza tra la tangente della spirale e il lato inferiore della spirale è 1/3d o maggiore o se in una parte di fune, che corre su una puleggia o viene avvolta su un tamburo, la differenza fra la tangente della spirale e il lato inferiore della spirale è 1/10 o maggiore la fune deve essere scartata. INFIASCATURA: consiste in un allungamento dei trefoli esterni con conseguente rigonfiamento a fiasco che si manifesta in un punto ben definito della fune che deve essere scartata immediatamente oppure, posto che la parte restante di fune sia utilizzabile, deve essere rimossa la parte deformata. FUORIUSCITA O DISTORSIONE DELL'ANIMA O DEL TREFOLO: è una particolare deformazione ad infiascatura, la fune deve essere scartata o eliminata la parte deformata posto che la restante lunghezza di fune sia utilizzabile. FUORIUSCITA DEI FILI AD ASOLA: generalmente i fili fuoriescono in gruppi sul lato opposto della fune rispetto a quello in contatto con la gola della puleggia, la fune deve essere scartata immediatamente. INCREMENTO LOCALIZZATO DEL DIAMETRO: se il diametro della fune ad anima metallica aumenta del5% od oltre, oppure per le funi con anima tessile del 10% od oltre, è necessario ricercarne la ragione e prendere in considerazione lo scarto. PARTI APPIATTITE: è probabile che i segmenti di fune appiattiti che corrono su una puleggia si deteriorino più velocemente e presentino fili rotti. In questi casi, ma a seconda dell'appiattimento, si può prendere in considerazione lo scarto. COCCA O ASOLA SCHIACCIATA: queste funi devono essere scartate immediatamente. PIEGATURA NELLA FUNE: è probabile che le parti di fune con una grave piegatura che corrono su una puleggia si deteriorino più velocemente e presentino fili rotti. In questo caso la fune deve essere scartata. DANNEGGIAMENTO DOVUTO A CALORE O AD ARCO ELETTRICO: si presenta nelle funi che generalmente lavorano a temperatura ambiente ma che sono state soggette ad effetti termici eccezionalmente alti, in questo caso la fune deve essere scartata immediatamente.

ULTERIORI INFORMAZIONI SI POSSONO TROVARE ALL'INTERNO DELLA NORMATIVA UNI ISO 4309:2011

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DICHIARAZIONE DI CONFORMITA' EN 10204 2.1

DECLARATION OF CONFORMITY ACC.TO EN 10204 2.1

Alioto Group srl dichiara che le informazioni riporate di seguito sono conformi al certificato originale

Alioto Group srl declares that the information stated below is in conformity with the original factory test certificate

Cliente: / **Customer:**	FAGIOLI SPA VIA FERRARIS 13 42049 SANT'ILARIO D'ENZA RE IT	**Destinazione** / **Ship to**	VIA FERRARIS 13 42049 SANT'ILARIO D'ENZA ITALIA
Rif. Cliente / **Ref. Customer**	ODA N. PUR/RE 2015/00861 DEL 23-12-2015 23/12/2015	**Rif. DDT** / **Bill of Delivery**	BC 2016 109 13/01/2016
Certificato n: / **Certificate n.:**	2015/OC. 5727.0010.002 13/01/2016		

CARATTERISTICHE GENERALI/GENERAL SPECIFICATION

Articolo: / **Item:** FUNE ACCIAIO 216 AM FORMING ZN. RES.220 DX Ø 30

Carico di rottura minimo (2160 N/mm2) kN **Minimum breaking load (2160 N/mm2) kN**	812	**Carico di rottura minimo (220 kgf/mm2) kgf** **Minimum breaking load (220 kgf/mm2) kgf**	82720
Numero di fili **Number of wires**	265	**Diametro nominale della fune (mm)** **Nominal rope diameter (mm)**	30
Diametro fili esterni (mm) **Outer wires diameter (mm)**	1,77	**Costruzione fune** **Rope construction**	6x K36+IWRC
Tipo di anima **Type of core**	IWRC	**Senso di avvolgimento** **Type of lay**	RHOL
Tipologia di finitura **Type of external surface**	GALV	**Lunghezza Effettiva di Impiego (mt)** **Effective Length (mt)**	250
Marcatura di tracciabilita' **Traceability Remark**	OC15.5727.010.2	**Quantità** **Quantity**	1

Note / **Note** PIOMB.REDANCIA PIENA AD UN LATO

Dichiarazione di Conformità
Con la presente certificazione di conformità si dichiara che il prodotto fornito è in accordo alle norme del D.Lgs. 17/2010 del 27/01/2010 relativo alla Direttiva Macchine 2006/42/CE. Qualunque modifica, cambiamento e/o variazione di questo accessorio non discussa con il produttore rende invalido questo certificato.

Declaration of Conformity
This Conformity Certificate declares that certified product is according to D.Lgs 17/2010 dated 27/01/2010 relatively to the Directive Machine 2006/42/CE. The present certification will become invalid in case of variations not agreed with the manufacturer.
Product manufactured in extra CEE Country.

Rappresentante Legale
Carlo Alioto

www.aliotogroup.com

NORME DI USO E MANUTENZIONE

(ATTENZIONE: FORNIRE COPIA AGLI UTILIZZATORI)

Ogni lunghezza di fune segue l'applicazione delle norme di cui al D.Lgs. 17/2010 del 27/01/2010 relativo alla Direttiva Macchine 2006/42/CE concernente il riavvicinamento delle legislazioni degli Stati membri relativi alle macchine.
Qualsiasi modifica apportata ad un qualsivoglia componente non discussa con il produttore rende invalide sia le presenti norme di uso e manutenzione che il certificato di conformità.

LE SEGUENTI INFORMAZIONI DEVONO ESSERE SEGUITE ED APPLICATE SOLO SE NON SONO PRESENTI DIVERSE INDICAZIONI DI USO E MANUTENZIONE DEL COSTRUTTORE DELLA MACCHINA SULLA QUALE LE FUNI SONO IMPIEGATE.

FUNI D'ACCIAIO

Le funi d'acciaio più comuni sono costituite da un'anima centrale e da un certo numero di trefoli cordati ad elica intorno ad essa. L'anima può essere tessile o metallica: si dice tessile quando quando è costituita da fibre sintetiche o naturali; metallica quando è costituita da un trefolo (WSC) o da una fune metallica più semplice (IWRC).
Il trefolo è l'insieme di più fili d'acciaio disposti ad elica attorno ad uno centrale.
I dati salienti che caratterizzano le funi d'acciaio sono i seguenti: DIAMETRO, FORMAZIONE, SENSO DI AVVOLGIMENTO, CARICO DI ROTTURA MINIMO, SEZIONE METALLICA, MASSA METRICA, RIVESTIMENTO PROTETTIVO DEI FILI, INGRASSATURA.
DIAMETRO (Ø): è quello della circonferenza circoscritta alla sua sezione normale e viene espresso in millimetri (mm). Il diametro nominale della fune è la dimensione che serve ad individuarla. Il diametro apparente della fune è il diametro misurato a fune completamente scarica. Il diametro effettivo della fune è il diametro che si misura con le seguenti modalità: a) si sottopone la fune ad un carico pari al 5% del carico di rottura minimo; b) vengono effettuate due doppie misurazioni ad una distanza di almeno 1 metro una dall'altra e a 90° tra loro; c) la media aritmetica dei quattro valori ottenuti è il diametro effettivo. Le tolleranze ammesse sul diametro effettivo sono riportate nella tabella sulla normativa UNI EN 12385-4:2008 al punto 5.4.1(prospetto 3).
FORMAZIONE: Le funi a trefoli vengono indicate in successione con: a) numero dei trefoli; b) numero dei fili componenti ciascun trefolo (se la fune è compattata davanti a questo valore viene aggiunta la lettera "K"); c) composizione dell'anima. Per esempio la dicitura 6x K36+WC indica una fune compattata a 6 trefoli con 36 fili ciascuno e un'anima metallica; la dicitura 6x19+FC indica una fune con 6 trefoli ognuno con 19 fili e un'anima tessile.
SENSO DI AVVOLGIMENTO: osservando una fune a trefoli vediamo che sia i trefoli rispetto alla fune, sia i fili rispetto ai trefoli, descrivono delle eliche. Si definisce con la lettera "Z" una rotazione dell'elica verso destra, mentre con la lettera "S" una rotazione dell'elica verso sinistra. Per convenzione si indica prima la rotazione del filo e poi quella del trefolo. Nel caso in cui si abbiano lettere diverse, la fune si chiama "CROCIATA" nel verso della lettera maiuscola, mentre se le lettere sono uguali si chiama "PARALLELA". Pertanto: "sZ"=CROCIATA DESTRA (RHOL); "zS"=CROCIATA SINISTRA (LHOL); "zZ"=PARALLELA DESTRA (RHLL); "sS"=PARALLELA SINISTRA (LHLL).
CARICHI DI ROTTURA: a) carico di rottura nominale: è quello minimo garantito che viene indicato in tabella, che viene riportatato sull'attestato di conformità e che serve per il calcolo delle portate; carico di rottura effettivo: è il carico reale a cui si rompe effettivamente la fune (deve sempre essere superiore a quello nominale); carico somma: è un valore puramente teorico che si riferisce alla somma dei carichi di rottura dei singoli fili (non serve per calcolare la portata delle funi).
SEZIONE METALLICA: è la somma delle aree dei singoli fili misurate sulla sezione normale all'asse degli stessi.
MASSA METRICA: indicato come valore per metro, è un valore teorico riportato nelle tabelle delle funi e che serve per calcolare con buona approssimazione il peso totale di una certa quantità di fune espressa in metri.
RIVESTIMENTO PROTETTIVO DEI FILI: i fili elementari delle funi sono di acciaio lucido. Essi vengono protetti pertanto da lubrificanti specifici. Se necessario possono anche essere ulteriormente protetti da zincatura a caldo, solitamente in tre versioni: A, AB, B secondo quanto riportato nella normativa UNI EN 10244-2:2009.
INGRASSATURA: tutte le funi d'acciaio devono essere ingrassate di tanto in tanto secondo quanto verrà stabilito da un addetto competente. In alcuni casi può risultare necessario pulire la fune prima di applicare il lubrificante, affinchè sia efficace. Il grasso della fune deve essere compatibile con il grasso originale applicato dal fabbricante e deve avere caratteristiche penetranti. Se il tipo di ingrassaggio della fune non è specificato nel manuale della macchina, l'utilizzatore deve cercare informazioni dal fornitore o dal fabbricante della fune.
LA MAUTENZIONE DELLA FUNE DEVE ESSERE GESTITA IN RELAZIONE AL TIPO DI FUNE, ALLA FREQUENZA D'USO E ALLE CONDIZIONI AMBIENTALI.
ISPEZIONE VISIVA GIORNALIERA: Almeno la sezione di fune operativa in quel particolare giorno deve essere osservata con l'obiettivo di scoprire qualsiasi deterioramento generale o danno meccanico. Questo deve includere i punti di attacco della fune alla macchina. Inoltre la fune dovrebbe essere controllata per assicurarsi che alloggi correttamente sul tamburo e sulle pulegge e che non si sia spostata dalla sua posizione normale operativa.
ISPEZIONE PERIODICA: Le ispezioni periodiche devono essere eseguite da un addetto competente, il quale dovrà stabilire se la fune può rimanere in servizio in sicurezza e dopo quanto tempo deve essere sottoposta alla prossima ispezione periodica oppure se deve essere necessario sostituirla immediatamente o entro uno specifico lasso di tempo.

PRINCIPALI CRITERI DI ROTTURA E SCARTO (UNI ISO 4309:2011)

ROTTURA DEI FILI: è la più frequente causa di scarto delle funi. La normativa sopra citata sancisce il numero massimo di rotture nei fili esterni oltre il quale la fune deve essere sostituita. Il numero di rotture di fili deve essere contato nel punto della fune in cui è presente la maggiore concentrazione di rotture. La lunghezza dell'areada considerare per il controllo può essere 6d oppure 30d ("d"=diametro nominale della fune). La fune deve essere scartata quando il numero di fili rotti contati nella porzione considerata sia maggiore o uguale a quello stabilito dalla tabella sulla normativa UNI ISO 4309:2011 al punto 6.2.4 (prospetto3) e al punto 6.2.5 (prospetto 4).
ROTTURA DEI TREFOLI: Nel caso in cui si verifichi una rottura dei trefoli, la fune deve essere scartata immediatamente.
RIDUZIONE DEL DIAMETRO DELLA FUNE (USURA INTERNA): Quando il diametro effettivo della fune si riduce del 15% rispetto al diametro nominal a causa dell'usura interna, la fune deve essere scartata. Se si verifica un' evidente diminuzione localizzata del diametro, come quella causata dalla rottura dell'anima, la stessa deve essere scartata.
Le funi con una sezione metallica molto elevata hanno un diametro effettivo più stabile.
ABRASIONE (USURA ESTERNA): Nel caso in cui si verifichi un decremento del diametro della fune del 10% rispetto al suo diametro nominale a causa dell'abrasione superficiale, la fune deve essere scartata immediatamente.
DEFORMAZIONE DELLA FUNE: Una distorsione visibile della fune rispetto alla sua forma normale è classificata come deformazione. Generalmente si risolve in una distribuzione non uniforme dello sforzo nella fune nell'area della deformazione, che spesso si rileva localizzata. Ogni fune considerata in condizioni pericolose deve essere scartata immediatamente. Le principali cause di deformazione sono: ONDULAZIONE: se in una parte diritta di fune, che non corre mai su una puleggia o viene avvolta su un tamburo, la differenza tra la tangente della spirale e il lato inferiore della spirale è 1/3d o maggiore o se in una parte di fune, che corre su una puleggia o viene avvolta su un tamburo, la differenza fra la tangente della spirale e il lato inferiore della spirale è 1/10 o maggiore la fune deve essere scartata. INFIASCATURA: consiste in un allungamento dei trefoli esterni con conseguente rigonfiamento a fiasco che si manifesta in un punto ben definito della fune che deve essere scartata immediatamente oppure, posto che la parte restante di fune sia utilizzabile, deve essere rimossa la parte deformata. FUORIUSCITA O DISTORSIONE DELL'ANIMA O DEL TREFOLO: è una particolare deformazione ad infiascatura, la fune deve essere scartata o eliminata la parte deformata posto che la restante lunghezza di fune sia utilizzabile. FUORIUSCITA DEI FILI AD ASOLA: generalmente i fili fuoriescono in gruppi sul lato opposto della fune rispetto a quello in contatto con la gola della puleggia, la fune deve essere scartata immediatamente. INCREMENTO LOCALIZZATO DEL DIAMETRO: se il diametro della fune ad anima metallica aumenta del5% od oltre, oppure per le funi con anima tessile del 10% od oltre, è necessario ricercarne la ragione e prendere in considerazione lo scarto. PARTI APPIATTITE: è probabile che i segmenti di fune appiattiti che corrono su una puleggia si deteriorino più velocemente e presentino fili rotti. In questi casi, ma a seconda dell'appiattimento, si può prendere in considerazione lo scarto. COCCA O ASOLA SCHIACCIATA: queste funi devono essere scartate immediatamente. PIEGATURA NELLA FUNE: è probabile che le parti di fune con una grave piegatura che corrono su una puleggia si deteriorino più velocemente e presentino fili rotti. In questo caso la fune deve essere scartata. DANNEGGIAMENTO DOVUTO A CALORE O AD ARCO ELETTRICO: si presenta nelle funi che generalmente lavorano a temperatura ambiente ma che sono state soggette ad effetti termici eccezionalmente alti, in questo caso la fune deve essere scartata immediatamente.

ULTERIORI INFORMAZIONI SI POSSONO TROVARE ALL'INTERNO DELLA NORMATIVA UNI ISO 4309:2011

www.aliotogroup.com

DICHIARAZIONE DI CONFORMITA' EN 10204 2.1

DECLARATION OF CONFORMITY ACC.TO EN 10204 2.1

Alioto Group srl dichiara che le informazioni riporate di seguito sono conformi al certificato originale

Alioto Group srl declares that the information stated below is in conformity with the original factory test certificate

Cliente:	FAGIOLI SPA	**Destinazione**	
Customer:	VIA FERRARIS 13 42049 SANT'ILARIO D'ENZA RE IT	**Ship to**	VIA FERRARIS 13 42049 SANT'ILARIO D'ENZA ITALIA

Rif. Cliente **Ref. Customer**	ODA N. PUR/RE 2015/00861 DEL 23-12-2015 23/12/2015	**Rif. DDT** **Bill of Delivery**	BC 2016 109 13/01/2016	**Certificato n:** **Certificate n.:**	2015/OC.5727.0010.003 13/01/2016

CARATTERISTICHE GENERALI/GENERAL SPECIFICATION

Articolo: / **Item:** FUNE ACCIAIO 216 AM FORMING ZN. RES.220 DX Ø 30

Carico di rottura minimo (2160 N/mm2) kN **Minimum breaking load (2160 N/mm2) kN**	812	**Carico di rottura minimo (220 kgf/mm2) kgf** **Minimum breaking load (220 kgf/mm2) kgf**	82720
Numero di fili **Number of wires**	265	**Diametro nominale della fune (mm)** **Nominal rope diameter (mm)**	30
Diametro fili esterni (mm) **Outer wires diameter (mm)**	1,77	**Costruzione fune** **Rope construction**	6x K36+IWRC
Tipo di anima **Type of core**	IWRC	**Senso di avvolgimento** **Type of lay**	RHOL
Tipologia di finitura **Type of external surface**	GALV	**Lunghezza Effettiva di Impiego (mt)** **Effective Length (mt)**	250
Marcatura di tracciabilita' **Traceability Remark**	OC15.5727.010.3	**Quantità** **Quantity**	1

Note / **Note** PIOMB.REDANCIA PIENA AD UN LATO

Dichiarazione di Conformità

Con la presente certificazione di conformità si dichiara che il prodotto fornito è in accordo alle norme del D.Lqs. 17/2010 del 27/01/2010 relativo alla Direttiva Macchine 2006/42/CE. Qualunque modifica, cambiamento e/o variazione di questo accessorio non discussa con il produttore rende invalido questo certificato.

Declaration of Conformity

This Conformity Certificate declares that certified product is according to D.Lqs 17/2010 dated 27/01/2010 relatively to the Directive Machine 2006/42/CE. The present certification will become invalid in case of variations not agreed with the manufacturer.
Product manufactured in extra CEE Country.

Rappresentante Legale
Carlo Alioto

www.aliotogroup.com

NORME DI USO E MANUTENZIONE

(ATTENZIONE: FORNIRE COPIA AGLI UTILIZZATORI)

Ogni lunghezza di fune segue l'applicazione delle norme di cui al D.Lgs. 17/2010 del 27/01/2010 relativo alla Direttiva Macchine 2006/42/CE concernente il riavvicinamento delle legislazioni degli Stati membri relativi alle macchine.
Qualsiasi modifica apportata ad un qualsivoglia componente non discussa con il produttore rende invalide sia le presenti norme di uso e manutenzione che il certificato di conformità.

LE SEGUENTI INFORMAZIONI DEVONO ESSERE SEGUITE ED APPLICATE SOLO SE NON SONO PRESENTI DIVERSE INDICAZIONI DI USO E MANUTENZIONE DEL COSTRUTTORE DELLA MACCHINA SULLA QUALE LE FUNI SONO IMPIEGATE.

FUNI D'ACCIAIO

Le funi d'acciaio più comuni sono costituite da un'anima centrale e da un certo numero di trefoli cordati ad elica intorno ad essa. L'anima può essere tessile o metallica: si dice tessile quando quando è costituita da fibre sintetiche o naturali; metallica quando è costituita da un trefolo (WSC) o da una fune metallica più semplice (IWRC).
Il trefolo è l'insieme di più fili d'acciaio disposti ad elica attorno ad uno centrale.
I dati salienti che caratterizzano le funi d'acciaio sono i seguenti: DIAMETRO, FORMAZIONE, SENSO DI AVVOLGIMENTO, CARICO DI ROTTURA MINIMO, SEZIONE METALLICA, MASSA METRICA, RIVESTIMENTO PROTETTIVO DEI FILI, INGRASSATURA.
DIAMETRO (Ø): è quello della circonferenza circoscritta alla sua sezione normale e viene espresso in millimetri (mm). Il diametro nominale della fune è la dimensione che serve ad individuarla. Il diametro apparente della fune è il diametro misurato a fune completamente scarica. Il diametro effettivo della fune è il diametro che si misura con le seguenti modalità: a) si sottopone la fune ad un carico pari al 5% del carico di rottura minimo; b) vengono effettuate due doppie misurazioni ad una distanza di almeno 1 metro una dall'altra e a 90° tra loro; c) la media aritmetica dei quattro valori ottenuti è il diametro effettivo. Le tolleranze ammesse sul diametro effettivo sono riportate nella tabella sulla normativa UNI EN 12385-4:2008 al punto 5.4.1(prospetto 3).
FORMAZIONE: Le funi a trefoli vengono indicate in successione con: a) numero dei trefoli; b) numero dei fili componenti ciascun trefolo (se la fune è compattata davanti a questo valore viene aggiunta la lettera "K"); c) composizione dell'anima. Per esempio la dicitura 6x K36+WC indica una fune compattata a 6 trefoli con 36 fili ciascuno e un'anima metallica; la dicitura 6x19+FC indica una fune con 6 trefoli ognuno con 19 fili e un'anima tessile.
SENSO DI AVVOLGIMENTO: osservando una fune a trefoli vediamo che sia i trefoli rispetto alla fune, sia i fili rispetto ai trefoli, descrivono delle eliche. Si definisce con la lettera "Z" una rotazione dell'elica verso destra, mentre con la lettera "S" una rotazione dell'elica verso sinistra. Per convenzione si indica prima la rotazione del filo e poi quella del trefolo. Nel caso in cui si abbiano lettere diverse, la fune si chiama "CROCIATA" nel verso della lettera maiuscola, mentre se le lettere sono uguali si chiama "PARALLELA". Pertanto: "sZ"=CROCIATA DESTRA (RHOL); "zS"=CROCIATA SINISTRA (LHOL); "zZ"=PARALLELA DESTRA (RHLL); "sS"=PARALLELA SINISTRA (LHLL).
CARICHI DI ROTTURA: a) carico di rottura nominale: è quello minimo garantito che viene indicato in tabella, che viene riportatato sull'attestato di conformità e che serve per il calcolo delle portate; carico di rottura effettivo: è il carico reale a cui si rompe effettivamente la fune (deve sempre essere superiore a quello nominale); carico somma: è un valore puramente teorico che si riferisce alla somma dei carichi di rottura dei singoli fili (non serve per calcolare la portata delle funi).
SEZIONE METALLICA: è la somma delle aree dei singoli fili misurate sulla sezione normale all'asse degli stessi.
MASSA METRICA: indicato come valore per metro, è un valore teorico riportato nelle tabelle delle funi e che serve per calcolare con buona approssimazione il peso totale di una certa quantità di fune espressa in metri.
RIVESTIMENTO PROTETTIVO DEI FILI: i fili elementari delle funi sono di acciaio lucido. Essi vengono protetti pertanto da lubrificanti specifici. Se necessario possono anche essere ulteriormente protetti da zincatura a caldo, solitamente in tre versioni: A, AB, B secondo quanto riportato nella normativa UNI EN 10244-2:2009.
INGRASSATURA: tutte le funi d'acciaio devono essere ingrassate di tanto in tanto secondo quanto verrà stabilito da un addetto competente. In alcuni casi può risultare necessario pulire la fune prima di applicare il lubrificante, affinchè sia efficace. Il grasso della fune deve essere compatibile con il grasso originale applicato dal fabbricante e deve avere caratteristiche penetranti. Se il tipo di ingrassaggio della fune non è specificato nel manuale della macchina, l'utilizzatore deve cercare informazioni dal fornitore o dal fabbricante della fune.
LA MAUTENZIONE DELLA FUNE DEVE ESSERE GESTITA IN RELAZIONE AL TIPO DI FUNE, ALLA FREQUENZA D'USO E ALLE CONDIZIONI AMBIENTALI.
ISPEZIONE VISIVA GIORNALIERA: Almeno la sezione di fune operativa in quel particolare giorno deve essere osservata con l'obiettivo di scoprire qualsiasi deterioramento generale o danno meccanico. Questo deve includere i punti di attacco della fune alla macchina. Inoltre la fune dovrebbe essere controllata per assicurarsi che alloggi correttamente sul tamburo e sulle pulegge e che non si sia spostata dalla sua posizione normale operativa.
ISPEZIONE PERIODICA: Le ispezioni periodiche devono essere eseguite da un addetto competente, il quale dovrà stabilire se la fune può rimanere in servizio in sicurezza e dopo quanto tempo deve essere sottoposta alla prossima ispezione periodica oppure se deve essere necessario sostituirla immediatamente o entro uno specifico lasso di tempo.

PRINCIPALI CRITERI DI ROTTURA E SCARTO (UNI ISO 4309:2011)

ROTTURA DEI FILI: è la più frequente causa di scarto delle funi. La normativa sopra citata sancisce il numero massimo di rotture nei fili esterni oltre il quale la fune deve essere sostituita. Il numero di rotture di fili deve essere contato nel punto della fune in cui è presente la maggiore concentrazione di rotture. La lunghezza dell'areada considerare per il controllo può essere 6d oppure 30d ("d"=diametro nominale della fune). La fune deve essere scartata quando il numero di fili rotti contati nella porzione considerata sia maggiore o uguale a quello stabilito dalla tabella sulla normativa UNI ISO 4309:2011 al punto 6.2.4 (prospetto3) e al punto 6.2.5 (prospetto 4).
ROTTURA DEI TREFOLI: Nel caso in cui si verifichi una rottura dei trefoli, la fune deve essere scartata immediatamente.
RIDUZIONE DEL DIAMETRO DELLA FUNE (USURA INTERNA): Quando il diametro effettivo della fune si riduce del 15% rispetto al diametro nominal a causa dell'usura interna, la fune deve essere scartata. Se si verifica un' evidente diminuzione localizzata del diametro, come quella causata dalla rottura dell'anima, la stessa deve essere scartata.
Le funi con una sezione metallica molto elevata hanno un diametro effettivo più stabile.
ABRASIONE (USURA ESTERNA): Nel caso in cui si verifichi un decremento del diametro della fune del 10% rispetto al suo diametro nominale a causa dell'abrasione superficiale, la fune deve essere scartata immediatamente.
DEFORMAZIONE DELLA FUNE: Una distorsione visibile della fune rispetto alla sua forma normale è classificata come deformazione. Generalmente si risolve in una distribuzione non uniforme dello sforzo nella fune nell'area della deformazione, che spesso si rileva localizzata. Ogni fune considerata in condizioni pericolose deve essere scartata immediatamente. Le principali cause di deformazione sono: ONDULAZIONE: se in una parte diritta di fune, che non corre mai su una puleggia o viene avvolta su un tamburo, la differenza tra la tangente della spirale e il lato inferiore della spirale è 1/3d o maggiore o se in una parte di fune, che corre su una puleggia o viene avvolta su un tamburo, la differenza fra la tangente della spirale e il lato inferiore della spirale è 1/10 o maggiore la fune deve essere scartata. INFIASCATURA: consiste in un allungamento dei trefoli esterni con conseguente rigonfiamento a fiasco che si manifesta in un punto ben definito della fune che deve essere scartata immediatamente oppure, posto che la parte restante di fune sia utilizzabile, deve essere rimossa la parte deformata. FUORIUSCITA O DISTORSIONE DELL'ANIMA O DEL TREFOLO: è una particolare deformazione ad infiascatura, la fune deve essere scartata o eliminata la parte deformata posto che la restante lunghezza di fune sia utilizzabile. FUORIUSCITA DEI FILI AD ASOLA: generalmente i fili fuoriescono in gruppi sul lato opposto della fune rispetto a quello in contatto con la gola della puleggia, la fune deve essere scartata immediatamente. INCREMENTO LOCALIZZATO DEL DIAMETRO: se il diametro della fune ad anima metallica aumenta del5% od oltre, oppure per le funi con anima tessile del 10% od oltre, è necessario ricercarne la ragione e prendere in considerazione lo scarto. PARTI APPIATTITE: è probabile che i segmenti di fune appiattiti che corrono su una puleggia si deteriorino più velocemente e presentino fili rotti. In questi casi, ma a seconda dell'appiattimento, si può prendere in considerazione lo scarto. COCCA O ASOLA SCHIACCIATA: queste funi devono essere scartate immediatamente. PIEGATURA NELLA FUNE: è probabile che le parti di fune con una grave piegatura che corrono su una puleggia si deteriorino più velocemente e presentino fili rotti. In questo caso la fune deve essere scartata. DANNEGGIAMENTO DOVUTO A CALORE O AD ARCO ELETTRICO: si presenta nelle funi che generalmente lavorano a temperatura ambiente ma che sono state soggette ad effetti termici eccezionalmente alti, in questo caso la fune deve essere scartata immediatamente.

ULTERIORI INFORMAZIONI SI POSSONO TROVARE ALL'INTERNO DELLA NORMATIVA UNI ISO 4309:2011

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DICHIARAZIONE DI CONFORMITA' EN 10204 2.1

DECLARATION OF CONFORMITY ACC.TO EN 10204 2.1

Alioto Group srl dichiara che le informazioni riporate di seguito sono conformi al certificato originale

Alioto Group srl declares that the information stated below is in conformity with the original factory test certificate

Cliente:	FAGIOLI SPA	**Destinazione**	
Customer:	VIA FERRARIS 13 42049 SANT'ILARIO D'ENZA RE IT	**Ship to**	VIA FERRARIS 13 42049 SANT'ILARIO D'ENZA ITALIA

Rif. Cliente **Ref. Customer**	ODA N. PUR/RE 2015/00861 DEL 23-12-2015 23/12/2015	**Rif. DDT** **Bill of Delivery**	BC 2016 109 13/01/2016	**Certificato n:** **Certificate n.:**	2015/OC.5727.0010.004 13/01/2016

CARATTERISTICHE GENERALI/GENERAL SPECIFICATION

Articolo: FUNE ACCIAIO 216 AM FORMING ZN. RES.220 DX Ø 30
Item:

Carico di rottura minimo (2160 N/mm2) kN **Minimum breaking load (2160 N/mm2) kN**	812	**Carico di rottura minimo (220 kgf/mm2) kgf** **Minimum breaking load (220 kgf/mm2) kgf**	82720
Numero di fili **Number of wires**	265	**Diametro nominale della fune (mm)** **Nominal rope diameter (mm)**	30
Diametro fili esterni (mm) **Outer wires diameter (mm)**	1,77	**Costruzione fune** **Rope construction**	6x K36+IWRC
Tipo di anima **Type of core**	IWRC	**Senso di avvolgimento** **Type of lay**	RHOL
Tipologia di finitura **Type of external surface**	GALV	**Lunghezza Effettiva di Impiego (mt)** **Effective Length (mt)**	250
Marcatura di tracciabilita' **Traceability Remark**	OC15.5727.010.4	**Quantità** **Quantity**	1

Note PIOMB.REDANCIA PIENA AD UN LATO

Note

Dichiarazione di Conformità
Con la presente certificazione di conformità si dichiara che il prodotto fornito è in accordo alle norme del D.Lgs. 17/2010 del 27/01/2010 relativo alla Direttiva Macchine 2006/42/CE. Qualunque modifica, cambiamento e/o variazione di questo accessorio non discussa con il produttore rende invalido questo certificato.

Declaration of Conformity
This Conformity Certificate declares that certified product is according to D.Lgs 17/2010 dated 27/01/2010 relatively to the Directive Machine 2006/42/CE. The present certification will become invalid in case of variations not agreed with the manufacturer.
Product manufactured in extra CEE Country.

Rappresentante Legale
Carlo Alioto

www.aliotogroup.com

NORME DI USO E MANUTENZIONE

(ATTENZIONE: FORNIRE COPIA AGLI UTILIZZATORI)

Ogni lunghezza di fune segue l'applicazione delle norme di cui al D.Lgs. 17/2010 del 27/01/2010 relativo alla Direttiva Macchine 2006/42/CE concernente il riavvicinamento delle legislazioni degli Stati membri relativi alle macchine.
Qualsiasi modifica apportata ad un qualsivoglia componente non discussa con il produttore rende invalide sia le presenti norme di uso e manutenzione che il certificato di conformità.

LE SEGUENTI INFORMAZIONI DEVONO ESSERE SEGUITE ED APPLICATE SOLO SE NON SONO PRESENTI DIVERSE INDICAZIONI DI USO E MANUTENZIONE DEL COSTRUTTORE DELLA MACCHINA SULLA QUALE LE FUNI SONO IMPIEGATE.

FUNI D'ACCIAIO

Le funi d'acciaio più comuni sono costituite da un'anima centrale e da un certo numero di trefoli cordati ad elica intorno ad essa. L'anima può essere tessile o metallica: si dice tessile quando quando è costituita da fibre sintetiche o naturali; metallica quando è costituita da un trefolo (WSC) o da una fune metallica più semplice (IWRC).
Il trefolo è l'insieme di più fili d'acciaio disposti ad elica attorno ad uno centrale.
I dati salienti che caratterizzano le funi d'acciaio sono i seguenti: DIAMETRO, FORMAZIONE, SENSO DI AVVOLGIMENTO, CARICO DI ROTTURA MINIMO, SEZIONE METALLICA, MASSA METRICA, RIVESTIMENTO PROTETTIVO DEI FILI, INGRASSATURA.

DIAMETRO (Ø): è quello della circonferenza circoscritta alla sua sezione normale e viene espresso in millimetri (mm). Il diametro nominale della fune è la dimensione che serve ad individuarla. Il diametro apparente della fune è il diametro misurato a fune completamente scarica. Il diametro effettivo della fune è il diametro che si misura con le seguenti modalità: a) si sottopone la fune ad un carico pari al 5% del carico di rottura minimo; b) vengono effettuate due doppie misurazioni ad una distanza di almeno 1 metro una dall'altra e a 90° tra loro; c) la media aritmetica dei quattro valori ottenuti è il diametro effettivo. Le tolleranze ammesse sul diametro effettivo sono riportate nella tabella sulla normativa UNI EN 12385-4:2008 al punto 5.4.1(prospetto 3).

FORMAZIONE: Le funi a trefoli vengono indicate in successione con: a) numero dei trefoli; b) numero dei fili componenti ciascun trefolo (se la fune è compattata davanti a questo valore viene aggiunta la lettera "K"); c) composizione dell'anima. Per esempio la dicitura 6x K36+WC indica una fune compattata a 6 trefoli con 36 fili ciascuno e un'anima metallica; la dicitura 6x19+FC indica una fune con 6 trefoli ognuno con 19 fili e un'anima tessile.

SENSO DI AVVOLGIMENTO: osservando una fune a trefoli vediamo che sia i trefoli rispetto alla fune, sia i fili rispetto ai trefoli, descrivono delle eliche. Si definisce con la lettera "Z" una rotazione dell'elica verso destra, mentre con la lettera "S" una rotazione dell'elica verso sinistra. Per convenzione si indica prima la rotazione del filo e poi quella del trefolo. Nel caso in cui si abbiano lettere diverse, la fune si chiama "CROCIATA" nel verso della lettera maiuscola, mentre se le lettere sono uguali si chiama "PARALLELA". Pertanto: "sZ"=CROCIATA DESTRA (RHOL); "zS"=CROCIATA SINISTRA (LHOL); "zZ"=PARALLELA DESTRA (RHLL); "sS"=PARALLELA SINISTRA (LHLL).

CARICHI DI ROTTURA: a) carico di rottura nominale: è quello minimo garantito che viene indicato in tabella, che viene riportatato sull'attestato di conformità e che serve per il calcolo delle portate; carico di rottura effettivo: è il carico reale a cui si rompe effettivamente la fune (deve sempre essere superiore a quello nominale); carico somma: è un valore puramente teorico che si riferisce alla somma dei carichi di rottura dei singoli fili (non serve per calcolare la portata delle funi).

SEZIONE METALLICA: è la somma delle aree dei singoli fili misurate sulla sezione normale all'asse degli stessi.

MASSA METRICA: indicato come valore per metro, è un valore teorico riportato nelle tabelle delle funi e che serve per calcolare con buona approssimazione il peso totale di una certa quantità di fune espressa in metri.

RIVESTIMENTO PROTETTIVO DEI FILI: i fili elementari delle funi sono di acciaio lucido. Essi vengono protetti pertanto da lubrificanti specifici. Se necessario possono anche essere ulteriormente protetti da zincatura a caldo, solitamente in tre versioni: A, AB, B secondo quanto riportato nella normativa UNI EN 10244-2:2009.

INGRASSATURA: tutte le funi d'acciaio devono essere ingrassate di tanto in tanto secondo quanto verrà stabilito da un addetto competente. In alcuni casi può risultare necessario pulire la fune prima di applicare il lubrificante, affinchè sia efficace. Il grasso della fune deve essere compatibile con il grasso originale applicato dal fabbricante e deve avere caratteristiche penetranti. Se il tipo di ingrassaggio della fune non è specificato nel manuale della macchina, l'utilizzatore deve cercare informazioni dal fornitore o dal fabbricante della fune.

LA MAUTENZIONE DELLA FUNE DEVE ESSERE GESTITA IN RELAZIONE AL TIPO DI FUNE, ALLA FREQUENZA D'USO E ALLE CONDIZIONI AMBIENTALI.

ISPEZIONE VISIVA GIORNALIERA: Almeno la sezione di fune operativa in quel particolare giorno deve essere osservata con l'obiettivo di scoprire qualsiasi deterioramento generale o danno meccanico. Questo deve includere i punti di attacco della fune alla macchina. Inoltre la fune dovrebbe essere controllata per assicurarsi che alloggi correttamente sul tamburo e sulle pulegge e che non si sia spostata dalla sua posizione normale operativa.

ISPEZIONE PERIODICA: Le ispezioni periodiche devono essere eseguite da un addetto competente, il quale dovrà stabilire se la fune può rimanere in servizio in sicurezza e dopo quanto tempo deve essere sottoposta alla prossima ispezione periodica oppure se deve essere necessario sostituirla immediatamente o entro uno specifico lasso di tempo.

PRINCIPALI CRITERI DI ROTTURA E SCARTO (UNI ISO 4309:2011)

ROTTURA DEI FILI: è la più frequente causa di scarto delle funi. La normativa sopra citata sancisce il numero massimo di rotture nei fili esterni oltre il quale la fune deve essere sostituita. Il numero di rotture di fili deve essere contato nel punto della fune in cui è presente la maggiore concentrazione di rotture. La lunghezza dell'areada considerare per il controllo può essere 6d oppure 30d ("d"=diametro nominale della fune). La fune deve essere scartata quando il numero di fili rotti contati nella porzione considerata sia maggiore o uguale a quello stabilito dalla tabella sulla normativa UNI ISO 4309:2011 al punto 6.2.4 (prospetto3) e al punto 6.2.5 (prospetto 4).

ROTTURA DEI TREFOLI: Nel caso in cui si verifichi una rottura dei trefoli, la fune deve essere scartata immediatamente.

RIDUZIONE DEL DIAMETRO DELLA FUNE (USURA INTERNA): Quando il diametro effettivo della fune si riduce del 15% rispetto al diametro nominal a causa dell'usura interna, la fune deve essere scartata. Se si verifica un' evidente diminuzione localizzata del diametro, come quella causata dalla rottura dell'anima, la stessa deve essere scartata.
Le funi con una sezione metallica molto elevata hanno un diametro effettivo più stabile.

ABRASIONE (USURA ESTERNA): Nel caso in cui si verifichi un decremento del diametro della fune del 10% rispetto al suo diametro nominale a causa dell'abrasione superficiale, la fune deve essere scartata immediatamente.

DEFORMAZIONE DELLA FUNE: Una distorsione visibile della fune rispetto alla sua forma normale è classificata come deformazione. Generalmente si risolve in una distribuzione non uniforme dello sforzo nella fune nell'area della deformazione, che spesso si rileva localizzata. Ogni fune considerata in condizioni pericolose deve essere scartata immediatamente. Le principali cause di deformazione sono: ONDULAZIONE: se in una parte diritta di fune, che non corre mai su una puleggia o viene avvolta su un tamburo, la differenza tra la tangente della spirale e il lato inferiore della spirale è 1/3d o maggiore o se in una parte di fune, che corre su una puleggia o viene avvolta su un tamburo, la differenza fra la tangente della spirale e il lato inferiore della spirale è 1/10 o maggiore la fune deve essere scartata. INFIASCATURA: consiste in un allungamento dei trefoli esterni con conseguente rigonfiamento a fiasco che si manifesta in un punto ben definito della fune che deve essere scartata immediatamente oppure, posto che la parte restante di fune sia utilizzabile, deve essere rimossa la parte deformata. FUORIUSCITA O DISTORSIONE DELL'ANIMA O DEL TREFOLO: è una particolare deformazione ad infiascatura, la fune deve essere scartata o eliminata la parte deformata posto che la restante lunghezza di fune sia utilizzabile. FUORIUSCITA DEI FILI AD ASOLA: generalmente i fili fuoriescono in gruppi sul lato opposto della fune rispetto a quello in contatto con la gola della puleggia, la fune deve essere scartata immediatamente. INCREMENTO LOCALIZZATO DEL DIAMETRO: se il diametro della fune ad anima metallica aumenta del5% od oltre, oppure per le funi con anima tessile del 10% od oltre, è necessario ricercarne la ragione e prendere in considerazione lo scarto. PARTI APPIATTITE: è probabile che i segmenti di fune appiattiti che corrono su una puleggia si deteriorino più velocemente e presentino fili rotti. In questi casi, ma a seconda dell'appiattimento, si può prendere in considerazione lo scarto. COCCA O ASOLA SCHIACCIATA: queste funi devono essere scartate immediatamente. PIEGATURA NELLA FUNE: è probabile che le parti di fune con una grave piegatura che corrono su una puleggia si deteriorino più velocemente e presentino fili rotti. In questo caso la fune deve essere scartata. DANNEGGIAMENTO DOVUTO A CALORE O AD ARCO ELETTRICO: si presenta nelle funi che generalmente lavorano a temperatura ambiente ma che sono state soggette ad effetti termici eccezionalmente alti, in questo caso la fune deve essere scartata immediatamente.

ULTERIORI INFORMAZIONI SI POSSONO TROVARE ALL'INTERNO DELLA NORMATIVA UNI ISO 4309:2011

C.M.T. S.r.l.

web: www.cmtwinches.com
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ITALY
Phone & FAX: 0039-0733-224089

Inspection Form (procedure n°P46.50.IF)

JOB N°	5245 - P.O. PUR/RE 2015 / 00760 - 17/11/2015
CUSTOMER	FAGIOLI SPA
REPORT N°	B.28/01/2016

Functional inspection - Summary Chart - Electric Winches

	Speed variation test	Functionalities	Dynamic load test	Band brake holding	Negative brake holding	Abnormal noise / temperature check	Approved
Winch Serial Number							
245.1	ok	ok	24 T	35 T	24 T	ok	ok
245.2	ok	ok	24 T	35 T	24 T	ok	ok
245.3	ok	ok	24 T	35 T	24 T	ok	ok
245.4	ok	ok	24 T	35 T	24 T	ok	ok

Note:

FILE 16AA01 50
RINA — Witnessed ☒ Reviewed ☐
Date 28/01/16 — The Surveyor

Date of inspection: 28 / 01 / 16

Inspector in charge:

C.M.T. s.r.l.
Via Tamburoni scn
62010 MONTELUPONE (MC)
Cod. Fisc. - Part.IVA 01516000447

C.M.T. S.r.l.

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ITALY
Phone & FAX: 0039-0733-224089

Inspection Form (procedure n°P46.50.IF)

JOB N°	5245 - P.O. PUR/RE 2015 / 00760 - 17/11/2015
CUSTOMER	FAGIOLI SPA
REPORT N°	B.28/01/2016

Visual inspection - Summary Chart - Electric Winches

	Label inspection	Compliance if Dimensions	Compliance of painting	Compliance of electric connections	Greasing inspection	Absence of Defects	Approved
Winch Serial Number							
245.1	ok	ok	ok	ok	ok	ok	ok
245.2	ok	ok	ok	ok	ok	ok	ok
245.3	ok	ok	ok	ok	ok	ok	ok
245.4	ok	ok	ok	ok	ok	ok	ok

Note:

FILE RINA 50
RINA — Witnessed / Reviewed
Date 28/01/16 — The Surveyor

Date of inspection: 28/01/16

Inspector in charge: C.M.T. s.r.l.
Via Tambroni scn
62010 MONTELUPONE (MC)
Cod. Fisc. – Part.IVA 01516060447

Client:

ROSETTI

Job:

CROSSWIND

Title:

APPENDIX G - Load-out and Stand-by Mooring Analyses

1	15-07-25	Accepted for contruction (AFC)	A.Balzarotti	F.Ceroni	C.Antonellini
0	30-06-25	Issued for Approval	TECON	FC	CA
REV	**DATE**	**DESCRIPTION**	**PREP.**	**CHK.**	**APPROV.**

TABLE OF CONTENTS

1. GENERAL 3
2. REFERENCE CODE AND DOCUMENTS 4
2.1 CODES 4
2.2 REFERENCE DOCUMENTS 4
2.3 SOFTWARE 4
3. CONCLUSIONS 5
3.1 PRACTICAL GUIDANCE 5
4. MOORING ANALYSIS 6
4.1 ENVIRONMENTAL DATA 8
4.2 QUAY ARRANGEMENT 8
4.3 WINDAGE AREAS 10
5. MOORING ANALYSIS RESULTS INTACT 12
5.1 LOADOUT MOORING – ALL WIND DIRECTIONS 12
5.2 LONG TERM (POST-LOADOUT) MOORING – ALL WIND DIRECTIONS 15
6. MOORING ANALYSIS RESULTS – SINGLE LINE FAILURE 19
6.1 LOADOUT MOORING – SINGLE LINE FAILURE 19

1. GENERAL

This report presents the results of the mooring analyses of barge Vervece carried out for TP and BLPH for the following situation at RM fabrication yard:

- Operation mooring configuration (e.g. during loadouts)
- Alongside post load-out mooring configuration (e.g. barge fully loaded during seafastening welding and completion activities)

The mooring arrangement drawings are presented in Appendix to Loadout manual.

2. REFERENCE CODE AND DOCUMENTS

2.1 Codes

/1/. DNVGL-ST-N001 Marine operations and marine warranty, 2023
/2/. IMO (2008). IS code – international code on intact stability. Part A. London, UK: IMO resolution MSC.267 (85)(89)
/3/. IMO (2009). SOLAS – International convenction for the safety of life at sea. Chapter II-1. Part B-1.

2.2 Reference documents

/4/. 110B22-MT-DD-507-00	yard fenders
/5/. ROS	Mooring rope datasheet
/6/. 123A90-FDL-MT-DD-00405	Loadout mooring analysis
/7/. 123A90-FDL-MT-DD-00406	Long term mooring arrangement

2.2.1 Barge documents

/8/. Vervece	Stability booklet

2.3 Software

/9/. OPTIMOOR by tension Technology, version 6.2.8

3. CONCLUSIONS

The table below presents the omnidirectional windspeed capacity based on the most critical wind heading for all the considered configurations.

- Loadout mooring: the stern-to quay mooring configuration can withstand a wind speed of 14.9 m/s with barge draft at quay elevation.

- Alongside post load outs mooring: it complies with the 10-years return period maximum average wind speed with barge in sail away condition.

Omnidirectional wind speed	Load out mooring	Post load out mooring
Intact condition	29 knots	44 knots

Table 3-1: Omnidirectional max wind speed for the mooring configurations

3.1 Practical Guidance

The mooring arrangement (lines, winches, bollards) will be continuously monitored by the mooring operators and adjusted if required.

Favorable weather conditions are required for load out operation, the wind speed limit is set to 10m/s based on SPMT stability, bollards and lines capacity.

4. MOORING ANALYSIS

The calculation models are based on mooring plan and vessel characteristics, considering the wind area of the loaded vessel.

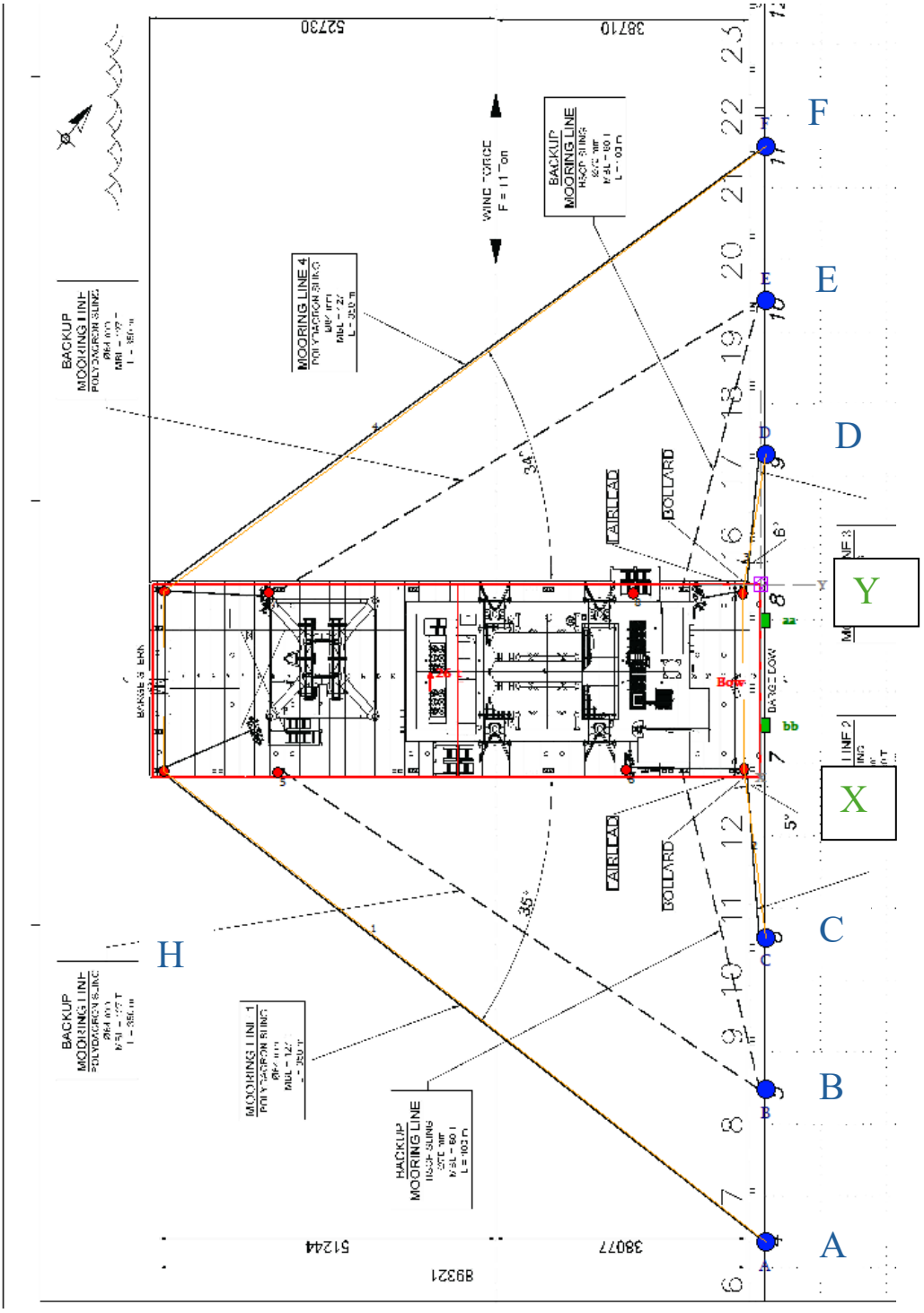


Figure 4-1: OPTIMOOR model – loadout

Berth Data for PBY loadout

(file L:\COMMESSE\ROS\1835\04-CALCOLI\OPTIMOOR\0_loadout\PBY-loadout.bth)
Units in m & tonnes
Solid Pier Shields Wind
Solid Pier Shields Waves

Left to Right of Screen Site Plan Points:	90°
Width of Channel (for Current):	500
Quay Height (Fixed) above Datum:	1.8
Dredged Depth below Datum:	7.0
Permissible Surge Excursion Fwd/Aft: ±	1.00
Permissible Sway Excursion Port/Stbd: ±	1.00
Permissible Vertical Movement: ±	0.50
Recess (Y-Dist from Origin to Quayside):	0.0
Wind Speed Specified at Height:	10.0
Current Specified at Depth:	mean

Hook/ Bollard	X-Dist to Origin	Dist to Fender Line	Ht above Pier	Allowable Load
A	93.2	0.7	0.1	50
B	71.6	0.7	0.1	50
C	50.0	0.7	0.1	50
D	-18.5	0.7	0.1	50
E	-40.2	0.7	0.1	50
F	-62.2	0.7	0.1	50

Fender	X-Dist to Origin	Y-Dist	Ht above Datum	Width Along Side	Face Contact Area (m²)
aa	5.0		1.0	2.0	3.0
bb	20.0		1.0	2.0	3.0

Fender Load-Compression Data
aa 100 tonnes
0.01 m

bb 100 tonnes
0.01 m

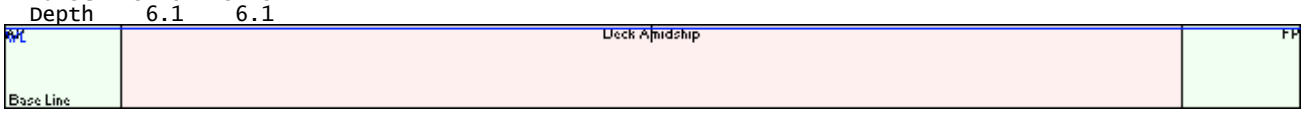
Vessel Data for VERVECE

(file L:\COMMESSE\ROS\1835\04-CALCOLI\OPTIMOOR\0_loadout\vervece.vsl)
Units in m, mm, & tonnes
Longitudinal datum at Midship

LBP:	91.4
Breadth:	27.4
Depth:	6.1
End-on projected windage area:	790 above deck level
Side projected windage area:	340 above deck level
Longitudinal Centroid:	-2.0 fwd midship
Fendering possible from:	0.410 LBP aft of midship
to:	0.410 LBP fwd of midship
Current drag data based on:	OPTIMOOR (Generic Data)
Wind drag data based on:	Pontoon

Flatside Contour

X-dist	-37.5	37.5
Depth	6.1	6.1



Line No.	Fair-Lead X	Fair-Lead Y	Ht on Deck	Dist to Winch	Brake Limit	Pre-Tension	Line Size-Type-BL	Tail Segment-1 Lgth-Size-Type-BL
1	-44.2	-12.8	0.2	8.0	35	20	76 PE 127	
2	43.0	-12.8	0.2	10.0	35	20	76 PE 80	
3	43.0	12.8	0.2	10.0	35	20	76 PE 80	
4	-44.2	12.8	0.2	8.0	35	20	76 PE 127	
5	-28.0	-12.9	0.2	0.0		20	76 PE 127	
6	25.5	-12.5	0.2	0.0		20	76 PE 80	
7	-28.0	12.5	0.2	0.0		20	60 PE 127	
8	25.5	12.5	0.2	0.0		20	60 PE 80	

Codes for Types of Line:
PE: PolyEster (new)

4.1 Environmental Data

4.1.1 Operational conditions

The wind limit set for the loadout operation is 10 m/s; to cover uncertainties in both monitoring and wind speed an alpha factor of 0.67 is applied, resulting in a design wind speed of 14.9 m/s, omnidirectional.

The sheltered location is in a dead-end waterway, hence no current loads are expected and applied. The same applies for wave loads and swell.

4.1.2 Post loadout conditions

The minimum wind speed is the 10-years maximum average of 22.6 m/s omnidirectional.

The sheltered location is in a dead-end waterway, hence no current loads are expected and applied. The same applies for wave loads and swell.

4.2 Quay Arrangement

Description of the mooring system is given in section 14 of Loadout manual main text.

4.2.1 Bollards

Bollards capacity, SWL = 50 t (ref Attachment F)

4.2.2 Winches

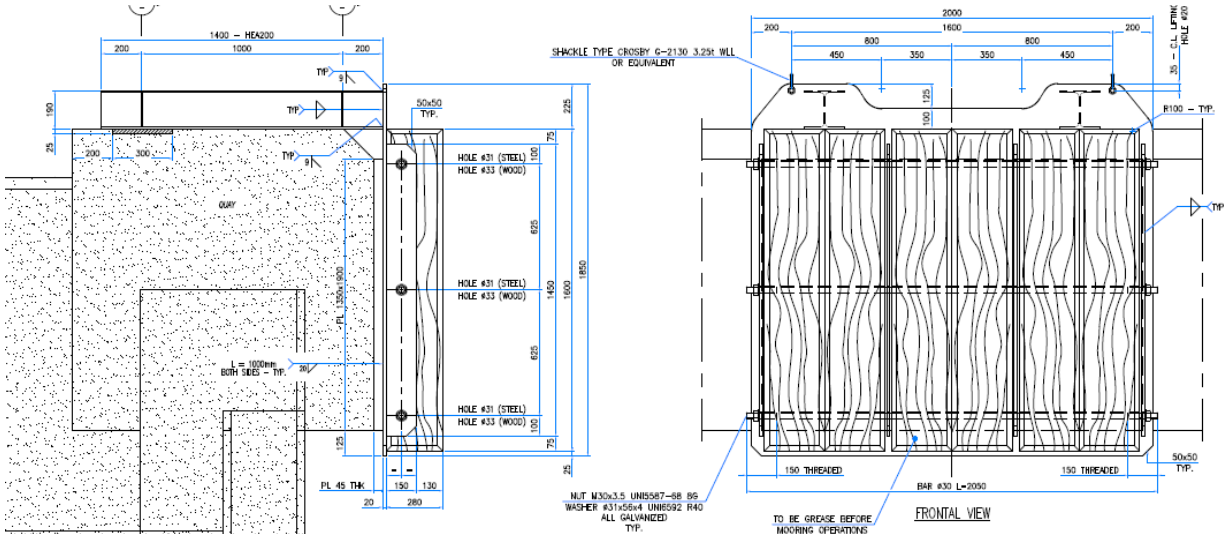
Winches pull capacity, SWL = 24 t
Winches brake capacity, SWL = 35 t

4.2.3 Mooring lines

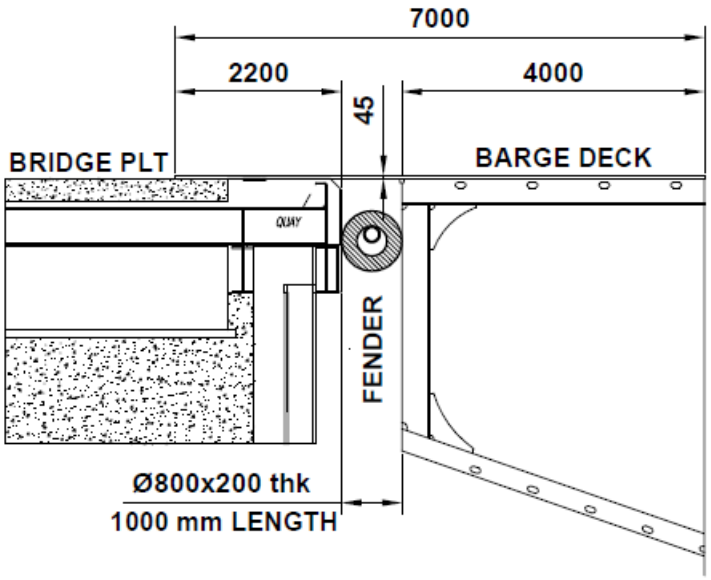
Item	Material	Diameter [mm]	Length [m]	Mass [kg / 100m]	MBL [mton]
Mooring lines	polydacron	76.0	350.0	400.0	127

4.2.4 Fenders

The maximum compression is assumed with a reaction force of 100 t compression for the rigid fenders used during loadout.



While the quay fenders are Hollow cylindric fenders 800x400 L = 1000 mm.
The employed fenders are 1000 mm long and they are composed by an internal steel pipe supporting hard rubber pipe with an external diameter of 800 mm and a thickness equal to 200 mm, these fenders are linked to the capping beam by means of steel chain passing through the internal steel pipe.
The following picture shows a typical section of the fenders employed for loadout operation:



The maximum compression is assumed at 50% with a reaction force of 360 kN compression.

4.3 Windage areas

The exposed windage areas are composed by cargoes and vessel. Optimoor automatically calulates the vessel area, while cargo windage areas are inputed.

Cargo exposed areas are defined in section 8.2 of LO manual, and here after summarized:

Lateral area

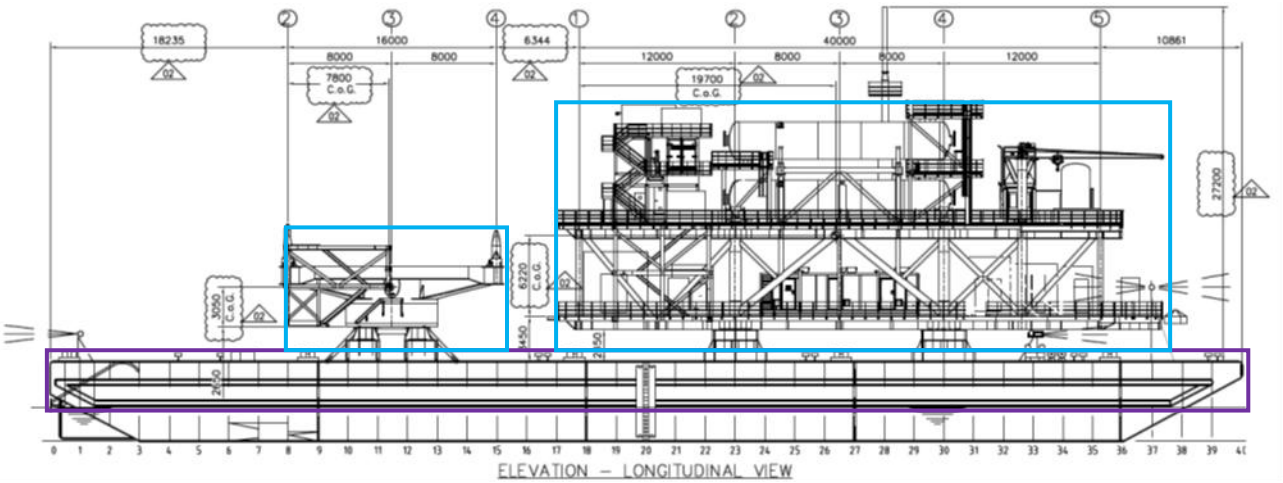


Figure 4-2: Windage lateral area

The following list summarizes the main data relevant to Exposed Areas shown above:

- Cargo Barge (Violet): Exposed area equal to 190 m2 (considering Low Tide Condition) with a Center of Exposed Area located at midship;
- TP, Topside & Grillages (Blue): BLPH Exposed Area equal to 650 m2 with a Center of Exposed Area located at 30.9 m from Barge bow, TP Exposed Area equal to 140 m2 with a Center of Exposed Area located at 66.4m from Barge bow, CF covered by the above numbers.

Total side windage area = 190+790 m2

Front area

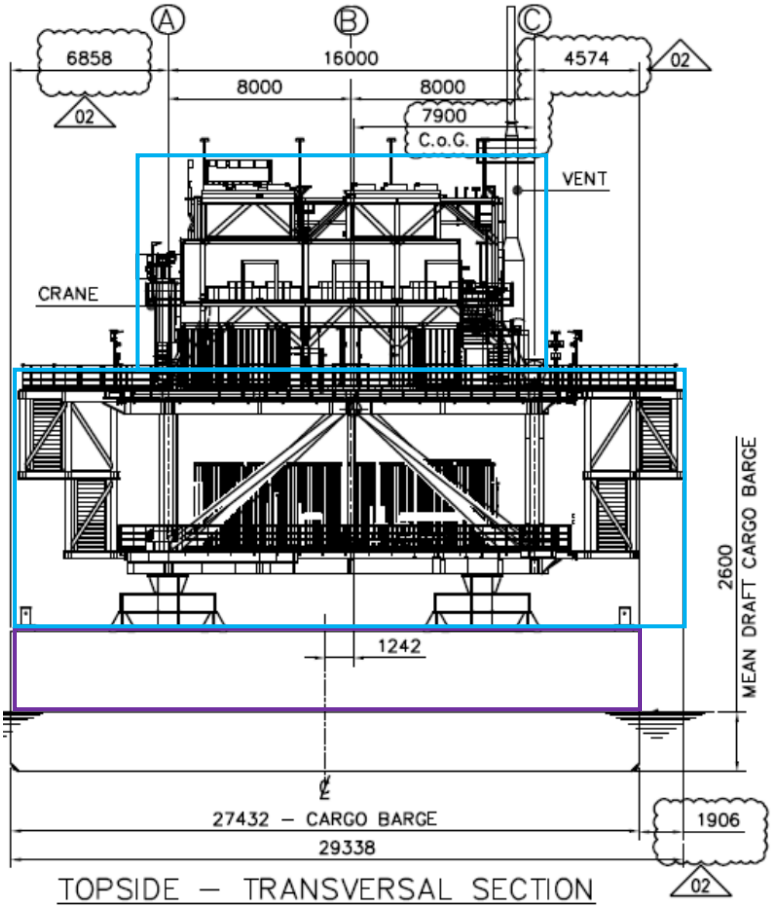


Figure 4-3: Windage front area

The following list summarizes the main data relevant to Exposed Areas considered for this condition:

- Cargo barge (Violet): Exposed area equal to 80 m2 (considering towing ballast arrangement) with a Center of Exposed Area located on Barge Centre Line;
- Topside (Blue): Exposed Area equal to 340 m2 with a Center of Exposed Area located on Barge Centre Line;

Total front windage area = 80+340 m2

5. MOORING ANALYSIS RESULTS INTACT

Mooring analyses are performed following the WSD approach, hence the Safety factos used for:

- Bollards: SF = 2.0 intact, SF = 1.5 damaged
- Lines: SF = 3.0 intact, SF = 2.0 damaged

5.1 Loadout mooring – All wind directions

The wind rose given in fig.5-3 shows the maximum allowable wind speed per heading to stay within the SWL of the bollards on the quay as those are the limiting factors for the mooring spread. Directions refer to berth X-axis.

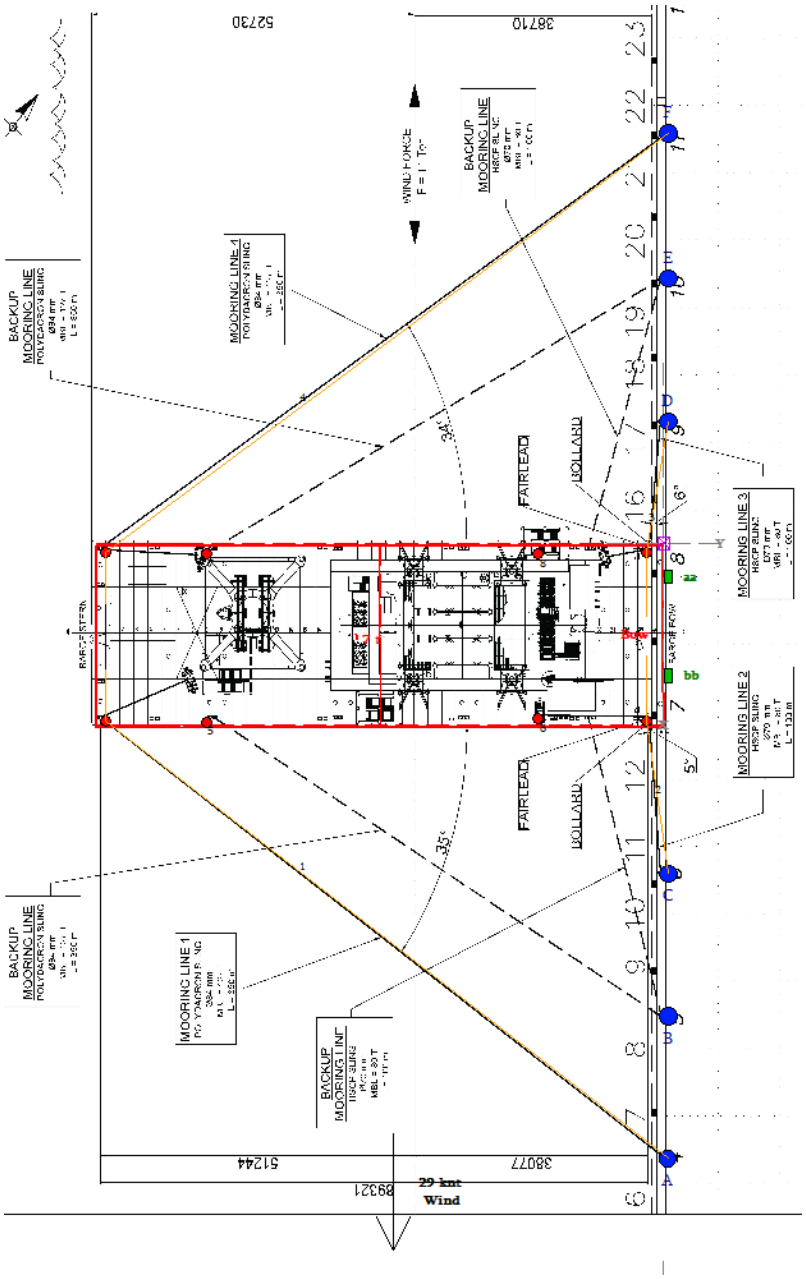


Figure 5-1: OPTIMOOR layout

Static Mooring Response for VERVECE at PBY loadout

Units in m & tonnes (file L:\COMMESSE\ROS\1783\04-CALCOLI\10-OPTIMOOR\0_loadout\LO.opt)
Remarks: MOORING ARRANGEMENT LOADOUT OPS. IN PBY YARD - RAVENNA
Intact

Static Analysis for Time: 0700 02 Aug 2025
Water Level: 0.00 above Datum
Draft: 4.3
Trim: 0.0
Bottom Clearance: 2.7

Deck Level at Target: 0.0 above pier
Wind Speed: 29 knots
Wind Direction: All° True (solid pier shields wind)

Fwd Offset of Vessel Target: 0.0 from Berth Target
Total End-On Windage Area: 839
Total Side Windage Area: 505

	Longitudinal	Transverse	Yaw Moment/LBP
Target Moves(min and max):	0.0 fwd 0.0 aft	0.4 inw -0.3 out	0.0° port 0.0° stbd	0.0 up 0.0 up

Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slippage	Worst Directn	Line Tension	Percent Strength
1-A	17.8	103.4		1.1	180°	35.0	28%
2-C	4.8	29.0			175°	26.5	33%
3-D	4.3	25.4			0°	26.4	33%
4-F	17.6	101.9		1.3	0°	35.0	28%

Fender	Thrust	Compression	Pressure	Contact Area
aa	53	0.00	17.6	100%
bb	62	0.01	20.7	100%

Hook/ Bollard	X-Force	Y-Force	Other X-Load	Other Y-Load	Total Horiz Force	Direction in Plan	Uplift
A	-28.2	-20.8			35.0	-126°	
C	-3.7	-26.2			26.5	-172°	0.1
D	-4.5	26.0			26.4	-10°	0.1
F	-28.8	20.1			35.0	-55°	

Approximate natural periods
Surge: 3.9 Sway: 68 secs

Figure 5-2: OPTIMOOR results

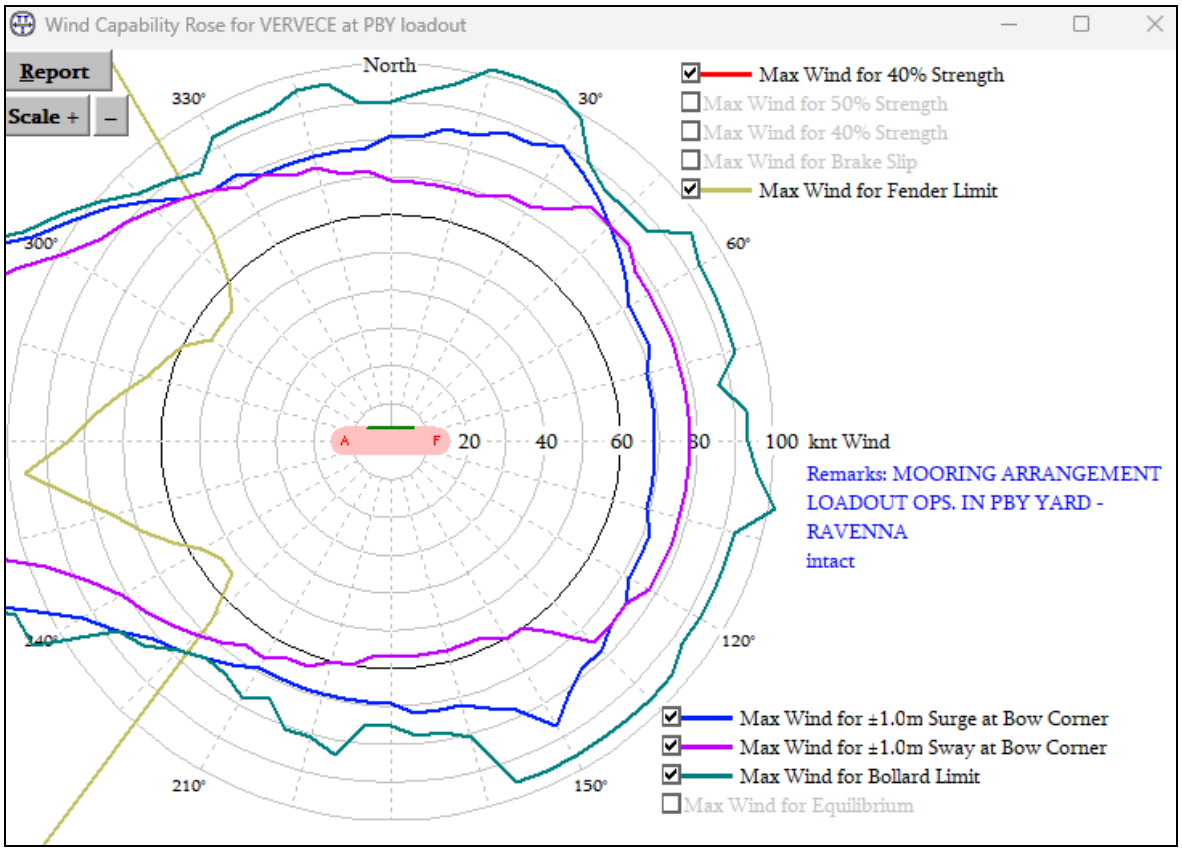


Figure 5-3: wind rose loadout – max allowable wind speed per heading

5.1.1 Summary Table

Maximum Fender compression = 62 t < 100 t	UC = 0.62
Maximum Line Tension = 35 t < 127 / 3 = 42.3	UC = 0.82
Maximum Bollard force = 35 t < 50 t (allowable)	UC = 0.70

5.2 Long term (post-loadout) mooring – All wind directions

The wind rose given in fig. 5-5 shows the maximum allowable wind speed per heading to stay within the SWL of the bollards on the quay as those are the limiting factors for the mooring spread.

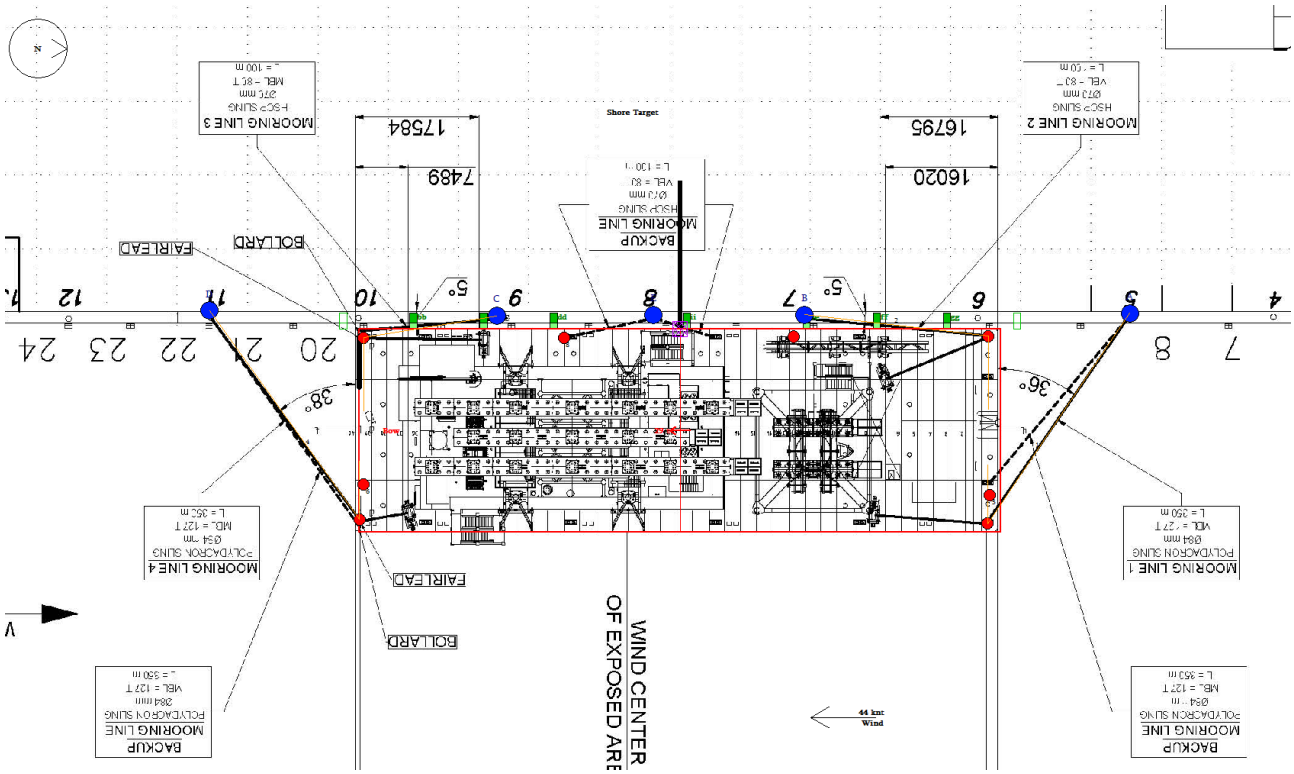


Figure 5-4: OPTIMOOR layout

Berth Data for PBY long-term

(file L:\COMMESSE\ROS\1835\04-CALCOLI\OPTIMOOR\1_long-term\PBY-longterm.bth)
Units in m & tonnes
Solid Pier Shields Wind
Solid Pier Shields Waves

Left to Right of Screen Site Plan Points:	0°
Width of Channel (for Current):	500
Pier Height (Fixed) above Datum:	1.8
Dredged Depth below Datum:	7.0
Permissible Surge Excursion Fwd/Aft: ±	1.00
Permissible Sway Excursion Port/Stbd: ±	1.00
Permissible Vertical Movement: ±	0.50
Dist of Berth Target to Right of Origin:	0.0
Wind Speed Specified at Height:	10.0
Current Specified at Depth:	mean

Hook/ Bollard	X-Dist to Origin	Dist to Fender Line	Ht above Pier	Allowable Load
A	64.1	2.0	0.1	50
B	17.7	2.0	0.1	50
C	-26.1	2.0	0.1	50
D	-67.0	2.0	0.1	50
E	-3.8	2.0	0.1	50

Fender	X-Dist to Origin	Ht above Datum	Width Along Side	Face Contact Area (m²)
aa	-48.0	0.0	1.0	
bb	-38.0	0.0	1.0	
cc	-28.0	0.0	1.0	
dd	-18.0	0.0	1.0	
ee	18.0	0.0	1.0	
ff	28.0	0.0	1.0	
gg	38.0	0.0	1.0	
hh	48.0	0.0	1.0	
ii	1.0	0.0	1.0	

Fender Load-Compression Data

aa	150	360	tonnes
	0.17	0.40	m
bb	150	360	tonnes
	0.17	0.40	m
cc	150	360	tonnes
	0.17	0.40	m
dd	150	360	tonnes
	0.17	0.40	m
ee	150	360	tonnes
	0.17	0.40	m
ff	150	360	tonnes
	0.17	0.40	m
gg	150	360	tonnes
	0.17	0.40	m
hh	150	360	tonnes
	0.17	0.40	m
ii	150	360	tonnes
	0.17	0.40	m

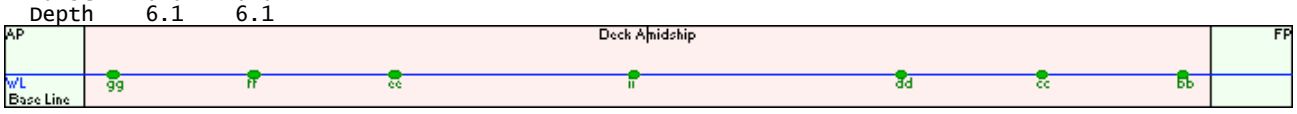
Vessel Data for VERVECE

(file L:\COMMESSE\ROS\1783\04-CALCOLI\10-OPTIMOOR\1_long-term\vervece.vsl)
Units in m, mm, & tonnes
Longitudinal datum at Midship

LBP:	91.4
Breadth:	27.4
Depth:	6.1
Target:	45.7 fwd from midship and 0.0 above deck at side
End-on projected windage area:	790 above deck level
Side projected windage area:	340 above deck level
Longitudinal Centroid:	-2.0 fwd midship
Fendering possible from:	0.438 LBP aft of midship
to:	0.438 LBP fwd of midship
Current drag data based on:	OPTIMOOR (Generic Data)
Wind drag data based on:	Pontoon

Flatside Contour

X-dist	-40.0	40.0
Depth	6.1	6.1



Line No.	Fair-Lead X	Fair-Lead Y	Ht on Deck	Dist to Winch	Brake Limit	Pre-Tension	Line Size-Type-BL	Tail Segment-1 Lgth-Size-Type-BL
1	-43.8	-12.5	0.2	8.0	35	20	76 PE 127	
2	-43.9	12.5	0.2	10.0	35	20	76 PE 80	
3	45.1	12.5	0.2	10.0	35	20	76 PE 80	
4	45.7	-12.5	0.2	8.0	35	20	76 PE 127	
5	-44.1	-8.0	0.2	0.0		20	76 PE 127	
6	45.1	-8.0	0.2	0.0		20	76 PE 80	
7	-16.2	12.5	0.2	0.0		20	60 PE 127	
8	16.6	12.5	0.2	0.0		20	60 PE 80	

Codes for Types of Line:
PE: PolyEster (new)

Static Mooring Response for VERVECE at PBY long-term

Units in m & tonnes (file L:\COMMESSE\ROS\1783\04-CALCOLI\10-OPTIMOOR\1_long-term\LT.opt)
Remarks: MOORING ARRANGEMENT LONG TERM IN PBY YARD - RAVENNA
draft @ SA

Static Analysis for Time: 0700 04 Aug 2025
Water Level: 0.00 above Datum
Draft: 2.5
Trim: 0.0
Bottom Clearance: 4.5

Deck Level at Target: 1.8 above pier
Wind Speed: 44 knots
Wind Direction: All° True (solid pier shields wind)

Fwd Offset of Vessel Target: 45.7 from Berth Target
Total End-On Windage Area: 889
Total Side Windage Area: 669

	Longitudinal	Transverse	Yaw Moment/LBP
Target Moves(min and max):	1.4 fwd	0.0 inw	0.0° port 0.0 up
	-1.2 aft	0.0 inw	0.0° stbd 0.0 up

Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slippage	Worst Directn	Line Tension	Percent Strength
1-A	4.6	38.2			340°	26.7	21%
2-B	4.8	31.6			180°	29.9	37%
3-C	3.7	25.6			20°	32.1	40%
4-D	4.7	38.7			180°	26.0	20%

Fender	Thrust	Compression	Pressure	Contact Area
bb	10	0.01		
cc	10	0.01		
dd	9	0.01		
ee	9	0.01		
ff	10	0.01		
gg	10	0.01		
ii	9	0.01		

Hook/ Bollard	X- Force	Y- Force	Other X-Load	Other Y-Load	Total Horiz Force	Direction in Plan	Uplift
A	-16.2	21.1			26.6	-38°	1.4
B	29.6	3.4			29.8	83°	2.1
C	-31.6	4.9			32.0	-81°	3.0
D	16.3	20.3			26.0	39°	1.4

Approximate natural periods
Surge: 35 Sway: 5.9 secs

Figure 5-5: OPTIMOOR results

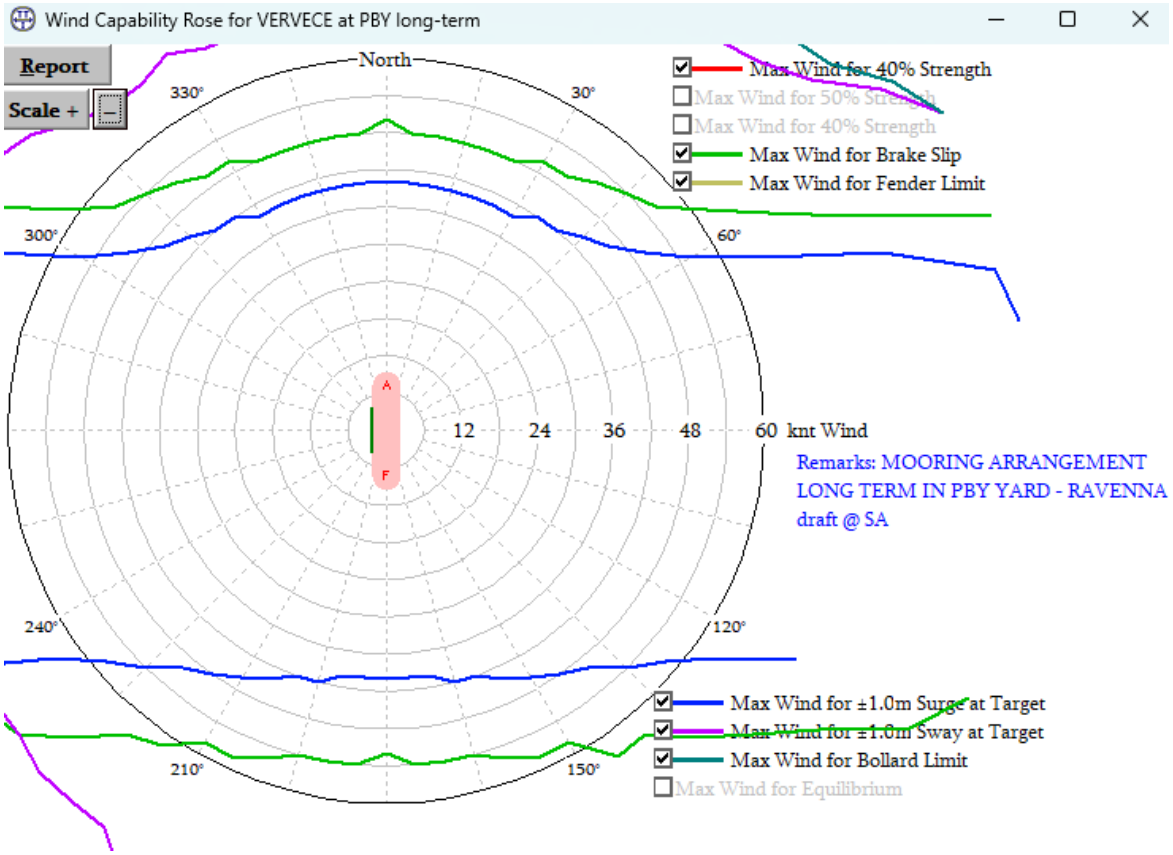


Figure 5-6: wind rose POST-loadout – max allowable wind speed per heading

5.2.1 Summary Table

Maximum Fender compression = 10 t < 360 kN/9.81 UC = 0.27

Maximum Line Tension = 32.1 t < 127 / 3 = 42.3 UC = 0.75

Maximum Bollard force = 32.1 t < 50 t (allowable) UC = 0.64

6. MOORING ANALYSIS RESULTS – SINGLE LINE FAILURE

Mooring analyses are performed following the WSD approach, hence the Safety factos used for:

- Bollards: SF = 2.0 intact, SF = 1.5 damaged
- Lines: SF = 3.0 intact, SF = 2.0 damaged

6.1 Loadout mooring – Single line failure

6.1.1 Failure line 1

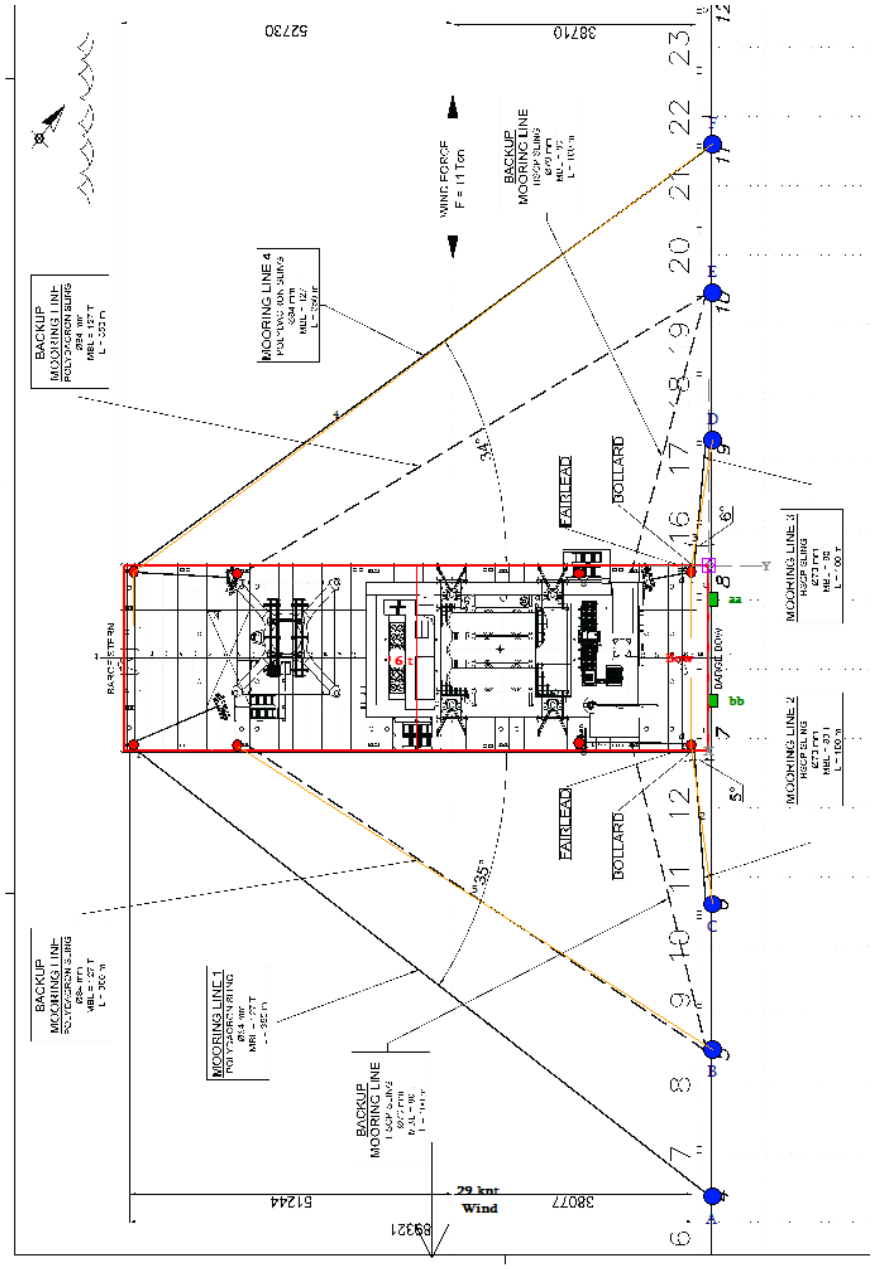


Figure 6-1: OPTIMOOR layout – damaged STB - STERN

Static Mooring Response for VERVECE at PBY loadout

Units in m & tonnes (file L:\COMMESSE\ROS\1783\04-CALCOLI\10-OPTIMOOR\0_loadout\LO-D1.opt)
Remarks: MOORING ARRANGEMENT LOADOUT OPS. IN PBY YARD - RAVENNA
damaged line 1

Static Analysis for Time: 0700 02 Aug 2025
Water Level: 0.00 above Datum
Draft: 4.3
Trim: 0.0
Bottom Clearance: 2.7

Deck Level at Target: 0.0 above pier
Wind Speed: 29 knots
Wind Direction: All° True (solid pier shields wind)

Fwd Offset of Vessel Target: 0.0 from Berth Target
Total End-On Windage Area: 839
Total Side Windage Area: 505

	Longitudinal	Transverse	Yaw Moment/LBP
Target Moves(min and max):	0.0 fwd	0.1 inw	0.0° stbd	0.0 up
	0.0 fwd	-0.5 out	-0.4° stbd	0.0 up

Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slippage	Worst Directn	Line Tension	Percent Strength
2-C	5.0	28.8			170°	26.6	33%
3-D	4.0	25.7			0°	24.6	31%
4-F	17.5	102.0		1.1	355°	35.0	28%
5-B	12.5	74.5			190°	39.8	31%

Fender	Thrust	Compression	Pressure	Contact Area
aa	77	0.00	25.6	100%
bb	33	0.00	11.1	100%

Hook/ Bollard	X- Force	Y- Force	Other X-Load	Other Y-Load	Total Horiz Force	Direction in Plan	Uplift
B	-34.3	-20.3			39.8	-121°	
C	-4.3	-26.3			26.6	-171°	0.1
D	-4.1	24.3			24.6	-10°	0.1
F	-28.7	20.3			35.0	-55°	

Approximate natural periods
Surge: 3.9 Sway: 67 secs

Figure 6-2: OPTIMOOR results - damaged STB - STERN

Summary Table

Maximum Fender compression = 77 t < 100 t UC = 0.77

Maximum Line Tension = 40 t < 127 / 2 = 63.5 UC = 0.63

Maximum Bollard force = 40 t < 50 t (allowable) UC = 0.80

6.1.2 Failure line 4

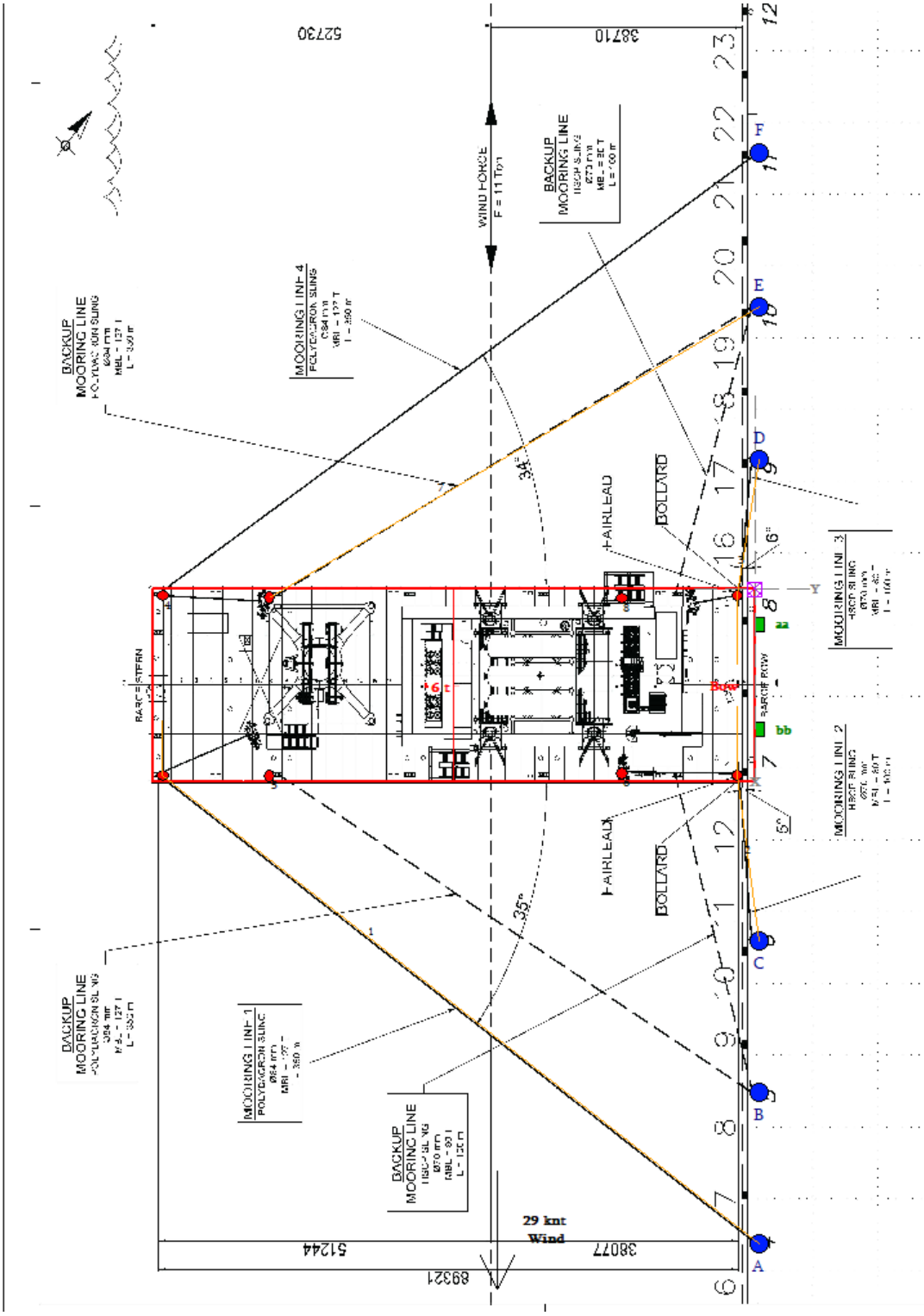


Figure 6-3: OPTIMOOR layout – damaged PS - STERN

Static Mooring Response for VERVECE at PBY loadout

Units in m & tonnes (file L:\COMMESSE\ROS\1783\04-CALCOLI\10-OPTIMOOR\0_loadout\LO-D4.opt)
Remarks: MOORING ARRANGEMENT LOADOUT OPS. IN PBY YARD - RAVENNA
damaged line 4

Static Analysis for Time: 0700 02 Aug 2025
Water Level: 0.00 above Datum
Draft: 4.3
Trim: 0.0
Bottom Clearance: 2.7

Deck Level at Target: 0.0 above pier
Wind Speed: 29 knots
Wind Direction: All° True (solid pier shields wind)

Fwd Offset of Vessel Target: 0.0 from Berth Target
Total End-On Windage Area: 839
Total Side Windage Area: 505

	Longitudinal	Transverse	Yaw Moment/LBP	
Target Moves(min and max):	0.3 fwd	0.2 inw	1.5° port	0.0 up
	-0.5 aft	-0.1 out	0.1° port	0.0 up

Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slippage	Worst Directn	Line Tension	Percent Strength
1-A	17.0	103.5			210°	34.9	27%
2-C	4.8	29.0			155°	24.0	30%
3-D	4.3	25.5			10°	26.2	33%
7-E	11.0	74.1			0°	36.6	29%

Fender	Thrust	Compression	Pressure	Contact Area
aa		0.00		
bb	74	0.01	24.8	100%

Hook/ Bollard	X- Force	Y- Force	Other X-Load	Other Y-Load	Total Horiz Force	Direction in Plan	Uplift
A	-28.0	-20.8			34.9	-127°	
C	-3.1	-23.8			24.0	-173°	0.1
D	-6.4	25.4			26.2	-14°	0.1
E	-32.6	16.7			36.6	-63°	

Approximate natural periods
Surge: 3.9 Sway: 68 secs

Figure 6-4: OPTIMOOR results - damaged PS - BOW

Summary Table

Maximum Fender compression = 74 t < 100 t UC = 0.74

Maximum Line Tension = 36.6 t < 127 / 2 = 63.5 UC = 0.57

Maximum Bollard force = 36.6 t < 50 t (allowable) UC = 0.73

6.1.3 Failure line 2

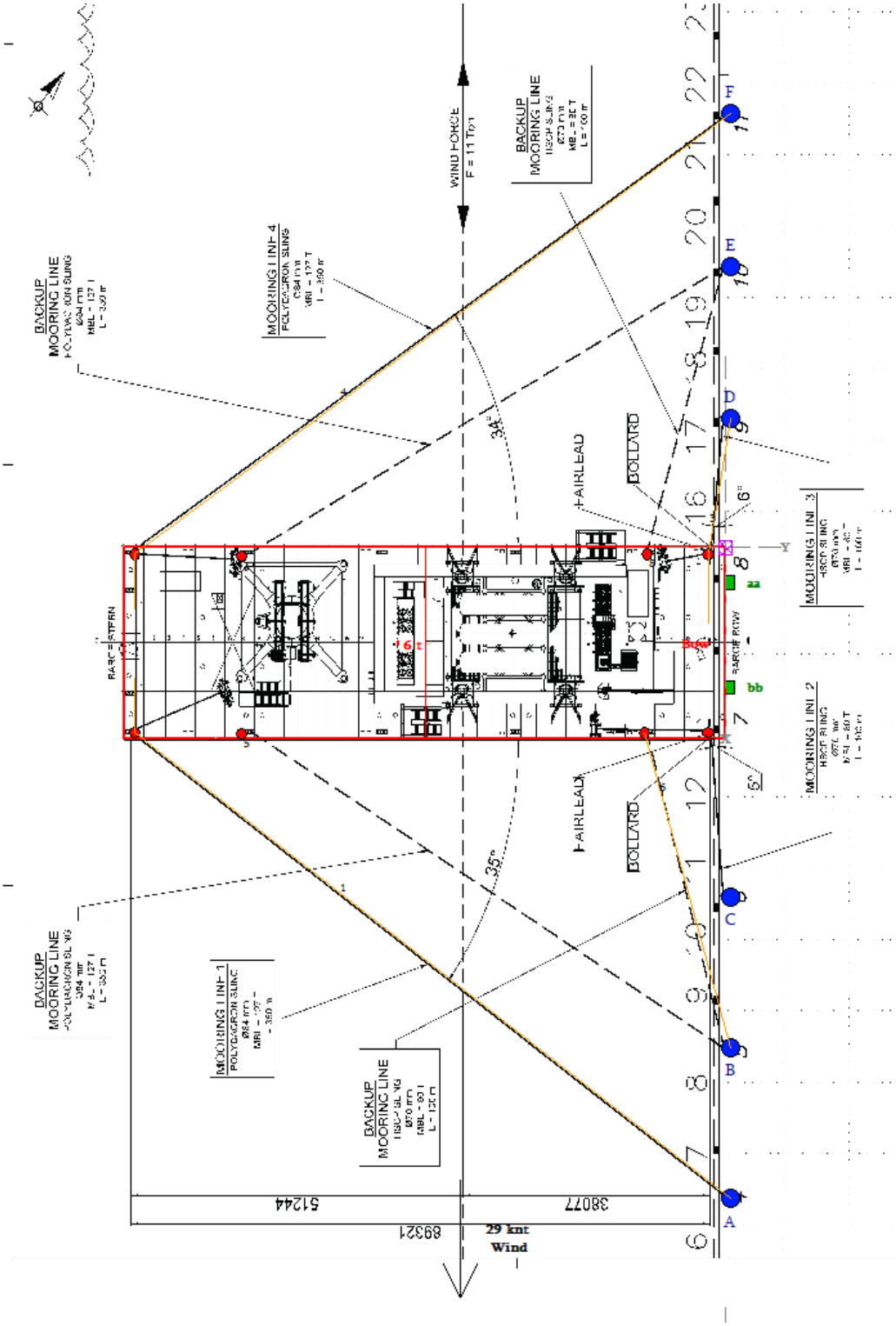


Figure 6-5: OPTIMOOR layout – damaged STB - BOW

Static Mooring Response for VERVECE at PBY loadout

Units in m & tonnes (file L:\COMMESSE\ROS\1783\04-CALCOLI\10-OPTIMOOR\0_loadout\LO-D2.opt)
Remarks: MOORING ARRANGEMENT LOADOUT OPS. IN PBY YARD - RAVENNA
damaged line 2

Static Analysis for Time: 0700 02 Aug 2025
Water Level: 0.00 above Datum
Draft: 4.3
Trim: 0.0
Bottom Clearance: 2.7

Deck Level at Target: 0.0 above pier
Wind Speed: 29 knots
Wind Direction: All° True (solid pier shields wind)

Fwd Offset of Vessel Target: 0.0 from Berth Target
Total End-On Windage Area: 839
Total Side Windage Area: 505

	Longitudinal	Transverse	Yaw Moment/LBP
Target Moves(min and max):	0.3 fwd	0.3 inw	1.6° port	0.0 up
	-0.5 aft	-0.3 out	0.0° port	0.0 up

Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slippage	Worst Directn	Line Tension	Percent Strength
1-A	17.9	102.5		1.2	180°	35.0	28%
3-D	4.3	25.4			15°	27.8	35%
4-F	17.7	103.5		2.7	355°	35.0	28%
6-B	7.2	39.8			175°	28.9	36%

Fender	Thrust	Compression	Pressure	Contact Area
aa	34	0.00	11.2	100%
bb	80	0.01	26.5	100%

Hook/ Bollard	X-Force	Y-Force	Other X-Load	Other Y-Load	Total Horiz Force	Direction in Plan	Uplift
A	-28.2	-21.4			35.0	-126°	
B	-8.0	-27.7			28.9	-164°	0.1
D	-6.8	27.0			27.8	-14°	0.1
F	-29.5	20.1			35.0	-57°	

Approximate natural periods
Surge: 3.9 Sway: 73 secs

Figure 6-6: OPTIMOOR results - damaged PS - STERN

Summary Table

Maximum Fender compression = 80 t < 100 t UC = 0.80

Maximum Line Tension = 35.0 t < 127 / 2 = 63.5 UC = 0.55

Maximum Bollard force = 35.0 t < 50 t (allowable) UC = 0.70

6.1.1 Failure line 3

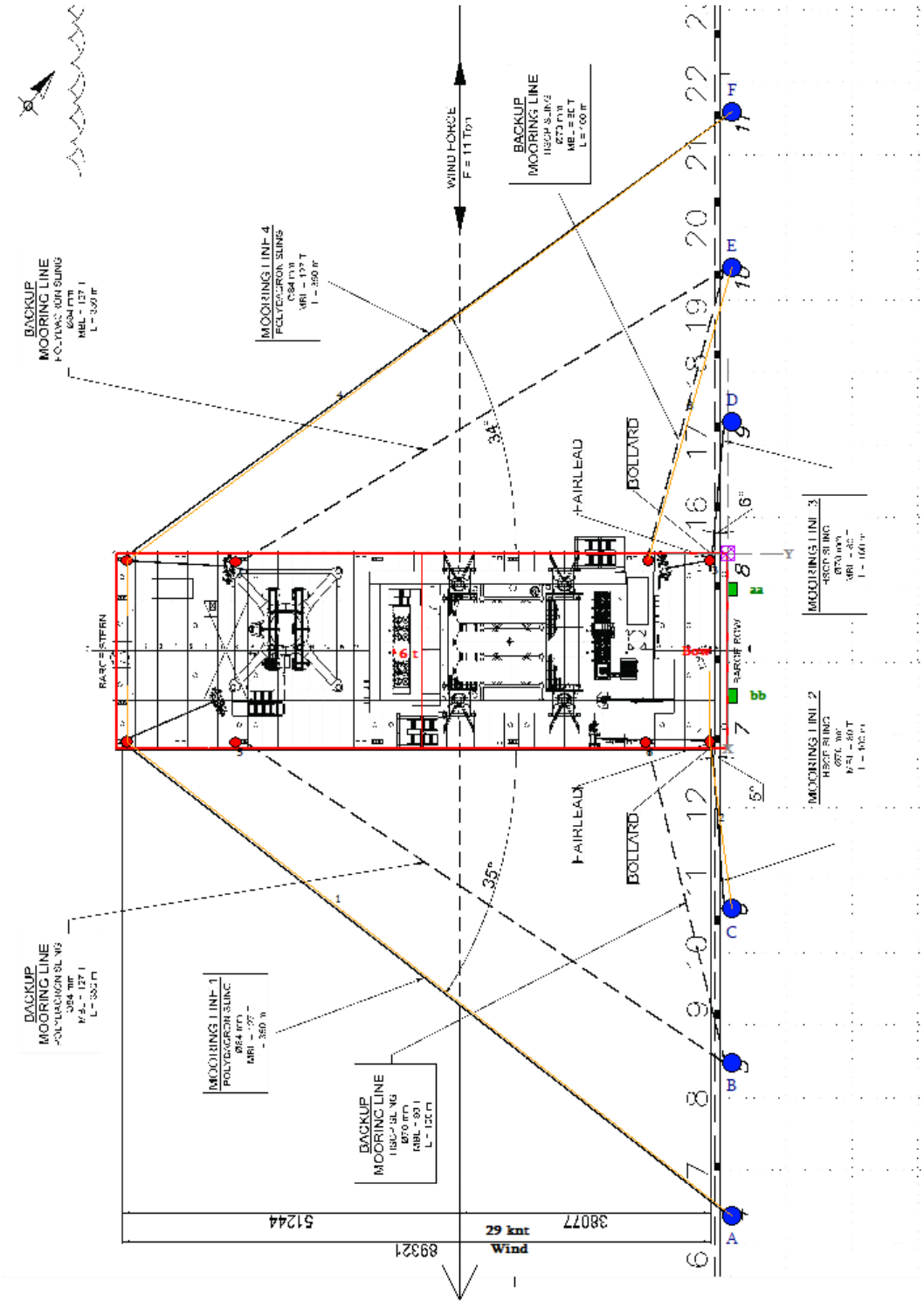


Figure 6-7: OPTIMOOR layout – damaged PS - BOW

Static Mooring Response for VERVECE at PBY loadout

Units in m & tonnes (file L:\COMMESSE\ROS\1783\04-CALCOLI\10-OPTIMOOR\0_loadout\LO-D3.opt)
Remarks: MOORING ARRANGEMENT LOADOUT OPS. IN PBY YARD - RAVENNA
damaged line 3

Static Analysis for Time: 0700 02 Aug 2025
Water Level: 0.00 above Datum
Draft: 4.3
Trim: 0.0
Bottom Clearance: 2.7

Deck Level at Target: 0.0 above pier
Wind Speed: 29 knots
Wind Direction: All° True (solid pier shields wind)

Fwd Offset of Vessel Target: 0.0 from Berth Target
Total End-On Windage Area: 839
Total Side Windage Area: 505

	Longitudinal	Transverse	Yaw Moment/LBP
Target Moves(min and max):	0.0 fwd	0.4 inw	0.0° port 0.0 up
	0.0 fwd	-0.3 out	0.0° stbd 0.0 up

Line to Bollard	Pull -in	Tot.Line Length	In-Line ±Motion	Winch Slippage	Worst Directn	Line Tension	Percent Strength
1-A	16.0	104.5			180°	31.7	25%
2-C	4.8	29.0			175°	26.9	34%
4-F	15.0	103.4			0°	28.2	22%
8-E	6.5	36.5			0°	28.4	35%

Fender	Thrust	Compression	Pressure	Contact Area
aa	48	0.00	16.0	100%
bb	47	0.00	15.8	100%

Hook/ Bollard	X- Force	Y- Force	Other X-Load	Other Y-Load	Total Horiz Force	Direction in Plan	Uplift
A	-25.5	-18.9			31.7	-127°	
C	-3.8	-26.6			26.9	-172°	0.1
E	-8.3	27.1			28.4	-17°	0.1
F	-23.1	16.2			28.2	-55°	

Approximate natural periods
Surge: 3.9 Sway: 74 secs

Figure 6-8: OPTIMOOR results - damaged STB - STERN

Summary Table

Maximum Fender compression = 48 t < 100 t UC = 0.48

Maximum Line Tension = 31.7 t < 127 / 2 = 63.5 UC = 0.50

Maximum Bollard force = 31.7 t < 50 t (allowable) UC = 0.63

Client	**ROSETTI**
Project	**CROSSWIND PROJECT**
Document type	**OPERATIVE PROCEDURE**
Content	**TRANSITION PIECE – LOAD OUT PROCEDURE**
Doc. nr.	**030-CRO-LO-02-002**
Client doc. nr.	

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Rev.	**Date**	**Document status**	**prep.**	**check.**	**appr.**

Revision history:

Rev.	Date	Description of revision
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0	14/07/25	Issued for execution

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Contents

1. SCOPE 5
2. REFERENCE DOCUMENTS 6
2.1 Standard and code 6
2.2 Client documents 6
2.3 Fagioli documents 6
3. STAFF AND RESPONSIBILITY 7
3.1 Responsibility matrix 7
3.2 Organization chart 10
3.3 Key personnel 11
4. SAFETY 17
5. COMMUNICATIONS 18
6. OPERATIONAL CRITERIA FOR YARD TRANSPORT AND LOAD-OUT OPERATIONS 19
6.1 Loading Phase 19
6.2 Heavy transport by SPMT 19
6.3 Load-out operation 21
6.4 TP transfer on barge grillage structure activity 22
7. BERTH DATA 23
8. EQUIPMENT FOR THE OPERATION 24
8.1 EQUIPMENT FOR TRANSPORT AND LOAD-OUT OPERATIONS 24
9. OPERATION 25
9.1 Trailers assembly 25
9.2 Preliminary check prior TP loading operation 25
9.3 Loading operation 25
9.4 Preliminary check prior starting inland transport 26
9.5 Inland transport 27
9.6 Preliminary check prior load-out phase 27
9.7 Load-out 28
9.8 Preliminary check before TP lowering activities on barge grillage 29
9.9 TOP SIDE lowering on barge grillage phase 30
10. DECISION TO DISCONTINUE THE LOAD-OUT 30
11. ATTACHMENT 31

11.1 Client drawings 31
11.2 Fagioli drawings 32
11.3 SPMT stability check 33
11.4 SPMTs data sheet 34
11.5 Fagioli SPMT's check list 35
11.6 SPMT spine beam check 36
11.7 Lashing calculation 37
11.8 SPMT traction check 38
11.9 Risk assessment 39
11.10 Contingency plan 40
11.11 Toolbox meeting 41

1. SCOPE

The purpose of the present operative procedure is to define the Responsibilities, the Operational Criteria, the equipment and the operative steps to be followed for the execution of the load-out onto the barge of the TRANSITION PIECE (TP) which is reported in the below *Table 1*.

		WEIGHTED WEIGHT (+3% contingency included)
Item #1	TP	254.5 t

Table 1: TP to be loaded out on the barge

The load-out operations will be carried out at the Rosetti Yard (Ravenna – Italy).

The present procedure covers the following operations:

- Heavy transport of the TP by Self Propeller Modular Trailer (SPMT) from fabrication area to the berth.
- Loading TP on the barge.

This procedure is a general guideline for the preparation and execution of the load out operations. Other operational details shall be also taken from the specific drawings attached to the present document.
The procedure shall be read in conjunction with the documentations provided by the HSE's departments related to the safety aspects of the preparations and the operations.

The present procedure defines the staff responsibility, the equipment to be used for the operations and the steps for the safe execution of the job. Any deviation to this procedure shall be reviewed first by the Site Manager / Load out Manager (SM) and in case of need approved by the Fagioli Engineering Department prior to making the changes.

The **load-out starting point** is when the barge is moored (as per load-out mooring arrangement), SPMT's trailers are positioned underneath the TP, the "*Ready for load-out certificate*" and "*Certificate of Approval*" are issued, and the TS is ready to be loaded out.
The **load-out ending point** is when the TP is released on the grillage of the barge and the minimum required sea-fastening is installed.

2. REFERENCE DOCUMENTS

2.1 Standard and code

1. ISO 9001:2015 “Quality Management System – Requirements”.
2. UNI ISO 45001:2018 “Occupational Health & Safety Management Systems - Requirements with guidance for use”.
3. DNVGL-ST-N001:2020 “Marine operations and marine warranty”.

The reference Codes and Standards shall be used in their last edition / revision available at the date.

2.2 Client documents

Client documents:

- To see in appendix 1

The reference documents shall be used in their last revision “*issued for use*”, “*issued for execution*”.

2.3 Fagioli documents

Fagioli documents:

- To see in appendix 2

The reference documents shall be used in their last revision “*issued for use*”, “*issued for execution*”.

3. STAFF AND RESPONSIBILITY

3.1 Responsibility matrix

With regards to the reference Contracts between Fagioli, the Client and possible Other Parties (contractors, subcontractors, port authority, etc.), the company Fagioli, the Client and the Others are responsible for the design, the procurement, and the operations according to the Responsibility Matrix which is reported below.

Type of activities	Activities	Fagioli	Client (Rosetti)	Others	Note
Engineering	Provide information about TP (weight, CoG position, protrusion, etc.)		X		
Engineering	Provide load-out quay details drawing, capacity and section through quay wall		X		
Engineering	Investigation / check of the underwater soil in the load-out area to identify and remove rocks and debris that could damage barge		X		Subsea survey report or bathymetry shall be available
Engineering	Preparation of installation area and site path from loading up to load out area (removal of obstructions, fences, curbs…)		X		
Engineering	Check of bridges, culverts, underground or similar in the SPMT operational area		X		
Engineering	Load-out quay structural check for the SPMT's imposed loads		X		The input for the structural checks are reported in the Transport drawings (local and global bearing pressure of the SPMT's)
Engineering	Provide tide table for the berth		X		
Engineering	Provide environmental parameters (wave, current, wind, etc.) for the berth		X		
Engineering	Provide barge's booklet complete of drawings, hydrostatic tables and curves of stability		X		
Engineering	Barge general arrangement drawing with allowable deck load		X		
Engineering	Barge stowage plan drawings		X		
Engineering	Details of ballast pumping system		X		
Engineering	Method of fendering between and quay		X		

Type of activities	Activities	Fagioli	Client (Rosetti)	Others	Note
Engineering	Fenders data sheet and positioning on the quay		X		
Engineering	Barge positioning during load-out		X		
Engineering	Ro-ro ramp design and check		X		
Engineering	Load-out operative procedure	X	X		
Engineering	Ballast plan during load-out and preparing the barge at required height for the load-out		X		
Engineering	Mooring drawings and mooring calculation report for load-out		X		
Engineering	Mooring drawings and mooring calculation report for stand-by condition		X		
Engineering	Transport drawings for the load-out	X			
Engineering	Grillage and sea-fastening design (drawings and calculations)		X		
Engineering	Barge local structural check and calculations		X		
Supply	Mooring equipment for the load-out	X	X		N. 4 winches by Fagioli; all other mooring equipment by Client
Supply	Mooring equipment for the stand-by condition	X	X		N. 4 winches by Fagioli; all other mooring equipment by Client
Supply	Ro-ro ramps		X		
Supply	Grillage and sea-fastening		X		
Supply	Barge ballast equipment and Ballast Operators	X	X		N. 6 ballast pump by Fagioli; all other ballast equipment / personnel by Client
Supply	SPMT's Convoy and SPMT's Operators	X			
Supply	Fire Extinguishers		X		
Supply	Tug boats for HTV movement		X		
Supply	Welding equipment		X		
Supply	Site lights on the barge		X		
Supply	Site lights on quay and storage area		X		
Operational	Engage the Marine Warranty Surveyor		X		
Operational	Transport permits		X		
Operational	Berth permits		X		
Operational	Provide weather forecast		X		

Type of activities	Activities	Fagioli	Client (Rosetti)	Others	Note
Operational	Winches positioning on barge / quay		X		
Operational	All barge mooring operations / activities for load-out		X		
Operational	All barge mooring operations / activities for stand-by condition		X		
Operational	Barge mooring equipment installation / removal for load-out		X		
Operational	Barge mooring equipment installation / removal for stand-by condition		X		
Operational	Ro-ro ramps installation / removal		X		
Operational	Gas free certificate for barge		X		
Operational	Barge ballast operations during load out		X		
Operational	Barge ballast operations during stand-by condition		X		
Operational	SPMT's convoy preparation	X			
Operational	Grillage installation before load-out operation		X		
Operational	Ready for Load-out certificate		X		
Operational	Certificate of Approval for load out		X		
Operational	Load-out operation by means of SPMT's	X			
Operational	Sea-fastening installation after the load-out operation		X		
Operational	Protection of SPMT's in case of hot works (sparks, etc.)		X		
Operational	Load-in operation of empty SPMT from the barge	X			
Operational	Survey of TP in its final position		X		
Operational	RINA (or any other Third Party company) approval according to the MWS approved sea fastening and grillage plan		X		If any
Operational	Tug operations		X		
Operational	Barge preparation for sail away		X		
Operational	Any barge movements inside the quay area		X		
Operational	Pre-sail-away (PSA) inspection		X		
Operational	Sail away certificate		X		

Table 2: Responsibility Matrix

3.2 Organization chart

The load-out activities will be executed in accordance with this procedure. As per the below "*Organization chart*", the load-out planning and preparation involves key members of Client, Fagioli and Other organizations.

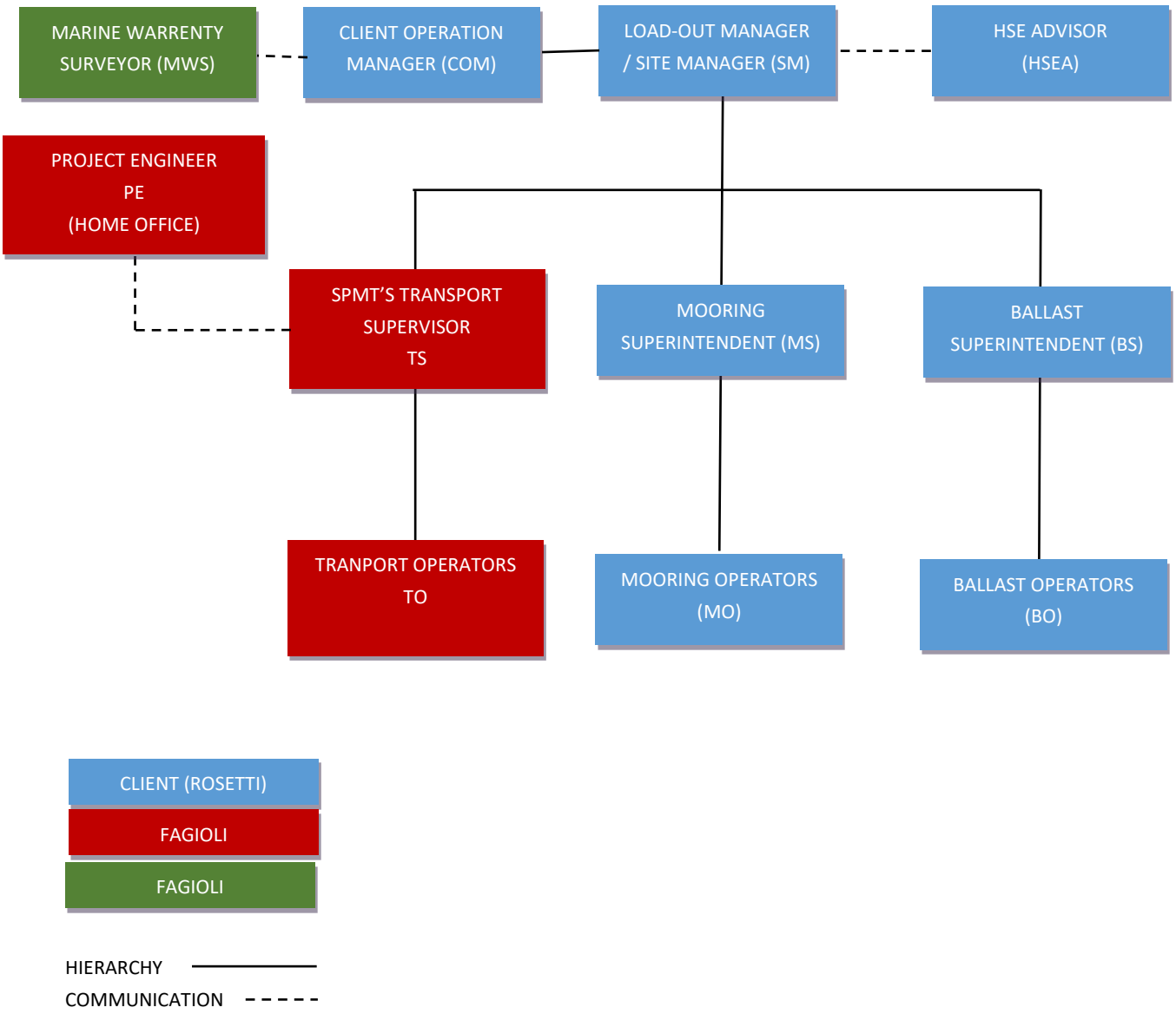


Figure 1: Organization chart

3.3 Key personnel

The key persons involved in the operations and their applicable responsibilities are as follows:

Key person	**Client Operation Manager**
Company	**Client**
Give instruction to:	Site Manager / Load-out Manager (SM)
Receive instruction from:	Client Management
Main duties	1) Acts as Client Company representative during the load-out operations. 2) Issues in agreement with MWS the "*Ready for Load-out certificate*" and coordinates all Parties with the MWS during the load-out operations. 3) Provides weather forecast from 7 days before the operations every 6 hours until load-out is completed.

Key person	**Marine Warranty Surveyor (MWS)**
Company	TBD
Assist:	Client Operation Manager
Receive instruction from:	Head Office
Main duties	1) Provides independent third-party technical review and approval of load-out operations on behalf of Client, from the planning stages through to the physical execution. 2) Prepares and issues the "*Certificate of Approval*" before start of load-out operations with the agreement of COM.

Key person	**Site Manager / Load-out Manager (SM)**
Company	**Client**
Give instructions to:	Ballast Superintendent (BS) Transport Superintendent (TS) Mooring Superintendent (MS)
Receive instruction from:	Client Operation Manager (COM)
Main duties	1) Be responsible for the execution of the transport and of the load out activities.

	2) Explains the operations to all parties involved and establish the coordination with them, according to the Organization Chart in field, interfacing with the Fagioli Home Office Departments, the Client and the other Parties. 3) Conducts the *Daily Toolbox Meeting* with all parties involved about the activities that will take place in the site. 4) Plans and schedules all the site activities for the preparations and the executions of the load out. 5) Ensures that the communication between all parties is maintained in field. 6) Collects, keeps updated and distributes to all the parties involved the technical documentation. 7) Manages the deviation to the present procedure, getting approval, as required, by Home Office (PE) and by COM. 8) Collects all the certificates for the equipment and the materials used during operations. 9) Collects the *check list* duly prepared and signed by the Superintendents. 10) Be the only person who gives the conventional signals to the superintendents during job execution. 11) Be authorized to suspend the work in case of any unacceptable environmental or safety risk. 12) Ensures that the weather forecast values are within the limit of the weather criteria for the operations according to the present procedure.

Key person	**HSE Advisor (HSEA)**
Company	**Client**
Assist:	Site Manager / Load-out Manager (SM)
Receive instruction from:	HSE Manager
Main duties	1) Ensure development and timely delivery of HSE documentation. 2) Provide assistance to SM in implementing HSE requirements. 3) Liaise with internal and external stakeholders to assist/advise in HSE matters. 4) Participate in incident investigations to identify root causes and lessons learned.

Key person	**Project Engineer (PE)**
Company	**Fagioli**
Assist:	Transport superintendent
Receive instruction from:	Engineering Management
Main duties	1) Receives and collects the right and valid input engineering information from Client. 2) Prepares the operational drawings helped by drafting personnel, getting the required approval from Client, and issues the drawings / documents in revision "Issued for Use" to be followed in field. 3) Prepares the operational procedure, getting the required approval from Client, and issue the document in revision "Issued for Use" to be followed in field. 4) Develops all the engineering activities related to yard transport and to the load out according to the project design criteria established with the Client. 5) In case of need he (himself or substitute) is present during the operations and assist the operational team in case of a deviation from the present operational procedure for unexpected reasons.

Key person	**Transport Superintendent (TS)**
Company	**Fagioli**
Give instruction to:	Transport Operators (TO)
Receive instruction from:	Site Manager / Load out Manager (SM)
Main duties	1) Be responsible for the correct preparation and execution of the transport operations by SPMT's. 2) Be the only person who gives the conventional signals to the SPMT's operators during job execution. 3) Be responsible for the SPMT's hydraulic and electronic functions. 4) Superintends the SPMT's preparation, in particular the hydraulic suspension groups. 5) Be responsible for the lashing of the TOP SIDE's on the SPMT's according to the transport drawings. 6) Be responsible for the preparation of the *check lists* of the SPMT's before their use. 7) Superintends the *functional tests* of the SPMT's before their use.

	8) Instructs the operators of the SPMT's about their duties for the transport operations. 9) Superintends the periodic inspection and maintenance activities of SPMT's. 10) Be authorizes to suspend the work in case of any unacceptable environmental or safety risk. 11) Inspects the operational area and the job site before moving the SPMT's. 12) Coordinates the *contingency plan* in case of need.

Key person	**Transport Operator (TO)**
Company	**Fagioli**
Give instruction to:	-
Receive instruction from:	Transport Superintendent (TS)
Main duties	1) Prepares the convoys following the instructions of TS, in particular for the hydraulic suspension groups and lashing. 2) Performs the *functional tests* of the SPMT's before their use. 3) Be responsible for trailer hydraulic and electronic functions. 4) Performs the periodic inspection and maintenance activities of SPMT's. 5) Implements the *contingency plan* in case of need.

Key person	**Ballast Superintendent (BS)**
Company	**Client**
Give instruction to:	Ballast Operators (BO)
Receive instruction from:	Site Manager / Load out Manager (SM)
Main duties	1) Be responsible for the correct preparation and execution of the ballast operations. 2) Be the only person who gives the conventional signals to the ballast operators during job execution. 3) Be responsible for the ballast equipment functions. 4) Superintends the ballast equipment preparation. 5) Be responsible for the preparation of the *check lists* of the ballast equipment before their use. 6) Superintends the *functional tests* of the ballast equipment before their use.

	7) Instructs the operators of the ballast equipment about their duties for the ballast operations. 8) Superintends the periodic inspection and maintenance activities of the ballast equipment. 9) Be authorizes to suspend the work in case of any unacceptable environmental or safety risk. 10) Coordinates the *contingency plan* in case of need.

Key person	**Ballast Operator (BO)**
Company	**Client**
Give instruction to:	-
Receive instruction from:	Ballast Superintendent (BS)
Main duties	1) Prepares the ballast equipment following the instructions of BS. 2) Performs the *functional tests* of the ballast equipment before their use. 3) Performs the periodic inspection and maintenance activities of ballast equipment. 4) Implements the *contingency plan* in case of need.

Key person	**Mooring Superintendent (MS)**
Company	**Client**
Give instruction to:	Mooring Operators (MO)
Receive instruction from:	Site Manager / Load out Manager (SM)
Main duties	1) Be responsible for the correct preparation and execution of the mooring operations. 2) Be the only person who gives the conventional signals to the mooring operators during job execution. 3) Be responsible for the mooring equipment functions. 4) Superintends the mooring equipment preparation. 5) Be responsible for the preparation of the *check lists* of the mooring equipment before their use. 6) Superintends the *functional tests* of the mooring equipment (winches and fairleads) before their use. 7) Instructs the operators of the mooring equipment about their duties for the mooring operations. 8) Superintends the periodic inspection and maintenance activities of the mooring equipment (winches, etc…).

	9) Be authorizes to suspend the work in case of any unacceptable environmental or safety risk. 10) Coordinates the *contingency plan* in case of need.

Key person	**Mooring Operator (MO)**
Company	**Port Authority**
Give instruction to:	-
Receive instruction from:	Mooring Superintendent (MS)
Main duties	1) Prepares the mooring equipment following the instructions of MS. 2) Perform the *functional tests* of the mooring equipment (winches) before their use. 3) Performs the periodic inspection and maintenance activities of mooring equipment (winches). 4) Implements the *contingency plan* in case of need.

4. SAFETY

As far as Occupational Health, Safety & Environment aspects are concerned, all personnel involved in the operations shall refer to the documents provided by the HSE's department, such as DVRS, DUVRI and any additional applicable documentation relevant to the project.

Furthermore, the following aspects are particularly important for a safe and successful execution of the operations in subject and shall be organized/checked carefully by the Site Manager / Load out manager (SM):

1. Carry out an Operational Meeting with all involved parties, to explain the load out operations, to clarify the responsibility of everybody and to set up the communication lines.
2. Carry out a toolbox meeting before the execution of each operation, discussing the hazards associated with the task and outlining what preventive and protective measures are foreseen to mitigate such hazards.
3. Ensure that *Risk Assessment* and *Contingency Plan* are well known by all personnel involved.
4. Ensure that sightseers are kept away from the operations.
5. Ensure that personnel are at adequate distance from *tensioned mooring wires* during tensioning and during all the operations.
6. Monitor weather forecast.
7. Ensure that all personnel wear all necessary *Personal Protective Equipment*.
8. Check all equipment before use, in particular check all hydraulic hoses using the relevant check lists. operation shall not start if there is any pending points.
9. Ensure that the anticipated loads on SPMTs are known, including the safe working loads and the pressure for the equipment being used.
10. Absorber material shall be available in case of oil/fuel spillage.
11. Fagioli SM, TS, MS and BS shall always be present during the operations.
12. Fagioli SM shall ensure that the *Emergency Plan* is available, the plan shall comprise of a layout with indication of Muster Points, First Aid Kits, Fire Extinguishers, Spill Kits, Life Buoy and any additional emergency response equipment.

5. COMMUNICATIONS

Before starting the operations, a meeting is held with all the parties involved, to explain the load out operation and to clarify the responsibility of everybody and set up the communication lines. Each personnel shall be aware about its task and its location on board or onshore, according to the *Safety Plan* and according to their duties during the operations.

The SM, BS, BO, TS, TO, MS and MO are provided with radio.

All parties are aware of all applicable *Emergency Procedures* according to the *Safety Plan*.

6. OPERATIONAL CRITERIA FOR YARD TRANSPORT AND LOAD-OUT OPERATIONS

Operational criteria / requirements for the main activities will be listed in this chapter.

6.1 Loading Phase

The **loading operation starting point** begin after that the SPMT will be in Rosetti yard beside the TP. The **loading operation ending point** when the TP will be completely positioned onto SPMT.

The final decision for starting with the operations will be agreed on site, considering the following operational guidelines:

PARAMETER	VALUE
Max operational wind for yard transport by SPMT's	10 m/s (3s gust at 10m above waterline)
Min operational temperature	-15° C
Max operational temperature	+50° C
Visibility limit	± 100 m

6.2 Heavy transport by SPMT

Heavy Transport engineering shall consist of an analysis and selection of appropriate transportation arrangement for SPMT's, defining also the operational tolerances (max. SPMT's speed, max axle load, max wind speed, max out of verticality).
The load distribution in a transport should normally be calculated as a quasi-static load case by distributing the design transport weight of the transported unit and any special load to each structural temporary member and to the SPMT's.
The Nominal Weight is supplied by Client trough a Weight Report and adequate contingency factor is already included. Envelope ± 250 mm of CoG location shall be taken into consideration to compensate any inaccuracy.
Between bottom steel frame of transported unit and top steel frame of SPMT's, plywood shall be used (friction coefficient wood/ steel = 0,21).
Additional lashing for safety reason between SPMT's bed and support beams will be carried out. The lashing system definition is showed in dedicated DWG.
SPMT's hydraulic circuits shall be arranged in such a way that a 3 points system is realized; with this system, the reactions on the trailers are practically constant and there is no overstress on the transported unit.

In the operational conditions, the pressures on the SPMT's hydraulic circuits shall never exceed the allowable values stated by the manufacturer, which depend also from the travelling speed.
For transport, the stability analysis shall be carried out, considering the maximum transverse / longitudinal wind, center of gravity location inaccuracy and the operational tolerances (max. out of verticality) and brake and inertial movement effect.
Total tractive power (number of powered axles) shall be checked to be sufficient to overcome acceleration and slope along the road path.

PARAMETER	VALUE
Max operational wind for yard transport by SPMT's	10 m/s (3s gust at 10m above waterline)
Min operational temperature	-15° C
Max operational temperature	+50° C
Visibility limit	1.5 times the length of the TP no activities will occur in case of thunderstorm with lightning, fog, heavy rain which reduce visibility below this limit
TOP SIDE longitudinal out of verticality	± 1°
TOP SIDE transversal out of verticality	± 1°
Min. transport path capacity	10 t/m^2
Speed limit	0.5 Km/h

Note: Friction coefficient table

Table 2-4 Friction Coefficients

Surface 1	*Surface 2*	*Condition*	*μ*
Steel	Steel	Wet	0.0
Steel	Steel	Dry	0.1
Steel	Timber (wood)	Wet	0.2
Steel	Timber (wood)	Dry	0.3
Steel	Rubber	Wet and dry	0.3

Note: The table is based on recommendations in IMO re. A.714(17). It is assume that the friction surfaces are free from oil or other lubricating fluids

6.3 Load-out operation

The **load-out operation starting point** begin after barge preparation. The load-out operation ending point is when the TP will be in final position before lowering phase.
The final decision for starting the operations will be agreed on site, considering the following operational guidelines:

PARAMETER	VALUE
Max operational wind for load-out by SPMT's	10 m/s (3s gust at 10m above waterline) (or to be advise by Client in case of lower value)
Min operational temperature	-15° C
Max operational temperature	+50° C
Max significant wave height	to be advise by Client
Max current velocity	to be advise by Client
Visibility limit	1.5 times the length of the HTV no activities will occur in case of thunderstorm with lightning, fog, heavy rain which reduce visibility below this limit
Max difference in elevation between HTV deck and quay	0/+100 mm during crossing the ro-ro ramps only
Max. swell effect on HTV	± 100 mm (minimum period 10 sec).
Barge max trim	1.0 %)
Barge max heel	0.5 %
TP longitudinal out of verticality (controlled during the operations by spirit level positioned onto SPMT load bed)	± 1 % Including trim effect
TP transversal out of verticality (controlled during the operations by spirit level positioned onto SPMT load bed)	± 1 % Including heel effect
Min. quay ground capacity and deck capacity	10 t/m^2
Tide range	As per Tide Tables attached, to be verified with tide measurements starting no later than 5 days prior the scheduled load-out

Note: SPMT load-out weather limitation shall be compared with mooring weather limitation.

6.4 TP transfer on barge grillage structure activity

The **unloading operation** will start after the load-out convoy will be in final position in accordance with operational dwg. The **lowering operation ending point** is when the TP will be completely seated on barge grillage.

PARAMETER	VALUE
Max operational wind for load-out by SPMT's	10 m/s (3s gust at 10m above waterline) (or to be advise by Client in case of lower value)
Min operational temperature	-15° C
Max operational temperature	+50° C
Max significant wave height	to be advise by Client
Max current velocity	to be advise by Client
Visibility limit	1.5 times the length of the HTV no activities will occur in case of thunderstorm with lightning, fog, heavy rain which reduce visibility below this limit
Max. swell effect on HTV	± 100 mm (minimum period 10 sec).
HTV max trim	1.0 %
HTV max heel	0.5 %
TOP SIDE longitudinal out of verticality	± 1 % Including trim effect
TOPSIDE transversal out of verticality	± 1 % Including heel effect

7. BERTH DATA

TP will be loaded-out from Rosetti Yard (Piomboni) along the ro-ro ramps, positioned between the barge and berth, and transferred to the grillage onto the barge.
The berth is shown in the below picture.



Figure 2: Berth plan view

8. EQUIPMENT FOR THE OPERATION

The main equipment to be used for the yard transport and load-out operations are reported in the following chapter. As a general rule, all the equipment shall be inspected and functionally tested before their use at site with relevant *check lists*.

8.1 EQUIPMENT FOR TRANSPORT AND LOAD-OUT OPERATIONS

The equipment to be used for the yard transport and load-out operations are as follows:

Fagioli

- N. 2 x 10 axles (36-40t/axle capacity).
- N. 2 PPUs.
- Tot: No 20 axles + No 2 PPU

All the above equipment available at job site, is subject to periodic inspections; moreover prior to commencement of the operations the equipment will be checked according to inspection *check lists*.

Client / Others

- Grillage and sea-fastening;
- Ro-ro ramps;
- Site lights for quay and storage area;
- Site lights for barge;
- Service cranes;
- Service forklift(s) / mainlift(s);
- Equipment and tools for installing grillage and sea-fastening;
- Gangway with safety net.

The details of TPs/equipment provided by Client / Others are being worked outside of this procedure using other project processes and will be confirmed by the owner prior to commencing the load-out operation.

9. OPERATION

Herein will be listed the operative phases and related check for execution of the operation.

9.1 Trailers assembly

SPMT will be assembly at Rosetti yard by hydraulic service crane min SWL 60 t.

9.2 Preliminary check prior TP loading operation

Preliminary check prior loading operation phases of items, the following checks shall be carried out (as applicable) under the supervision of SM with the assistance of TS.

1. Weather conditions are suitable for the execution of the operation.
2. Coordination information has been notified to the other Contractors working in the area.
3. All transportation equipment, installation aids, standard rigging hardware is available.
4. Drivers/operators have full understanding of the load-in Procedure and Safety Plan.
5. Immediately prior to the operation a 'tool box talk' will be held to explain in detail the extent of the operation and the procedures involved.
6. All required personnel (qualified drivers/operators, safety, signal persons, mechanics...) are available for the operation.
7. Before the operation, the work area will be clearly identified, and all unauthorized personnel excluded.
8. The clearance below the is suitable for SPMT insertion
9. Throughout the operation one clearly identified person (SM) will be in charge and it is this person only who is authorized to issue instructions to the equipment operators to commence. However, any person involved and conversant with the operation if they feel safety is being compromised is authorized to say STOP.
10. Organization/roles/responsibilities, communications plan have been defined and clearly understood by all the personnel involved in the operation.
11. Check that radio systems are functioning correctly.

9.3 Loading operation

The TP is located internal of Rosetti yard. It'll be loaded directly by SPMT.
Loading operation shall not commence until MWS CoA has been issued.
The loading operation will be done after weighing activities. At this stage, the elevation of the TP will be as follow:

The lower grillage structure elevation from ground level:

- lower grillage structure height is 1550 mm

Due of spreader/spacer equipment design the trailer contact height is:

- 1270 mm (theory).

The TP will be finally loaded onto transport trailers by jacking up trailer platform, using the hydraulic stroke of same trailer.

The loading sequence will be as follow:

1. SPMT block will be transferred from the assembling nearly TP area.
2. Loading of TP will start immediately after Client Superintendent (CS) authorization.
3. SPMT units will be maneuvered into position beneath the support point and will be positioned according to the transportation arrangement drawings to ensure accurate positioning. Make sure that trailers are hydraulically connected in the right way so that stability is grant and no overstress is induced in the steel structure of the TP.
4. SPMT units will be gradually elevated to take the load by raising the SPMT's stroke till they are in contact with the bottom of the TOP SIDE upper grillage. Shim with plywood as required to have full contact between SPMT's and the contact point.
5. Take gradually: check that the pressure in the hydraulic circuits agrees with the predicted values.
6. Check that the TP structure has no abnormal deflections
7. Another careful check will be made on the pressure of the hydraulic supporting groups and the level of the platform, before starting the lifting operation.
8. Lifting of the TP, by hydraulic stroke of trailer, up to have 50 mm clearance between upper grillage structures and concrete block.
9. Check that the TP/spreader beams structure has no abnormal deflections.
10. Check if the SPMT spine beam deflection is in accordance with the predicted calculation.
11. Another careful check will be made on the pressure of the hydraulic supporting groups and the level of the platform, before starting the lashing operations.
12. Lashing material will be installed as for DWG

9.4 Preliminary check prior starting inland transport

Before starting the inland transport of TP, the following checks shall be carried out (as applicable) under the supervision of SM with the assistance of TS.

1. All lashing arrangement has been performed as for drawing.
2. Weather conditions are suitable for the execution of the operation: max operational wind speed = 10 m/s gust clear visibility (no fog, no heavy rain, and no snow).
3. Weather forecast are suitable for carrying out the operation
4. All spare contingency equipment / materials are available at the quay.
5. SPMT check list is done

6. Transport route and ro-ro jetty areas are clear from obstructions and the other working Contractors.
7. Rosetti CS together with Fagioli SM will check that at no point on the path of the SPMTs the terrain inclination will exceed the capability of the SPMTs to maintain a maximum of 1° of out of verticality.
8. Coordination information has been notified to the other Contractors working in the area by Rosetti
9. All transportation equipment, installation aids, standard rigging hardware are available.
10. Drivers/operators have full understanding of the load-in Procedure and Safety Plan.
11. Immediately prior to the operation, a 'tool box talk' will be held to explain in detail the extent of the operation and the procedures involved.
12. All required personnel (qualified drivers/operators, safety, signal persons, mechanics...) are available for the operation.
13. Before the operation, the work area will be clearly identified and all unauthorized personnel excluded.
14. Throughout the operation one clearly identified person (SM) will be in charge and it is only this person who is authorized to issue instructions to the equipment operators to commence. However, any person involved and conversant with the operation if they feel safety is being compromised is authorized to say STOP.
15. Organization/roles/responsibilities, communications plan have been defined and clearly understood by all the personnel involved in the operation.
16. Check that radio systems are functioning correctly.

9.5 Inland transport

The heavy transport operations shall be executed under the supervision of the SM, according to the transport drawings and Method Statement "issue for execution".

The SM/TS will be in contact by radio with the SPMT operators to instruct them during the operation. The TS will be constantly monitoring the operations for conformity with information elaborated during the engineering phase.

During the transportation phase, check:

1. The pressure in SPMT's hydraulic circuits remains in accordance with the anticipated values.
2. Upon arrival at the storage area, the TP will be aligned with the barge long axis.
3. The maximum speed doesn't exceed 0.5 Km/h
4. The pressure in SPMT's hydraulic circuits remains in accordance with the anticipated values.
5. For Yard maneuver to see DWG in appendix 2

9.6 Preliminary check prior load-out phase

Before starting the load-out convoy, the following checks shall be carried out (as applicable) under the supervision of SM with the assistance of TS.

1. Weather conditions are suitable for the execution of the loadout operation (with 24 hours forecast window): max operational wind speed = 10 m/s (3 s gust). (no fog, no heavy rain, no snow)
2. Weather forecast are suitable for carried out the operation
3. Sea conditions are within the operational limits (tides and swell)
4. Barge mooring is correctly/suitable
5. All spare contingency equipment / materials are available at the quay.
6. SPMT check list is done
7. Link span bridges are installed according to the drawing.
8. Jetties area are clear from obstructions and the other working Contractors.
9. Coordination information has been notified to the other Contractors working in the area.
10. Drivers/operators have full understanding of the load-out Procedure and Safety Plan.
11. Immediately prior to the operation, a 'tool box talk' will be held to explain in detail the extent of the operation and the procedures involved.
12. All required personnel (qualified drivers/operators, safety, signal persons, mechanics...) are available for the operation.
13. Before the operation, the work area will be clearly identified and all unauthorized personnel excluded.
14. Throughout the operation, one clearly identified person (SM-TS) will be in charge and he is only this person who is authorized to issue instructions to the equipment operators to commence. However any person involved and conversant with the operation if they feel safety is being compromised is authorized to say STOP.
15. Organization/roles/responsibilities, communications plan have been defined and clearly understood by all the personnel involved in the operation.
16. Check that radio systems are functioning correctly.

9.7 Load-out

The Load-out commence after the barge has been ballasted to the required draft. The barge will be moored with stern to quay side. When the barge mooring will be ready the barge bridge plates will be installed by Rosetti.
In charge of the load-out will be the SM who will be in constant radio contact with the barge load-out engineer (by Rosetti) and TS. SM/TS will be in constant radio contact with the experienced SPMT Operators who will steer and adjust SPMT height/elevation as the SPMT's negotiate the change in elevation of the ramps.
The barge moorings will be checked periodically by visually inspection.
The SPMT's will pause periodically in line with the flow rate of the ballast pumps to maintain the barge level with the quay during all stages of the transfer operation.

Load-out operation must take care of the following steps:

1. The SPMT's are ready;

2. When the barge is in level with the quay, at the suitable tide the SPMT will start moving slowly on bridge steel plates. Travelling speed will be synchronized with the barge ballasting.
3. Ballast Engineers shall instruct the SM to move and to stop. The barge ballast system shall work to keep even keel throughout the roll-on.
4. Do not overtake the maximum travelling speed (0.5 km/h); synchronize the movement with the barge ballasting.
5. The SM shall monitor the level of the bridge plates.
6. The barge mooring shall be continuously monitored by visually checking the mooring lines' catenaries and mooring lines' terminations.
7. Mooring winches are appropriately tensioned and ready for loadout
8. Level difference between barge and quay shall not exceed 0mm/+100 mm.
9. The Load-out will continue until load transfer is completed, i.e. the last axle of SPMT's is on the barge.
10. The transport convoy will move forward (bow side) up to reach the TP barge final location.

During TP load-out activities the SPMT height will be kept at approx. 1500 mm.

9.8 Preliminary check before TP lowering activities on barge grillage

Before starting the TP final lowering on grillage, the following checks shall be carried out (as applicable) under the supervision of SM with the assistance of TS.

1. TP position is in accordance with stowage plan.
2. Weather conditions are suitable for the execution of the lowering operation (with 24 hours forecast window): max operational wind speed = 10 m/s (3 s gust). (no fog, no heavy rain, no snow)
3. Sea conditions are within the operational limits (tides and swell).
4. Barge mooring is correctly/suitable.
5. All spare contingency equipment / materials are available at the quay.
6. Coordination information has been notified to the other Contractors working in the area.
7. Drivers/operators have full understanding of the load-out Procedure and Safety Plan.
8. Immediately prior to the operation, a 'tool box talk' will be held to explain in detail the extent of the operation and the procedures involved.
9. All required personnel (qualified drivers/operators, safety, signal persons, mechanics...) are available for the operation.
10. Before the operation, the work area will be clearly identified and all unauthorized personnel excluded.
11. Throughout the operation one clearly identified person (SM) will be in charge and He is only this person who is authorized to issue instructions to the equipment operators to commence. However, any person involved and conversant with the operation if they feel safety is being compromised is authorized to say STOP.
12. Check that radio systems are functioning correctly.

9.9 TOP SIDE lowering on barge grillage phase

The unloading operation for TP will start after the convoy will be in final position in accordance with stowage plan.
The TP will be finally seated onto lower grillage by jacking down trailer platform, using the hydraulic stroke of same trailer.
The lower grillage structure on barge will have the following height:

- lower grillage structure height is 1650 mm

Due of spreader/spacer equipment design, the trailer contact height – i.e. the height of the trailer load bed at the time of first contact with the lower grillage structure – is:

- 1370 mm

Unloading operation must take care of the following steps:

1. The SPMT's bed lowers up to get 10 mm clearance from TOP SIDE upper grillage structure to barge grillage.
2. Another position check will be made from SM and load-out engineer.
3. 50% weight download on lower grillage: by SPMT lifting system.
4. Check of gap on each support point.
5. TP weight resuming on SPMT system.
6. Shimming insertion on required location between lower grillage and upper grillage, if any.
7. Complete TP weight download on lower grillage.
8. Transport lashing material removal.
9. SPMT removal.

10. DECISION TO DISCONTINUE THE LOAD-OUT

This section describes the condition which would require discontinuing load-out operations.
This decision will be made as a result of a major failure of load-out system and only if it is safer to discontinue than to continue with the load-out operation.
The decision to postpone or terminate the load-out operation has to be taken after technical discussion among all Parties (Client / MWS / Fagioli / Contractor / Subcontractor).

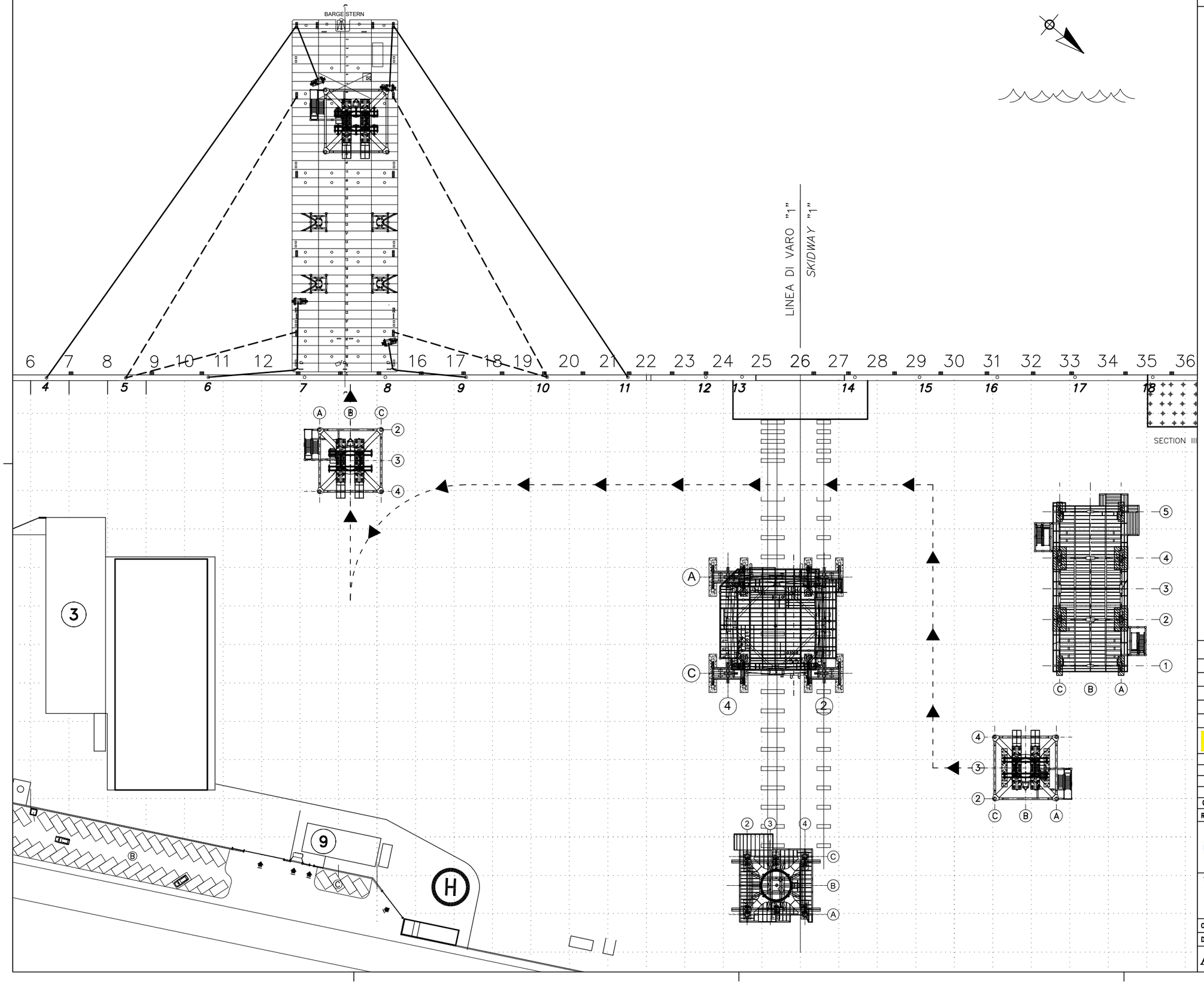
Load-out shall stop and the TP shall be made safe if any of following conditions occur:

a) If a problem develops with the stability or buoyancy of the barge (see Client contingency plan).
b) If a problem develops with the mooring of the barge (temporary stop, see Client contingency plan).
c) If a problem develops with the SPMTs (see attachment – SPMT's contingency plan).
d) If a problem develops with ballasting system failure (temporary stop, see Client contingency plan).

11. ATTACHMENT

11.1 Client drawings

STEP 1



NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.

REFERENCE DRAWINGS

DWG No.	DESCRIPTION

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
00	29/05/25	GS	FC	CA	ISSUED FOR CONSTRUCTION

CROSSWIND

ROSETTI MARINO

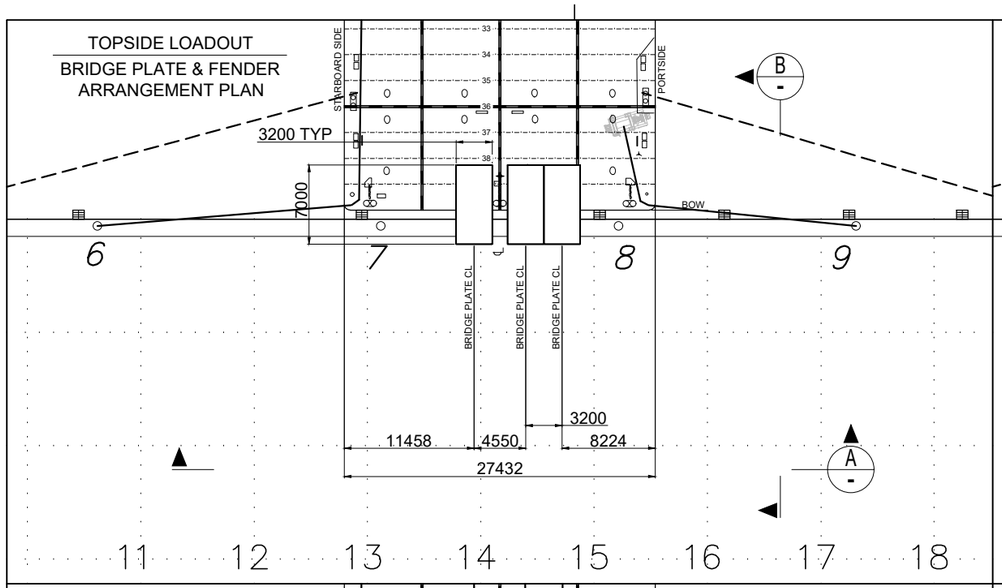
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CROSSWIND LOADOUT
YARD LAYOUT – STEP 1

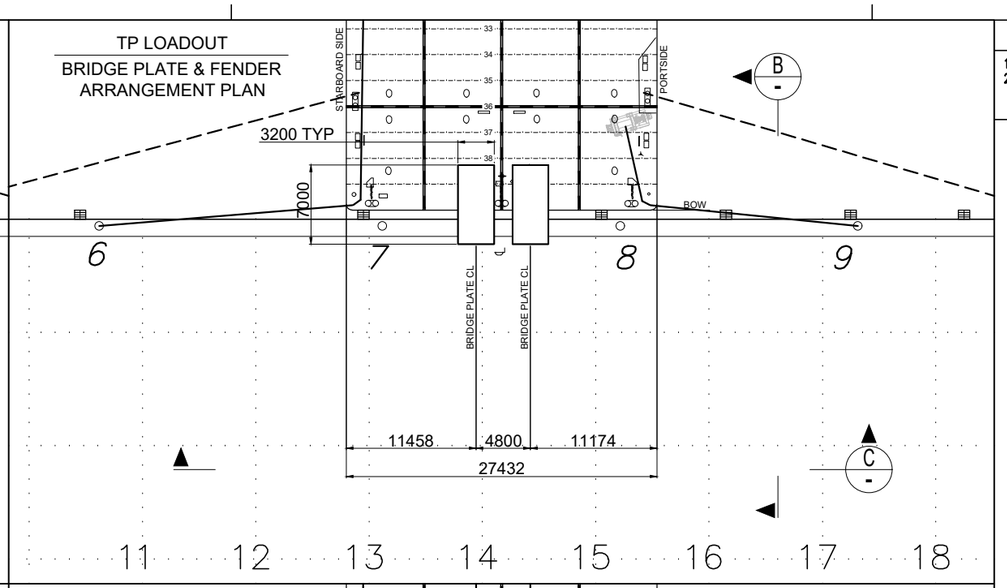
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE
DRAWN G.SEGURINI	CHECKED F.CERONI	APPROVED C.ANTONELLINI	DATE 29/05/25

A1	DRAWING NO.	SHEET	REV.
	123A90-FDL-MT-DD-00402-00	001	00

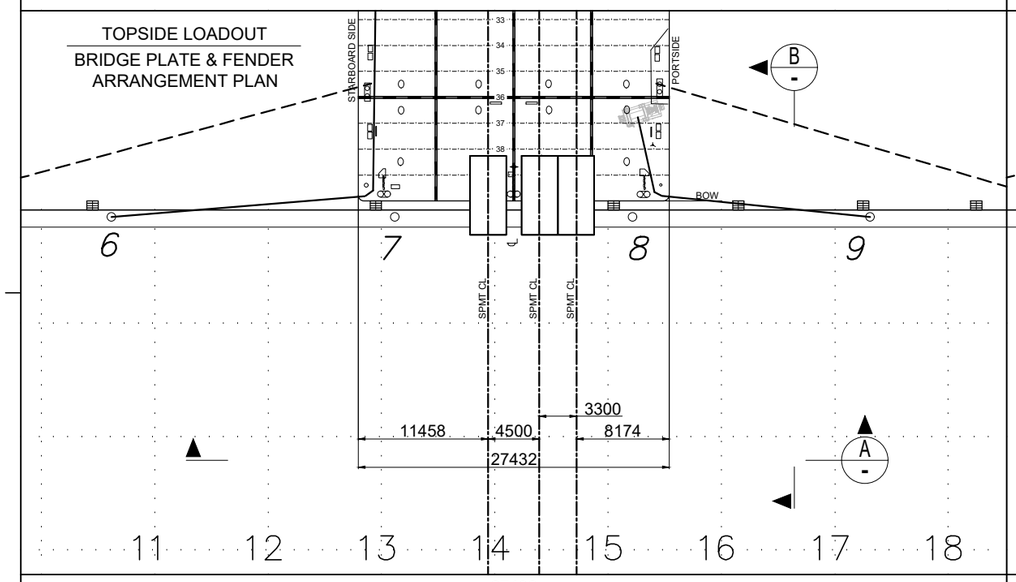
TOPSIDE LOADOUT
BRIDGE PLATE & FENDER
ARRANGEMENT PLAN



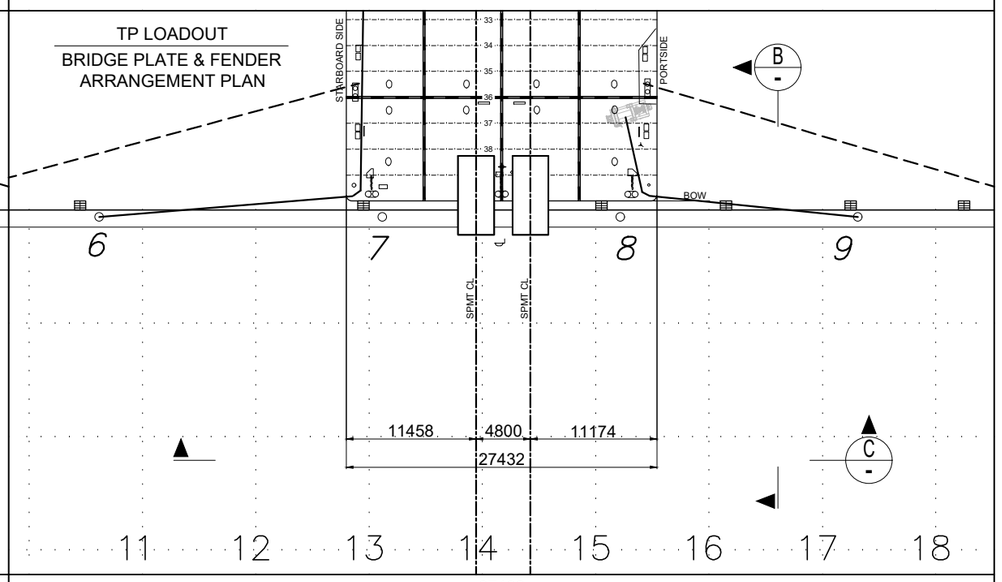
TP LOADOUT
BRIDGE PLATE & FENDER
ARRANGEMENT PLAN



TOPSIDE LOADOUT
BRIDGE PLATE & FENDER
ARRANGEMENT PLAN

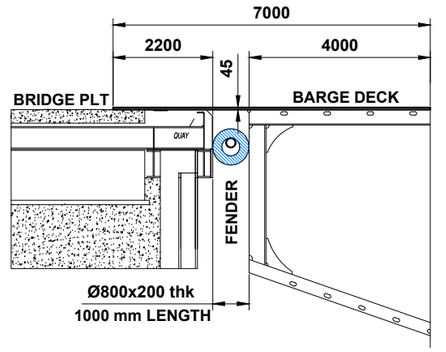


TP LOADOUT
BRIDGE PLATE & FENDER
ARRANGEMENT PLAN



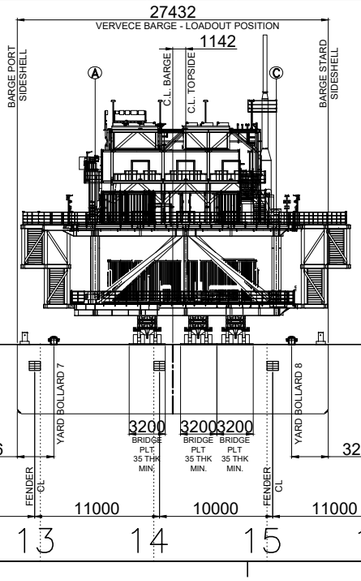
NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.
2 – PLATES FOR LOADOUT ARE 7000x3200x35 min

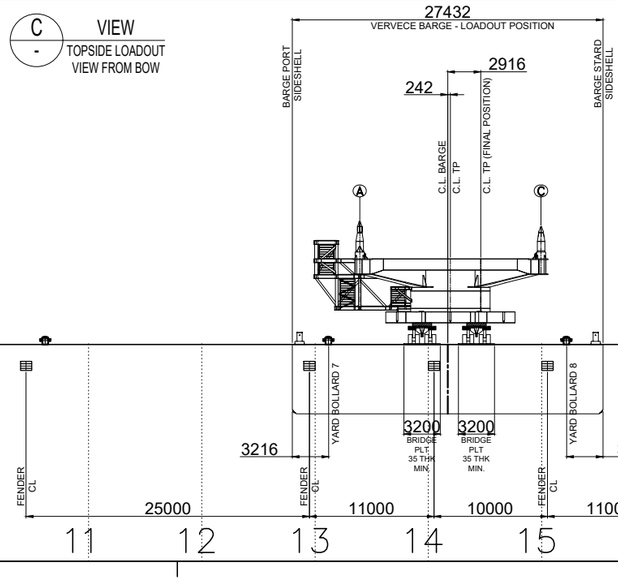


B / - VIEW
TYP SECTION

A / - VIEW
TOPSIDE LOADOUT
VIEW FROM BOW



C / - VIEW
TOPSIDE LOADOUT
VIEW FROM BOW



REFERENCE DRAWINGS

DWG No.	DESCRIPTION

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	12/06/25	SG	FC	CA	
00	03/03/25	CB	FC	CA	

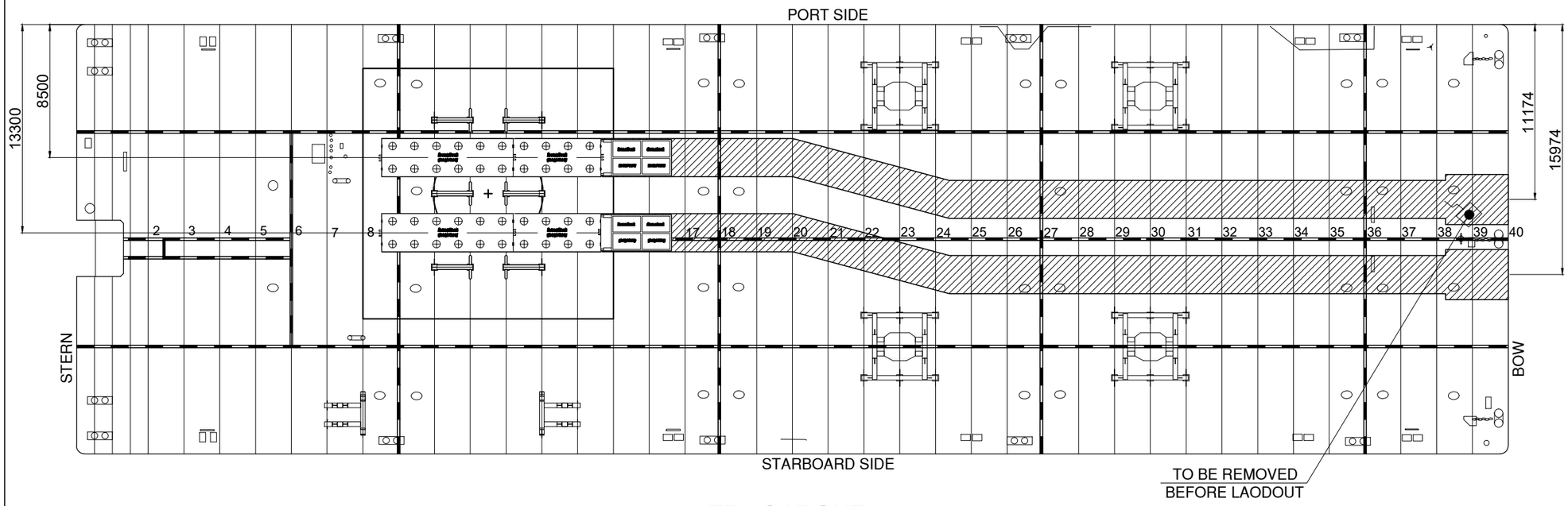
CROSSWIND

ROSETTI MARINO

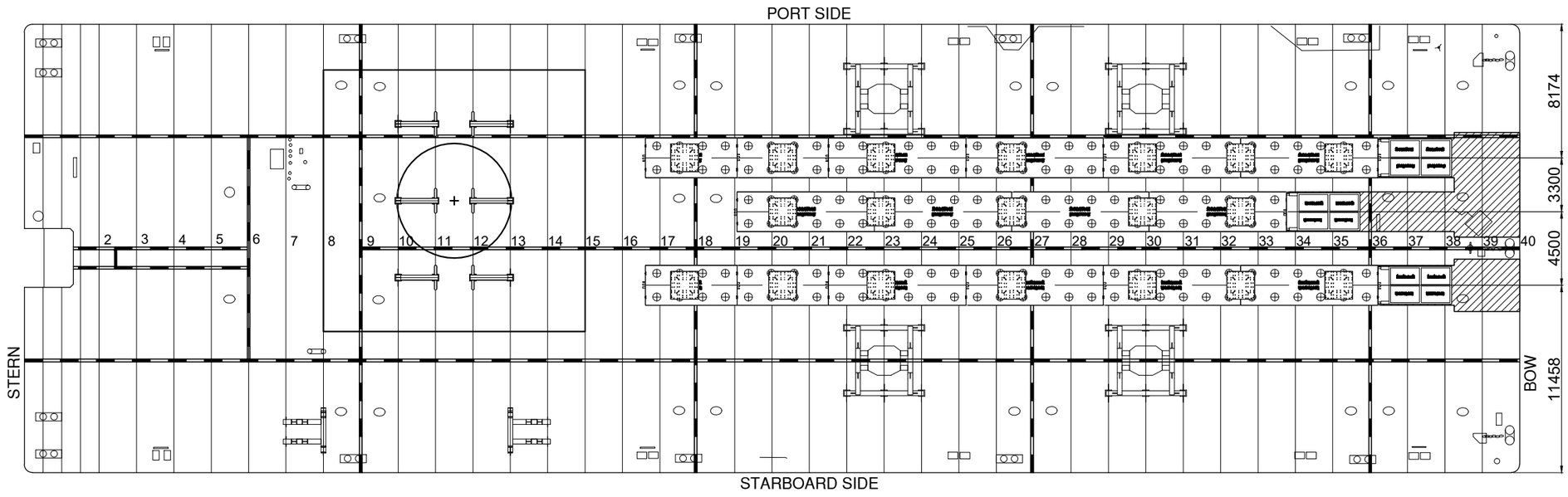
TITLE :
BASE LOAD POWER HUB (BLPH)
BRIDGE PLT & FENDERS
GENERAL ARRANGEMENT

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE
DRAWN C.BENZONI	CHECKED F.CERONI	APPROVED C.ANTONELLINI	DATE 12/06/25

A1	DRAWING NO. 123A90-FDL-MT-DD-00407-01	SHEET 001	REV. 01



TP LOADOUT



TOPSIDE LOADOUT

NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.

REFERENCE DRAWINGS

DWG No.	DESCRIPTION

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	12/06/25	SG	FC	CA	ISSUED FOR CONSTRUCTION
00	30/05/25	GS	FC	CA	ISSUED FOR CONSTRUCTION

CROSSWIND

ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
LOADOUT TOPSIDE & TP
SPMT PATH ON BARGE

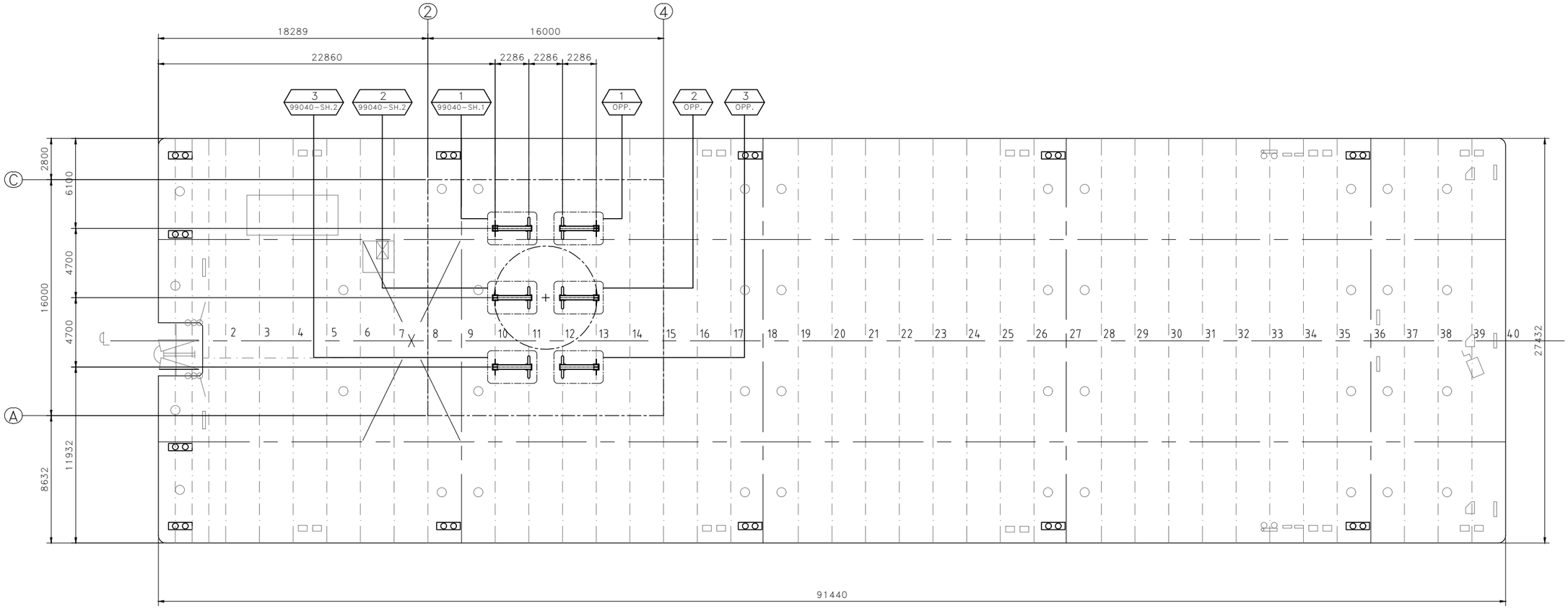
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK . | SCALE

DRAWN G.SEGURINI | CHECKED F.CERONI | APPROVED C.ANTONELLINI | DATE 12/06/25

A1 | DRAWING NO. 123A90-FDL-MT-DD-00409-00 | SHEET 001 | REV. 01

DRAWING NO. 123A90-DDL-TI-DD-99039

REV. 01



TP – LOWER GRILLAGE – ASSEMBLY

SCALE 1:150

NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.
2 – ALL ELEVATIONS ARE REFERED TO C.D.

HOLDS

REFERENCE DRAWINGS

DWG No.	DESCRIPTION
123A90-DDL-ST-DD-90025	DRAWING LIST
123A90-DDL-ST-DD-90026	GENERAL NOTES
123A90-DDL-TI-DD-99036	TP – UPPER GRILLAGE – PLAN VIEW
123A90-DDL-TI-DD-99040	TP – LOWER GRILLAGE – SECTION AND DETAILS

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	13/02/25	SGR	AB	DLS	ACCEPTED FOR CONSTRUCTION (AFC)
01	10/01/25	SGR	AB	DLS	ACCEPTED FOR CONSTRUCTION (AFC)
00	29/11/24	SGR	AB	DLS	ISSUE FOR REVIEW (IFR)

TECON

CROSSWIND

ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TP – LOWER GRILLAGE
ASSEMBLY

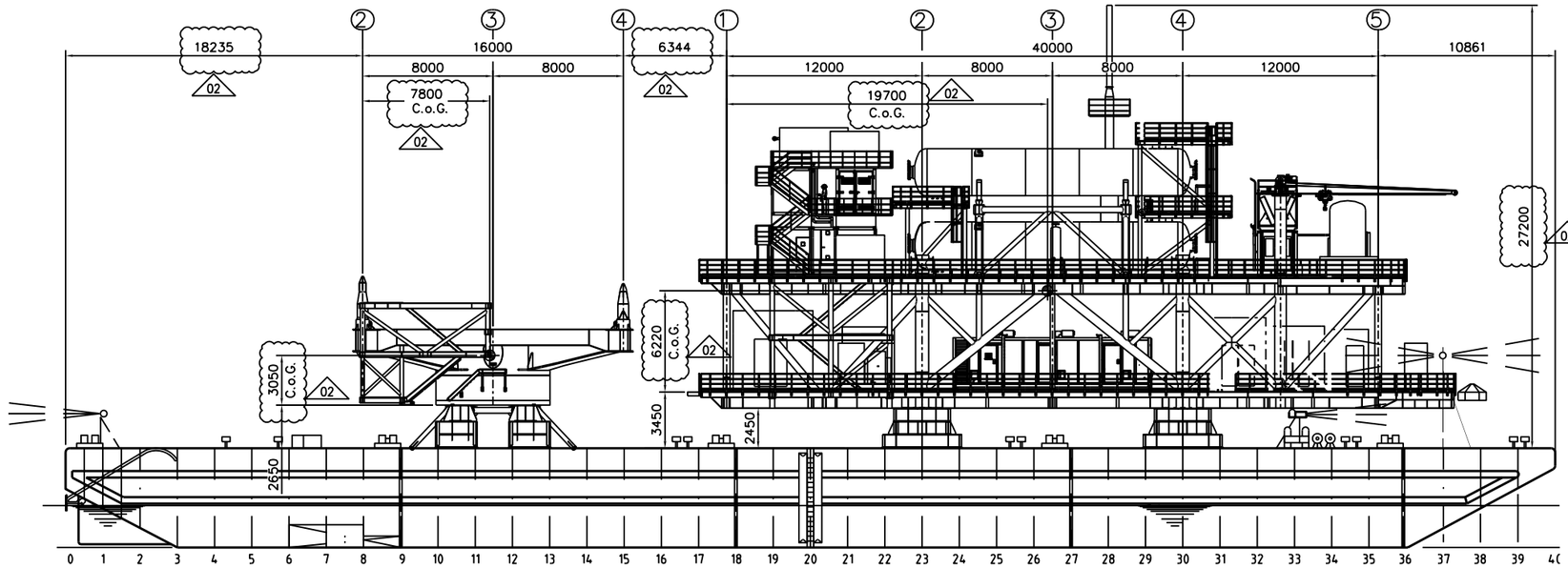
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN S.GRIFFINI	CHECKED A.BALZAROTTI	APPROVED D.LO STERZO	DATE 13/02/25

A1	DRAWING NO. 123A90-DDL-TI-DD-99039	SHEET 001	REV. 02

File Name : 123A90-DDL-TI-DD-99039_02.dwg

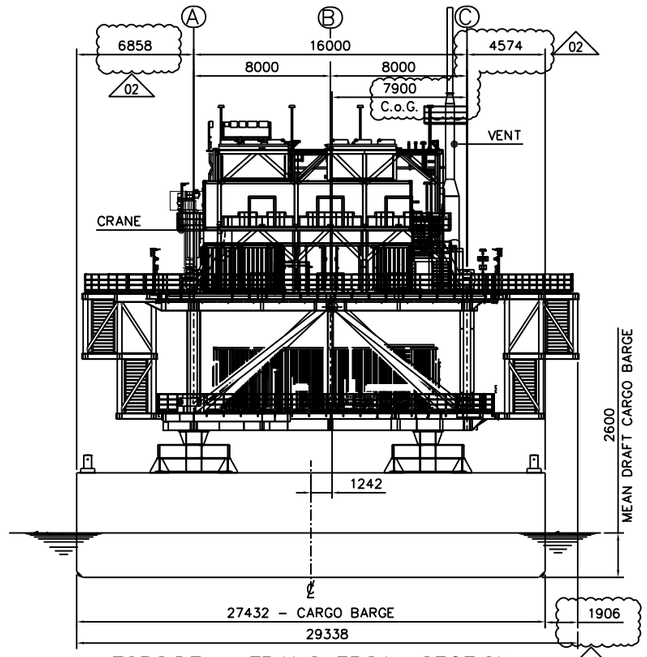
DRAWING NO. 123A90-DDL-TI-DD-99015

REV. 02



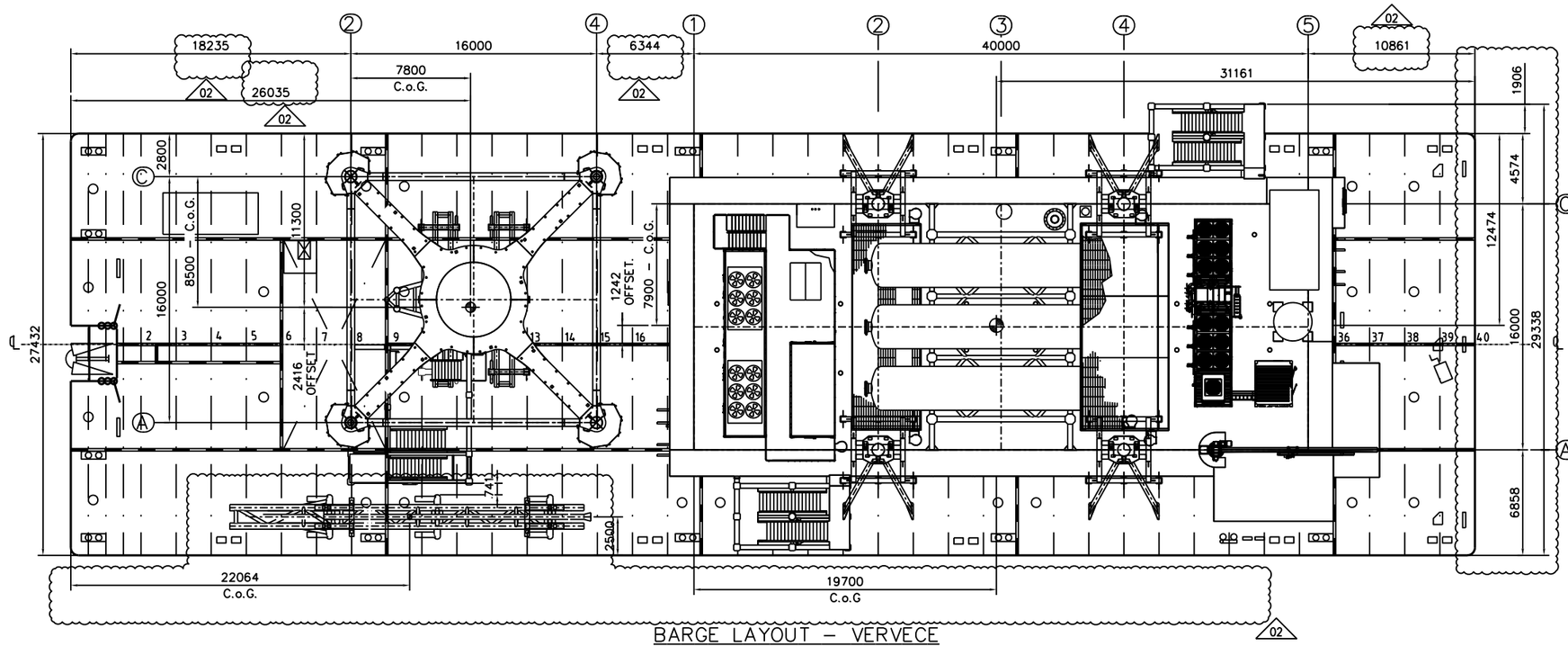
ELEVATION – LONGITUDINAL VIEW

SCALE 1:175



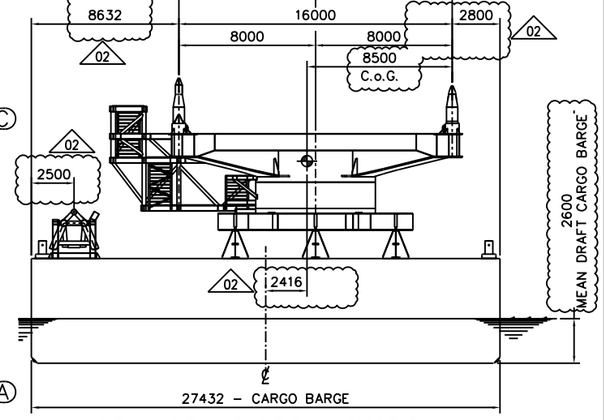
TOPSIDE – TRANSVERSAL SECTION

SCALE 1:175



BARGE LAYOUT – VERVECE

SCALE 1:175



TP – TRANSVERSAL SECTION

SCALE 1:175

VERVECE		
LENGTH	300' 0"	91.440 m
BREADTH	90' 0"	27.432 m
DEPTH	20' 0"	6.096 m

UNIFORM DECK LOAD = 25 T/sqm

CLASS LR+ 100 A1 PONTOON

WELDING WHERE NOT SHOWN : ◺3.5

WEIGHT LIST	
TOPSIDE	= 1802 t
TP	= 290 t
TOPSIDE L.GRILLAGE & SF	= 75 t
TP L.GRILLAGE & SF	= 45 t
CAISSON FRAME	= 26 t
CAISSON GRILLAGE & SF	= 0.5 t

NOTES	HOLDS
1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O. 2 – ALL ELEVATIONS ARE REFERED TO C.D.	

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	26/02/25	SGR	AB	DLS	ACCEPTED FOR CONSTRUCTION (AFC)
01	07/10/24	SGR	AB	DLS	ACCEPTED FOR CONSTRUCTION (AFC)
00	12/01/24	SGR	AB	DLS	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

TITLE : **BASE LOAD POWER HUB (BLPH)**
BARGE LAYOUT

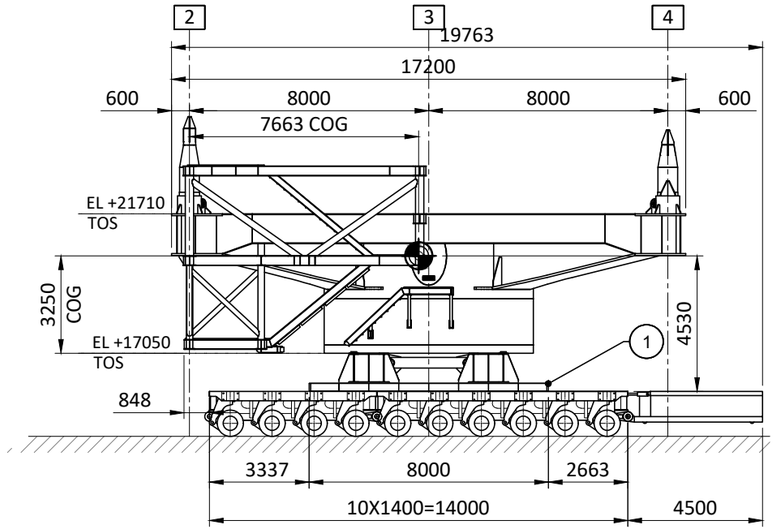
CONTRACT NO./TITLE	CW-1-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK		SCALE 1:175
DRAWN S.GRIFFINI	CHECKED A.BALZAROTTI	APPROVED D.LO STERZO	DATE 26/02/25
A1	DRAWING NO. 123A90-DDL-TI-DD-99015	SHEET 001	REV. 02

File Name : 123A90-DDL-TI-DD-99015_02.dwg

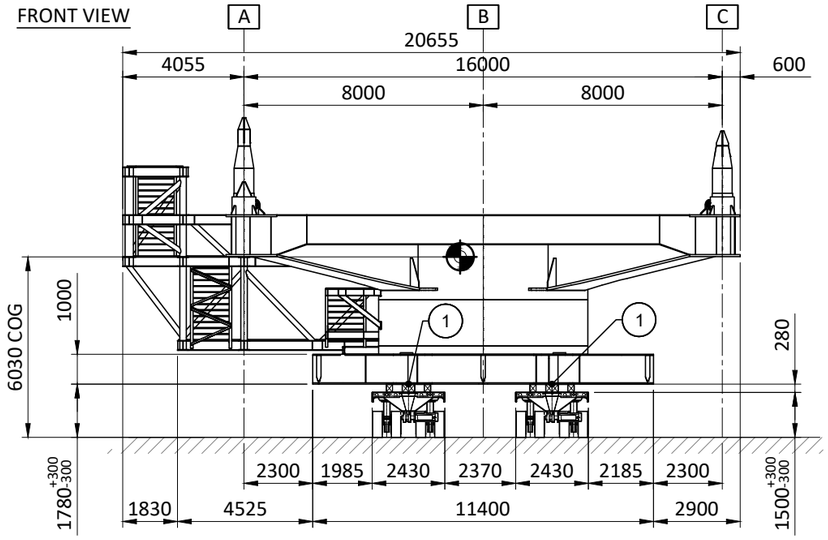
11.2 Fagioli drawings

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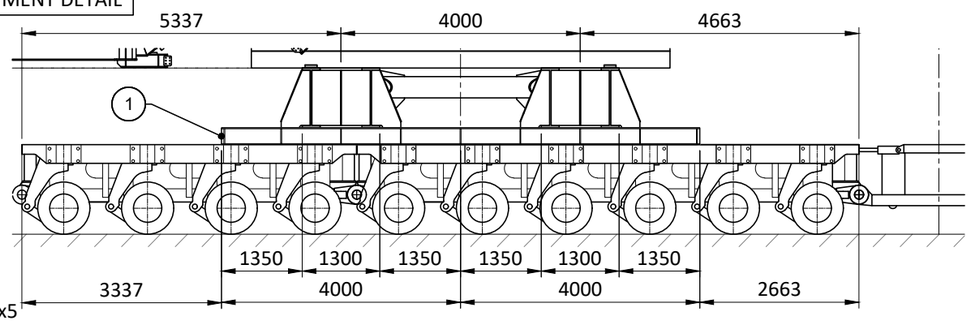
LATERAL VIEW



FRONT VIEW



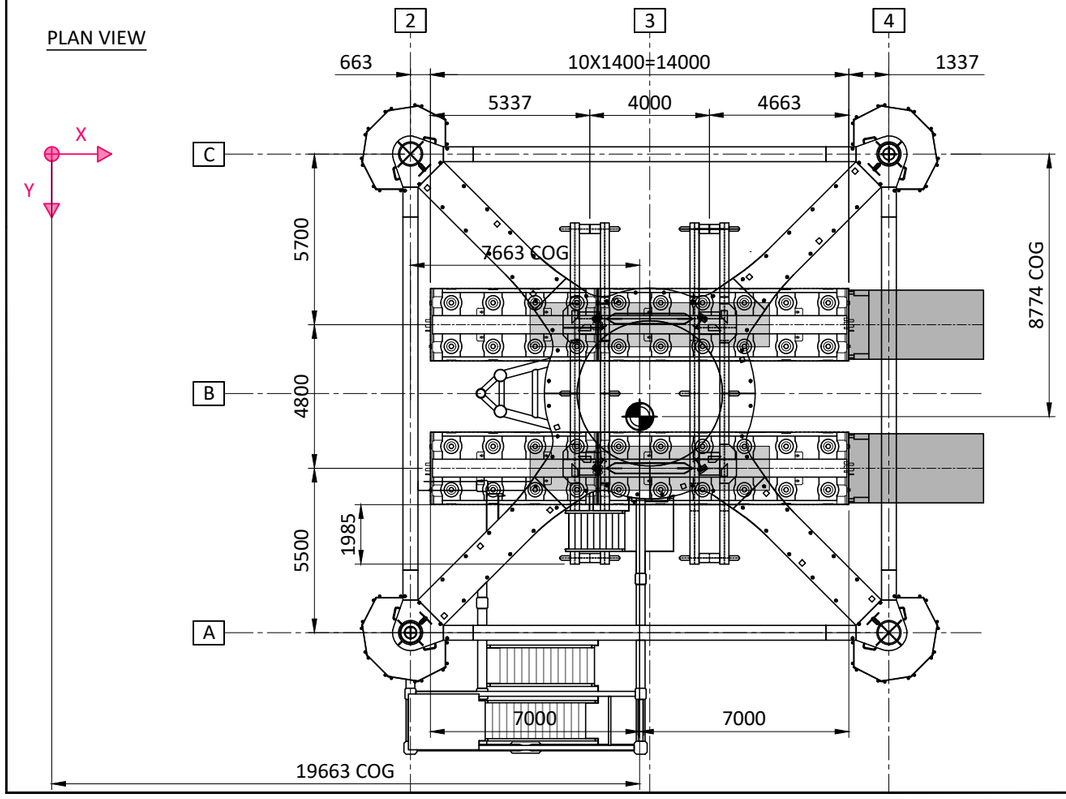
EQUIPMENT DETAIL



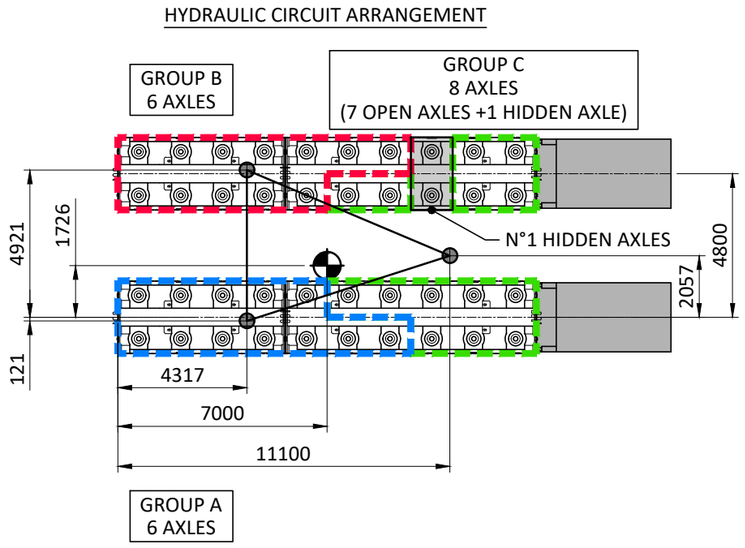
MATERIAL LIST

#	DESCRIPTION	WEIGHT cad. (Kg)	Q.TY TOT
1	SPREADER MAT SM.03 4000x1480x280 mm	4000.0	2
	TOTAL WEIGHT (Kg)		8000.0

PLAN VIEW



HYDRAULIC CIRCUIT ARRANGEMENT

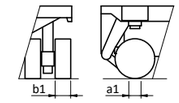


TRANSPORT CONFIGURATION: 20 AXLES

ITEM weight (contingency included)			**254,5 t**
SPMT dead weight			99 t
EQUIPMENT weight			8 t
TOTAL weight			361,5 t
		BASE VALUES	**MAX VALUES**
Group A 6 AXLES	Weight per axles	22,8 t	24,0 t
	Capacity per axles	36,0 t	36,0 t
	Cylinder pressure	155 bar	164 bar
	Contact pressure under the wheel	7,7 kg/cm²	7,9 kg/cm²
	Average Ground pressure	6,7 t/m²	7,1 t/m²
Group B 6 AXLES	Weight per axles	13,7 t	15,0 t
	Capacity per axles	36,0 t	36,0 t
	Cylinder pressure	89 bar	98 bar
	Contact pressure under the wheel	5,8 kg/cm²	6,2 kg/cm²
	Average Ground pressure	4,0 t/m²	4,4 t/m²
Group C-D 8 AXLES (1 Hidden Axles)	Weight per axles	20,4 t	21,2 t
	Capacity per axles	36,0 t	36,0 t
	Cylinder pressure	138 bar	143 bar
	Contact pressure under the wheel	7,3 kg/cm²	7,4 kg/cm²
	Average Ground pressure	6,0 t/m²	6,2 t/m²

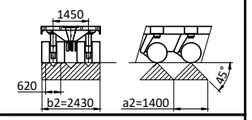
LOCAL WHEEL BEARING AREA [a1xb1] = $[\frac{P}{(n*p)}]$

where P = weight per axle (kg)
n = number of wheels for axle (4)
p = contact pressure under the wheel (kg/cm²)



GLOBAL LOADED AREA BELOW CONVOY [a2xb2] = $[\frac{P}{p2}]$

where P = weight per axle (kg)
p2 = average ground pressure (kg/cm²)



OPERATIONAL PARAMETERS:
- MAX TRAVELING SPEED: 0.5 km/h
- MAX OPERATIONAL WIND SPEED : 16.0 m/s
- MINIMUM REQUIRED GROUND BEARING CAPACITY: 10.0 t/m²
- THE GROUND SHALL BE COMPACTED AND LEVELED. MAX SLOPE:1%
- ALLOWABLE TRANSVERSE INCLINATION OF CONVOY(OUT OF VERTICALITY): 1°
- ALLOWABLE LONGITUDINAL INCLINATION OF CONVOY (OUT OF VERTICALITY):1°
- AXLES PRESSURE SHALL BE CONTINUOUSLY CHECKED, ACTING ON THE HYDRAULIC SYSTEM TO COMPENSATE ANY DEVIATION RESPECT TO THE EXPECTED VALUES. USE WATER LEVEL TO CHECK SPMT OUT OF VERTICALITY .

NOTE:
1. MODULE WEIGHT: 254.5 t (NET WEIGHT +3 % CONT. INCLUDED).
2. MODULE WEIGHT AND COG AS PER CLIENT DOCUMENT: 123A90-DDL-ST-DA-90087 (Last Rev)
3. MAX VALUES INCLUDE ALL THE EFFECTS SUCH AS WIND, OUT OF VERTICALITY, COG ENVELOPE.
4. TIPPING ANGLE: 9.9°
5. OVERLOAD ANGLE: 15.7°
6. PLYWOOD OR RUBBER SHEETS SHALL BE POSITIONED BETWEEN ANY STEEL SURFACE IN CONTACT (U.O.N.).
7. LOCAL AND GLOBAL ITEM STRENGHT CHECK BY CLIENT;
8. THE BOTTOM PART OF THE MODULE SHALL BE CLEAR OF OBSTRUCTIONS (PIPES, SECONDARY STRUCTURE).
9. BEFORE MOVING THE TRAILER, CHECK THE HYDRAULIC PRESSURE / AXLE LOAD AND BE SURE THAT THE VALUES ARE EQUAL TO THE THEORETICAL VALUES IN THE TABLE (BASIC VALUES).
10. ITEM TO BE LASHED TO THE TRAILER FRAME AS PER DRAWING. IF NOT SHOWN, LASHING SHALL BE DEFINED BY TRANSPORT SUPERINTENDENT.

Rev.	Descrizione revisione / Description of revision	Data / Date	Disegnato / Drawn by	Controllato / Checked by	Approvato / Approved by
D	FOR APPROVAL	14/07/25	SMG	GG	LG
C	FOR APPROVAL	11/07/25	SMG	GG	LG

FAGIOLI

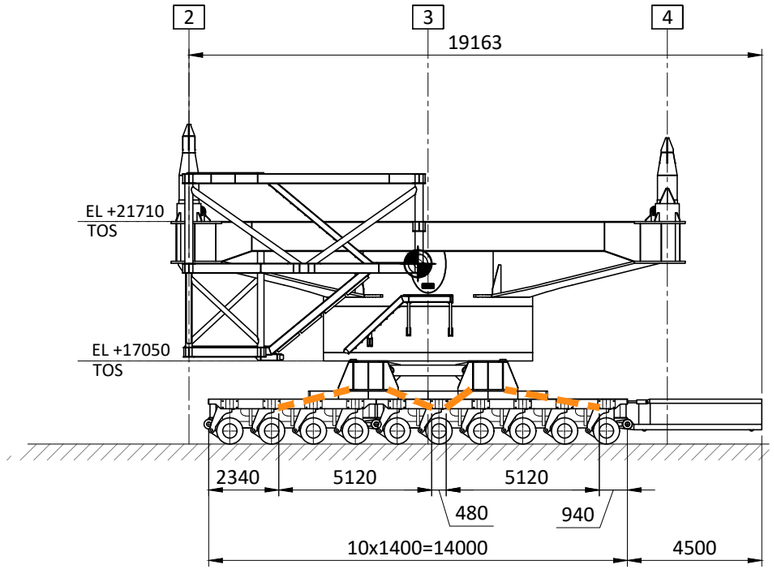
CLIENTE/CUSTOMER: ROSETTI
FAGIOLI AREA: EMEA
DESCRIZIONE COMMESSA/JOB DESCRIPTION: CROSSWIND PROJECT - LOADOUT & WEIGHING TOPSIDE & TP
DESCRIZIONE DISEGNO/DRAWING DESCRIPTION: TP LOADOUT - TRANSPORT DRAWING

NUM. DISEGNO/DRAWING NUMBER	SCALA/SCALE	FORMATO/SIZE	COMMESSA/JOB
030-CRO-DP-02-001	1:200	A3	

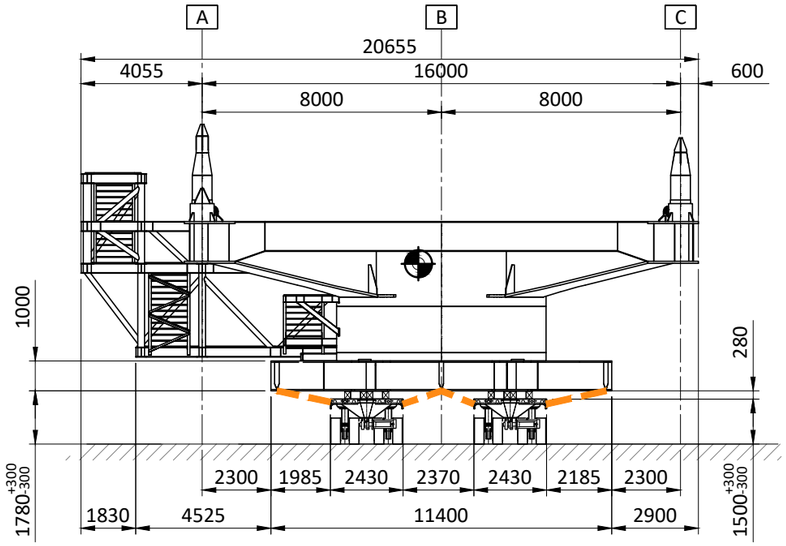
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LASHING LINE DETAILS - SWL 14 t - TYPICAL

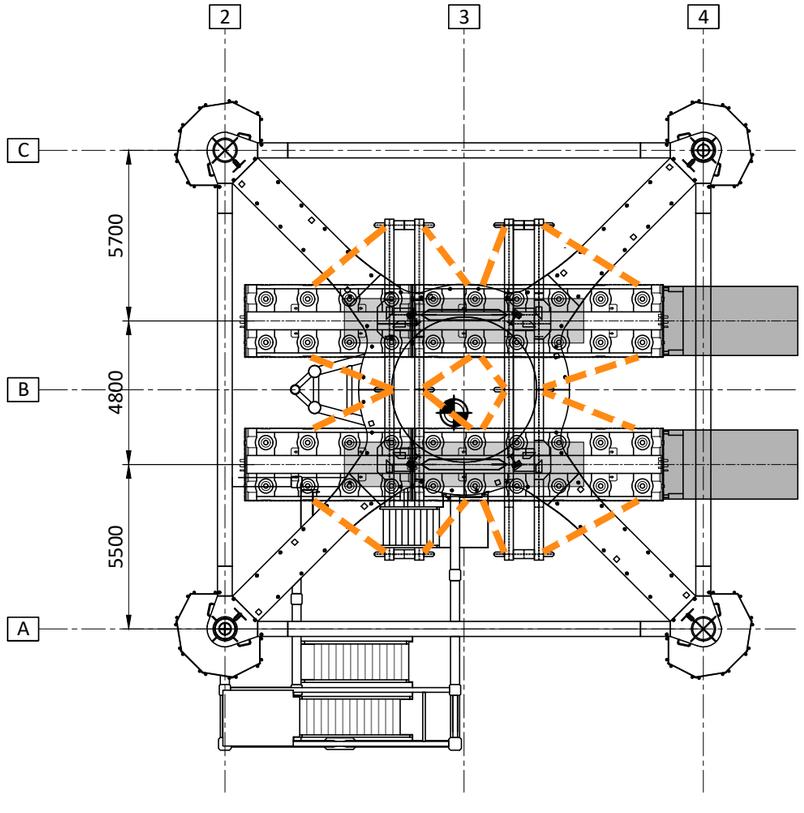
LATERAL VIEW



FRONT VIEW



PLAN VIEW



POS D: HOOK
Lifting: SWL=8t S.F=6
Lashing: SWL=16t S.F=3

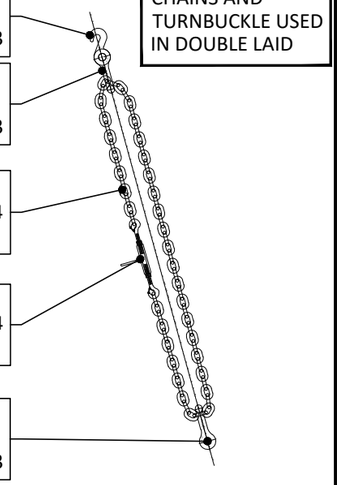
POS A: SHACKLE
Lifting: SWL=9.5t S.F=6
Lashing: SWL=19t S.F=3

POS C: CHAIN Ø13mm
Lifting: SWL=5.3t S.F=4
Lashing: SWL=7t S.F=3

POS B: TURNBUCKLE
Lifting: SWL=5.4t S.F=4
Lashing: SWL=7t S.F=3

POS A: SHACKLE
Lifting: SWL=9.5t S.F=6
Lashing: SWL=19t S.F=3

CHAINS AND TURNBUCKLE USED IN DOUBLE LAID



	LASHING LINE EQUIPMENTS	Q.TY
A	SHACKLE SWL 9.5 t (SF.6 per Lifting) → SWL 19 t (SF.3 per Lashing)	32
B	Turnbuckle for chain Ø13 mm	16
C	CHAIN Ø13 mm SWL 5.3t (SF.4 per Lifting) → SWL 7t (SF.3 per Lashing) USED IN DOUBLE LAID Real lashing line SWL 14.0t-MBL 42.0 t	16
D	HOOK SWL 8t (S.F 6 per Lifting) → SWL 16 t (SF.3 per Lashing)	16

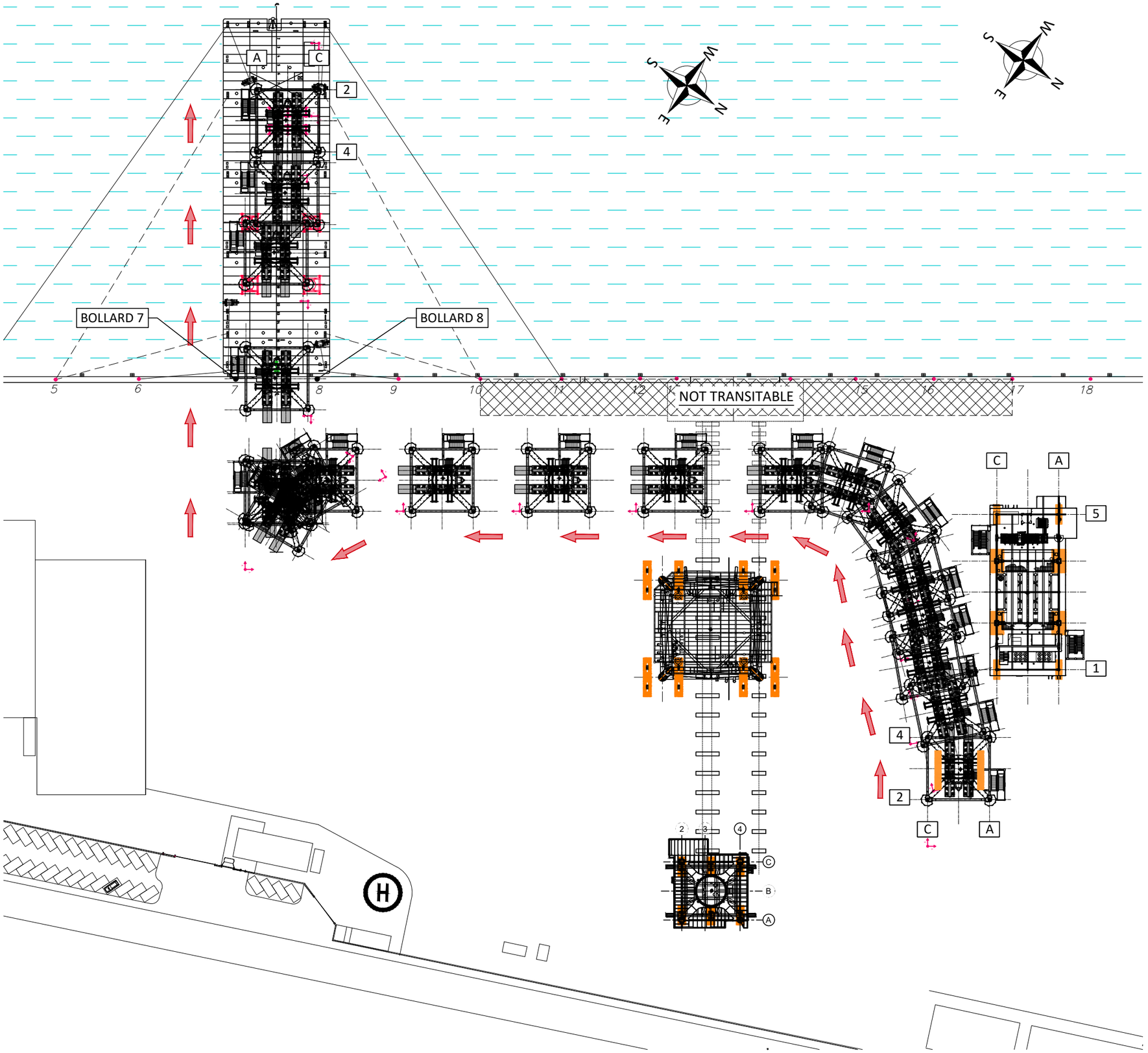
NB:
LASHING LINE CONNECTION TO ITEM CAN BE DONE BY WITH OR WITHOUT HOOK

Rev.	Descrizione revisione Description of revision	Data Date	Disegnato Drawn by	Controllato Checked by	Approvato Approved by
B	FOR APPROVAL	11/07/25	SMG	GG	LG
A	FOR COMMENTS	30/06/25	SMG	GG	LG

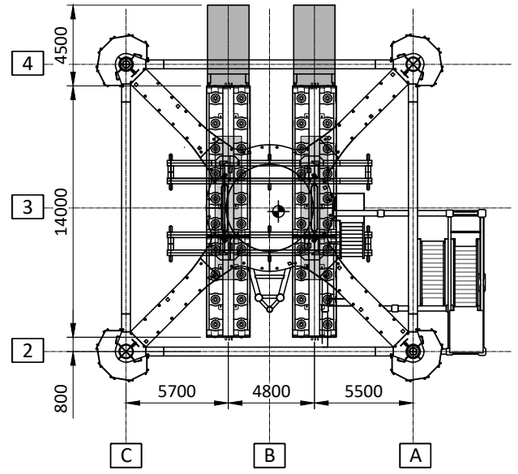
FAGIOLI

CLIENTE/CUSTOMER: ROSETTI
FAGIOLI AREA: EMEA
DESCRIZIONE COMMESSA/JOB DESCRIPTION: CROSSWIND PROJECT
DESCRIZIONE DISEGNO/DRAWING DESCRIPTION: TP - TRANSPORT DRAWING ON ROSETTI YARD - LASHING SYSTEM

NUM. DISEGNO/DRAWING NUMBER	SCALA/SCALE	FORMATO/SIZE	COMMESSA/JOB
030-CRO-DP-02-005	1:200	A3	



TRANSITION PIECE
scale x3



NOTE:

1. FOR TRANSPORT DRAWING SEE DWG:
   030-CRO-DP-02-001 (LAST.REV.)

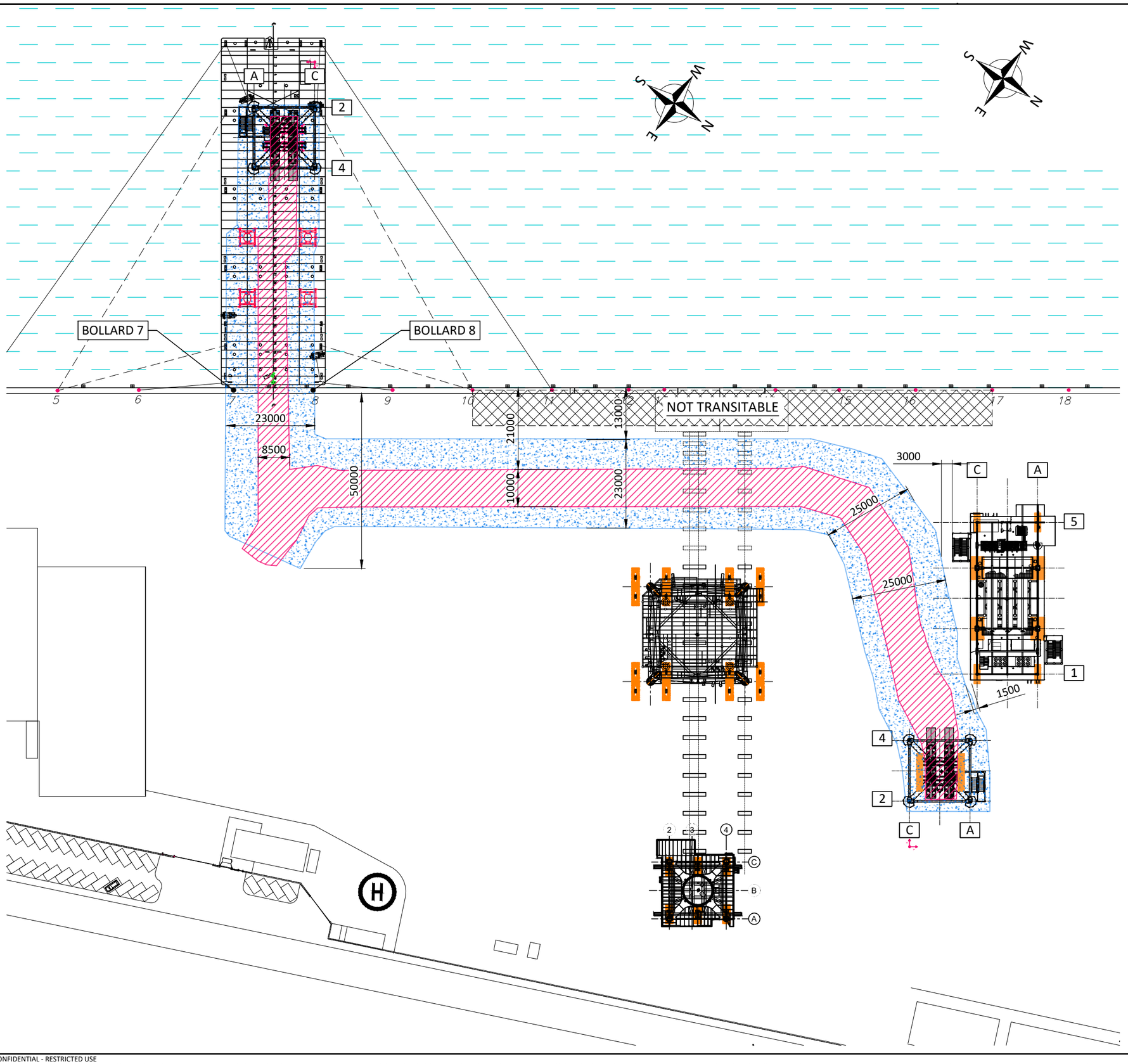
Rev.	Descrizione revisione Description of revision	Data Date	Disegnato Drawn by	Controllato Checked by	Approvato Approved by
A	FOR COMMENT	08/07/25	SMG	GG	LG

FAGIOLI

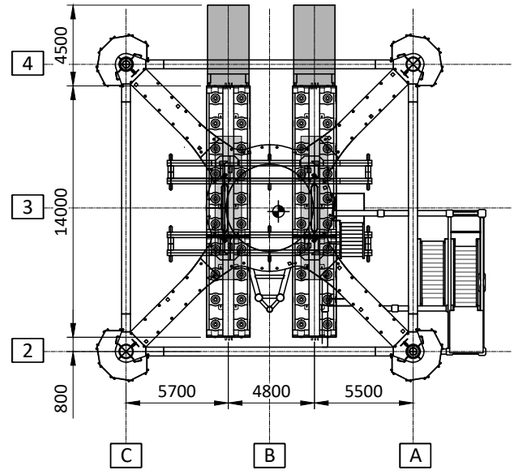
CLIENTE/CUSTOMER: ROSETTI
FAGIOLI AREA: EMEA
DESCRIZIONE COMMESSA/JOB DESCRIPTION: CROSSWIND PROJECT - LOADOUT & WEIGHING TOPSIDE & TP
DESCRIZIONE DISEGNO/DRAWING DESCRIPTION: TP - LOAD OUT TRANSIT CHECK - PLAN VIEW

NUM. DISEGNO/DRAWING NUMBER	SCALA/SCALE	FORMATO/SIZE	COMMESSA/JOB
030-CRO-DP-02-101	1:1000	A3	

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TRANSITION PIECE
scale x3



LEGEND

TRAILER AREA

ITEM AREA

NOTE:

1. FOR TRANSPORT DRAWING SEE DWG: 030-CRO-DP-02-001 (LAST.REV.)

Rev.	Descrizione revisione / Description of revision	Data / Date	Disegnato / Drawn by	Controllato / Checked by	Approvato / Approved by
A	FOR COMMENT	08/07/25	SMG	GG	LG

FAGIOLI

CLIENTE/CUSTOMER: ROSETTI

FAGIOLI AREA: EMEA

DESCRIZIONE COMMESSA/JOB DESCRIPTION: CROSSWIND PROJECT - LOADOUT & WEIGHING TOPSIDE & TP

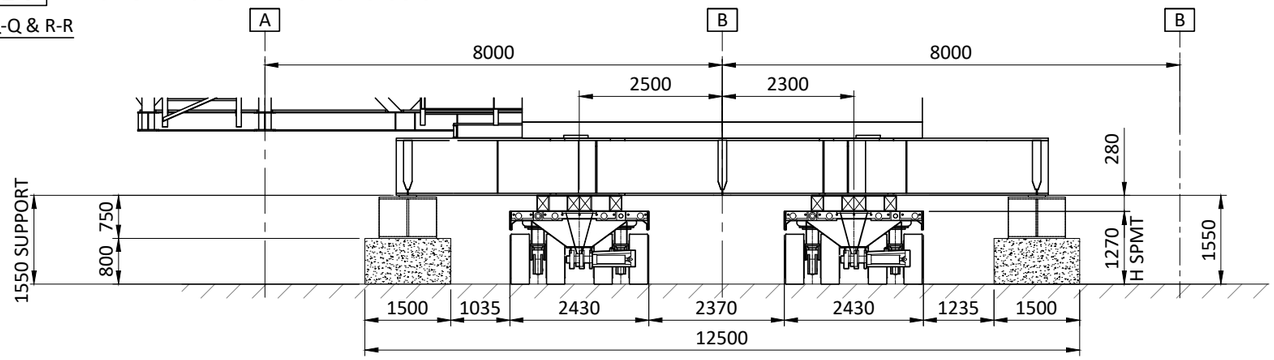
DESCRIZIONE DISEGNO/DRAWING DESCRIPTION: TP- LOAD OUT TRANSIT CHECK - AREAS TO BE REQUIRED

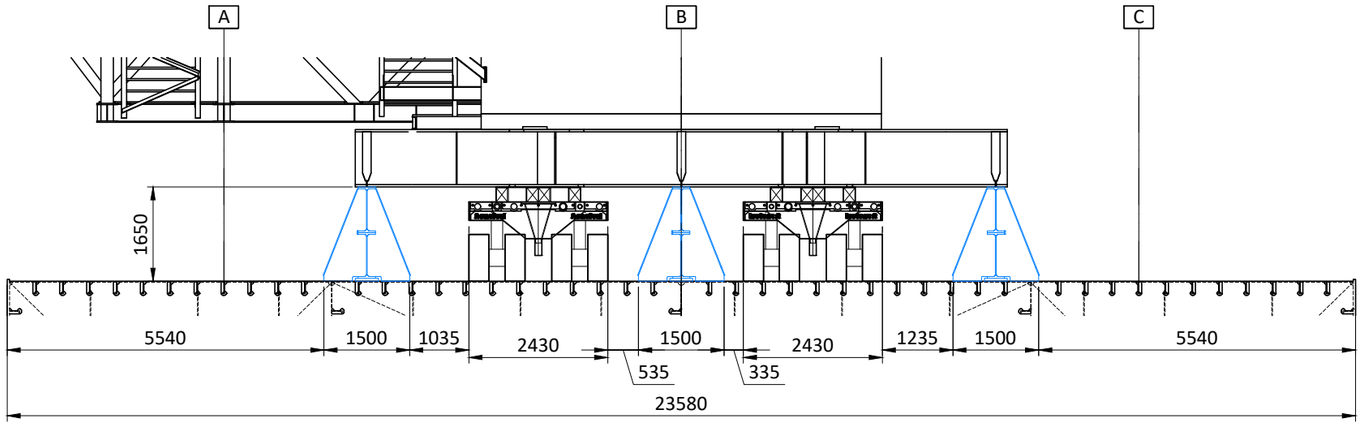
NUM. DISEGNO/DRAWING NUMBER	SCALA/SCALE	FORMATO/SIZE	COMMESSA/JOB
030-CRO-DP-02-102	1:1000	A3	

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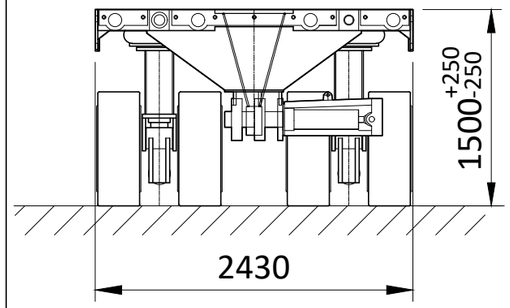
PHASE 1 TRANSITION PIECE ON FABRICATION STOOLS

VIEW Q-Q & R-R

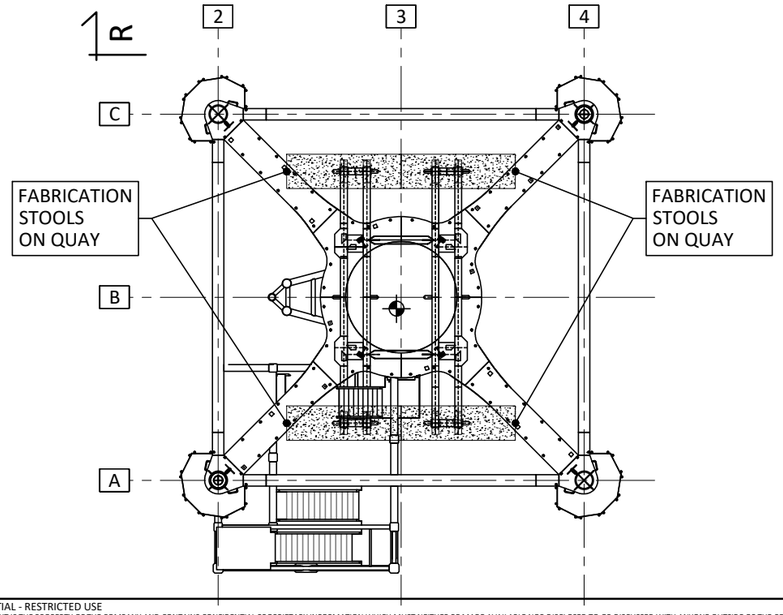




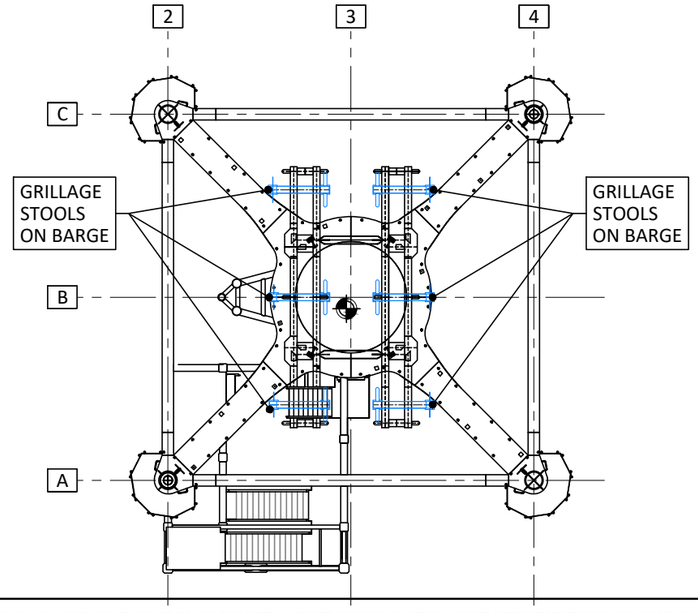
SPMT STROKE



REFERENCE PLAN WITH FABRICATION STOOLS
scale:4



REFERENCE PLAN WITH GRILLAGE BEAMS
scale:4



NOTE:

1. FOR TRANSPORT DRAWING SEE DWG:
   030-CRO-DP-02-001 (LAST.REV.)
2. FOR LOAD OUT MANOUVERING SEE DWG:
   030-CRO-DP-02-101÷102 (LAST.REV.)

Rev.	Descrizione revisione Description of revision	Data Date	Disegnato Drawn by	Controllato Checked by	Approvato Approved by
A	FOR COMMENT	30/06/25	SMG	GG	LG

FAGIOLI

CLIENTE/CUSTOMER	ROSETTI
FAGIOLI AREA	EMEA
DESCRIZIONE COMMESSA/JOB DESCRIPTION	CROSSWIND PROJECT
DESCRIZIONE DISEGNO/DRAWING DESCRIPTION	TP - SPMT ELEVATION AT OPERATIVE PHASES

NUM. DISEGNO/DRAWING NUMBER	SCALA/SCALE	FORMATO/SIZE	COMMESSA/JOB
030-CRO-DP-02-200	N.A.	A3	

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11.3 SPMT stability check

SPREADSHEET NR.	SSH-SPMT-001		
REV.	7	DATE	24/07/2024
PREP.	ACL	APPR.	LG

SELF PROPELLED MODULAR TRAILER
AXLE LOADS AND STABILITY CALCULATION

FAGIOLI

PROJECT	CROSSWIND	ITEM	TP	DATE	11/07/2025
CLIENT	ROSETTI			PREP.	SMG
DOC. N.	030-CRO-SSH-02-001	REV.	c	APPR.	LG

DATA SUMMARY

Item weight	254,5 t
Convoy weight	99,0 t
Equipment weight	8,0 t
Total weight	361,5 t
Max convoy speed	0,5 km/h
Axles	20
Open axles	20
Hidden axles	0
Wind speed	16,0 m/s
Wind action height	6,0 m
Shape factor	1,5
Transversal area	100,0 m²
Longitudinal area	100,0 m²

TRAILER DATA

	Group A	Group B	Group C/D
Type	MSPE 48 t	MSPE 48 t	MSPE 48 t
Axle weight	4,2 t	4,2 t	4,2 t
Open axles	5,0	5,0	10,0
Hidden axles	0,0	0,0	0,0
x	0 mm	0 mm	4800 mm
y	0 mm	7000 mm	3500 mm

Global CoG

Weight	X	Y	Z
254,5 t	1726 mm	3500 mm	6030 mm

STABILITY CHECK

Allowable stability angle	7,0 °
Tipping angle	16,0 °
Safety factor	2,3
Check	OK

Overload angle

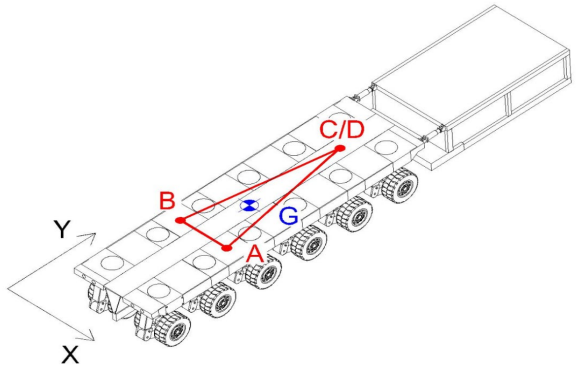
26,0 °

STRENGTH CHECK - BASE CASE (NO WIND, NO COG ENVELOPE, NO OUT OF VERTICALITY)

Group	Axle load	Capacity	Check	Cylinder pressure	Average Ground pressure	Tyres Ground pressure
Group A	21,6 t	48,0 t	OK	128 bar	6,4 t/m²	7,5 kg/cm²
Group B	21,6 t	48,0 t	OK	128 bar	6,4 t/m²	7,5 kg/cm²
Group C/D	14,5 t	48,0 t	OK	84 bar	4,3 t/m²	6,0 kg/cm²

STRENGTH CHECK - MAX CASE (WIND, COG ENVELOPE, OUT OF VERTICALITY)

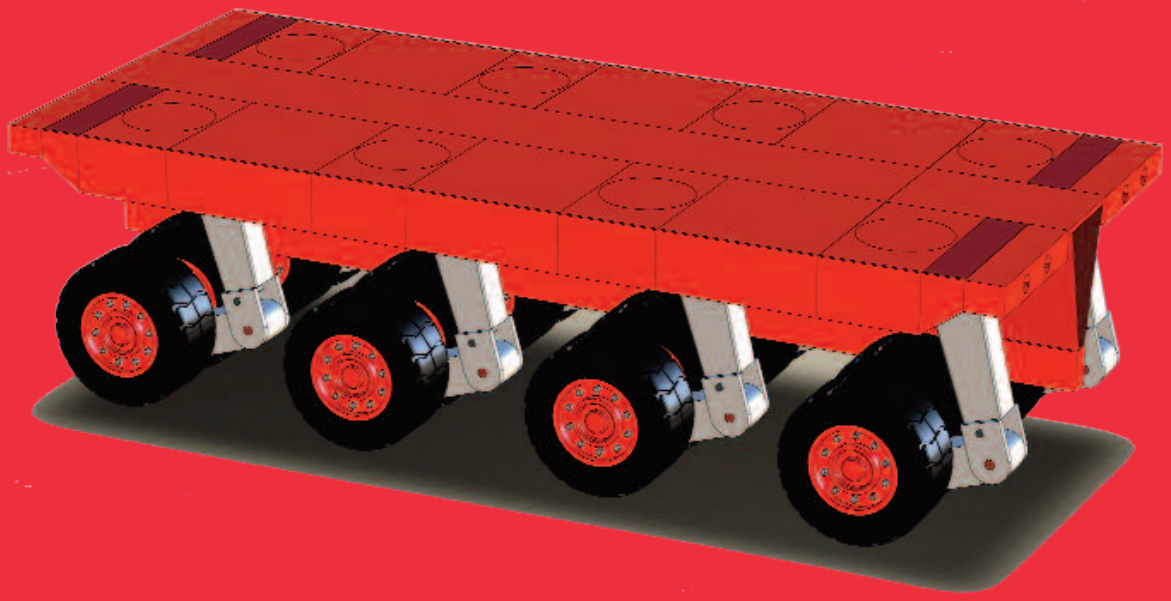
Group	Axle load	Capacity	Check	Cylinder pressure	Average Ground pressure	Tyres Ground pressure
Group A	23,1 t	48,0 t	OK	137 bar	6,8 t/m²	7,8 kg/cm²
Group B	23,1 t	48,0 t	OK	137 bar	6,8 t/m²	7,8 kg/cm²
Group C/D	15,4 t	48,0 t	OK	89 bar	4,5 t/m²	6,2 kg/cm²



11.4 SPMTs data sheet

FAGIOLI

SPMTs (36 - 40 - 50 - 60 TON)





TECHNICAL BROCHURE

SPMTs - OVERVIEW

Self-propelled modular transporters (SPMT's) are multi-axle trailers designed for the transportation of large and heavy cargoes. The SPMT's are designed in **modular construction** and can be coupled side to side and end to end.

The SPMT's consist of a very strong and rigid chassis, which also acts as a load-carrying platform to which wheel bogies are attached in pairs to form the required length of transporter.

Each wheel bogie consists of two rubber tyres wheels and is rigidly fixed to the chassis by a hinged elbow joint, which is supported on hydraulic rams. This hydraulic ram acts as the suspension for the SPMT and also provides the lifting capability. Attached to the end of the SPMT is a Diesel driven power pack, which provides hydraulic power to the various functions of the SPMT.

The SPMT is propelled by **hydraulic drive motors**, which are mounted on the axles of the SPMT. Hydraulic power is supplied from a pump on the power pack to each of the drive motors and speed is controlled via a remote hand operated portable console. Forward and reverse travel is achieved by reversing the flow of hydraulic oil to the drive motors.

Speed of the driven axle is controlled by flow regulators, which prevent over-speed of the wheels occurring. Normal operating speed of the SPMT's is 5 km/hr, but may vary depending on the load and configuration.

The **steering** of the SPMT's offers major advantages over other forms of conventional hydraulic trailers. The steering is controlled by electro-hydraulic motors rather than by a series of mechanical steering rods.

Each of the axles of the transporter moves independently and are monitored and controlled by the computerised control system of the transporter. This offers total flexibility of steering options with each wheel bogie able to swing through 260o (+130°). The position of each wheel is controlled electronically through the remote operations console and nine steering programs are available. The electronic steering control can be utilised for a group of two or more SPMT's to ensure that all wheel bogies of all the transporters act together and turn about a single point.

A hydraulic cylinder supports each of the wheel bogies. The cylinders on each bogie can be linked hydraulically to the other wheel bogie cylinders to form groups, this allows free flow of hydraulic fluid between each hydraulic ram allowing the SPMT to negotiate uneven ground, cambers and gradients whilst maintaining equal loading in each hydraulic ram within that group.

To link all hydraulic rams on a single trailer would result in an unstable transporter bed with no control. The SPMT is normally split hydraulically into three separate hydraulic groups (A three-point suspension) that can be controlled individually from the main power unit.

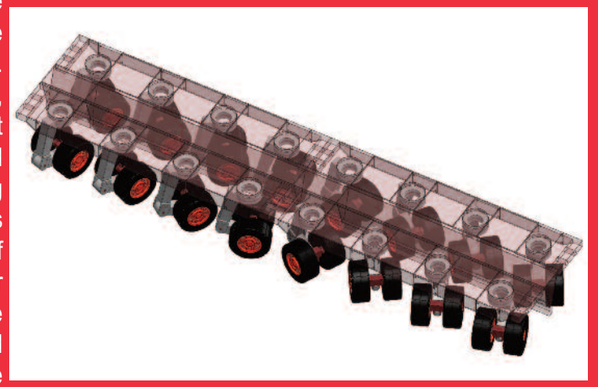


SPMTs - TECHNICAL DATA

As the SPMT negotiates uneven ground, or gradients the hydraulic fluid will free flow within each suspension to maintain equal loading within each suspension group. Addition hydraulic fluid can be can be pumped from the Power Unit (PPU) into or out of each cylinder group to adjust the level of the SPMT.
Systematic and controlled pumping of hydraulic fluid into or out of each suspension can raise or lower the transporter bed +300mm from the normal running height of 1500mm.
Control of the elevation of the transporter is through the hand operated remote console. Safety valves protect the hydraulic circuit so that the transporter platform does not collapse in the unlikely event of hydraulic failure. The SPMT's are equipped with an electro-hydraulic braking system with hydraulically activated spring loaded brake cylinders installed in the wheel hubs. The brakes are controlled through the hand operated remote console. Hydraulic pressure supplied to the brake cylinders pre-loads the brakes and any reduction in this hydraulic pressure will activate the brakes via a mechanical spring; the braking force that results is in proportion to the reduction in hydraulic pressure. In the event of failure of the diesel power pack, hydraulic pump, electronic control system, or other controlling equipment causing a loss in hydraulic pressure, the brakes will be applied automatically through the spring mechanism. The load carrying capacity of a transporter platform (or group of platforms) is directly proportional to the number of axle line. The capacity of each axle line varies from 36 up to 60 ton gross. A transporter convoy, composed of transporter units and power packs can be controlled by a single operator by means of the hand operated remote console. All units are both CE and TUV certified and are provided with identification plates that allow them to be driven on public roads.



COMPENSATION BY HYDRAULIC SYSTEM IN CASE OF UNEVEN GROUND



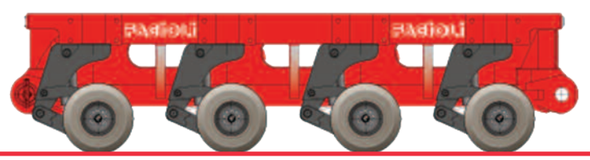
STEERING CAPABILITY

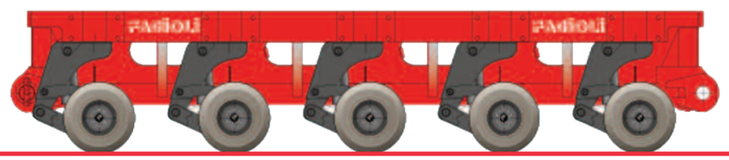


SPMTs					
		36	36	40	40
DETAILS	AXLE LINES	4	6	4	6
	SUSPENSIONS	8 (4 of which driven)	12 (4 or 6 of which driven)	8 (4 of which driven)	12 (4 or 6 of which driven)
	TYRES TYPE	215/75 R 17.5" (4 per suspension) 355/65-15 PR 24 IC 40	215/75 R 17.5" (4 per suspension) 355/65-15 PR 24 IC 40	355/65 Pr24 IC40 (2 per suspension) 355/65-15 24 Pr	355/65 Pr24 IC40 (2 per suspension) 355/65-15 24 Pr
	LOAD PER AXLE LINES	36 ton	36 ton	40 ton	40 ton
	GROSS WEIGHT	up to 146.4 ton	up to 219.6 ton	160 ton	240 ton
	DEAD WEIGHT	up to 18 ton approx.	up to 24 ton approx.	up to 18 ton approx.	up to 24 ton approx.
	PAYLOAD CAPACITY	up to 130 ton approx.	up to 195.6 ton approx.	up to 143.5 ton approx.	up to 216 ton approx.
	PLATFORM HEIGHT	1350 + 380 - 220 mm 1500 +/- 350 mm	1350 + 380 - 220 mm 1500 +/- 350 mm	1500 +/- 350 mm	1500 +/- 350 mm
	PLATFORM DIMENSIONS	5920 x 2430 mm	8720 x 2430 mm	5600 x 2430 mm	8400 x 2430 mm
	INTER-AXLE	1400 mm			

SPMTs - TECHNICAL DATA

SPMTs					
		50	50	60	60
DETAILS	AXLE LINES	4	6	4	5
	SUSPENSIONS	8 (4 of which driven)	12 (4 or 6 of which driven)	8 (4 of which driven)	10 (5 of which driven)
	TYRES TYPE	H37x14-15 24Pr TUBELESS	H37x14-15 24Pr TUBELESS	33,5x11,25-15 26Pr TUBELESS	33,5x11,25-15 26Pr TUBELESS
	LOAD PER AXLE LINES	50 ton	50 ton	60 ton	60 ton
	GROSS WEIGHT	200 ton	300 ton	240 ton	300 ton
	DEAD WEIGHT	17,5 ton	25,5 ton	19,1 ton	23,5 ton
	PAYLOAD CAPACITY	182,5 ton	274,5 ton	220,9 ton	276,5 ton
	PLATFORM HEIGHT	1540 +/- 350 mm	1540 +/- 350 mm	1460 +/- 300 mm	1460 +/- 300 mm
	PLATFORM DIMENSIONS	5600 x 2430 mm	8400 x 2430 mm	5600 x 2430 mm	7000 x 2430 mm
	INTER-AXLE	1400 mm			



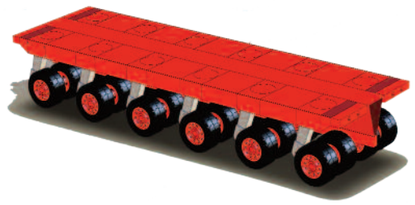




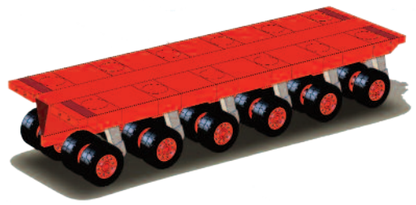
SPMTs - TECHNICAL DATA



STEERING

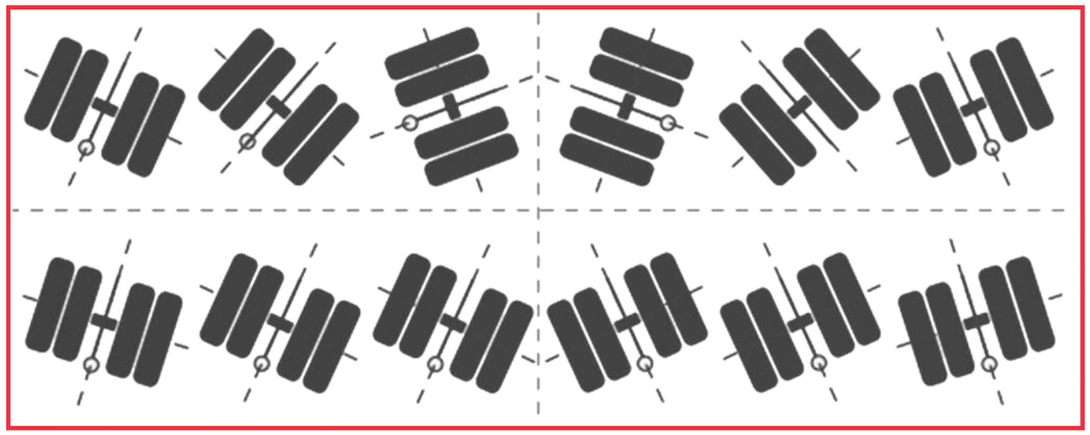


CAPABILITY

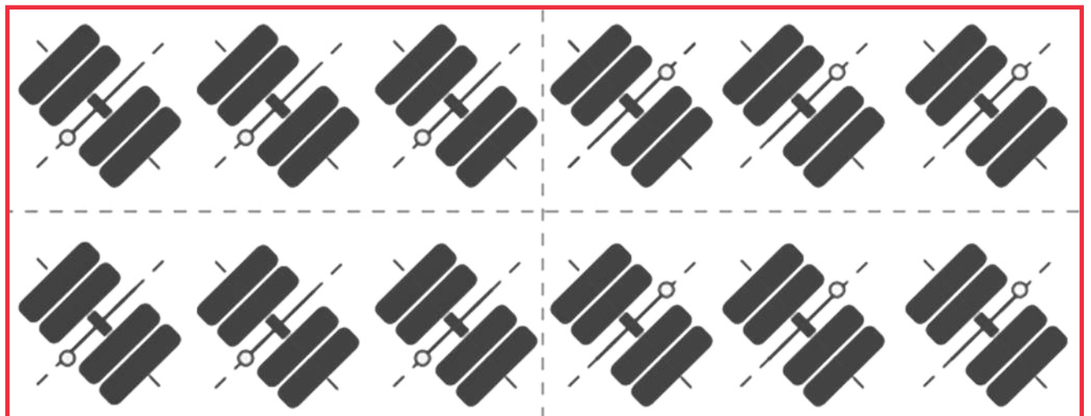




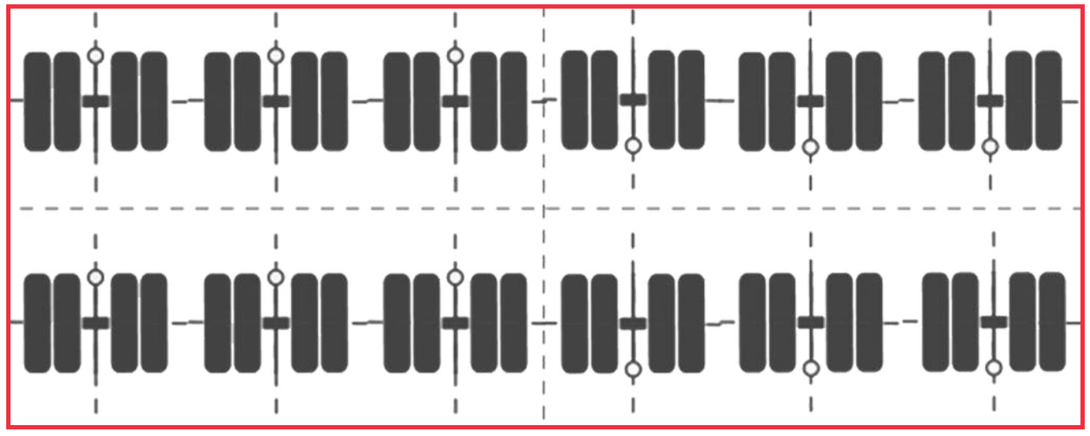
NORMAL DRIVE



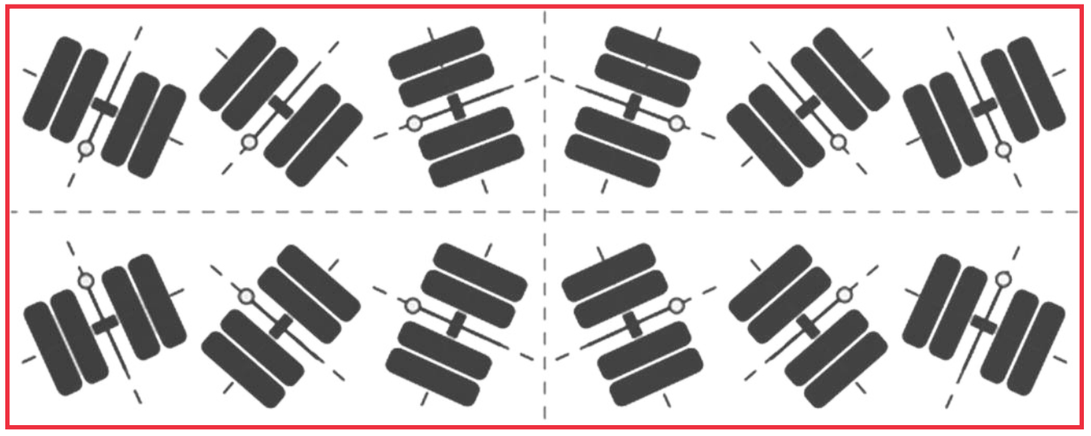
DIAGONAL DRIVE



LATERAL DRIVE



CIRCULAR DRIVE



SPMTs - TECHNICAL DATA

POWER PACK UNITS (PPU's)	SMALL	BIG
Length	2,420 mm	4,450 mm
Width	2,330 mm	2,330 mm
Height	1,100 mm	1,600 mm
Weight	3.8 ton	6.9 ton
Engine Capacity	100 HP	320 HP

•Power pack units (PPU's) can be attached to either (or both) universal and bolt end couplings to supply power for hydrostatic self-propulsion, hydraulic axle support lift and lower system, VD-steering, hydraulic brake system and for supply of the electric/electronic systems.

•Distribution gear and hydraulic axial piston pump with variable displacement for the various working systems. Hydrostatic propulsion, lift/lower system, steering and brake system and distribution gear flanged directly to the diesel engine with hydraulic axial piston pump.

•Hydraulic oil tank (approx. 7001 tr) designed for the operation with extended combinations. Tank designed in stainless steel.

•Diesel fuel tank with a volume of approximately 4001.

•PPU's hydraulically adjustable on the coupling side, which is advantageous for barge operations.

•Four adjustable landing gear, lifting eyelets for crane loading as well as lashes for forklift operation.

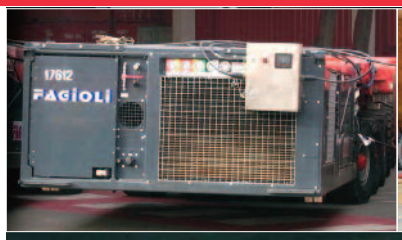
•PPU's completely covered. System connection lines for direct longitudinal coupling as well as side connection for the PPU's in a compound operation.

•Operating and control instruments arranged and protected in the terminal box.

•PPU's completely equipped and ex-works tested.

•Electronic throttle control of the single PPU as well as control of the PPU's in a compound. In addition, manually actuated accelerator for emergency operation.

•Engine Power up to 355 kW









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11.5 Fagioli SPMT's check list

FAGIOLI	**SPMT SITE CHECKLIST** *CHECK LIST DI CANTIERE PER SPMT*	STCH-SPMT-01	Revision / *Revisione*:	0
			Date / *Data*:	01.06.18

Project: *Progetto:*		**Serial No. / Plate:** *N° Seriale / Targa:*		**Location:** *Luogo:*	
Client: *Cliente:*		**Date:** *Data:*		**Time:** *Ora:*	

Check: *Controlli:*	**Ok** *Ok*	**No** *No*	**N/A** *N/A*	**Remarks:** *Osservazioni:*
PPU – Power Pack Unit				
1. Confirm check workshop maintenance completed *Conferma check list manutenzione d'officina completata*				Ask for a copy at the workshop maintenance *Chiedere copia ad officina*
2. Check integrity of lifting points *Controllare integrità punti di sollevamento*				
3. Check control and signalling elements working properly *Verificare il corretto funzionamento degli elementi di controllo e segnalazione*				
4. Check buzzer working properly *Verificare il corretto funzionamento del segnalatore acustico*				
5. Check emergency stop switches working properly *Verificare il corretto funzionamento degli interruttori di arresto di emergenza*				
6. Check display working properly *Verificare il corretto funzionamento del Display*				
7. Check engine oil level *Verificare il livello di riempimento dell'olio motore*				Topping up engine oil, if necessary *Eventualmente rabboccare*
8. Check cooling system for damage or leaks *Verificare che il sistema di raffreddamento non presenti danni o perdite*				
9. Check that front of radiator panels is not obstructed and is not dirty *Verificare che il fronte dei pannelli radiatori non sia ostruito e non sia sporco*				
10. Check cooling filling level *Controllare il livello di riempimento del fluido refrigerante*				Check only when the engine is cold and if necessary, always top up with cold engine *Controllo solo a motore freddo ed eventualmente rabboccare sempre a motore freddo*
11. Check integrity and correct connection of the engine air manifolds *Controllare integrità e corretta connessione collettori aria motore*				
12. Check that hydraulic connections, rigid and flexible hydraulic pipes are not damaged or leaking *Verificare che i collegamenti idraulici, i tubi idraulici rigidi e flessibili non presentino danneggiamenti o perdite*				
13. Check that pumps and valves are not damaged or leaking *Verificare che pompe e valvole non presentino danneggiamenti o perdite*				
14. Check that hydraulic tank is not damaged or leaking *Verificare che il serbatoio idraulico non presenti danneggiamenti o perdite*				
15. Check oil level in the hydraulic tank *Verificare il livello dell'olio nel serbatoio idraulico*				Oil level in the hydraulic tank must be at "Max" indication with SPMT floor completely lowered, topping up if necessary *A pianale completamente abbassato il livello di riempimento del serbatoio idraulico deve essere in corrispondenza dell'indicazione "Max", eventualmente rabboccare*
16. Check that diesel engine belts are taut and not worn or damaged *Verificare che le cinghie del motore diesel siano tese e non usurate o danneggiate*				Check, tighten or replace the belts with the engine switched off and reassemble any disassembled protections *Controllare, tendere o sostituire le cinghie a motore spento e rimontare le protezioni eventualmente smontate*
17. Check that fuel tank is not damaged or leaking. *Verificare che il serbatoio del carburante non presenti danneggiamenti o perdite*				
18. Check fuel level in the fuel tank *Verificare il livello di carburante nel serbatoio carburante*				Topping up, if necessary *Eventualmente rabboccare*
19. Check tightness of all fuel pipes *Controllo della tenuta di tutti i tubi carburante*				
20. Check for any damage or leaks to hydraulic filter *Verificare l'eventuale presenza di danni o perdite al filtro idraulico*				
21. Check compressed air tank *Controllare il serbatoio dell'aria compressa*				If necessary, drain air tanks *Eventualmente drenare i serbatoi aria*
22. Check functioning of the PPU lighting *Verificare funzionamento illuminazione PPU*				If necessary, replace the faulty bulbs *Eventualmente sostituire le lampadine difettose*
23. Check that power lines and fittings are not damaged or incorrectly connected *Controllare che le linee elettriche ed i raccordi non presentino danneggiamenti o errate connessioni*				

Check: *Controlli:*	**Ok** *Ok*	**No** *No*	**N/A** *N/A*	**Remarks:** *Osservazioni:*
24. Verify that Use and Maintenance Manual is available at site *Verificare che il Manuale d'uso e manutenzione sia disponibile in cantiere*				
25. Check for any damage, cracks and deformations on the steel structures (frame, fasteners, etc…) *Verificare eventuale presenza di danneggiamenti, cricche e deformazioni sulle strutture in acciaio (telaio, elementi di fissaggio, ecc…)*				
26. Check connections of the control panel cables (clean and dry) *Verificare i collegamenti dei cavi della pulsantiera (pulita ed asciutta)*				
27. Connect control panel to PPU and run the diagnostic programs *Connettere la pulsantiera alla PPU ed eseguire i programmi di diagnostica*				
28. Check that "brake reserve" pressure gauge is at 200 BAR *Verificare che il manometro "riserva freno" sia a 200 BAR*				
29. Check, after releasing the brakes, that "Brake" pressure gauge has risen to 200 BAR *Verificare, dopo aver sbloccato i freni, che il manometro "Freno" sia salito a 200 BAR*				
30. Complete any project specific check lists *Completare eventuali check list specifiche di progetto*				See Project operating procedure *Vedere Procedura operativa di progetto*
Moduli				
31. Confirm check workshop maintenance completed *Conferma check list manutenzione d'officina completata*				Ask for a copy at the workshop maintenance *Chiedere copia ad officina*
32. Check integrity of lifting points *Controllare integrità punti di sollevamento*				
33. Check emergency stop switches working properly *Verificare il corretto funzionamento degli interruttori di arresto di emergenza*				
34. Check for any damage or leakage to hydraulic cylinders *Verificare l'eventuale presenza di danni o perdite ai cilindri idraulici*				
35. Check for any damage or leakage to hydraulic hoses, rigid pipes and screw connections *Verificare l'eventuale presenza di danni o perdite ai tubi idraulici flessibili, nelle tubazioni rigide e nei raccordi a vite*				
36. Check that connections of flexible hydraulic pipes are correct *Verificare che le connessioni dei tubi idraulici flessibili siano corrette*				
37. Check that connection valves of hydraulic hoses are correctly tightened *Verificare che le valvole di connessione dei tubi idraulici flessibili siano correttamente serrate*				
38. Check that all hoses are well grouped and do not interfere the steering *Verificare che tutti i tubi flessibili siano ben raggruppati e non siano d'intralcio alla sterzatura*				
39. Check the correct mechanical connection between modules and between modules and PPU (lower pin and upper tie rods) *Verificare la corretta connessione meccanica tra moduli e tra moduli e PPU (perno inferiore e tiranti superiori)*				
40. Check convoy lighting working properly *Verificare funzionamento corretto dell'illuminazione*				If necessary, replace the faulty bulbs *Eventualmente sostituire le lampadine difettose*
41. Check that the power lines and fittings are not damaged or incorrectly connected *Controllare che le linee elettriche ed i raccordi non presentino danneggiamenti o errate connessioni*				
42. Check that control rods of the hydraulic cylinders are clean and grease-lubricated *Controllare che le aste di controllo dei cilindri idraulici siano pulite e lubrificate con grasso*				

Check: *Controlli:*	**Ok** *Ok*	**No** *No*	**N/A** *N/A*	**Remarks:** *Osservazioni:*
43. Check tire tread wear *Verificare l'usura del battistrada dei pneumatici*				If necessary, replace *Eventualmente sostituire*
44. Check for any damage to tires *Verificare l'eventuale presenza di danneggiamenti nei pneumatici*				If necessary, replace *Eventualmente sostituire*
45. Check for any foreign bodies in the tires *Verificare l'eventuale presenza di corpi estranei nei pneumatici*				If necessary, replace. *Eventualmente sostituire.*
46. Check correct tire pressure *Verificare la corretta pressione dei pneumatici*				10 BAR for all standard SPMT tires (up to 40t/axle capacity). EVO type carriages (up to 50t/axle) and EVO II (up to 60t/axle) tire pressure is function of axle load: refer to the Use and Maintenance Manual *10 BAR per tutti i pneumatici SPMT standard (fino a 40t/asse di capacità). Carrelli tipo EVO (fino a 50t/asse) ed EVO II (fino a 60t/asse) la pressione del pneumatico è funzione del carico assiale: consultare Manuale di uso e manutenzione*
47. Check for any damage, cracks and deformations on the steel structures (frame, fasteners, etc…) *Verificare eventuale presenza di danneggiamenti, cricche e deformazioni sulle strutture in acciaio (telaio, elementi di fissaggio, ecc…)*				
48. Check that all pantograph locking pins have been removed *Verificare che tutti i perni di blocco dei pantografi siano stati rimossi*				
49. Check that cutting valves are correctly positioned (open / closed) according to the project diagram *Controllare che le valvole di sezionatura siano correttamente posizionate (aperte/chiuse) in accordo allo schema di progetto*				
50. Check that all traction and cylinder shut-off valves are open *Controllare che le valvole di intercettazione trazione e cilindro siano tutte aperte*				
51. Complete any project specific check lists *Completare eventuali check list specifiche di progetto*				See Project operating procedure *Vedere Procedura operativa di progetto*

Note:
Note:

This Check List refers to the checks to be carried out on site before the SPMTs are put into operation and before the operations are carried out.
Questa Check List è relativa ai controlli da effettuarsi in cantiere prima della messa in funzione dei carrelli e prima dell'esecuzione delle operazioni.

1. Check list to be completed by qualified SPMT Supervisor and Operator trained to use the machine, according to Use and Maintenance Manual, Operative Designs and Operating Procedure related to the specific Project
   Check list da compilarsi da parte di SPMT Supervisor ed Operatore qualificati ed addestrati per l'utilizzo della macchina, seguendo il Manuale di Uso e Manutenzione, i Disegni Operativi e la Procedura Operativa relativi al Progetto specifico
2. Any repairs and oil topping up must be carried out by trained and authorized personnel
   Eventuali riparazioni e rabbocchi olio devono essere eseguiti da personale addestrato e autorizzato
3. Maintenance checks are to be performed by maintenance personnel according to the maintenance plan according to Use and Maintenance Manual
   I controlli di manutenzione si intendono eseguiti da personale di manutenzione secondo il piano di manutenzione previsto nel Manuale Uso e Manutenzione del mezzo.
4. For any doubt / clarification contact the engineering department of the Fagioli head office
   Per qualsiasi dubbio/chiarimento contattare il dipartimento di ingegneria della sede Fagioli

Operator *Operatore*	**Supervisor** *Preposto*
Name and surname: *Nome e cognome:*	**Name and surname:** *Nome e cognome:*
Signature: *Firma:*	**Signature:** *Firma:*

11.6 SPMT spine beam check

FAGIOLI EMEA

Department ENGINEERING

Client	**ROSETTI MARINO S.P.A.**
Project	**CROSSWIND**
Document type	**CALCULATION REPORT**
Content	**SPINE BEAM CHECK - TP**
Doc. nr.	**030-CRO-TR-02-001**
Client doc. nr.	**n.a.**

A	10/07/2025	For comments	MM		
Rev.	**Date**	**Document status**	**prep.**	**check.**	**appr.**

Revision history:

Rev.	Date	Description of revision
A	10/07/2025	For comments

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Contents

1. SCOPE 4
2. REFERENCE DOCUMENTS 4
2.1 STANDARD AND CODES 4
2.1 CLIENT DOCUMENTS 5
2.2 FAGIOLI DOCUMENTS 5
3. MATERIALS AND STRUCTURES 5
3.1 SPMTs SPINE BEAM 5
4. TRAILER STRUCTURAL CHECKS 5
4.1 LOADS AND EFFECTS 5
4.2 SPINE BEAM CHECK AND DISPLACEMENTS 7
4.2.1 SPINE BEAM 1 – GROUP B/A 8
4.2.2 SPINE BEAM 2 – GROUP C 10
4.2.3 SPINE BEAMS STRUCTURAL CHECK 11

1. SCOPE

Scope of the present document is the structural check of the SPMT's spine beam and the spreader beams used for the land transport and load-out of the TP of the Crosswind project.

This document shows the loads applied to the Module as well, in order to permit adequate structural checks of the Module's structures and upper grillage (if any) during SPMT transport phase.

Below the geometrical characteristic of the Module are reported:

	ITEM MARK / ID	WEIGHT (contingency included)	MAIN DIMENSIONS (L x B x H)
Item #1	TP	254,5 t	20655 x 17199 x 7910 mm

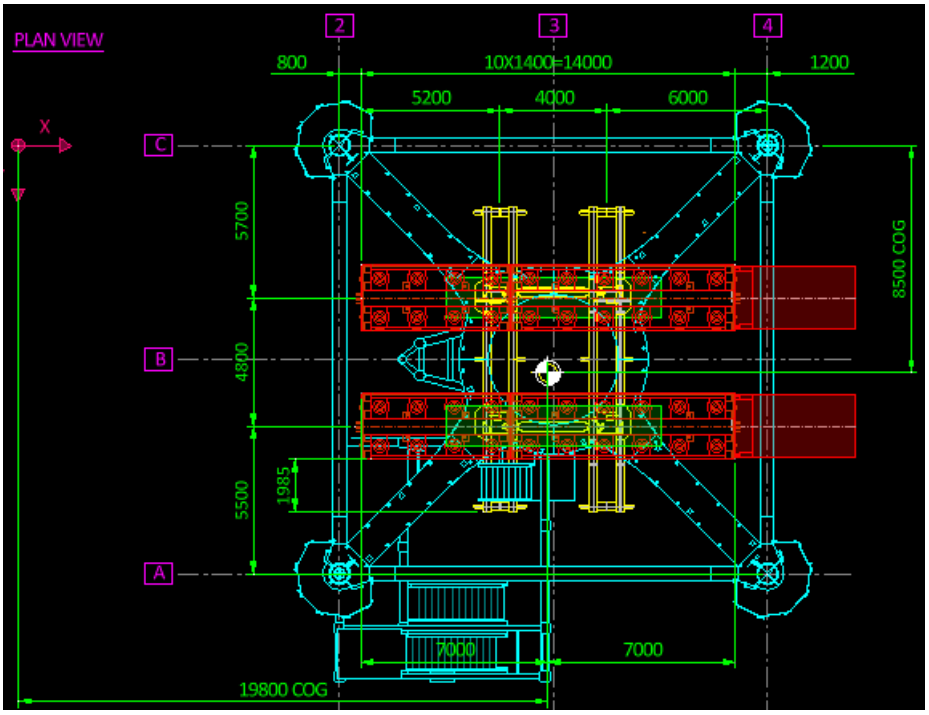


Figure 1. Item transport arrangement (plan view).

2. REFERENCE DOCUMENTS

2.1 STANDARD AND CODES

- The structural checks are carried out using the Allowable Stress Method (ASM);

2.1 CLIENT DOCUMENTS

- n.a.

2.2 FAGIOLI DOCUMENTS

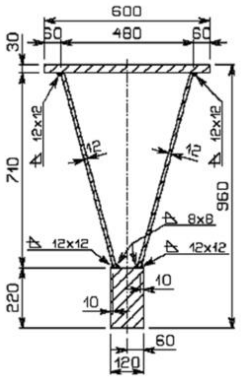
- 030-CRO-DP-02-001

3. MATERIALS AND STRUCTURES

3.1 SPMTs SPINE BEAM

SPMTs spine beam is made by ***S690QL*** steel and its main static parameters are:

- σ_{yield} 6900 kg/cm^2
- A: 620 cm^2
- A_s: 228 cm^2
- J_{xx}: 826634 cm^4
- W_{xx}: 17570 cm^3
- $M_{all-SPMT}$: +670 tm/-500 tm
- $V_{all-SPMT}$: 350 t



4. TRAILER STRUCTURAL CHECKS

4.1 LOADS AND EFFECTS

The following calculations will be referred to the load base values and to the load max values as well, according to Fagioli's transport drawing 030-CRO-DP-02-001.

Max axle load include:

- CoG envelope window effect
- Out of Verticality effect
- Slope effect
- Wind effect
- Acc/Deceleration effect

CoG envelope window effect:

Tolerance box in all directions considered:

	CoG envelope
Transversal x direction [mm] +/-	250
Longitudinal y direction [mm]+/-	250
Vertical z direction [mm]+/-	250

Out of Verticality effect:

Max Out of verticality considered in any direction is 1.75% (1°).

Slope effect:

Max slope considered in any direction is 1% (0.57°).

Wind effect:

Wind load on the modules and on the trailers has been calculated as follows:

$$0{,}5 * C_s * C_h * \rho * V^2 * A$$

where:

- ρ is the density of the reference air, conventionally assumed constant at 1.25 kg/m^3;
- V is the wind reference speed (in m/s), 3 sec gust;
- C_s is the shape coefficient, depending on the shape of the conveyed accessory exposed to wind;
- C_h is the height coefficient, depending on the height on the ground of the area exposed to wind;
- A is the area exposed to the wind on the module, including any secondary structures present.

The wind reference design speed is chosen at V = 16 m/s (10 m above the ground, 3 second gusts).

The shape coefficient of the transported object, including any secondary structures, has been taken equal to C_s = 1.5.

The areas exposed to the wind on the module, including any secondary structures present, are conventionally taken as per Figure 2 here below:

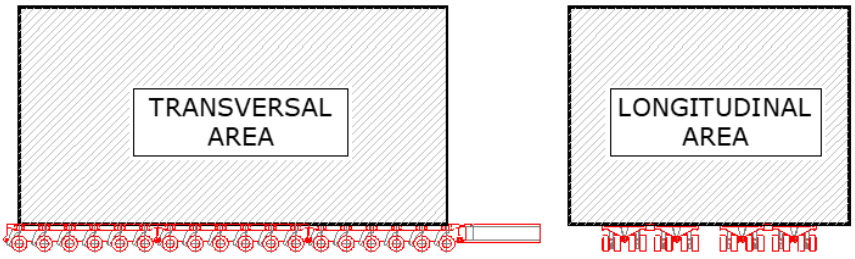


Figure 2: *Area exposed to the wind.*

Acc/Deceleration effect

The force of inertia in the longitudinal and transverse direction due to the acc/deceleration of the carriages, as their travel speed varies, will be assumed to be equal to:

a) for speed < 1,0 km/h ⇒ $a_{1/2}$ = 0,00 – acc/deceleration 0,00g ⇒ negligible effect;

b) for speed < 5,0 km/h ⇒ $a_{1/2}$= 0,05 – acc/deceleration a = 0,05g ⇒ effect comparable to 2.8 ° of inclination of the walkway;

c) for speed > 5,0 km/h ⇒ $a_{1/2}$ = to be evaluated case by case, according to the real speed of the vehicle and the type of road surface.

The force of inertia in the vertical direction:

- a_v = 0.00 x g Vertical acc/deceleration negligible.

4.2 SPINE BEAM CHECK AND DISPLACEMENTS

A FEM model was created to find the correct values of the reactions and so of the bending moment. The SPMT's spine beam has been modelled using beam elements with equivalent inertia. A concentrated force is applied to the beam where the axles transfer the hydraulic pressure of the circuit. The vertical restraints (DY) are applied in correspondence of the module structure/grillage beams, making the system isostatic.

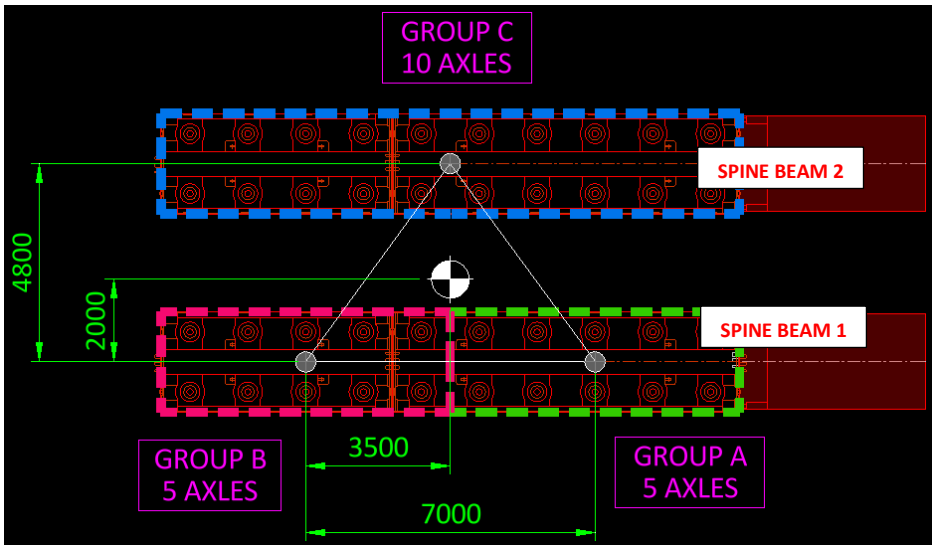


Figure 2: SPMTs line arrangement.

Considering what is expressed below, each axle is subjected to the following load:

$$F = SP - DL$$

where:

- DL = 4,2 ton is the axle self weight;
- SP = 28,9 ton is the hydraulic group A maximum reaction for axle;
- SP = 28,9 ton is the hydraulic group B maximum reaction for axle;
- SP = 20,9 ton is the hydraulic group C maximum reaction for axle.

The spine beam of group B/A is analysed in the following chapters.

4.2.1 SPINE BEAM 1 – GROUP B/A

In the following figures, the bending moment (*Figure 3*) and shear force (*Figure 4*) diagrams are presented, obtained by applying the loads that maximise the reactions per axis for Group A (28,9) and Group B (28,9), respectively, along with the self weight of the spine beam.

	MIN	MAX
BM2 (tf·m)	-22,86	256,8
	[Bm:14]	[Bm:22]

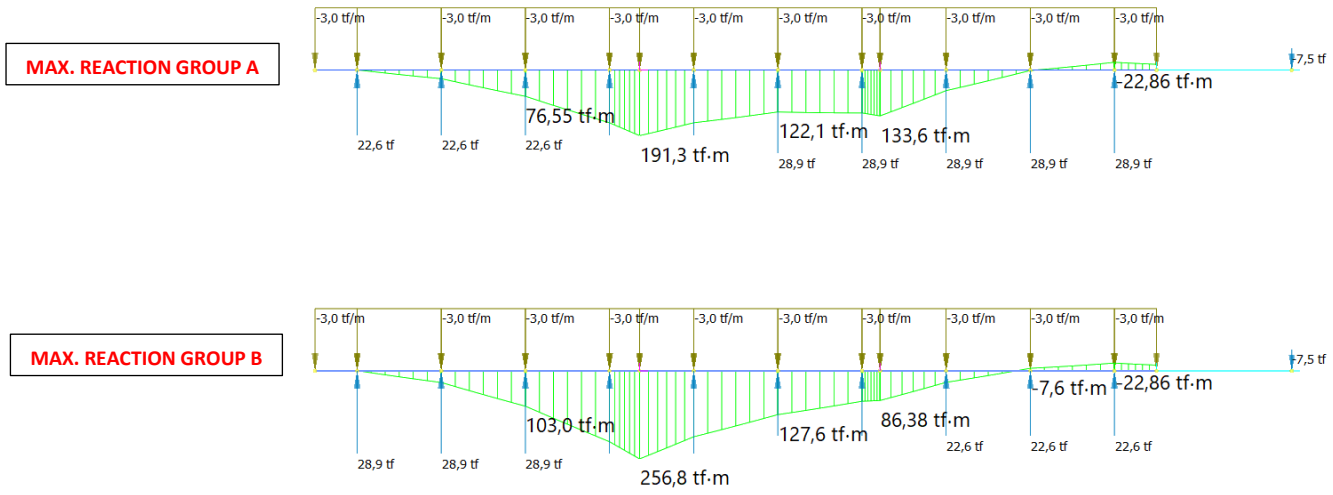


Figure 3: Bending moment diagram of the spine beam, for maximising axle loads on Group A (top) and Group B (low), respectively.

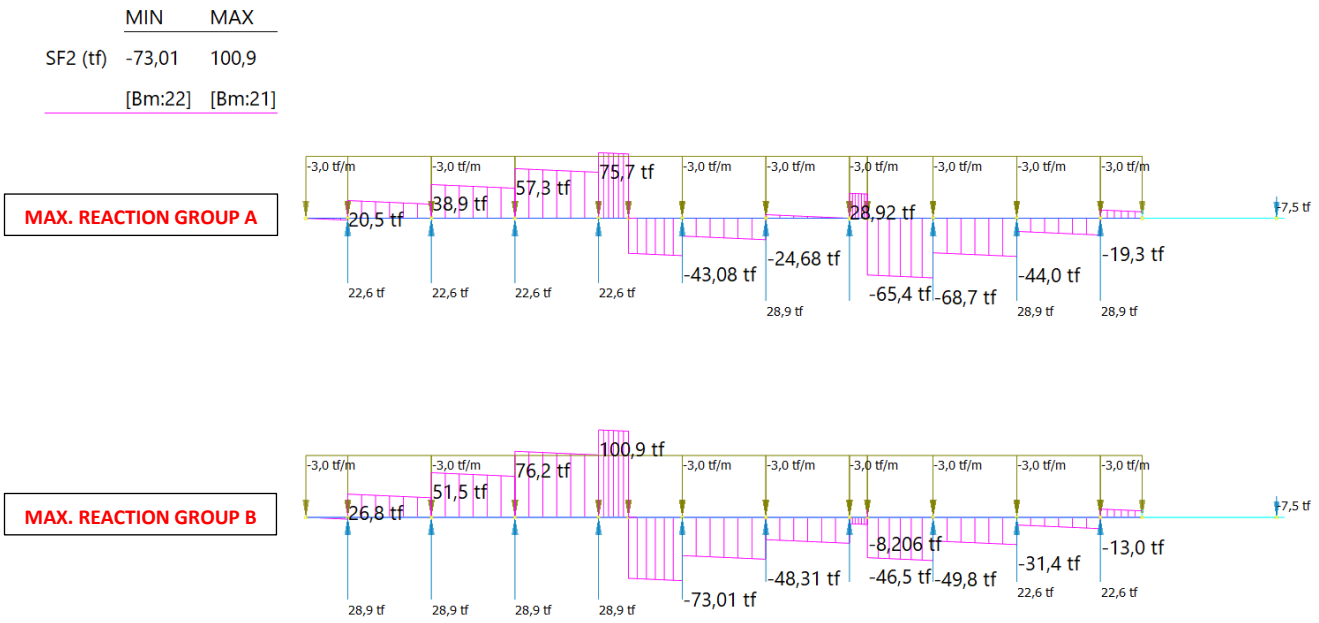


Figure 4: Shear force diagram of the spine beam, for maximising axle loads on Group A (top) and Group B (low), respectively.

Here below are the graphics of spine beam deflection.

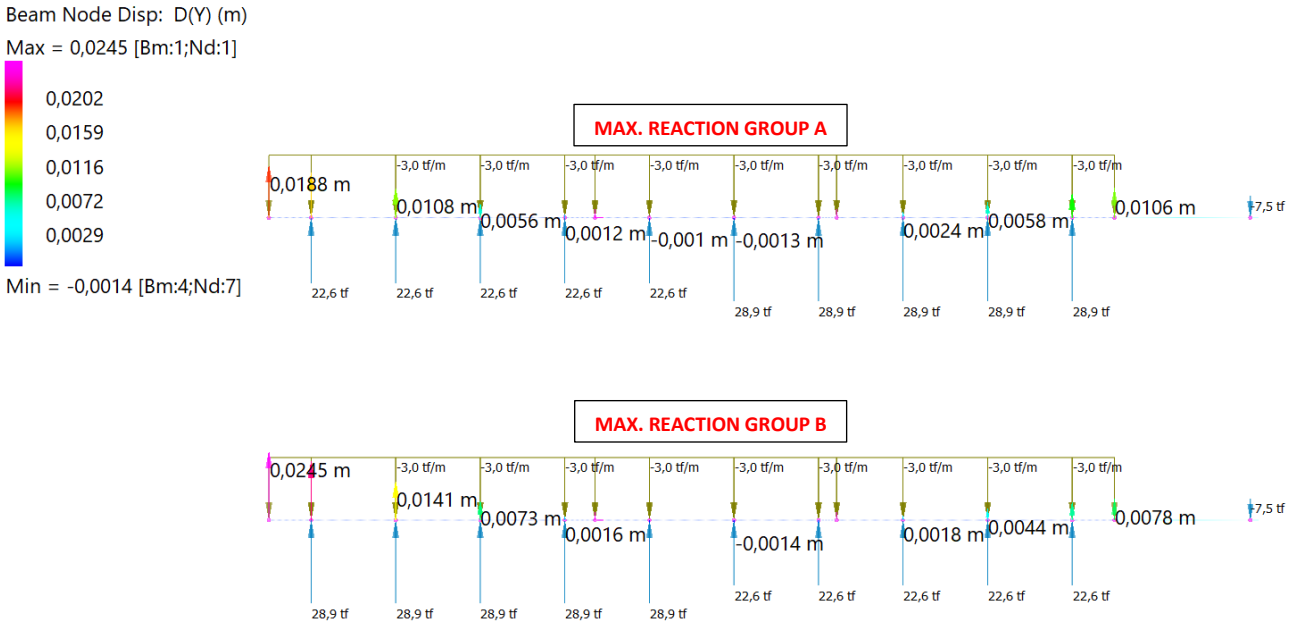


Figure 5: Spine beam deflection for maximising axle loads on Group A (top) and Group B (low), respectively.

Note: Unless the max bending moment and shear value are within the max allowable, no recommendation from SPMT vendor regarding max deflection.

4.2.2 SPINE BEAM 2 – GROUP C

In the following figures, the bending moment (*Figure 6*) and shear force (*Figure 7*) diagrams are presented, obtained by applying the loads that maximise the reactions per axis for Group C (20,9 t), along with the self weight of the spine beam.

	MIN	MAX
BM2 (tf·m)	-22,86	173,6
	[Bm:9]	[Bm:10]

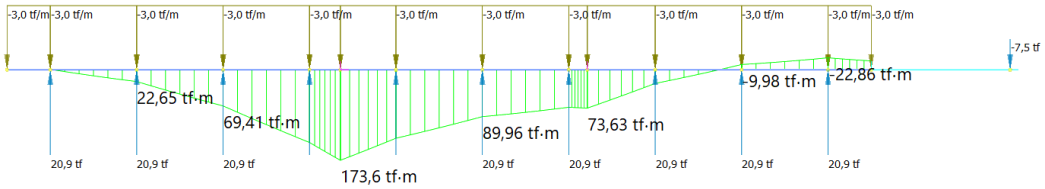


Figure 6: Bending moment diagram of the spine beam, for maximising axle loads on Group C.

	MIN	MAX
SF2 (tf)	-48,34	68,9
	[Bm:11]	[Bm:10]

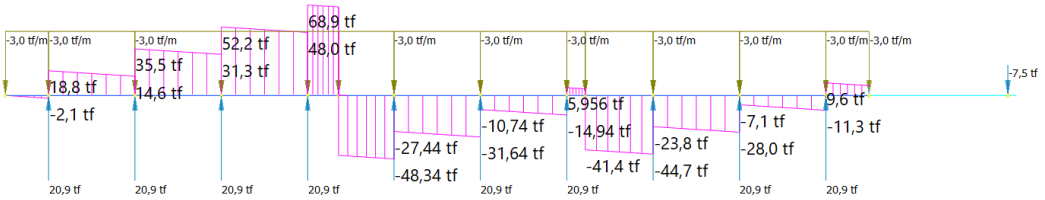


Figure 7: Shear force diagram of the spine beam, for maximising axle loads on Group C.

Here below is the graphic of spine beam deflection.

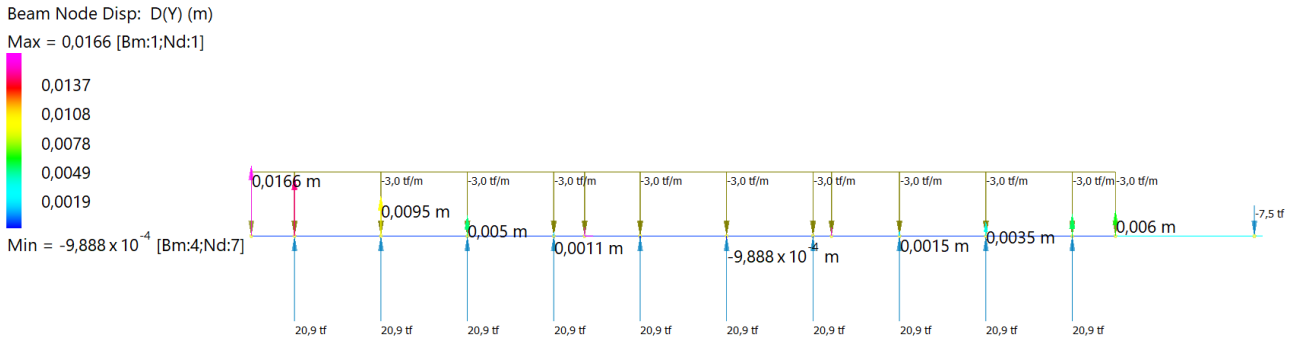


Figure 8: Spine beam deflection for maximising axle loads on Group C.

Note: Unless the max bending moment and shear value are within the max allowable, no recommendation from SPMT vendor regarding max deflection.

4.2.3 SPINE BEAMS STRUCTURAL CHECK

Table 1 presents an overview of the structural check carried out on the 2 spine beams.

	M_{sd} (tm)	$M_{all\text{-}SPMT}$ (tm)	$M_{sd}/M_{all\text{-}SPMT}$	V_{sd} (tm)	$V_{all\text{-}SPMT}$ (tm)	$V_{sd}/V_{all\text{-}SPMT}$
Spine beam 1	256,8	670	0,38	100,9	350	0,29
Spine beam 2	173,6	670	0,26	68,9	350	0,20

Table 1: Structural check of the spine beams.

CHECK OK!

11.7 Lashing calculation

OBJECTS:	**LASHING VERIFICATION FOR TP TRANSPORTATION**
PROJECT:	**CROSSWIND**
CLIENT:	**ROSETTI MARINO S.P.A.**
REFERENCE FAGIOLI DOCUMENTS:	**030-CRO-DP-02-005**
	030-CRO-DP-02-001
REFERENCE CLIENT DOCUMENT:	**n.a.**

1. SCOPE

The scope of this technical note is to shown the lashing verification for the transportation of the item TP for the Crosswind Project. The verification is carried out in accordance with the standard "IMO – Cargo stowage and securing, 2003", following the alternative method described in the paragraph 7.3.

The lashing system is represented in the reference drawing 030-CRO-DP-02-005 (a snapshot of the drawing is reported in *Figure 1*).

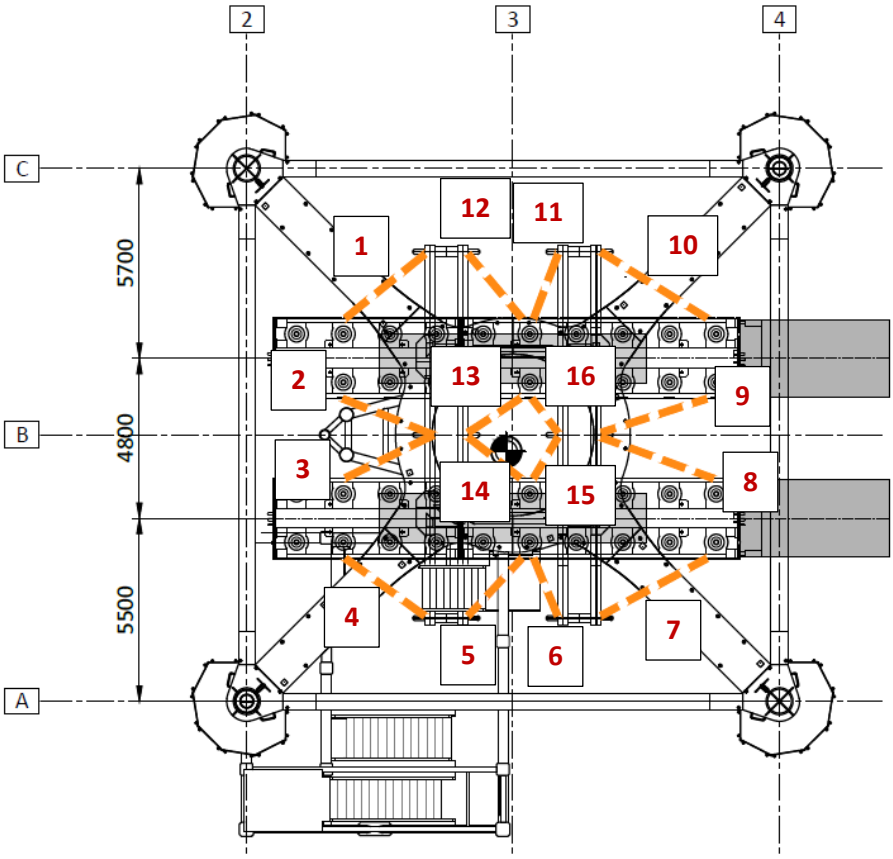


Figure 1 – Plan view of the lashing system.

2. CALCULATION OF HORIZONTAL FORCES

WIND LOAD

For the wind load calculation, NTC 2018 has been employed.

- Reference wind speed $v_r = 25\ m/s$
- Transversal area exposed to wind $A_x = 100\ m^2$
- Longitudinal area exposed to wind $A_y = 100\ m^2$
- Height of barycenter from ground $z_w = 5{,}8\ m$
- Exposition coefficient $c_e = 2{,}02$
- Air density $\rho = 1{,}25\ kg/m^3$

Since the exposure surfaces are identical in both directions, the horizontal forces due to wind are equally longitudinally and transversally to the convoy, and are calculated as follows:

$$F_{w,x} = F_{w,y} = \frac{1}{2} \cdot \rho \cdot v_r^2 \cdot c_e \cdot A_w = 8{,}03\ tf$$

FORCE DUE TO OUT OF VERTICALITY

The maximum out of verticality (OoV) considered for the transport phase is 3° in both longitudinal and transversal direction. This value is the sum of the allowable inclination of convoy (1°), and the 2° of out of verticality required by the DNV-GL. From this, the horizontal forces due to OoV (equal in the two directions) are:

$$F_{OoV} = W \cdot \sin \alpha_{OoV} = 13{,}32\ tf$$

Where W is the transported item weight equal to 254,5 ton.

DIFFERENTIAL TRACTION FORCE BETWEEN SEPARETED VEHICLES

Since the vehicles are not rigidly connected to each other, during starting, braking, and movement, differential traction forces may arise, caused by a lack of synchronization between the motors, resulting in forces transmitted from the vehicles to the transported item. These kinds of forces, acting on the longitudinal direction (since the SPMTs will only move in such direction), are calculated as follows:

$$F_t = 50\% \cdot P_t \cdot n_{drive\ ax.} = 22\ tf$$

Where:

- P_t is the maximum traction power of each drive axle, equal to 11 tf;
- $n_{drive\ ax.}$ is the number of axle drive in a row, in this case equal to 4.

DYNAMIC HORIZONTAL FORCE

Since the transport is carried out at a maximum speed of 0.5 km/h, it is not necessary to consider dynamic forces due to eventual accelerations.

3. CALCULATION OF RESISTANCE FORCES

The external horizontal forces must be smaller than the resistance forces, i.e. the friction force between the item and the trailer and the force of the lashing system that connect the item to the SPMTs.

FRICTION FORCE

As specified in the 030-CRO-DP-01-001, plywood or rubber sheets shall be positioned between any steel surface in contact. So it's possible to consider a friction coefficient $\mu = 0{,}3$. The friction force is calculated as:

$$F_f = m \cdot \mu = 76{,}35\ tf$$

LASHING FORCES

The item is connected to the convoy by 16 lashing lines formed by chains and turnbuckle used in double laid. The resistance of the lashing system is calculated in accordance with the standard "IMO – Cargo stowage and securing, 2003". Every lashing line has vertical and horizontal securing angles, α e β, that develop securing effects both in longitudinal and transverse direction.

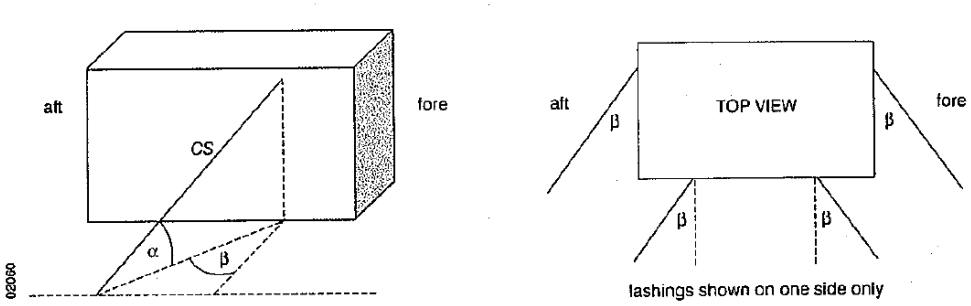


Figure 2 – Definition of the securing angles.

The properties of the lashing system are:

- Breaking load — BL = 21,2
- Maximum securing load — SWL = BL/2 = 10,6
- Calculated strength — CS = 2·SWL / 1,5 = 14 tf

4. SLIDING AND TIPPING VERIFICATION

The lashing system must be verified in the following case:

- Transverse sliding
- Longitudinal sliding
- Transverse tipping

TRANSVERSE SLIDING

For the transverse sliding (along +y direction), the following formulae must be verified:

$$F_{y,sd} = F_{w,y} + F_{OoV} + F_t \leq F_{y,rd} = \mu \cdot m + \sum_{i=1}^{n} CS_{i,y}$$

The results are presented in the figure below:

$F_{w,y}$ (tf)	8,03						
F_{OoV} (tf)	13,32						
F_t (tf)	22						
$F_{y,sd}$ (tf)	**43,35**						
TRANSVERSE SLIDING (+y)							
Tensioned Lashing line ID	CS (tf)	L tot. (m)	H tot. (m)	L projected (m)	α (°)	β (°)	$CS_{i,y}$ (tf)
1	14	3,04	0,60	2,37	11,15	51,13	8,62
12	14	2,49	0,60	1,60	13,54	39,98	10,43
11	14	2,04	0,60	0,73	16,37	20,79	12,56
10	14	3,73	0,60	3,16	9,14	57,96	7,33
3	14	2,92	0,60	2,62	11,63	64,00	6,01
14	14	1,97	0,60	1,55	16,96	52,05	8,24
15	14	1,41	0,60	0,73	23,04	30,92	11,05
8	14	3,58	0,60	3,37	9,51	69,91	4,74
						$\Sigma CS_{i,y}$ (tf)	68,98
						$F_{y,friction}$ (tf)	76,35
						$F_{y,rd}$ (tf)	**145,33**
$F_{y,sd}/F_{y,rd}$	0,30		CHECK OK!				

Figure 3 – Transverse sliding verification.

The transverse sliding along -y direction brings to very similar results since the lashing system is almost perfectly symmetric.

LONGITUDINAL SLIDING

For the longitudinal sliding, the following formulae must be verified:

$$F_{x,sd} = F_{w,x} + F_{OoV} + F_t \leq F_{x,rd} = \mu \cdot m + \sum_{i=1}^{n} CS_{i,x}$$

The results are presented in the figure below:

$F_{w,x}$ (tf)	8,03						
F_{OoV} (tf)	13,32						
F_t (tf)	22						
$F_{x,sd}$ (tf)	**43,35**						
LONGITUDINAL SLIDING (+x)							
Tensioned Lashing line ID	CS (tf)	L tot. (m)	H tot. (m)	L projected (m)	α (°)	β (°)	$CS_{i,x}$ (tf)
1	14	3,04	0,60	2,37	11,15	51,13	10,69
2	14	2,91	0,60	2,70	11,65	68,31	12,74
3	14	2,92	0,60	2,62	11,63	64,00	12,32
4	14	2,92	0,60	2,36	11,63	54,09	11,11
11	14	2,04	0,60	0,73	16,37	20,79	4,77
16	14	1,27	0,60	0,77	25,29	37,32	7,67
15	14	1,41	0,60	0,73	23,04	30,92	6,62
6	14	1,85	0,60	0,72	17,93	22,72	5,14
						$\Sigma CS_{i,x}$ (tf)	71,07
						$F_{x,friction}$ (tf)	76,35
						$F_{x,rd}$ (tf)	**147,42**
$F_{x,sd}/F_{x,rd}$	0,29		CHECK OK!				

Figure 4 – Longitudinal sliding verification.

The longitudinal sliding along -x direction brings to very similar results since the lashing system is almost perfectly symmetric.

TRANSVERSE TIPPING

For the transverse tipping, the following formulae must be verified:

$$M_{UNSTAB} \leq M_{STAB}$$

For simplicity and safety purposes, the contribution of the lashing system has been neglected in the calculation of stabilizing moment. The previous formula then becomes:

$$1{,}5 \cdot (F_{x,sd} \cdot z_{CoG}) \leq 0{,}9 \cdot (W \cdot a)$$

Where a is the stabilizing arm, equal to the minimum distance between the CoG of the item and the support of the item on the convoy. Therefore:

$$1{,}5 \cdot (43{,}35 \cdot 5{,}83) \leq 0{,}9 \cdot (254{,}5 \cdot 2{,}45)$$

$$379{,}10\ tm \leq 561{,}17\ tm$$

CHECK OK!

11.8 SPMT traction check

FAGIOLI	DRIVIN FORCE CHECK	rev. 00 date 19-11-2011 by U.S.

PROJECT: CROSSWIND PRJ **ITEM :** TP **DATE :** 30/06/25

DWG FAGIOLI: 030-CRO-DP-02-001

DATE

Item Weight				P	=	254,50	t
Equipment weight				Pe	=	8,00	t
Trailer dead weigth				Pp	=	99,00	t
Total weight				Wl	=	361,50	t
Axles number				N	=	20	
Drive axles number				Nt	=	8	
Weight load for axles				Wl	=	18,08	t
Rolling Friction f_R				f_R	=	0,025	
Modular type (SPMT;MSPE;MSPE Evo;MSPM)						MSPE	
Inclination (%)						5	%
Inclination (radiant)						0,050	rad
Inclination (degree)						2,9	deg
Soil friction coefficient	Rubber- Off road compacted			Φ	=	0,4	
Max axle driving force (No 2 suspension)		F_{Z1}	=	12,23	t	120	KN

TRACTION CHECK

Total driving force	(F_{Z1}*Nt)	F	=	97,86	t	960	KN
Max theoric slope	((F-Wl*g*f_R)/(Wl*g))*100			α	=	24,57	%
Max real slope (-15%)				**α***	=	**20,88**	**%**
Max angle				φ	=	11,80	deg

SLIPPING CHECK

Total weight on drive axles	(Nt*Wl)	W_{Nt}	=	145	t	1419	KN
Traction force	(W_{Nt}*Φ)	F_1	=	57,84	t	567	KN
				α**	=	**13,50**	**%**

MAX ALLOWABLE SLOPE	13,5 %

THE CONVOY CAN TRANSIT AT MAX SLOPE	5 %

11.9 Risk assessment

Index

1. Definition pag. 3

2. Risk Assessment Plan pag. 5

3. Risk Assessment Record Sheet pag. 6

1. Definitions

A 'Risk' is defined as the combination of the Damage of the consequences and the likelihood that harm or damage will actually occur.
A 'Hazard' is defined as anything that has the potential to cause harm or damage.

1.1. Risk Assessment (Hazard Identification and Risk Analysis)

This Risk Assessment has been based on many similar projects and carried out as follows:

- All activities and actions have been identified;
- All hazards associated with these activities and actions have been identified;
- The Hazard Effect of any hazards have been identified;
- The Damage of consequences and probability of each hazard have been identified;
- A Risk Assessment for each hazard has been produced;
- Risk mitigating preventative and protective measures have been developed as required;
- Residual risks remaining have been confirmed as acceptable.

In the event of this Risk Assessment not reducing all risk to an acceptable level the following actions are required:

- Further risk mitigating preventative and protective measures are to be developed as required;
- An action plan is to be completed for those hazards where adequate control measures still need to be confirmed and the risks reduced to an acceptable level.

A flow diagram showing this process is included in the following pages of this document.

The Risk Assessment for each activity has been documented on Risk Assessment Record Sheets and these forms are attached to this document.

A combination of FAGIOLI equipment will be used in the execution of this project.

This Risk Assessment Document identifies all hazards that may expose personnel, property or the environment to danger, assess the risk involved and ensure that preventative and protective measures are implemented to reduce these risks to an acceptable level.

1.2. Criteria (Project Risk Matrix)

R = P x D

P				
4	4	8	12	16
3	3	6	9	12
2	2	4	6	8
1	1	2	3	4
	1	**2**	**3**	**4**

D

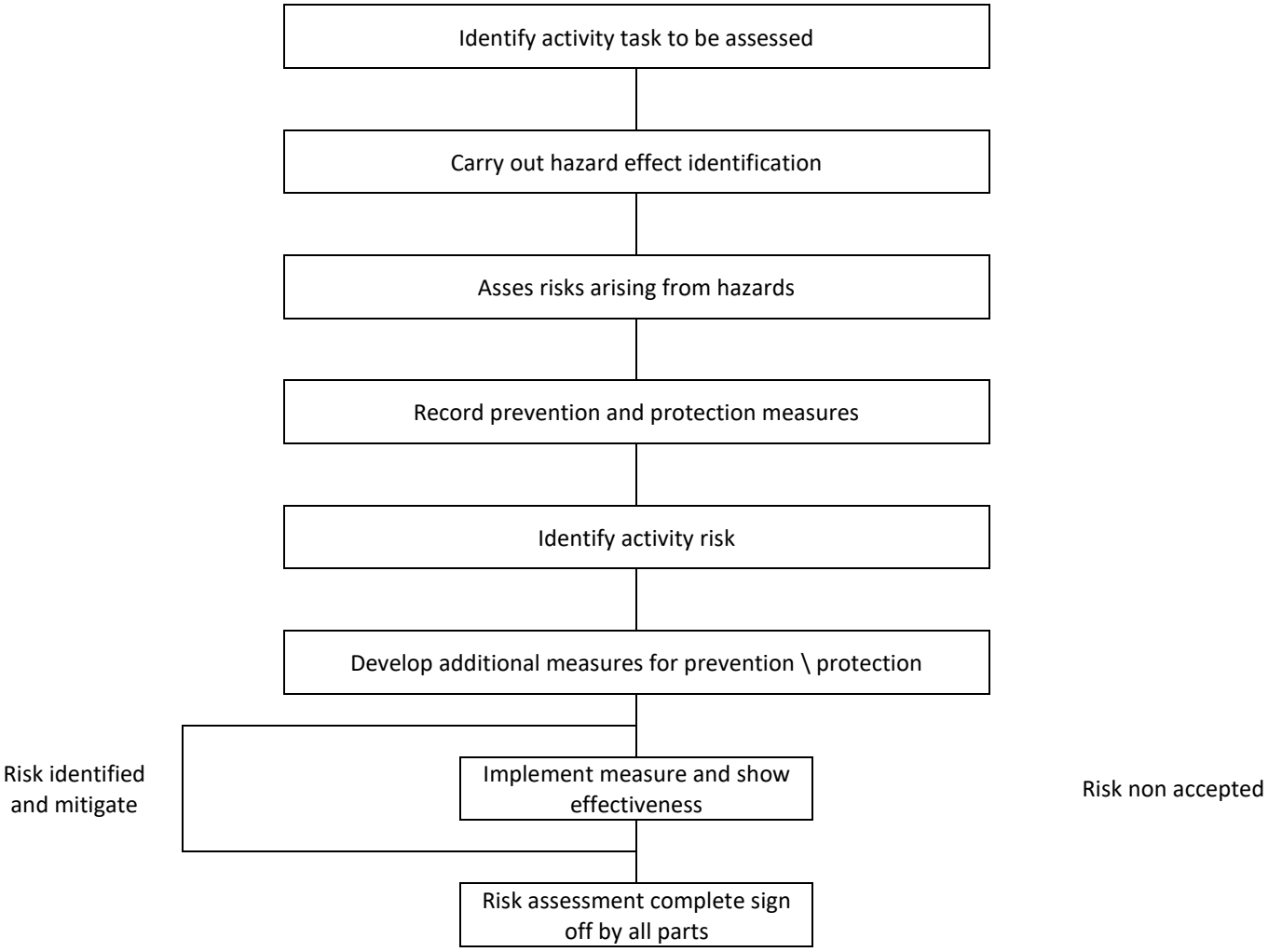
Probability Definitions (P)

Category	Definitions	Working Definition
4	Very Likely	Almost inevitable the same event will routinely occur during the course of similar work
3	Likely	It is considered likely the same event could still occur during the course of similar work
2	Unlikely	A rare combination of factors required for the same event to occur during course of similar work
1	Very Unlikely	It is considered a freak combination of factors would be required for the same event to occur in the future

Damage Definitions (D)

Damage Category		Damages Considerations		
		Harm to people	**Environmental damage**	**Damage to properties**
4	Catastrophic	Fatalities / Multiple serious injuries	Massive and uncontrolled release of a substance or damage with significant environmental impact extending well beyond site boundary. Chronic pollution resulting in damage lasting more than 12 months.	Over 500.000 €. Extensive damage (multiple fire / explosion) or loss of installation / facilities.
3	Significant	LTI / Temporary or permanent partial disability	Outside boundaries. Localized pollution given rise to significant environmental impact but unlikely to last beyond 1 month. Repeated exceeding of legal conditions. Recovery/rehabilitation may require external assistance	More than 100.000 € and less than 500.000 €. Significant damage to local area or essential plant and equipment.
2	Moderate	Medical treatment / Restricted work case	Within site boundaries. Short term environmental impact. Single legal exceeding recoverable by worksite	More than 50.000 € and less than 100.000 €. Limited damage to plant and equipment.
1	Negligible	First Aid injury	Within site boundaries. No significant environmental impact or exceeding of legal conditions. Easily controlled, recovered by worksite	Less than 50.000 €. Insignificant damage to plant and equipment.

2. Risk Assessment Plan



All risks will be assessed in conjunction with the Risk Management System.

The scope of risk assessment is to identify the hazards, evaluate mitigation measures already in place and then to identify any further mitigation measures required.

All planned activities will be assessed as early as possible to ensure that mitigation measures can be implemented in a timely fashion.

SHSE&QAO (Safety Health Security Environmental & Quality Assurance Officer), PSM (Project Site Manager), Superintendent will meet weekly to ensure that upcoming activities are identified and assessed.

In case of changing to schedule, PSM (Project Site Manager) will immediately inform the SHSE&QAO (Safety Health Security Environmental & Quality Assurance Officer).

3. Risk Assessment Record Sheets

Risk Assessment Record Sheets identified the hazard, hazard effect, preventative & protective measures and the risk calculation.

Each hazard is identified against an individual risk, however, hazard effect and preventative & protective measures are considered as factors of combined consequences and mitigation.

Activity – *Manual Lifting & Handling of Loads*

Risk Assessment Record Sheet No: 1 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
01	Fall of object from height	(4) 3	(2) 1	(8) 3	Back strain	Use of mechanical aids
	Fatigue	(3) 2	(1) 1	(3) 2	Muscle / Ligament injury	Manual handling training
	Heavy loads	(3) 2	(1) 1	(3) 2	Crushing	Split loads
	Unstable loads	(3) 2	(2) 1	(6) 2	Cuts & abrasions	Team lifting
	Sharp edges	(3) 2	(2) 1	(6) 2	Slips. Trips & falls	Good housekeeping
	Poor lifting technique	(3) 2	(1) 1	(3) 2	Hernias	Good lifting technique (refer to MGSSL-PR07-REV.02-MOVIMENTAZIONE MANUALE DI CARICHI)
	Poor housekeeping	(2) 2	(3) 1	(6) 2	Damage to plant & equipment	Good stacking methods
	Uneven surfaces	(3) 2	(1) 1	(3) 2		Good communications
						Toolbox talks
						Knowledge of load
						Job rotation
						Rest periods (do not work more than 12 hours in a day)
						PPE
						Do not lift loads heavier than 25kg

This Risk Assessment has been reviewed and accepted			
Action plan applicable		YES	NO
HSEM	General Manager	Date	
L. Fantini	M. Massetti	01.08.12	

Damage:	
4	Catastrophic
3	Significant
2	Moderate
1	Negligible

Probability:	
4	Very likely
3	Likely
2	Unlikely
1	Very unlikely

Criteria:	
R = 1	Low
2 ≤ R ≤ 3	Medium
4 ≤ R ≤ 8	High
9 ≤ R ≤ 16	Elevated

Activity – *Use Of Hand Tools*

Risk Assessment Record Sheet No: 2 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
02	Trapping / Jamming	(4) 3	(2) 1	(8) 3	Injury to personnel	Maintained equipment
	Fall of object from height	(4) 3	(2) 1	(8) 3	Damage to plant & equipment	Damaged / worn tools exchanged
	Flying particles	(3) 2	(2) 1	(6) 2		Regular tool inspections
	Damaged/worn tools	(3) 2	(2) 1	(6) 2		Good housekeeping
	Noise	(3) 2	(2) 1	(6) 2		Toolbox meeting
						Competent personnel
						PPE

This Risk Assessment has been reviewed and accepted			
Action plan applicable		YES	NO
HSEM	General Manager	Date	
L. Fantini	M. Massetti	01.08.12	

Damage:	
4	Catastrophic
3	Significant
2	Moderate
1	Negligible

Probability:	
4	Very likely
3	Likely
2	Unlikely
1	Very unlikely

Criteria:	
R = 1	Low
2 ≤ R ≤ 3	Medium
4 ≤ R ≤ 8	High
9 ≤ R ≤ 16	Elevated

Activity – *Fire Safety*

Risk Assessment Record Sheet No: 3 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
09	Overload of electrical circuits	(3) 2	(2) 1	(6) 2	Injury to personnel	Trained/Competent personnel
	Faulty electrical equipment	(3) 2	(2) 1	(6) 2	Damage to plant & equipment	Maintained equipment
	Diesel power pack	(3) 2	(2) 1	(6) 2		Good housekeeping
	Welding equipment & operations	(3) 2	(2) 1	(6) 2		Good communications (radios)
						Life saving apparatus
	Sparks from metal grinding	(3) 2	(2) 1	(6) 2		Safety Barriers
						Extinguishers fitted to Diesel Power Packs
						High visibility clothing
						Toolbox meeting
						Supervision where necessary
						Hot Woks Permit to be coordinated with Rosetti
						PPE
						AED available in the yard (short travel distance from the quay)
						Emergency response based on Yard Emergency Response Plan

This Risk Assessment has been reviewed and accepted				Damage:	Probability:	Criteria:	
Action plan applicable		YES	NO	4 Catastrophic	4 Very likely	R = 1	Low
HSEM	General Manager	Date		3 Significant	3 Likely	2 ≤ R ≤ 3	Medium
L. Fantini	M. Massetti	01.08.12		2 Moderate	2 Unlikely	4 ≤ R ≤ 8	High
				1 Negligible	1 Very unlikely	9 ≤ R ≤ 16	Elevated

Activity - *Electrical Safety*

Risk Assessment Record Sheet No: 4 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
04	Electric shock	(3) 2	(2) 1	(6) 2	Injury to personnel	Trained / Competent personnel
	Faulty electrical equipment	(3) 2	(1) 1	(3) 2	Damage to plant & equipment	Maintained equipment
	Overload of electrical circuits	(3) 2	(1) 1	(3) 2		Good housekeeping
	Thermal effects	(3) 2	(1) 1	(3) 2		Safe systems of work
						Life saving apparatus
						Toolbox meeting
						Supervision where necessary
						PPE

This Risk Assessment has been reviewed and accepted			
Action plan applicable		YES	NO
HSEM	General Manager	Date	
L. Fantini	M. Massetti	01.08.12	

Damage:	
4	Catastrophic
3	Significant
2	Moderate
1	Negligible

Probability:	
4	Very likely
3	Likely
2	Unlikely
1	Very unlikely

Criteria:	
R = 1	Low
$2 \leq R \leq 3$	Medium
$4 \leq R \leq 8$	High
$9 \leq R \leq 16$	Elevated

Activity –*Assembly / Maintenance / Demobilizing SPMT Transporters*

Risk Assessment Record Sheet No: 05 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
05	Trapping / Jamming	(4) 3	(2) 1	(8) 3	Injury to persons working in close proximity	Trained / Competent personnel
	Moving vehicles	(4) 3	(2) 1	(8) 3		Banksman
	Fall of person from height	(4) 3	(2) 1	(8) 3	Injury to operator	Maintained equipment
	Fall of object from height	(4) 3	(2) 1	(8) 3	Damage to plant & equipment	Worn damaged tool exchange
	Damaged / worn tools	(3) 2	(2) 1	(6) 2	Damage to environment	Good housekeeping
	Poor housekeeping	(3) 2	(2) 1	(6) 2		Assistance when maneuvering trailers
	Hydraulic pressure release	(3) 2	(2) 1	(6) 2		
	Adverse weather conditions	(3) 2	(2) 1	(6) 2		Good communications
						2 way radios
						Isolation of power packs
						Restricted access / Taped area
						Operations / Maintenance manuals
						High visibility clothing
						Toolbox meeting
						Supervision when necessary
						Use of safety harness
						Use the Proper Fall-Arrest Equipment
						Tools and materials must be kept in containers that are secure
						Weather forecast

This Risk Assessment has been reviewed and accepted			
Action plan applicable		YES	NO
HSEM	General Manager	Date	
L. Fantini	M. Massetti	01.08.12	

Damage:	
4	Catastrophic
3	Significant
2	Moderate
1	Negligible

Probability:	
4	Very likely
3	Likely
2	Unlikely
1	Very unlikely

Criteria:	
R = 1	Low
2 ≤ R ≤ 3	Medium
4 ≤ R ≤ 8	High
9 ≤ R ≤ 16	Elevated

Activity – *Hydraulic System Connection & Testing (SPMT's and Cranes)*

Risk Assessment Record Sheet No: 06 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
06	Hydraulic pressure release	(4) 3	(2) 1	(8) 3	Injury to personnel	Pressure testing of hydraulic system prior to dispatch (Cert. Package)
	Fall of person from height	(4) 3	(2) 1	(8) 3	Injury to persons working in close proximity	
	Fall of object from height	(4) 3	(2) 1	(8) 3		
	Poor mechanical connections	(4) 2	(1) 1	(4) 2	Damage to plant & equipment	Use of biodegradable oils
	Adverse weather conditions	(3) 2	(1) 1	(3) 2	Damage to environment	Good housekeeping
	Hydraulic oil spillage	(2) 1	(2) 1	(4) 1		Maintained equipment
						Provide power units with drip trays
						Inspected / Certified access equipment
						Erection Statement
						Certification Package
						All connections to be checked
						Spillage Kits to be provided
						Toolbox meeting
						PPE
						Use of safety harness
						Use the Proper Fall-Arrest Equipment
						Tools and materials must be kept in containers that are secure.
						Eye cleaning safety kit

This Risk Assessment has been reviewed and accepted			
Action plan applicable		YES	NO
HSEM	General Manager	Date	
L. Fantini	M. Massetti	01.08.12	

Damage:	
4	Catastrophic
3	Significant
2	Moderate
1	Negligible

Probability:	
4	Very likely
3	Likely
2	Unlikely
1	Very unlikely

Criteria:	
R = 1	Low
$2 \leq R \leq 3$	Medium
$4 \leq R \leq 8$	High
$9 \leq R \leq 16$	Elevated

Activity – *Transportation of Abnormal Loads*

Risk Assessment Record Sheet No: 07 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
7	Loss of load	(4) 3	(2) 1	(8) 3	Injury to operator	Trained/Competent operators
	Collision	(4) 3	(2) 1	(8) 3	Damage to equipment/cargo	Supervision
	Fall of object /material from height	(4) 3	(2) 1	(8) 3	Damage to ground	Maintained equipment
					Damage to underground / overhead services	High visible/Audible warning of moving vehicle
	Overturning	(4) 3	(2) 1	(8) 3		
	Trapping	(4) 3	(2) 1	(8) 3	Disruption to local traffic	High visible warning of wide/long load
	Moving vehicles	(4) 3	(2) 1	(8) 3		
	Poor securing	(4) 3	(2) 1	(8) 3		Advance notification of proposed movement to relative bodies
	Collapse/Subsidence of ground	(4) 2	(1) 1	(4) 2		
	Striking overhead obstructions	(4) 2	(1) 1	(4) 2		Engineering studies/survey of: Ground limitations/loadings; Width restrictions/clearances; Stability of load(COG)
	Inadequate access	(3) 2	(1) 1	(3) 2		
	Adverse weather conditions	(3) 2	(1) 1	(3) 2		
						Toolbox meeting
						Good communications
						Safety barriers
						Good housekeeping
						Restrict maximum speed of vehicles to 0,5 Km/hour
						Factor 1 to 2 seconds bring vehicles to a stop.
						Continuous monitoring level indicators.
						Provide watcher along the transportation road and at narrow gaps like reduced clearance to the concrete construction support

This Risk Assessment has been reviewed and accepted			
Action plan applicable		YES	NO
HSEM	General Manager	Date	
L. Fantini	M. Massetti	01.08.12	

Damage:	
4	Catastrophic
3	Significant
2	Moderate
1	Negligible

Probability:	
4	Very likely
3	Likely
2	Unlikely
1	Very unlikely

Criteria:	
R = 1	Low
2 ≤ R ≤ 3	Medium
4 ≤ R ≤ 8	High
9 ≤ R ≤ 16	Elevated

Activity – *Working Over / Near Water*

Risk Assessment Record Sheet No: 08 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
8	Falling from height / into water	(4) 3	(2) 1	(8) 3	Injury to operator/drowning	Trained/Competent operators
	Damage to quay edge	(3) 2	(1) 1	(3) 2	Damage to equipment/cargo	Supervision
					Damage to plant/equipment	Maintained equipment
					Collapse of quayside	Life saving apparatus
						High visibility clothing
						Engineering checks for imposed loads to quay
						Supervision where necessary
						Good communications
						Safety barriers
						Good housekeeping
						Toolbox meeting
						Life vests
						PPE
						Use of safety harness

This Risk Assessment has been reviewed and accepted			
Action plan applicable		YES	NO
HSEM	General Manager	Date	
L. Fantini	M. Massetti	01.08.12	

Damage:	
4	Catastrophic
3	Significant
2	Moderate
1	Negligible

Probability:	
4	Very likely
3	Likely
2	Unlikely
1	Very unlikely

Criteria:	
R = 1	Low
2 ≤ R ≤ 3	Medium
4 ≤ R ≤ 8	High
9 ≤ R ≤ 16	Elevated

Activity – *Spillage of Hazardous Materials*

Risk Assessment Record Sheet No: 09 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
9	Loss of hydraulic oil	(3) 2	(2) 1	(6) 2	Contamination of local environment	Trained/Competent operators
	Loss of diesel	(3) 2	(2) 1	(6) 2		Supervision
	Loss of engine oil	(3) 2	(2) 1	(6) 2	Slipping of pedestrians	Maintained equipment
					Skidding of vehicles	Good communications
					Fire/explosion	Safety barriers
					Contamination of skin	Good housekeeping
						Toolbox meeting
						High visibility clothing
						Life vests
						PPE
						Each convoy to carry adequate absorbent materials
						Each convoy to carry suitable fire extinguishers
						Spare liquids to be in correct containers and adequately stowed
						Spill kit

This Risk Assessment has been reviewed and accepted				Damage:	Probability:	Criteria:	
Action plan applicable		YES	NO	4 Catastrophic	4 Very likely	R = 1	Low
HSEM	General Manager	Date		3 Significant	3 Likely	2 ≤ R ≤ 3	Medium
L. Fantini	M. Massetti	01.08.12		2 Moderate	2 Unlikely	4 ≤ R ≤ 8	High
				1 Negligible	1 Very unlikely	9 ≤ R ≤ 16	Elevated

11.10 Contingency plan

Equipment/ Environment	RISK	CONTINGENCY
SPMT	Tyre failure	Isolate the axle of affected tyre by closing suspension valve. Complete the site transportation. Spare wheels complete with tyres are available at job site. The convoy system can accept max 10 isolate suspension for each hydraulic group
SPMT	Axle failure	Isolate the affected axle hydraulically, raise the axle into the elevated position and lock off. Complete the site transportation with one less axle, using the spare SPMT's capacity. The convoy system can accept max 10 isolate suspension for each hydraulic group
SPMT	Power pack failure	Disconnect the power pack not working. Make a hose by-pass from the running power pack. One power pack can move up to 40 axles
SPMT	Electronics controls failure	The digital system is a twin system. Activate the back-up. Or change the electronic box with spare components.
SPMT	SPMT spine beam overstress	Moment distribution calculations are carried out before any transportation, to ensure that moment capacity of SPMT is not exceeded. If deflection in the spine beam is greater than predicted, set down and investigate prior to moving.
SPMT	Ground failure on route	For any local failure, stop movement immediately. Lock off the affected axles and stabilize SPMT using the remaining axles. Fill the ground hole with hard wood and proceed slowly. The convoy system can accept max 10 isolate suspension for each hydraulic group
SPMT	Fuel, Oil spillage	Clean up any spillage using clean up kits (absorbent materials).
SPMT	Weight/CoG incorrectly described by Client	Carefully monitor suspension pressures / loads when initial jacking up takes place. If pressures are not acceptable, lower the unit onto temporary supports. Ask clarification; relocate the SPMT to fit with the actual location of CoG. If doubt continues, then carry out independent weighing. Max percentage overpressure lifting system is 20%; it means the max pressure circuit is 312 Bar.

11.11 Toolbox meeting

FAGIOLI	SITE TOOL BOX MEETING	STCH-TBMT-01	Revision:	0
			Date:	01.10.18

Project:				Location:	
Client:		Date:		Time:	

Attendees	Signature	Position

Activity 1				
Supervisor:				
Operators:				
Riggers:				

Activity 2				
Supervisor:				
Operators:				
Riggers:				

Activity 3				
Supervisor:				
Operators:				
Riggers:				

Activity 4				
Supervisor:				
Operators:				
Riggers:				

Activity 5				
Supervisor:				
Operators:				
Riggers:				

Activity 6				
Supervisor:				
Operators:				
Riggers:				

Notes:

HSE:	Site Manager:
Signature:	**Signature:**

Fagioli area	**FAGIOLI EMEA**
Department	**ENGINEERING**

Client	**ROSETTI MARINO S.P.A.**
Project	**123A90 (CROSSWIND) PROJECT**
Document type	**OPERATIVE PROCEDURE**
Content	**TOP SIDE**
	TRANSPORT - LOAD OUT PROCEDURE
Doc. nr.	**030-CRO-LO-01-002-0**
Client doc. nr.	**na**

0	15/07/2025	Issued for execution	S.T.	E.B.	G.G.
A	01/07/2025	Issued for comment	S.T.	E.B.	G.G.
Rev.	**Date**	**Document status**	**prep.**	**check.**	**appr.**

Revision history:

Rev.	Date	Description of revision
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0	15/07/2025	Issued for execution

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Contents

1. SCOPE 5
2. REFERENCE DOCUMENTS 6
2.1 Standard and code 6
2.2 Client documents 6
2.3 Fagioli documents 6
3. STAFF AND RESPONSIBILITY 7
3.1 Responsibility matrix 7
3.2 Organization chart 10
3.3 Key personnel 11
4. SAFETY 17
5. COMMUNICATIONS 18
6. Operational Requirements and Criteria. 19
6.1 Loading Phase 19
6.2 Heavy transport by SPMT 19
6.3 Load-out operation 21
6.4 TOP SIDE transfer on barge grillage structure activity 22
7. BERTH DATA 23
8. EQUIPMENT FOR THE OPERATION 24
8.1 Equipment for RO-RO operations 24
9. OPERATION 25
9.1 Trailers assembly 25
9.2 Preliminary check prior TOP SIDE loading operation 25
9.3 Loading operation 25
9.4 Preliminary check prior starting inland transport 26
9.5 Inland transport 27
9.6 Preliminary check prior load-out phase 27
9.7 Load-out 28
9.8 Preliminary check before TOP SIDE lowering activities on BARGE grillage 29
9.9 TOP SIDE lowering on BARGE grillage phase 30
10. DECISION TO DISCONTINUE THE LOAD-OUT 31
11. ATTACHMENT 32

11.1 Client drawings 32
11.2 Fagioli drawings 33
11.3 SPMT stability check 34
11.4 SPMTs data sheet 35
11.5 Fagioli SPMT's check list 36
11.6 SPMT spine beam check 37
11.7 Lashing calculation 38
11.8 SPMT traction check 39
11.9 Risk assessment 40
11.10 Contingency plan 41
11.11 Toolbox meeting 42

1. SCOPE

The purpose of the present operative procedure is to define the Responsibilities, the Operational Criteria, the equipment, and the operative steps to be followed for the execution of the load-out onto the barge the TOP SIDE which is reported in the *Table 1*.

	JACKET MARK / ID	WEIGHT (contingency included or not)
Item #1	TOP SIDE BLPH	1802 t

Table 1: TOP SIDE detail

The load-out operations will be carried out at the Rosetti Yard (Ravenna – Italy)

The present procedure covers the following operations:

- Heavy transport of the TOP SIDE by Self Propeller Modular Trailer (SPMT) from storage area to the berth.
- Loading TOP SIDE on the barge.

This procedure is a general guideline for the preparation and execution of the load out operations. Other operational details shall be also taken from the specific drawings attached to the present document.
The procedure shall be read in conjunction with the documentations provided by the HSE's departments related to the safety aspects of the preparations and the operations.

The present procedure defines the staff responsibility, the equipment to be used for the operations and the steps for the safe execution of the job. Any deviation to this procedure shall be reviewed first by the Site Manager / Load out Manager (SM) and in case of need approved by the Fagioli Engineering Department prior to making the changes.

The **load-out starting point** is when the barge is moored (as per load-out mooring arrangement), SPMT's trailers are positioned underneath the TOP SIDE, the "Ready for load-out certificate" and "Certificate of Approval" are issued, and the TOP SIDE is ready to be loaded out.
The **load-out ending point** is when the TOP SIDE is released on the grillage of the barge and the minimum required sea-fastening is installed.

2. REFERENCE DOCUMENTS

Herein the standard related standards code.

2.1 Standard and code

1. ISO 9001:2015 “Quality Management System – Requirements”.
2. UNI ISO 45001:2018 “Occupational Health & Safety Management Systems - Requirements with guidance for use”.
3. DNVGL-ST-N001:2020 “Marine operations and marine warranty”.

The reference Codes and Standards shall be used in their last edition / revision available at the date.

2.2 Client documents

Client documents:

- To see in appendix 1

The reference documents shall be used in their last revision “*issued for use*”, “*issued for execution*”.

2.3 Fagioli documents

Fagioli documents:

- To see in appendix 2

The reference documents shall be used in their last revision “*issued for use*”, “*issued for execution*”.

3. STAFF AND RESPONSIBILITY

3.1 Responsibility matrix

With regards to the reference Contracts between Fagioli, the Client and possible Other Parties (contractors, subcontractors, port authority, etc.), the company Fagioli, the Client and the Others are responsible for the design, the procurement, and the operations according to the Responsibility Matrix which is reported below.

Type of activities	Activities	Fagioli	Client (Rosetti)	Others	Note
Engineering	Provide information about JACKET (weight, CoG position, protrusion, etc.)		X		
Engineering	Provide load-out quay details drawing, capacity and section through quay wall		X		
Engineering	Investigation / check of the underwater soil in the load-out area to identify and remove rocks and debris that could damage barges		X		Subsea survey report or bathymetry shall be available
Engineering	Preparation of installation area and site path from loading up to load-out area (removal of obstructions, fences, curbs…)		X		
Engineering	Check of bridges, culverts, underground or similar in the SPMT operational area		X		
Engineering	Load-out quay structural check for the SPMT's imposed loads		X		The input for the structural checks are reported in the Transport drawings (local and global bearing pressure of the SPMT's)
Engineering	Provide tide table for the berth		X		
Engineering	Provide environmental parameters (wave, current, wind, etc.) for the berth		X		
Engineering	Provide barge's booklet complete of drawings, hydrostatic tables and curves of stability		X		
Engineering	Barge general arrangement drawing with allowable deck load		X		
Engineering	Barge stowage plan drawings		X		
Engineering	Details of ballast pumping system		X		

Type of activities	Activities	Fagioli	Client (Rosetti)	Others	Note
Engineering	Method of fendering between barge and quay		X		
Engineering	Fenders data sheet and positioning on the quay		X		
Engineering	Barge positioning during load-out		X		
Engineering	Ro-ro ramp design and check		X		
Engineering	Load-out operative procedure	X	X		
Engineering	Ballast plan during load-out and preparing the barge at required height for the load-out		X		
Engineering	Mooring drawings and mooring calculation report for load-out		X		
Engineering	Mooring drawings and mooring calculation report for stand-by condition		X		
Engineering	Transport drawings for the load-out	X			
Engineering	Grillage and sea-fastening design (drawings and calculations)		X		
Engineering	Barge local structural check and calculations		X		
Supply	Mooring equipment for the load-out		X		
Supply	Mooring equipment for the stand-by condition		X		
Supply	Ro-ro ramps		X		
Supply	Grillage and sea-fastening		X		
Supply	Barge ballast equipment and Ballast Operators		X		
Supply	SPMT's Convoy and SPMT's Operators	X			
Supply	Fire Extinguishers		X		
Supply	Tugboats for barge movement		X		
Supply	Welding equipment		X		
Supply	Site lights on the barge		X		
Supply	Site lights on quay and storage area		X		
Operational	Engage the Marine Warranty Surveyor		X		
Operational	Transport permits		X		
Operational	Berth permits		X		
Operational	Provide weather forecast		X		
Operational	Winches positioning on barge/quay		X		

Type of activities	Activities	Fagioli	Client (Rosetti)	Others	Note
Operational	All barge mooring operations / activities for load-out		X		
Operational	All barge mooring operations / activities for stand-by condition		X		
Operational	Barge mooring equipment installation / removal for load-out		X		
Operational	Barge mooring equipment installation / removal for stand-by condition		X		
Operational	Ro-ro ramps installation / removal		X		
Operational	Gas free certificate for Barge		X		
Operational	Barge ballast operations during load out		X		
Operational	Barge ballast operations during stand-by condition		X		
Operational	SPMT's convoy preparation	X			
Operational	Grillage installation before load-out operation		X		
Operational	Ready for Load-out certificate		X		
Operational	Certificate of Approval for load out		X		
Operational	Load-out operation by means of SPMT's	X			
Operational	Sea-fastening installation after the load-out operation		X		
Operational	Protection of SPMT's in case of hot works (sparks, etc.)		X		
Operational	Load-in operation of empty SPMT's trailer from the barge	X			
Operational	Survey of item in its final position		X		
Operational	RINA approval according to the MWS approved sea fastening and grillage plan		X		If any
Operational	Barge tug operations		X		
Operational	Barge preparation for sail away		X		
Operational	Any barge movements inside the quay area		X		
Operational	Pre-sail-away (PSA) inspection		X		

Table 2: Responsibility Matrix

3.2 Organization chart

The load-out activities will be executed in accordance with this procedure. As per the below "*Organization chart*", the load-out planning and preparation involves key members of Client, Fagioli and Other organizations.

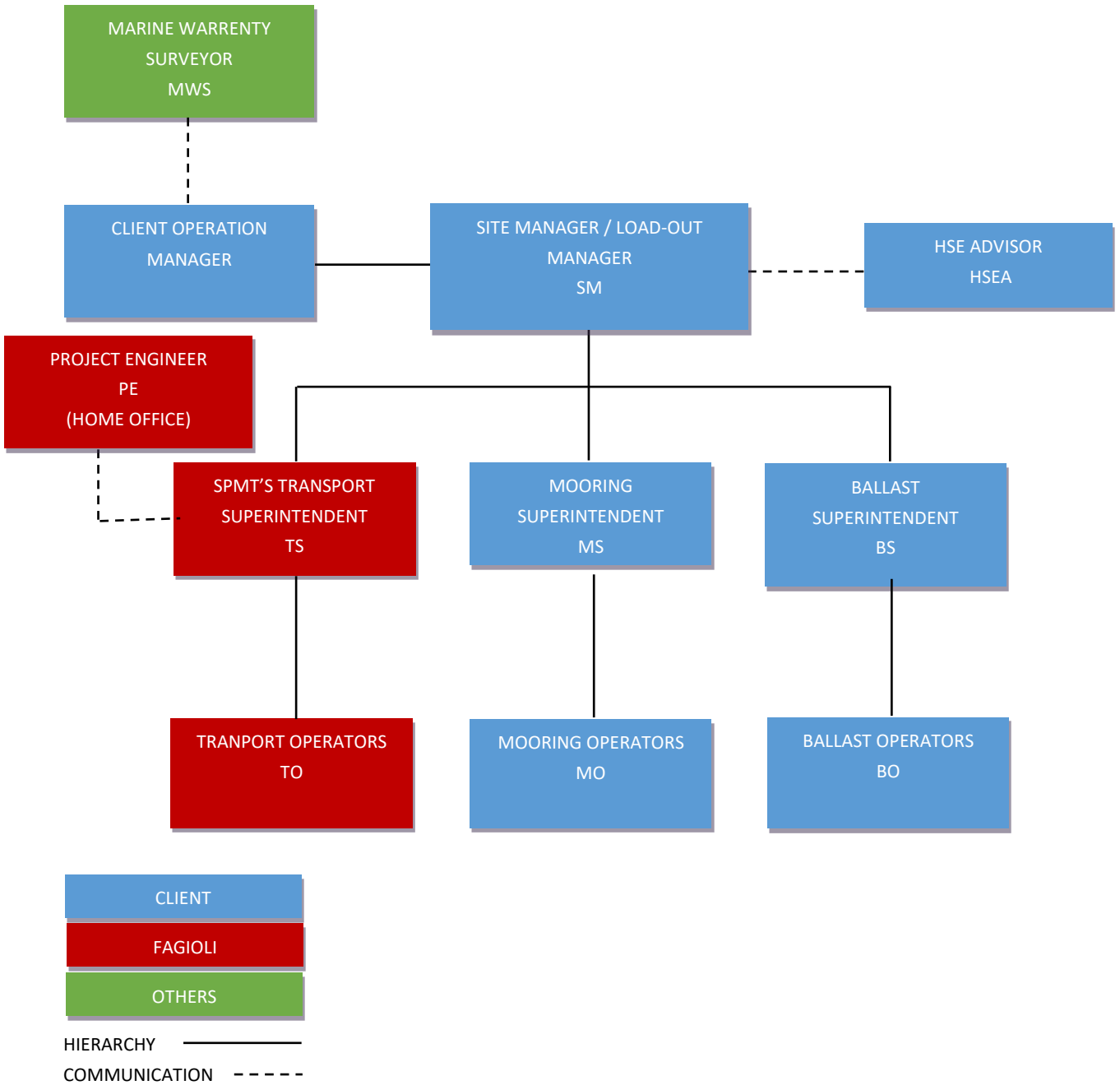


Figure 2: Organization chart

3.3 Key personnel

The key persons involved in the operations and their applicable responsibilities are as follows:

Key person	**Client Operation Manager**
Company	**Client**
Give instruction to:	Site Manager / Load-out Manager (SM)
Receive instruction from:	Client Management
Main duties	1) Acts as Client Company representative during the load-out operations. 2) Issues in agreement with MWS the "*Ready for Load-out certificate*" and coordinates all Parties with the MWS during the load-out operations. 3) Provides weather forecast from 7 days before the operations every 6 hours until load-out is completed.

Key person	Marine Warranty Surveyor (MWS)
Company	LOC
Assist:	Client Operation Manager
Receive instruction from:	Head Office
Main duties	1) Provides independent third-party technical review and approval of load-out operations on behalf of Client, from the planning stages through to the physical execution. 2) Prepares and issues the "*Certificate of Approval*" before start of load-out operations with the agreement of COM.

Key person	**Site Manager / Load-out Manager (SM)**
Company	**Client**
Give instructions to:	Ballast Superintendent (BS) Transport Superintendent (TS) Mooring Superintendent (MS)
Receive instruction from:	Client Operation Manager (COM)
Main duties	1) Be responsible for the execution of the transport and of the load out activities. 2) Explains the operations to all parties involved and establish the coordination with them, according to the Organization Chart in

	field, interfacing with the Fagioli Home Office Departments, the Client and the other Parties. 3) Conducts the *Daily Tool Box Meeting* with all parties involved about the activities that will take place in the site. 4) Plans and schedules all the site activities for the preparations and the executions of the load out. 5) Ensures that the communication between all parties is maintained in field. 6) Collects, keeps updated and distributes to all the parties involved the technical documentation. 7) Manages the deviation to the present procedure, getting approval, as required, by Home Office (PE) and by COM. 8) Collects all the certificates for the equipment and the materials used during operations. 9) Collects the *check list* duly prepared and signed by the Superintendents. 10) Be the only person who gives the conventional signals to the superintendents during job execution. 11) Be authorized to suspend the work in case of any unacceptable environmental or safety risk. 12) Ensures that the weather forecast values are within the limit of the weather criteria for the operations according to the present procedure.

Key person	**HSE Advisor (HSEA)**
Company	**Client**
Assist:	Site Manager / Load-out Manager (SM)
Receive instruction from:	HSE Manager
Main duties	1) Ensure development and timely delivery of HSE documentation. 2) Provide assistance to SM in implementing HSE requirements. 3) Liaise with internal and external stakeholders to assist/advise in HSE matters. 4) Participate in incident investigations to identify root causes and lessons learned.

Key person	**Project Engineer (PE)**
Company	**Fagioli**
Assist:	Transport superintendent
Receive instruction from:	Engineering Management
Main duties	1) Receives and collects the right and valid input engineering information from Client. 2) Prepares the operational drawings helped by drafting personnel, getting the required approval from Client, and issues the drawings / documents in revision "Issued for Use" to be followed in field. 3) Prepares the operational procedure, getting the required approval from Client, and issue the document in revision "Issued for Use" to be followed in field. 4) Develops all the engineering activities related to yard transport and to the load out according to the project design criteria established with the Client. 5) In case of need he (himself or substitute) is present during the operations and assist the operational team in case of a deviation from the present operational procedure for unexpected reasons.

Key person	**Transport Superintendent (TS)**
Company	**Fagioli**
Give instruction to:	Transport Operators (TO)
Receive instruction from:	Site Manager / Load out Manager (SM)
Main duties	1) Be responsible for the correct preparation and execution of the transport operations by SPMT's. 2) Be the only person who gives the conventional signals to the SPMT's operators during job execution. 3) Be responsible for the SPMT's hydraulic and electronic functions. 4) Superintends the SPMT's preparation, in particular the hydraulic suspension groups. 5) Be responsible for the lashing of the TOP SIDE's on the SPMT's according to the transport drawings. 6) Be responsible for the preparation of the *check lists* of the SPMT's before their use. 7) Superintends the *functional tests* of the SPMT's before their use. 8) Instructs the operators of the SPMT's about their duties for the transport operations.

	9) Superintends the periodic inspection and maintenance activities of SPMT's. 10) Be authorizes to suspend the work in case of any unacceptable environmental or safety risk. 11) Inspects the operational area and the job site before moving the SPMT's. 12) Coordinates the *contingency plan* in case of need.

Key person	**Transport Operator (TO)**
Company	**Fagioli**
Give instruction to:	-
Receive instruction from:	Transport Superintendent (TS)
Main duties	1) Prepares the convoys following the instructions of TS, in particular for the hydraulic suspension groups and lashing. 2) Performs the *functional tests* of the SPMT's before their use. 3) Be responsible for trailer hydraulic and electronic functions. 4) Performs the periodic inspection and maintenance activities of SPMT's. 5) Implements the *contingency plan* in case of need.

Key person	**Ballast Superintendent (BS)**
Company	**Client**
Give instruction to:	Ballast Operators (BO)
Receive instruction from:	Site Manager / Load out Manager (SM)
Main duties	1) Be responsible for the correct preparation and execution of the ballast operations. 2) Be the only person who gives the conventional signals to the ballast operators during job execution. 3) Be responsible for the ballast equipment functions. 4) Superintends the ballast equipment preparation. 5) Be responsible for the preparation of the *check lists* of the ballast equipment before their use. 6) Superintends the *functional tests* of the ballast equipment before their use. 7) Instructs the operators of the ballast equipment about their duties for the ballast operations.

	8) Superintends the periodic inspection and maintenance activities of the ballast equipment. 9) Be authorizes to suspend the work in case of any unacceptable environmental or safety risk. 10) Coordinates the *contingency plan* in case of need.

Key person	**Ballast Operator (BO)**
Company	**Client**
Give instruction to:	-
Receive instruction from:	Ballast Superintendent (BS)
Main duties	1) Prepares the ballast equipment following the instructions of BS. 2) Performs the *functional tests* of the ballast equipment before their use. 3) Performs the periodic inspection and maintenance activities of ballast equipment. 4) Implements the *contingency plan* in case of need.

Key person	**Mooring Superintendent (MS)**
Company	**Client**
Give instruction to:	Mooring Operators (MO)
Receive instruction from:	Site Manager / Load out Manager (SM)
Main duties	1) Be responsible for the correct preparation and execution of the mooring operations; 2) Be the only person who gives the conventional signals to the mooring operators during job execution; 3) Be responsible for the mooring equipment functions; 4) Superintends the mooring equipment preparation; 5) Be responsible for the preparation of the *check lists* of the mooring equipment before their use; 6) Superintends the *functional tests* of the mooring equipment (winches and fairleads) before their use; 7) Instructs the operators of the mooring equipment about their duties for the mooring operations; 8) Superintends the periodic inspection and maintenance activities of the mooring equipment (winches, etc…). 9) Be authorizes to suspend the work in case of any unacceptable environmental or safety risk;

	10) Coordinates the *contingency plan* in case of need.

Key person	**Mooring Operator (MO)**
Company	**Port Authority**
Give instruction to:	-
Receive instruction from:	Mooring Superintendent (MS)
Main duties	1) Prepares the mooring equipment following the instructions of MS; 2) Perform the *functional tests* of the mooring equipment (winches) before their use; 3) Performs the periodic inspection and maintenance activities of mooring equipment (winches); 4) Implements the *contingency plan* in case of need.

4. SAFETY

As far as Occupational Health, Safety & Environment aspects are concerned, all personnel involved in the operations shall refer to the documents provided by the HSE's department, such as DVRS, DUVRI and any additional applicable documentation relevant to the project.

Furthermore, the following aspects are particularly important for a safe and successful execution of the operations in subject and shall be organized/checked carefully by the Site Manager / Load out manager (SM):

1. Carry out an Operational Meeting with all involved parties, to explain the load out operations, to clarify the responsibility of everybody and to set up the communication lines.
2. Carry out a toolbox meeting before the execution of each operation, discussing the hazards associated with the task and outlining what preventive and protective measures are foreseen to mitigate such hazards.
3. Ensure that *Risk Assessment* and *Contingency Plan* are well known by all personnel involved.
4. Ensure that sightseers are kept away from the operations.
5. Ensure that personnel are at adequate distance from *tensioned mooring wires* during tensioning and during all the operations.
6. Monitor weather forecast.
7. Ensure that all personnel wear all necessary *Personal Protective Equipment*.
8. Check all equipment before use, in particular check all hydraulic hoses using the relevant check lists. operation shall not start if there is any pending points.
9. Ensure that the anticipated loads on SPMTs are known, including the safe working loads and the pressure for the equipment being used.
10. Absorber material shall be available in case of oil/fuel spillage.
11. Fagioli SM, TS, MS and BS shall always be present during the operations.
12. Fagioli SM shall ensure that the *Emergency Plan* is available, the plan shall comprise of a layout with indication of Muster Points, First Aid Kits, Fire Extinguishers, Spill Kits, Life Buoy and any additional emergency response equipment.

5. COMMUNICATIONS

The communication between all party involved will be in English language.

Before starting the operations, a meeting is held with all the parties involved, to explain the load out operation and to clarify the responsibility of everybody and set up the communication lines. Each personnel shall be aware about its task and its location on board or onshore, according to the *Safety Plan* and according to their duties during the operations.

The SM, BS, BO, TS, TO, MS and MO are provided with radio.

All parties are aware of all applicable *Emergency Procedures* according to the *Safety Plan*.

6. Operational Requirements and Criteria.

In this chapter It'll be listed the operational criteria/requirements for the main activities.

6.1 Loading Phase

The **loading operation starting point** begin after that the SPMT will be in Rosetti yard beside the TOP SIDE.
The **loading operation ending** point when the TOP SIDE will be completely positioned onto SPMT.

The final decision for starting with the operations will be agreed on site, considering the following operational guidelines:

PARAMETER	VALUE
Max operational wind for yard transport by SPMT's	10 m/s (3s gust at 10m above waterline)
Min operational temperature	-15° C
Max operational temperature	+50° C
Visibility limit	± 100 m

6.2 Heavy transport by SPMT

Heavy Transport engineering shall consist of an analysis and selection of appropriate transportation arrangement for SPMT's, defining also the operational tolerances (max. SPMT's speed, max axle load, max wind speed, max out of verticality).
The load distribution in a transport should normally be calculated as a quasi-static load case by distributing the design transport weight of the transported unit and any special load to each structural temporary member and to the SPMT's.
The Nominal Weight is supplied by Client trough a Weight Report and adequate contingency factor is already included. Envelope ± 500 mm of CoG location shall be taken into consideration to compensate any inaccuracy.
Between bottom steel frame of transported unit and top steel frame of SPMT's, plywood shall be used (friction coefficient wood/ steel = 0,21).
Additional lashing for safety reason between SPMT's bed and support beams will be carried out. The lashing system definition is showed in dedicated DWG.
SPMT's hydraulic circuits shall be arranged in such a way that a 3 points system is realized; with this system, the reactions on the trailers are practically constant and there is no overstress on the transported unit.

In the operational conditions, the pressures on the SPMT's hydraulic circuits shall never exceed the allowable values stated by the manufacturer, which depend also from the travelling speed.
For transport, the stability analysis shall be carried out, considering the maximum transverse / longitudinal wind, center of gravity location inaccuracy and the operational tolerances (max. out of verticality) and brake and inertial movement effect.
Total tractive power (number of powered axles) shall be checked to be sufficient to overcome acceleration and slope along the road path.

PARAMETER	VALUE
Max operational wind for yard transport by SPMT's	10 m/s (3s gust at 10m above waterline)
Min operational temperature	-15° C
Max operational temperature	+50° C
Visibility limit	1.5 times the length of the TOP SIDE no activities will occur in case of thunderstorm with lightning, fog, heavy rain which reduce visibility below this limit
TOP SIDE longitudinal out of verticality	± 1°
TOP SIDE transversal out of verticality	± 1°
Min. transport path capacity	11.5 t/m^2
Speed limit	0.5 Km/h

Note: Friction coefficient table

Table 2-4 Friction Coefficients

Surface 1	*Surface 2*	*Condition*	*μ*
Steel	Steel	Wet	0.0
Steel	Steel	Dry	0.1
Steel	Timber (wood)	Wet	0.2
Steel	Timber (wood)	Dry	0.3
Steel	Rubber	Wet and dry	0.3

Note: The table is based on recommendations in IMO re. A.714(17). It is assume that the friction surfaces are free from oil or other lubricating fluids

6.3 Load-out operation

The **load-out operation starting points** begin after BARGE preparation. The **load-out operation ending point** is when the TOP SIDE will be in final position before lowering phase.
The final decision for starting the operations will be agreed on site, considering the following operational guidelines:

PARAMETER	VALUE
Max operational wind for load-out by SPMT's	10 m/s (3s gust at 10m above waterline) (or to be advise by Client in case of lower value)
Min operational temperature	-15° C
Max operational temperature	+50° C
Max significant wave height	to be advise by Client
Max current velocity	to be advise by Client
Visibility limit	1.5 times the length of the BARGE no activities will occur in case of thunderstorm with lightning, fog, heavy rain which reduce visibility below this limit
Max difference in elevation between barge deck and quay	0/+100 mm during crossing the ro-ro ramps only
Max. swell effect on barge	± 100 mm (minimum period 10 sec).
Barge max trim	1.0 %
Barge max heel	0.5 %
TOP SIDE longitudinal out of verticality	± 1° Including trim effect
TOP SIDE transversal out of verticality (controlled during the operations by spirit level positioned onto SPMT load bed)	± 1° Including heel effect
Min. quay ground capacity and deck capacity	11.5 t/m^2
Tide range	As per Tide Tables attached, to be verified with tide measurements starting no later than 5 days prior the scheduled load-out

Note: SPMT load-out weather limitation shall be compared with mooring weather limitation.

6.4 TOP SIDE transfer on barge grillage structure activity

The **unloading operation** will start after the load-out convoy will be in final position in accordance with operational dwg. The **lowering operation ending point** is when the TOP SIDE will be completely seated on BARGE grillage.

PARAMETER	VALUE
Max operational wind for load-out by SPMT's	10 m/s (3s gust at 10m above waterline) (or to be advise by Client in case of lower value)
Min operational temperature	-15° C
Max operational temperature	+50° C
Max significant wave height	to be advise by Client
Max current velocity	to be advise by Client
Visibility limit	1.5 times the length of the BARGE no activities will occur in case of thunderstorm with lightning, fog, heavy rain which reduce visibility below this limit
Max. swell effect on BARGE	± 100 mm (minimum period 10 sec).
BARGE max trim	1.0 %
BARGE max heel	0.5 %
TOP SIDE longitudinal out of verticality	± 1 % Including trim effect
TOPSIDE transversal out of verticality	± 1 % Including heel effect

7. BERTH DATA

The Module will be loaded-out from Rosetti Yard (Piomboni) along the ro-ro ramps, positioned between the barge and berth, and transferred to the grillage onto the Barge.

The Berth is shown in the picture below.



Figure 2: Berth plan view

8. EQUIPMENT FOR THE OPERATION

The main equipment to be used for the yard transport and load-out operations are reported in the following chapter. As a general rule, all the equipment shall be inspected and functionally tested before their use at site with relevant *check lists*.

8.1 Equipment for RO-RO operations

The equipment to be used for the yard transport and load-out operations are as follows:

Fagioli

- N. 12 x 6 axles (48t/axle capacity) + N. 4 x 4 (48t/axle capacity).
- N. 3 PPUs.

All the above equipment available at job site, is subject to periodic inspections. moreover prior to commencement of the operations the equipment will be checked according to inspection *check lists*.

Client / Others

- Grillage and sea-fastening;
- Ro-ro ramps;
- Site lights for Quay and Storage Area;
- Site lights for Barge;
- Service cranes;
- Service forklift(s) / mainlift(s);
- Equipment and tools for installing grillage and sea-fastening;
- Gangway with safety net

The details of TOP SIDEs/equipment provided by Client / Others are being worked outside of this procedure using other project processes and will be confirmed by the owner prior to commencing the load-out operation.

9. OPERATION

Herein will be listed the operative phases and related check for execution of the operation.

9.1 Trailers assembly

SPMT will be assembly at Rosetti yard by hydraulic service crane min SWL 60 t.

9.2 Preliminary check prior TOP SIDE loading operation

Preliminary check prior loading operation phases of items, the following checks shall be carried out (as applicable) under the supervision of SM with the assistance of TS.

1. Weather conditions are suitable for the execution of the operation.
2. Coordination information has been notified to the other Contractors working in the area.
3. All transportation equipment, installation aids, standard rigging hardware is available.
4. Drivers/operators have full understanding of the load-in Procedure and Safety Plan.
5. Immediately prior to the operation a 'tool box talk' will be held to explain in detail the extent of the operation and the procedures involved.
6. All required personnel (qualified drivers/operators, safety, signal persons, mechanics...) are available for the operation.
7. Before the operation, the work area will be clearly identified, and all unauthorized personnel excluded.
8. The clearance below the is suitable for SPMT insertion
9. Throughout the operation one clearly identified person (SM) will be in charge and it is only this person who is authorized to issue instructions to the equipment operators to commence. However, any person involved and conversant with the operation if they feel safety is being compromised is authorized to say STOP.
10. Organization/roles/responsibilities, communications plan have been defined and clearly understood by all the personnel involved in the operation.
11. Check that radio systems are functioning correctly.

9.3 Loading operation

The TOP SIDE is located internal of Rosetti yard. It'll be loaded directly by SPMT.
Loading operation shall not commence until MWS CoA has been issued.
The loading operation will be done after weighing activities. At this stage, the elevation of the TOP SIDE will be as follow:

The lower grillage structure elevation from ground level:

- TOP SIDE row A - A lower grillage structure height is 2400 mm;

- TOP SIDE row B - B lower grillage structure height is 2400 mm;
- TOP SIDE row C - C lower grillage structure height is 2400 mm.

The TOP SIDE will be finally loaded onto transport trailers by jacking up trailer platform, using the hydraulic stroke of same trailer.

The loading sequence will be as follow:

1. SPMT block will be transferred from the assembling nearly TOP SIDE area.
2. Loading of will start immediately after Client Superintendent (CS) authorization.
3. SPMT units will be maneuvered into position beneath the support point and will be positioned according to the transportation arrangement drawings to ensure accurate positioning. Make sure that trailers are hydraulically connected in the right way so that stability is grant and no overstress is induced in the steel structure of the TOP SIDE.
4. SPMT units will be gradually elevated to take the load by raising the SPMT's stroke till they are in contact with the bottom of the TOP SIDE upper grillage. Shim with plywood as required to have full contact between SPMT's and the contact point.
5. Take gradually: check that the pressure in the hydraulic circuits agrees with the predicted values.
6. Check that the TOP SIDE structure has no abnormal deflections
7. Another careful check will be made on the pressure of the hydraulic supporting groups and the level of the platform, before starting the lifting operation.
8. Lifting of the TOP SIDE, by hydraulic stroke of trailer, up to have 50 mm clearance between upper grillage structures and concrete block.
9. Check that the TOP SIDE/spreader beams structure has no abnormal deflections.
10. Check if the SPMT spine beam deflection is in accordance with the predicted calculation.
11. Another careful check will be made on the pressure of the hydraulic supporting groups and the level of the platform, before starting the lashing operations.
12. Lashing material will be installed as for DWG

9.4 Preliminary check prior starting inland transport

Before starting the inland transport of TOP SIDE, the following checks shall be carried out (as applicable) under the supervision of SM with the assistance of TS.

1. All lashing arrangement has been performed as for drawing.
2. Weather conditions are suitable for the execution of the operation: max operational wind speed = 10 m/s gust clear visibility (no fog, no heavy rain, and no snow).
3. Weather forecast are suitable for to carried out the operation
4. All spare contingency equipment / materials are available at the quay.
5. SPMT check list is done
6. Transport route and ro-ro jetty areas are clear from obstructions and the other working Contractors.

7. Rosetti CS together with Fagioli SM will check that at no point on the path of the SPMTs the terrain inclination will exceed the capability of the SPMTs to maintain a maximum of 1° of out of verticality.
8. Coordination information has been notified to the other Contractors working in the area by Rosetti
9. All transportation equipment, installation aids, standard rigging hardware are available.
10. Drivers/operators have full understanding of the load-in Procedure and Safety Plan.
11. Immediately prior to the operation, a 'tool box talk' will be held to explain in detail the extent of the operation and the procedures involved.
12. All required personnel (qualified drivers/operators, safety, signal persons, mechanics...) are available for the operation.
13. Before the operation, the work area will be clearly identified and all unauthorized personnel excluded.
14. Throughout the operation one clearly identified person (SM) will be in charge and it is only this person who is authorized to issue instructions to the equipment operators to commence. However, any person involved and conversant with the operation if they feel safety is being compromised is authorized to say STOP.
15. Organization/roles/responsibilities, communications plan have been defined and clearly understood by all the personnel involved in the operation.
16. Check that radio systems are functioning correctly.

9.5 Inland transport

The heavy transport operations shall be executed under the supervision of the SM, according to the transport drawings and Method Statement "issue for execution".

The SM/TS will be in contact by radio with the SPMT operators to instruct them during the operation. The TS will be constantly monitoring the operations for conformity with information elaborated during the engineering phase.

During the transportation phase, check:

1. The pressure in SPMT's hydraulic circuits remains in accordance with the anticipated values.
2. Upon arrival at the storage area, the TOP SIDE will be aligned with the barge long. axis.
3. The maximum speed doesn't exceed 0.5 Km/h
4. The pressure in SPMT's hydraulic circuits remains in accordance with the anticipated values.
5. For Yard maneuver to see DWG in appendix 2

9.6 Preliminary check prior load-out phase

Before starting the load-out convoy, the following checks shall be carried out (as applicable) under the supervision of SM with the assistance of TS.

1. Weather conditions are suitable for the execution of the loadout operation (with 24 hours forecast window): max operational wind speed = 10 m/s (3 s gust). (no fog, no heavy rain, no snow)
2. Weather forecast are suitable for carried out the operation
3. Sea conditions are within the operational limits (tides and swell)
4. Barge mooring is correctly/suitable
5. All spare contingency equipment / materials are available at the quay.
6. SPMT check list is done
7. Link span bridges are installed according to the drawing.
8. Jetties area are clear from obstructions and the other working Contractors.
9. Coordination information has been notified to the other Contractors working in the area.
10. Drivers/operators have full understanding of the load-out Procedure and Safety Plan.
11. Immediately prior to the operation, a 'tool box talk' will be held to explain in detail the extent of the operation and the procedures involved.
12. All required personnel (qualified drivers/operators, safety, signal persons, mechanics...) are available for the operation.
13. Before the operation, the work area will be clearly identified and all unauthorized personnel excluded.
14. Throughout the operation, one clearly identified person (SM-TS) will be in charge and He is only this person who is authorized to issue instructions to the equipment operators to commence. However any person involved and conversant with the operation if they feel safety is being compromised is authorized to say STOP.
15. Organization/roles/responsibilities, communications plan have been defined and clearly understood by all the personnel involved in the operation.
16. Check that radio systems are functioning correctly.

9.7 Load-out

The Load-out commence after the barge has been ballasted to the required draft. The barge will be moored with stern to quay side. When the barge mooring will be ready the barge bridge plates will be installed by Rosetti.
In charge of the load-out will be the SM who will be in constant radio contact with the barge load-out engineer (by Rosetti) and TS. SM/TS will be in constant radio contact with the experienced SPMT Operators who will steer and adjust SPMT height/elevation as the SPMT's negotiate the change in elevation of the ramps.
The barge moorings will be checked periodically by visually inspection.
The SPMT's will pause periodically in line with the flow rate of the ballast pumps to maintain the barge level with the quay during all stages of the transfer operation.

Load-out operation must take care of the following steps:

1. The SPMT's are ready;

2. When the BARGE is in level with the quay, at the suitable tide the SPMT will start moving slowly on bridge steel plates. Travelling speed will be synchronized with the BARGE ballasting.
3. Ballast Engineers shall instruct the SM to move and to stop. The BARGE ballast system shall work to keep even keel throughout the roll-on.
4. Do not overtake the maximum travelling speed (0.5 km/h); synchronize the movement with the BARGE ballasting.
5. The SM shall monitor the level of the bridge plates.
6. The BARGE mooring shall be continuously monitored by visually checking the mooring lines' catenaries and mooring lines' terminations.
7. Mooring winches are appropriately tensioned and ready for loadout.
8. Level difference between BARGE and quay shall not exceed 0mm/+100 mm
9. The Load-out will continue until Load transfer is complete i.e. last axle of SPMT's is on the BARGE.
10. The transport convoy will move forward (bow side) up to reach the TOP SIDE BARGE final location

During TOP SIDE load-out activities the SPMT height will be kept at approx. 1500 mm.

9.8 Preliminary check before TOP SIDE lowering activities on BARGE grillage

Before starting the TOP SIDE final lowering on grillage, the following checks shall be carried out (as applicable) under the supervision of SM with the assistance of TS.

1. TOP SIDE position is in accordance with stowage plan
2. Weather conditions are suitable for the execution of the lowering operation (with 24 hours forecast window): max operational wind speed = 16 m/s (3 s gust). (no fog, no heavy rain, no snow)
3. Sea conditions are within the operational limits (tides and swell)
4. BARGE mooring is correctly/suitable
5. All spare contingency equipment / materials are available at the quay.
6. Coordination information has been notified to the other Contractors working in the area.
7. Drivers/operators have full understanding of the load-out Procedure and Safety Plan.
8. Immediately prior to the operation, a 'tool box talk' will be held to explain in detail the extent of the operation and the procedures involved.
9. All required personnel (qualified drivers/operators, safety, signal persons, mechanics...) are available for the operation.
10. Before the operation, the work area will be clearly identified and all unauthorized personnel excluded.
11. Throughout the operation one clearly identified person (SM) will be in charge and He is only this person who is authorized to issue instructions to the equipment operators to commence. However, any person involved and conversant with the operation if they feel safety is being compromised is authorized to say STOP.
12. Check that radio systems are functioning correctly.

9.9 TOP SIDE lowering on BARGE grillage phase

The unloading operation for TOP SIDE will start after the convoy will be in final position in accordance with stowage plan.
The TOP SIDE will be finally seated onto lower grillage by jacking down trailer platform, using the hydraulic stroke of same trailer.

The lower grillage structure on BARGE will have the following height:

- TOP SIDE row A lower grillage structure height is 2450mm
- TOP SIDE row B lower grillage structure height is 2450mm
- TOP SIDE row C lower grillage structure height is 2450mm

Due of spreader/spacer equipment design, the trailer contact height – i.e. the height of the trailer load bed at the time of first contact with the lower grillage structure – is:

- TOP SIDE row A: height 1600 mm
- TOP SIDE row B: height 1600 mm
- TOP SIDE row C: height 1600mm

Unloading operation must take care of the following steps:

1. The SPMT's bed lowers up to get 10 mm clearance from TOP SIDE upper grillage structure to BARGE grillage
2. Another position check will be made from SM and load-out engineer
3. 50% weight download on lower grillage: by SPMT lifting system
4. Check of gap on each support point
5. TOP SIDE weight resuming on SPMT system.
6. Shimming insertion on required location between lower grillage and upper grillage, if any.
7. Complete TOP SIDE weight download on lower grillage.
8. Transport lashing material removal
9. SPMT removal

10. DECISION TO DISCONTINUE THE LOAD-OUT

This section describes the condition which would require discontinuing load-out operations.
This decision will be made as a result of a major failure of load-out system and only if it is safer to discontinue than to continue with the load-out operation.
The decision to postpone or terminate the load-out operation has to be taken after technical discussion among all Parties (Client / MWS / Fagioli / Contractor / Subcontractor).

Load-out shall stop and the TOP SIDE shall be made safe if any of following conditions occur:

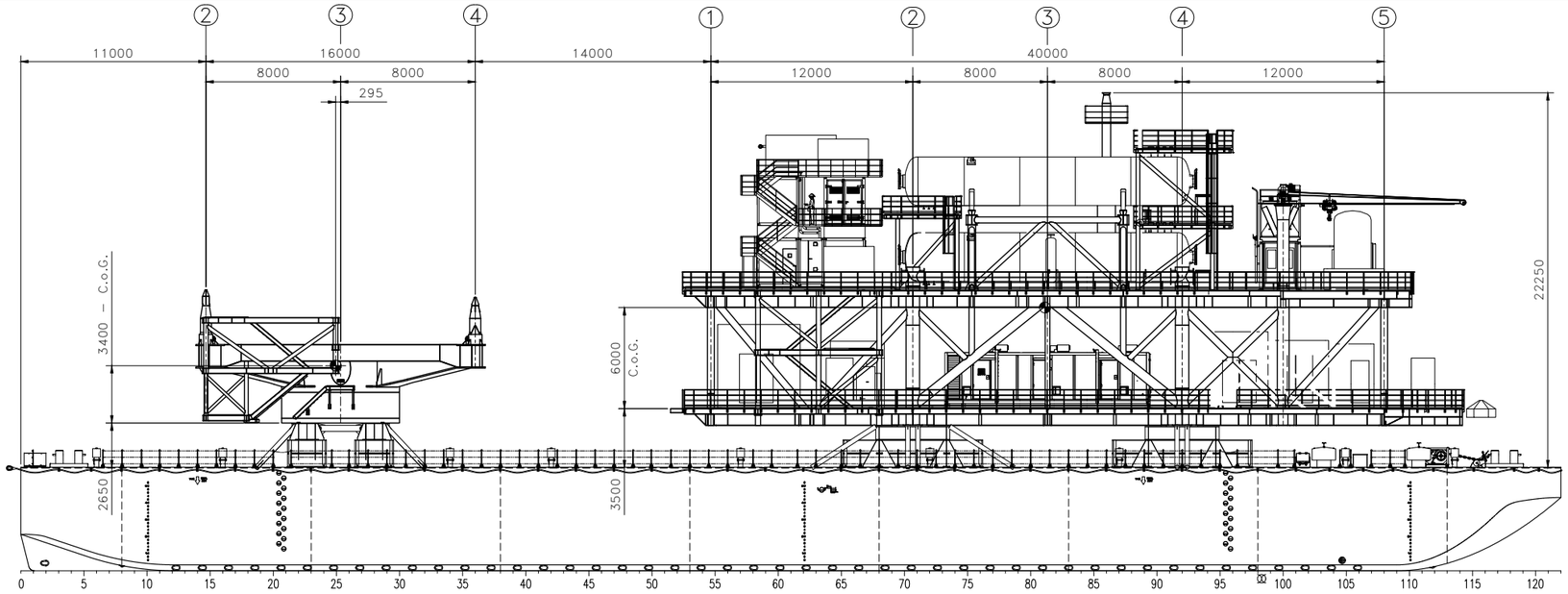
a) If a problem develops with the stability or buoyancy of the BARGE (see Client contingency plan).
b) If a problem develops with the mooring of the BARGE (temporary stop, see Client contingency plan).
c) If a problem develops with the SPMTs (see attachment – SPMT's contingency plan).
d) If a problem develops with ballasting system failure (temporary stop, see Client contingency plan).

11. ATTACHMENT

11.1 Client drawings

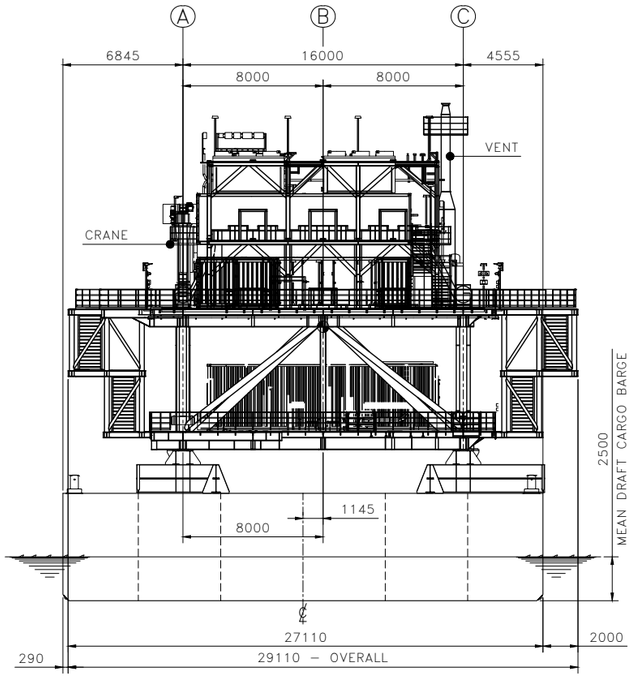
DRAWING NO. 123A90-DDL-TI-DD-99015

REV. 02



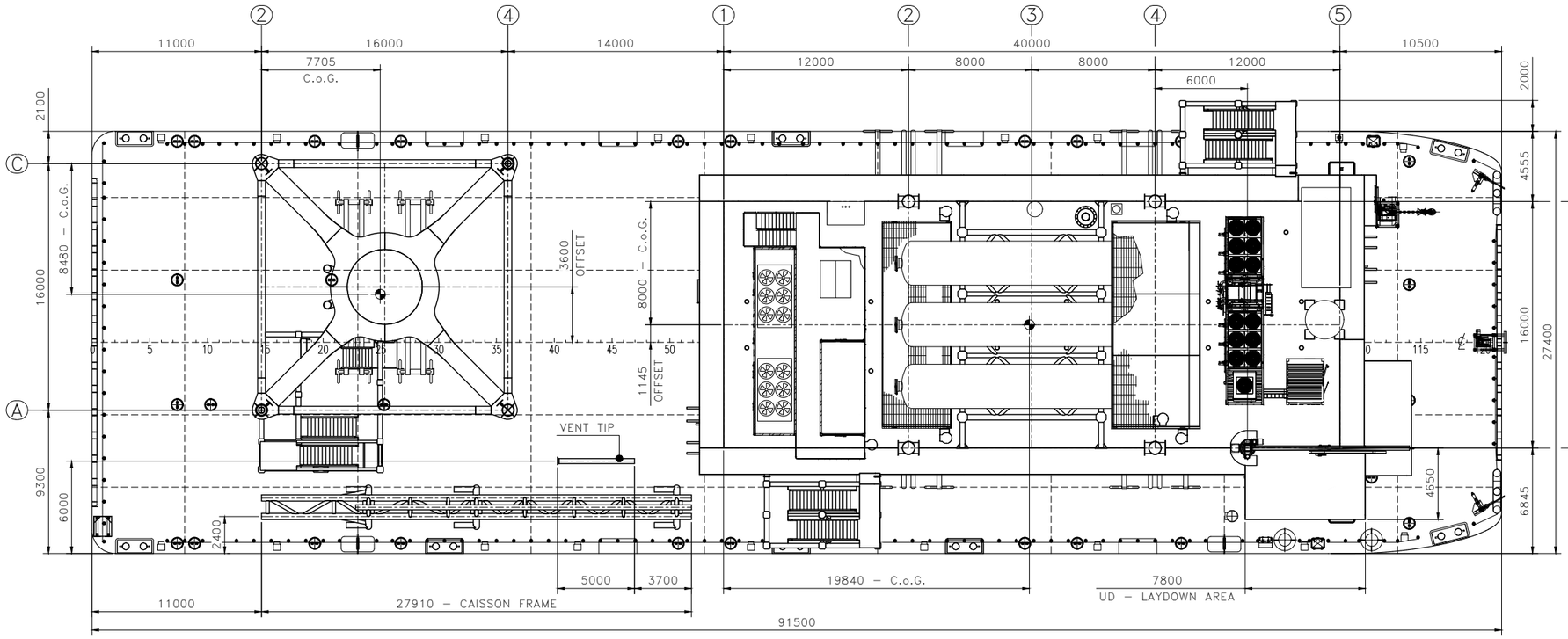
ELEVATION – LONGITUDINAL VIEW

SCALE 1:175



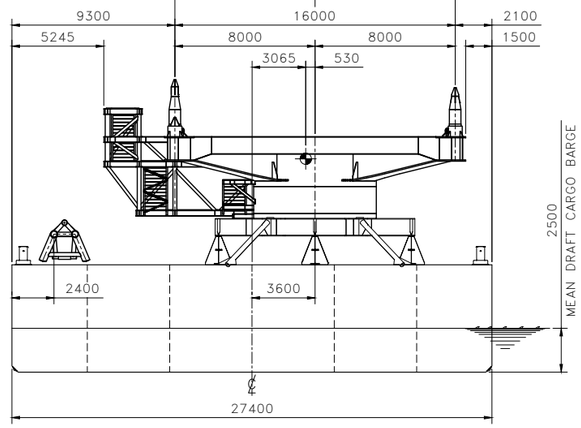
TOPSIDE – TRANSVERSAL SECTION

SCALE 1:175



BARGE LAYOUT – PLAN VIEW

SCALE 1:175



TP – TRANSVERSAL SECTION

SCALE 1:175

02

STAN PONTOON - B27		
LENGTH	= 300' 0"	91.500 m
BREADTH	= 90' 0"	27.400 m
DEPTH	= 20' 0"	6.100 m
DRAUGHT ABT	= 15' 75"	4.800 m
UNIFORM DECK LOAD	= 20 T/sqm	

WEIGHT LIST	
TOPSIDE	= 1830 t
TP	= 280 t
TOPSIDE GRILLAGE & SF	= 100 t
TP GRILLAGE & SF	= 45 t
CAISSON FRAME	= 26 t
VENT TIP	= 0.4 t

NOTES	HOLDS
1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O. 2 – ALL ELEVATIONS ARE REFERED TO C.D.	

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
02	11/09/24	SGR	AB	DLS	ACCEPTED FOR CONSTRUCTION (AFC)
01	05/02/24	SGR	AB	DLS	ACCEPTED FOR CONSTRUCTION (AFC)
00	12/01/24	SGR	AB	DLS	ISSUE FOR REVIEW (IFR)

CROSSWIND

ROSETTI MARINO

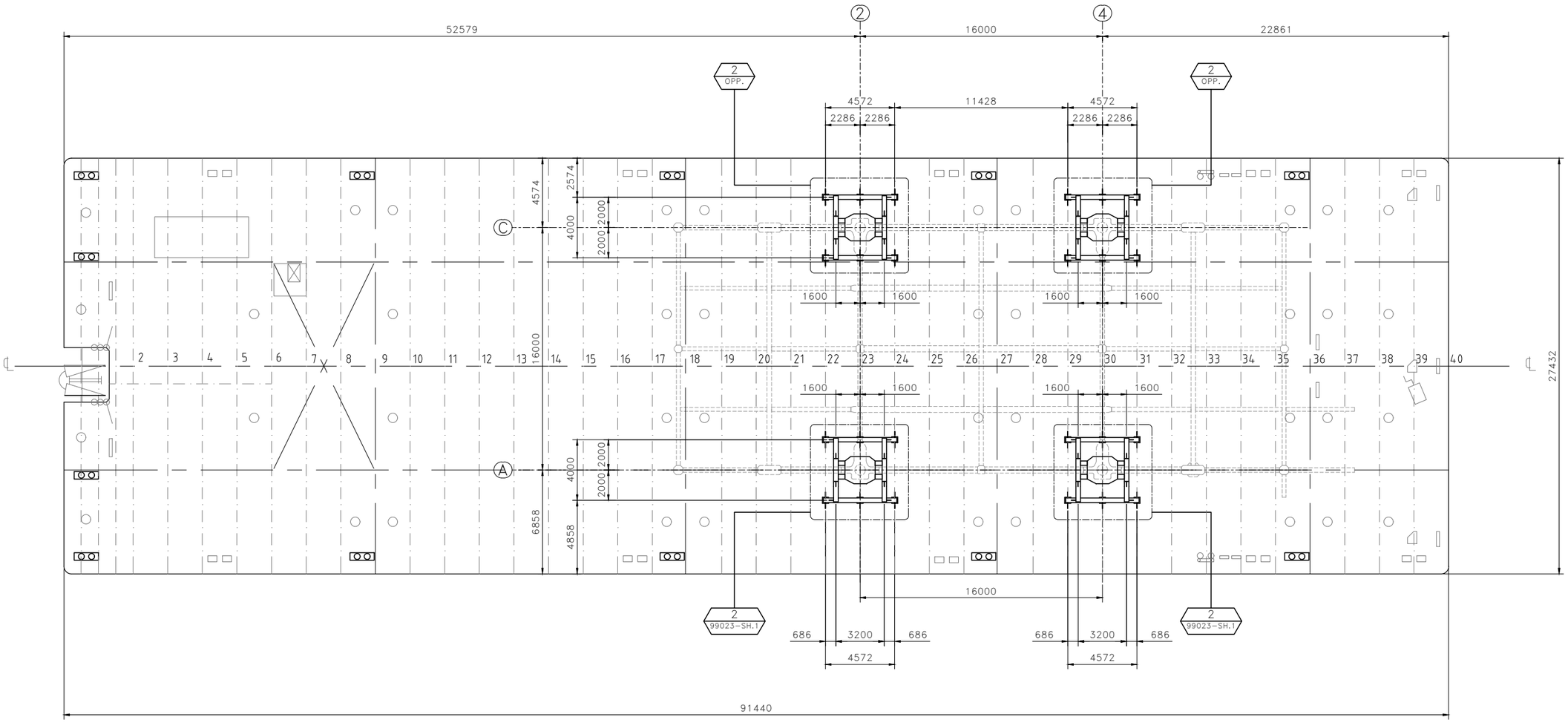
TITLE : BASE LOAD POWER HUB (BLPH)
BARGE LAYOUT

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:175
DRAWN S.GRIFFINI	CHECKED A.BALZAROTTI	APPROVED D.LO STERZO	DATE 11/09/24
A1	DRAWING NO. 123A90-DDL-TI-DD-99015	SHEET 001	REV. 02

File Name : 123A90-DDL-TI-DD-99015_02.dwg

DRAWING NO. 123A90-DDL-TI-DD-99021

REV. 01



TOP SIDE – GRILLAGE – ASSEMBLY

SCALE 1:150

NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.
2 – ALL ELEVATIONS ARE REFERED TO C.D.

HOLDS

REFERENCE DRAWINGS

DWG No.	DESCRIPTION
123A90-DDL-ST-DD-90025	DRAWING LIST
123A90-DDL-ST-DD-90026	GENERAL NOTES
123A90-DDL-TI-DD-99022	TOP SIDE – GRILLAGE ROW C – PLAN AND SECTION
123A90-DDL-TI-DD-99023	TOP SIDE – GRILLAGE ROW A – PLAN AND SECTION

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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00	20/01/25	SGR	AB	DLS	ISSUE FOR REVIEW (IFR)

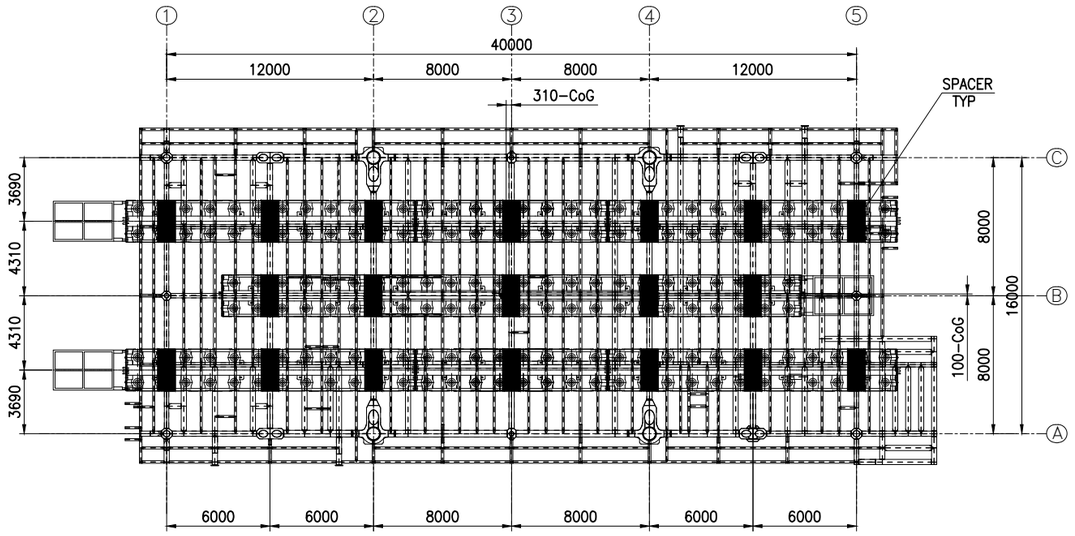
CROSSWIND

ROSETTI MARINO

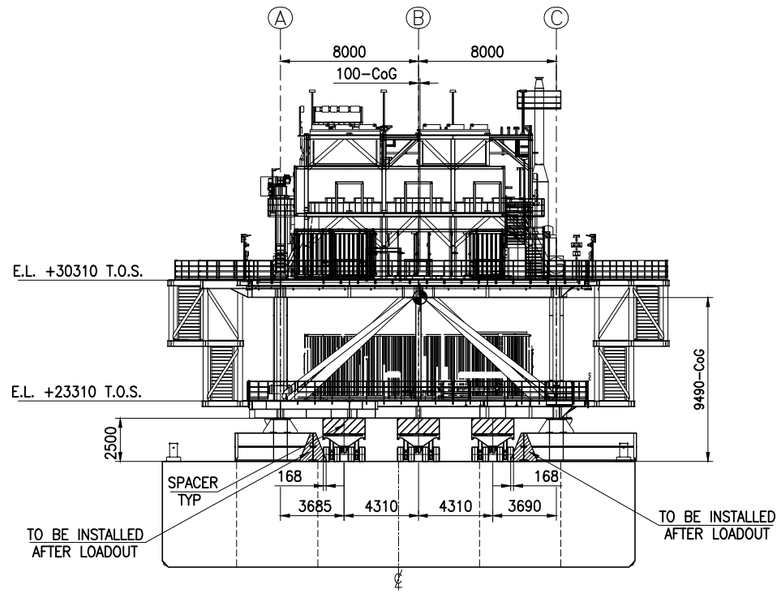
TITLE : BASE LOAD POWER HUB (BLPH)
TOP SIDE – GRILLAGE
ASSEMBLY

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:150
DRAWN S.GRIFFINI	CHECKED A.BALZAROTTI	APPROVED D.LO STERZO	DATE 14/02/25
A1	DRAWING NO. 123A90-DDL-TI-DD-99021	SHEET 001	REV. 01

File Name : 123A90-DDL-TI-DD-99021_01.dwg



TOPSIDE – PLAN VIEW
ITEM WEIGHT=1802 T



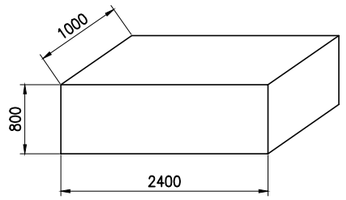
BARGE – TRANSVERSAL SECTION

NOTES

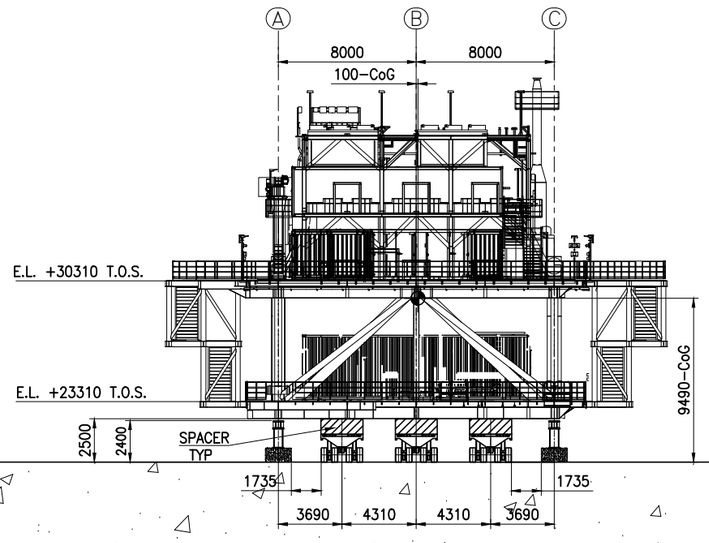
1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.
2 – ALL ELEVATIONS ARE REFERED TO C.D.
3 – LOADOUT DESIGN GROSS WEIGHT AND CoG AS PER WCR REV.03

TYP SPACER DETAIL

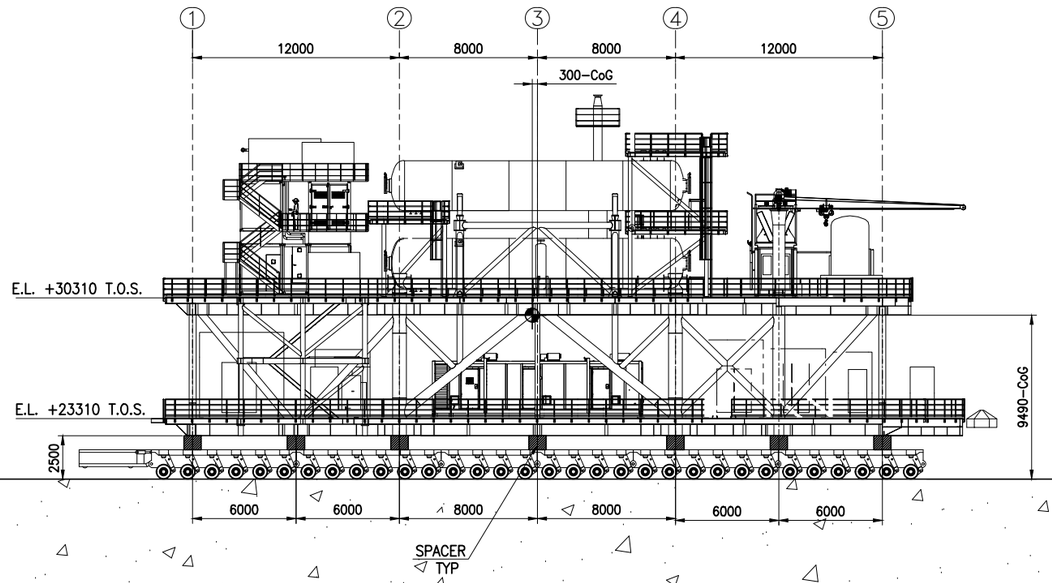
SUPPORT POINT SPMT – STRUCTURE



No. 19 PCS REQD



YARD – TRANSVERSAL SECTION



TOPSIDE – LONGITUDINAL VIEW

REFERENCE DRAWINGS

DWG No.	DESCRIPTION

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
00	02/10/24	AG	FC	CA	

CROSSWIND

ROSETTI MARINO

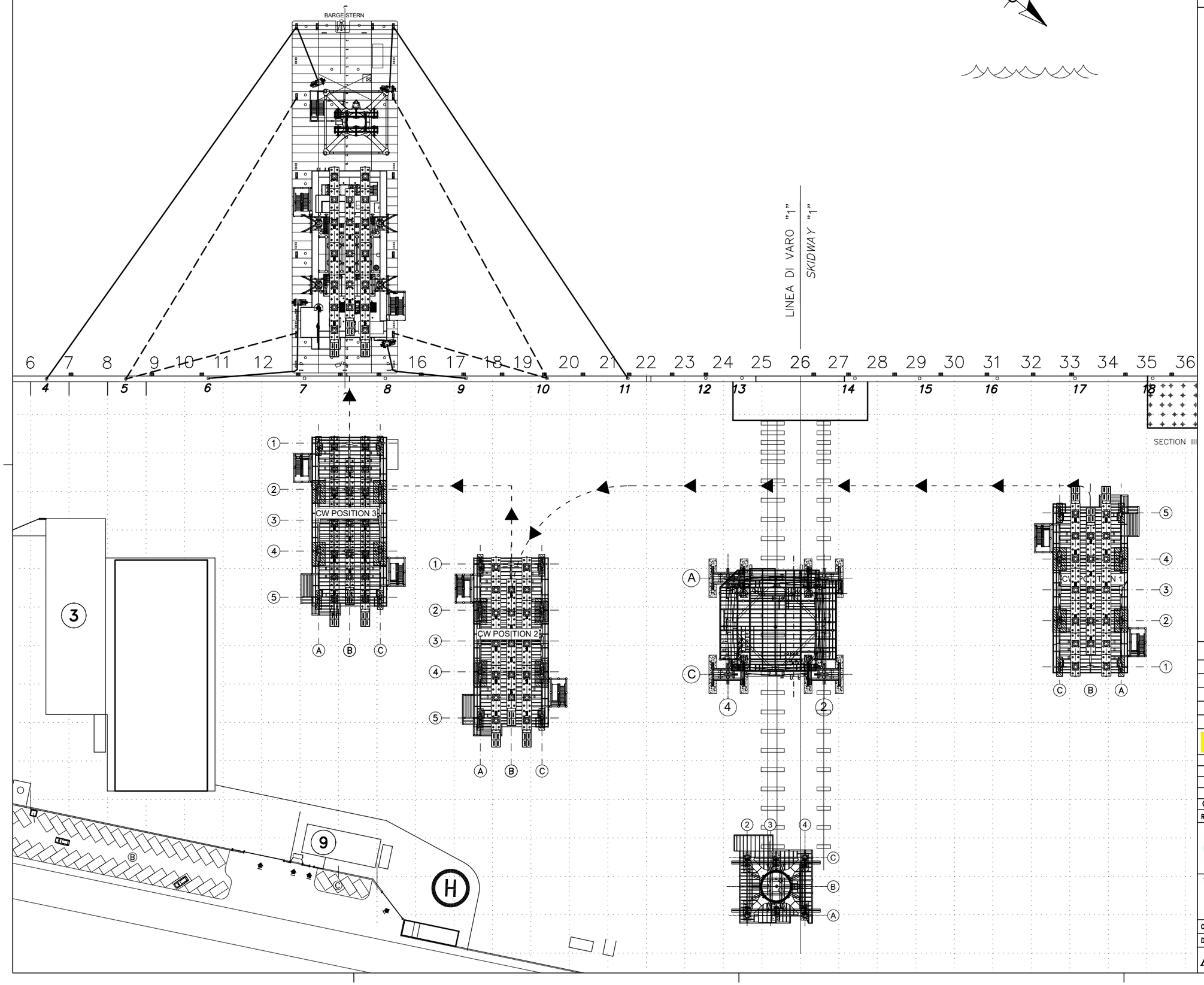
TITLE :

TOPSIDE LOADOUT – SPMT CONFIGURATION

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK .			SCALE
DRAWN A.GASPERONI	CHECKED F.CERONI	APPROVED C.ANTONELLINI	DATE 02/10/24

A1	DRAWING NO. 123A90-FDL-MT-DD-00401	SHEET 001	REV. 00

STEP 2



NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.

REFERENCE DRAWINGS

DWG No.	DESCRIPTION

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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CROSSWIND

ROSETTI MARINO

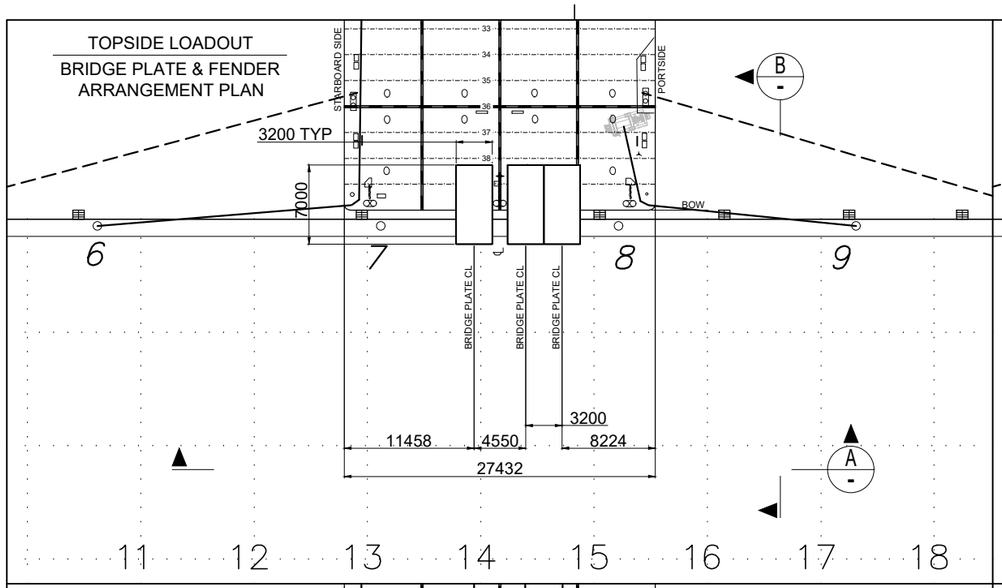
TITLE :

BASE LOAD POWER HUB (BLPH)
CROSSWIND LOADOUT
YARD LAYOUT – STEP 2

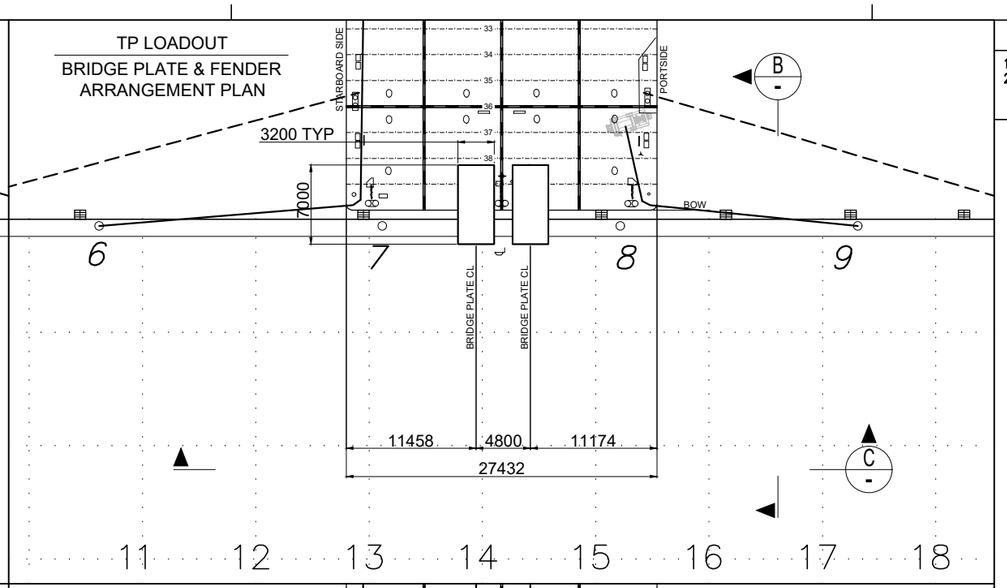
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE
DRAWN G.SEGURINI	CHECKED F.CERONI	APPROVED C.ANTONELLINI	DATE 27/05/25

A1	DRAWING NO. 123A90-FDL-MT-DD-00403-00	SHEET 001	REV. 00

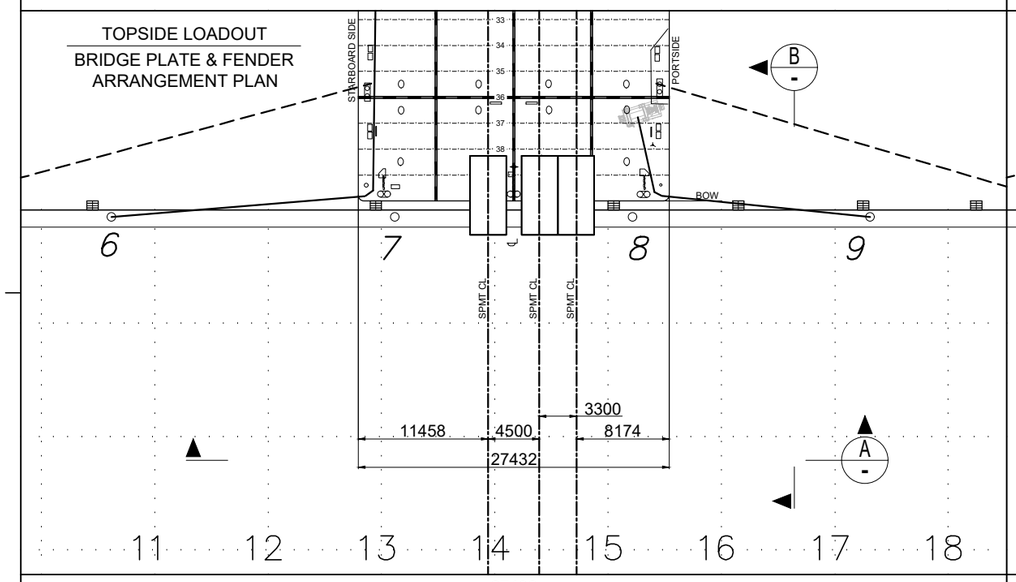
TOPSIDE LOADOUT
BRIDGE PLATE & FENDER
ARRANGEMENT PLAN



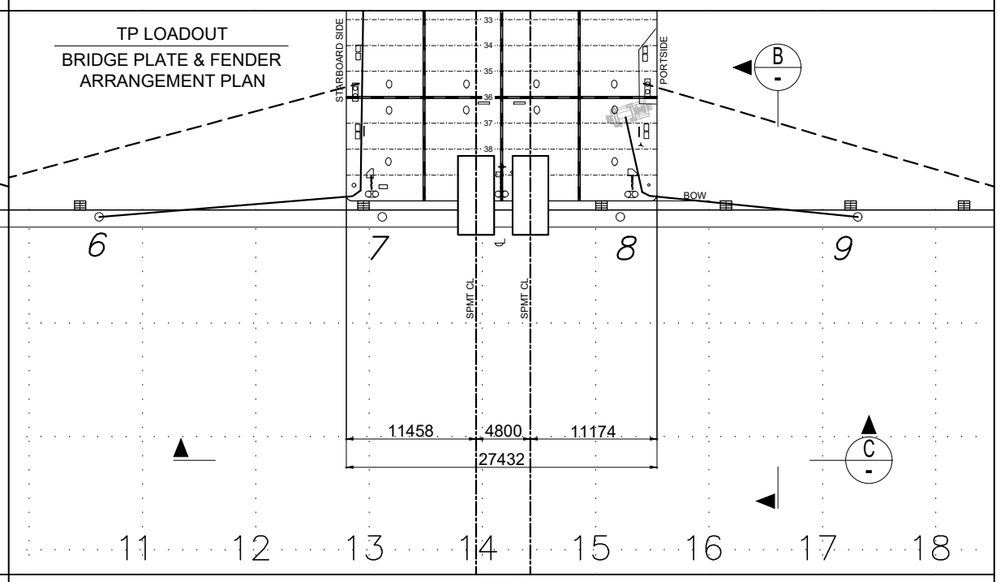
TP LOADOUT
BRIDGE PLATE & FENDER
ARRANGEMENT PLAN



TOPSIDE LOADOUT
BRIDGE PLATE & FENDER
ARRANGEMENT PLAN

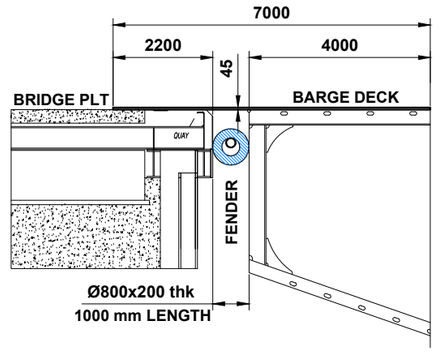


TP LOADOUT
BRIDGE PLATE & FENDER
ARRANGEMENT PLAN



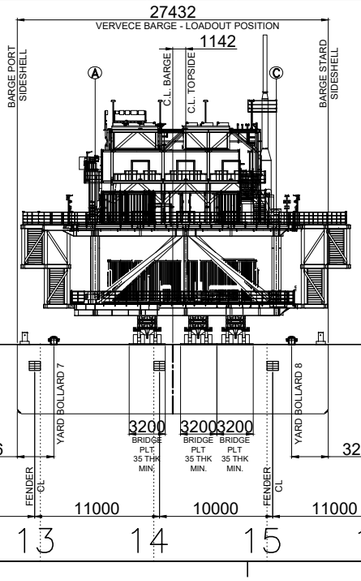
NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.
2 – PLATES FOR LOADOUT ARE 7000x3200x35 min

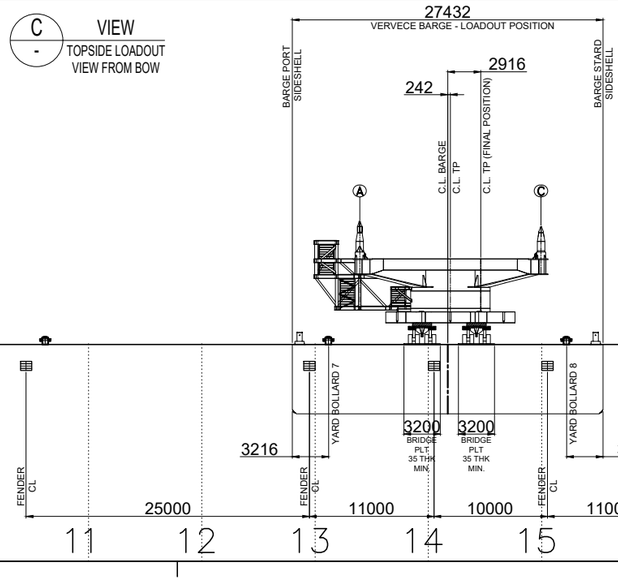


B / - VIEW
TYP SECTION

A / - VIEW
TOPSIDE LOADOUT
VIEW FROM BOW



C / - VIEW
TOPSIDE LOADOUT
VIEW FROM BOW



REFERENCE DRAWINGS

DWG No.	DESCRIPTION

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
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00	03/03/25	CB	FC	CA	

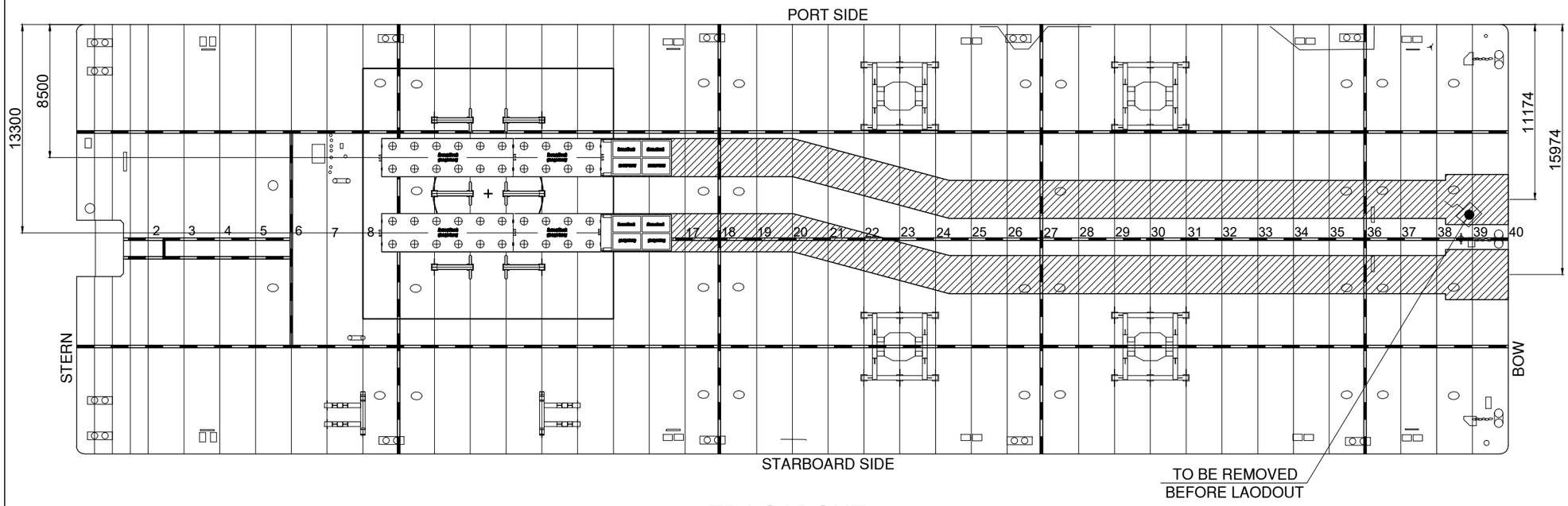
CROSSWIND

ROSETTI MARINO

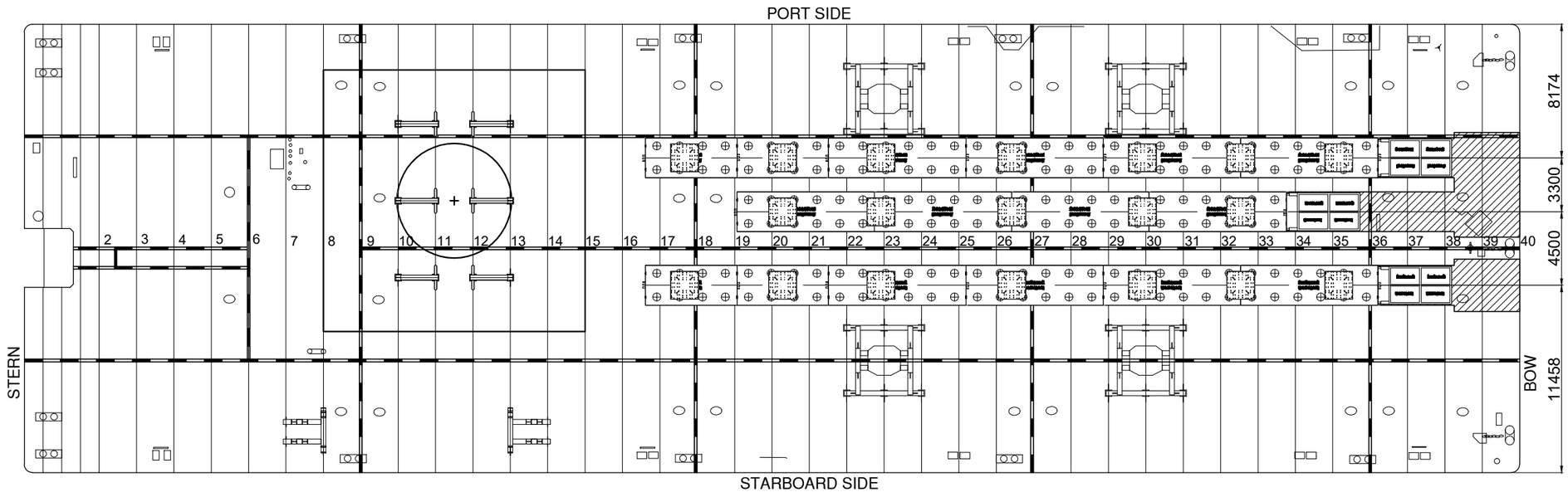
TITLE :
BASE LOAD POWER HUB (BLPH)
BRIDGE PLT & FENDERS
GENERAL ARRANGEMENT

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE
DRAWN C.BENZONI	CHECKED F.CERONI	APPROVED C.ANTONELLINI	DATE 12/06/25

A1	DRAWING NO. 123A90-FDL-MT-DD-00407-01	SHEET 001	REV. 01



TP LOADOUT



TOPSIDE LOADOUT

NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.

REFERENCE DRAWINGS

DWG No.	DESCRIPTION

TECON

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
01	12/06/25	SG	FC	CA	ISSUED FOR CONSTRUCTION
00	30/05/25	GS	FC	CA	ISSUED FOR CONSTRUCTION

CROSSWIND

ROSETTI MARINO

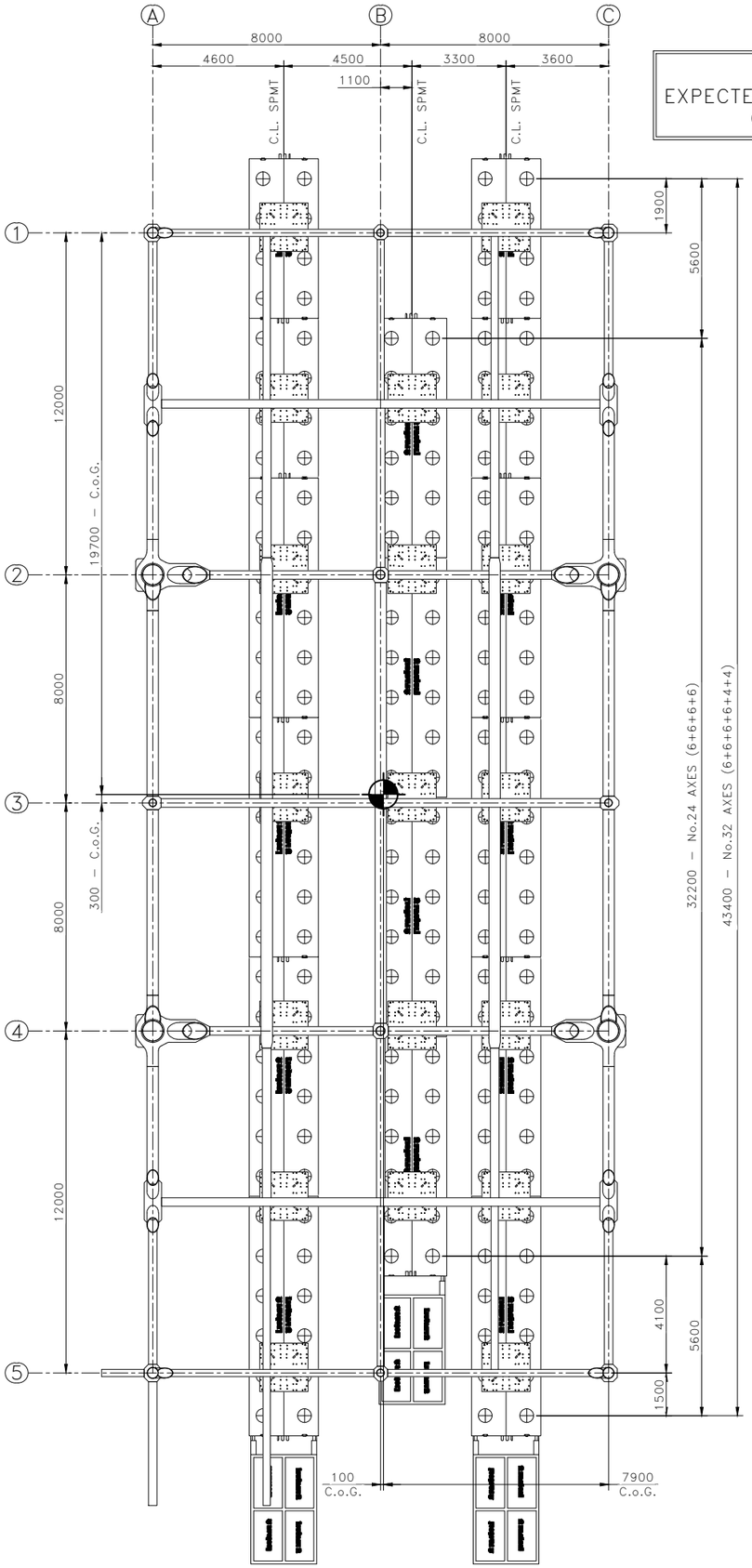
TITLE :
BASE LOAD POWER HUB (BLPH)
LOADOUT TOPSIDE & TP
SPMT PATH ON BARGE

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK . | SCALE

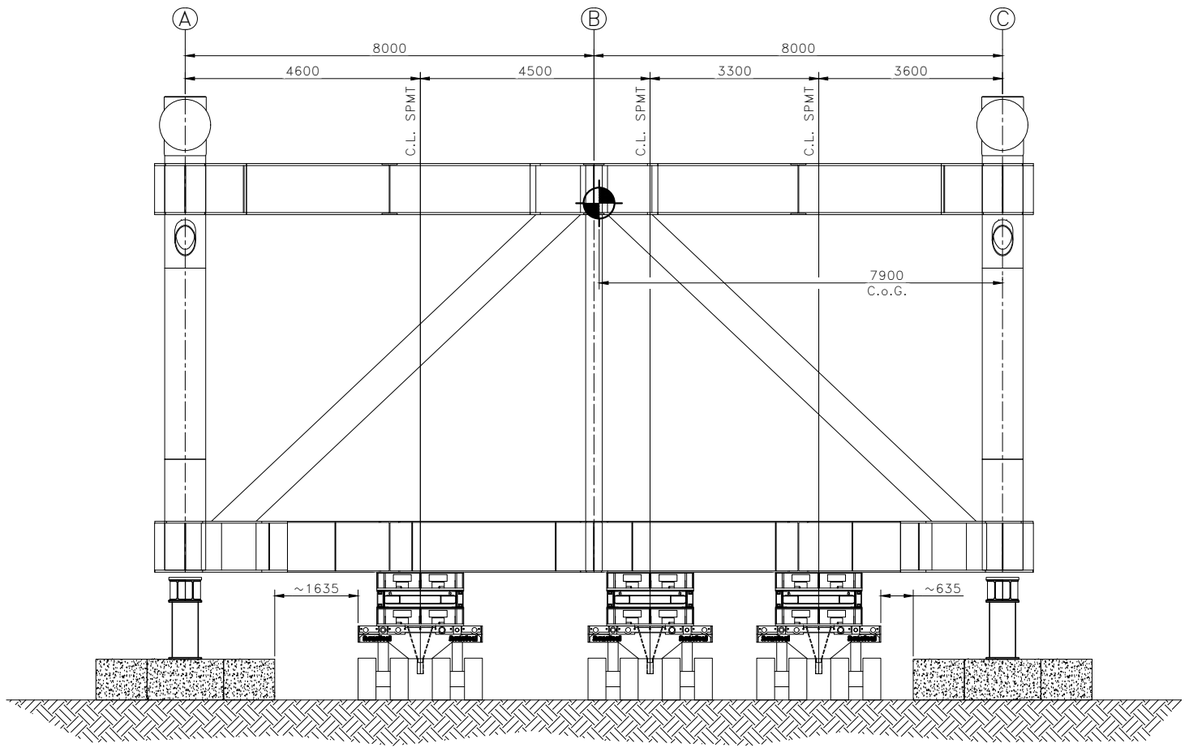
DRAWN G.SEGURINI | CHECKED F.CERONI | APPROVED C.ANTONELLINI | DATE 12/06/25

A1 | DRAWING NO. 123A90-FDL-MT-DD-00409-00 | SHEET 001 | REV. 01

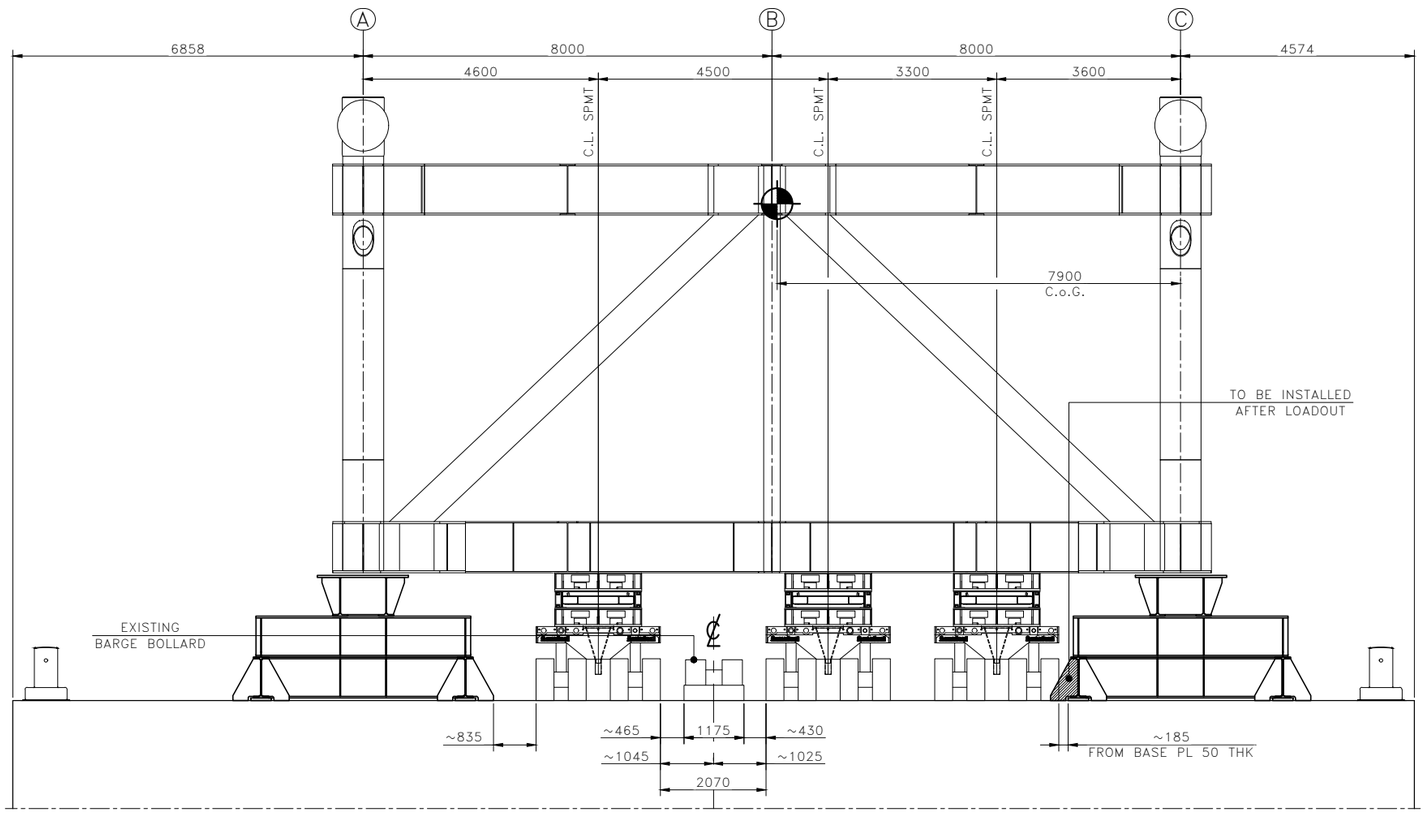
LOADOUT
EXPECTED WEIGHT = 1802 ton
(CONTINGENCY INCLUDED)



TOPSIDE – LOWER DECK – PRIMARY STEEL
SCALE 1:100



TOPSIDE – TRANSVERSAL VIEW AT YARD
SCALE 1:60



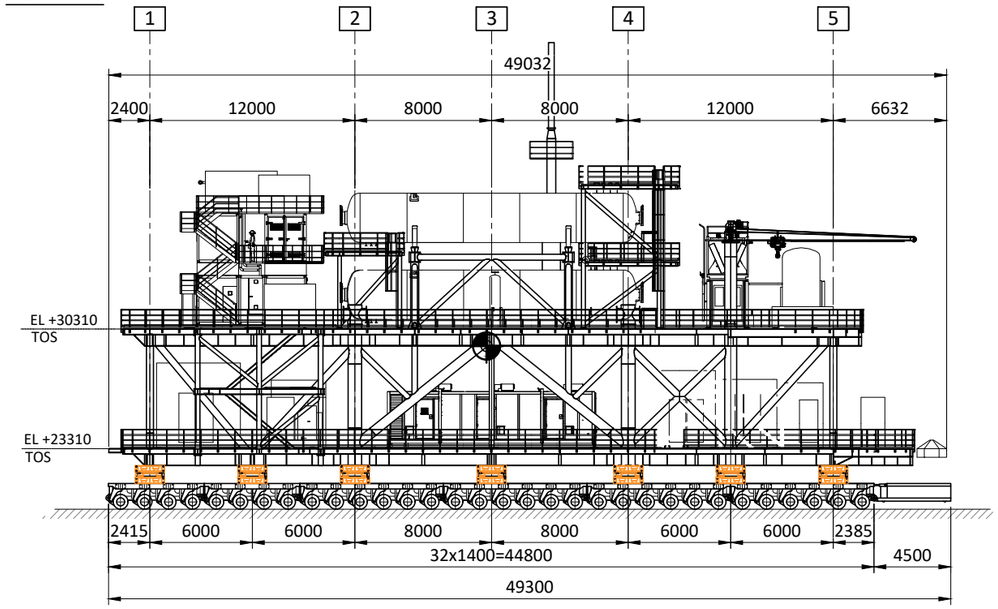
TOPSIDE – TRANSVERSAL VIEW AT BARGE
SCALE 1:60

TKtecon
ROS1783 – SK-011_02 10.06.2025

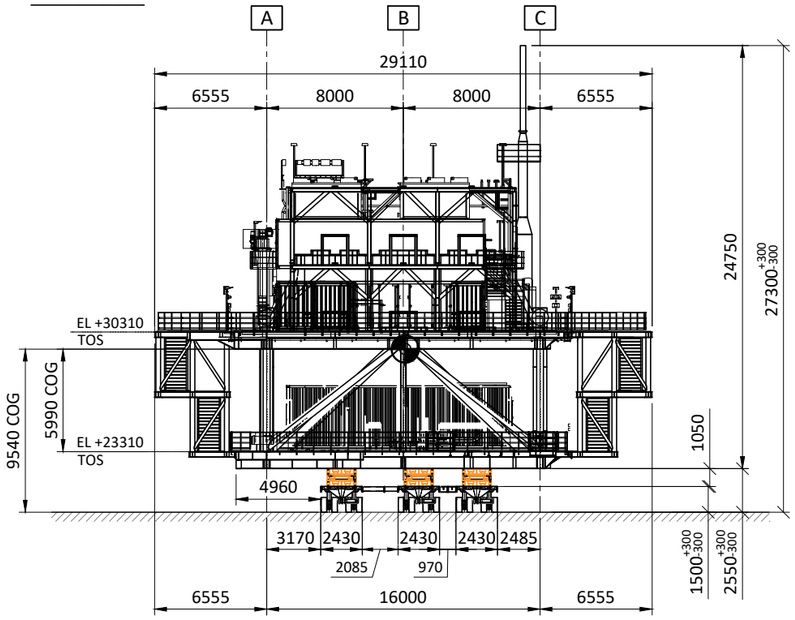
11.2 Fagioli drawings

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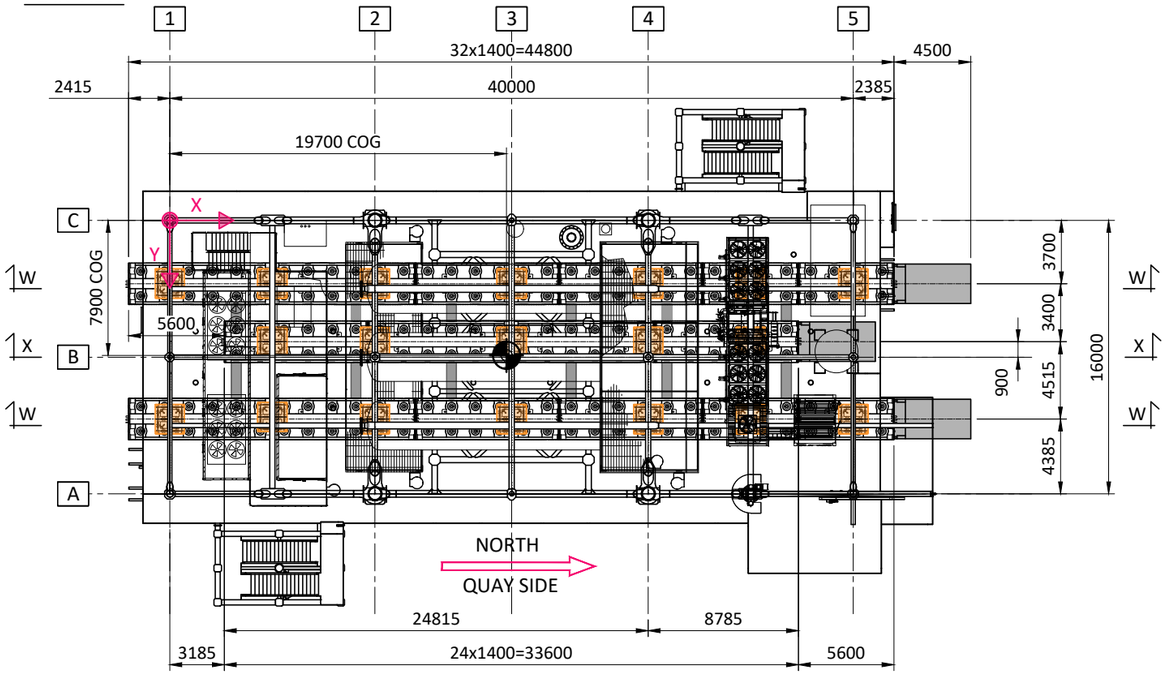
VIEW W-W



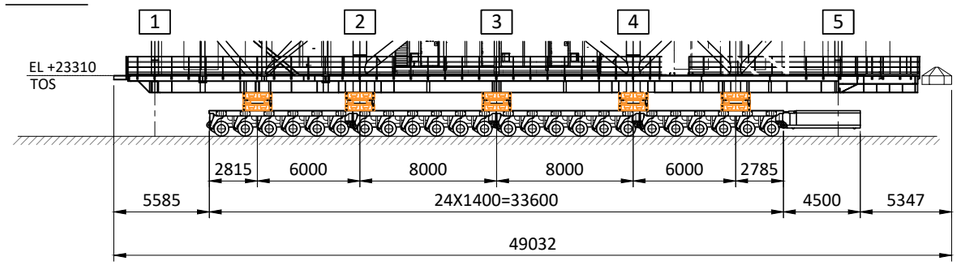
FRONT VIEW



PLAN VIEW

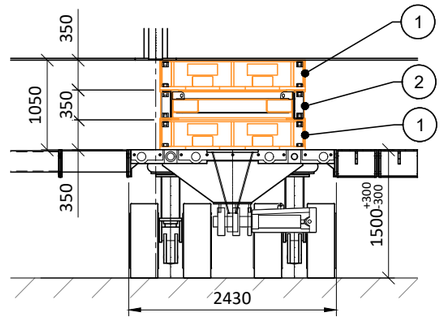


VIEW X-X



EQUIPMENT DETAIL

scale x5



MATERIAL LIST

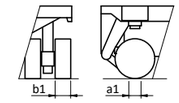
#	DESCRIPTION	WEIGHT cad. (Kg)	Q.TY TOT
1	TWR 17.00 1700x1700x350 mm	2050.0	38
2	TWR 17.01 1700x1700x350 mm	525.0	19
TOTAL WEIGHT (Kg)			87875.0

TRANSPORT CONFIGURATION: 88 AXLES

ITEM weight (contingency included)			**1802 t**
SPMT dead weight			392,1 t
EQUIPMENT weight			87,875 t
TOTAL weight			2282 t
		BASE VALUES	**MAX VALUES**
Group A 22 AXLES	Weight per axles	28,6 t	36,2 t
	Capacity per axles	48,0 t	48,0 t
	Cylinder pressure	171 bar	219 bar
	Contact pressure under the wheel	8,5 kg/cm²	9,4 kg/cm²
	Average Ground pressure	8,4 t/m²	10,6 t/m²
Group B 22 AXLES	Weight per axles	28,6 t	36,2 t
	Capacity per axles	48,0 t	48,0 t
	Cylinder pressure	171 bar	219 bar
	Contact pressure under the wheel	8,5 kg/cm²	9,4 kg/cm²
	Average Ground pressure	8,4 t/m²	10,6 t/m²
Group C-D 44 AXLES	Weight per axles	23,3 t	28,6 t
	Capacity per axles	48,0 t	48,0 t
	Cylinder pressure	139 bar	171 bar
	Contact pressure under the wheel	7,8 kg/cm²	8,5 kg/cm²
	Average Ground pressure	6,9 t/m²	8,4 t/m²

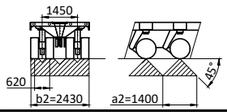
LOCAL WHEEL BEARING AREA [a1xb1] = $[\frac{P}{(n*p)}]$

where P = weight per axle (kg)
n = number of wheels for axle (4)
p = contact pressure under the wheel (kg/cm²)



GLOBAL LOADED AREA BELOW CONVOY [a2xb2] = $[\frac{P}{p2}]$

where P = weight per axle (kg)
p2 = average ground pressure (kg/cm²)



OPERATIONAL PARAMETERS:
- MAX TRAVELING SPEED: 0.5 km/h
- MAX OPERATIONAL WIND SPEED : 16.0 m/s
- MINIMUM REQUIRED GROUND BEARING CAPACITY: 10.8 t/m²
- THE GROUND SHALL BE COMPACTED AND LEVELED. MAX SLOPE:1%
- ALLOWABLE TRANSVERSE INCLINATION OF CONVOY(OUT OF VERTICALITY): 1°
- ALLOWABLE LONGITUDINAL INCLINATION OF CONVOY (OUT OF VERTICALITY):1°
- AXLES PRESSURE SHALL BE CONTINUOUSLY CHECKED, ACTING ON THE HYDRAULIC SYSTEM TO COMPENSATE ANY DEVIATION RESPECT TO THE EXPECTED VALUES. USE WATER LEVEL TO CHECK SPMT OUT OF VERTICALITY .

NOTE:
1. MODULE WEIGHT: 1802 t (NET WEIGHT +0.00% CONT. INCLUDED).
2. MODULE WEIGHT AND COG AS PER CLIENT DOCUMENT: 123A90-FDL-MT-DD-00401 (Last Rev) 123A90-DDL-TI-DD-99015 (Last Rev)
3. MAX VALUES INCLUDE ALL THE EFFECTS SUCH AS WIND, OUT OF VERTICALITY, COG ENVELOPE.
4. TIPPING ANGLE: 16.2°
5. OVERLOAD ANGLE: 9.6°
6. PLYWOOD OR RUBBER SHEETS SHALL BE POSITIONED BETWEEN ANY STEEL SURFACE IN CONTACT (U.O.N.).
7. LOCAL AND GLOBAL ITEM STRENGHT CHECK BY CLIENT;
8. THE BOTTOM PART OF THE MODULE SHALL BE CLEAR OF OBSTRUCTIONS (PIPES, SECONDARY STRUCTURE).
9. BEFORE MOVING THE TRAILER, CHECK THE HYDRAULIC PRESSURE / AXLE LOAD AND BE SURE THAT THE VALUES ARE EQUAL TO THE THEORETICAL VALUES IN THE TABLE (BASIC VALUES).
10. ITEM TO BE LASHED TO THE TRAILER FRAME AS PER DRAWING. IF NOT SHOWN, LASHING SHALL BE DEFINED BY TRANSPORT SUPERINTENDENT.

Rev.	Descrizione revisione / Description of revision	Data / Date	Disegnato / Drawn by	Controllato / Checked by	Approvato / Approved by
A	FOR COMMENT	08/07/25	SMG	GG	LG

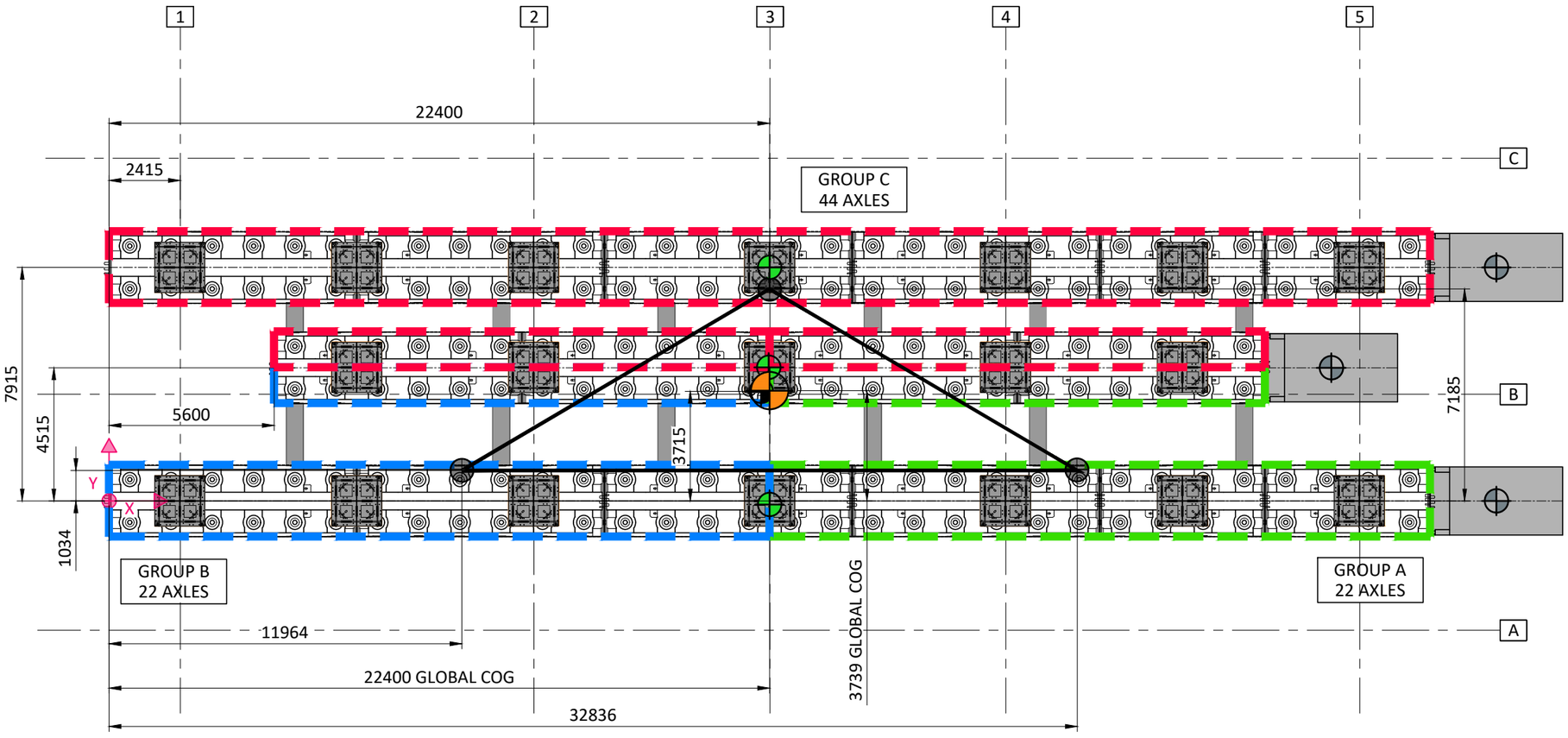
FAGIOLI

CLIENTE/CUSTOMER: ROSETTI
FAGIOLI AREA: EMEA
DESCRIZIONE COMMESSA/JOB DESCRIPTION: CROSSWIND PROJECT -LOADOUT & WEIGHING TOPSIDE & TP
DESCRIZIONE DISEGNO/DRAWING DESCRIPTION: TOPSIDE - TRANSPORT DRAWING - SHEET 1/2

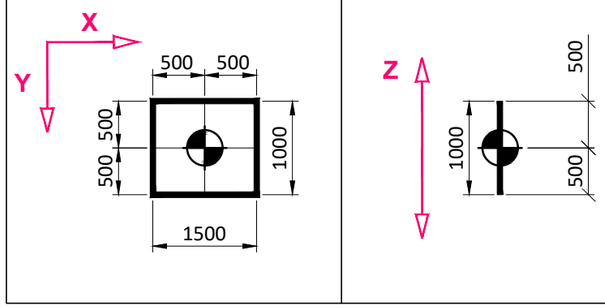
NUM. DISEGNO/DRAWING NUMBER	SCALA/SCALE	FORMATO/SIZE	COMMESSA/JOB
030-CRO-DP-01-001	1:350	A3	

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HYDRAULIC CIRCUIT ARRANGEMENT



C.O.G. ENVELOPE



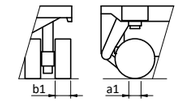
LEGEND

- TOPSIDE COG
- PPU SPMT COG
- EQUIPMENT COG
- GLOBAL COG= TOPSIDE COG +PPU SPMT COG + EQUIPMENT COG

TRANSPORT CONFIGURATION: 88 AXLES			
ITEM weight (contingency included)			**1802 t**
SPMT dead weight			392,1 t
EQUIPMENT weight			87,875 t
TOTAL weight			2282 t
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	Contact pressure under the wheel	8,5 kg/cm^2	9,4 kg/cm^2
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	Capacity per axles	48,0 t	48,0 t
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	Contact pressure under the wheel	7,8 kg/cm^2	8,5 kg/cm^2
	Average Ground pressure	6,9 t/m^2	8,4 t/m^2

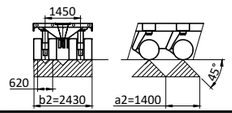
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where P = weight per axle (kg)
n = number of wheels for axle (4)
p = contact pressure under the wheel (kg/cm²)



GLOBAL LOADED AREA BELOW CONVOY [a2xb2] = $[\frac{P}{p2}]$

where P = weight per axle (kg)
p2 = average ground pressure (kg/cm²)



OPERATIONAL PARAMETERS:
- MAX TRAVELING SPEED: 0.5 km/h
- MAX OPERATIONAL WIND SPEED : 16.0 m/s
- MINIMUM REQUIRED GROUND BEARING CAPACITY: 10.7 t/m²
- THE GROUND SHALL BE COMPACTED AND LEVELED. MAX SLOPE:1%
- ALLOWABLE TRANSVERSE INCLINATION OF CONVOY(OUT OF VERTICALITY): 1°
- ALLOWABLE LONGITUDINAL INCLINATION OF CONVOY (OUT OF VERTICALITY):1°
- AXLES PRESSURE SHALL BE CONTINUOUSLY CHECKED, ACTING ON THE HYDRAULIC SYSTEM TO COMPENSATE ANY DEVIATION RESPECT TO THE EXPECTED VALUES. USE WATER LEVEL TO CHECK SPMT OUT OF VERTICALITY .

NOTE:
1. MODULE WEIGHT: 1802 t (NET WEIGHT +0.00% CONT. INCLUDED).
2. MODULE WEIGHT AND COG AS PER CLIENT DOCUMENT: 123A90-FDL-MT-DD-00401 (Last Rev) 123A90-DDL-TI-DD-99015 (Last Rev)
3. MAX VALUES INCLUDE ALL THE EFFECTS SUCH AS WIND, OUT OF VERTICALITY, COG ENVELOPE.
4. TIPPING ANGLE: 16.2°
5. OVERLOAD ANGLE: 9.6°
6. PLYWOOD OR RUBBER SHEETS SHALL BE POSITIONED BETWEEN ANY STEEL SURFACE IN CONTACT (U.O.N.).
7. LOCAL AND GLOBAL ITEM STRENGHT CHECK BY CLIENT;
8. THE BOTTOM PART OF THE MODULE SHALL BE CLEAR OF OBSTRUCTIONS (PIPES, SECONDARY STRUCTURE).
9. BEFORE MOVING THE TRAILER, CHECK THE HYDRAULIC PRESSURE / AXLE LOAD AND BE SURE THAT THE VALUES ARE EQUAL TO THE THEORETICAL VALUES IN THE TABLE (BASIC VALUES).
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Rev.	Descrizione revisione / Description of revision	Data / Date	Disegnato / Drawn by	Controllato / Checked by	Approvato / Approved by
A	FOR COMMENT	08/07/25	SMG	GG	LG

FAGIOLI

CLIENTE/CUSTOMER	FAGIOLI AREA
ROSETTI	EMEA

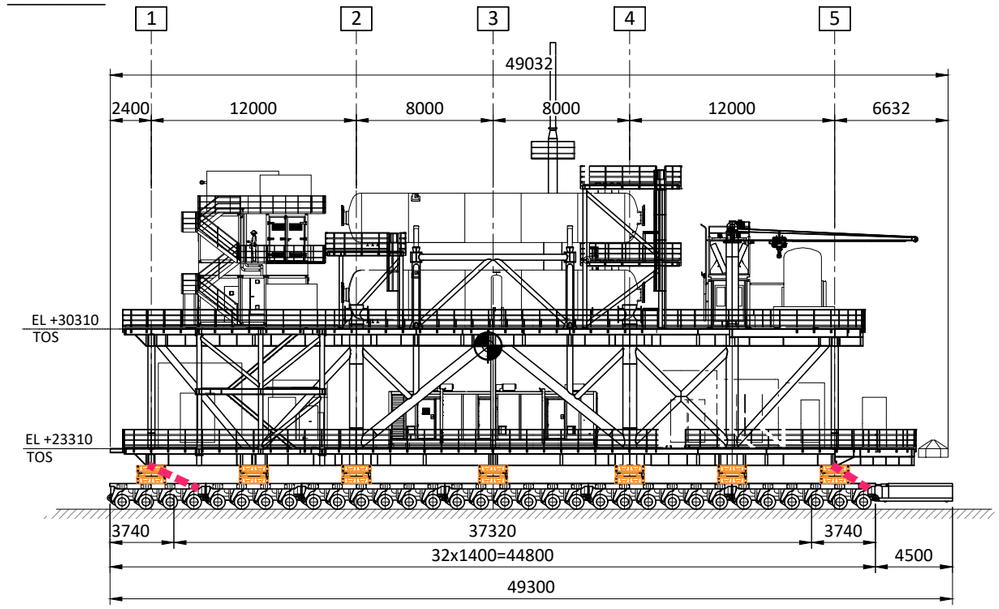
DESCRIZIONE COMMESSA/JOB DESCRIPTION
CROSSWIND PROJECT -LOADOUT & WEIGHING TOPSIDE & TP

DESCRIZIONE DISEGNO/DRAWING DESCRIPTION
TOPSIDE - TRANSPORT DRAWING - SHEET 2/2

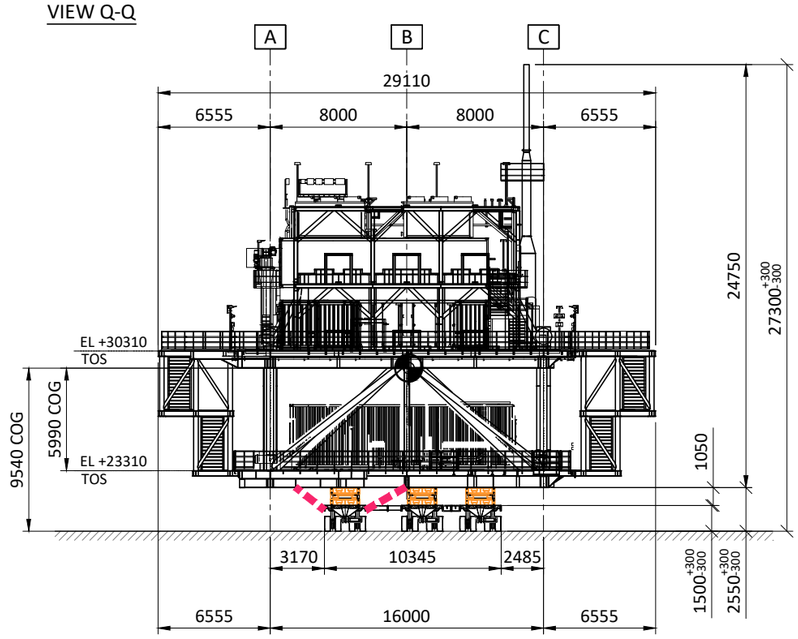
NUM. DISEGNO/DRAWING NUMBER	SCALA/SCALE	FORMATO/SIZE	COMMESSA/JOB
030-CRO-DP-01-002	1:175	A3	

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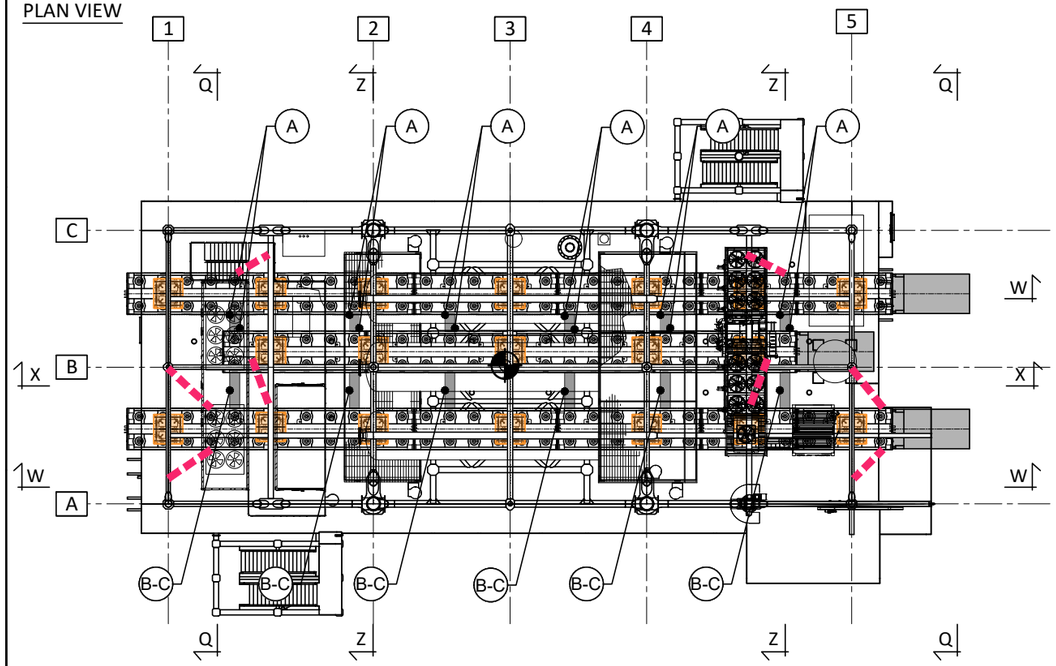
VIEW W-W



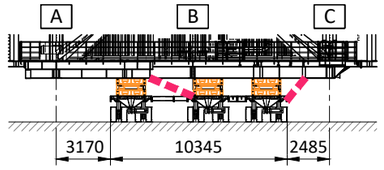
VIEW Q-Q



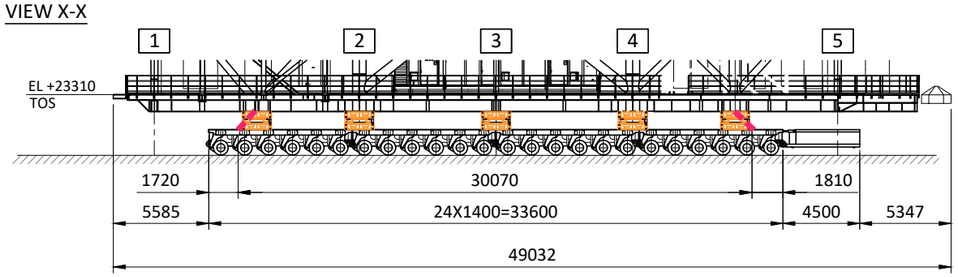
PLAN VIEW



VIEW Z-Z

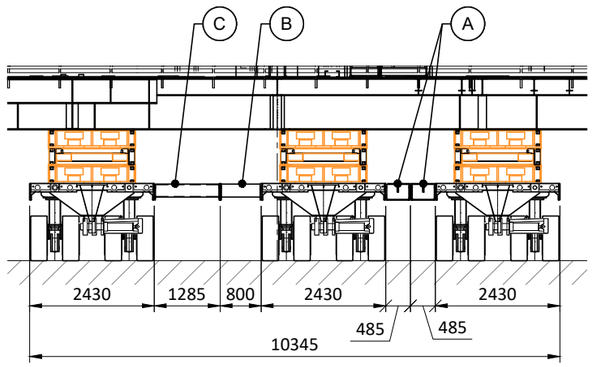


VIEW X-X



SPMT SPACERS

scale x3



MATERIAL LIST

#	DESCRIPTION	WEIGHT cad. (Kg)	Q.TY TOT
A	SPACER L=470 mm 580x485x320 mm	147.5	12
B	SPACER L=800 mm 800x580x320 mm	222.0	12
C	SPACER L=1285 mm 1285x580x320 mm	208.0	12
TOTAL WEIGHT (Kg)			6930.0

LASHING LINE DETAILS - SWL 14 t - TYPICAL

POS D: HOOK
Lifting: SWL=8t S.F=6
Lashing: SWL=16t S.F=3

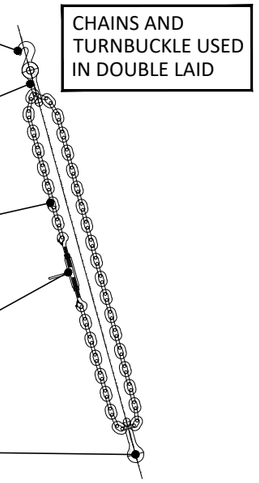
POS A: SHACKLE
Lifting: SWL=9.5t S.F=6
Lashing: SWL=19t S.F=3

POS C: CHAIN Ø13mm
Lifting: SWL=5.3t S.F=4
Lashing: SWL=7t S.F=3

POS B: TURNBUCKLE
Lifting: SWL=5.4t S.F=4
Lashing: SWL=7t S.F=3

POS A: SHACKLE
Lifting: SWL=9.5t S.F=6
Lashing: SWL=19t S.F=3

CHAINS AND TURNBUCKLE USED IN DOUBLE LAID



	LASHING LINE EQUIPMENTS	Q.TY
A	SHACKLE SWL 9.5 t (SF.6 per Lifting) → SWL 19 t (SF.3 per Lashing)	16
B	Turnbuckle for chain Ø13 mm	8
C	CHAIN Ø13 mm SWL 5.3t (SF.4 per Lifting) → SWL 7t (SF.3 per Lashing) USED IN DOUBLE LAID Real lashing line SWL 14.0t-MBL 42.0 t	8
D	HOOK SWL 8t (S.F 6 per Lifting) → SWL 16 t (SF.3 per Lashing)	8

NB:
LASHING LINE CONNECTION TO ITEM CAN BE DONE BY WITH OR WITHOUT HOOK

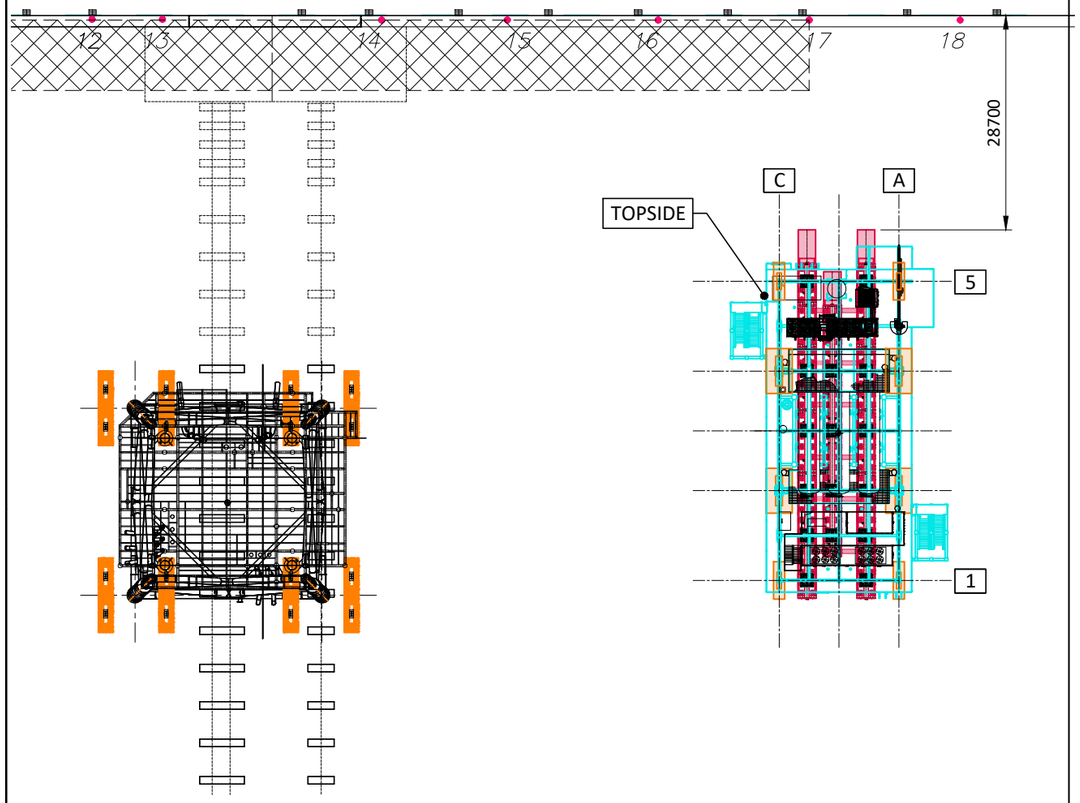
Rev.	Descrizione revisione Description of revision	Data Date	Disegnato Drawn by	Controllato Checked by	Approvato Approved by
A	FOR COMMENTS	08/07/25	SMG	LG	GG

FAGIOLI

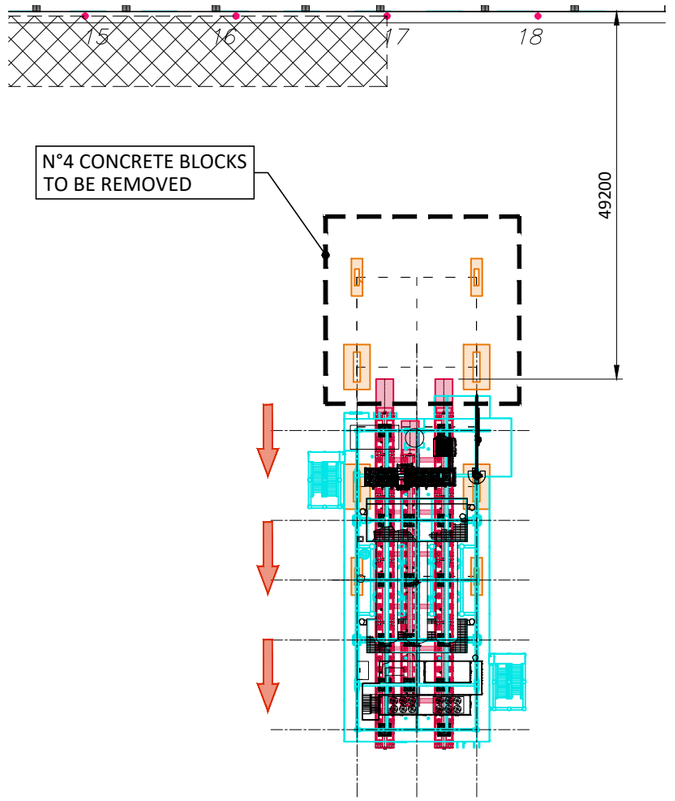
CLIENTE/CUSTOMER: ROSETTI
FAGIOLI AREA: EMEA
DESCRIZIONE COMMESSA/JOB DESCRIPTION: CROSSWIND PROJECT
DESCRIZIONE DISEGNO/DRAWING DESCRIPTION: TOPSIDE - TRANSPORT DRAWING ON ROSETTI YARD - LASHING SYSTEM

NUM. DISEGNO/DRAWING NUMBER	SCALA/SCALE	FORMATO/SIZE	COMMESSA/JOB
030-CRO-DP-01-005	1:350	A3	

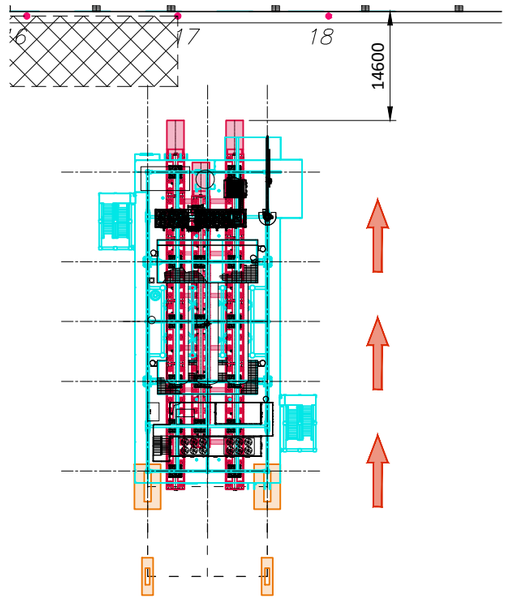
PHASE 1



PHASE 2



PHASE 3



Rev.	Descrizione revisione Description of revision	Data Date	Disegnato Drawn by	Controllato Checked by	Approvato Approved by
A	FOR COMMENT	08/07/25	SMG	GG	LG

FAGIOLI

CLIENTE/CUSTOMER: ROSETTI

FAGIOLI AREA: EMEA

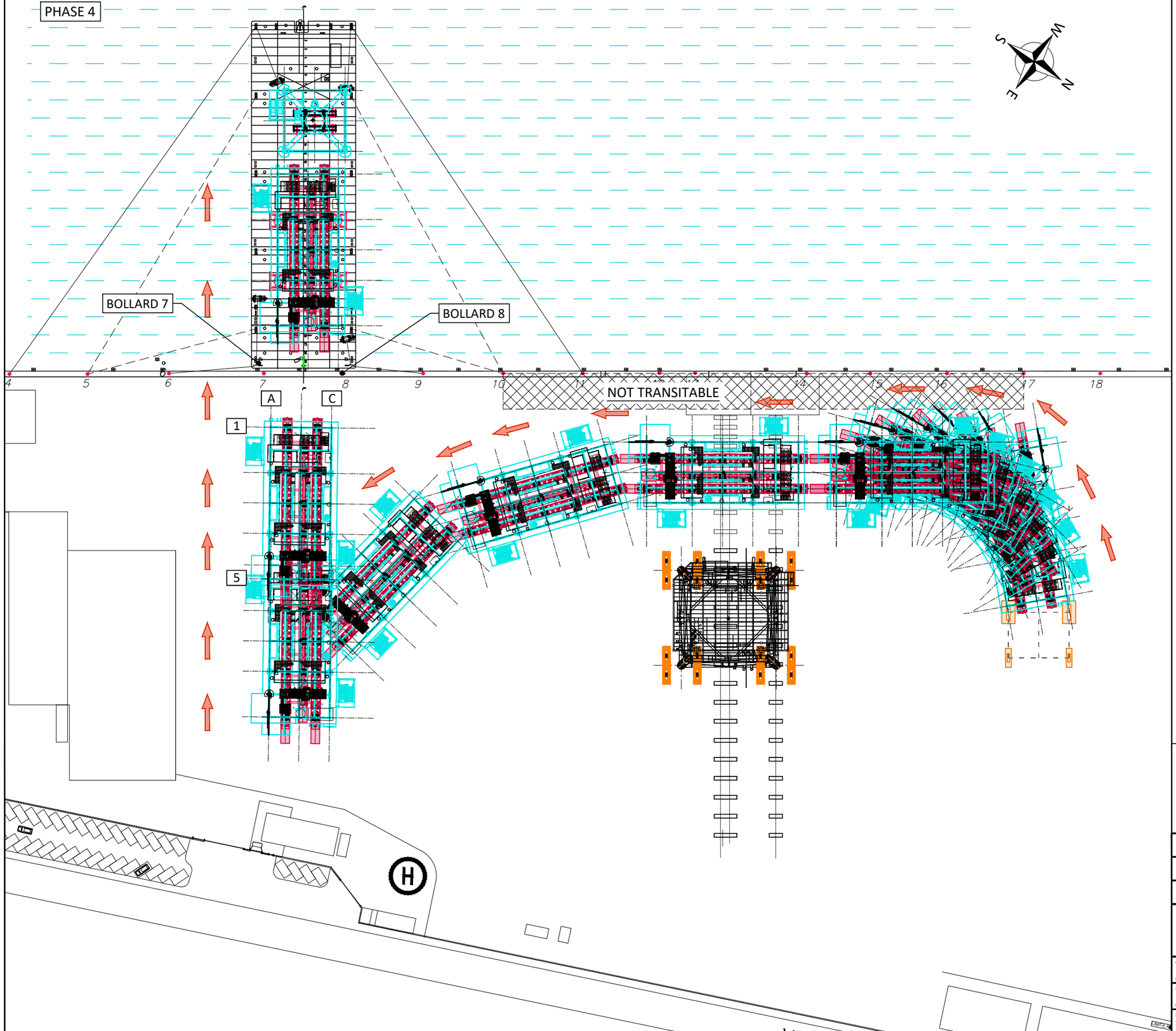
DESCRIZIONE COMMESSA/JOB DESCRIPTION: CROSSWIND PROJECT - LOADOUT & WEIGHING TOPSIDE & TP

DESCRIZIONE DISEGNO/DRAWING DESCRIPTION: TOPSIDE - LOAD OUT TRANSIT CHECK - PHASES 1-2-3

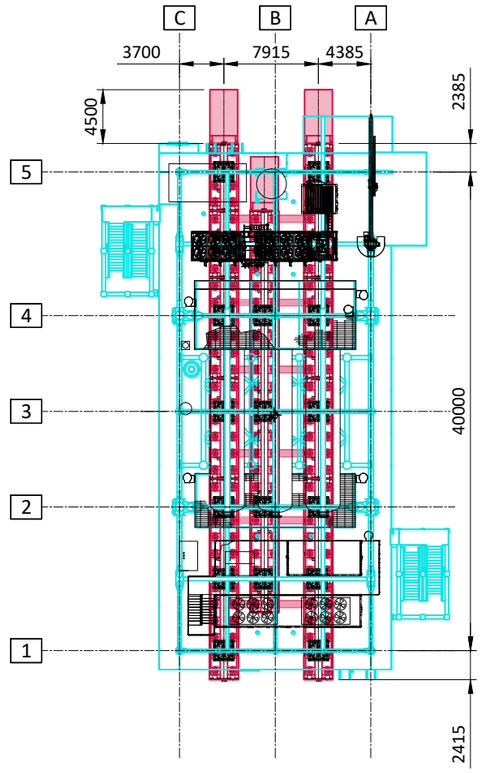
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NUM. DISEGNO/DRAWING NUMBER	SCALA/SCALE	FORMATO/SIZE	COMMESSA/JOB
030-CRO-DP-01-101	1:1000	A3	

PHASE 4



TOPSIDE
scale x2



NOTE:

1. FOR TRANSPORT DRAWING SEE DWG:
   030-CRO-DP-01-001-002 (LAST.REV.)

Rev.	Descrizione revisione Description of revision	Data Date	Disegnato Drawn by	Controllato Checked by	Approvato Approved by
A	FOR COMMENT	08/07/25	SMG	GG	LG

FAGIOLI

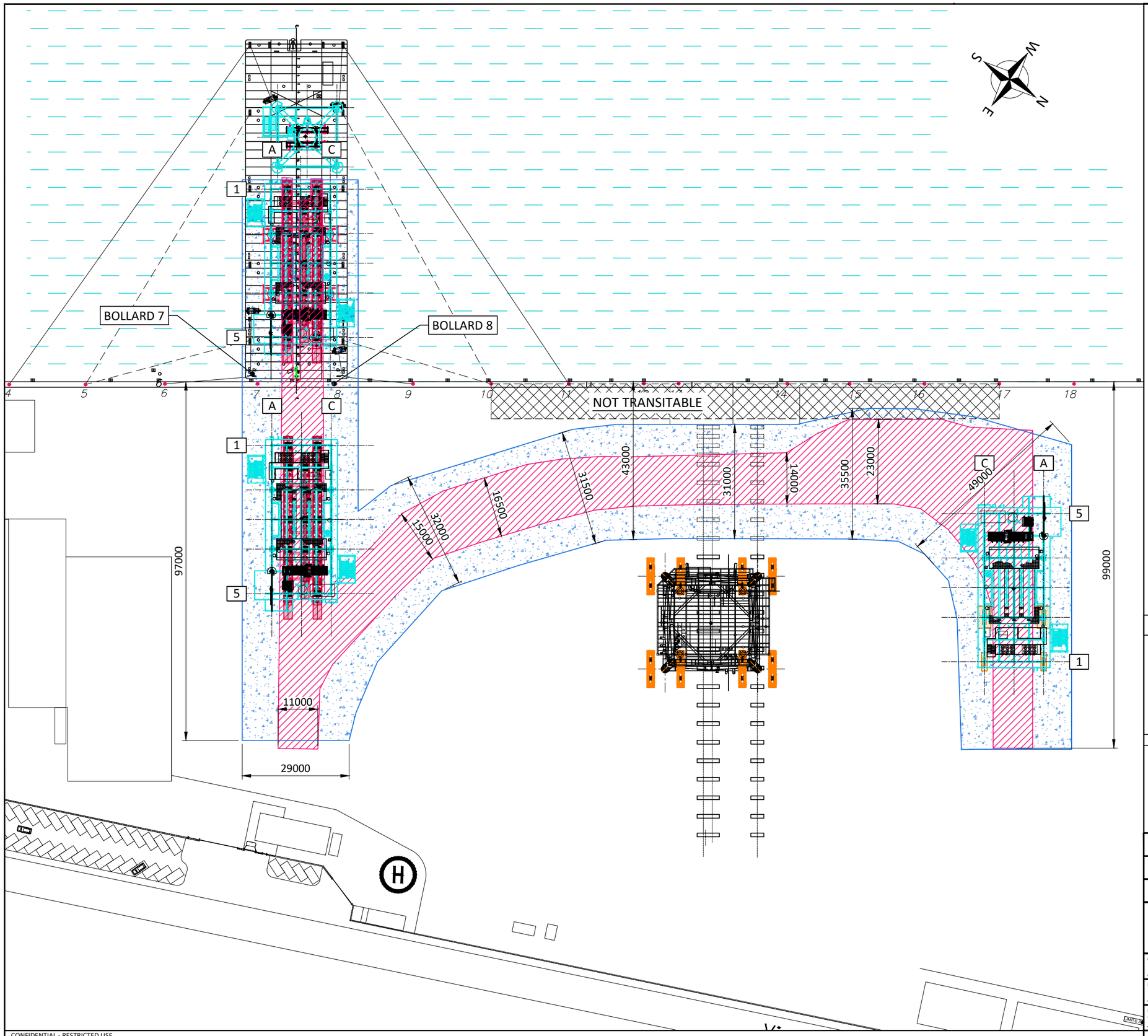
CLIENTE/CUSTOMER	FAGIOLI AREA
ROSETTI	EMEA

DESCRIZIONE COMMESSA/JOB DESCRIPTION
CROSSWIND PROJECT - LOADOUT & WEIGHING TOPSIDE & TP

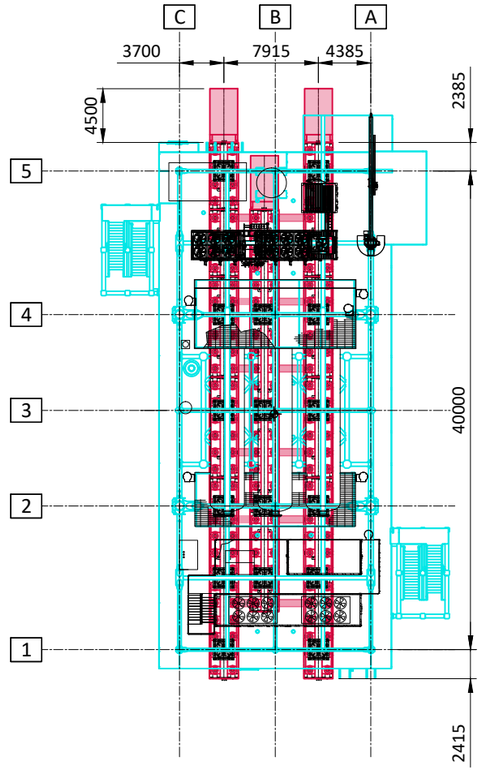
DESCRIZIONE DISEGNO/DRAWING DESCRIPTION
TOPSIDE - LOAD OUT TRANSIT CHECK - PLAN VIEW - PHASE 4

NUM. DISEGNO/DRAWING NUMBER	SCALA/SCALE	FORMATO/SIZE	COMMESSA/JOB
030-CRO-DP-01-102	1:1000	A3	

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TOPSIDE
scale x2



LEGEND

TRAILER AREA

ITEM AREA

NOTE:

1. FOR TRANSPORT DRAWING SEE DWG:
   030-CRO-DP-01-001-002 (LAST.REV.)

Rev.	Descrizione revisione Description of revision	Data Date	Disegnato Drawn by	Controllato Checked by	Approvato Approved by
A	FOR COMMENT	08/07/25	SMG	GG	LG

FAGIOLI

CLIENTE/CUSTOMER: ROSETTI

FAGIOLI AREA: EMEA

DESCRIZIONE COMMESSA/JOB DESCRIPTION: CROSSWIND PROJECT - LOADOUT & WEIGHING TOPSIDE & TP

DESCRIZIONE DISEGNO/DRAWING DESCRIPTION: TOPSIDE - LOAD OUT TRANSIT CHECK - AREAS TO BE PREPARED

NUM. DISEGNO/DRAWING NUMBER	SCALA/SCALE	FORMATO/SIZE	COMMESSA/JOB
030-CRO-DP-01-103	1:1000	A3	

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11.3 SPMT stability check

SPREADSHEET NR.	SSH-SPMT-001		
REV.	7	DATE	24/07/2024
PREP.	ACL	APPR.	LG

SELF PROPELLED MODULAR TRAILER
AXLE LOADS AND STABILITY CALCULATION

FAGIOLI

PROJECT	CROSSWIND	ITEM	TOPSIDE	DATE	10/07/2025
CLIENT	ROSETTI			PREP.	SMG
DOC. N.	030-CRO-SSH-01-001	REV.	A	APPR.	GG

DATA SUMMARY

Item weight	1912,4 t
Convoy weight	369,6 t
Equipment weight	0,0 t
Total weight	2282,0 t
Max convoy speed	0,5 km/h
Axles	88
Open axles	88
Hidden axles	0
Wind speed	16,0 m/s
Wind action height	9,5 m
Shape factor	1,5
Transversal area	1000,0 m²
Longitudinal area	600,0 m²

TRAILER DATA

	Group A	Group B	Group C/D
Type	MSPE 48 t	MSPE 48 t	MSPE 48 t
Axle weight	4,2 t	4,2 t	4,2 t
Open axles	22,0	22,0	44,0
Hidden axles	0,0	0,0	0,0
x	32836 mm	11964 mm	22400 mm
y	1034 mm	1034 mm	7185 mm

Global CoG

Weight	X	Y	Z
1912,4 t	22400 mm	3738 mm	9327 mm

STABILITY CHECK

Allowable stability angle	7,0 °
Tipping angle	16,2 °
Safety factor	2,3
Check	OK

Overload angle

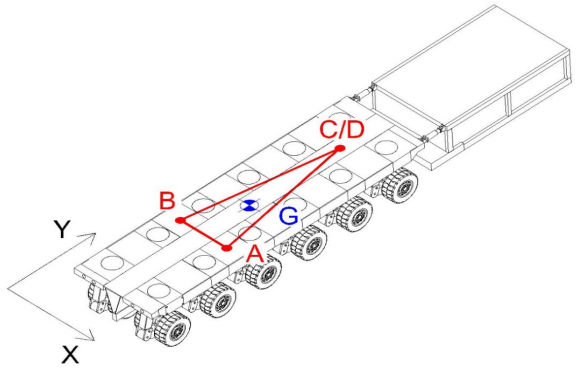
9,6 °

STRENGTH CHECK - BASE CASE (NO WIND, NO COG ENVELOPE, NO OUT OF VERTICALITY)

Group	Axle load	Capacity	Check	Cylinder pressure	Average Ground pressure	Tyres Ground pressure
Group A	28,6 t	48,0 t	OK	171 bar	8,4 t/m²	8,5 kg/cm²
Group B	28,6 t	48,0 t	OK	171 bar	8,4 t/m²	8,5 kg/cm²
Group C/D	23,3 t	48,0 t	OK	139 bar	6,9 t/m²	7,8 kg/cm²

STRENGTH CHECK - MAX CASE (WIND, COG ENVELOPE, OUT OF VERTICALITY)

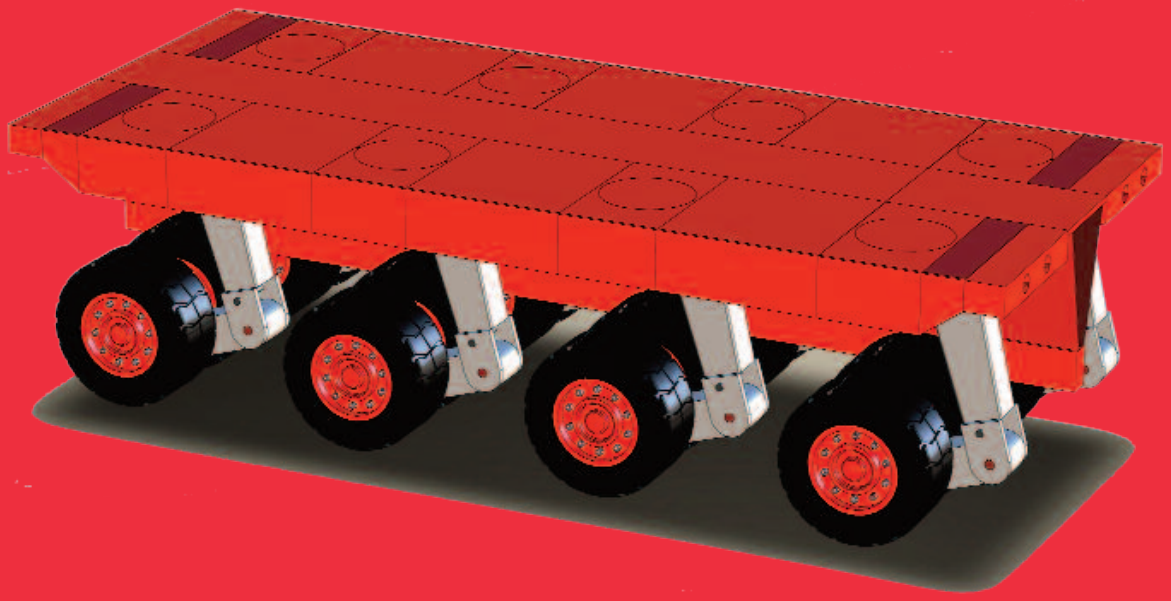
Group	Axle load	Capacity	Check	Cylinder pressure	Average Ground pressure	Tyres Ground pressure
Group A	36,2 t	48,0 t	OK	219 bar	10,6 t/m²	9,4 kg/cm²
Group B	36,2 t	48,0 t	OK	219 bar	10,6 t/m²	9,4 kg/cm²
Group C/D	28,6 t	48,0 t	OK	171 bar	8,4 t/m²	8,5 kg/cm²



11.4 SPMTs data sheet

FAGIOLI

SPMTs (36 - 40 - 50 - 60 TON)





TECHNICAL BROCHURE

SPMTs - OVERVIEW

Self-propelled modular transporters (SPMT's) are multi-axle trailers designed for the transportation of large and heavy cargoes. The SPMT's are designed in **modular construction** and can be coupled side to side and end to end.

The SPMT's consist of a very strong and rigid chassis, which also acts as a load-carrying platform to which wheel bogies are attached in pairs to form the required length of transporter.

Each wheel bogie consists of two rubber tyres wheels and is rigidly fixed to the chassis by a hinged elbow joint, which is supported on hydraulic rams. This hydraulic ram acts as the suspension for the SPMT and also provides the lifting capability. Attached to the end of the SPMT is a Diesel driven power pack, which provides hydraulic power to the various functions of the SPMT.

The SPMT is propelled by **hydraulic drive motors**, which are mounted on the axles of the SPMT. Hydraulic power is supplied from a pump on the power pack to each of the drive motors and speed is controlled via a remote hand operated portable console. Forward and reverse travel is achieved by reversing the flow of hydraulic oil to the drive motors.

Speed of the driven axle is controlled by flow regulators, which prevent over-speed of the wheels occurring. Normal operating speed of the SPMT's is 5 km/hr, but may vary depending on the load and configuration.

The **steering** of the SPMT's offers major advantages over other forms of conventional hydraulic trailers. The steering is controlled by electro-hydraulic motors rather than by a series of mechanical steering rods.

Each of the axles of the transporter moves independently and are monitored and controlled by the computerised control system of the transporter. This offers total flexibility of steering options with each wheel bogie able to swing through 260o (+130°). The position of each wheel is controlled electronically through the remote operations console and nine steering programs are available. The electronic steering control can be utilised for a group of two or more SPMT's to ensure that all wheel bogies of all the transporters act together and turn about a single point.

A hydraulic cylinder supports each of the wheel bogies. The cylinders on each bogie can be linked hydraulically to the other wheel bogie cylinders to form groups, this allows free flow of hydraulic fluid between each hydraulic ram allowing the SPMT to negotiate uneven ground, cambers and gradients whilst maintaining equal loading in each hydraulic ram within that group.

To link all hydraulic rams on a single trailer would result in an unstable transporter bed with no control. The SPMT is normally split hydraulically into three separate hydraulic groups (A three-point suspension) that can be controlled individually from the main power unit.

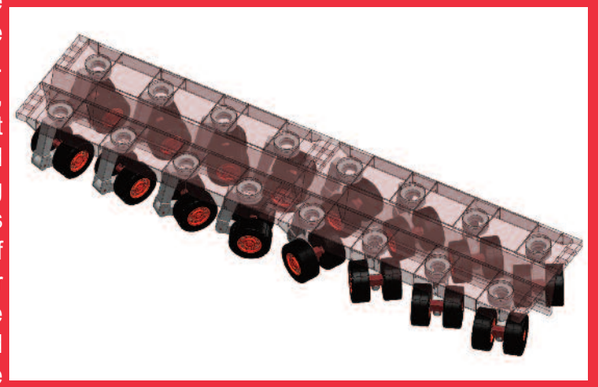


SPMTs - TECHNICAL DATA

As the SPMT negotiates uneven ground, or gradients the hydraulic fluid will free flow within each suspension to maintain equal loading within each suspension group. Addition hydraulic fluid can be can be pumped from the Power Unit (PPU) into or out of each cylinder group to adjust the level of the SPMT.
Systematic and controlled pumping of hydraulic fluid into or out of each suspension can raise or lower the transporter bed +300mm from the normal running height of 1500mm.
Control of the elevation of the transporter is through the hand operated remote console. Safety valves protect the hydraulic circuit so that the transporter platform does not collapse in the unlikely event of hydraulic failure. The SPMT's are equipped with an electro-hydraulic braking system with hydraulically activated spring loaded brake cylinders installed in the wheel hubs. The brakes are controlled through the hand operated remote console. Hydraulic pressure supplied to the brake cylinders pre-loads the brakes and any reduction in this hydraulic pressure will activate the brakes via a mechanical spring; the braking force that results is in proportion to the reduction in hydraulic pressure. In the event of failure of the diesel power pack, hydraulic pump, electronic control system, or other controlling equipment causing a loss in hydraulic pressure, the brakes will be applied automatically through the spring mechanism. The load carrying capacity of a transporter platform (or group of platforms) is directly proportional to the number of axle line. The capacity of each axle line varies from 36 up to 60 ton gross. A transporter convoy, composed of transporter units and power packs can be controlled by a single operator by means of the hand operated remote console. All units are both CE and TUV certified and are provided with identification plates that allow them to be driven on public roads.



COMPENSATION BY HYDRAULIC SYSTEM IN CASE OF UNEVEN GROUND



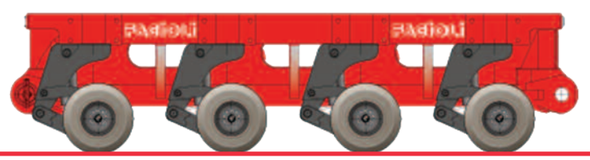
STEERING CAPABILITY

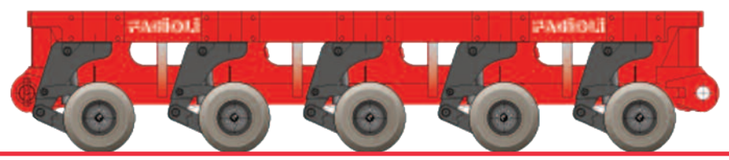


SPMTs					
		36	36	40	40
DETAILS	AXLE LINES	4	6	4	6
	SUSPENSIONS	8 (4 of which driven)	12 (4 or 6 of which driven)	8 (4 of which driven)	12 (4 or 6 of which driven)
	TYRES TYPE	215/75 R 17.5" (4 per suspension) 355/65-15 PR 24 IC 40	215/75 R 17.5" (4 per suspension) 355/65-15 PR 24 IC 40	355/65 Pr24 IC40 (2 per suspension) 355/65-15 24 Pr	355/65 Pr24 IC40 (2 per suspension) 355/65-15 24 Pr
	LOAD PER AXLE LINES	36 ton	36 ton	40 ton	40 ton
	GROSS WEIGHT	up to 146.4 ton	up to 219.6 ton	160 ton	240 ton
	DEAD WEIGHT	up to 18 ton approx.	up to 24 ton approx.	up to 18 ton approx.	up to 24 ton approx.
	PAYLOAD CAPACITY	up to 130 ton approx.	up to 195.6 ton approx.	up to 143.5 ton approx.	up to 216 ton approx.
	PLATFORM HEIGHT	1350 + 380 - 220 mm 1500 +/- 350 mm	1350 + 380 - 220 mm 1500 +/- 350 mm	1500 +/- 350 mm	1500 +/- 350 mm
	PLATFORM DIMENSIONS	5920 x 2430 mm	8720 x 2430 mm	5600 x 2430 mm	8400 x 2430 mm
	INTER-AXLE	1400 mm			

SPMTs - TECHNICAL DATA

SPMTs					
		50	50	60	60
DETAILS	AXLE LINES	4	6	4	5
	SUSPENSIONS	8 (4 of which driven)	12 (4 or 6 of which driven)	8 (4 of which driven)	10 (5 of which driven)
	TYRES TYPE	H37x14-15 24Pr TUBELESS	H37x14-15 24Pr TUBELESS	33,5x11,25-15 26Pr TUBELESS	33,5x11,25-15 26Pr TUBELESS
	LOAD PER AXLE LINES	50 ton	50 ton	60 ton	60 ton
	GROSS WEIGHT	200 ton	300 ton	240 ton	300 ton
	DEAD WEIGHT	17,5 ton	25,5 ton	19,1 ton	23,5 ton
	PAYLOAD CAPACITY	182,5 ton	274,5 ton	220,9 ton	276,5 ton
	PLATFORM HEIGHT	1540 +/- 350 mm	1540 +/- 350 mm	1460 +/- 300 mm	1460 +/- 300 mm
	PLATFORM DIMENSIONS	5600 x 2430 mm	8400 x 2430 mm	5600 x 2430 mm	7000 x 2430 mm
	INTER-AXLE	1400 mm			



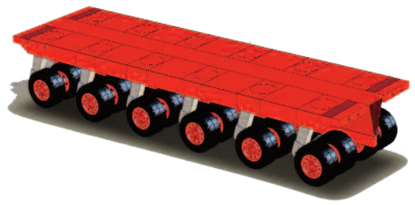




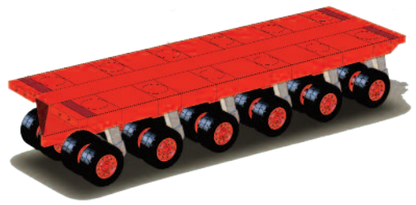
SPMTs - TECHNICAL DATA



STEERING

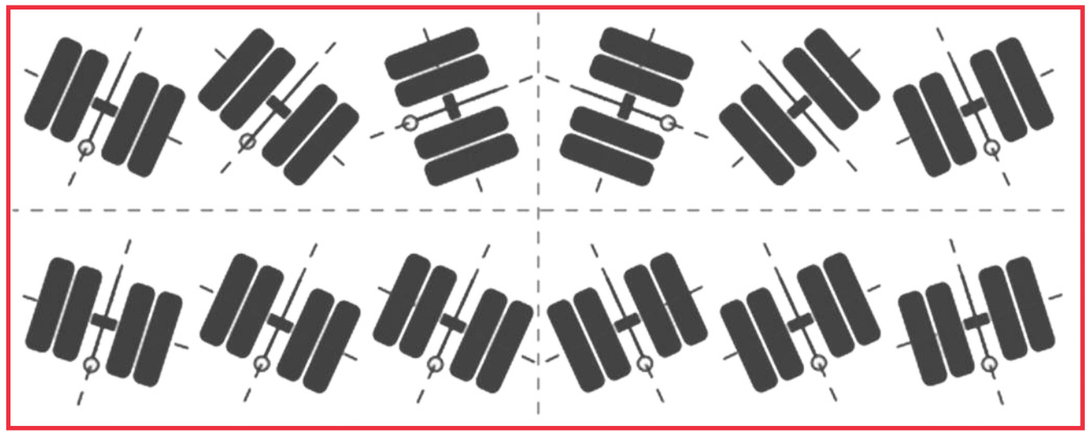


CAPABILITY

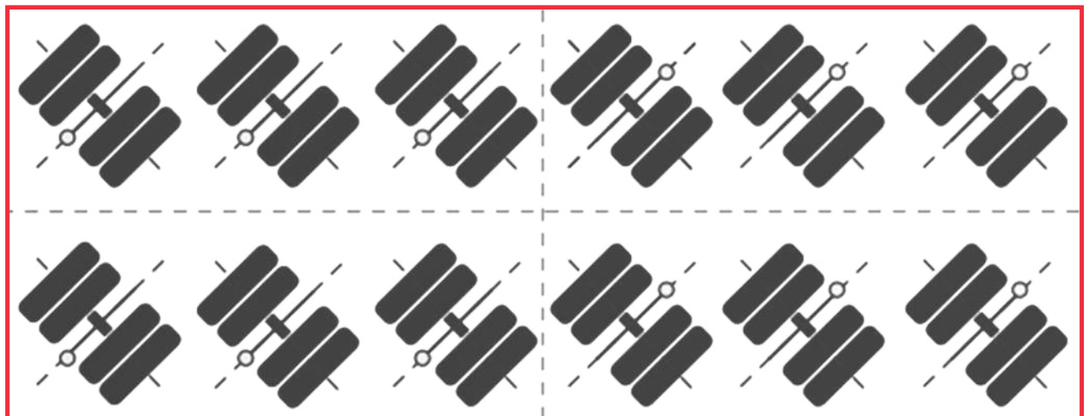




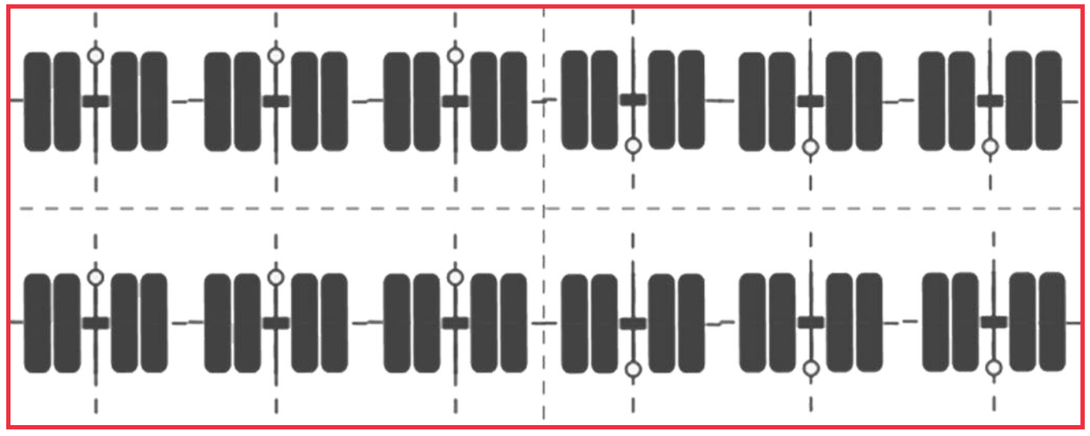
NORMAL DRIVE



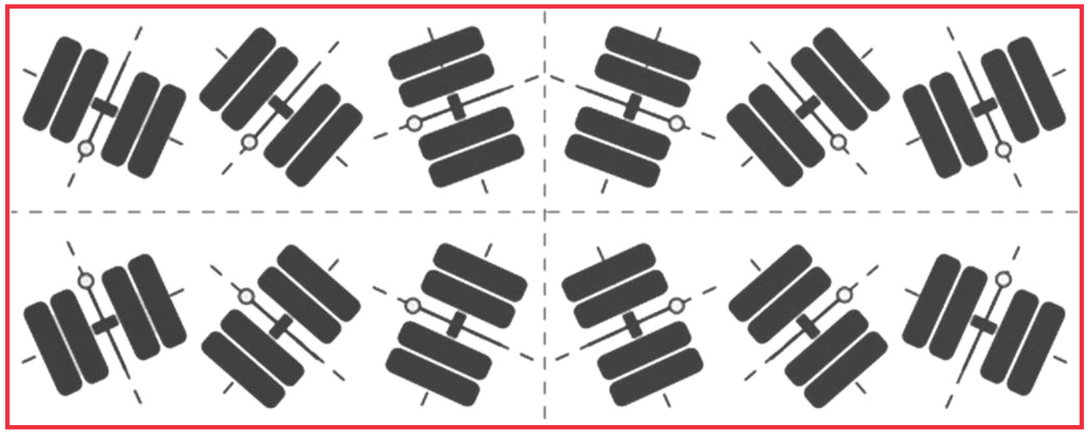
DIAGONAL DRIVE



LATERAL DRIVE



CIRCULAR DRIVE



SPMTs - TECHNICAL DATA

POWER PACK UNITS (PPU's)	SMALL	BIG
Length	2,420 mm	4,450 mm
Width	2,330 mm	2,330 mm
Height	1,100 mm	1,600 mm
Weight	3.8 ton	6.9 ton
Engine Capacity	100 HP	320 HP

•Power pack units (PPU's) can be attached to either (or both) universal and bolt end couplings to supply power for hydrostatic self-propulsion, hydraulic axle support lift and lower system, VD-steering, hydraulic brake system and for supply of the electric/electronic systems.

•Distribution gear and hydraulic axial piston pump with variable displacement for the various working systems. Hydrostatic propulsion, lift/lower system, steering and brake system and distribution gear flanged directly to the diesel engine with hydraulic axial piston pump.

•Hydraulic oil tank (approx. 7001 tr) designed for the operation with extended combinations. Tank designed in stainless steel.

•Diesel fuel tank with a volume of approximately 4001.

•PPU's hydraulically adjustable on the coupling side, which is advantageous for barge operations.

•Four adjustable landing gear, lifting eyelets for crane loading as well as lashes for forklift operation.

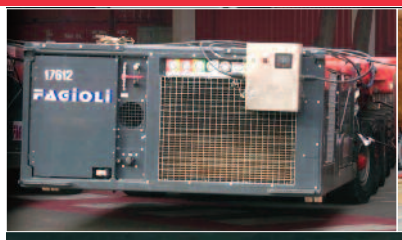
•PPU's completely covered. System connection lines for direct longitudinal coupling as well as side connection for the PPU's in a compound operation.

•Operating and control instruments arranged and protected in the terminal box.

•PPU's completely equipped and ex-works tested.

•Electronic throttle control of the single PPU as well as control of the PPU's in a compound. In addition, manually actuated accelerator for emergency operation.

•Engine Power up to 355 kW









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11.5 Fagioli SPMT's check list

FAGIOLI	**SPMT SITE CHECKLIST** *CHECK LIST DI CANTIERE PER SPMT*	STCH-SPMT-01	Revision / *Revisione*:	0
			Date / *Data*:	01.06.18

Project: *Progetto:*		**Serial No. / Plate:** *N° Seriale / Targa:*		**Location:** *Luogo:*	
Client: *Cliente:*		**Date:** *Data:*		**Time:** *Ora:*	

Check: *Controlli:*	**Ok** *Ok*	**No** *No*	**N/A** *N/A*	**Remarks:** *Osservazioni:*
PPU – Power Pack Unit				
1. Confirm check workshop maintenance completed *Conferma check list manutenzione d'officina completata*				Ask for a copy at the workshop maintenance *Chiedere copia ad officina*
2. Check integrity of lifting points *Controllare integrità punti di sollevamento*				
3. Check control and signalling elements working properly *Verificare il corretto funzionamento degli elementi di controllo e segnalazione*				
4. Check buzzer working properly *Verificare il corretto funzionamento del segnalatore acustico*				
5. Check emergency stop switches working properly *Verificare il corretto funzionamento degli interruttori di arresto di emergenza*				
6. Check display working properly *Verificare il corretto funzionamento del Display*				
7. Check engine oil level *Verificare il livello di riempimento dell'olio motore*				Topping up engine oil, if necessary *Eventualmente rabboccare*
8. Check cooling system for damage or leaks *Verificare che il sistema di raffreddamento non presenti danni o perdite*				
9. Check that front of radiator panels is not obstructed and is not dirty *Verificare che il fronte dei pannelli radiatori non sia ostruito e non sia sporco*				
10. Check cooling filling level *Controllare il livello di riempimento del fluido refrigerante*				Check only when the engine is cold and if necessary, always top up with cold engine *Controllo solo a motore freddo ed eventualmente rabboccare sempre a motore freddo*
11. Check integrity and correct connection of the engine air manifolds *Controllare integrità e corretta connessione collettori aria motore*				
12. Check that hydraulic connections, rigid and flexible hydraulic pipes are not damaged or leaking *Verificare che i collegamenti idraulici, i tubi idraulici rigidi e flessibili non presentino danneggiamenti o perdite*				
13. Check that pumps and valves are not damaged or leaking *Verificare che pompe e valvole non presentino danneggiamenti o perdite*				
14. Check that hydraulic tank is not damaged or leaking *Verificare che il serbatoio idraulico non presenti danneggiamenti o perdite*				
15. Check oil level in the hydraulic tank *Verificare il livello dell'olio nel serbatoio idraulico*				Oil level in the hydraulic tank must be at "Max" indication with SPMT floor completely lowered, topping up if necessary *A pianale completamente abbassato il livello di riempimento del serbatoio idraulico deve essere in corrispondenza dell'indicazione "Max", eventualmente rabboccare*
16. Check that diesel engine belts are taut and not worn or damaged *Verificare che le cinghie del motore diesel siano tese e non usurate o danneggiate*				Check, tighten or replace the belts with the engine switched off and reassemble any disassembled protections *Controllare, tendere o sostituire le cinghie a motore spento e rimontare le protezioni eventualmente smontate*
17. Check that fuel tank is not damaged or leaking. *Verificare che il serbatoio del carburante non presenti danneggiamenti o perdite*				
18. Check fuel level in the fuel tank *Verificare il livello di carburante nel serbatoio carburante*				Topping up, if necessary *Eventualmente rabboccare*
19. Check tightness of all fuel pipes *Controllo della tenuta di tutti i tubi carburante*				
20. Check for any damage or leaks to hydraulic filter *Verificare l'eventuale presenza di danni o perdite al filtro idraulico*				
21. Check compressed air tank *Controllare il serbatoio dell'aria compressa*				If necessary, drain air tanks *Eventualmente drenare i serbatoi aria*
22. Check functioning of the PPU lighting *Verificare funzionamento illuminazione PPU*				If necessary, replace the faulty bulbs *Eventualmente sostituire le lampadine difettose*
23. Check that power lines and fittings are not damaged or incorrectly connected *Controllare che le linee elettriche ed i raccordi non presentino danneggiamenti o errate connessioni*				

Check: *Controlli:*	**Ok** *Ok*	**No** *No*	**N/A** *N/A*	**Remarks:** *Osservazioni:*
24. Verify that Use and Maintenance Manual is available at site *Verificare che il Manuale d'uso e manutenzione sia disponibile in cantiere*				
25. Check for any damage, cracks and deformations on the steel structures (frame, fasteners, etc…) *Verificare eventuale presenza di danneggiamenti, cricche e deformazioni sulle strutture in acciaio (telaio, elementi di fissaggio, ecc…)*				
26. Check connections of the control panel cables (clean and dry) *Verificare i collegamenti dei cavi della pulsantiera (pulita ed asciutta)*				
27. Connect control panel to PPU and run the diagnostic programs *Connettere la pulsantiera alla PPU ed eseguire i programmi di diagnostica*				
28. Check that "brake reserve" pressure gauge is at 200 BAR *Verificare che il manometro "riserva freno" sia a 200 BAR*				
29. Check, after releasing the brakes, that "Brake" pressure gauge has risen to 200 BAR *Verificare, dopo aver sbloccato i freni, che il manometro "Freno" sia salito a 200 BAR*				
30. Complete any project specific check lists *Completare eventuali check list specifiche di progetto*				See Project operating procedure *Vedere Procedura operativa di progetto*
Moduli				
31. Confirm check workshop maintenance completed *Conferma check list manutenzione d'officina completata*				Ask for a copy at the workshop maintenance *Chiedere copia ad officina*
32. Check integrity of lifting points *Controllare integrità punti di sollevamento*				
33. Check emergency stop switches working properly *Verificare il corretto funzionamento degli interruttori di arresto di emergenza*				
34. Check for any damage or leakage to hydraulic cylinders *Verificare l'eventuale presenza di danni o perdite ai cilindri idraulici*				
35. Check for any damage or leakage to hydraulic hoses, rigid pipes and screw connections *Verificare l'eventuale presenza di danni o perdite ai tubi idraulici flessibili, nelle tubazioni rigide e nei raccordi a vite*				
36. Check that connections of flexible hydraulic pipes are correct *Verificare che le connessioni dei tubi idraulici flessibili siano corrette*				
37. Check that connection valves of hydraulic hoses are correctly tightened *Verificare che le valvole di connessione dei tubi idraulici flessibili siano correttamente serrate*				
38. Check that all hoses are well grouped and do not interfere the steering *Verificare che tutti i tubi flessibili siano ben raggruppati e non siano d'intralcio alla sterzatura*				
39. Check the correct mechanical connection between modules and between modules and PPU (lower pin and upper tie rods) *Verificare la corretta connessione meccanica tra moduli e tra moduli e PPU (perno inferiore e tiranti superiori)*				
40. Check convoy lighting working properly *Verificare funzionamento corretto dell'illuminazione*				If necessary, replace the faulty bulbs *Eventualmente sostituire le lampadine difettose*
41. Check that the power lines and fittings are not damaged or incorrectly connected *Controllare che le linee elettriche ed i raccordi non presentino danneggiamenti o errate connessioni*				
42. Check that control rods of the hydraulic cylinders are clean and grease-lubricated *Controllare che le aste di controllo dei cilindri idraulici siano pulite e lubrificate con grasso*				

Check: *Controlli:*	**Ok** *Ok*	**No** *No*	**N/A** *N/A*	**Remarks:** *Osservazioni:*
43. Check tire tread wear *Verificare l'usura del battistrada dei pneumatici*				If necessary, replace *Eventualmente sostituire*
44. Check for any damage to tires *Verificare l'eventuale presenza di danneggiamenti nei pneumatici*				If necessary, replace *Eventualmente sostituire*
45. Check for any foreign bodies in the tires *Verificare l'eventuale presenza di corpi estranei nei pneumatici*				If necessary, replace. *Eventualmente sostituire.*
46. Check correct tire pressure *Verificare la corretta pressione dei pneumatici*				10 BAR for all standard SPMT tires (up to 40t/axle capacity). EVO type carriages (up to 50t/axle) and EVO II (up to 60t/axle) tire pressure is function of axle load: refer to the Use and Maintenance Manual *10 BAR per tutti i pneumatici SPMT standard (fino a 40t/asse di capacità). Carrelli tipo EVO (fino a 50t/asse) ed EVO II (fino a 60t/asse) la pressione del pneumatico è funzione del carico assiale: consultare Manuale di uso e manutenzione*
47. Check for any damage, cracks and deformations on the steel structures (frame, fasteners, etc…) *Verificare eventuale presenza di danneggiamenti, cricche e deformazioni sulle strutture in acciaio (telaio, elementi di fissaggio, ecc…)*				
48. Check that all pantograph locking pins have been removed *Verificare che tutti i perni di blocco dei pantografi siano stati rimossi*				
49. Check that cutting valves are correctly positioned (open / closed) according to the project diagram *Controllare che le valvole di sezionatura siano correttamente posizionate (aperte/chiuse) in accordo allo schema di progetto*				
50. Check that all traction and cylinder shut-off valves are open *Controllare che le valvole di intercettazione trazione e cilindro siano tutte aperte*				
51. Complete any project specific check lists *Completare eventuali check list specifiche di progetto*				See Project operating procedure *Vedere Procedura operativa di progetto*

Note:
Note:

This Check List refers to the checks to be carried out on site before the SPMTs are put into operation and before the operations are carried out.
Questa Check List è relativa ai controlli da effettuarsi in cantiere prima della messa in funzione dei carrelli e prima dell'esecuzione delle operazioni.

1. Check list to be completed by qualified SPMT Supervisor and Operator trained to use the machine, according to Use and Maintenance Manual, Operative Designs and Operating Procedure related to the specific Project
   Check list da compilarsi da parte di SPMT Supervisor ed Operatore qualificati ed addestrati per l'utilizzo della macchina, seguendo il Manuale di Uso e Manutenzione, i Disegni Operativi e la Procedura Operativa relativi al Progetto specifico
2. Any repairs and oil topping up must be carried out by trained and authorized personnel
   Eventuali riparazioni e rabbocchi olio devono essere eseguiti da personale addestrato e autorizzato
3. Maintenance checks are to be performed by maintenance personnel according to the maintenance plan according to Use and Maintenance Manual
   I controlli di manutenzione si intendono eseguiti da personale di manutenzione secondo il piano di manutenzione previsto nel Manuale Uso e Manutenzione del mezzo.
4. For any doubt / clarification contact the engineering department of the Fagioli head office
   Per qualsiasi dubbio/chiarimento contattare il dipartimento di ingegneria della sede Fagioli

Operator *Operatore*	**Supervisor** *Preposto*
Name and surname: *Nome e cognome:*	**Name and surname:** *Nome e cognome:*
Signature: *Firma:*	**Signature:** *Firma:*

11.6 SPMT spine beam check

FAGIOLI EMEA

Department ENGINEERING

Client	**ROSETTI MARINO S.P.A.**
Project	**CROSSWIND**
Document type	**CALCULATION REPORT**
Content	**SPINE BEAM CHECK – TOP SIDE**
Doc. nr.	**030-CRO-TR-01-001**
Client doc. nr.	**n.a.**

A	10/07/2025	For comments	MM		
Rev.	**Date**	**Document status**	**prep.**	**check.**	**appr.**

Revision history:

Rev.	Date	Description of revision
A	10/07/2025	For comments

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Contents

1. SCOPE 4
2. REFERENCE DOCUMENTS 4
2.1 STANDARD AND CODES 4
2.1 CLIENT DOCUMENTS 4
2.2 FAGIOLI DOCUMENTS 5
3. MATERIALS AND STRUCTURES 5
3.1 SPMTs SPINE BEAM 5
4. TRAILER STRUCTURAL CHECKS 5
4.1 LOADS AND EFFECTS 5
4.2 SPINE BEAM CHECK AND DISPLACEMENTS 7
4.2.1 SPINE BEAM 1 – Group B/A 8
4.2.2 SPINE BEAM 2 – Group A/B/C 10
4.2.3 SPINE BEAM 3 – GROUP C 11
4.2.4 SPINE BEAMS STRUCTURAL CHECK 12

1. SCOPE

Scope of the present document is the structural check of the SPMT's spine beam used for the land transport and load-out of the Top Side of the Crosswind project.

This document shows the loads applied to the Module as well, in order to permit adequate structural checks of the Module's structures and upper grillage (if any) during SPMT transport phase.

Below the geometrical characteristic of the Module are reported:

	ITEM MARK / ID	WEIGHT (contingency included)	MAIN DIMENSIONS (L x B x H)
Item #1	Top Side	1802 t	49032 x 29110 x 24750 mm

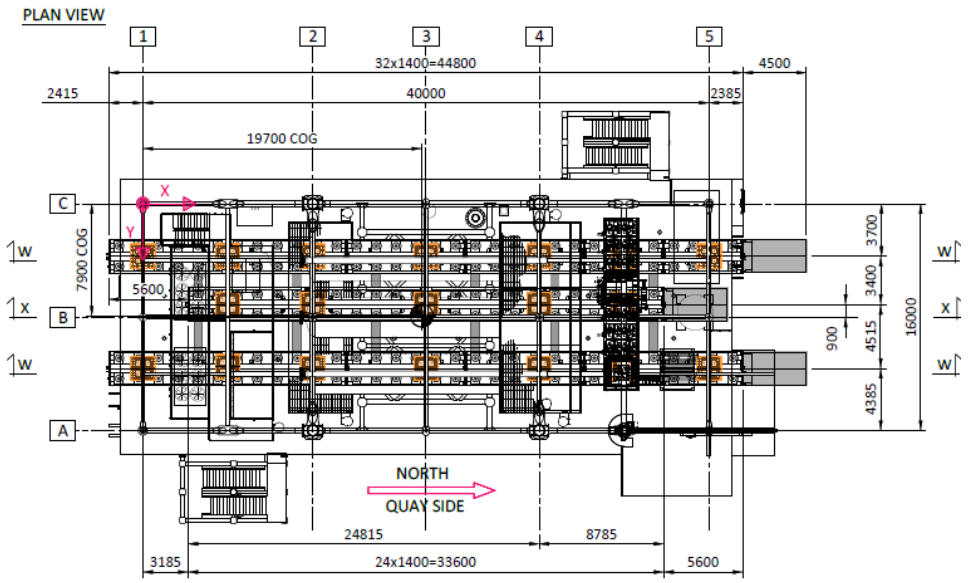


Figure 1. Item transport arrangement (plan view).

2. REFERENCE DOCUMENTS

2.1 STANDARD AND CODES

- The structural checks are carried out using the Allowable Stress Method (ASM);

2.1 CLIENT DOCUMENTS

- n.a.

2.2 FAGIOLI DOCUMENTS

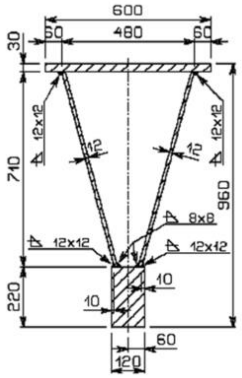
- 030-CRO-DP-01-001
- 030-CRO-DP-01-002

3. MATERIALS AND STRUCTURES

3.1 SPMTs SPINE BEAM

SPMTs spine beam is made by ***S690QL*** steel and its main static parameters are:

- σ_{yield} 6900 kg/cm^2
- A: 620 cm^2
- A_s: 228 cm^2
- J_{xx}: 826634 cm^4
- W_{xx}: 17570 cm^3
- $M_{all-SPMT}$: +670 tm/-500 tm
- $V_{all-SPMT}$: 350 t



4. TRAILER STRUCTURAL CHECKS

4.1 LOADS AND EFFECTS

The following calculations will be referred to the maximum load values. In particular, the maximum axle load include:

- CoG envelope window effect
- Out of Verticality effect
- Slope effect
- Wind effect
- Acc/Deceleration effect

CoG envelope window effect:

Tolerance box in all directions considered:

	CoG envelope
Transversal x direction [mm] +/-	500
Longitudinal y direction [mm]+/-	500
Vertical z direction [mm]+/-	500

Out of Verticality effect:

Max Out of verticality considered in any direction is 1.75% (1°).

Slope effect:

Max slope considered in any direction is 1% (0.57°).

Wind effect:

Wind load on the modules and on the trailers has been calculated as follows:

$$0{,}5 * C_s * C_h * \rho * V^2 * A$$

where:

- ρ is the density of the reference air, conventionally assumed constant at 1.25 kg/m^3;
- V is the wind reference speed (in m/s), 3 sec gust;
- C_s is the shape coefficient, depending on the shape of the conveyed accessory exposed to wind;
- C_h is the height coefficient, depending on the height on the ground of the area exposed to wind;
- A is the area exposed to the wind on the module, including any secondary structures present.

The wind reference design speed is chosen at V = 16 m/s (10 m above the ground, 3 second gusts).

The shape coefficient of the transported object, including any secondary structures, has been taken equal to C_s = 1.5.

The areas exposed to the wind on the module, including any secondary structures present, are conventionally taken as per *Figure 2* here below:

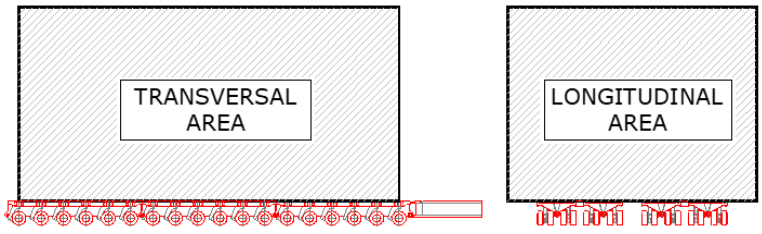


Figure 2: *Area exposed to the wind.*

Acc/Deceleration effect

The force of inertia in the longitudinal and transverse direction due to the acc/deceleration of the carriages, as their travel speed varies, will be assumed to be equal to:

a) for speed < 1,0 km/h $\Rightarrow$ $a_{1/2}$ = 0,00 – acc/deceleration 0,00g $\Rightarrow$ negligible effect;

b) for speed < 5,0 km/h $\Rightarrow$ $a_{1/2}$= 0,05 – acc/deceleration a = 0,05g $\Rightarrow$ effect comparable to 2.8 ° of inclination of the walkway;

c) for speed > 5,0 km/h $\Rightarrow$ $a_{1/2}$ = to be evaluated case by case, according to the real speed of the vehicle and the type of road surface.

The force of inertia in the vertical direction:

- a_v = 0.00 x g Vertical acc/deceleration negligible.

4.2 SPINE BEAM CHECK AND DISPLACEMENTS

A FEM model was created to find the correct values of the reactions and so of the bending moment. The SPMT's spine beam has been modelled using beam elements with equivalent inertia. A concentrated force is applied to the beam where the axles transfer the hydraulic pressure of the circuit. The vertical restraints (DY) are applied in correspondence of the module structure/grillage beams. The first one has both DX and DY fixed.

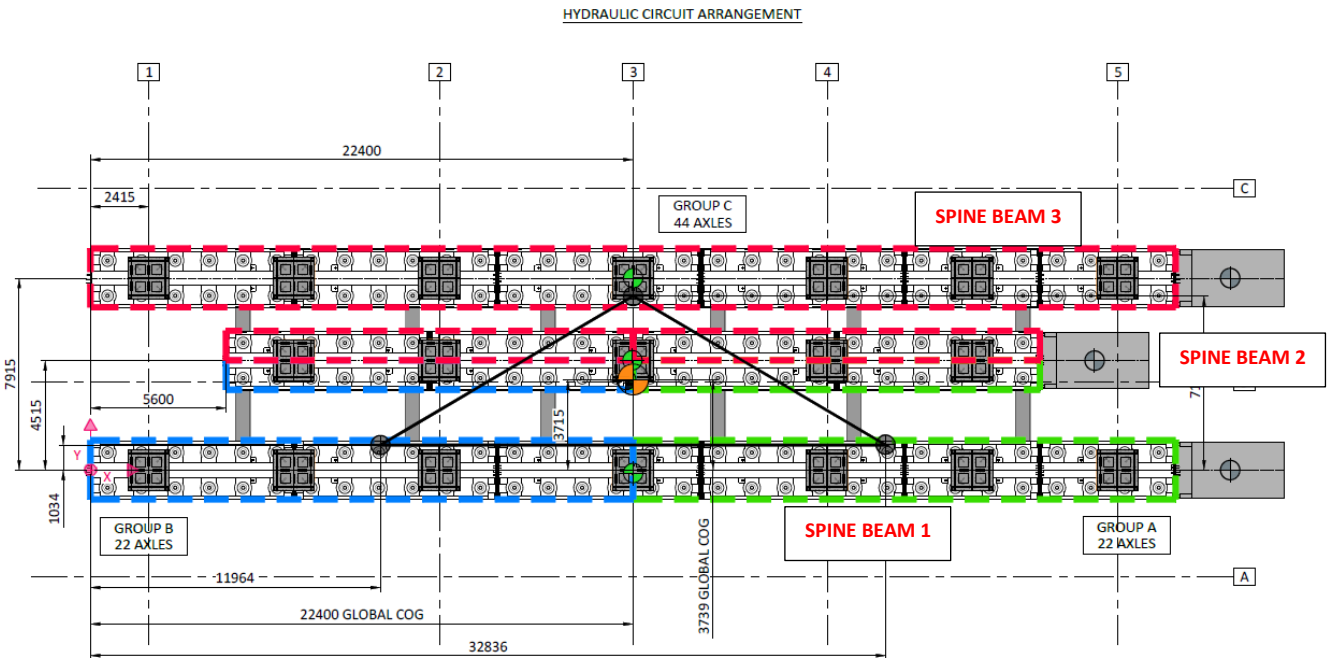


Figure 3: SPMTs line arrangement.

Considering what is expressed below, each axle is subjected to the following load:

$$F = SP - DL$$

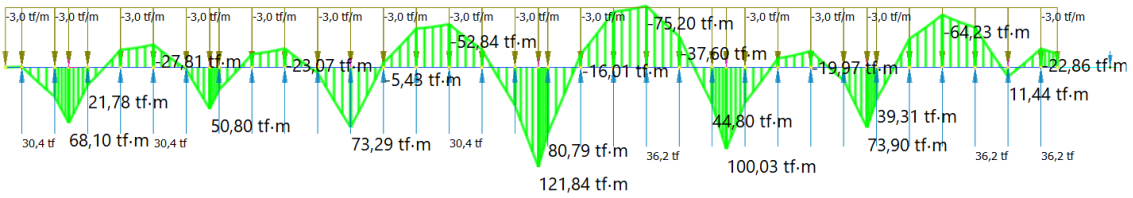
where:

- DL = 4,2 t is the axle self weight;
- SP = 36,2 t is the hydraulic group A maximum reaction for axle;
- SP = 36,2 t is the hydraulic group B maximum reaction for axle;
- SP = 28,6 t is the hydraulic group C maximum reaction for axle.

4.2.1 SPINE BEAM 1 – Group B/A

In the following figures, the bending moment (*Figure 4*) and shear force (*Figure 5*) diagrams are presented, obtained by applying the loads that maximise the reactions per axis for Group A (36,2 t) and Group B (36,2 t) respectively, along with the self weight of the spine beam.

	MIN	MAX
BM2 (tf·m)	-75,20	121,84
	[Bm:16]	[Bm:33]



	MIN	MAX
BM2 (tf·m)	-75,39	121,72
	[Bm:12]	[Bm:32]

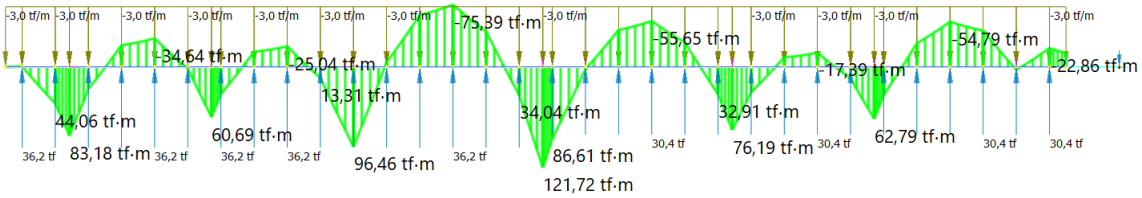
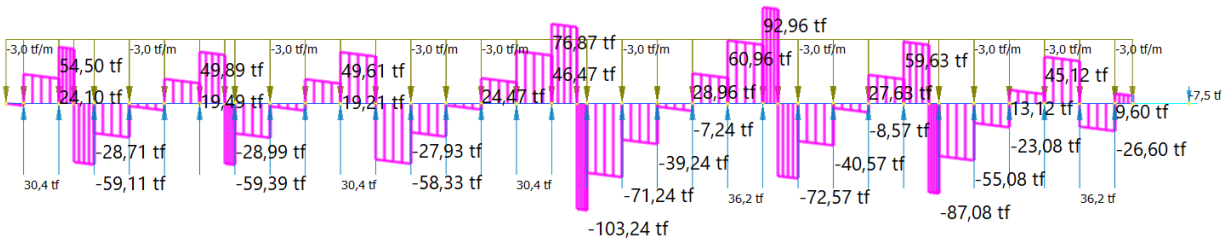


Figure 4: Bending moment diagram of the spine beam, for maximising axle loads on Group A (top) and Group B (low), respectively.

	MIN	MAX
SF2 (tf)	-103,24	92,96
	[Bm:33]	[Bm:34]



	MIN	MAX
SF2 (tf)	-88,37	89,18
	[Bm:33]	[Bm:32]

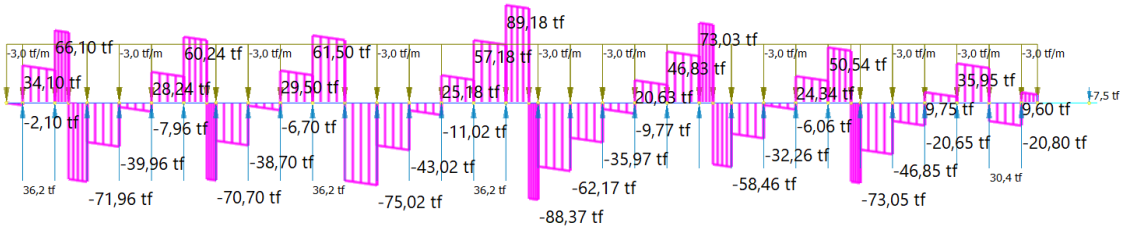


Figure 5: Shear force diagram of the spine beam, for maximising axle loads on Group A (top) and Group B (low), respectively.

Here below are the graphics of spine beam deflection.

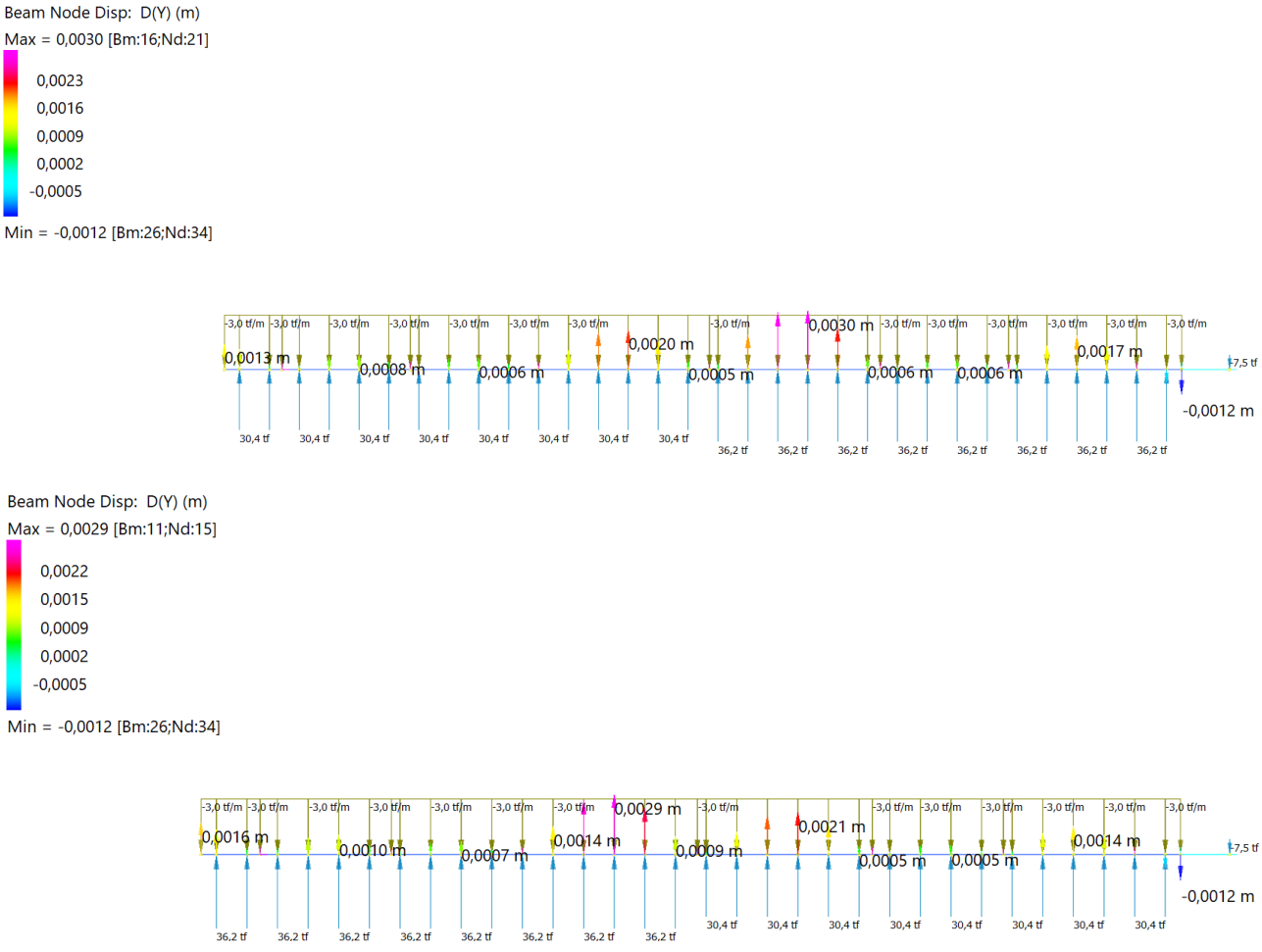


Figure 6: Spine beam deflection for maximising axle loads on Group A (top) and Group B (low), respectively.

Note: Unless the max bending moment and shear value are within the max allowable, no recommendation from SPMT vendor regarding max deflection.

4.2.2 SPINE BEAM 2 – Group A/B/C

In the following figures, the bending moment (*Figure 7*) and shear force (*Figure 8*) diagrams are presented, obtained by applying the loads that maximise the reactions per axis for Group A (36,2 t), Group B (36,2 t), and Group C (28,6 t), respectively, along with the self weight of the spine beam. In particular, the average between Group B and Group C maximum reactions is applied on the left hand side of the spine beam while the average between Group A and Group C maximum reactions is applied on the right hand side of the spine beam.

	MIN	MAX
BM2 (tf·m)	-65,47	118,09
	[Bm:11]	[Bm:15]

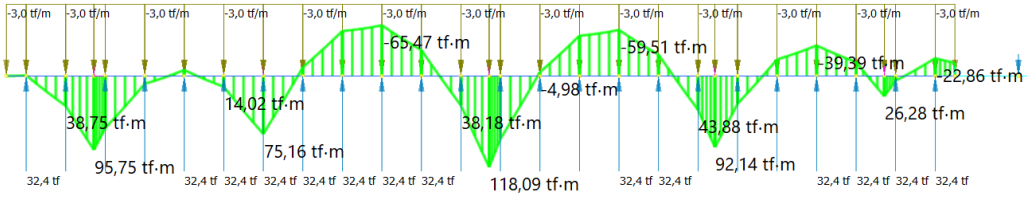


Figure 7: Bending moment diagram of the spine beam.

	MIN	MAX
SF2 (tf)	-92,07	81,42
	[Bm:15]	[Bm:14]

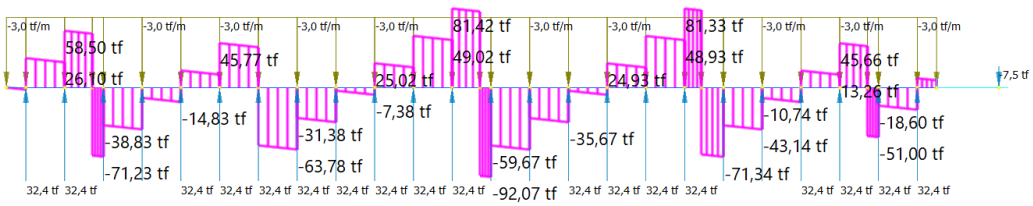


Figure 8: Shear force diagram of the spine beam.

Here below is the graphic of spine beam deflection.

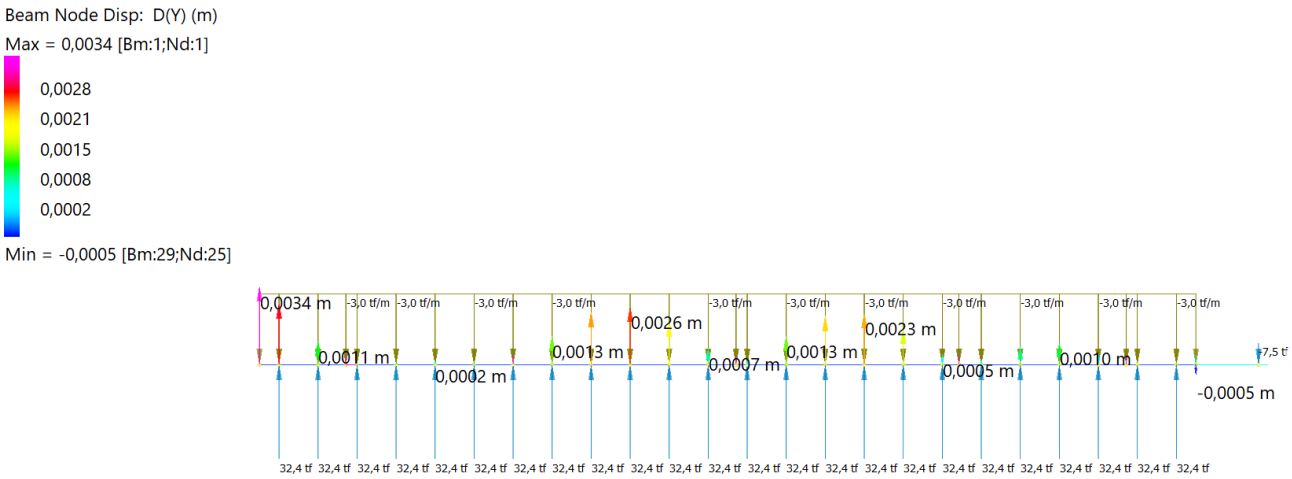


Figure 9: Spine beam deflection.

Note: Unless the max bending moment and shear value are within the max allowable, no recommendation from SPMT vendor regarding max deflection.

4.2.3 SPINE BEAM 3 – GROUP C

In the following figures, the bending moment (*Figure 10*) and shear force (*Figure 11*) diagrams are presented, obtained by applying the loads that maximise the reactions per axis for Group C (28,6 t) along with the self weight of the spine beam.

	MIN	MAX
BM2 (tf·m)	-55,03	102,17
	[Bm:17]	[Bm:32]

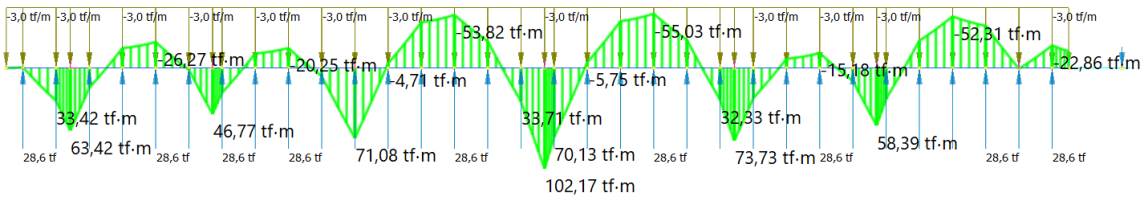


Figure 10: Bending moment diagram of the spine beam.

	MIN	MAX
SF2 (tf)	-80,70	69,96
	[Bm:33]	[Bm:32]

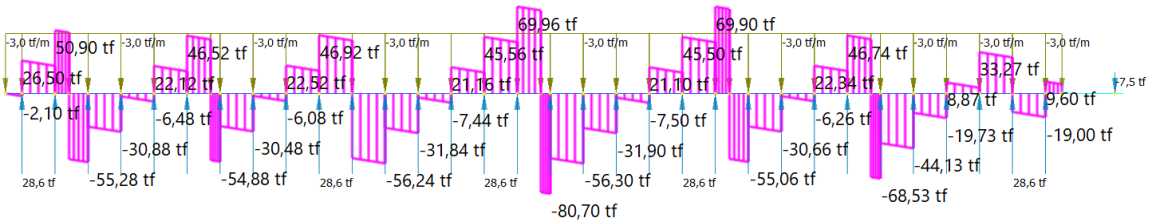


Figure 11: Shear force diagram of the spine beam.

Here below is the graphic of spine beam deflection.

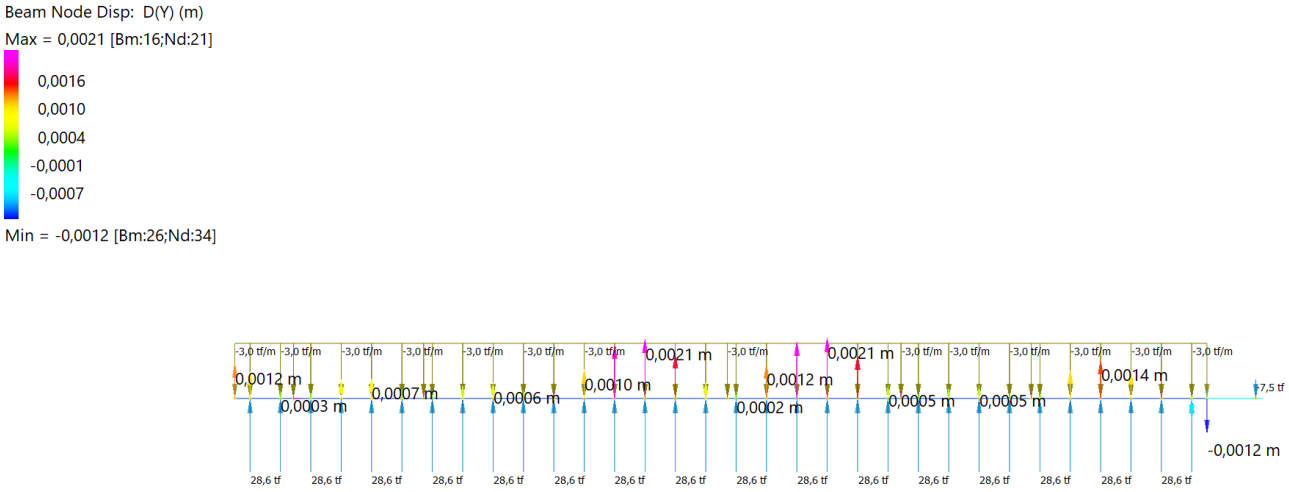


Figure 12: Spine beam deflection.

Note: Unless the max bending moment and shear value are within the max allowable, no recommendation from SPMT vendor regarding max deflection.

4.2.4 SPINE BEAMS STRUCTURAL CHECK

Table 1 presents an overview of the structural check carried out on the 3 spine beams.

	M_{sd} (tm)	$M_{all\text{-}SPMT}$ (tm)	$M_{sd}/M_{all\text{-}SPMT}$	V_{sd} (tm)	$V_{all\text{-}SPMT}$ (tm)	$V_{sd}/V_{all\text{-}SPMT}$
Spine beam 1	121,84	670	0,18	103,24	350	0,29
Spine beam 2	118,09	670	0,18	92,07	350	0,26
Spine beam 3	102,17	670	0,15	80,7	350	0,23

Table 1: Structural check of the spine beams.

CHECK OK!

11.7 Lashing calculation

OBJECTS:	**LASHING VERIFICATION FOR TOP SIDE TRANSPORTATION**
PROJECT:	**CROSSWIND**
CLIENT:	**ROSETTI MARINO S.P.A.**
REFERENCE FAGIOLI DOCUMENTS:	**030-CRO-DP-01-005**
	030-CRO-DP-01-001
REFERENCE CLIENT DOCUMENT:	**n.a.**

1. SCOPE

The scope of this technical note is to shown the lashing verification for the transportation of the item TP for the Crosswind Project. The verification is carried out in accordance with the standard "IMO – Cargo stowage and securing, 2003", following the alternative method described in the paragraph 7.3.

The lashing system is represented in the reference drawing 030-CRO-DP-01-005 (a snapshot of the drawing is reported in *Figure 1*).

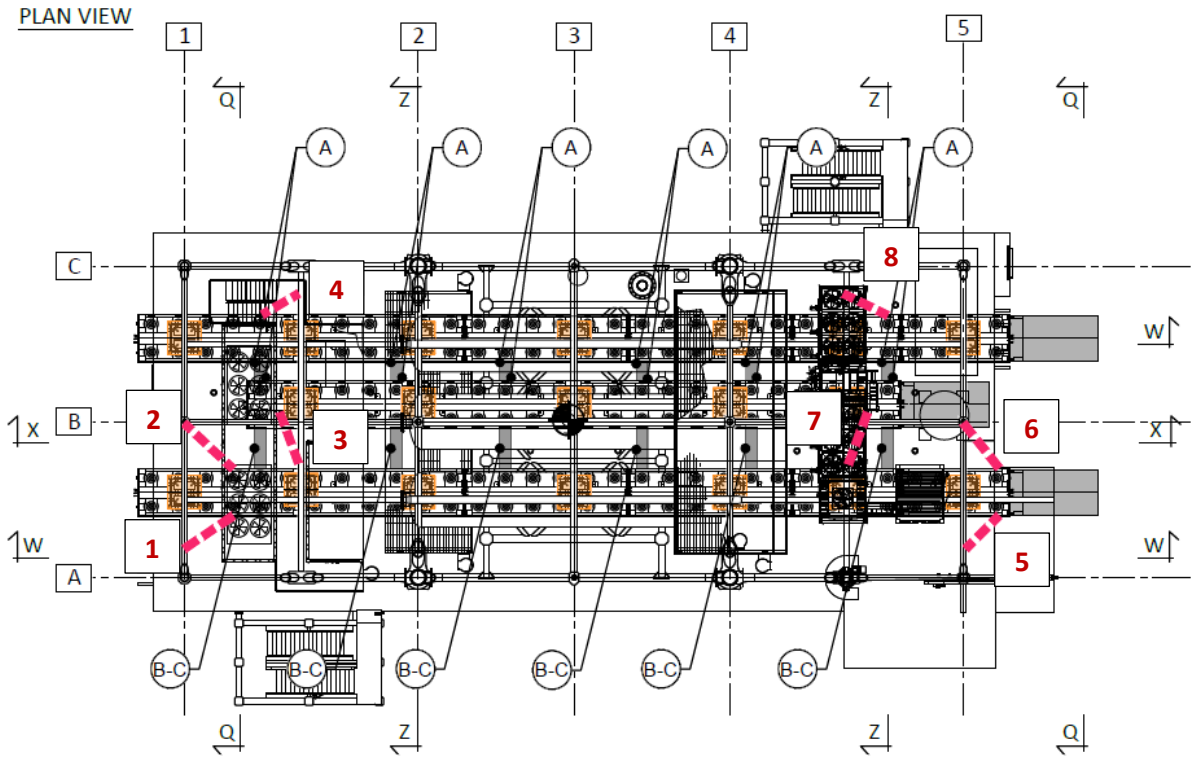


Figure 1 – Plan view of the lashing system.

2. CALCULATION OF HORIZONTAL FORCES

WIND LOAD

For the wind load calculation, NTC 2018 has been employed.

- Reference wind speed $v_r = 25\ m/s$
- Transversal area exposed to wind $A_x = 1000\ m^2$
- Longitudinal area exposed to wind $A_y = 600\ m^2$
- Height of barycenter from ground $z_w = 9{,}5\ m$
- Exposition coefficient $c_e = 2{,}02$
- Air density $\rho = 1{,}25\ kg/m^3$

The longitudinal and transversal horizontal forces due to wind are calculated as follows

$$F_{w,x} = \frac{1}{2} \cdot \rho \cdot v_r^2 \cdot c_e \cdot A_x = 80{,}31\ tf$$

$$F_{w,y} = \frac{1}{2} \cdot \rho \cdot v_r^2 \cdot c_e \cdot A_y = 48{,}19\ tf$$

FORCE DUE TO OUT OF VERTICALITY

The maximum out of verticality (OoV) considered for the transport phase is 3° in both longitudinal and transversal direction. This value is the sum of the allowable inclination of convoy (1°), and the 2° of out of verticality required by the DNV-GL. From this, the horizontal forces due to OoV (equal in the two directions) are:

$$F_{OoV} = W \cdot \sin \alpha_{OoV} = 94{,}31\ tf$$

Where W is the transported item weight equal to 1802 ton.

DIFFERENTIAL TRACTION FORCE BETWEEN SEPARETED VEHICLES

Since the vehicles are rigidly connected to each other, during starting, braking, and movement, no differential traction forces may arise.

DYNAMIC HORIZONTAL FORCE

Since the transport is carried out at a maximum speed of 0.5 km/h, it is not necessary to consider dynamic forces due to eventual accelerations.

3. CALCULATION OF RESISTANCE FORCES

The external horizontal forces must be smaller than the resistance forces, i.e. the friction force between the item and the trailer and the force of the lashing system that connect the item to the SPMTs.

FRICTION FORCE

As specified in the 030-CRO-DP-01-001, plywood or rubber sheets shall be positioned between any steel surface in contact. Therefore, it is possible to consider a friction coefficient $\mu = 0{,}3$. The friction force is calculated as:

$$F_f = m \cdot \mu = 540{,}6\ tf$$

LASHING FORCES

The item is connected to the convoy by 8 lashing lines formed by chains and turnbuckle used in double laid. The resistance of the lashing system is calculated in accordance with the standard "IMO – Cargo stowage and securing, 2003". Every lashing line has vertical and horizontal securing angles, α e β, that develop securing effects both in longitudinal and transverse direction.

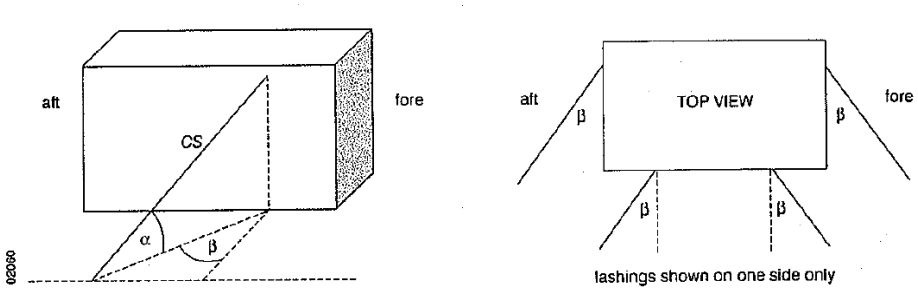


Figure 2 – Definition of the securing angles.

The properties of the lashing system are:

- Breaking load BL = 21,2

- Maximum securing load SWL = BL/2 = 10,6
- Calculated strength CS = 2·SWL / 1,5 = 14 tf

4. SLIDING AND TIPPING VERIFICATION

The lashing system must be verified in the following case:

- Transverse sliding
- Longitudinal sliding
- Transverse tipping

TRANSVERSE SLIDING

For the transverse sliding (along +y direction), the following formulae must be verified:

$$F_{y,sd} = F_{w,y} + F_{OoV} \leq F_{y,rd} = \mu \cdot m + \sum_{i=1}^{n} CS_{i,y}$$

The results are presented in the figure below:

$F_{w,y}$ (tf)	48,19						
F_{OoV} (tf)	94,31						
F_t (tf)	0						
$F_{y,sd}$ (tf)	**142,50**						
TRANSVERSE SLIDING							
Lashing line ID	CS (tf)	L tot. (m)	H tot. (m)	L projected (m)	α (°)	β (°)	$CS_{i,y}$ (tf)
1	14	3,00	1,35	2,49	24,25	56,01	7,14
2	14	3,40	1,35	2,49	21,64	47,03	8,87
3	14	2,76	1,35	0,95	26,06	20,02	11,82
4	14	2,13	1,35	1,84	32,42	59,94	5,92
5	14	2,38	1,35	1,69	29,59	45,14	8,59
6	14	2,90	1,35	1,81	24,94	38,57	9,92
7	14	2,79	1,35	0,97	25,81	20,34	11,82
8	14	2,49	1,35	2,24	28,47	63,84	5,43
						$0,5*\Sigma Cs_{i,y}$ (tf)	34,75
						$F_{y,friction}$ (tf)	540,6
						$F_{y,rd}$ (tf)	**575,35**
$F_{y,sd}/F_{y,rd}$	0,25		CHECK OK!				

Figure 3 – Transverse sliding verification.

All lashing lines are shown in the figure above. It is reasonably assumed that half of the lines will be in tension.

LONGITUDINAL SLIDING

For the longitudinal sliding, the following formulae must be verified:

$$F_{x,sd} = F_{w,x} + F_{OoV} \leq F_{x,rd} = \mu \cdot m + \sum_{i=1}^{n} CS_{i,x}$$

The results are presented in the figure below:

$F_{w,x}$ (tf)	80,31						
F_{OoV} (tf)	94,31						
F_t (tf)	0						
$F_{x,sd}$ (tf)	**174,62**						
LONGITUDINAL SLIDING							
Lashing line ID	CS (tf)	L tot. (m)	H tot. (m)	L projected (m)	α (°)	β (°)	$CS_{i,x}$ (tf)
1	14	3,00	1,35	2,49	24,25	56,01	10,58
2	14	3,40	1,35	2,49	21,64	47,03	9,52
3	14	2,76	1,35	0,95	26,06	20,02	4,31
4	14	2,13	1,35	1,84	32,42	59,94	10,23
5	14	2,38	1,35	1,69	29,59	45,14	8,63
6	14	2,90	1,35	1,81	24,94	38,57	7,91
7	14	2,79	1,35	0,97	25,81	20,34	4,38
8	14	2,49	1,35	2,24	28,47	63,84	11,05
						$0,5*\Sigma Cs_{i,x}$ (tf)	33,31
						$F_{x,friction}$ (tf)	540,6
						$F_{x,rd}$ (tf)	**573,91**
$F_{x,sd}/F_{x,rd}$	0,30		CHECK OK!				

Figure 4 – Longitudinal sliding verification.

All lashing lines are shown in the figure above. It is reasonably assumed that half of the lines will be in tension.

TRANSVERSE TIPPING

For the transverse tipping, the following formulae must be verified:

$$M_{UNSTAB} \leq M_{STAB}$$

For simplicity and safety purposes, the contribution of the lashing system has been neglected in the calculation of stabilizing moment. The previous formula then becomes:

$$1{,}5 \cdot (F_{x,sd} \cdot z_{CoG}) \leq 0{,}9 \cdot (W \cdot a_x)$$

$$1{,}5 \cdot (F_{y,sd} \cdot z_{CoG}) \leq 0{,}9 \cdot (W \cdot a_y)$$

Where a_x, a_y are the stabilizing arm, equal to the minimum distances between the CoG of the item and the support of the item on the convoy, the longitudinal and transversal direction, respectively. Therefore:

$$1{,}5 \cdot (174{,}62 \cdot 9{,}50) \leq 0{,}9 \cdot (1802 \cdot 19{,}83)$$
$$2488{,}34\ tm \leq 32160{,}29\ tm$$

CHECK OK!

$$1{,}5 \cdot (142{,}50 \cdot 9{,}50) \leq 0{,}9 \cdot (1802 \cdot 5{,}07)$$
$$2030{,}63\ tm \leq 8222{,}53\ tm$$

CHECK OK!

11.8 SPMT traction check

FAGIOLI	DRIVIN FORCE CHECK	rev. 00 date 19-11-2011 by U.S.

PROJECT: 123A90 (CROSSWIND) PROJECT **ITEM :** TOP SIDE **DATE :** 01/07/25

DWG FAGIOLI: 030-CRO-LO-01-002-0

DATE

Item Weight				P	=	1.802,00	t
Equipment weight				Pe	=	87,88	t
Trailer dead weigth				Pp	=	392,10	t
Total weight				Wl	=	2.281,98	t
Axles number				N	=	88	
Drive axles number				Nt	=	36	
Weight load for axles				Wl	=	25,93	t
Rolling Friction f_R				f_R	=	0,025	
Modular type (SPMT;MSPE;MSPE Evo;MSPM)						MSPE	
Inclination (%)						5	%
Inclination (radiant)						0,050	rad
Inclination (degree)						2,9	deg
Soil friction coefficient	Rubber- Off road compacted			Φ	=	0,4	
Max axle driving force (No 2 suspension)		F_{Z1}	=	12,23	t	120	KN

TRACTION CHECK

Total driving force	(F_{Z1}*Nt)	F	=	440,37	t	4320	KN
Max theoric slope	((F-Wl*g*f_R)/(Wl*g))*100			α	=	16,80	%
Max real slope (-15%)				**α***	=	**14,28**	**%**
Max angle				φ	=	8,13	deg

SLIPPING CHECK

Total weight on drive axles	(Nt*Wl)	W_{Nt}	=	934	t	9158	KN
Traction force	(W_{Nt}*Φ)	F_1	=	373,41	t	3663	KN
				α**	=	**13,86**	**%**

MAX ALLOWABLE SLOPE **13,86364 %**

THE CONVOY CAN TRANSIT AT MAX SLOPE **5 %**

11.9 Risk assessment

Index

1. Definition pag. 3

2. Risk Assessment Plan pag. 5

3. Risk Assessment Record Sheet pag. 6

1. Definitions

A 'Risk' is defined as the combination of the Damage of the consequences and the likelihood that harm or damage will actually occur.
A 'Hazard' is defined as anything that has the potential to cause harm or damage.

1.1. Risk Assessment (Hazard Identification and Risk Analysis)

This Risk Assessment has been based on many similar projects and carried out as follows:

- All activities and actions have been identified;
- All hazards associated with these activities and actions have been identified;
- The Hazard Effect of any hazards have been identified;
- The Damage of consequences and probability of each hazard have been identified;
- A Risk Assessment for each hazard has been produced;
- Risk mitigating preventative and protective measures have been developed as required;
- Residual risks remaining have been confirmed as acceptable.

In the event of this Risk Assessment not reducing all risk to an acceptable level the following actions are required:

- Further risk mitigating preventative and protective measures are to be developed as required;
- An action plan is to be completed for those hazards where adequate control measures still need to be confirmed and the risks reduced to an acceptable level.

A flow diagram showing this process is included in the following pages of this document.

The Risk Assessment for each activity has been documented on Risk Assessment Record Sheets and these forms are attached to this document.

A combination of FAGIOLI equipment will be used in the execution of this project.

This Risk Assessment Document identifies all hazards that may expose personnel, property or the environment to danger, assess the risk involved and ensure that preventative and protective measures are implemented to reduce these risks to an acceptable level.

1.2. Criteria (Project Risk Matrix)

R = P x D

P				
4	4	8	12	16
3	3	6	9	12
2	2	4	6	8
1	1	2	3	4
	1	**2**	**3**	**4**

D

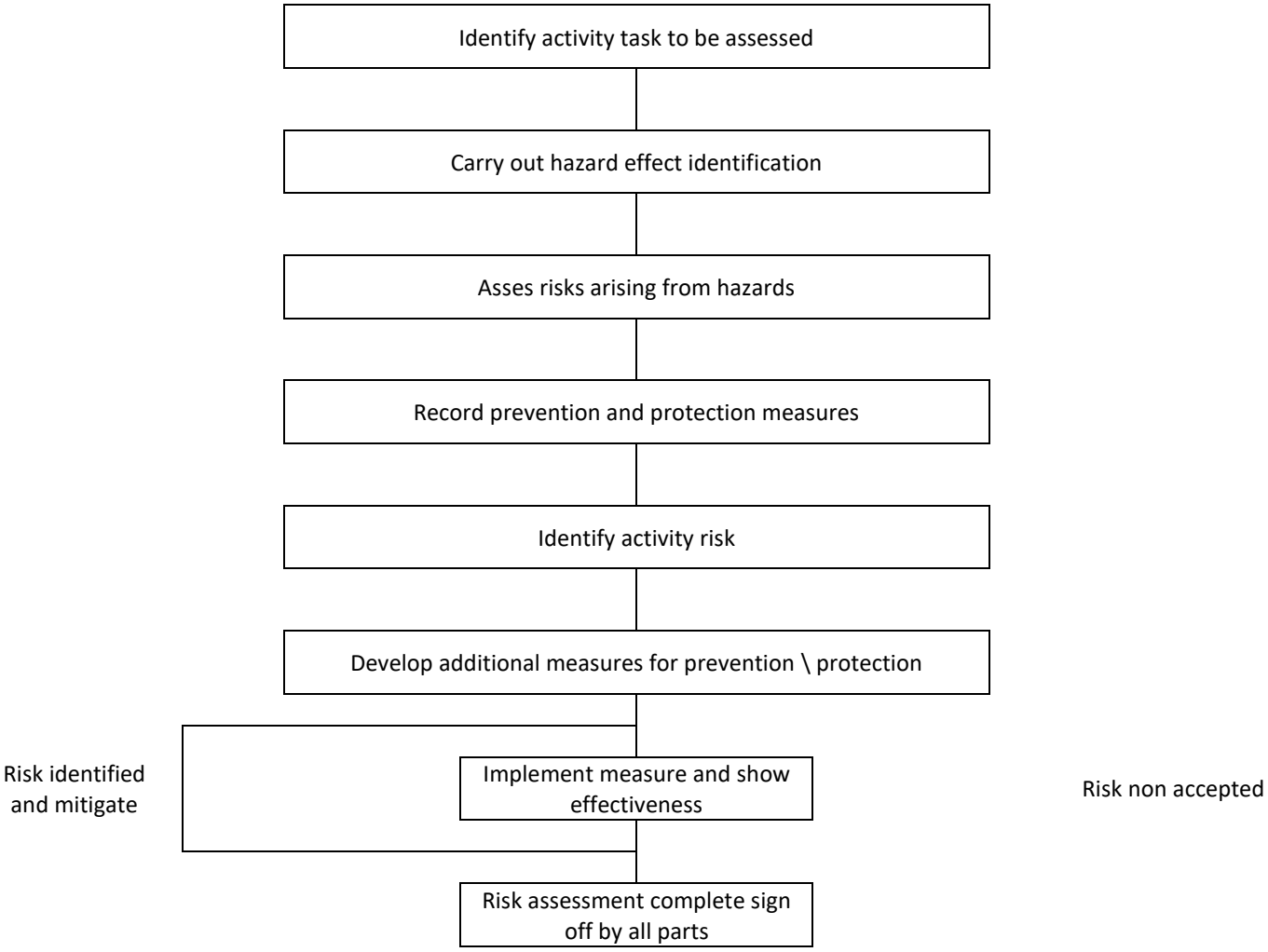
Probability Definitions (P)

Category	Definitions	Working Definition
4	Very Likely	Almost inevitable the same event will routinely occur during the course of similar work
3	Likely	It is considered likely the same event could still occur during the course of similar work
2	Unlikely	A rare combination of factors required for the same event to occur during course of similar work
1	Very Unlikely	It is considered a freak combination of factors would be required for the same event to occur in the future

Damage Definitions (D)

Damage Category		Damages Considerations		
		Harm to people	**Environmental damage**	**Damage to properties**
4	Catastrophic	Fatalities / Multiple serious injuries	Massive and uncontrolled release of a substance or damage with significant environmental impact extending well beyond site boundary. Chronic pollution resulting in damage lasting more than 12 months.	Over 500.000 €. Extensive damage (multiple fire / explosion) or loss of installation / facilities.
3	Significant	LTI / Temporary or permanent partial disability	Outside boundaries. Localized pollution given rise to significant environmental impact but unlikely to last beyond 1 month. Repeated exceeding of legal conditions. Recovery/rehabilitation may require external assistance	More than 100.000 € and less than 500.000 €. Significant damage to local area or essential plant and equipment.
2	Moderate	Medical treatment / Restricted work case	Within site boundaries. Short term environmental impact. Single legal exceeding recoverable by worksite	More than 50.000 € and less than 100.000 €. Limited damage to plant and equipment.
1	Negligible	First Aid injury	Within site boundaries. No significant environmental impact or exceeding of legal conditions. Easily controlled, recovered by worksite	Less than 50.000 €. Insignificant damage to plant and equipment.

2. Risk Assessment Plan



All risks will be assessed in conjunction with the Risk Management System.

The scope of risk assessment is to identify the hazards, evaluate mitigation measures already in place and then to identify any further mitigation measures required.

All planned activities will be assessed as early as possible to ensure that mitigation measures can be implemented in a timely fashion.

SHSE&QAO (Safety Health Security Environmental & Quality Assurance Officer), PSM (Project Site Manager), Superintendent will meet weekly to ensure that upcoming activities are identified and assessed.

In case of changing to schedule, PSM (Project Site Manager) will immediately inform the SHSE&QAO (Safety Health Security Environmental & Quality Assurance Officer).

3. Risk Assessment Record Sheets

Risk Assessment Record Sheets identified the hazard, hazard effect, preventative & protective measures and the risk calculation.

Each hazard is identified against an individual risk, however, hazard effect and preventative & protective measures are considered as factors of combined consequences and mitigation.

Activity – *Manual Lifting & Handling of Loads*

Risk Assessment Record Sheet No: 1 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
01	Fall of object from height	(4) 3	(2) 1	(8) 3	Back strain	Use of mechanical aids
	Fatigue	(3) 2	(1) 1	(3) 2	Muscle / Ligament injury	Manual handling training
	Heavy loads	(3) 2	(1) 1	(3) 2	Crushing	Split loads
	Unstable loads	(3) 2	(2) 1	(6) 2	Cuts & abrasions	Team lifting
	Sharp edges	(3) 2	(2) 1	(6) 2	Slips. Trips & falls	Good housekeeping
	Poor lifting technique	(3) 2	(1) 1	(3) 2	Hernias	Good lifting technique (refer to MGSSL-PR07-REV.02-MOVIMENTAZIONE MANUALE DI CARICHI)
	Poor housekeeping	(2) 2	(3) 1	(6) 2	Damage to plant & equipment	Good stacking methods
	Uneven surfaces	(3) 2	(1) 1	(3) 2		Good communications
						Toolbox talks
						Knowledge of load
						Job rotation
						Rest periods (do not work more than 12 hours in a day)
						PPE
						Do not lift loads heavier than 25kg

This Risk Assessment has been reviewed and accepted			
Action plan applicable		YES	NO
HSEM	General Manager	Date	
L. Fantini	M. Massetti	01.08.12	

Damage:	
4	Catastrophic
3	Significant
2	Moderate
1	Negligible

Probability:	
4	Very likely
3	Likely
2	Unlikely
1	Very unlikely

Criteria:	
R = 1	Low
2 ≤ R ≤ 3	Medium
4 ≤ R ≤ 8	High
9 ≤ R ≤ 16	Elevated

Activity – *Use Of Hand Tools*

Risk Assessment Record Sheet No: 2 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
02	Trapping / Jamming	(4) 3	(2) 1	(8) 3	Injury to personnel	Maintained equipment
	Fall of object from height	(4) 3	(2) 1	(8) 3	Damage to plant & equipment	Damaged / worn tools exchanged
	Flying particles	(3) 2	(2) 1	(6) 2		Regular tool inspections
	Damaged/worn tools	(3) 2	(2) 1	(6) 2		Good housekeeping
	Noise	(3) 2	(2) 1	(6) 2		Toolbox meeting
						Competent personnel
						PPE

This Risk Assessment has been reviewed and accepted			
Action plan applicable		YES	NO
HSEM	General Manager	Date	
L. Fantini	M. Massetti	01.08.12	

Damage:	
4	Catastrophic
3	Significant
2	Moderate
1	Negligible

Probability:	
4	Very likely
3	Likely
2	Unlikely
1	Very unlikely

Criteria:	
R = 1	Low
2 ≤ R ≤ 3	Medium
4 ≤ R ≤ 8	High
9 ≤ R ≤ 16	Elevated

Activity – *Fire Safety*

Risk Assessment Record Sheet No: 3 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
09	Overload of electrical circuits	(3) 2	(2) 1	(6) 2	Injury to personnel	Trained/Competent personnel
	Faulty electrical equipment	(3) 2	(2) 1	(6) 2	Damage to plant & equipment	Maintained equipment
	Diesel power pack	(3) 2	(2) 1	(6) 2		Good housekeeping
	Welding equipment & operations	(3) 2	(2) 1	(6) 2		Good communications (radios)
						Life saving apparatus
	Sparks from metal grinding	(3) 2	(2) 1	(6) 2		Safety Barriers
						Extinguishers fitted to Diesel Power Packs
						High visibility clothing
						Toolbox meeting
						Supervision where necessary
						Hot Woks Permit to be coordinated with Rosetti
						PPE
						AED available in the yard (short travel distance from the quay)
						Emergency response based on Yard Emergency Response Plan

This Risk Assessment has been reviewed and accepted				Damage:	Probability:	Criteria:	
Action plan applicable		YES	NO	4 Catastrophic	4 Very likely	R = 1	Low
HSEM	General Manager	Date		3 Significant	3 Likely	2 ≤ R ≤ 3	Medium
L. Fantini	M. Massetti	01.08.12		2 Moderate	2 Unlikely	4 ≤ R ≤ 8	High
				1 Negligible	1 Very unlikely	9 ≤ R ≤ 16	Elevated

Activity - *Electrical Safety*

Risk Assessment Record Sheet No: 4 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
04	Electric shock	(3) 2	(2) 1	(6) 2	Injury to personnel	Trained / Competent personnel
	Faulty electrical equipment	(3) 2	(1) 1	(3) 2	Damage to plant & equipment	Maintained equipment
	Overload of electrical circuits	(3) 2	(1) 1	(3) 2		Good housekeeping
	Thermal effects	(3) 2	(1) 1	(3) 2		Safe systems of work
						Life saving apparatus
						Toolbox meeting
						Supervision where necessary
						PPE

This Risk Assessment has been reviewed and accepted			
Action plan applicable		YES	NO
HSEM	General Manager	Date	
L. Fantini	M. Massetti	01.08.12	

Damage:	
4	Catastrophic
3	Significant
2	Moderate
1	Negligible

Probability:	
4	Very likely
3	Likely
2	Unlikely
1	Very unlikely

Criteria:	
R = 1	Low
$2 \leq R \leq 3$	Medium
$4 \leq R \leq 8$	High
$9 \leq R \leq 16$	Elevated

Activity –*Assembly / Maintenance / Demobilizing SPMT Transporters*

Risk Assessment Record Sheet No: 05 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
05	Trapping / Jamming	(4) 3	(2) 1	(8) 3	Injury to persons working in close proximity	Trained / Competent personnel
	Moving vehicles	(4) 3	(2) 1	(8) 3		Banksman
	Fall of person from height	(4) 3	(2) 1	(8) 3	Injury to operator	Maintained equipment
	Fall of object from height	(4) 3	(2) 1	(8) 3	Damage to plant & equipment	Worn damaged tool exchange
	Damaged / worn tools	(3) 2	(2) 1	(6) 2	Damage to environment	Good housekeeping
	Poor housekeeping	(3) 2	(2) 1	(6) 2		Assistance when maneuvering trailers
	Hydraulic pressure release	(3) 2	(2) 1	(6) 2		
	Adverse weather conditions	(3) 2	(2) 1	(6) 2		Good communications
						2 way radios
						Isolation of power packs
						Restricted access / Taped area
						Operations / Maintenance manuals
						High visibility clothing
						Toolbox meeting
						Supervision when necessary
						Use of safety harness
						Use the Proper Fall-Arrest Equipment
						Tools and materials must be kept in containers that are secure
						Weather forecast

This Risk Assessment has been reviewed and accepted			
Action plan applicable		YES	NO
HSEM	General Manager	Date	
L. Fantini	M. Massetti	01.08.12	

Damage:	
4	Catastrophic
3	Significant
2	Moderate
1	Negligible

Probability:	
4	Very likely
3	Likely
2	Unlikely
1	Very unlikely

Criteria:	
R = 1	Low
2 ≤ R ≤ 3	Medium
4 ≤ R ≤ 8	High
9 ≤ R ≤ 16	Elevated

Activity – *Hydraulic System Connection & Testing (SPMT's and Cranes)*

Risk Assessment Record Sheet No: 06 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
06	Hydraulic pressure release	(4) 3	(2) 1	(8) 3	Injury to personnel	Pressure testing of hydraulic system prior to dispatch (Cert. Package)
	Fall of person from height	(4) 3	(2) 1	(8) 3	Injury to persons working in close proximity	
	Fall of object from height	(4) 3	(2) 1	(8) 3		
	Poor mechanical connections	(4) 2	(1) 1	(4) 2	Damage to plant & equipment	Use of biodegradable oils
	Adverse weather conditions	(3) 2	(1) 1	(3) 2	Damage to environment	Good housekeeping
	Hydraulic oil spillage	(2) 1	(2) 1	(4) 1		Maintained equipment
						Provide power units with drip trays
						Inspected / Certified access equipment
						Erection Statement
						Certification Package
						All connections to be checked
						Spillage Kits to be provided
						Toolbox meeting
						PPE
						Use of safety harness
						Use the Proper Fall-Arrest Equipment
						Tools and materials must be kept in containers that are secure.
						Eye cleaning safety kit

This Risk Assessment has been reviewed and accepted			
Action plan applicable		YES	NO
HSEM	General Manager	Date	
L. Fantini	M. Massetti	01.08.12	

Damage:	
4	Catastrophic
3	Significant
2	Moderate
1	Negligible

Probability:	
4	Very likely
3	Likely
2	Unlikely
1	Very unlikely

Criteria:	
R = 1	Low
$2 \leq R \leq 3$	Medium
$4 \leq R \leq 8$	High
$9 \leq R \leq 16$	Elevated

Activity – *Transportation of Abnormal Loads*

Risk Assessment Record Sheet No: 07 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
7	Loss of load	(4) 3	(2) 1	(8) 3	Injury to operator	Trained/Competent operators
	Collision	(4) 3	(2) 1	(8) 3	Damage to equipment/cargo	Supervision
	Fall of object /material from height	(4) 3	(2) 1	(8) 3	Damage to ground	Maintained equipment
					Damage to underground / overhead services	High visible/Audible warning of moving vehicle
	Overturning	(4) 3	(2) 1	(8) 3		
	Trapping	(4) 3	(2) 1	(8) 3	Disruption to local traffic	High visible warning of wide/long load
	Moving vehicles	(4) 3	(2) 1	(8) 3		
	Poor securing	(4) 3	(2) 1	(8) 3		Advance notification of proposed movement to relative bodies
	Collapse/Subsidence of ground	(4) 2	(1) 1	(4) 2		
	Striking overhead obstructions	(4) 2	(1) 1	(4) 2		Engineering studies/survey of: Ground limitations/loadings; Width restrictions/clearances; Stability of load(COG)
	Inadequate access	(3) 2	(1) 1	(3) 2		
	Adverse weather conditions	(3) 2	(1) 1	(3) 2		
						Toolbox meeting
						Good communications
						Safety barriers
						Good housekeeping
						Restrict maximum speed of vehicles to 0,5 Km/hour
						Factor 1 to 2 seconds bring vehicles to a stop.
						Continuous monitoring level indicators.
						Provide watcher along the transportation road and at narrow gaps like reduced clearance to the concrete construction support

This Risk Assessment has been reviewed and accepted			
Action plan applicable		YES	NO
HSEM	General Manager	Date	
L. Fantini	M. Massetti	01.08.12	

Damage:	
4	Catastrophic
3	Significant
2	Moderate
1	Negligible

Probability:	
4	Very likely
3	Likely
2	Unlikely
1	Very unlikely

Criteria:	
R = 1	Low
2 ≤ R ≤ 3	Medium
4 ≤ R ≤ 8	High
9 ≤ R ≤ 16	Elevated

Activity – *Working Over / Near Water*

Risk Assessment Record Sheet No: 08 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
8	Falling from height / into water	(4) 3	(2) 1	(8) 3	Injury to operator/drowning	Trained/Competent operators
	Damage to quay edge	(3) 2	(1) 1	(3) 2	Damage to equipment/cargo	Supervision
					Damage to plant/equipment	Maintained equipment
					Collapse of quayside	Life saving apparatus
						High visibility clothing
						Engineering checks for imposed loads to quay
						Supervision where necessary
						Good communications
						Safety barriers
						Good housekeeping
						Toolbox meeting
						Life vests
						PPE
						Use of safety harness

This Risk Assessment has been reviewed and accepted			
Action plan applicable		YES	NO
HSEM	General Manager	Date	
L. Fantini	M. Massetti	01.08.12	

Damage:	
4	Catastrophic
3	Significant
2	Moderate
1	Negligible

Probability:	
4	Very likely
3	Likely
2	Unlikely
1	Very unlikely

Criteria:	
R = 1	Low
2 ≤ R ≤ 3	Medium
4 ≤ R ≤ 8	High
9 ≤ R ≤ 16	Elevated

Activity – *Spillage of Hazardous Materials*

Risk Assessment Record Sheet No: 09 of 9

Item	Hazard	Damage x Probability = Risk ( ) Without Controls			Hazard effect	Preventative & Protective Measures
		Damage	Probability	Risk		
9	Loss of hydraulic oil	(3) 2	(2) 1	(6) 2	Contamination of local environment	Trained/Competent operators
	Loss of diesel	(3) 2	(2) 1	(6) 2		Supervision
	Loss of engine oil	(3) 2	(2) 1	(6) 2	Slipping of pedestrians	Maintained equipment
					Skidding of vehicles	Good communications
					Fire/explosion	Safety barriers
					Contamination of skin	Good housekeeping
						Toolbox meeting
						High visibility clothing
						Life vests
						PPE
						Each convoy to carry adequate absorbent materials
						Each convoy to carry suitable fire extinguishers
						Spare liquids to be in correct containers and adequately stowed
						Spill kit

This Risk Assessment has been reviewed and accepted				Damage:	Probability:	Criteria:	
Action plan applicable		YES	NO	4 Catastrophic	4 Very likely	R = 1	Low
HSEM	General Manager	Date		3 Significant	3 Likely	2 ≤ R ≤ 3	Medium
L. Fantini	M. Massetti	01.08.12		2 Moderate	2 Unlikely	4 ≤ R ≤ 8	High
				1 Negligible	1 Very unlikely	9 ≤ R ≤ 16	Elevated

11.10 Contingency plan

Equipment/ Environment	RISK	CONTINGENCY
SPMT	Tyre failure	Isolate the axle of affected tyre by closing suspension valve. Complete the site transportation. Spare wheels complete with tyres are available at job site. The convoy system can accept max 10 isolate suspension for each hydraulic group
SPMT	Axle failure	Isolate the affected axle hydraulically, raise the axle into the elevated position and lock off. Complete the site transportation with one less axle, using the spare SPMT's capacity. The convoy system can accept max 10 isolate suspension for each hydraulic group
SPMT	Power pack failure	Disconnect the power pack not working. Make a hose by-pass from the running power pack. One power pack can move up to 40 axles
SPMT	Electronics controls failure	The digital system is a twin system. Activate the back-up. Or change the electronic box with spare components.
SPMT	SPMT spine beam overstress	Moment distribution calculations are carried out before any transportation, to ensure that moment capacity of SPMT is not exceeded. If deflection in the spine beam is greater than predicted, set down and investigate prior to moving.
SPMT	Ground failure on route	For any local failure, stop movement immediately. Lock off the affected axles and stabilize SPMT using the remaining axles. Fill the ground hole with hard wood and proceed slowly. The convoy system can accept max 10 isolate suspension for each hydraulic group
SPMT	Fuel, Oil spillage	Clean up any spillage using clean up kits (absorbent materials).
SPMT	Weight/CoG incorrectly described by Client	Carefully monitor suspension pressures / loads when initial jacking up takes place. If pressures are not acceptable, lower the unit onto temporary supports. Ask clarification; relocate the SPMT to fit with the actual location of CoG. If doubt continues, then carry out independent weighing. Max percentage overpressure lifting system is 20%; it means the max pressure circuit is 312 Bar.

11.11 Toolbox meeting

FAGIOLI	SITE TOOL BOX MEETING	STCH-TBMT-01	Revision:	0
			Date:	01.10.18

Project:				Location:	
Client:		Date:		Time:	

Attendees	Signature	Position

Activity 1				
Supervisor:				
Operators:				
Riggers:				

Activity 2				
Supervisor:				
Operators:				
Riggers:				

Activity 3				
Supervisor:				
Operators:				
Riggers:				

Activity 4				
Supervisor:				
Operators:				
Riggers:				

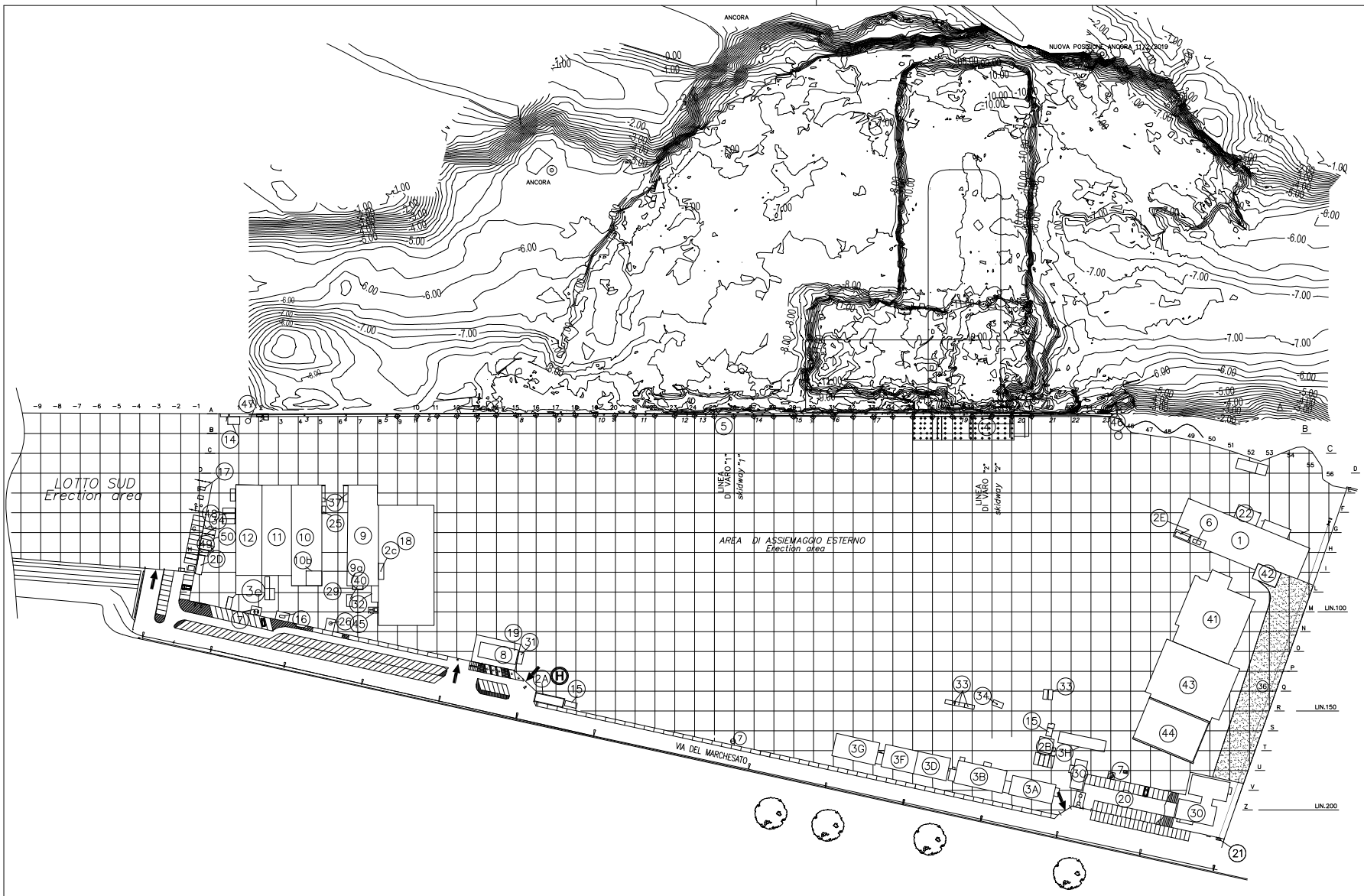
Activity 5				
Supervisor:				
Operators:				
Riggers:				

Activity 6				
Supervisor:				
Operators:				
Riggers:				

Notes:

HSE:	Site Manager:
Signature:	**Signature:**

Software: Auto–CAD r2000 File: CADdraw.dwg



Quote batimetriche riferite al L.M.M.
riferimento CS RMN2–mareometro di Marina di Ravenna

ROSETTI MARINO RAVENNA ITALY

REV. REV.	DATA DATE	DESCRIZIONE / DESCRIPTION	DISEGN. DRAWN.	CONTR. CHECK.	APPROV. APPROV.	Q. A APPROV.
3						
2						
1						
0	18/03/19	EMISSIONE	MTM			

CANTIERE PIOMBONE
Via del Marchesato 37
Marina di Ravenna

PLANIMETRIA GENERALE/GENERAL LAY–OUT
BATIMETRIA STATO DI FATTO AL 28.02.2019
BATHIMETRY AS–BUILT AL 28.02.2019

DIS. N° / DWG Nr 79004.855
SCALA / SCALE 1:2000
FOGLIO SHEET 1 DI OF 1

Stampa: _ Foglio: A3

SIDE SCAN SONAR
MORPHOLOGICAL SURVEYS

Morphological survey for the verification of the seabed in front of ROSETTI YARD inside the Piomboni area (Port of Ravenna)

Rif. C2124

CONFORMITY CERTIFICATE OF THE AREA

Client:

ROSETTI MARINO

Index of revision

Rev.	Date	Description	Issue	Verified	Approved
0	21/05/2021	Emissione	S. Mancini	I. Malavolti	F. Morello
1					
2					
3					

INDEX

1.0 SCOP OF WORK....4
2.0 SCOP OF DOCUMNT....5
3.0 DEFINITION....7
4.0 CONFORMITY DECLARATION OF SEABED AREA....8

DOCUMENT ANNEX

ANNEX 1:	**Technical Final Report**	
ANNEX 2:	**Schede Tecniche della Strumentazione**	
ANNEX 2-A	*Digital*	Software di Navigazione/Acquisizione/ Processing PDS Opzione MBES
ANNEX 2-B	*Digital*	Sistema di posizionamento RTK Trimble R20-2
ANNEX 2-C	*Digital*	Sistema di posizionamento Hemisphere Vector V102
ANNEX 2-D	*Digital*	Sistema Side Scan Sonar Edgetech 4125P
ANNEX 3:	**Monografia del caposaldo topografico utilizzato**	
ANNEX 4:	**Cartografia Tematica**	
ANNEX 4-A	*Digital*	SSS Navigation Chart - Scale 1:1000
ANNEX 4B	*Digital*	Carta Del Fotomosaico HF Scala 1:1000
ANNEX 4-C	*Digital*	Carta Del Fotomosaico LF Scala 1:1000
ANNEX 4-D	*Digital*	Carta Morfologica Scala 1:1000
ANNEX 4-E	*Digital*	Bathymetrc Chart Scale 1:1000
ANNEX 5:	**DTM**	
ANNEX 6:	**Fotomosaico**	
ANNEX 6-A	*Digital*	Fotomosaico in Alta Frequanza
ANNEX 6-B	*Digital*	Fotomosaico in Bassa Frequanza
ANNEX 7:	**PDS LITE VIEW**	
ANNEX 7-A	*Digital*	PDS Lite View Software installation file
ANNEX 7-B	*Digital*	PDS Lite View Software Manual

1.0 SCOP OF WORK

Subsea Fenix Srl from Ravenna have been completed morphological surveys in front of the Rosetti Marino Yard in the area known as the Piomboni inside Ravenna Harbor.

The entire work was carried out with the aim of mapping the seabed surface and identifying the presence of any targets / anomalies such as wrecks or debris, that could be dangerous or an obstacle to the clear navigation and safe approach to the Rosetti jetty. The focus of the survey must guarantee the following information:

- Mapping the morphology of the seabed;
- Target identification;
- Sizing and positioning of any target identified;
- Bathymetric and Morphological data merging;



Image 1 – Rosetti Marino "Piomboni" Yard

The service offered by Subsea Fenix srl included the supply of equipment, operators and everything necessary to perform the required survey, including data processing and their cartographic representation.

2.0 SCOP OF DOCUMNT

To complete the scope of work, this declaration was drawn up and delivered. The document hold the conclusions reached from the analysis of the onsite collected data.

The annex of this document was written to describe i the methods of execution of surveys and data processing, the list and characteristics of the instrumentation used and the personnel employed.

The conclusions was obtained by the analysis of the data acquired and mapped. All the info and the data used to determinate this conclusion was summarized in all the document and map annex to this document.

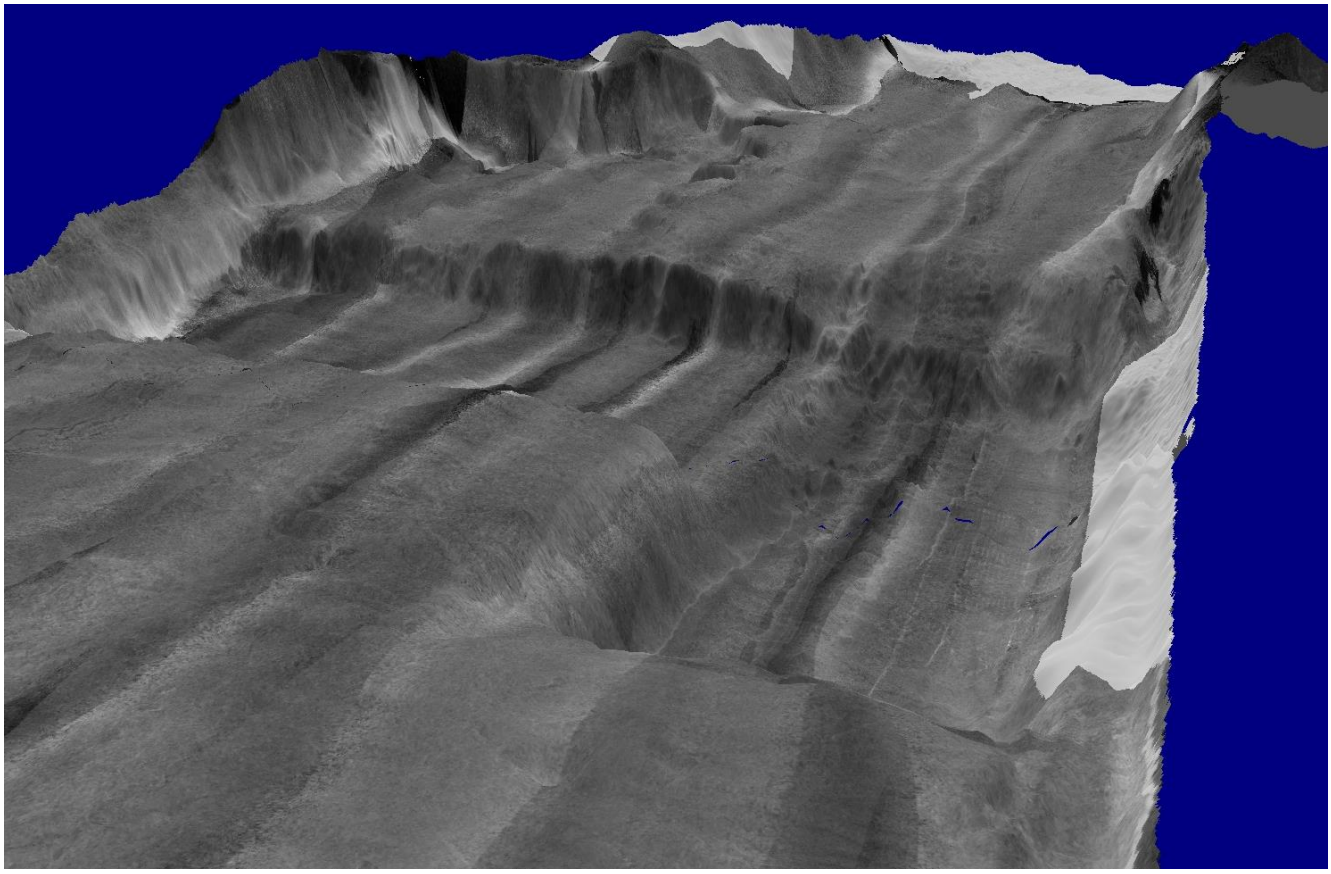


Image 2 – 3D Image of photomosaic

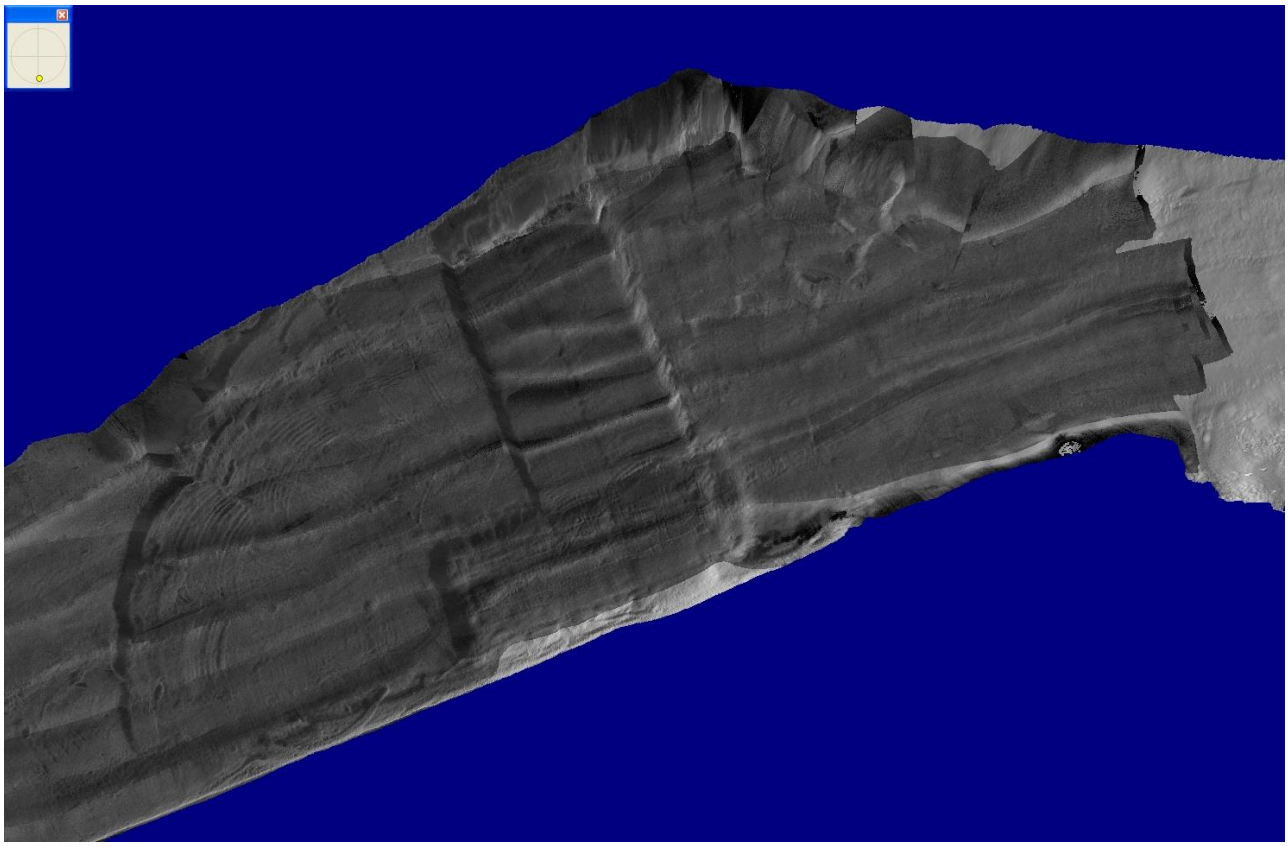


Image 3 – 2D Image of photomosaic

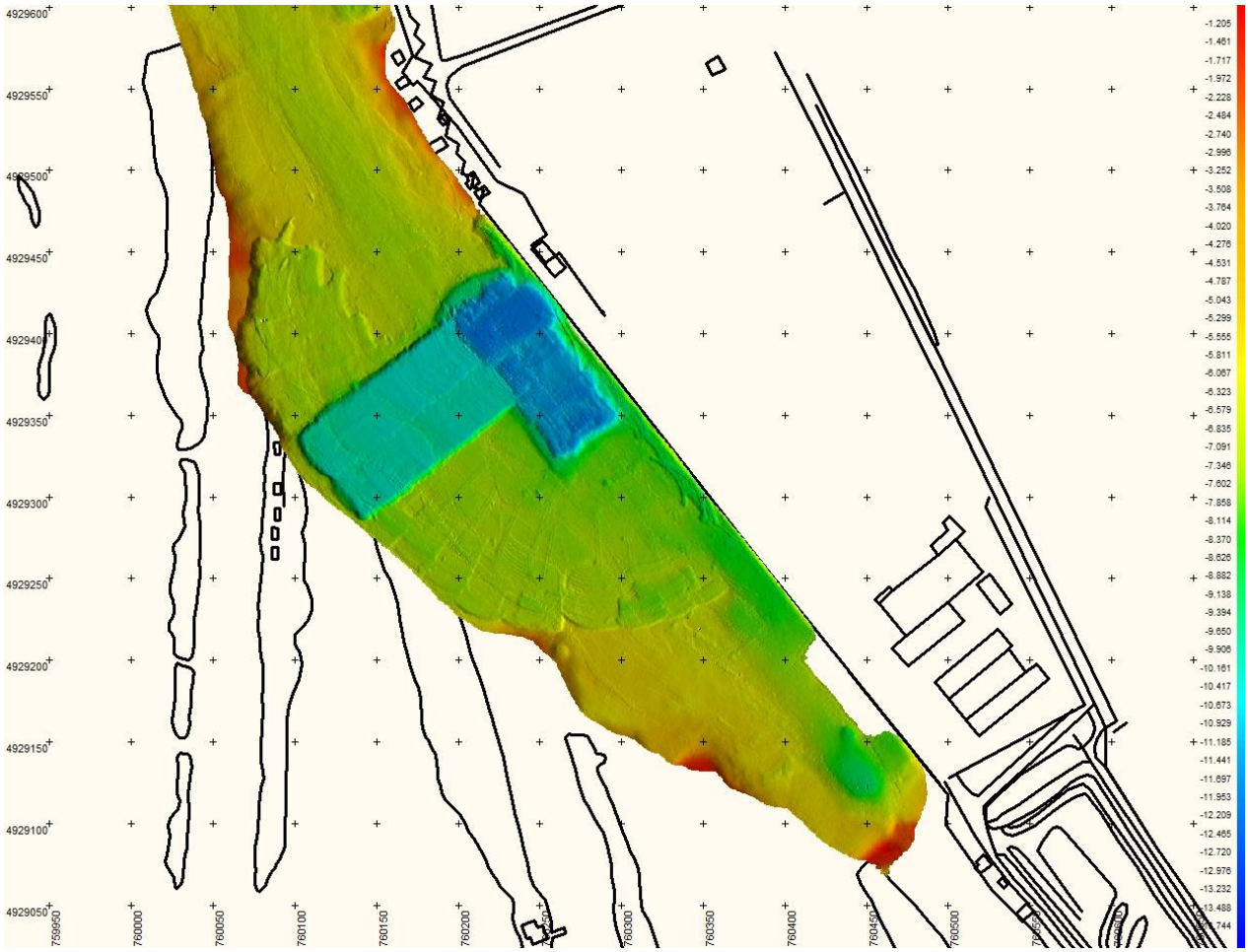


Image 4 – DTM Image

3.0 DEFINITION

- **Client** **Rosetti Marino Srl;**
- **Contractor** Subsea Fenix Srl;
- **Executor** Subsea Fenix Srl;

4.0 CONFORMITY DECLARATION OF SEABED AREA

On 14th May 2021 Subsea Fenix Srl has performed a detailed morphological survey of the Seabad Morphological survey for the verification of the seabed in front of ROSETTI YARD inside the Piomboni area (Port of Ravenna)

The entire work was carried out with the aim of mapping the seabed surface and identifying the presence of any targets / anomalies such as wrecks or debris, that could be dangerous or an obstacle to the clear navigation and safe approach to the Rosetti jetty.

The survey inspection was execute by using a very High Fr3equacy Side Scan Sonar 1250 kHz) system combined with appropriate positioning system and software capable to recording, validate and analyse the acquired data. By making a series of dockside parallel line, spaced 25m, we obtained 100% of coverage of the seabed and 200% of data overlap.

The summary results obtained with the survey, did not report inside the on the seabed any targets, anomalies such as wrecks or debris, that could be dangerous or an obstacle to the clear navigation and safe approach to the Rosetti jetty.

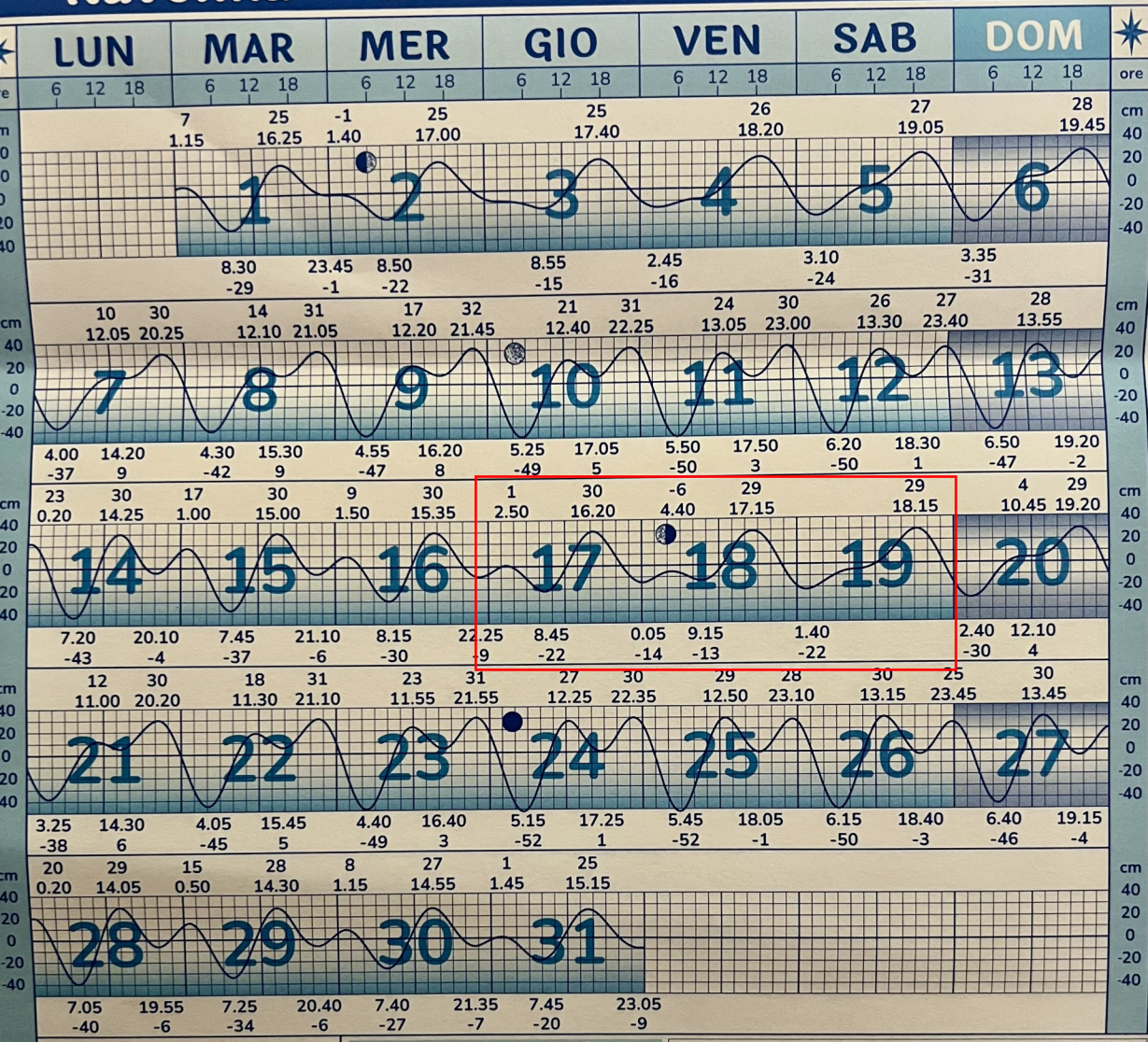
LUGLIO 2025

Ora Legale

• Ravenna •

Previsioni di marea nell'Adriatico settentrionale

RAVENNA PORTO - Lat. 44° 29' 31" Nord - Long. 12° 17' 33" Est • VALORI ASTRONOMICI



ANTICIPI E RITARDI DELLE MAREE - APPROSSIMATI - NEI PORTI IN MINUTI E CON AMPIEZZA RELATIVA

ANTICIPI		RITARDI	
Trieste	55'(100%)	Cesenatico	5'(70%)
Grado	45'(100%)	Rimini	10'(70%)
Lignano	35'(100%)	Riccione	15'(70%)

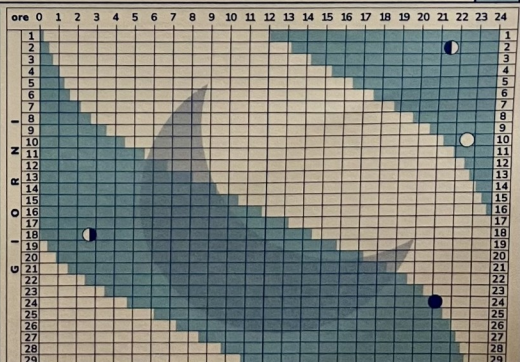
IL SOLE:

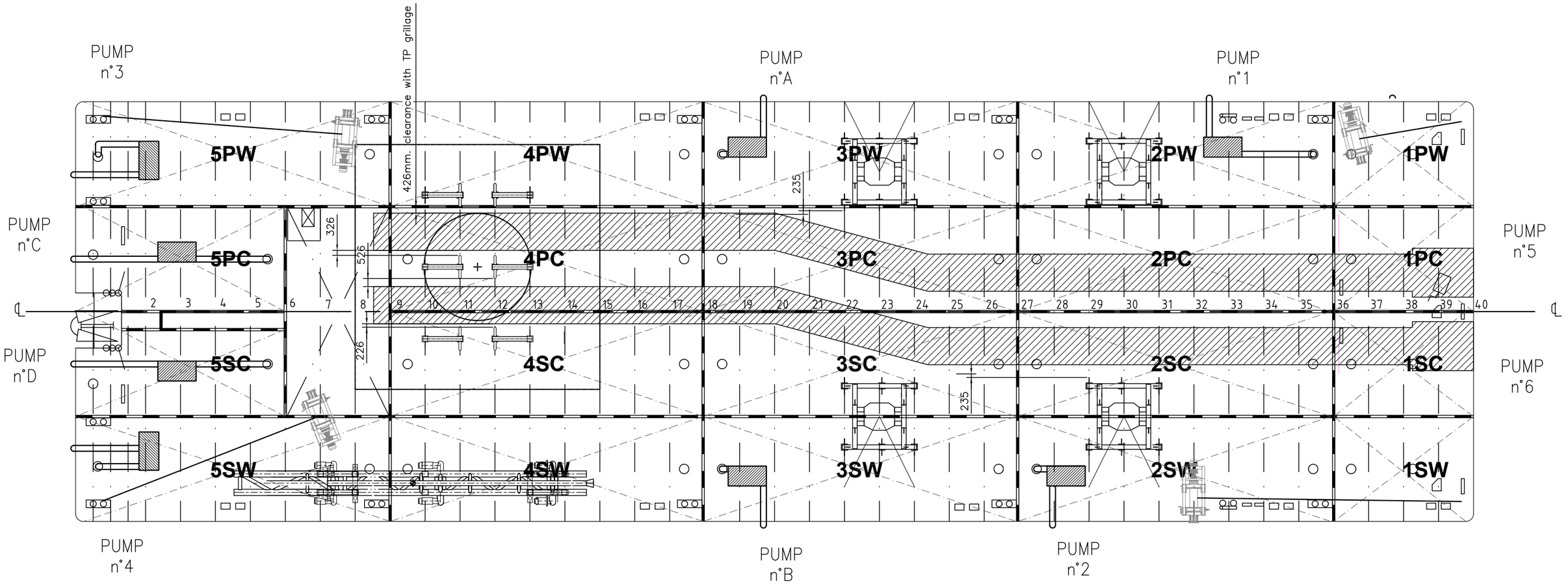
gg.	leva	tram.
1	05.29	20.59
4	05.31	20.59
7	05.33	20.58
10	05.35	20.57
13	05.37	20.55
16	05.40	20.53
19	05.43	20.51
22	05.46	20.48

LA LUNA:

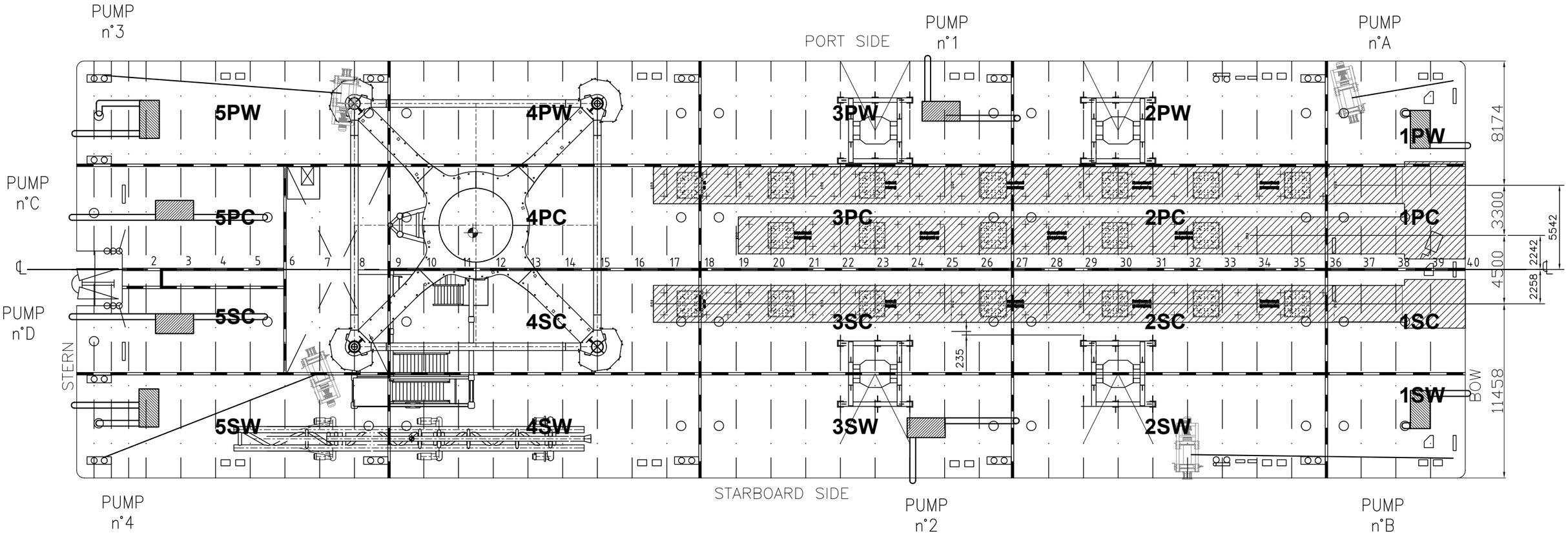
sorge ▬▬ tramonta

Nel grafico è evidenziato il tempo in cui la Luna è visibile nell'arco delle 24 ore. La Luna ed il Sole sono gli astri che principalmente esercitano una attrazione in grado di





PORTABLE BALLAST PUMP TABLE - TP loadout				
PUMP N.	CAPACITY [M3/H]	BARGE TANK	BALLAST ARRANGEMENT	NOTE
1	250	2PW	IN & OUT	LOAD TRANSFER
2	250	2SW	IN & OUT	LOAD TRANSFER
3	250	5PW	IN & OUT	LOAD TRANSFER
4	250	5SW	IN & OUT	LOAD TRANSFER
A	300	3PW	IN & OUT	TIDE
B	300	3SW	IN & OUT	TIDE
C	300	5PC	IN & OUT	TIDE
D	300	5SC	IN & OUT	TIDE



PORTABLE BALLAST PUMP TABLE - BLPH loadout				
PUMP N.	CAPACITY [M3/H]	BARGE TANK	BALLAST ARRANGEMENT	NOTE
1	300	2PW / 3PW	IN & OUT	LOAD TRANSFER
2	300	2SW / 3SW	IN & OUT	LOAD TRANSFER
3	300	5PW	IN & OUT	LOAD TRANSFER
4	300	5SW	IN & OUT	LOAD TRANSFER
A	300	1PW	IN & OUT	TIDE
B	300	1SW	IN & OUT	TIDE
C	300	5PC	IN & OUT	TIDE
D	300	5SC	IN & OUT	TIDE

Base Load Power Hub (BLPH)

APPENDIX O – Ballast Sequence for TP

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Rev.	Date	Description	Prepared	Reviewed	Approved
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Revision / Change Log

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Table of contents

1 INTRODUCTION 6
1.1 PROJECT OVERVIEW 6
1.1.1 Project Location 6
1.1.2 Project Concept 7
2 SCOPE 9
3 REFERENCES 10
3.1 CODES AND STANDARDS 10
3.2 PROJECT DOCUMENTS 10
3.3 SOFTWARE 10
4 TRANSPORTATION ARRANGMENT 11
5 CARGO BARGE 12
5.1 MOSES MODEL 12
5.2 LIGHTSHIP 18
5.3 DOWNFLOODING POINTS 18
5.4 ALLOWABLE LONG. BENDING MOMENT AND SHEAR IN STILL WATER 18
6 LOAD-OUT SIMULATION 19
6.1 LOAD DESCRIPTION 20
6.2 BALLAST WATER MANAGEMENT 23
6.3 LOADOUT SEQUENCE 23
6.4 MOSES OUTPUT SUMMARY 27
6.4.1 Step 0: barge ready for loadout. Barge is with 4.30m draft evenkeel 27
6.4.2 Step 1 28
6.4.3 Step 2 29
6.4.4 Step 3 30
6.4.5 Step 4 31
6.4.6 Step 5 – All axles on board 32
6.4.7 Step 6: Shifting phase. All axles on board. 33
6.4.8 Step 7: Shifting phase. All axles on board. 34

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6.4.9 Step 8: Shifting phase. All axles on board. 35
6.4.10 Step 9: Shifting phase. All axles on board. 36
6.4.11 Step 10: Transversal shifting phase. 37
6.4.12 Step 11: Shifting phase. 38
6.4.13 Step 12: Transversal shifting phase. 39
6.4.14 Step 13: Shifting phase. 40
6.4.15 Step 14: TP in final position 41
6.5 BALLAST CORRECTION FOR TIDE 42
6.5.1 Tide -40cm Phase 0 42
6.5.2 Tide +40cm Phase 0 43
7 BARGE LONGITUDINAL STRUCTURAL CHECKS 45
8 BARGE INTACT STABILITY – COMPLETE MOSES OUTPUT 46
9 BALLASTING SYSTEM CHECKS 122
9.1 BALLAST TANK CAPACITY 122
9.2 BALLAST PUMPING CAPACITY 122

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List of Figures

Figure 1.1 HOLLANDSE KUST NOORD WIND PARK Location Map 6
Figure 1.2 - Wind Park Details 7
Figure 1.3 – BLPH Concept 7
Figure 4.1 – Barge layout 11
Figure 5.1 – Barge MOSES model and ref. system 13
Figure 5.2 – Barge Compartments 16
Figure 6.1 – Grillage arrangement – Top view 19
Figure 6.2 – TP loadout scheme 20
Figure 6.3 – Loads 21
Figure 6.4 – Loadout Phase 0 23
Figure 6.5 – Loadout Phases 24
Figure 6.6 – Ballast plan for tide compensation 42

List of tables

Table 6.1 – Axles loads 22
Table 6.2 – Loadout summary Tables 25
Table 6.3 – Loadout summary Tables - Detailed 26

List of Attachments

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

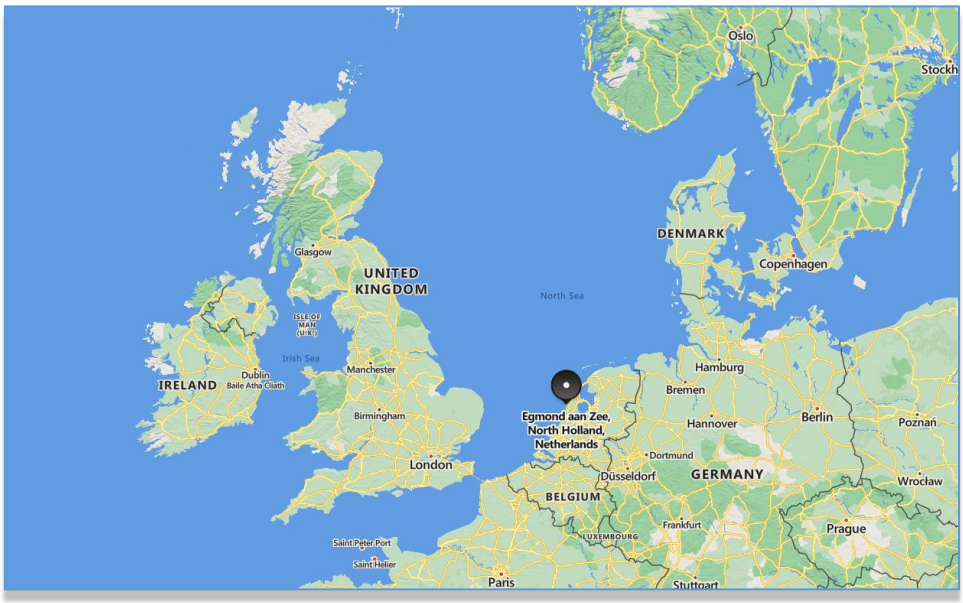


Figure 1.1 HOLLANDSE KUST NOORD WIND PARK Location Map

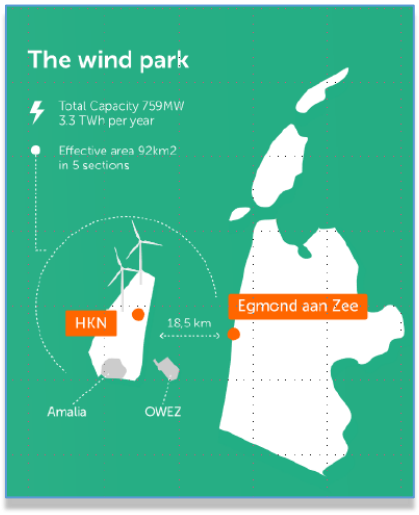


Figure 1.2 - Wind Park Details

The wind farm consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

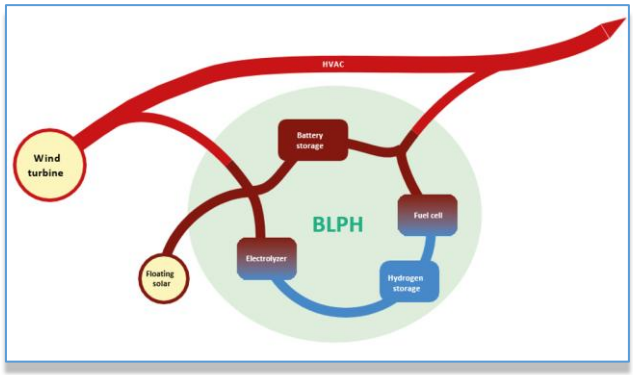


Figure 1.3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH is to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 SCOPE

This report presents the results of the load-out simulation of Transition Piece on board of VERVECE barge.

The selected cargo barge has the following main dimensions:

- Barge Name: Vervece
- LOA: 91.44 m
- Breadth: 27.43 m
- Depth: 6.1 m
- Frame Spacing: 2.286 m

The quay elevation above the mean sea level is 1.75 m.

The operation is planned to be performed the 17th of July 2025; the tide variation shall therefore be -20cm / +30cm.

Normal operation is planned in the rising tide phase. Tide variation shows, for the month of July-August, one deep tide saddle over the 24h. See appendix M.

Load out operation is classified type 2, given the possibility for water level differences due to environmental effects, as per section 10.2.1 of Ref./2/.

The analysis is performed in accordance with the design requirements, criteria and parameters reported in the Structural Design Premises, Ref./4/.

The International System of units (SI) is used in all engineering assessments and calculations.

The hull of the barge and the ballast compartments were modelled using Moses language, Ref./19/.

The Multi-Operational Structural Engineering Simulator (MOSES) offshore engineering software package, developed by Ultramarine Inc., was used to simulate intact stability, and assess the longitudinal strength of the transportation barge during load-out operations.

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3 REFERENCES

3.1 CODES AND STANDARDS

Doc. No.	Description
/1/ API RP 2A-WSD	Recommended practice for planning, designing and constructing fixed offshore platforms – Working stress design – 22nd edition – 2014
/2/ DNV-ST-N001	DNV - Marine operation and marine warranty - 2023

3.2 PROJECT DOCUMENTS

Doc. No.	Description
/3/ 123A90-DDL-MD-RE-01006	Monthly Weight Report
/4/ 123A90-DDL-ST-SP-90017	Structural Design Basis
/5/ 123A90-DDL-ST-SP-90018	Structural Material Specification for Topside & TP
/6/ 123A90-DDL-ST-SP-90118	Structural Material Specification for Flange & Bolts
/7/ 123A90-DDL-ST-TN-90119	Evaluating ISO and DNV approaches
/8/ 123A90-DDL-TI-SP-99014	Specification for TP, Topside and Caissons Transportation and Installation
/9/ 123A90-DDL-ST-RE-90008	TP loadout analysis
/10/ 123A90-DDL-TI-RE-99003	Technical note – validation of TP grillage and SF design on barge Vervece
/11/ 123A90-DDL-TI-RE-99004	TP Gr&SF report
/12/ 123A90-DDL-TI-DD-99036	TP – Upper Grillage plan view
/13/ 123A90-DDL-TI-DD-99037	TP upper grillage sections
/14/ 123A90-DDL-TI-DD-99038	TP upper grillage section and details
/15/ 123A90-DDL-TI-DD-99039	TP – Lower Grillage Assembly
/16/ 123A90-DDL-TI-DD-99040	TP – Lower Grillage – Plan and Section
/17/ 123A90-DDL-TI-RE-99013	TP & CF – Yard Checklist
/18/	Vervece Stability booklet

3.3 SOFTWARE

Doc. No.	Description
/19/ MOSES	Hydrostatic and Hydrodynamic Analysis Software for Offshore Installation and Platform Design– BENTLEY Inc, v.12

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4 TRANSPORTATION ARRANGMENT

The TP will be supported by SPMT installed directly below the upper grillage beams. It is assumed to be located on the barge deck as follows:

- With respect to the barge longitudinal axis an offset of 2416mm towards port side.
- Row 2 is located 18235mm from the barge stern.

The following figure shows the arrangement of the TP structure on the barge.

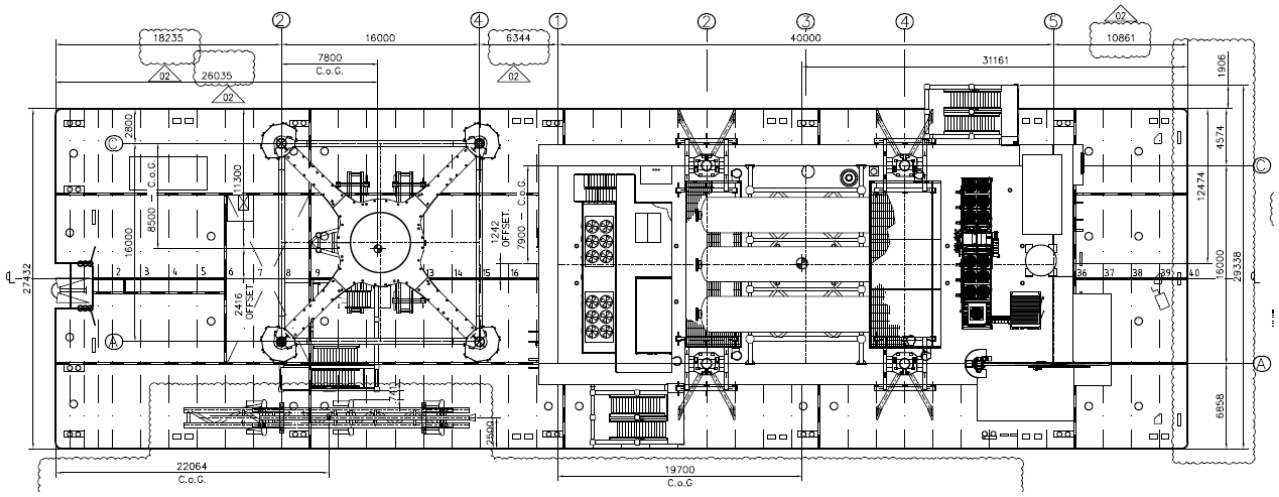


Figure 4.1 – Barge layout

Once the TP is loaded out onto the barge by means of the hydraulic trailers SPMT, it is lowered and it is supported on the 3 rows of the lower grillage beams.

The transportation restraint scheme is finally completed with the seafastenings.

Considering the depth of lower grillage (including shim plates mm), the bottom ends of TP flange is located at elevation +2.65 m above the barge deck.

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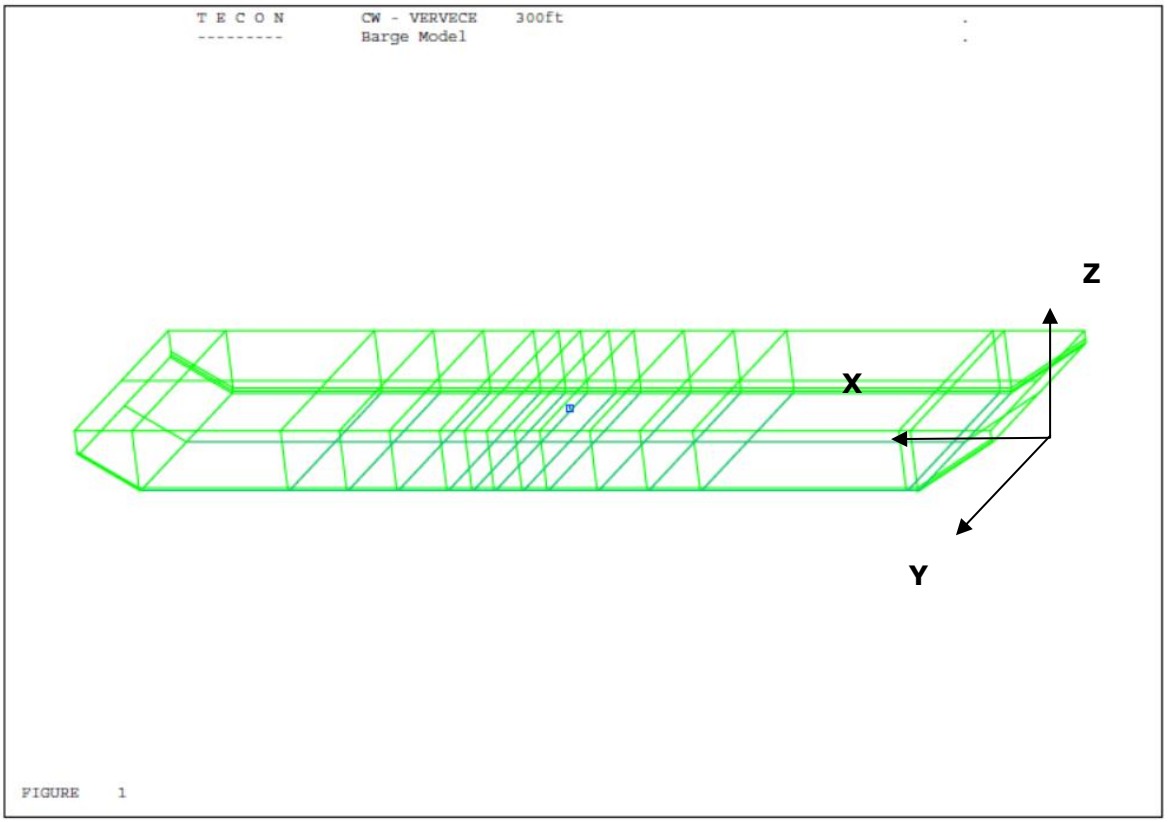
5 CARGO BARGE

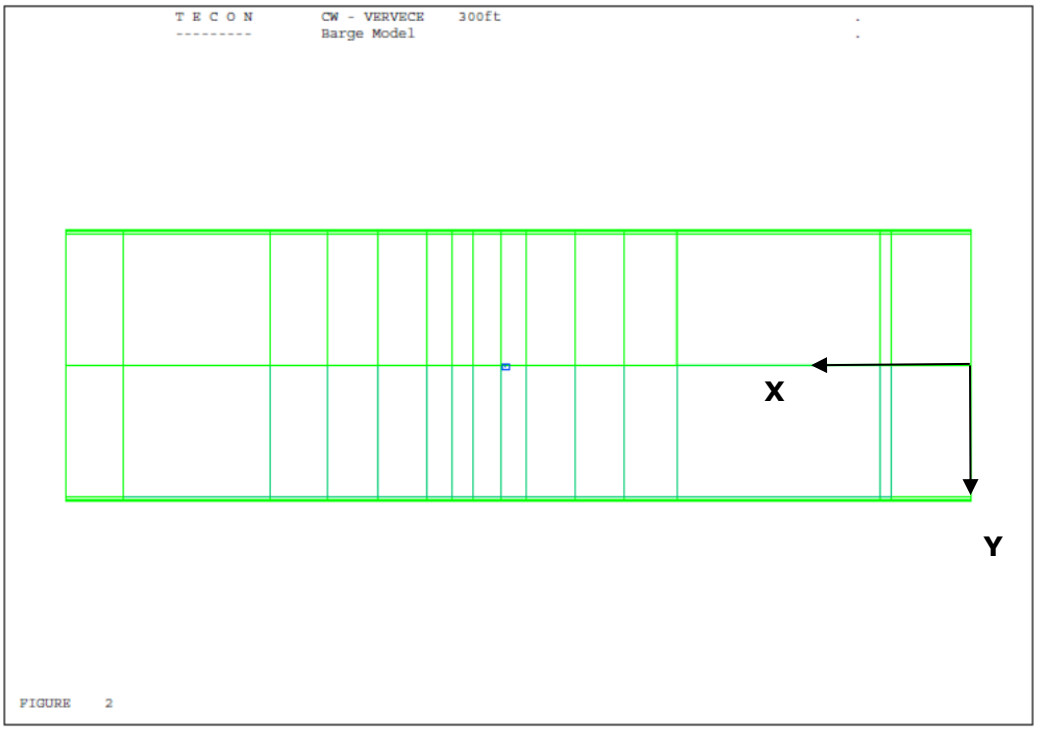
5.1 MOSES MODEL

VERVECE model was set out in MOSES language based on the hull drawings and on the tanks capacities and weight distribution included in the barge documents.

The standard Moses reference system has the origin at the bow of the barge, on the centreline and at keel elevation, the X axis positive from bow to stern, the Y axis positive to starboard and the Z axis positive upwards.

The Moses barge hull model is shown in the following figures:





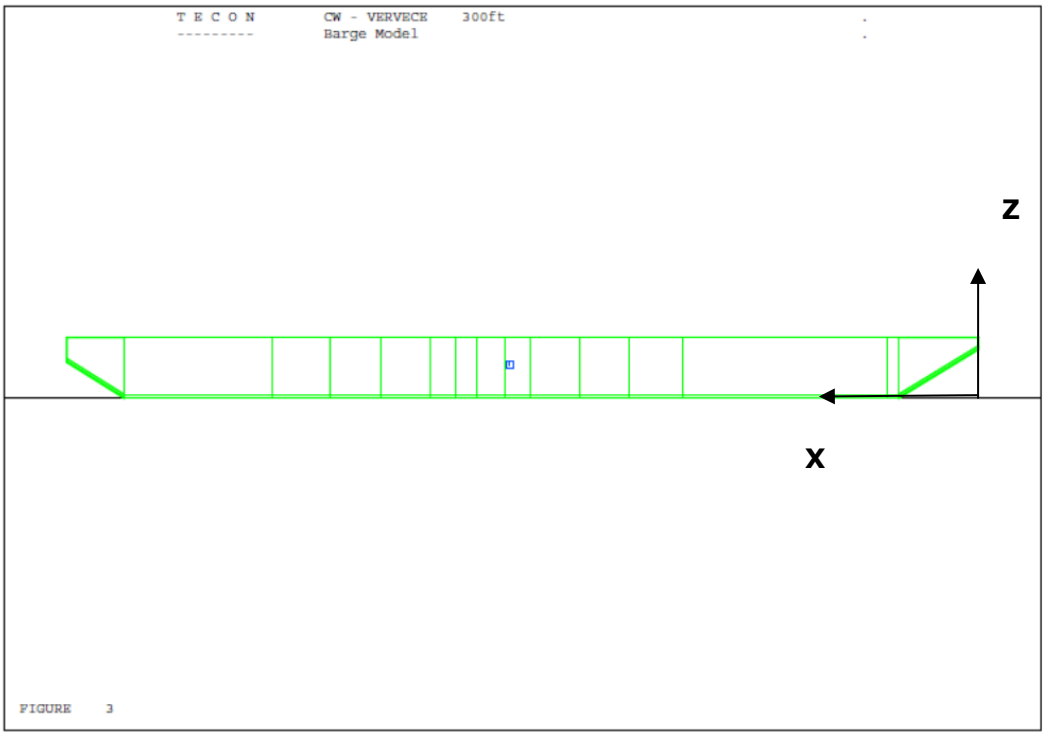


Figure 5.1 – Barge MOSES model and ref. system

The Barge hydrostatic properties are summarised in the following tables.

The density used for sea water is 1.025 t/m3.

```
**********************************************************************************************************
*                                          ***  MOSES   ***                                              *
*                                          ----------------                    25 March, 2025            *
*          T E C O N       CW - VERVECE    300ft                               .                         *
*          ---------       Hydrostatic Curves                                  .                         *
*                                                                                                        *
**********************************************************************************************************

                              +++ H Y D R O S T A T I C   P R O P E R T I E S +++
                              ==================================================

                  Process = DEFAULT: Units = Degrees, Meters, M-Tons, and MPa Unless Stated

                                        Results are in the Body System

                                              For Body VERVECE
```

/--- Condition ---			//- Displac-/	/-- Center Of Buoyancy --/			/ W.P. /	/C. Flotation /		/---- Metacentric Heights ----/			
Draft	Trim	Roll	M-Tons	---X---	---Y---	---Z---	Area	---X---	---Y---	-KMT-	-KML-	-BMT-	-BML-
0.10	0.00	0.00	211.04	46.85	0.00	0.05	2081.674	46.85	0.00	619.45	5128.82	619.40	5128.77
0.20	0.00	0.00	425.67	46.85	-0.00	0.10	2101.925	46.85	-0.00	313.63	2588.77	313.53	2588.67
0.30	0.00	0.00	641.89	46.85	0.00	0.15	2116.956	46.84	0.00	210.82	1743.33	210.67	1743.18
0.40	0.00	0.00	859.65	46.85	0.00	0.20	2132.015	46.84	0.00	159.57	1321.77	159.37	1321.57
0.50	0.00	0.00	1078.63	46.84	-0.00	0.25	2140.752	46.84	0.00	127.79	1066.52	127.54	1066.27
0.60	0.00	0.00	1298.50	46.84	0.00	0.30	2149.490	46.84	0.00	106.68	896.91	106.37	896.61
0.70	0.00	0.00	1519.27	46.84	-0.00	0.35	2158.227	46.83	0.00	91.64	776.06	91.29	775.70
0.80	0.00	0.00	1740.94	46.84	0.00	0.40	2166.965	46.83	0.00	80.39	685.59	79.99	685.19
0.90	0.00	0.00	1963.50	46.84	-0.00	0.45	2175.702	46.83	0.00	71.66	615.36	71.20	614.90
1.00	0.00	0.00	2186.96	46.84	0.00	0.50	2184.439	46.83	0.00	64.69	559.26	64.19	558.75
1.10	0.00	0.00	2411.31	46.84	-0.00	0.56	2193.177	46.83	0.00	59.00	513.42	58.45	512.87
1.20	0.00	0.00	2636.56	46.84	-0.00	0.61	2201.914	46.82	0.00	54.27	475.29	53.67	474.68
1.30	0.00	0.00	2862.70	46.84	-0.00	0.66	2210.652	46.82	0.00	50.28	443.07	49.62	442.41
1.40	0.00	0.00	3089.74	46.83	0.00	0.71	2219.389	46.82	0.00	46.87	415.49	46.16	414.78
1.50	0.00	0.00	3317.68	46.83	0.00	0.76	2228.126	46.82	0.00	43.92	391.62	43.16	390.86
1.60	0.00	0.00	3546.51	46.83	-0.00	0.81	2236.864	46.81	0.00	41.34	370.77	40.53	369.96
1.70	0.00	0.00	3776.23	46.83	-0.00	0.86	2245.601	46.81	0.00	39.07	352.40	38.21	351.54
1.80	0.00	0.00	4006.86	46.83	-0.00	0.91	2254.339	46.81	0.00	37.07	336.10	36.15	335.19
1.90	0.00	0.00	4238.37	46.83	-0.00	0.96	2263.076	46.81	0.00	35.28	321.54	34.31	320.58
2.00	0.00	0.00	4470.79	46.83	0.00	1.01	2271.813	46.81	0.00	33.67	308.46	32.65	307.45
2.10	0.00	0.00	4704.09	46.83	0.00	1.07	2280.551	46.80	0.00	32.22	296.65	31.15	295.58
2.20	0.00	0.00	4938.30	46.83	0.00	1.12	2289.288	46.80	0.00	30.91	285.93	29.79	284.81
2.30	0.00	0.00	5173.40	46.82	0.00	1.17	2298.026	46.80	0.00	29.71	276.17	28.54	275.00
2.40	0.00	0.00	5409.40	46.82	-0.00	1.22	2306.763	46.80	0.00	28.62	267.23	27.40	266.01
2.50	0.00	0.00	5646.29	46.82	-0.00	1.27	2315.500	46.79	0.00	27.63	259.03	26.35	257.76
2.60	0.00	0.00	5884.07	46.82	0.00	1.32	2324.238	46.79	0.00	26.71	251.48	25.38	250.15
2.70	0.00	0.00	6122.75	46.82	-0.00	1.38	2332.975	46.79	0.00	25.86	244.50	24.49	243.12
2.80	0.00	0.00	6362.33	46.82	0.00	1.43	2341.713	46.79	0.00	25.08	238.03	23.65	236.60
2.90	0.00	0.00	6602.80	46.82	0.00	1.48	2350.450	46.79	0.00	24.35	232.03	22.88	230.55
3.00	0.00	0.00	6844.17	46.82	0.00	1.53	2359.188	46.78	0.00	23.68	226.44	22.15	224.91
3.10	0.00	0.00	7086.44	46.81	0.00	1.58	2367.925	46.78	0.00	23.06	221.22	21.47	219.64
3.20	0.00	0.00	7329.60	46.81	0.00	1.63	2376.663	46.78	-0.00	22.47	216.35	20.84	214.71
3.30	0.00	0.00	7573.65	46.81	0.00	1.69	2385.400	46.78	0.00	21.93	211.78	20.24	210.10
3.40	0.00	0.00	7818.61	46.81	-0.00	1.74	2394.138	46.77	0.00	21.42	207.50	19.68	205.76
3.50	0.00	0.00	8064.45	46.81	0.00	1.79	2402.875	46.77	-0.00	20.94	203.47	19.15	201.68
3.60	0.00	0.00	8311.19	46.81	0.00	1.84	2411.444	46.77	-0.00	20.49	199.63	18.65	197.79
3.70	0.00	0.00	8558.60	46.81	0.00	1.90	2415.958	46.69	-0.00	20.04	195.05	18.14	193.15
3.80	0.00	0.00	8806.47	46.80	0.00	1.95	2420.419	46.61	-0.00	19.61	190.71	17.66	188.76
3.90	0.00	0.00	9054.78	46.80	0.00	2.00	2424.867	46.52	-0.00	19.21	186.60	17.21	184.60
4.00	0.00	0.00	9303.56	46.79	0.00	2.05	2429.302	46.44	-0.00	18.83	182.70	16.78	180.65
4.10	0.00	0.00	9552.79	46.78	-0.00	2.10	2433.730	46.36	0.00	18.48	179.00	16.37	176.90
4.20	0.00	0.00	9802.47	46.77	-0.00	2.16	2438.159	46.28	0.00	18.14	175.49	15.99	173.34
4.30	0.00	0.00	10052.61	46.75	0.00	2.21	2442.588	46.20	-0.00	17.82	172.15	15.62	169.95
4.40	0.00	0.00	10303.21	46.74	0.00	2.26	2447.017	46.11	0.00	17.52	168.98	15.26	166.72
4.50	0.00	0.00	10554.25	46.72	-0.00	2.31	2451.446	46.03	-0.00	17.24	165.95	14.93	163.64
4.60	0.00	0.00	10805.76	46.70	-0.00	2.36	2455.874	45.95	-0.00	16.97	163.06	14.61	160.69
4.70	0.00	0.00	11057.71	46.69	-0.00	2.42	2460.303	45.87	-0.00	16.72	160.30	14.30	157.88
4.80	0.00	0.00	11310.12	46.67	0.00	2.47	2464.732	45.79	-0.00	16.47	157.66	14.01	155.20
4.90	0.00	0.00	11562.96	46.65	0.00	2.52	2468.126	45.72	-0.00	16.24	154.95	13.72	152.43
5.00	0.00	0.00	11815.95	46.63	-0.00	2.57	2468.198	45.72	-0.00	16.00	151.75	13.43	149.18
5.10	0.00	0.00	12068.95	46.61	0.00	2.62	2468.228	45.72	-0.00	15.77	148.68	13.15	146.06
5.20	0.00	0.00	12321.94	46.59	-0.00	2.68	2468.245	45.72	0.00	15.55	145.74	12.88	143.06
5.30	0.00	0.00	12574.93	46.57	-0.00	2.73	2468.249	45.72	-0.00	15.34	142.91	12.62	140.18
5.40	0.00	0.00	12827.93	46.56	0.00	2.78	2468.249	45.72	-0.00	15.15	140.20	12.37	137.42
5.50	0.00	0.00	13080.93	46.54	0.00	2.83	2468.249	45.72	-0.00	14.96	137.59	12.13	134.76
5.60	0.00	0.00	13333.92	46.52	-0.00	2.88	2468.249	45.72	-0.00	14.78	135.09	11.90	132.20
5.70	0.00	0.00	13586.92	46.51	-0.00	2.93	2468.249	45.72	-0.00	14.61	132.68	11.68	129.74
5.80	0.00	0.00	13839.91	46.49	-0.00	2.99	2468.249	45.72	-0.00	14.45	130.36	11.46	127.37

5.90	0.00	0.00	14092.91	46.48	0.00	3.04	2468.249	45.72	-0.00	14.30	128.12	11.26	125.08
6.00	0.00	0.00	14345.91	46.47	-0.00	3.09	2468.249	45.72	-0.00	14.15	125.97	11.06	122.88

+++ H Y D R O S T A T I C C O E F F I C I E N T S +++

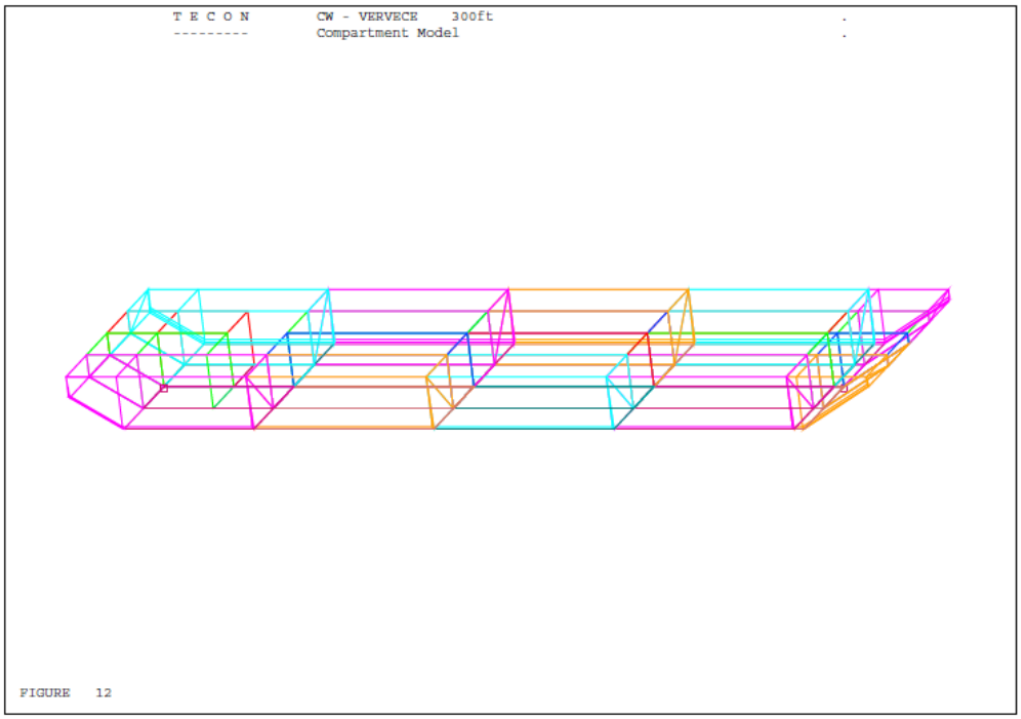
Process = DEFAULT: Units = Degrees, Meters, M-Tons, and MPa Unless Stated

Results are in the Body System

For Body VERVECE

/--- Condition ---/			Displacement	Wetted Surface	Load To Change Draft 1 MM	/--- For KG = KB ----/ Moment To Change .01 Deg	
Draft	Trim	Roll				--- Heel ---	--- Trim ---
0.10	0.00	0.00	211.04	2120.1	2.13	22.81	188.91
0.20	0.00	0.00	425.67	2151.4	2.15	23.29	192.32
0.30	0.00	0.00	641.89	2178.7	2.17	23.60	195.29
0.40	0.00	0.00	859.65	2206.1	2.19	23.91	198.28
0.50	0.00	0.00	1078.63	2232.2	2.19	24.01	200.73
0.60	0.00	0.00	1298.50	2258.4	2.20	24.11	203.20
0.70	0.00	0.00	1519.27	2284.7	2.21	24.21	205.69
0.80	0.00	0.00	1740.94	2311.0	2.22	24.30	208.20
0.90	0.00	0.00	1963.50	2337.4	2.23	24.40	210.72
1.00	0.00	0.00	2186.96	2363.9	2.24	24.50	213.27
1.10	0.00	0.00	2411.31	2390.4	2.25	24.60	215.84
1.20	0.00	0.00	2636.56	2417.0	2.26	24.70	218.43
1.30	0.00	0.00	2862.70	2443.6	2.27	24.79	221.04
1.40	0.00	0.00	3089.74	2470.3	2.27	24.89	223.67
1.50	0.00	0.00	3317.68	2497.1	2.28	24.99	226.33
1.60	0.00	0.00	3546.51	2524.0	2.29	25.09	229.00
1.70	0.00	0.00	3776.23	2550.9	2.30	25.19	231.69
1.80	0.00	0.00	4006.86	2577.9	2.31	25.28	234.41
1.90	0.00	0.00	4238.37	2604.9	2.32	25.38	237.15
2.00	0.00	0.00	4470.79	2632.0	2.33	25.48	239.90
2.10	0.00	0.00	4704.09	2659.2	2.34	25.58	242.68
2.20	0.00	0.00	4938.30	2686.4	2.35	25.68	245.48
2.30	0.00	0.00	5173.40	2713.7	2.36	25.77	248.30
2.40	0.00	0.00	5409.40	2741.1	2.36	25.87	251.15
2.50	0.00	0.00	5646.29	2768.5	2.37	25.97	254.01
2.60	0.00	0.00	5884.07	2796.0	2.38	26.07	256.90
2.70	0.00	0.00	6122.75	2823.6	2.39	26.17	259.80
2.80	0.00	0.00	6362.33	2851.2	2.40	26.26	262.73
2.90	0.00	0.00	6602.80	2878.9	2.41	26.36	265.69
3.00	0.00	0.00	6844.17	2906.7	2.42	26.46	268.66
3.10	0.00	0.00	7086.44	2934.5	2.43	26.56	271.66
3.20	0.00	0.00	7329.60	2962.4	2.44	26.66	274.67
3.30	0.00	0.00	7573.65	2990.3	2.45	26.75	277.71
3.40	0.00	0.00	7818.61	3018.4	2.45	26.85	280.78
3.50	0.00	0.00	8064.45	3046.4	2.46	26.95	283.86
3.60	0.00	0.00	8311.19	3074.5	2.47	27.05	286.91
3.70	0.00	0.00	8558.60	3100.3	2.48	27.10	288.53
3.80	0.00	0.00	8806.47	3126.2	2.48	27.15	290.13
3.90	0.00	0.00	9054.78	3152.1	2.49	27.20	291.73
4.00	0.00	0.00	9303.56	3178.0	2.49	27.25	293.33
4.10	0.00	0.00	9552.79	3204.0	2.49	27.30	294.94
4.20	0.00	0.00	9802.47	3230.0	2.50	27.35	296.55
4.30	0.00	0.00	10052.61	3256.0	2.50	27.40	298.17
4.40	0.00	0.00	10303.21	3282.0	2.51	27.45	299.80
4.50	0.00	0.00	10554.25	3308.1	2.51	27.50	301.43
4.60	0.00	0.00	10805.76	3334.3	2.52	27.55	303.06
4.70	0.00	0.00	11057.71	3360.4	2.52	27.60	304.71
4.80	0.00	0.00	11310.12	3386.6	2.53	27.65	306.35
4.90	0.00	0.00	11562.96	3412.3	2.53	27.69	307.62
5.00	0.00	0.00	11815.95	3436.0	2.53	27.69	307.65
5.10	0.00	0.00	12068.95	3459.8	2.53	27.69	307.66
5.20	0.00	0.00	12321.94	3483.6	2.53	27.69	307.67
5.30	0.00	0.00	12574.93	3507.3	2.53	27.69	307.67
5.40	0.00	0.00	12827.93	3531.1	2.53	27.69	307.67
5.50	0.00	0.00	13080.93	3554.9	2.53	27.69	307.67
5.60	0.00	0.00	13333.92	3578.7	2.53	27.69	307.67
5.70	0.00	0.00	13586.92	3602.4	2.53	27.69	307.67
5.80	0.00	0.00	13839.91	3626.2	2.53	27.69	307.67
5.90	0.00	0.00	14092.91	3650.0	2.53	27.69	307.67
6.00	0.00	0.00	14345.91	3673.8	2.53	27.69	307.67

The modelled compartment codes are shown in the following figure



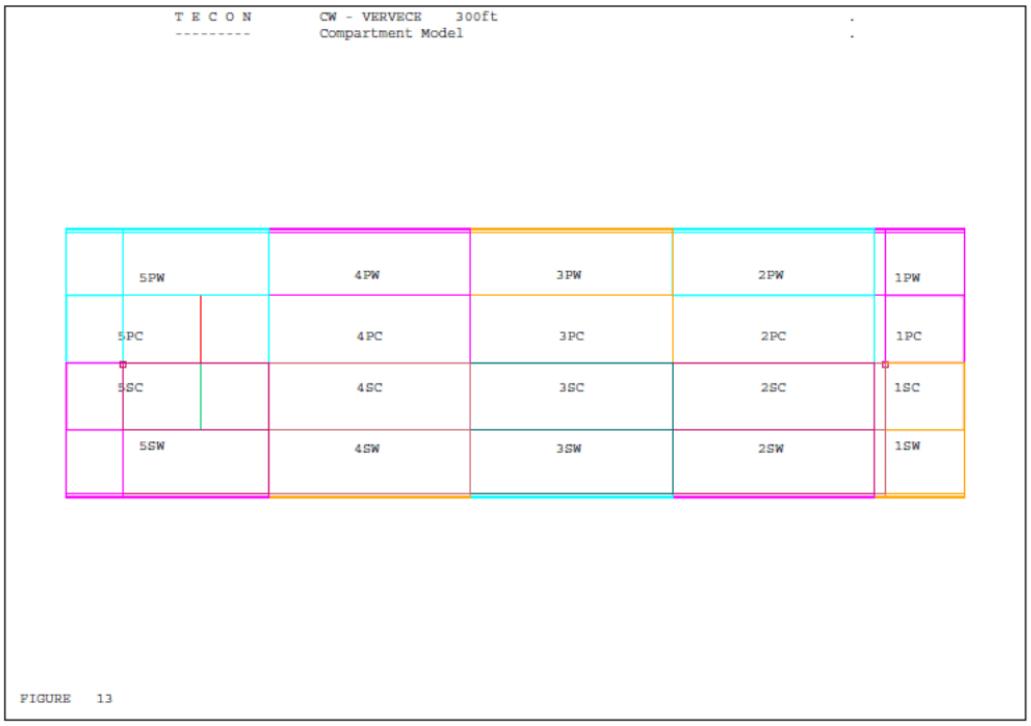


Figure 5.2 – Barge Compartments

The capacity plan for ballast compartments is presented in the Moses output.

The density used for ballast water is 1.025 t/m3 (same of sea water).

```
*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*          T E C O N       CW - VERVECE    300ft                                    .                          *
*          ---------       Capacity Plan                                            .                          *
*****************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ======================================================================
                Process = DEFAULT: Units = Degrees, Meters, M-Tons, and MPa Unless Stated

                                  Results Are Reported In Body System

                        Draft =     0.00 Roll Angle =     0.00 Pitch Angle =     0.00

                                     Wet Radii Of Gyration About CG

                                K-X =     7.95 K-Y =    24.53 K-Z =    25.56

                                          /-- Center of Gravity ---/  Sounding   % Full
                        Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                        ----------------  Part VERVECE    ------------
                        LOAD_GRO   1832.80    47.02     0.00     3.52
                        --- Contents ---
                        1PC         234.61     5.60    -3.43     3.81     6.10   100.00
                        1PW         234.98     5.60   -10.28     3.82     6.10   100.00
                        1SC         235.12     5.60     3.43     3.81     6.10   100.00
                        1SW         234.98     5.60    10.28     3.82     6.10   100.00
                        2PC         873.69    19.43    -3.43     3.05     6.10   100.00
                        2PW         873.63    19.43   -10.28     3.05     6.10   100.00
                        2SC         873.69    19.43     3.43     3.05     6.10   100.00
                        2SW         873.63    19.43    10.28     3.05     6.10   100.00
                        3PC         873.69    40.01    -3.43     3.05     6.10   100.00
                        3PW         873.63    40.00   -10.28     3.05     6.10   100.00
                        3SC         873.69    40.01     3.43     3.05     6.10   100.00
                        3SW         873.63    40.01    10.28     3.05     6.10   100.00
                        4PC         873.69    60.58    -3.43     3.05     6.10   100.00
                        4PW         873.63    60.58   -10.28     3.05     6.10   100.00
                        4SC         873.69    60.58     3.43     3.05     6.10   100.00
                        4SW         873.63    60.58    10.28     3.05     6.10   100.00
                        5PC         492.02    83.89    -3.43     3.31     6.10   100.00
                        5PW         793.58    80.40   -10.28     3.22     6.10   100.00
                        5SC         484.29    83.89     3.43     3.31     6.10   100.00
                        5SW         793.58    80.40    10.28     3.22     6.10   100.00
                        ========  ========  =======  =======  =======
                        Total     15819.89    45.53    -0.00     3.18
                        Buoyancy      0.00     0.00     0.00     0.00

                             +++ C O M P A R T M E N T   P R O P E R T I E S +++
                             ===================================================
                                       Results Are Reported In Body System

                            Process = DEFAULT: Units = Degrees, Meters, M-Tons, and MPa Unless Stated

                                      Fill   Specific /--- Ballast ---/ /------ % Full --------/ Sounding
                             Name     Type    Gravity  Maximum  Current   Max.    Min.    Curr.  --------

                            1PC     CORRECT     1.0250    234.6    234.6  100.00    0.00  100.00     6.096
                            1PW     CORRECT     1.0250    235.0    235.0  100.00    0.00  100.00     6.096
                            1SC     CORRECT     1.0250    235.1    235.1  100.00    0.00  100.00     6.096
                            1SW     CORRECT     1.0250    235.0    235.0  100.00    0.00  100.00     6.096
                            2PC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                            2PW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                            2SC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                            2SW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                            3PC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                            3PW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                            3SC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                            3SW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                            4PC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                            4PW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                            4SC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                            4SW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                            5PC     CORRECT     1.0250    492.0    492.0  100.00    0.00  100.00     6.096
                            5PW     CORRECT     1.0250    793.6    793.6  100.00    0.00  100.00     6.096
                            5SC     CORRECT     1.0250    484.3    484.3  100.00    0.00  100.00     6.096
                            5SW     CORRECT     1.0250    793.6    793.6  100.00    0.00  100.00     6.096
```

5.2 LIGHTSHIP

As indicated in the barge Stability booklet the barge has the following properties:

- Lightweight = 1833 t
- LCG = 44.42 m
- VCG = 3.524 m
- TCG = 0.0 m

5.3 DOWNFLOODING POINTS

Down flooding points have been modelled at barge edges and at deck elevation+600mm, Ref./18/.

Following FloodingPoints are included in the calculations:

No.	Type	Fr.AP(M)	Fr.CL(M)	Ab/BASE(M)	Description
1	3	90.000	-13.000	6.700	Ventilator, Tk. 1 PW
2	3	90.000	13.000	6.700	Ventilator, Tk. 1 SW
3	3	1.000	-13.000	6.700	Ventilator, Tk. 5 PW
4	3	1.000	13.000	6.700	Ventilator, TK. 5 SW

5.4 ALLOWABLE LONG. BENDING MOMENT AND SHEAR IN STILL WATER

Section 13 of Ref./18/, indicates the following values of bending moment and shear in still water:

	Max B.M.	W
Hogging	26700 tm	3.24 m3
Sagging	26130 tm	3.24 m3
Max shear midship	6150 ton	

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6 LOAD-OUT SIMULATION

The load-out was fully simulated using the software MOSES. The TP grillage layout on Vervece barge is shown below. Pre installed items on barge in final position are:

- CF and its grillage
- BLPH lower grillage
- TP lower grillage.

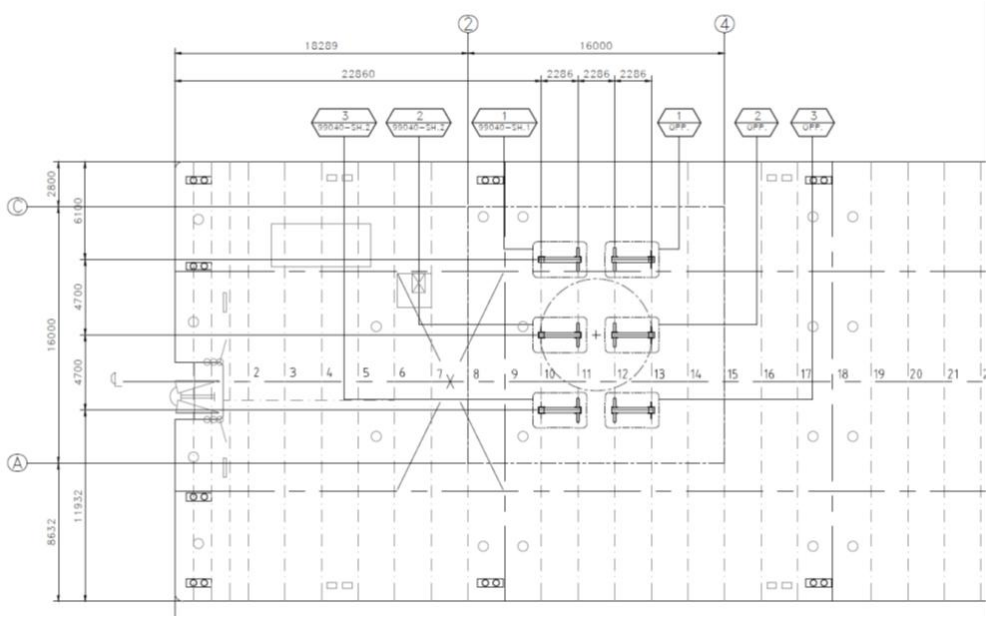


Figure 6.1 – Grillage arrangement – Top view

The operation was divided into 14 steps plus the initial step 0 that shows the initial ballast pattern. In recognition of the physical limitations of the ballasting system, the following criteria have been applied in the load-out analyses:

- At 3% volume ballast tanks are considered empty.
- at 98% volume ballast tanks are considered full.

The load-out simulation was performed according to the following premises:

Load-out date: 17th of July 2025

Starting hour: 8:00 AM

Trailer speed: 9 to 20 m / hour

6.1 LOAD DESCRIPTION

The SPMT drawing, Ref. Appendix H, shows all data for the load-out on board of the cargo barge.

The following figures show parts of the above-mentioned drawing.

CoG position is taken from ref. /3/, according to the last issued WCR revision, TP has the following CoG and weight position relevant to loadout condition:

- Loadout expected weight 361.5 ton (-55.5 ton compared with WCR) including SPMTs;
  TP weighed weight +3% cont. = 254.5 ton
  SPMTs and spacers = 99+8 ton
- X_G = 19.663 m;
- Y_G = 8.774 m;
- Z_G = 20.10 m.

TP loadout scheme with CoG position is shown in the next figure.

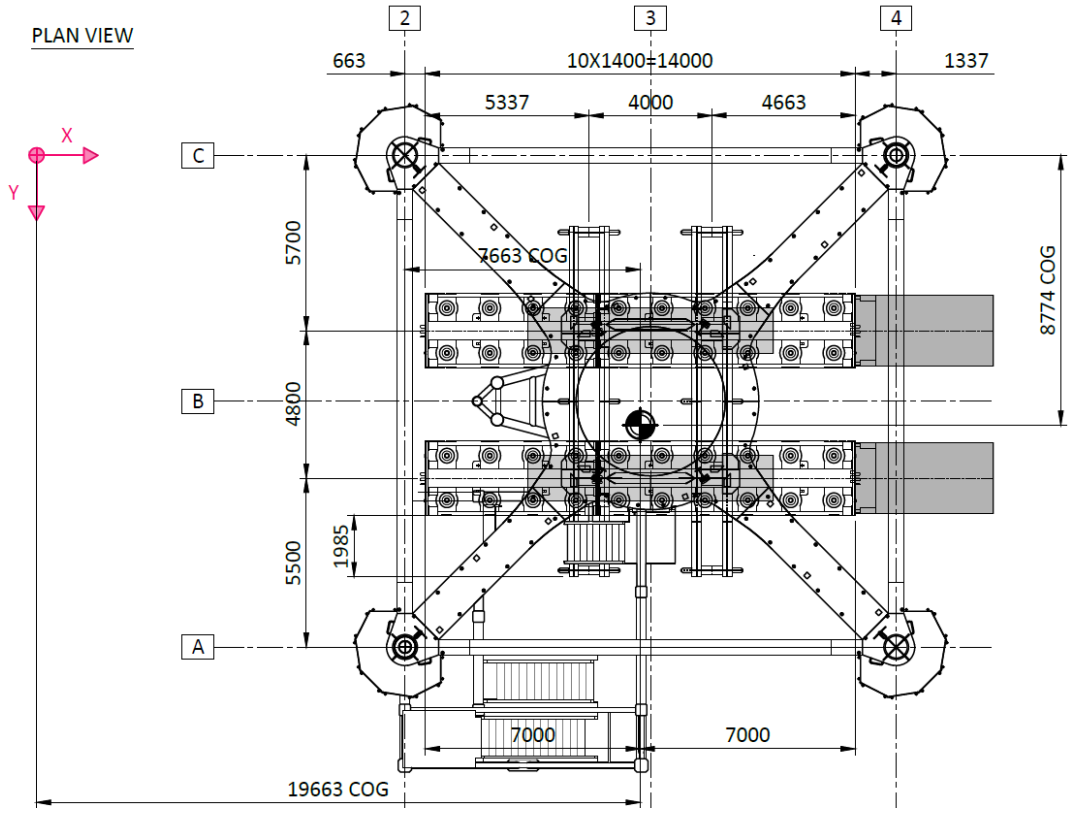


Figure 6.2 – TP loadout scheme

Note: ballast plan is prepared according to WCR having, the weighing operation, confirmed the CoG position and the final weight.

Lower Grillage weight, CF and its grillage and SF and BLPH grillage were all applied as external loads to the barge model.

- TP LOW-GRIL WEIGHT = 45 t
- BLPH GRILLAGE WEIGHT = 75 t
- CF WEIGHT = 28 t
- CF GRILLAGE WEIGHT = 0.5 t

TRANSPORT CONFIGURATION: 20 AXLES			
ITEM weight (contingency included)			**310 t**
SPMT dead weight			99 t
EQUIPMENT weight			8 t
TOTAL weight			417 t
		BASE VALUES	**MAX VALUES**
Group A 6 AXLES	Weight per axles	26,7 t	33,5 t
	Capacity per axles	36,0 t	36,0 t
	Cylinder pressure	183 bar	233 bar
	Contact pressure under the wheel	8,3 kg/cm^2	9,1 kg/cm^2
	Average Ground pressure	7,8 t/m^2	9,8 t/m^2
Group B 6 AXLES	Weight per axles	21,2 t	27,7 t
	Capacity per axles	36,0 t	36,0 t
	Cylinder pressure	143 bar	190 bar
	Contact pressure under the wheel	7,4 kg/cm^2	8,4 kg/cm^2
	Average Ground pressure	6,2 t/m^2	8,1 t/m^2
Group C-D 8 AXLES (1 Hidden Axles)	Weight per axles	18,5 t	22,0 t
	Capacity per axles	36,0 t	36,0 t
	Cylinder pressure	124 bar	149 bar
	Contact pressure under the wheel	6,9 kg/cm^2	7,6 kg/cm^2
	Average Ground pressure	5,5 t/m^2	6,5 t/m^2

Figure 6.3 – Loads

For load out simulation the loads have been described as a set of concentrated forces, one per each trailer axle, i.e. at 1.4m interval. The following tables report the complete set of loads applied, with ref to the above fig. 6.2.

LoadNam	Weight	Xw	Yw	Zw
GA-1-01	26.70	0.000	2.258	1.000
GA-1-02	26.70	1.400	2.258	1.000
GA-1-03	26.70	2.800	2.258	1.000
GA-1-04	26.70	4.200	2.258	1.000
GA-1-05	26.70	5.600	2.258	1.000
GA-1-06	13.35	7.000	2.983	1.000
GA-1-07	13.35	8.400	2.983	1.000
GB-1-01	21.20	0.000	-2.542	1.000
GB-1-02	21.20	1.400	-2.542	1.000
GB-1-03	21.20	2.800	-2.542	1.000
GB-1-04	21.20	4.200	-2.542	1.000
GB-1-05	21.20	5.600	-2.542	1.000
GB-1-06	10.60	7.000	-3.267	1.000
GB-1-07	10.60	8.400	-3.267	1.000
GC-1-01	9.25	7.000	-1.817	1.000
GC-1-02	9.25	8.400	-1.817	1.000
GC-1-04	18.50	11.200	-2.542	1.000
GC-1-05	18.50	12.600	-2.542	1.000
GC-2-01	9.25	7.000	1.533	1.000
GC-2-02	9.25	8.400	1.533	1.000
GC-2-03	18.50	9.800	2.258	1.000
GC-2-04	18.50	11.200	2.258	1.000
GC-2-05	18.50	12.600	2.258	1.000

Table 6.1 – Axles loads

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6.2 BALLAST WATER MANAGEMENT

Barge is equipped with an internal ballast management system; therefore, water can be both moved to other tanks or discharged to the sea.

6.3 LOADOUT SEQUENCE

The above-described operation sequence was divided into the following steps:

Step 0 Barge ready for starting load-out of the TP from the bow. The ballast pattern is selected in order of having the barge deck at the same elevation as the quay.

Barge is with 4.30m draft even keel

VERVECE - BALLAST PLAN - load-out TP - Ph.0 - Draft = 4.30m evenkeel

STERN						BOW
	74.0% **5PW** u=1.45m		50% **4PW** u=3.0m	50% **3PW**	50% **2PW** u=3.0m	90% **1PW** u=0.40m
	50% **5PC** u=3.0m		full **4PC**	30% **3PC** u=4.30m	50% **2PC** u=3.0m	full **1PC**
	50% **5SC** u=3.0m		full **4SC**	30% **3SC** u=4.30m	50% **2SC** u=3.0m	full **1SC**
	73.5% **5SW** u=1.45m		50% **4SW** u=3.0m	50% **3SW**	50% **2SW** u=3.0m	90% **1SW** u=0.40m

Figure 6.4 – Loadout Phase 0

Step 1 The first 2 axles of group A and B enter the barge bow.

Step 2 Trailers advance 2.80 m: next 2+2 axles of trailers of group A and B on board. Total axles on board: 6.

Step 3 Trailers advance 2.80 m: next 2+2 axles of trailers of group A and B on board. Total axles on board: 10.

Step 4 Trailers advance 2.80 m: next 1 axle of trailers of group A and 1 axle of group B and first axles of trailers of group C/D on board. Total axles on board: 14.

Step 5 Trailers advance 4.2 m: all groups on board.

Step 6 Trailers advance 9 m

Step 7 Trailers advance 9 m

Step 8 Trailers advance 9 m

Step 9 Trailers advance 9 m

Step 10 Trailers shift toward PS

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Step 11 Trailers advance 7 m

Step 12 Trailers shift toward PS for final alignment with grillage

Step 13 Trailers advance 8 m

Step 14 Trailers advance 8.57m. TP reaches the transport position.

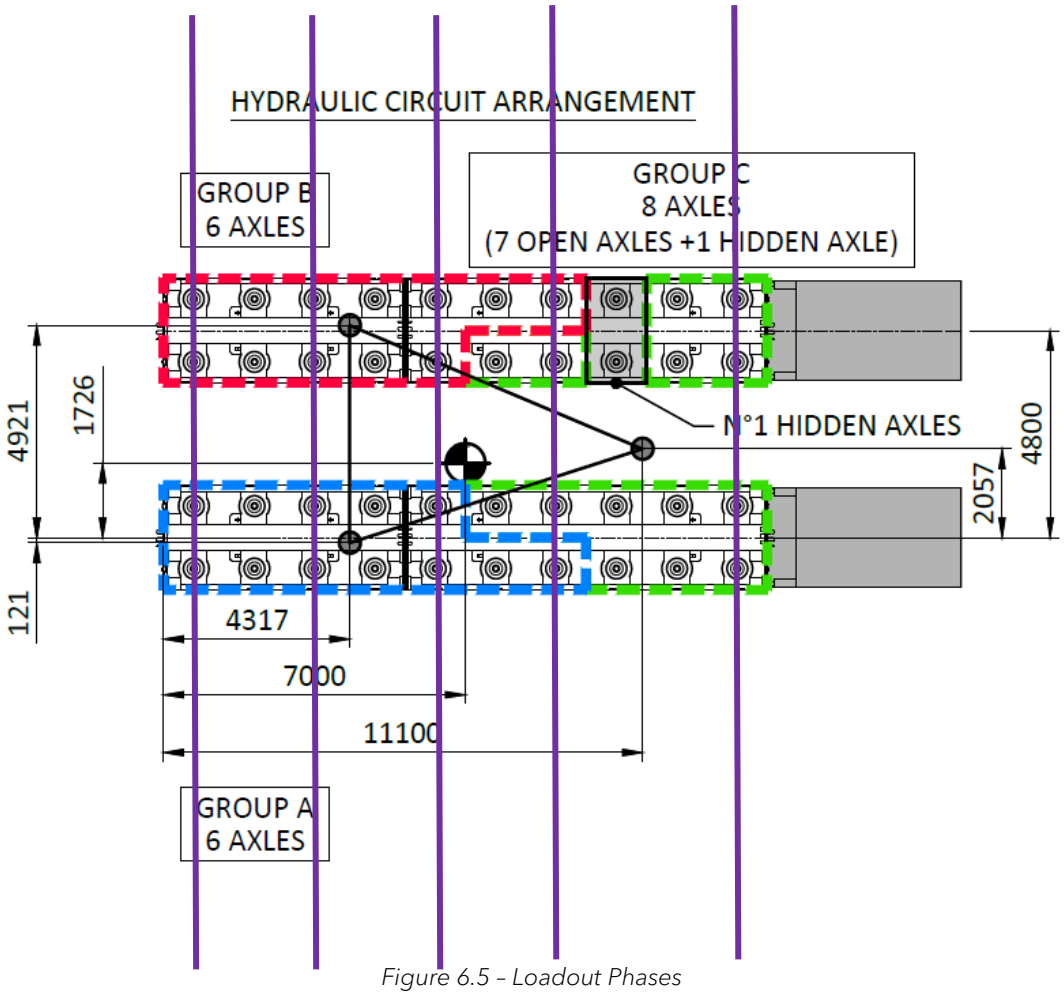


Figure 6.5 – Loadout Phases

The here below tables summarize the ballast variations.

TECON CW TP LOADOUT ON VERVECE

BALLASTING SUMMARY

STEP	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	MAX.	MIN.
TRAVEL DISTANCE [m]	0	3.01	5.81	8.61	11.41	15.61	24.61	33.61	42.61	51.61	51.61	58.61	58.61	66.61	75.18		
WEIGHT ON BARGE [t]	0	48	144	240	324	417	417	417	417	417	417	417	417	417	417		
VERVECE BARGE DATA:																	
Displacement [t]	10053	10053	10053	10053	10053	10053	10053	10053	10053	10053	10053	10053	10053	10053	10053		
Draft at Bow[m]	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3		
Draft at Stern[m]	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3		
Pitch Angle [deg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Roll Angle [deg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
GMT (m)	14.4	14.38	14.33	14.27	14.22	14.17	14.19	14.21	14.23	14.24	14.24	14.25	14.25	14.25	14.26		
ACTIVE TANKS BALLAST WEIGHT [t]																MAX.	MIN.
2PW	428	396	335	277	227	179	210	240	270	300	286	310	295	323	351	428	179
2SW	423	392	330	271	221	171	202	232	263	293	307	331	345	372	401	423	171
5PW	574	581	595	607	614	618	587	556	526	496	482	458	444	417	388	618	388
5SW	569	577	590	601	608	610	579	549	518	488	503	478	493	466	437	610	437
ACTIVE TANKS SOUNDING [m]																MAX.	MIN.
2PW	3.06	2.84	2.4	1.98	1.63	1.28	1.5	1.72	1.94	2.15	2.05	2.22	2.12	2.31	2.52	3.06	1.28
2SW	3.03	2.81	2.36	1.94	1.58	1.23	1.45	1.67	1.88	2.1	2.2	2.37	2.47	2.66	2.87	3.03	1.23
5PW	4.65	4.7	4.8	4.89	4.94	4.97	4.74	4.52	4.3	4.09	3.99	3.81	3.71	3.52	3.3	4.97	3.30
5SW	4.62	4.67	4.77	4.84	4.9	4.91	4.69	4.47	4.25	4.03	4.14	3.96	4.07	3.87	3.66	4.91	3.66
ACTIVE TANKS ULLAGE [m]																MAX.	MIN.
2PW	3.03	3.26	3.69	4.11	4.47	4.81	4.59	4.37	4.16	3.94	4.05	3.87	3.98	3.79	3.58	4.81	3.03
2SW	3.06	3.29	3.73	4.16	4.51	4.87	4.65	4.43	4.21	4	3.9	3.73	3.63	3.43	3.23	4.87	3.06
5PW	1.45	1.39	1.29	1.21	1.15	1.13	1.35	1.57	1.79	2.01	2.11	2.28	2.38	2.58	2.79	2.79	1.13
5SW	1.48	1.43	1.33	1.25	1.2	1.19	1.41	1.63	1.85	2.06	1.96	2.13	2.03	2.22	2.43	2.43	1.19
BALLAST OPERATION (ballast variation) [t]																TOTAL VARIATION [t]	
2PW		-31	-61	-59	-50	-48	31	30	30	30	-14	24	-15	27	29	479	
2SW		-32	-62	-59	-50	-50	31	30	30	30	14	24	14	27	29	462	
5PW		8	14	12	8	3	-31	-30	-30	-30	-14	-24	-14	-27	-29	274	
5SW		7	13	11	7	2	-31	-30	-30	-30	14	-24	15	-27	-29	270	
BALLAST OPERATION (Pump Capacity)[m^3/h]																MAX.	MIN.
2PW		-186	-244	-236	-300	-288	186	180	180	180	-84	144	-90	162	174	186	-300
2SW		-192	-248	-236	-300	-300	186	180	180	180	84	144	84	162	174	186	-300
5PW		48	56	48	48	18	-186	-180	-180	-180	-84	-144	-84	-162	-174	56	-186
5SW		42	52	44	42	12	-186	-180	-180	-180	84	-144	90	-162	-174	90	-186
time (min.)	0	10'	15'	15'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	10'	150'	-

Table 6.2 – Loadout summary Tables

From the above table the total amount of moved water is 417 t (same of WCR).

Weight ballast (t)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Barge draft [m]	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
2PW	396	335	277	227	179	210	240	270	300	286	310	295	323	351
2SW	392	330	271	221	171	202	232	263	293	307	331	345	372	401
5PW	581	595	607	614	618	587	556	526	496	482	458	444	417	388
5SW	577	590	601	608	610	579	549	518	488	503	478	493	466	437

Ballast Sounding (m)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Barge draft [m]	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
2PW	2.84	2.4	1.98	1.63	1.28	1.5	1.72	1.94	2.15	2.05	2.22	2.12	2.31	2.52
2SW	2.81	2.36	1.94	1.58	1.23	1.45	1.67	1.88	2.1	2.2	2.37	2.47	2.66	2.87
5PW	4.7	4.8	4.89	4.94	4.97	4.74	4.52	4.3	4.09	3.99	3.81	3.71	3.52	3.3
5SW	4.67	4.77	4.84	4.9	4.91	4.69	4.47	4.25	4.03	4.14	3.96	4.07	3.87	3.66

Weight ballast Variation (t)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Barge draft [m]	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
2PW	-31	-61	-59	-50	-48	31	30	30	30	-14	24	-15	27	29
2SW	-32	-62	-59	-50	-50	31	30	30	30	14	24	14	27	29
5PW	8	14	12	8	3	-31	-30	-30	-30	-14	-24	-14	-27	-29
5SW	7	13	11	7	2	-31	-30	-30	-30	14	-24	15	-27	-29

Ballast Ullage (t)

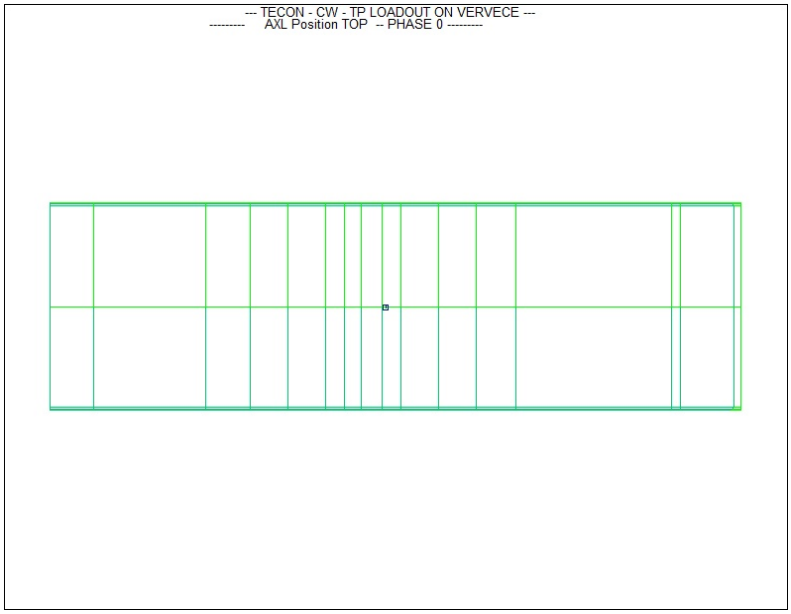
Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Barge draft [m]	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
2PW	3.26	3.69	4.11	4.47	4.81	4.59	4.37	4.16	3.94	4.05	3.87	3.98	3.79	3.58
2SW	3.29	3.73	4.16	4.51	4.87	4.65	4.43	4.21	4	3.9	3.73	3.63	3.43	3.23
5PW	1.39	1.29	1.21	1.15	1.13	1.35	1.57	1.79	2.01	2.11	2.28	2.38	2.58	2.79
5SW	1.43	1.33	1.25	1.2	1.19	1.41	1.63	1.85	2.06	1.96	2.13	2.03	2.22	2.43

Table 6.3 – Loadout summary Tables - Detailed

Ballast variation lower than 15 ton are to be considered for numerical stability only.

6.4 MOSES OUTPUT SUMMARY

6.4.1 Step 0: barge ready for loadout. Barge is with 4.30m draft evenkeel



--- TECON - CW - TP LOADOUT ON VERVECE ---
BALLASTING SUMMARY

	5PW 574 t	4PW 426 t	3PW 426 t	2PW 428 t	1PW 206 t
	5PC 240 t	4PC Full	3PC Empty	2PC 426 t	1PC Full
	5SC 236 t	4SC Full	3SC Empty	2SC 426 t	1SC Full
	5SW 569 t	4SW 426 t	3SW 426 t	2SW 423 t	1SW 206 t

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)

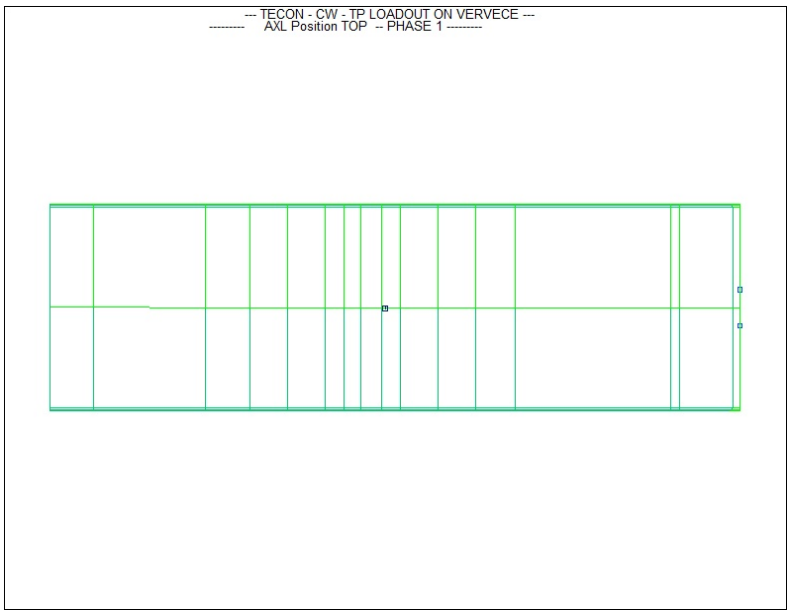
PHASE: 0 STRUCTURE WEIGHT ON BARGE(t): 0 DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00

Phase -0-

Tank No	Ballast	Sounding	Ullage	Tank No	Ballast	Sounding	Ullage
1PC	224	6,02	,08	3SC	256	1,83	4,27
1PW	206	5,70	,40	3SW	426	3,05	3,04
1SC	225	6,02	,08	4PC	835	5,97	,12
1SW	206	5,70	,40	4PW	426	3,05	3,04
2PC	426	3,05	3,05	4SC	835	5,97	,12
2PW	428	3,06	3,03	4SW	426	3,05	3,04
2SC	426	3,05	3,05	5PC	240	3,42	2,67
2SW	423	3,03	3,06	5PW	574	4,65	1,45
3PC	256	1,83	4,27	5SC	236	3,42	2,67
3PW	426	3,05	3,04	5SW	569	4,62	1,48

Being the distance between quay and barge bow <= 1.0m, the load of the axles is considered onshore on onboard.

6.4.2 Step 1



--- TECON - CW - TP LOADOUT ON VERVECE ---
BALLASTING SUMMARY

Barge pump PS - OUT

	5PW 8 t	4PW	3PW	2PW -31 t	1PW
	5PC	4PC	3PC	2PC	1PC
	5SC	4SC	3SC	2SC	1SC
	5SW 7 t	4SW	3SW	2SW -32 t	1SW

Barge pump STB - OUT

PHASE: 1
TRAVEL DISTANCE: 3,01

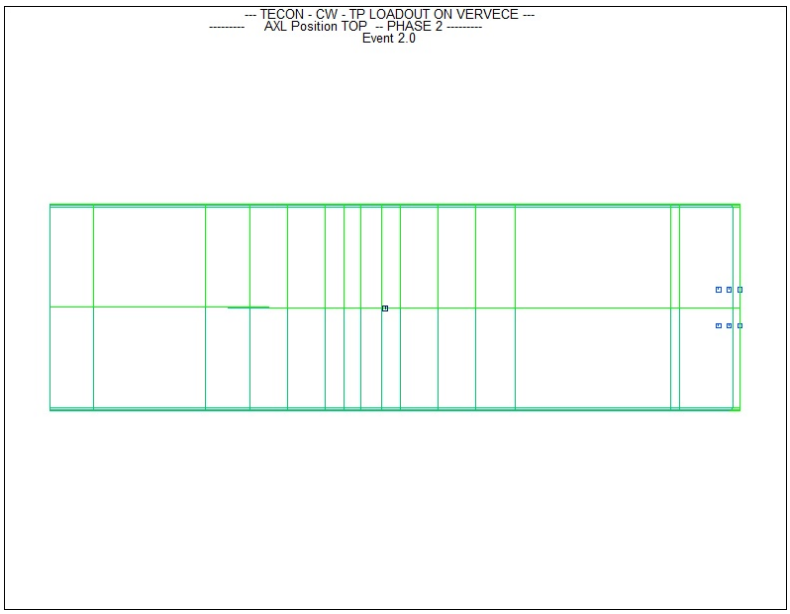
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 47,9

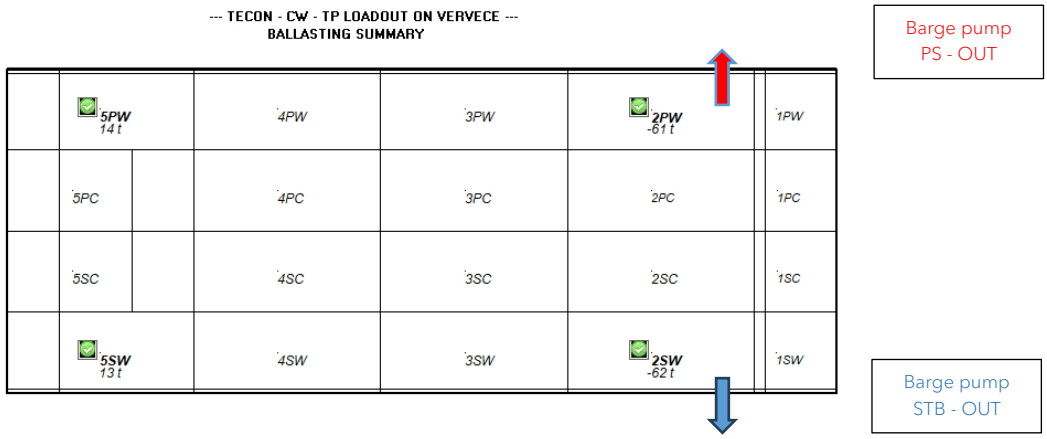
Phase -1-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	-31	2,84	-,22	3,26	,22	186,
2SW	-32	2,81	-,23	3,29	,23	192,
5PW	8	4,70	,06	1,39	-,06	48,
5SW	7	4,67	,05	1,43	-,05	42,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.3 Step 2





PHASE: 2
TRAVEL DISTANCE: 5,81

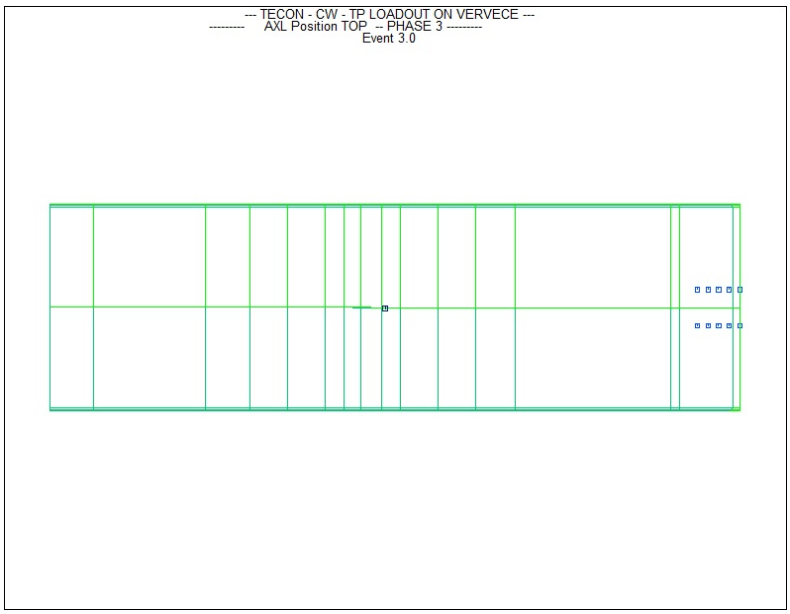
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 143,7

Phase -2-

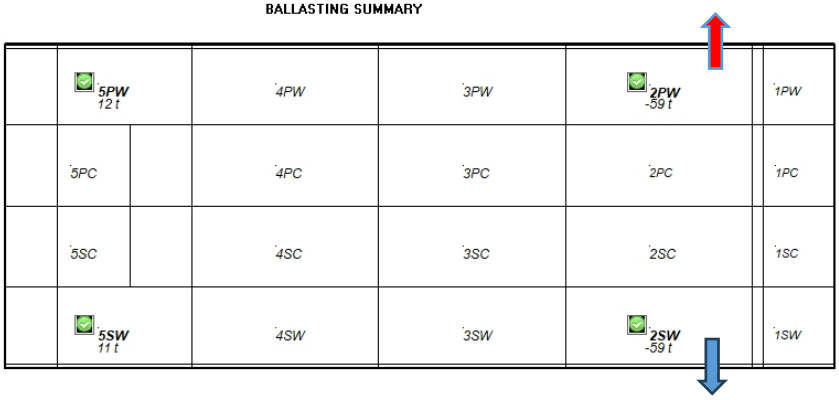
Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	-61	2,40	-,44	3,69	,44	244,
2SW	-62	2,36	-,44	3,73	,44	248,
5PW	14	4,80	,10	1,29	-,10	56,
5SW	13	4,77	,10	1,33	-,10	52,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.4 Step 3



--- TECON - CW - TP LOADOUT ON VERVECE ---
BALLASTING SUMMARY



Barge pump
PS - OUT

Barge pump
STB - OUT

PHASE: 3
TRAVEL DISTANCE: 8,61

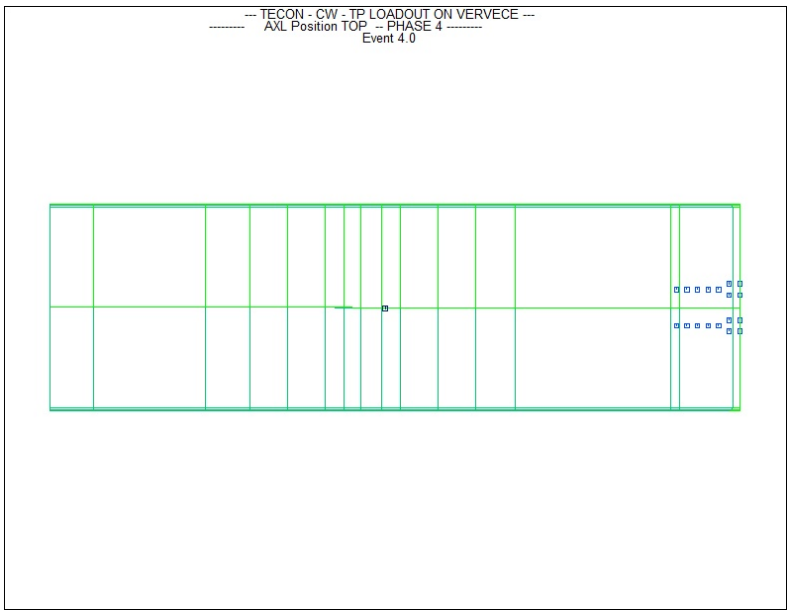
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 239,5

Phase -3-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	-59	1,98	-,42	4,11	,42	236,
2SW	-59	1,94	-,42	4,16	,42	236,
5PW	12	4,89	,08	1,21	-,08	48,
5SW	11	4,84	,08	1,25	-,08	44,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.5 Step 4



--- TECON - CW - TP LOADOUT ON VERVECE ---
BALLASTING SUMMARY

	5PW 8 t	4PW	3PW	2PW -50 t	1PW
	5PC	4PC	3PC	2PC	1PC
	5SC	4SC	3SC	2SC	1SC
	5SW 7 t	4SW	3SW	2SW -50 t	1SW

Barge pump PS - OUT

Barge pump STB - OUT

PHASE: 4
TRAVEL DISTANCE: 11,41

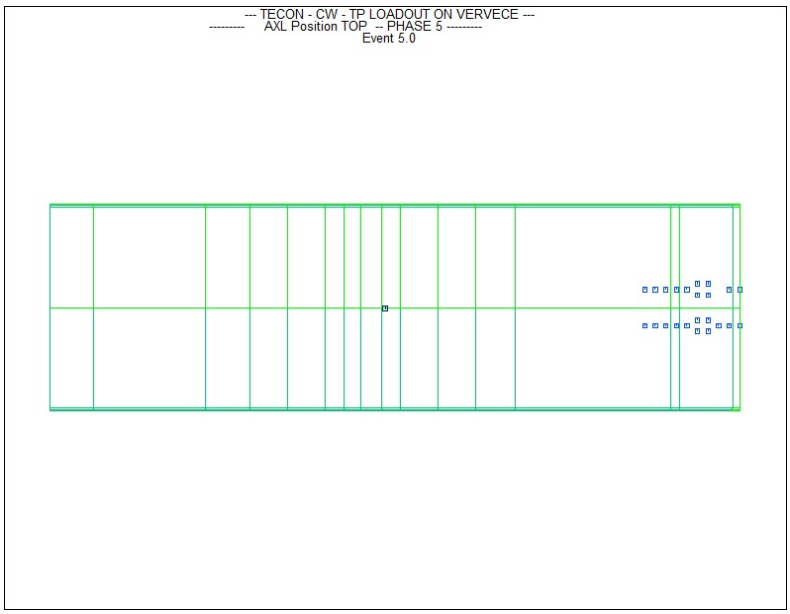
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 324,4

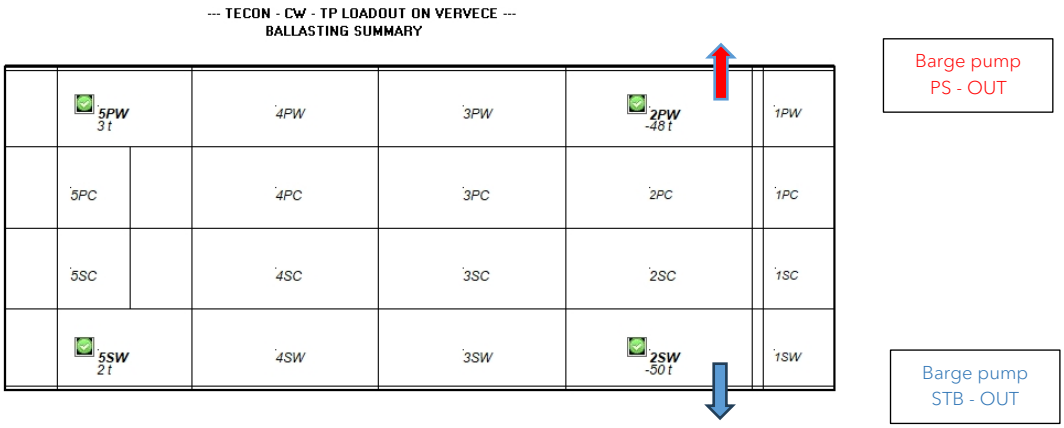
Phase -4-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	-50	1,63	-,36	4,47	,36	300,
2SW	-50	1,58	-,36	4,51	,36	300,
5PW	8	4,94	,05	1,15	-,05	48,
5SW	7	4,90	,05	1,20	-,05	42,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.6 Step 5 – All axles on board





PHASE: 5
TRAVEL DISTANCE: 15,61

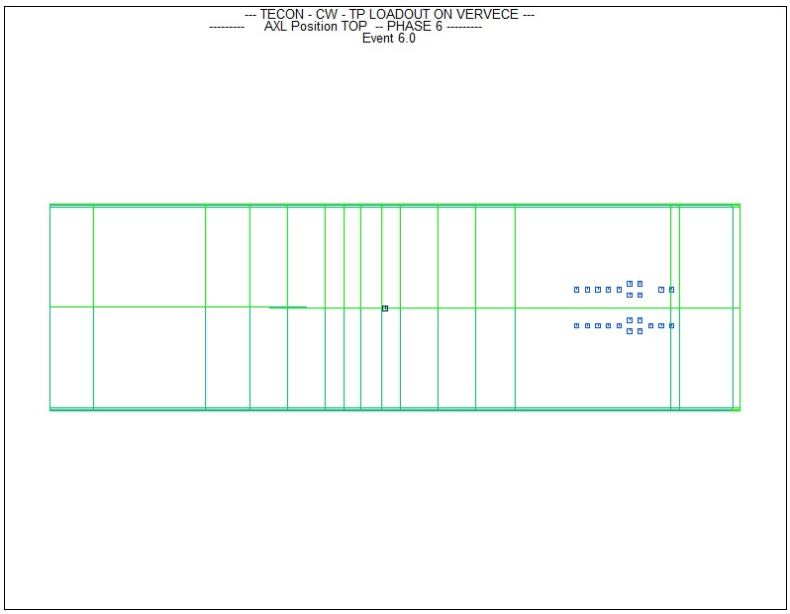
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 416,9

Phase -5-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	-48	1,28	-,34	4,81	,34	288,
2SW	-50	1,23	-,35	4,87	,35	300,
5PW	3	4,97	,02	1,13	-,02	18,
5SW	2	4,91	,01	1,19	-,01	12,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.7 Step 6: Shifting phase. All axles on board.



--- TECON - CW - TP LOADOUT ON VERVECE ---
BALLASTING SUMMARY

Barge pump PS

5PW -31 t	4PW	3PW	2PW 31 t	1PW
5PC	4PC	3PC	2PC	1PC
5SC	4SC	3SC	2SC	1SC
5SW -31 t	4SW	3SW	2SW 31 t	1SW

Barge pump STB

PHASE: 6
TRAVEL DISTANCE: 24,61

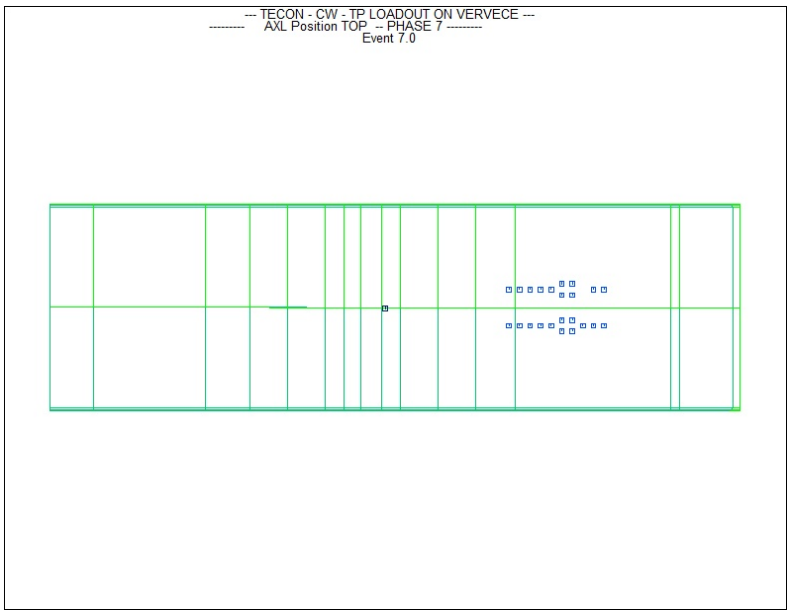
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 416,9

Phase -6-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	31	1,50	,22	4,59	-,22	186,
2SW	31	1,45	,22	4,65	-,22	186,
5PW	-31	4,74	-,22	1,35	,22	186,
5SW	-31	4,69	-,22	1,41	,22	186,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.8 Step 7: Shifting phase. All axles on board.



--- TECON - CW - TP LOADOUT ON VERVECE ---
BALLASTING SUMMARY

Barge pump PS

5PW -30 t	4PW	3PW	2PW 30 t	1PW
5PC	4PC	3PC	2PC	1PC
5SC	4SC	3SC	2SC	1SC
5SW -30 t	4SW	3SW	2SW 30 t	1SW

Barge pump STB

PHASE: 7
TRAVEL DISTANCE: 33,61

DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 416,9

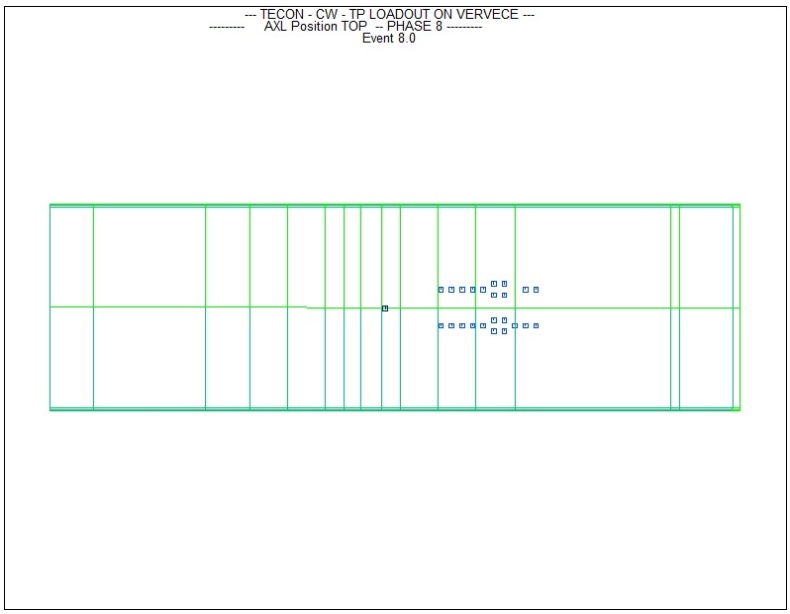
Phase -7-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	30	1,72	,22	4,37	-,22	180,
2SW	30	1,67	,22	4,43	-,22	180,
5PW	-30	4,52	-,22	1,57	,22	180,
5SW	-30	4,47	-,22	1,63	,22	180,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

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6.4.9 Step 8: Shifting phase. All axles on board.



--- TECON - CW - TP LOADOUT ON VERVECE ---
BALLASTING SUMMARY

Barge pump PS

5PW -30 t	4PW	3PW	2PW 30 t	1PW
5PC	4PC	3PC	2PC	1PC
5SC	4SC	3SC	2SC	1SC
5SW -30 t	4SW	3SW	2SW 30 t	1SW

Barge pump STB

PHASE: 8
TRAVEL DISTANCE: 42,61

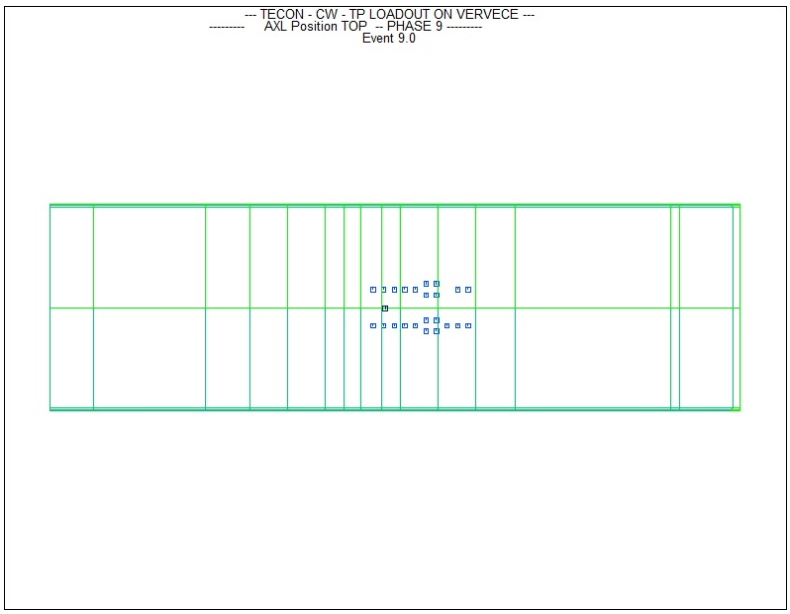
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 416,9

Phase -8-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	30	1,94	,22	4,16	-,22	180,
2SW	30	1,88	,22	4,21	-,22	180,
5PW	-30	4,30	-,22	1,79	,22	180,
5SW	-30	4,25	-,22	1,85	,22	180,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.10 Step 9: Shifting phase. All axles on board.



--- TECON - CW - TP LOADOUT ON VERVECE ---
BALLASTING SUMMARY

Barge pump PS

5PW -30 t	4PW	3PW	2PW 30 t	1PW
5PC	4PC	3PC	2PC	1PC
5SC	4SC	3SC	2SC	1SC
5SW -30 t	4SW	3SW	2SW 30 t	1SW

Barge pump STB

PHASE: 9
TRAVEL DISTANCE: 51,61

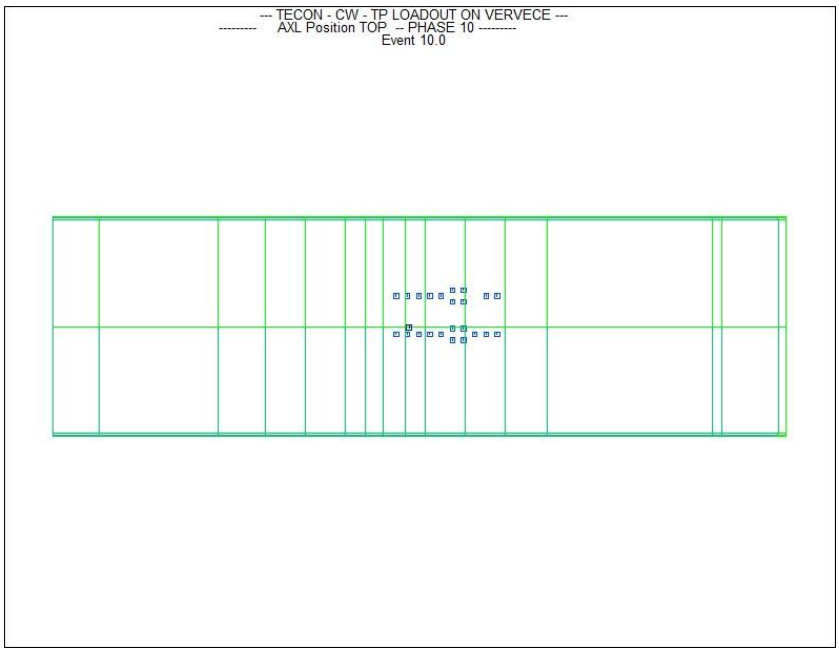
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 416,9

Phase -9-

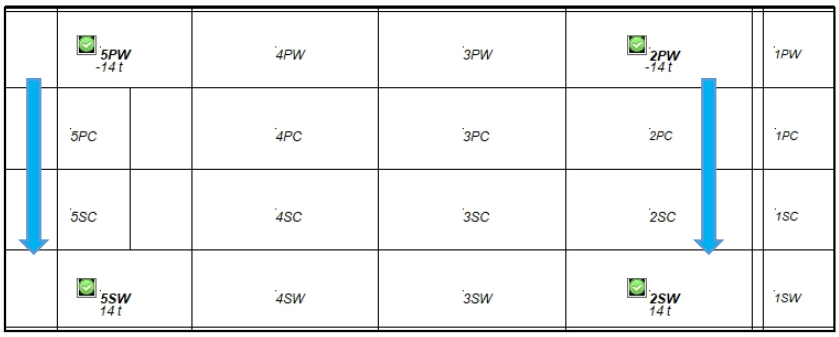
Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	30	2,15	,21	3,94	-,21	180,
2SW	30	2,10	,21	4,00	-,21	180,
5PW	-30	4,09	-,22	2,01	,22	180,
5SW	-30	4,03	-,22	2,06	,22	180,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.11 Step 10: Transversal shifting phase.



--- TECON - CW - TP LOADOUT ON VERVECE ---
BALLASTING SUMMARY



PHASE: 10
TRAVEL DISTANCE: 51,61

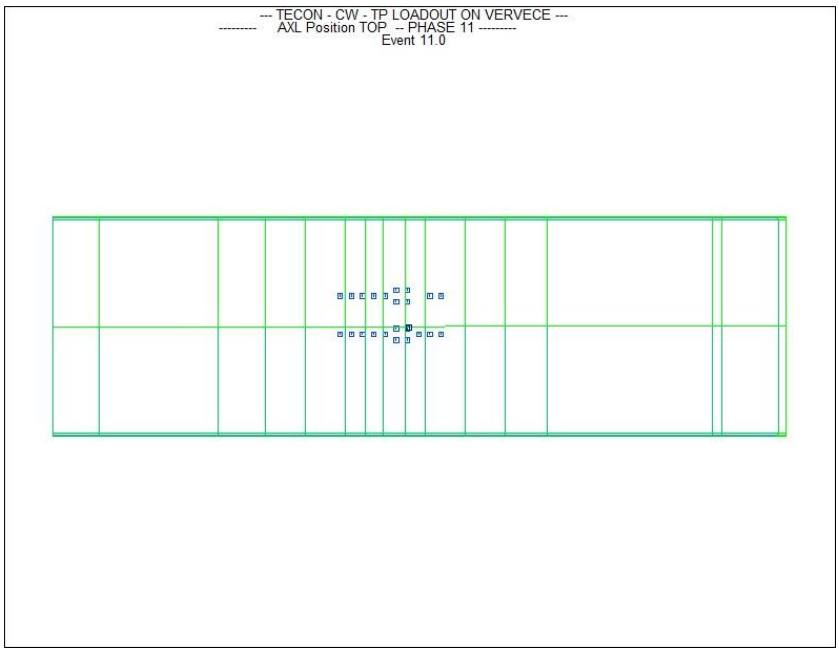
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 416,9

Phase -10-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	-14	2,05	-,10	4,05	,10	84,
2SW	14	2,20	,10	3,90	-,10	84,
5PW	-14	3,99	-,10	2,11	,10	84,
5SW	14	4,14	,10	1,96	-,10	84,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.12 Step 11: Shifting phase.



--- TECON - CW - TP LOADOUT ON VERVECE ---
BALLASTING SUMMARY

Barge pump PS

5PW -24 t	4PW	3PW	2PW 24 t	1PW
5PC	4PC	3PC	2PC	1PC
5SC	4SC	3SC	2SC	1SC
5SW -24 t	4SW	3SW	2SW 24 t	1SW

Barge pump STB

PHASE: 11
TRAVEL DISTANCE: 58,61

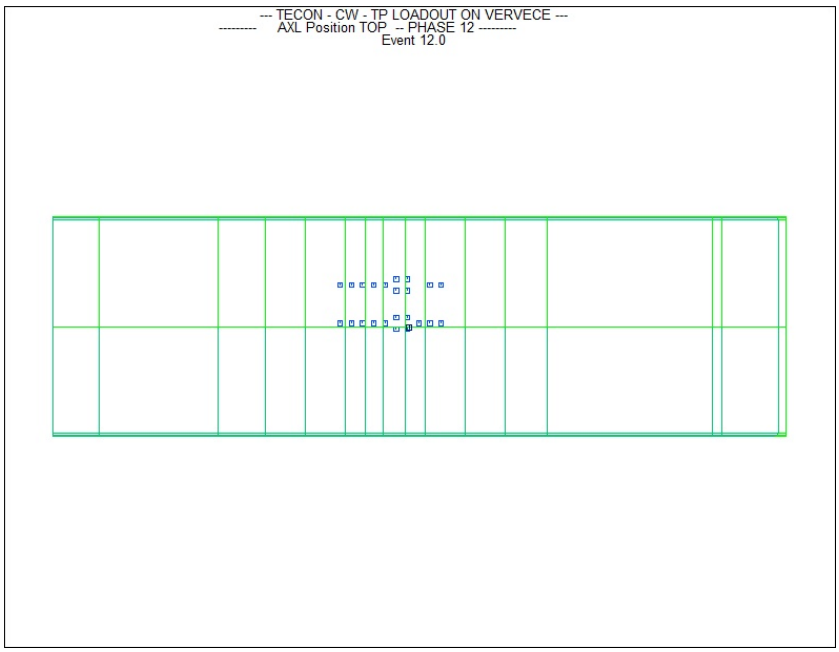
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 416,9

Phase -11-

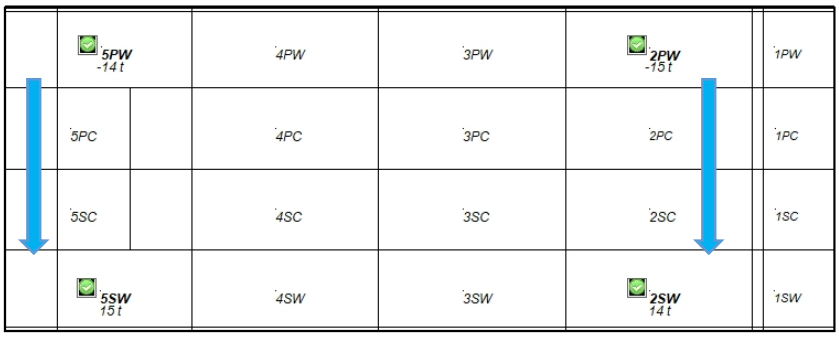
Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	24	2,22	,17	3,87	-,17	144,
2SW	24	2,37	,17	3,73	-,17	144,
5PW	-24	3,81	-,17	2,28	,17	144,
5SW	-24	3,96	-,17	2,13	,17	144,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.13 Step 12: Transversal shifting phase.



--- TECON - CW - TP LOADOUT ON VERVECE ---
BALLASTING SUMMARY



PHASE: 12
TRAVEL DISTANCE: 58,61

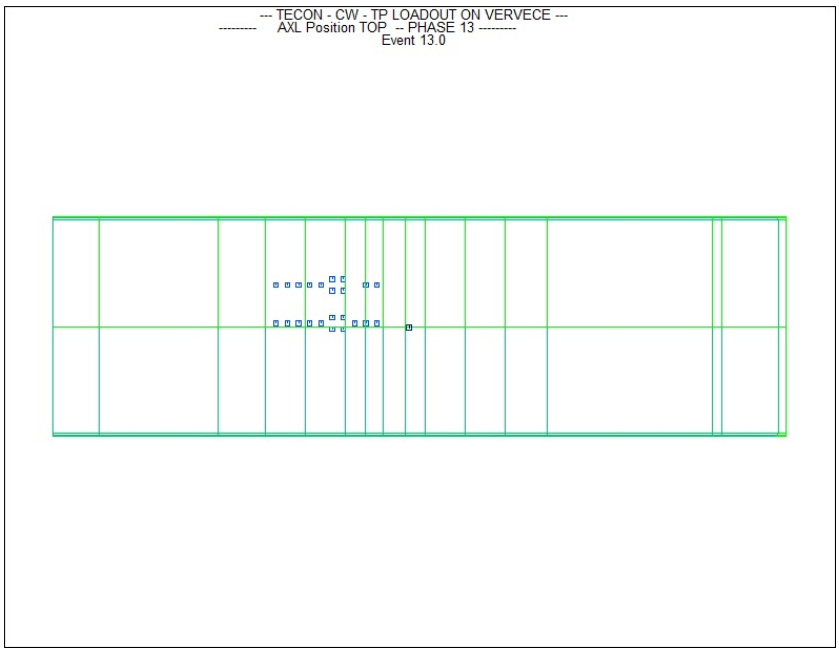
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 416,9

Phase -12-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	-15	2,12	-,11	3,98	,11	90,
2SW	14	2,47	,10	3,63	-,10	84,
5PW	-14	3,71	-,10	2,38	,10	84,
5SW	15	4,07	,11	2,03	-,11	90,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.14 Step 13: Shifting phase.



--- TECON - CW - TP LOADOUT ON VERVECE ---
BALLASTING SUMMARY

Barge pump PS

5PW -27 t	4PW	3PW	2PW 27 t	1PW
5PC	4PC	3PC	2PC	1PC
5SC	4SC	3SC	2SC	1SC
5SW -27 t	4SW	3SW	2SW 27 t	1SW

Barge pump STB

PHASE: 13
TRAVEL DISTANCE: 66,61

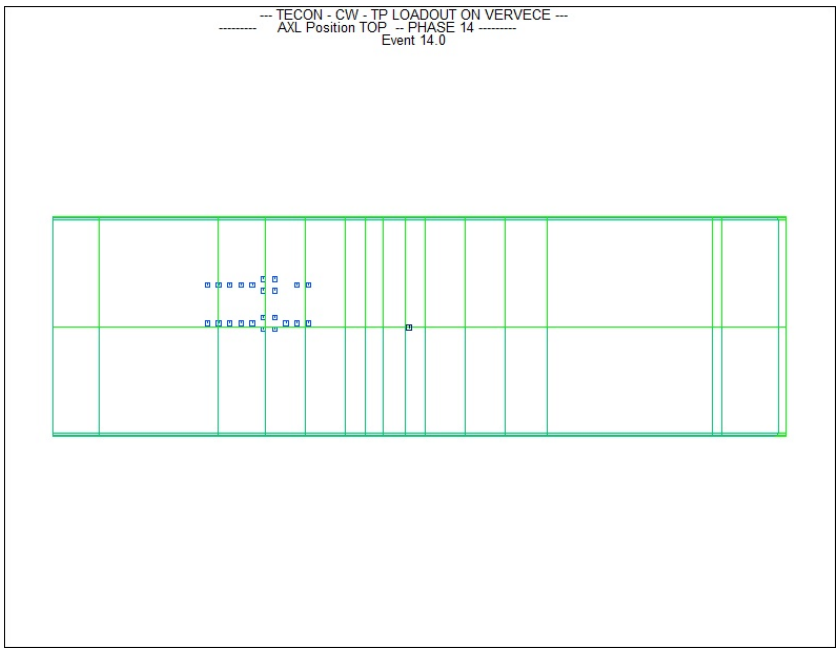
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 416,9

Phase -13-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	27	2,31	,19	3,79	-,19	162,
2SW	27	2,66	,19	3,43	-,19	162,
5PW	-27	3,52	-,20	2,58	,20	162,
5SW	-27	3,87	-,19	2,22	,19	162,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.15 Step 14: TP in final position



--- TECON - CW - TP LOADOUT ON VERVECE ---
BALLASTING SUMMARY

Barge pump PS

5PW -29 t	4PW	3PW	2PW 29 t	1PW
5PC	4PC	3PC	2PC	1PC
5SC	4SC	3SC	2SC	1SC
5SW -29 t	4SW	3SW	2SW 29 t	1SW

Barge pump STB

PHASE: 14
TRAVEL DISTANCE: 75,18

DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 416,9

Phase -14-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	29	2,52	,21	3,58	-,21	174,
2SW	29	2,87	,21	3,23	-,21	174,
5PW	-29	3,30	-,21	2,79	,21	174,
5SW	-29	3,66	-,21	2,43	,21	174,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.5 BALLAST CORRECTION FOR TIDE

The correction to compensate for sea level variation at start of LO operation is shown below. Intermediate level of water at start of operation requires interpolation of the values only in the tanks highlighted in yellow or blue.

VERVECE - BALLAST PLAN - load-out Ph.0. - LOW TIDE D=3.95m trim 0.10deg

	74.0% **5PW** u=1.45m		50% **4PW** u=3.0m	3% **3PW**	50% **2PW** u=3.0m	90% **1PW** u=0.40m
STERN	44% **5PC** u=3.1m		full **4PC**	30% **3PC** u=4.30m	50% **2PC** u=3.0m	full **1PC**
	44% **5SC** u=3.1m		full **4SC**	30% **3SC** u=4.30m	50% **2SC** u=3.0m	full **1SC**
	73.5% **5SW** u=1.45m		50% **4SW** u=3.0m	3% **3SW**	50% **2SW** u=3.0m	90% **1SW** u=0.40m

VERVECE - BALLAST PLAN - load-out Ph.0. - HIGH TIDE D=4.75m evenkeel

	74.0% **5PW** u=1.45m		50% **4PW** u=3.0m	97% **3PW** u=0.20m	50% **2PW** u=3.0m	90% **1PW** u=0.40m
STERN	62.5% **5PC** u=2.0m		full **4PC**	30% **3PC** u=4.30m	50% **2PC** u=3.0m	full **1PC**
	63.0% **5SC** u=2.0m		full **4SC**	30% **3SC** u=4.30m	50% **2SC** u=3.0m	full **1SC**
	73.5% **5SW** u=1.45m		50% **4SW** u=3.0m	96% **3SW** u=0.25m	50% **2SW** u=3.0m	90% **1SW** u=0.40m

Figure 6.6 – Ballast plan for tide compensation

6.5.1 Tide -40cm Phase 0

```
*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                    17 June, 2025                   *
*          T E C O N                                                .                                          *
*          ---------     Barge Configuration                                  .                                *
*                                                                                                               *
*****************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                    Results Are Reported In Body System

                          Draft =     3.95 Roll Angle =     0.00 Pitch Angle =     0.10

                                        Wet Radii Of Gyration About CG
```

```
                K-X =     7.77 K-Y =    26.45 K-Z =    27.23

                      GMT =    15.11 GML =   167.17

                         /-- Center of Gravity ---/  Sounding   % Full
Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

----------------  Part CF         ------------
LOAD_GRO     28.00    69.38    11.22     8.10
----------------  Part GRI&SF-B   ------------
LOAD_GRO     75.00    30.86    -1.14     7.35
----------------  Part GRI&SF-C   ------------
LOAD_GRO      0.50    67.44    11.22     7.10
----------------  Part GRI&SF-T   ------------
LOAD_GRO     45.00    65.20    -2.92     7.40
----------------  Part VERVECE    ------------
LOAD_GRO   1832.80    47.02     0.00     3.52
--- Contents ---
1PC          229.92     5.62    -3.43     3.77     6.02    98.00
1PW          211.48     5.72   -10.28     3.59     5.70    90.00
1SC          230.42     5.62     3.43     3.77     6.02    98.00
1SW          211.48     5.72    10.28     3.59     5.70    90.00
2PC          436.85    19.45    -3.43     1.52     3.05    50.00
2PW          436.81    19.45   -10.28     1.53     3.05    50.00
2SC          436.85    19.45     3.43     1.52     3.05    50.00
2SW          436.81    19.45    10.28     1.53     3.05    50.00
3PC          262.11    40.04    -3.43     0.91     1.83    30.00
3PW           33.50    40.27   -10.19     0.12     0.24     3.83
3SC          262.11    40.04     3.43     0.91     1.83    30.00
3SW           27.91    40.32    10.18     0.10     0.20     3.20
4PC          856.22    60.59    -3.43     2.99     5.97    98.00
4PW          436.82    60.60   -10.28     1.53     3.05    50.00
4SC          856.22    60.59     3.43     2.99     5.97    98.00
4SW          436.82    60.60    10.28     1.53     3.05    50.00
5PC          214.36    83.04    -3.43     1.65     3.06    43.57
5PW          587.25    80.15   -10.28     2.46     4.64    74.00
5SC          212.45    83.05     3.43     1.66     3.08    43.87
5SW          583.28    80.15    10.28     2.45     4.62    73.50
========  ========  =======  =======  =======
Total       9380.96    47.10    -0.00     2.56
Buoyancy    9380.95    47.10    -0.00     2.07


                  +++ D R A F T   M A R K   R E A D I N G S +++
                  ============================================

            Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        3.95 BOWST        3.95 MIDPO        4.03 MIDST        4.03 STEPO        4.11 STEST        4.11
```

6.5.2 Tide +40cm Phase 0

```
*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*                                          ----------------                          17 June, 2025               *
*         T E C O N                                                        .                                      *
*         ---------     Barge Configuration                                .                                      *
*                                                                                                                *
*****************************************************************************************************************

                +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                ======================================================================

              Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                              Results Are Reported In Body System

                   Draft =     4.75 Roll Angle =    -0.00 Pitch Angle =     0.00

                                  Wet Radii Of Gyration About CG

                            K-X =     8.14 K-Y =    24.90 K-Z =    25.85

                                  GMT =    13.09 GML =   147.02

                                     /-- Center of Gravity ---/  Sounding   % Full
                   Name      Weight    ---X---  ---Y---  ---Z---  -------- --------
```

```
----------------  Part CF          ------------
LOAD_GRO     28.00    69.38    11.22     8.10
----------------  Part GRI&SF-B    ------------
LOAD_GRO     75.00    30.86    -1.14     7.35
----------------  Part GRI&SF-C    ------------
LOAD_GRO      0.50    67.44    11.22     7.10
----------------  Part GRI&SF-T    ------------
LOAD_GRO     45.00    65.20    -2.92     7.40
----------------  Part VERVECE     ------------
LOAD_GRO   1832.80    47.02     0.00     3.52
--- Contents ---
1PC          229.92     5.62    -3.43     3.77     6.02    98.00
1PW          211.48     5.71   -10.28     3.59     5.70    90.00
1SC          230.42     5.62     3.43     3.77     6.02    98.00
1SW          211.48     5.71    10.28     3.59     5.70    90.00
2PC          436.85    19.43    -3.43     1.52     3.05    50.00
2PW          436.81    19.43   -10.28     1.53     3.05    50.00
2SC          436.85    19.43     3.43     1.52     3.05    50.00
2SW          436.81    19.43    10.28     1.53     3.05    50.00
3PC          262.11    40.01    -3.43     0.91     1.83    30.00
3PW          842.42    40.01   -10.28     2.94     5.88    96.43
3SC          262.11    40.01     3.43     0.91     1.83    30.00
3SW          836.89    40.01    10.28     2.92     5.84    95.79
4PC          856.22    60.58    -3.43     2.99     5.97    98.00
4PW          436.82    60.58   -10.28     1.53     3.05    50.00
4SC          856.22    60.58     3.43     2.99     5.97    98.00
4SW          436.82    60.58    10.28     1.53     3.05    50.00
5PC          306.89    83.47    -3.43     2.23     4.09    62.37
5PW          587.25    80.14   -10.28     2.46     4.64    74.00
5SC          304.91    83.48     3.43     2.25     4.12    62.96
5SW          583.28    80.13    10.28     2.45     4.62    73.50
========  ========  =======  =======  =======
Total     11183.85    46.68     0.00     2.65
Buoyancy  11183.85    46.68     0.00     2.44
```

```
+++ D R A F T   M A R K   R E A D I N G S +++
=============================================

Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.75 BOWST        4.75 MIDPO        4.75 MIDST        4.75 STEPO        4.75 STEST        4.75
```

7 BARGE LONGITUDINAL STRUCTURAL CHECKS

The longitudinal strength analysis was carried out for the still water condition. The complete MOSES output is reported in section 8.

The allowable stresses were assumed as follows:

- Fy = 235 N/mm^2 yield stress
- σ_{all} = 0.66 x Fy = 155 N/mm^2
- τ_{all} = 0.4 x Fy = 94 N/mm^2

For normal stress, the maximum usage factor, i.e. the maximum bending / allowable stress ratio, is 0.475 in phase 5 of loadout operation.

- UF = 12412/26130 = 0.475

For shear stress, the maximum usage factor is:

- UF_{shear} = 802/6150 = 0.13

in phase 4 of loadout.

Values of BM and Shear along the longitudinal section of the cargo barge were compared with the admissible values shown in section 5.4. All the values are within allowable ones.

The maximum deflection results 3.56 cm (ph.5).

8 BARGE INTACT STABILITY – COMPLETE MOSES OUTPUT

In the following tables, the allowable deflection was conventionally set equal to unity, therefore the values indicated under the columns with heading Deflection / Allowable are actually the computed deflections.

```
                                  ********************************
*                                         ***  MOSES   ***                                                    *
*                                         ----------------                          18 June, 2025           *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                         *
*          ---------     Intact Stability Check    -- PHASE 0 ---------                                      *
*                                                                                                            *
**************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                     Process is 0: Units Are Degrees, Meters, and M-Tons Unless Specified

                                   Results Are Reported In Body System

                         Draft =     4.30 Roll Angle =     0.00 Pitch Angle =     0.00

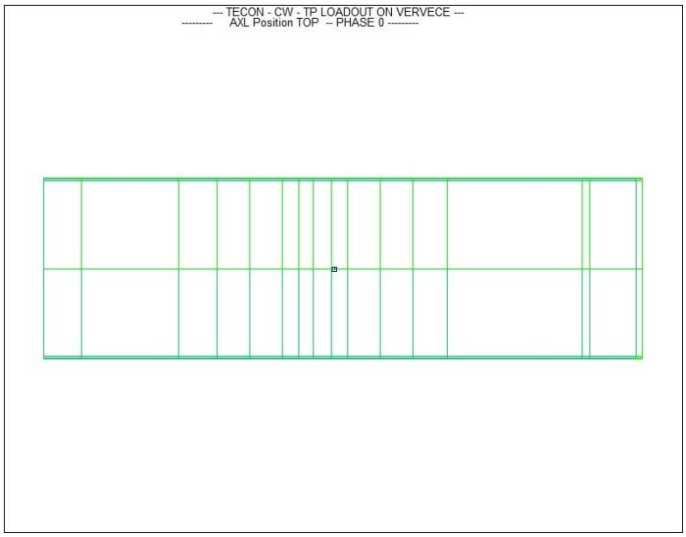
                                   Wet Radii Of Gyration About CG

                                K-X =     7.99 K-Y =    25.59 K-Z =    26.44

                                        GMT =    14.40 GML =   159.51

                                /-- Center of Gravity ---/  Sounding   % Full
                          Name   Weight     ---X---  ---Y---  ---Z---  -------- --------

                                ----------------  Part CF          ------------
                                LOAD_GRO     28.00    69.38    11.22     8.10
                                ----------------  Part GRI&SF-B    ------------
                                LOAD_GRO     75.00    30.86    -1.14     7.35
                                ----------------  Part GRI&SF-C    ------------
                                LOAD_GRO      0.50    67.44    11.22     7.10
                                ----------------  Part GRI&SF-T    ------------
                                LOAD_GRO     45.00    65.20    -2.92     7.40
                                ----------------  Part VERVECE     ------------
                                LOAD_GRO   1832.80    47.02     0.00     3.52
                                           --- Contents ---
                            1PC         224.31     5.62    -3.43     3.77     6.02    98.00
                            1PW         206.33     5.71   -10.28     3.59     5.70    90.00
                            1SC         224.80     5.62     3.43     3.77     6.02    98.00
                            1SW         206.33     5.71    10.28     3.59     5.70    90.00
                            2PC         426.19    19.43    -3.43     1.52     3.05    50.00
                            2PW         427.89    19.43   -10.28     1.53     3.06    50.20
                            2SC         426.19    19.43     3.43     1.52     3.05    50.00
                            2SW         423.45    19.43    10.28     1.52     3.03    49.68
                            3PC         255.71    40.01    -3.43     0.91     1.83    30.00
                            3PW         426.16    40.01   -10.28     1.53     3.05    50.00
                            3SC         255.71    40.01     3.43     0.91     1.83    30.00
                            3SW         426.16    40.01    10.28     1.53     3.05    50.00
                            4PC         835.34    60.58    -3.43     2.99     5.97    98.00
                            4PW         426.16    60.58   -10.28     1.53     3.05    50.00
                            4SC         835.34    60.58     3.43     2.99     5.97    98.00
                            4SW         426.16    60.58    10.28     1.53     3.05    50.00
                            5PC         240.01    83.19    -3.43     1.86     3.42    50.00
                            5PW         573.65    80.14   -10.28     2.46     4.65    74.09
                            5SC         236.24    83.19     3.43     1.86     3.42    50.00
                            5SW         569.19    80.13    10.28     2.45     4.62    73.52
                                       ========  ========  =======  =======  =======
                                       Total     10052.61    46.75    -0.00     2.50
                                       Buoyancy  10052.61    46.75    -0.00     2.21
```




```
                    ********************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 0 ---------                                  *
*                                                                                                        *
**********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 0: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
*********************************************************
*                                  ***  MOSES   ***                                    *
*                                  ----------------                 18 June, 2025     *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                    *
*        ---------     Intact Stability Check    -- PHASE 0 ---------                 . *
*                                                                                      *
****************************************************************************************************************
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+++ R I G H T I N G A R M R E S U L T S +++

Process is 0: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 2.50, and Wind Speed = 10 Knots

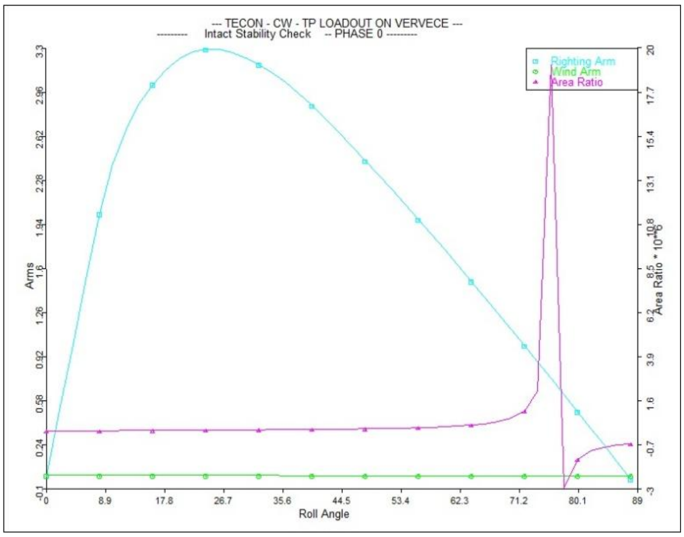
Initial: Roll = 0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	-0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.50	0.50	0.00	0.00	3147.89	0.503
4.29	4.00	0.00	9999.00	1.49	1.01	2.02	0.00	0.00	6471.55	1.010
4.27	6.00	0.00	9999.00	1.03	1.52	4.54	0.00	0.00	9999.00	1.518
4.25	8.00	0.00	9999.00	0.57	2.02	8.08	0.00	0.00	9999.00	2.021
4.26	10.00	0.00	9999.00	0.08	2.40	12.51	0.00	0.00	9999.00	2.402
4.31	12.00	0.00	9999.00	-0.46	2.67	17.58	0.00	0.00	9999.00	2.672
4.39	14.00	0.00	9999.00	-1.03	2.87	23.12	0.00	0.00	9999.00	2.871
4.48	16.00	0.00	9999.00	-1.63	3.02	29.01	0.00	0.00	9999.00	3.020
4.60	18.00	0.00	9999.00	-2.25	3.13	35.17	0.00	0.00	9999.00	3.133
4.72	20.00	0.00	9999.00	-2.88	3.22	41.52	0.00	0.00	9999.00	3.217
4.85	22.00	0.00	9999.00	-3.51	3.27	48.00	0.00	0.00	9999.00	3.269
4.97	24.00	0.00	9999.00	-4.14	3.29	54.56	0.00	0.00	9999.00	3.291
5.09	26.00	0.00	9999.00	-4.77	3.29	61.14	0.00	0.00	9999.00	3.287
5.20	28.00	0.00	9999.00	-5.39	3.26	67.69	0.00	0.00	9999.00	3.264
5.31	30.00	0.00	9999.00	-6.01	3.22	74.18	0.00	0.00	9999.00	3.225
5.41	32.00	0.00	9999.00	-6.62	3.17	80.58	0.00	0.00	9999.00	3.173
5.50	34.00	0.00	9999.00	-7.22	3.11	86.86	0.00	0.00	9999.00	3.109
5.58	36.00	0.00	9999.00	-7.81	3.03	93.00	-0.00	0.00	9999.00	3.034
5.66	38.00	0.00	9999.00	-8.39	2.95	98.99	-0.00	0.00	9999.00	2.950
5.73	40.00	0.00	9999.00	-8.96	2.86	104.79	-0.00	0.00	9999.00	2.856
5.80	42.00	0.00	9999.00	-9.52	2.75	110.40	-0.00	0.00	9999.00	2.754
5.86	44.00	0.00	9999.00	-10.07	2.65	115.80	-0.00	0.00	9999.00	2.648
5.91	46.00	0.00	9999.00	-10.61	2.54	120.99	-0.00	0.00	9999.00	2.540
5.95	48.00	0.00	9999.00	-11.13	2.43	125.96	-0.00	0.00	9999.00	2.431
5.99	50.00	0.00	9999.00	-11.64	2.32	130.72	-0.00	0.00	9999.00	2.321
6.02	52.00	0.00	9999.00	-12.14	2.21	135.24	-0.00	0.00	9999.00	2.208
6.04	54.00	0.00	9999.00	-12.62	2.09	139.55	-0.00	0.00	9999.00	2.094
6.05	56.00	0.00	9999.00	-13.08	1.98	143.62	-0.00	0.00	9999.00	1.978
6.06	58.00	0.00	9999.00	-13.53	1.86	147.46	-0.00	0.00	9999.00	1.860
6.06	60.00	0.00	9999.00	-13.97	1.74	151.06	-0.00	0.00	9999.00	1.741
6.05	62.00	0.00	9999.00	-14.38	1.62	154.42	-0.00	0.00	9999.00	1.621
6.03	64.00	0.00	9999.00	-14.78	1.50	157.54	-0.00	0.00	9999.00	1.499
6.01	66.00	0.00	9999.00	-15.16	1.38	160.42	-0.00	0.00	9999.00	1.377
5.98	68.00	0.00	9999.00	-15.53	1.25	163.05	-0.00	0.00	9999.00	1.253
5.94	70.00	0.00	9999.00	-15.87	1.13	165.43	-0.00	0.00	9999.00	1.128
5.90	72.00	0.00	9999.00	-16.19	1.00	167.56	-0.00	0.00	9999.00	1.003
5.85	74.00	0.00	9999.00	-16.50	0.88	169.44	-0.00	0.00	9999.00	0.876
5.79	76.00	0.00	9999.00	-16.78	0.75	171.06	-0.00	0.00	9999.00	0.749
5.72	78.00	0.00	9999.00	-17.05	0.62	172.43	-0.00	-0.00	-9999.00	0.621
5.65	80.00	0.00	9999.00	-17.29	0.49	173.55	-0.00	-0.00	-9999.00	0.493
5.57	82.00	0.00	9999.00	-17.51	0.36	174.40	-0.00	-0.00	-9999.00	0.364
5.48	84.00	0.00	9999.00	-17.71	0.23	175.00	-0.00	-0.00	-9999.00	0.234
5.39	86.00	0.00	9999.00	-17.89	0.10	175.34	-0.00	-0.00	-9999.00	0.104
5.29	88.00	0.00	9999.00	-18.05	-0.03	175.41	-0.00	-0.00	-9999.00	-0.028

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+++ S T A B I L I T Y   S U M M A R Y +++
=========================================


The Following Intact Condition
=======================================
Draft                    =     4.30 M
Roll                     =     0.00 Deg
Pitch                    =     0.00 Deg
VCG                      =     2.47 M
Axis Angle               =     0.00 Deg
Wind Vel                 =   100.00 Knots
1st Intercept            =     0.03 Deg
2st Intercept            =    87.55 Deg
NWT Down-Flooding        =    10.17 Deg
WT Down-Flooding         = Not App. Deg
MIN (1st Int. NWT Down)  =    10.17 Deg

Passes All of The Stability Requirements:
=========================================

GM                           >=    1.00      M    14.40 Passes
Range                        >=   36.00     DEG   87.39 Passes
Area Ratio                   >=    1.40          193.27 Passes
```

```
                            *******************************************************
*                                              ***  MOSES   ***                                     *
*                                             ----------------                  18 June, 2025       *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                               *
*          ------ Wind Exposed Areas ------                                                         *
*                                                                                                   *
*****************************************************************************************************
```

+++ L O A D   G R O U P   A T T R I B U T E S   F O R   P A R T   C F +++

Process is 0: Units Are Degrees, Meters, and M-Tons Unless Specified

LOAD GROUP	WEIGHT	CONT. NAME	FACTOR DISPL	FACTOR WIND	FACTOR ADD. MASS	FACTOR DRAG	AREA X	AREA Y	AREA Z	LOCATION X	LOCATION Y	LOCATION Z
CF	28.00									69.38	11.22	8.10

#WEI|010 #Weight

LOAD GROUP	WEIGHT	CONT. NAME	FACTOR DISPL	FACTOR WIND	FACTOR ADD. MASS	FACTOR DRAG	AREA X	AREA Y	AREA Z	LOCATION X	LOCATION Y	LOCATION Z
GRI&SF-B	75.00									30.86	-1.14	7.35

#WEI|004 #Weight

LOAD GROUP	WEIGHT	CONT. NAME	DISPL	WIND	FACTOR ADD. MASS	DRAG	AREA X	AREA Y	AREA Z	LOCATION X	LOCATION Y	LOCATION Z
GRI&SF-C	0.50									67.44	11.22	7.10

#WEI|008 #Weight

LOAD GROUP	WEIGHT	CONT. NAME	DISPL	WIND	FACTOR ADD. MASS	DRAG	AREA X	AREA Y	AREA Z	LOCATION X	LOCATION Y	LOCATION Z
GRI&SF-T	45.00									65.20	-2.92	7.40

#WEI|006 #Weight

LOAD GROUP	WEIGHT	CONT. NAME	DISPL	WIND	FACTOR ADD. MASS	DRAG	AREA X	AREA Y	AREA Z	LOCATION X	LOCATION Y	LOCATION Z
VERVECE	1832.80									47.02	0.00	3.52

#WEI|002 #Weight

```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          18 June, 2025        *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                  *
*        ------   Longitudinal Strength Analysis - Still Water  -- PHASE 0 ------   *
*                                                                                    *
**************************************************************************************************************
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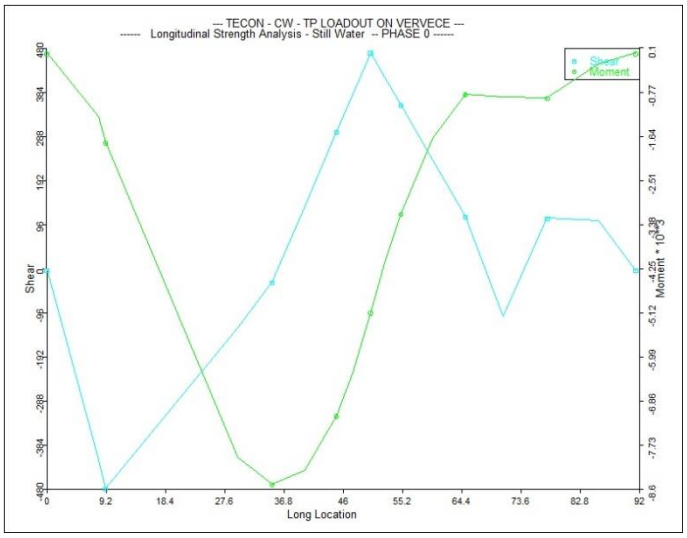
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 0: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-417	-1247	-0.0493	6.9449
9.14	-477	-1758	-0.0695	7.9230
29.72	-127	-7973	-0.3151	21.2966
35.00	-28	-8501	-0.3360	22.6689
40.00	135	-8235	-0.3254	23.0128
45.00	299	-7149	-0.2825	22.4563
47.50	380	-6301	-0.2490	21.8744
50.29	471	-5113	-0.2021	21.0211
52.50	418	-4133	-0.1633	20.2196
55.00	357	-3164	-0.1251	19.2056
60.00	236	-1680	-0.0664	16.9378
65.00	114	-805	-0.0318	14.4788
70.87	-103	-857	-0.0339	11.4708
77.72	110	-878	-0.0347	7.7854
85.70	104	-219	-0.0087	3.2880
91.44	-1	0	0.0000	0.0001



```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                          18 June, 2025        *
*         --- TECON - CW - TP LOADOUT ON VERVECE ---                                                  *
*         ---------     Intact Stability Check    -- PHASE 1 ---------                               *
*                                                                                                     *
*******************************************************************************************************************

                +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                ======================================================================

                 Process is 1: Units Are Degrees, Meters, and M-Tons Unless Specified

                              Results Are Reported In Body System

                     Draft =     4.30 Roll Angle =     0.00 Pitch Angle =     0.00

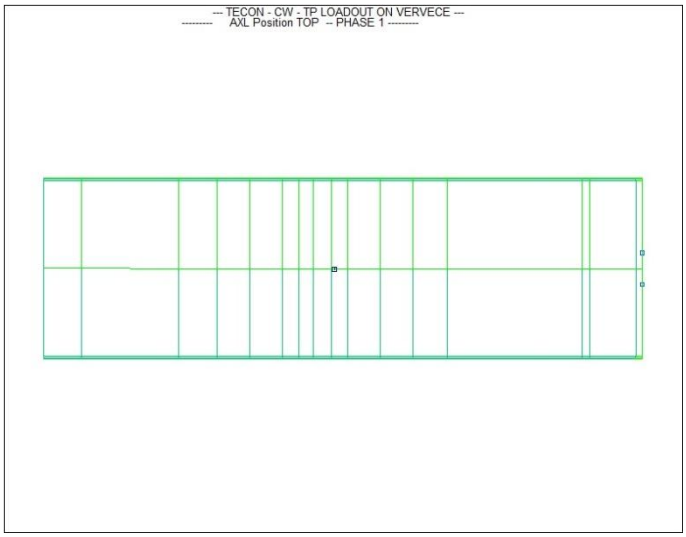
                                 Wet Radii Of Gyration About CG

                           K-X =     7.97 K-Y =    25.74 K-Z =    26.57

                                    GMT =    14.38 GML =   159.50

                           /-- Center of Gravity ---/  Sounding   % Full
                    Name    Weight    ---X---  ---Y---  ---Z---  -------- --------

                           ----------------  Part AXL1       ------------
                           LOAD_GRO     47.90     0.01     0.13     7.10
                           ----------------  Part CF         ------------
                           LOAD_GRO     28.00    69.38    11.22     8.10
                           ----------------  Part GRI&SF-B   ------------
                           LOAD_GRO     75.00    30.86    -1.14     7.35
                           ----------------  Part GRI&SF-C   ------------
                           LOAD_GRO      0.50    67.44    11.22     7.10
                           ----------------  Part GRI&SF-T   ------------
                           LOAD_GRO     45.00    65.20    -2.92     7.40
                           ----------------  Part VERVECE    ------------
                           LOAD_GRO   1832.80    47.02     0.00     3.52
                                        --- Contents ---
                      1PC      224.31     5.62    -3.43     3.77     6.02    98.00
                      1PW      206.33     5.71   -10.28     3.59     5.70    90.00
                      1SC      224.80     5.62     3.43     3.77     6.02    98.00
                      1SW      206.33     5.71    10.28     3.59     5.70    90.00
                      2PC      426.19    19.43    -3.43     1.52     3.05    50.00
                      2PW      396.48    19.43   -10.28     1.42     2.84    46.52
                      2SC      426.19    19.43     3.43     1.52     3.05    50.00
                      2SW      391.72    19.43    10.28     1.41     2.81    45.96
                      3PC      255.71    40.01    -3.43     0.91     1.83    30.00
                      3PW      426.16    40.01   -10.28     1.53     3.05    50.00
                      3SC      255.71    40.01     3.43     0.91     1.83    30.00
                      3SW      426.16    40.01    10.28     1.53     3.05    50.00
                      4PC      835.34    60.58    -3.43     2.99     5.97    98.00
                      4PW      426.16    60.58   -10.28     1.53     3.05    50.00
                      4SC      835.34    60.58     3.43     2.99     5.97    98.00
                      4SW      426.16    60.58    10.28     1.53     3.05    50.00
                      5PC      240.01    83.19    -3.43     1.86     3.42    50.00
                      5PW      581.43    80.15   -10.28     2.49     4.70    75.10
                      5SC      236.24    83.19     3.43     1.86     3.42    50.00
                      5SW      576.65    80.14    10.28     2.47     4.67    74.48
                           ========  ========  =======  =======  =======
                           Total     10052.61    46.75    -0.00     2.52
                           Buoyancy  10052.62    46.75    -0.00     2.21
```




```
                    ********************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 1 ---------                                  *
*                                                                                                        *
**********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 1: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
*********************************************************
*                                  ***  MOSES   ***                                    *
*                                  ----------------                 18 June, 2025     *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                    *
*        ---------     Intact Stability Check    -- PHASE 1 ---------                 . *
*                                                                                      *
****************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 1: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 2.52, and Wind Speed = 10 Knots

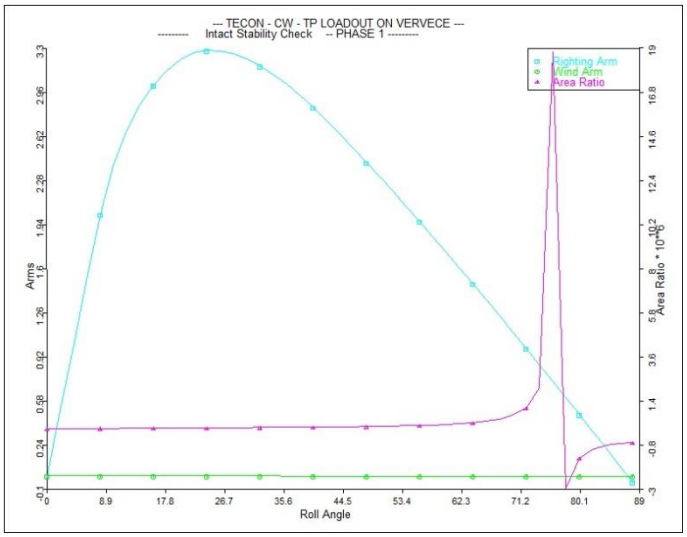
Initial: Roll = 0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	-0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.50	0.50	0.00	0.00	3142.98	0.502
4.29	4.00	0.00	9999.00	1.49	1.01	2.01	0.00	0.00	6461.45	1.008
4.27	6.00	0.00	9999.00	1.03	1.52	4.54	0.00	0.00	9999.00	1.516
4.25	8.00	0.00	9999.00	0.57	2.02	8.07	0.00	0.00	9999.00	2.018
4.26	10.00	0.00	9999.00	0.07	2.40	12.49	0.00	0.00	9999.00	2.398
4.31	12.00	0.00	9999.00	-0.46	2.67	17.55	0.00	0.00	9999.00	2.667
4.39	14.00	0.00	9999.00	-1.04	2.87	23.08	0.00	0.00	9999.00	2.865
4.48	16.00	0.00	9999.00	-1.63	3.01	28.96	0.00	0.00	9999.00	3.014
4.60	18.00	0.00	9999.00	-2.25	3.13	35.10	0.00	0.00	9999.00	3.126
4.72	20.00	0.00	9999.00	-2.88	3.21	41.44	0.00	0.00	9999.00	3.209
4.85	22.00	0.00	9999.00	-3.51	3.26	47.91	0.00	0.00	9999.00	3.261
4.97	24.00	0.00	9999.00	-4.14	3.28	54.45	0.00	0.00	9999.00	3.282
5.09	26.00	0.00	9999.00	-4.77	3.28	61.01	0.00	0.00	9999.00	3.278
5.20	28.00	0.00	9999.00	-5.39	3.25	67.54	0.00	0.00	9999.00	3.254
5.31	30.00	0.00	9999.00	-6.01	3.21	74.01	0.00	0.00	9999.00	3.214
5.41	32.00	0.00	9999.00	-6.62	3.16	80.39	0.00	0.00	9999.00	3.162
5.50	34.00	0.00	9999.00	-7.22	3.10	86.65	0.00	0.00	9999.00	3.097
5.58	36.00	0.00	9999.00	-7.81	3.02	92.77	-0.00	0.00	9999.00	3.022
5.66	38.00	0.00	9999.00	-8.39	2.94	98.73	-0.00	0.00	9999.00	2.938
5.73	40.00	0.00	9999.00	-8.96	2.84	104.51	-0.00	0.00	9999.00	2.844
5.80	42.00	0.00	9999.00	-9.52	2.74	110.09	-0.00	0.00	9999.00	2.742
5.86	44.00	0.00	9999.00	-10.07	2.64	115.47	-0.00	0.00	9999.00	2.635
5.91	46.00	0.00	9999.00	-10.61	2.53	120.63	-0.00	0.00	9999.00	2.527
5.95	48.00	0.00	9999.00	-11.13	2.42	125.58	-0.00	0.00	9999.00	2.418
5.99	50.00	0.00	9999.00	-11.64	2.31	130.30	-0.00	0.00	9999.00	2.307
6.02	52.00	0.00	9999.00	-12.14	2.19	134.80	-0.00	0.00	9999.00	2.194
6.04	54.00	0.00	9999.00	-12.62	2.08	139.08	-0.00	0.00	9999.00	2.080
6.05	56.00	0.00	9999.00	-13.08	1.96	143.12	-0.00	0.00	9999.00	1.963
6.06	58.00	0.00	9999.00	-13.53	1.85	146.93	-0.00	0.00	9999.00	1.845
6.06	60.00	0.00	9999.00	-13.97	1.73	150.50	-0.00	0.00	9999.00	1.726
6.05	62.00	0.00	9999.00	-14.38	1.61	153.83	-0.00	0.00	9999.00	1.605
6.03	64.00	0.00	9999.00	-14.78	1.48	156.92	-0.00	0.00	9999.00	1.483
6.01	66.00	0.00	9999.00	-15.16	1.36	159.76	-0.00	0.00	9999.00	1.360
5.98	68.00	0.00	9999.00	-15.53	1.24	162.36	-0.00	0.00	9999.00	1.236
5.94	70.00	0.00	9999.00	-15.87	1.11	164.70	-0.00	0.00	9999.00	1.111
5.90	72.00	0.00	9999.00	-16.19	0.98	166.80	-0.00	0.00	9999.00	0.985
5.85	74.00	0.00	9999.00	-16.50	0.86	168.64	-0.00	0.00	9999.00	0.858
5.79	76.00	0.00	9999.00	-16.78	0.73	170.23	-0.00	0.00	9999.00	0.731
5.72	78.00	0.00	9999.00	-17.05	0.60	171.57	-0.00	-0.00	-9999.00	0.603
5.65	80.00	0.00	9999.00	-17.29	0.47	172.64	-0.00	-0.00	-9999.00	0.474
5.57	82.00	0.00	9999.00	-17.51	0.34	173.46	-0.00	-0.00	-9999.00	0.345
5.48	84.00	0.00	9999.00	-17.71	0.21	174.02	-0.00	-0.00	-9999.00	0.215
5.39	86.00	0.00	9999.00	-17.89	0.08	174.32	-0.00	-0.00	-9999.00	0.085
5.29	88.00	0.00	9999.00	-18.05	-0.05	174.36	-0.00	-0.00	-9999.00	-0.047

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*                                  ***  MOSES   ***                                                  *
*                                  ----------------                          18 June, 2025        *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                               *
*          ------   Longitudinal Strength Analysis - Still Water  -- PHASE 1 ------                 *
*                                                                                                   *
*************************************************************************************************************

                  +++ L O N G I T U D I N A L   S T R E N G T H   R E S U L T S +++
                  ================================================================

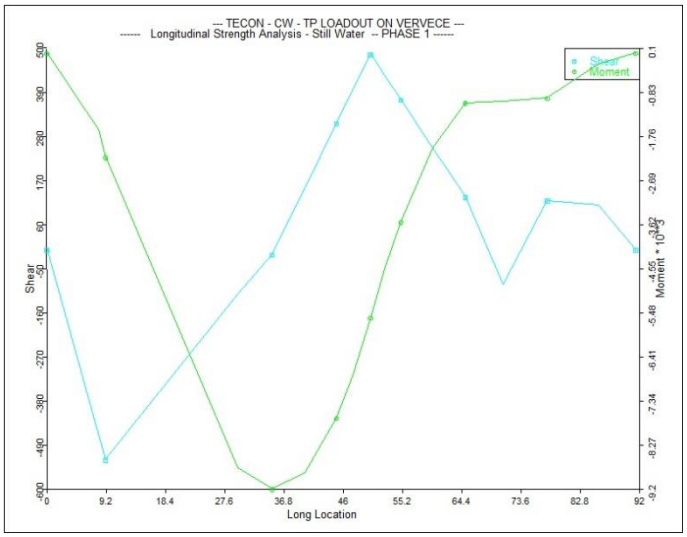
                Process is 1: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Allowable Stress =     155.00 Mpa

                                Allowable Deflection =       1.00 MM

     Longitudinal       Shear          Bending         B. Stress/     Deflection/
       Location         Force           Moment          Allowable      Allowable
    --------------  --------------  --------------  --------------  --------------

           0.00            -1              0          0.0000          0.0000
           8.00          -465          -1630         -0.0644          7.7408
           9.14          -525          -2195         -0.0868          8.8265
          29.72          -112          -8749         -0.3458         23.4979
          35.00           -13          -9197         -0.3635         24.9724
          40.00           150          -8855         -0.3500         25.3342
          45.00           314          -7695         -0.3041         24.7273
          47.50           395          -6809         -0.2691         24.0969
          50.29           486          -5579         -0.2205         23.1732
          52.50           433          -4566         -0.1805         22.3045
          55.00           372          -3559         -0.1407         21.2034
          60.00           251          -2000         -0.0791         18.7296
          65.00           129          -1049         -0.0415         16.0293
          70.87           -88          -1013         -0.0401         12.7045
          77.72           120           -948         -0.0375          8.6192
          85.70           109           -231         -0.0092          3.6388
          91.44            -1              0          0.0000          0.0001
```


--- TECON - CW - TP LOADOUT ON VERVECE ---
------ Longitudinal Strength Analysis - Still Water -- PHASE 1 ------
Shear
Moment
Shear
Moment * 10^3
Long Location
0
9.2
18.4
27.6
36.8
46
55.2
64.4
73.6
82.8
92

```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  -----------------                 18 June, 2025   *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                  *
*        ---------     Intact Stability Check    -- PHASE 2 ---------               *
*                                                                                    *
**************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                     Process is 2: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Results Are Reported In Body System

                        Draft =     4.30 Roll Angle =     0.00 Pitch Angle =     0.00

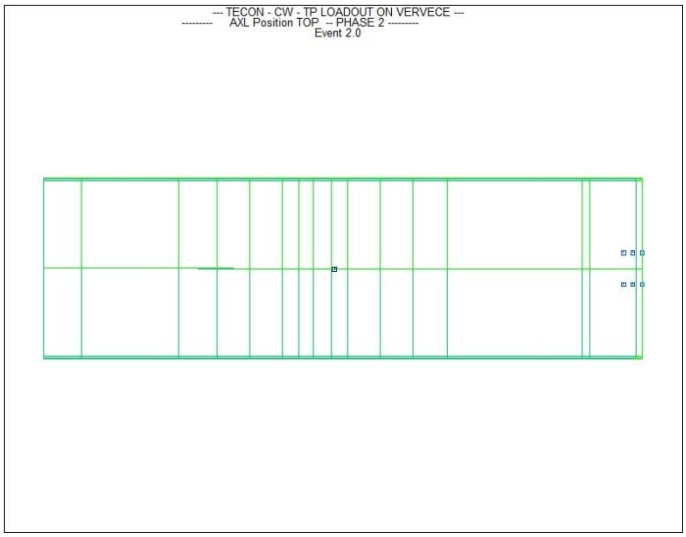
                                    Wet Radii Of Gyration About CG

                               K-X =     7.92 K-Y =    26.00 K-Z =    26.80

                                        GMT =    14.33 GML =   159.47

                               /-- Center of Gravity ---/  Sounding   % Full
                          Name  Weight    ---X---  ---Y---  ---Z---  -------- --------

                               ----------------  Part AXL2       ------------
                               LOAD_GRO    143.70     1.41     0.13     7.10
                               ----------------  Part CF         ------------
                               LOAD_GRO     28.00    69.38    11.22     8.10
                               ----------------  Part GRI&SF-B   ------------
                               LOAD_GRO     75.00    30.86    -1.14     7.35
                               ----------------  Part GRI&SF-C   ------------
                               LOAD_GRO      0.50    67.44    11.22     7.10
                               ----------------  Part GRI&SF-T   ------------
                               LOAD_GRO     45.00    65.20    -2.92     7.40
                               ----------------  Part VERVECE    ------------
                               LOAD_GRO   1832.80    47.02     0.00     3.52
                                            --- Contents ---
                          1PC      224.31     5.62    -3.43     3.77     6.02    98.00
                          1PW      206.33     5.71   -10.28     3.59     5.70    90.00
                          1SC      224.80     5.62     3.43     3.77     6.02    98.00
                          1SW      206.33     5.71    10.28     3.59     5.70    90.00
                          2PC      426.19    19.43    -3.43     1.52     3.05    50.00
                          2PW      335.35    19.43   -10.28     1.20     2.40    39.35
                          2SC      426.19    19.43     3.43     1.52     3.05    50.00
                          2SW      329.98    19.43    10.28     1.19     2.36    38.72
                          3PC      255.71    40.01    -3.43     0.91     1.83    30.00
                          3PW      426.16    40.01   -10.28     1.53     3.05    50.00
                          3SC      255.71    40.01     3.43     0.91     1.83    30.00
                          3SW      426.16    40.01    10.28     1.53     3.05    50.00
                          4PC      835.34    60.58    -3.43     2.99     5.97    98.00
                          4PW      426.16    60.58   -10.28     1.53     3.05    50.00
                          4SC      835.34    60.58     3.43     2.99     5.97    98.00
                          4SW      426.16    60.58    10.28     1.53     3.05    50.00
                          5PC      240.01    83.19    -3.43     1.86     3.42    50.00
                          5PW      595.28    80.18   -10.28     2.55     4.80    76.89
                          5SC      236.24    83.19     3.43     1.86     3.42    50.00
                          5SW      589.87    80.17    10.28     2.52     4.77    76.19
                               ========  ========  =======  =======  =======
                               Total     10052.61    46.76    -0.00     2.57
                               Buoyancy  10052.62    46.76    -0.00     2.21
```




```
                    ********************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 2 ---------                                  *
*                                                                                                        *
**********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 2: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
                    ******************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                          18 June, 2025        *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 2 ---------                                 . *
*                                                                                                       *
*************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 2: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 2.57, and Wind Speed = 10 Knots

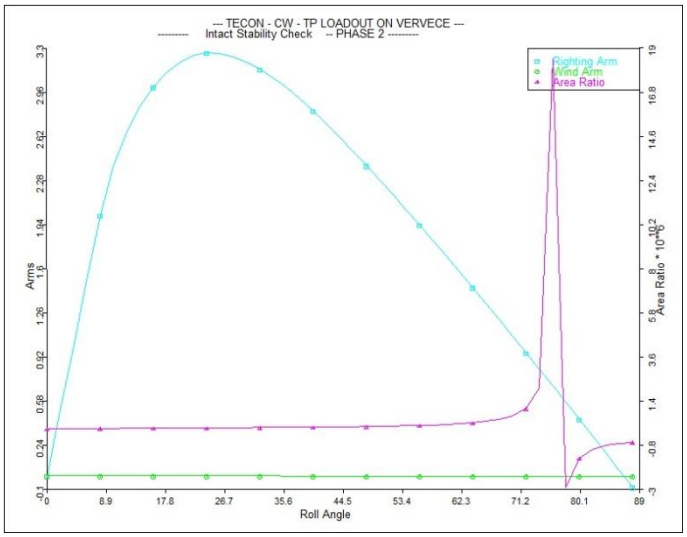
Initial: Roll = 0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	-0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.50	0.50	0.00	0.00	3132.33	0.501
4.29	4.00	0.00	9999.00	1.49	1.00	2.01	0.00	0.00	6439.61	1.005
4.27	6.00	0.00	9999.00	1.03	1.51	4.52	0.00	0.00	9999.00	1.511
4.25	8.00	0.00	9999.00	0.57	2.01	8.04	0.00	0.00	9999.00	2.011
4.26	10.00	0.00	9999.00	0.07	2.39	12.44	0.00	0.00	9999.00	2.390
4.31	12.00	0.00	9999.00	-0.46	2.66	17.49	0.00	0.00	9999.00	2.657
4.39	14.00	0.00	9999.00	-1.04	2.85	23.00	0.00	0.00	9999.00	2.853
4.48	16.00	0.00	9999.00	-1.63	3.00	28.85	0.00	0.00	9999.00	3.000
4.60	18.00	0.00	9999.00	-2.25	3.11	34.97	0.00	0.00	9999.00	3.111
4.72	20.00	0.00	9999.00	-2.88	3.19	41.27	0.00	0.00	9999.00	3.192
4.85	22.00	0.00	9999.00	-3.51	3.24	47.70	0.00	0.00	9999.00	3.243
4.97	24.00	0.00	9999.00	-4.14	3.26	54.21	0.00	0.00	9999.00	3.263
5.09	26.00	0.00	9999.00	-4.77	3.26	60.73	0.00	0.00	9999.00	3.257
5.20	28.00	0.00	9999.00	-5.39	3.23	67.22	0.00	0.00	9999.00	3.233
5.31	30.00	0.00	9999.00	-6.01	3.19	73.64	0.00	0.00	9999.00	3.192
5.41	32.00	0.00	9999.00	-6.62	3.14	79.97	0.00	0.00	9999.00	3.138
5.50	34.00	0.00	9999.00	-7.22	3.07	86.19	0.00	0.00	9999.00	3.073
5.58	36.00	0.00	9999.00	-7.81	3.00	92.25	-0.00	0.00	9999.00	2.997
5.66	38.00	0.00	9999.00	-8.39	2.91	98.16	-0.00	0.00	9999.00	2.912
5.73	40.00	0.00	9999.00	-8.96	2.82	103.89	-0.00	0.00	9999.00	2.818
5.80	42.00	0.00	9999.00	-9.52	2.72	109.43	-0.00	0.00	9999.00	2.717
5.86	44.00	0.00	9999.00	-10.07	2.61	114.76	-0.00	0.00	9999.00	2.612
5.91	46.00	0.00	9999.00	-10.61	2.50	119.87	-0.00	0.00	9999.00	2.504
5.95	48.00	0.00	9999.00	-11.13	2.39	124.77	-0.00	0.00	9999.00	2.394
5.99	50.00	0.00	9999.00	-11.64	2.28	129.45	-0.00	0.00	9999.00	2.282
6.02	52.00	0.00	9999.00	-12.14	2.17	133.90	-0.00	0.00	9999.00	2.168
6.04	54.00	0.00	9999.00	-12.62	2.05	138.12	-0.00	0.00	9999.00	2.053
6.05	56.00	0.00	9999.00	-13.08	1.94	142.11	-0.00	0.00	9999.00	1.936
6.06	58.00	0.00	9999.00	-13.53	1.82	145.86	-0.00	0.00	9999.00	1.817
6.06	60.00	0.00	9999.00	-13.97	1.70	149.37	-0.00	0.00	9999.00	1.697
6.05	62.00	0.00	9999.00	-14.38	1.58	152.65	-0.00	0.00	9999.00	1.576
6.03	64.00	0.00	9999.00	-14.78	1.45	155.67	-0.00	0.00	9999.00	1.453
6.01	66.00	0.00	9999.00	-15.16	1.33	158.46	-0.00	0.00	9999.00	1.329
5.98	68.00	0.00	9999.00	-15.53	1.20	160.99	-0.00	0.00	9999.00	1.204
5.94	70.00	0.00	9999.00	-15.87	1.08	163.27	-0.00	0.00	9999.00	1.078
5.90	72.00	0.00	9999.00	-16.19	0.95	165.30	-0.00	0.00	9999.00	0.951
5.85	74.00	0.00	9999.00	-16.50	0.82	167.07	-0.00	0.00	9999.00	0.824
5.79	76.00	0.00	9999.00	-16.78	0.70	168.59	-0.00	0.00	9999.00	0.696
5.72	78.00	0.00	9999.00	-17.05	0.57	169.86	-0.00	-0.00	-9999.00	0.567
5.65	80.00	0.00	9999.00	-17.29	0.44	170.86	-0.00	-0.00	-9999.00	0.437
5.57	82.00	0.00	9999.00	-17.51	0.31	171.61	-0.00	-0.00	-9999.00	0.307
5.48	84.00	0.00	9999.00	-17.71	0.18	172.09	-0.00	-0.00	-9999.00	0.177
5.39	86.00	0.00	9999.00	-17.89	0.05	172.31	-0.00	-0.00	-9999.00	0.046
5.29	88.00	0.00	9999.00	-18.05	-0.09	172.27	-0.00	-0.00	-9999.00	-0.086

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--- TECON - CW - TP LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 2
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^6
Roll Angle
0
8.9
17.8
26.7
35.6
44.5
53.4
62.3
71.2
80.1
89

```
*******************************************************
*                                *** MOSES ***                                *
*                                ----------------          18 June, 2025      *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                            *
*        ------   Longitudinal Strength Analysis - Still Water  -- PHASE 2 ------*
*                                                                              *
********************************************************************************************************************
```

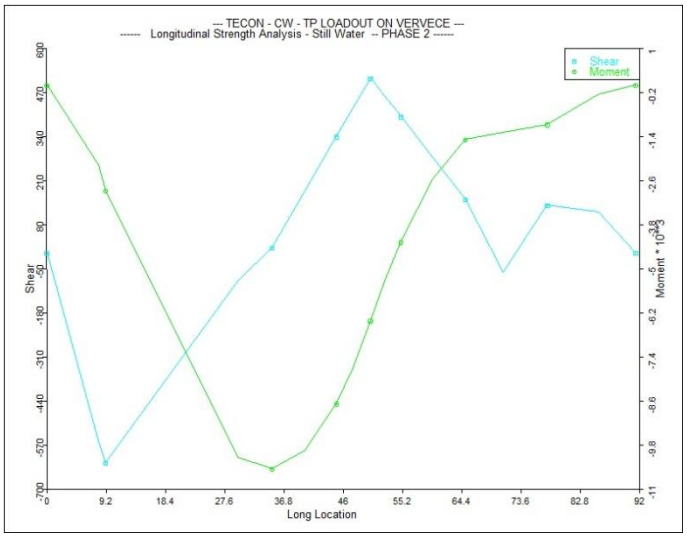
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 2: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-560	-2194	-0.0867	9.1166
9.14	-621	-2869	-0.1134	10.3909
29.72	-86	-10133	-0.4004	27.3756
35.00	13	-10439	-0.4125	29.0368
40.00	177	-9963	-0.3937	29.4340
45.00	341	-8667	-0.3425	28.7406
47.50	422	-7714	-0.3049	28.0257
50.29	512	-6410	-0.2533	26.9783
52.50	459	-5337	-0.2109	25.9916
55.00	399	-4263	-0.1685	24.7368
60.00	278	-2570	-0.1016	21.8989
65.00	156	-1484	-0.0587	18.7723
70.87	-61	-1290	-0.0510	14.8870
77.72	138	-1071	-0.0424	10.0945
85.70	116	-253	-0.0100	4.2595
91.44	-1	0	0.0000	0.0001



```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------                 18 June, 2025    *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                  *
*        ---------     Intact Stability Check    -- PHASE 3 ---------               *
*                                                                                    *
**************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                     Process is 3: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Results Are Reported In Body System

                         Draft =     4.30 Roll Angle =     0.00 Pitch Angle =     0.00

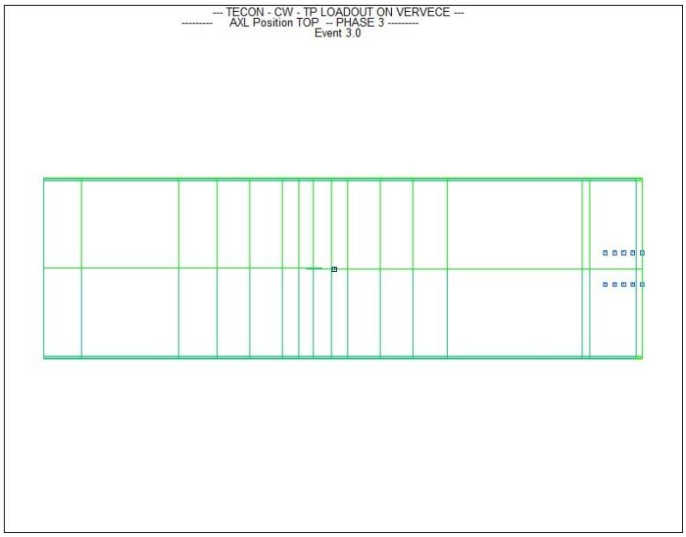
                                    Wet Radii Of Gyration About CG

                                K-X =     7.87 K-Y =    26.21 K-Z =    26.98

                                         GMT =    14.27 GML =   159.44

                                /-- Center of Gravity ---/  Sounding   % Full
                          Name   Weight    ---X---  ---Y---  ---Z---  -------- --------

                                ----------------  Part AXL3       ------------
                                LOAD_GRO    239.50     2.81     0.13     7.10
                                ----------------  Part CF         ------------
                                LOAD_GRO     28.00    69.38    11.22     8.10
                                ----------------  Part GRI&SF-B   ------------
                                LOAD_GRO     75.00    30.86    -1.14     7.35
                                ----------------  Part GRI&SF-C   ------------
                                LOAD_GRO      0.50    67.44    11.22     7.10
                                ----------------  Part GRI&SF-T   ------------
                                LOAD_GRO     45.00    65.20    -2.92     7.40
                                ----------------  Part VERVECE    ------------
                                LOAD_GRO   1832.80    47.02     0.00     3.52
                                             --- Contents ---
                          1PC       224.31     5.62    -3.43     3.77     6.02    98.00
                          1PW       206.33     5.71   -10.28     3.59     5.70    90.00
                          1SC       224.80     5.62     3.43     3.77     6.02    98.00
                          1SW       206.33     5.71    10.28     3.59     5.70    90.00
                          2PC       426.19    19.43    -3.43     1.52     3.05    50.00
                          2PW       276.53    19.43   -10.27     0.99     1.98    32.44
                          2SC       426.19    19.43     3.43     1.52     3.05    50.00
                          2SW       270.54    19.43    10.27     0.97     1.94    31.74
                          3PC       255.71    40.01    -3.43     0.91     1.83    30.00
                          3PW       426.16    40.01   -10.28     1.53     3.05    50.00
                          3SC       255.71    40.01     3.43     0.91     1.83    30.00
                          3SW       426.16    40.01    10.28     1.53     3.05    50.00
                          4PC       835.34    60.58    -3.43     2.99     5.97    98.00
                          4PW       426.16    60.58   -10.28     1.53     3.05    50.00
                          4SC       835.34    60.58     3.43     2.99     5.97    98.00
                          4SW       426.16    60.58    10.28     1.53     3.05    50.00
                          5PC       240.01    83.19    -3.43     1.86     3.42    50.00
                          5PW       606.82    80.19   -10.28     2.59     4.89    78.38
                          5SC       236.24    83.19     3.43     1.86     3.42    50.00
                          5SW       600.79    80.18    10.28     2.57     4.84    77.60
                                ========  ========  =======  =======  =======
                                Total     10052.61    46.75    -0.00     2.62
                                Buoyancy  10052.62    46.75    -0.00     2.21
```




```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                      18 June, 2025              *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                  *
*          ---------     Intact Stability Check    -- PHASE 3 ---------                               *
*                                                                                                     *
*******************************************************************************************************

                          +++ D R A F T   M A R K   R E A D I N G S +++
                          ============================================

                Process is 3: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
*********************************************************
*                                  ***  MOSES   ***                                    *
*                                  ----------------                 18 June, 2025     *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                    *
*        ---------     Intact Stability Check    -- PHASE 3 ---------                 . *
*                                                                                      *
****************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 3: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 2.62, and Wind Speed = 10 Knots

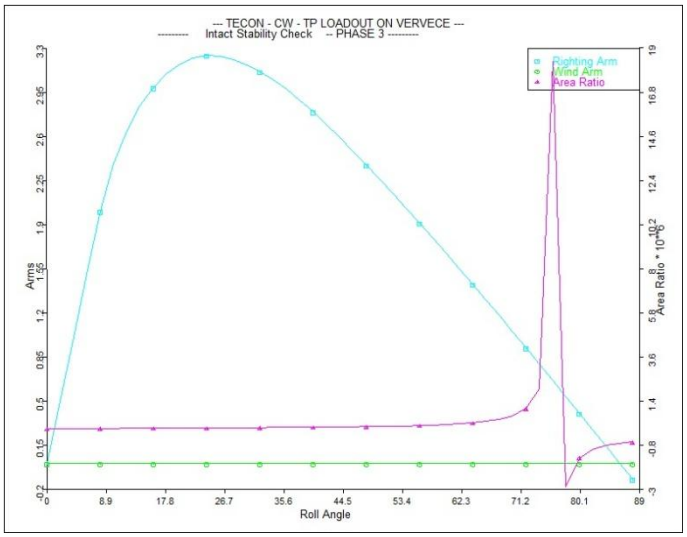
Initial: Roll = 0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	-0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.50	0.50	0.00	0.00	3120.80	0.499
4.29	4.00	0.00	9999.00	1.49	1.00	2.00	0.00	0.00	6415.95	1.001
4.27	6.00	0.00	9999.00	1.03	1.51	4.51	0.00	0.00	9999.00	1.505
4.25	8.00	0.00	9999.00	0.57	2.00	8.01	0.00	0.00	9999.00	2.003
4.26	10.00	0.00	9999.00	0.07	2.38	12.40	0.00	0.00	9999.00	2.380
4.31	12.00	0.00	9999.00	-0.46	2.65	17.42	0.00	0.00	9999.00	2.646
4.39	14.00	0.00	9999.00	-1.04	2.84	22.91	0.00	0.00	9999.00	2.841
4.48	16.00	0.00	9999.00	-1.63	2.99	28.74	0.00	0.00	9999.00	2.986
4.60	18.00	0.00	9999.00	-2.25	3.09	34.82	0.00	0.00	9999.00	3.095
4.72	20.00	0.00	9999.00	-2.88	3.17	41.09	0.00	0.00	9999.00	3.174
4.85	22.00	0.00	9999.00	-3.51	3.22	47.48	0.00	0.00	9999.00	3.223
4.97	24.00	0.00	9999.00	-4.14	3.24	53.95	0.00	0.00	9999.00	3.242
5.09	26.00	0.00	9999.00	-4.77	3.24	60.43	0.00	0.00	9999.00	3.235
5.20	28.00	0.00	9999.00	-5.39	3.21	66.87	0.00	0.00	9999.00	3.209
5.31	30.00	0.00	9999.00	-6.01	3.17	73.25	0.00	0.00	9999.00	3.167
5.41	32.00	0.00	9999.00	-6.62	3.11	79.53	0.00	0.00	9999.00	3.113
5.50	34.00	0.00	9999.00	-7.22	3.05	85.69	0.00	0.00	9999.00	3.047
5.58	36.00	0.00	9999.00	-7.81	2.97	91.71	-0.00	0.00	9999.00	2.971
5.66	38.00	0.00	9999.00	-8.39	2.89	97.56	-0.00	0.00	9999.00	2.887
5.73	40.00	0.00	9999.00	-8.96	2.79	103.24	-0.00	0.00	9999.00	2.794
5.80	42.00	0.00	9999.00	-9.52	2.69	108.73	-0.00	0.00	9999.00	2.693
5.86	44.00	0.00	9999.00	-10.07	2.59	114.01	-0.00	0.00	9999.00	2.588
5.91	46.00	0.00	9999.00	-10.61	2.48	119.08	-0.00	0.00	9999.00	2.480
5.95	48.00	0.00	9999.00	-11.13	2.37	123.93	-0.00	0.00	9999.00	2.371
5.99	50.00	0.00	9999.00	-11.64	2.26	128.56	-0.00	0.00	9999.00	2.259
6.02	52.00	0.00	9999.00	-12.14	2.15	132.97	-0.00	0.00	9999.00	2.146
6.04	54.00	0.00	9999.00	-12.62	2.03	137.14	-0.00	0.00	9999.00	2.030
6.05	56.00	0.00	9999.00	-13.08	1.91	141.08	-0.00	0.00	9999.00	1.911
6.06	58.00	0.00	9999.00	-13.53	1.79	144.79	-0.00	0.00	9999.00	1.792
6.06	60.00	0.00	9999.00	-13.97	1.67	148.25	-0.00	0.00	9999.00	1.671
6.05	62.00	0.00	9999.00	-14.38	1.55	151.47	-0.00	0.00	9999.00	1.548
6.03	64.00	0.00	9999.00	-14.78	1.42	154.44	-0.00	0.00	9999.00	1.425
6.01	66.00	0.00	9999.00	-15.16	1.30	157.16	-0.00	0.00	9999.00	1.300
5.98	68.00	0.00	9999.00	-15.53	1.17	159.64	-0.00	0.00	9999.00	1.174
5.94	70.00	0.00	9999.00	-15.87	1.05	161.86	-0.00	0.00	9999.00	1.047
5.90	72.00	0.00	9999.00	-16.19	0.92	163.82	-0.00	0.00	9999.00	0.919
5.85	74.00	0.00	9999.00	-16.50	0.79	165.53	-0.00	0.00	9999.00	0.791
5.79	76.00	0.00	9999.00	-16.78	0.66	166.98	-0.00	0.00	9999.00	0.662
5.72	78.00	0.00	9999.00	-17.05	0.53	168.18	-0.00	-0.00	-9999.00	0.532
5.65	80.00	0.00	9999.00	-17.29	0.40	169.11	-0.00	-0.00	-9999.00	0.402
5.57	82.00	0.00	9999.00	-17.51	0.27	169.78	-0.00	-0.00	-9999.00	0.271
5.48	84.00	0.00	9999.00	-17.71	0.14	170.19	-0.00	-0.00	-9999.00	0.140
5.39	86.00	0.00	9999.00	-17.89	0.01	170.34	-0.00	-0.00	-9999.00	0.009
5.29	88.00	0.00	9999.00	-18.05	-0.12	170.23	-0.00	-0.00	-9999.00	-0.124

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                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                          18 June, 2025          *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                 *
*          ------   Longitudinal Strength Analysis - Still Water  -- PHASE 3 ------                  *
*                                                                                                     *
*******************************************************************************************************

                  +++ L O N G I T U D I N A L   S T R E N G T H   R E S U L T S +++
                  ================================================================

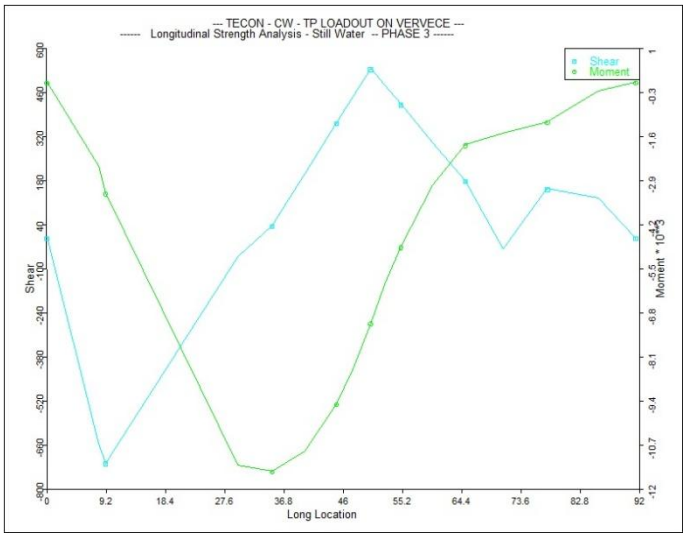
                Process is 3: Units Are Degrees, Meters, and M-Tons Unless Specified

                                Allowable Stress =     155.00 Mpa

                              Allowable Deflection =       1.00 MM

  Longitudinal       Shear          Bending         B. Stress/     Deflection/
    Location         Force           Moment          Allowable      Allowable
 --------------  --------------  --------------  --------------  --------------

       0.00             -1               0          0.0000          0.0000
       8.00           -656           -2490         -0.0984         10.2094
       9.14           -717           -3275         -0.1294         11.6369
      29.72            -63          -11291         -0.4462         30.5562
      35.00             36          -11479         -0.4536         32.3790
      40.00            200          -10890         -0.4304         32.8114
      45.00            363           -9482         -0.3747         32.0507
      47.50            444           -8472         -0.3348         31.2679
      50.29            535           -7105         -0.2808         30.1198
      52.50            482           -5982         -0.2364         29.0365
      55.00            422           -4852         -0.1918         27.6556
      60.00            301           -3046         -0.1204         24.5187
      65.00            179           -1848         -0.0731         21.0401
      70.87            -38           -1522         -0.0602         16.6920
      77.72            153           -1174         -0.0464         11.3147
      85.70            123            -271         -0.0107          4.7729
      91.44             -1               0          0.0000          0.0001
```


--- TECON - CW - TP LOADOUT ON VERVECE ---
------ Longitudinal Strength Analysis - Still Water -- PHASE 3 ------
Shear
Moment
Shear
Moment * 10^3
Long Location
600
460
320
180
40
-100
-240
-380
-520
-660
-800
1
-0.3
-1.6
-2.9
-4.2
-5.5
-6.8
-8.1
-9.4
-10.7
-12
0
9.2
18.4
27.6
36.8
46
55.2
64.4
73.6
82.8
92

```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------                 18 June, 2025    *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                  *
*        ---------     Intact Stability Check    -- PHASE 4 ---------               *
*                                                                                    *
**************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                     Process is 4: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Results Are Reported In Body System

                        Draft =     4.30 Roll Angle =     0.00 Pitch Angle =     0.00

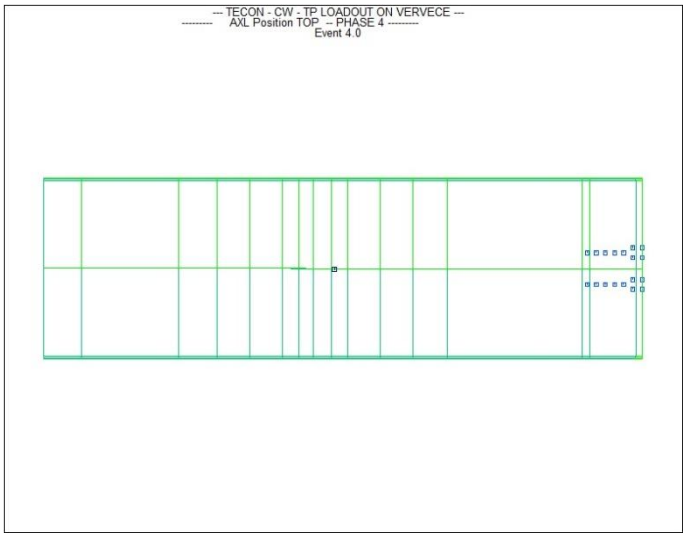
                                    Wet Radii Of Gyration About CG

                               K-X =     7.83 K-Y =    26.33 K-Z =    27.08

                                        GMT =    14.22 GML =   159.40

                               /-- Center of Gravity ---/  Sounding   % Full
                          Name  Weight    ---X---  ---Y---  ---Z---  -------- --------

                               ----------------  Part AXL4       ------------
                               LOAD_GRO    324.40     4.33     0.11     7.10
                               ----------------  Part CF         ------------
                               LOAD_GRO     28.00    69.38    11.22     8.10
                               ----------------  Part GRI&SF-B   ------------
                               LOAD_GRO     75.00    30.86    -1.14     7.35
                               ----------------  Part GRI&SF-C   ------------
                               LOAD_GRO      0.50    67.44    11.22     7.10
                               ----------------  Part GRI&SF-T   ------------
                               LOAD_GRO     45.00    65.20    -2.92     7.40
                               ----------------  Part VERVECE    ------------
                               LOAD_GRO   1832.80    47.02     0.00     3.52
                                            --- Contents ---
                          1PC      224.31     5.62    -3.43     3.77     6.02    98.00
                          1PW      206.33     5.71   -10.28     3.59     5.70    90.00
                          1SC      224.80     5.62     3.43     3.77     6.02    98.00
                          1SW      206.33     5.71    10.28     3.59     5.70    90.00
                          2PC      426.19    19.43    -3.43     1.52     3.05    50.00
                          2PW      226.82    19.43   -10.27     0.82     1.63    26.61
                          2SC      426.19    19.43     3.43     1.52     3.05    50.00
                          2SW      220.59    19.43    10.27     0.79     1.58    25.88
                          3PC      255.71    40.01    -3.43     0.91     1.83    30.00
                          3PW      426.16    40.01   -10.28     1.53     3.05    50.00
                          3SC      255.71    40.01     3.43     0.91     1.83    30.00
                          3SW      426.16    40.01    10.28     1.53     3.05    50.00
                          4PC      835.34    60.58    -3.43     2.99     5.97    98.00
                          4PW      426.16    60.58   -10.28     1.53     3.05    50.00
                          4SC      835.34    60.58     3.43     2.99     5.97    98.00
                          4SW      426.16    60.58    10.28     1.53     3.05    50.00
                          5PC      240.01    83.19    -3.43     1.86     3.42    50.00
                          5PW      614.33    80.21   -10.28     2.62     4.94    79.35
                          5SC      236.24    83.19     3.43     1.86     3.42    50.00
                          5SW      608.04    80.20    10.28     2.59     4.90    78.54
                               ========  ========  =======  =======  =======
                               Total     10052.61    46.75    -0.00     2.67
                               Buoyancy  10052.62    46.75    -0.00     2.21
```




```
                    ********************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 4 ---------                                  *
*                                                                                                        *
**********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 4: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
*********************************************************
*                                  ***  MOSES   ***                                    *
*                                  ----------------                 18 June, 2025     *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                    *
*        ---------     Intact Stability Check    -- PHASE 4 ---------                 . *
*                                                                                      *
****************************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 4: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 2.67, and Wind Speed = 10 Knots

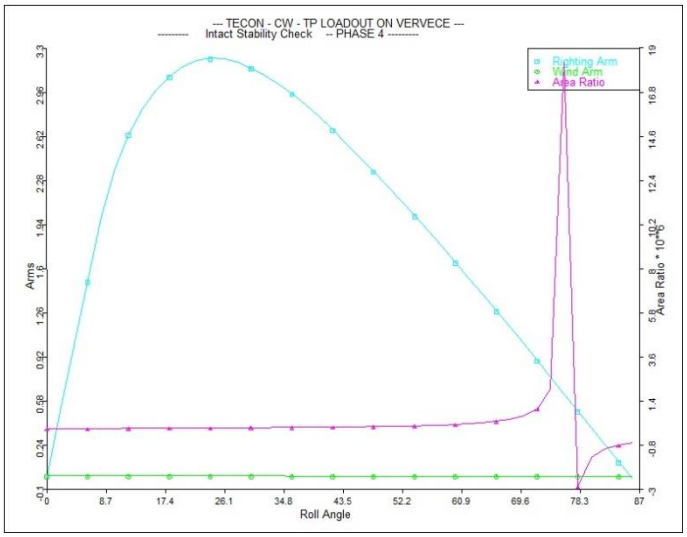
Initial: Roll = 0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	-0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.50	0.50	0.00	0.00	3110.03	0.497
4.29	4.00	0.00	9999.00	1.49	1.00	1.99	0.00	0.00	6393.83	0.998
4.27	6.00	0.00	9999.00	1.03	1.50	4.49	0.00	0.00	9999.00	1.500
4.25	8.00	0.00	9999.00	0.57	2.00	7.99	0.00	0.00	9999.00	1.997
4.26	10.00	0.00	9999.00	0.07	2.37	12.35	0.00	0.00	9999.00	2.372
4.31	12.00	0.00	9999.00	-0.46	2.64	17.36	0.00	0.00	9999.00	2.636
4.39	14.00	0.00	9999.00	-1.04	2.83	22.83	0.00	0.00	9999.00	2.828
4.48	16.00	0.00	9999.00	-1.63	2.97	28.63	0.00	0.00	9999.00	2.972
4.60	18.00	0.00	9999.00	-2.25	3.08	34.68	0.00	0.00	9999.00	3.079
4.72	20.00	0.00	9999.00	-2.88	3.16	40.92	0.00	0.00	9999.00	3.157
4.85	22.00	0.00	9999.00	-3.51	3.21	47.28	0.00	0.00	9999.00	3.205
4.97	24.00	0.00	9999.00	-4.14	3.22	53.71	0.00	0.00	9999.00	3.222
5.09	26.00	0.00	9999.00	-4.77	3.21	60.14	0.00	0.00	9999.00	3.215
5.20	28.00	0.00	9999.00	-5.39	3.19	66.55	0.00	0.00	9999.00	3.188
5.31	30.00	0.00	9999.00	-6.01	3.15	72.88	0.00	0.00	9999.00	3.146
5.41	32.00	0.00	9999.00	-6.62	3.09	79.12	0.00	0.00	9999.00	3.091
5.50	34.00	0.00	9999.00	-7.22	3.03	85.23	0.00	0.00	9999.00	3.026
5.58	36.00	0.00	9999.00	-7.81	2.95	91.21	-0.00	0.00	9999.00	2.950
5.66	38.00	0.00	9999.00	-8.39	2.87	97.03	-0.00	0.00	9999.00	2.865
5.73	40.00	0.00	9999.00	-8.96	2.77	102.66	-0.00	0.00	9999.00	2.772
5.80	42.00	0.00	9999.00	-9.52	2.67	108.11	-0.00	0.00	9999.00	2.671
5.86	44.00	0.00	9999.00	-10.07	2.57	113.35	-0.00	0.00	9999.00	2.566
5.91	46.00	0.00	9999.00	-10.61	2.46	118.37	-0.00	0.00	9999.00	2.459
5.95	48.00	0.00	9999.00	-11.13	2.35	123.18	-0.00	0.00	9999.00	2.350
5.99	50.00	0.00	9999.00	-11.64	2.24	127.77	-0.00	0.00	9999.00	2.238
6.02	52.00	0.00	9999.00	-12.14	2.12	132.13	-0.00	0.00	9999.00	2.125
6.04	54.00	0.00	9999.00	-12.62	2.01	136.26	-0.00	0.00	9999.00	2.009
6.05	56.00	0.00	9999.00	-13.08	1.89	140.16	-0.00	0.00	9999.00	1.891
6.06	58.00	0.00	9999.00	-13.53	1.77	143.83	-0.00	0.00	9999.00	1.771
6.06	60.00	0.00	9999.00	-13.97	1.65	147.25	-0.00	0.00	9999.00	1.649
6.05	62.00	0.00	9999.00	-14.38	1.53	150.42	-0.00	0.00	9999.00	1.525
6.03	64.00	0.00	9999.00	-14.78	1.40	153.35	-0.00	0.00	9999.00	1.401
6.01	66.00	0.00	9999.00	-15.16	1.27	156.02	-0.00	0.00	9999.00	1.275
5.98	68.00	0.00	9999.00	-15.53	1.15	158.44	-0.00	0.00	9999.00	1.148
5.94	70.00	0.00	9999.00	-15.87	1.02	160.61	-0.00	0.00	9999.00	1.020
5.90	72.00	0.00	9999.00	-16.19	0.89	162.52	-0.00	0.00	9999.00	0.892
5.85	74.00	0.00	9999.00	-16.50	0.76	164.18	-0.00	0.00	9999.00	0.762
5.79	76.00	0.00	9999.00	-16.78	0.63	165.57	-0.00	0.00	9999.00	0.632
5.72	78.00	0.00	9999.00	-17.05	0.50	166.71	-0.00	-0.00	-9999.00	0.502
5.65	80.00	0.00	9999.00	-17.29	0.37	167.58	-0.00	-0.00	-9999.00	0.371
5.57	82.00	0.00	9999.00	-17.51	0.24	168.19	-0.00	-0.00	-9999.00	0.239
5.48	84.00	0.00	9999.00	-17.71	0.11	168.54	-0.00	-0.00	-9999.00	0.108
5.39	86.00	0.00	9999.00	-17.89	-0.02	168.62	-0.00	-0.00	-9999.00	-0.025

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--- TECON - CW - TP LOADOUT ON VERVECE ---
--------- Intact Stability Check -- PHASE 4 ---------
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^-6
Roll Angle
0
8.7
17.4
26.1
34.8
43.5
52.2
60.9
69.6
78.3
87

```
*********************************************************
*                                  ***  MOSES   ***                                    *
*                                  ----------------                  18 June, 2025    *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                    *
*        ------   Longitudinal Strength Analysis - Still Water  -- PHASE 4 ------     *
*                                                                                      *
****************************************************************************************************************

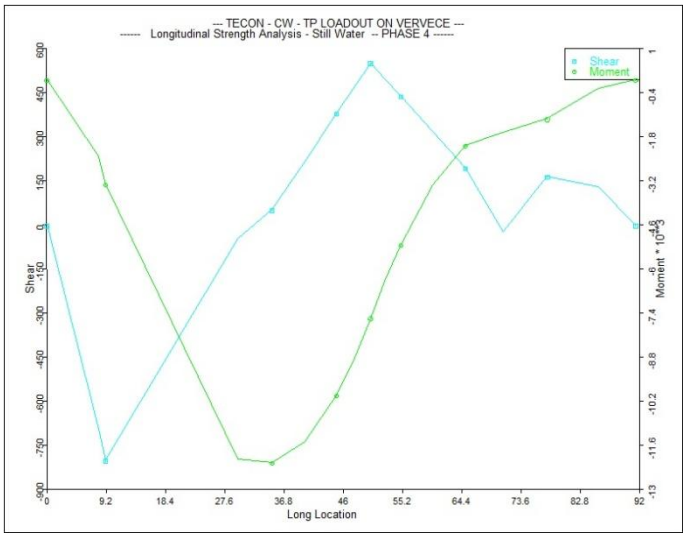
                    +++ L O N G I T U D I N A L   S T R E N G T H   R E S U L T S +++
                    ================================================================

                Process is 4: Units Are Degrees, Meters, and M-Tons Unless Specified

                                    Allowable Stress =     155.00 Mpa

                                  Allowable Deflection =       1.00 MM
```

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-693	-2458	-0.0972	10.8624
9.14	-802	-3320	-0.1312	12.3842
29.72	-48	-12057	-0.4765	32.5734
35.00	50	-12165	-0.4807	34.5101
40.00	215	-11502	-0.4545	34.9722
45.00	378	-10020	-0.3960	34.1738
47.50	459	-8973	-0.3546	33.3495
50.29	550	-7564	-0.2989	32.1387
52.50	497	-6408	-0.2533	30.9944
55.00	437	-5241	-0.2071	29.5338
60.00	315	-3360	-0.1328	26.2059
65.00	193	-2088	-0.0825	22.5018
70.87	-24	-1675	-0.0662	17.8559
77.72	163	-1242	-0.0491	12.1018
85.70	127	-283	-0.0112	5.1042
91.44	-1	0	0.0000	0.0001



```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------                 18 June, 2025    *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                  *
*        ---------     Intact Stability Check    -- PHASE 5 ---------               *
*                                                                                    *
**************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                     Process is 5: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Results Are Reported In Body System

                        Draft =     4.30 Roll Angle =     0.00 Pitch Angle =     0.00

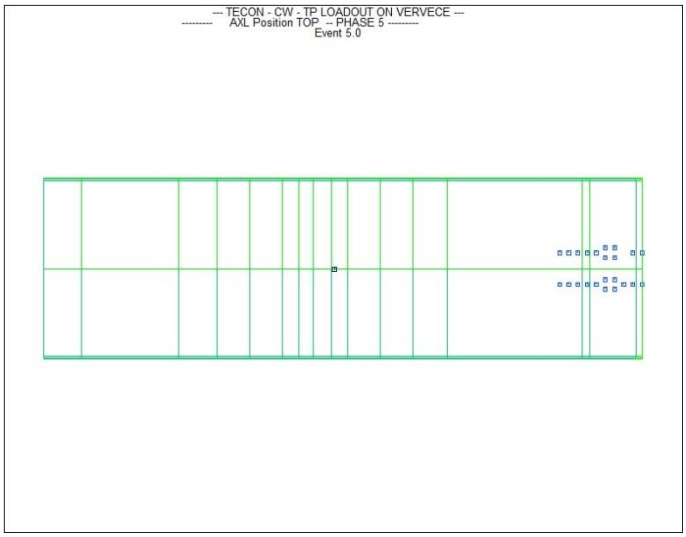
                                    Wet Radii Of Gyration About CG

                                K-X =     7.78 K-Y =    26.37 K-Z =    27.10

                                        GMT =    14.17 GML =   159.35

                                /-- Center of Gravity ---/  Sounding   % Full
                          Name   Weight    ---X---  ---Y---  ---Z---  -------- --------

                                ----------------  Part AXL5       ------------
                                LOAD_GRO    416.90     6.89     0.16     7.10
                                ----------------  Part CF         ------------
                                LOAD_GRO     28.00    69.38    11.22     8.10
                                ----------------  Part GRI&SF-B   ------------
                                LOAD_GRO     75.00    30.86    -1.14     7.35
                                ----------------  Part GRI&SF-C   ------------
                                LOAD_GRO      0.50    67.44    11.22     7.10
                                ----------------  Part GRI&SF-T   ------------
                                LOAD_GRO     45.00    65.20    -2.92     7.40
                                ----------------  Part VERVECE    ------------
                                LOAD_GRO   1832.80    47.02     0.00     3.52
                                             --- Contents ---
                          1PC      224.31     5.62    -3.43     3.77     6.02    98.00
                          1PW      206.33     5.71   -10.28     3.59     5.70    90.00
                          1SC      224.80     5.62     3.43     3.77     6.02    98.00
                          1SW      206.33     5.71    10.28     3.59     5.70    90.00
                          2PC      426.19    19.43    -3.43     1.52     3.05    50.00
                          2PW      178.73    19.43   -10.27     0.64     1.28    20.97
                          2SC      426.19    19.43     3.43     1.52     3.05    50.00
                          2SW      170.99    19.43    10.27     0.62     1.23    20.06
                          3PC      255.71    40.01    -3.43     0.91     1.83    30.00
                          3PW      426.16    40.01   -10.28     1.53     3.05    50.00
                          3SC      255.71    40.01     3.43     0.91     1.83    30.00
                          3SW      426.16    40.01    10.28     1.53     3.05    50.00
                          4PC      835.34    60.58    -3.43     2.99     5.97    98.00
                          4PW      426.16    60.58   -10.28     1.53     3.05    50.00
                          4SC      835.34    60.58     3.43     2.99     5.97    98.00
                          4SW      426.16    60.58    10.28     1.53     3.05    50.00
                          5PC      240.01    83.19    -3.43     1.86     3.42    50.00
                          5PW      617.69    80.21   -10.28     2.63     4.97    79.78
                          5SC      236.24    83.19     3.43     1.86     3.42    50.00
                          5SW      609.88    80.20    10.28     2.60     4.91    78.77
                                ========  ========  =======  =======  =======
                                Total     10052.61    46.75    -0.00     2.72
                                Buoyancy  10052.61    46.75    -0.00     2.21
```




```
                    ********************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 5 ---------                                  *
*                                                                                                        *
**********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 5: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
*********************************************************
*                                  ***  MOSES   ***                                    *
*                                  ----------------                 18 June, 2025     *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                    *
*        ---------     Intact Stability Check    -- PHASE 5 ---------                 . *
*                                                                                      *
****************************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 5: Units Are Degrees, Meters, and M-Tons Unless Specified

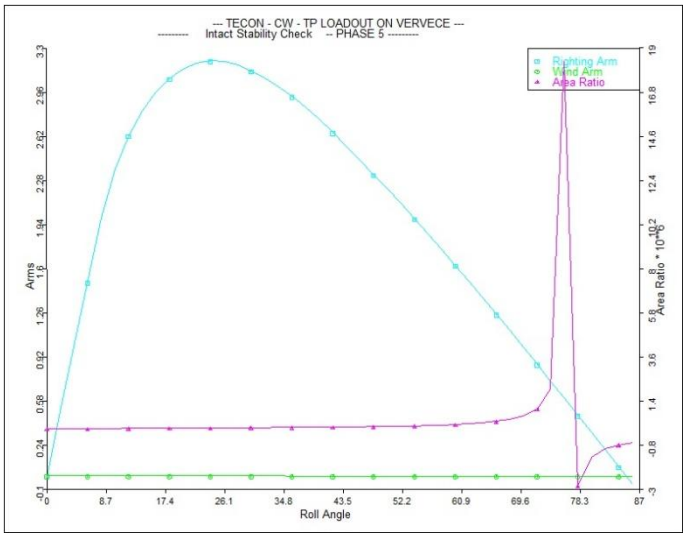
Moment Scaled By 10052.61, KG = 2.72, and Wind Speed = 10 Knots

Initial: Roll = 0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	-0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.50	0.50	0.00	0.00	3098.21	0.495
4.29	4.00	0.00	9999.00	1.49	0.99	1.98	0.00	0.00	6369.66	0.994
4.27	6.00	0.00	9999.00	1.03	1.49	4.47	0.00	0.00	9999.00	1.494
4.25	8.00	0.00	9999.00	0.57	1.99	7.96	0.00	0.00	9999.00	1.989
4.26	10.00	0.00	9999.00	0.08	2.36	12.31	0.00	0.00	9999.00	2.362
4.31	12.00	0.00	9999.00	-0.46	2.62	17.29	0.00	0.00	9999.00	2.624
4.39	14.00	0.00	9999.00	-1.04	2.82	22.73	0.00	0.00	9999.00	2.815
4.48	16.00	0.00	9999.00	-1.63	2.96	28.51	0.00	0.00	9999.00	2.957
4.60	18.00	0.00	9999.00	-2.25	3.06	34.53	0.00	0.00	9999.00	3.063
4.72	20.00	0.00	9999.00	-2.88	3.14	40.73	0.00	0.00	9999.00	3.139
4.85	22.00	0.00	9999.00	-3.51	3.19	47.06	0.00	0.00	9999.00	3.186
4.97	24.00	0.00	9999.00	-4.14	3.20	53.44	0.00	0.00	9999.00	3.202
5.09	26.00	0.00	9999.00	-4.77	3.19	59.84	0.00	0.00	9999.00	3.194
5.20	28.00	0.00	9999.00	-5.39	3.17	66.20	0.00	0.00	9999.00	3.167
5.31	30.00	0.00	9999.00	-6.01	3.12	72.49	0.00	0.00	9999.00	3.125
5.41	32.00	0.00	9999.00	-6.62	3.07	78.69	0.00	0.00	9999.00	3.070
5.50	34.00	0.00	9999.00	-7.22	3.00	84.76	0.00	0.00	9999.00	3.004
5.58	36.00	0.00	9999.00	-7.81	2.93	90.69	-0.00	0.00	9999.00	2.928
5.66	38.00	0.00	9999.00	-8.39	2.84	96.47	-0.00	0.00	9999.00	2.843
5.73	40.00	0.00	9999.00	-8.96	2.75	102.06	-0.00	0.00	9999.00	2.750
5.80	42.00	0.00	9999.00	-9.52	2.65	107.46	-0.00	0.00	9999.00	2.648
5.86	44.00	0.00	9999.00	-10.07	2.54	112.65	-0.00	0.00	9999.00	2.543
5.91	46.00	0.00	9999.00	-10.61	2.44	117.63	-0.00	0.00	9999.00	2.435
5.95	48.00	0.00	9999.00	-11.13	2.33	122.39	-0.00	0.00	9999.00	2.326
5.99	50.00	0.00	9999.00	-11.64	2.21	126.93	-0.00	0.00	9999.00	2.214
6.02	52.00	0.00	9999.00	-12.14	2.10	131.24	-0.00	0.00	9999.00	2.100
6.04	54.00	0.00	9999.00	-12.62	1.98	135.33	-0.00	0.00	9999.00	1.984
6.05	56.00	0.00	9999.00	-13.08	1.87	139.18	-0.00	0.00	9999.00	1.866
6.06	58.00	0.00	9999.00	-13.53	1.75	142.79	-0.00	0.00	9999.00	1.746
6.06	60.00	0.00	9999.00	-13.97	1.62	146.16	-0.00	0.00	9999.00	1.624
6.05	62.00	0.00	9999.00	-14.38	1.50	149.28	-0.00	0.00	9999.00	1.501
6.03	64.00	0.00	9999.00	-14.78	1.38	152.16	-0.00	0.00	9999.00	1.375
6.01	66.00	0.00	9999.00	-15.16	1.25	154.78	-0.00	0.00	9999.00	1.248
5.98	68.00	0.00	9999.00	-15.53	1.12	157.15	-0.00	0.00	9999.00	1.120
5.94	70.00	0.00	9999.00	-15.87	0.99	159.26	-0.00	0.00	9999.00	0.991
5.90	72.00	0.00	9999.00	-16.19	0.86	161.11	-0.00	0.00	9999.00	0.862
5.85	74.00	0.00	9999.00	-16.50	0.73	162.71	-0.00	0.00	9999.00	0.731
5.79	76.00	0.00	9999.00	-16.78	0.60	164.04	-0.00	0.00	9999.00	0.601
5.72	78.00	0.00	9999.00	-17.05	0.47	165.11	-0.00	-0.00	-9999.00	0.469
5.65	80.00	0.00	9999.00	-17.29	0.34	165.92	-0.00	-0.00	-9999.00	0.337
5.57	82.00	0.00	9999.00	-17.51	0.20	166.46	-0.00	-0.00	-9999.00	0.205
5.48	84.00	0.00	9999.00	-17.71	0.07	166.73	-0.00	-0.00	-9999.00	0.072
5.39	86.00	0.00	9999.00	-17.89	-0.06	166.75	-0.00	-0.00	-9999.00	-0.061


--- TECON - CW - TP LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 5
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^6
Roll Angle
0
8.7
17.4
26.1
34.8
43.5
52.2
60.9
69.6
78.3
87

```
**********************************************************
*                                  ***  MOSES    ***                                  *
*                                  ----------------                    18 June, 2025  *
*         --- TECON - CW - TP LOADOUT ON VERVECE ---                                  *
*         ------   Longitudinal Strength Analysis - Still Water  -- PHASE 5 ------   *
*                                                                                     *
***************************************************************************************************************

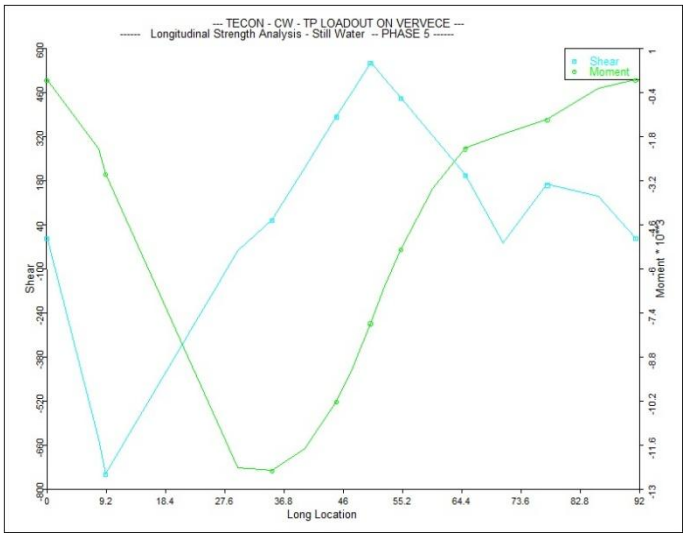
                    +++ L O N G I T U D I N A L   S T R E N G T H   R E S U L T S +++
                    ================================================================

                  Process is 5: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Allowable Stress =     155.00 Mpa

                                Allowable Deflection =       1.00 MM
```

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-642	-2192	-0.0867	10.9526
9.14	-751	-2996	-0.1184	12.4910
29.72	-43	-12332	-0.4873	33.1034
35.00	56	-12412	-0.4905	35.0974
40.00	220	-11722	-0.4632	35.5857
45.00	383	-10213	-0.4036	34.7892
47.50	465	-9152	-0.3617	33.9578
50.29	555	-7728	-0.3054	32.7332
52.50	502	-6561	-0.2593	31.5741
55.00	442	-5380	-0.2126	30.0923
60.00	321	-3473	-0.1373	26.7117
65.00	199	-2173	-0.0859	22.9424
70.87	-18	-1729	-0.0684	18.2081
77.72	167	-1266	-0.0501	12.3405
85.70	128	-286	-0.0114	5.2047
91.44	-1	0	0.0000	0.0001



```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                          18 June, 2025        *
*         --- TECON - CW - TP LOADOUT ON VERVECE ---                                                  *
*         ---------     Intact Stability Check    -- PHASE 6 ---------                               *
*                                                                                                     *
*******************************************************************************************************************

                +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                ======================================================================

                 Process is 6: Units Are Degrees, Meters, and M-Tons Unless Specified

                              Results Are Reported In Body System

                     Draft =     4.30 Roll Angle =    -0.00 Pitch Angle =    -0.00

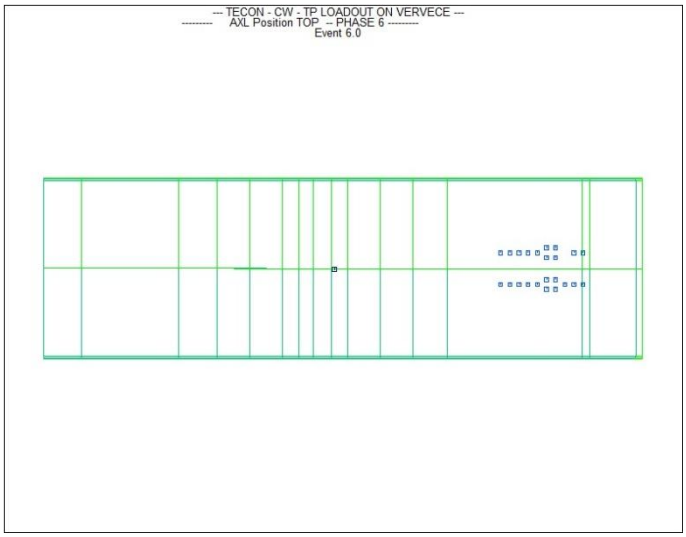
                                 Wet Radii Of Gyration About CG

                           K-X =     7.78 K-Y =    25.81 K-Z =    26.55

                                    GMT =    14.19 GML =   159.34

                           /-- Center of Gravity ---/  Sounding   % Full
                    Name    Weight    ---X---  ---Y---  ---Z---  -------- --------

                           ----------------  Part AXL6       ------------
                           LOAD_GRO    416.90    15.89     0.16     7.10
                           ----------------  Part CF         ------------
                           LOAD_GRO     28.00    69.38    11.22     8.10
                           ----------------  Part GRI&SF-B   ------------
                           LOAD_GRO     75.00    30.86    -1.14     7.35
                           ----------------  Part GRI&SF-C   ------------
                           LOAD_GRO      0.50    67.44    11.22     7.10
                           ----------------  Part GRI&SF-T   ------------
                           LOAD_GRO     45.00    65.20    -2.92     7.40
                           ----------------  Part VERVECE    ------------
                           LOAD_GRO   1832.80    47.02     0.00     3.52
                                        --- Contents ---
                      1PC      224.31     5.62    -3.43     3.77     6.02    98.00
                      1PW      206.33     5.71   -10.28     3.59     5.70    90.00
                      1SC      224.80     5.62     3.43     3.77     6.02    98.00
                      1SW      206.33     5.71    10.28     3.59     5.70    90.00
                      2PC      426.19    19.43    -3.43     1.52     3.05    50.00
                      2PW      209.63    19.43   -10.27     0.75     1.50    24.60
                      2SC      426.19    19.43     3.43     1.52     3.05    50.00
                      2SW      201.90    19.43    10.27     0.73     1.45    23.69
                      3PC      255.71    40.00    -3.43     0.91     1.83    30.00
                      3PW      426.16    40.00   -10.28     1.53     3.05    50.00
                      3SC      255.71    40.00     3.43     0.91     1.83    30.00
                      3SW      426.16    40.00    10.28     1.53     3.05    50.00
                      4PC      835.34    60.58    -3.43     2.99     5.97    98.00
                      4PW      426.16    60.58   -10.28     1.53     3.05    50.00
                      4SC      835.34    60.58     3.43     2.99     5.97    98.00
                      4SW      426.16    60.58    10.28     1.53     3.05    50.00
                      5PC      240.01    83.19    -3.43     1.86     3.42    50.00
                      5PW      586.78    80.16   -10.28     2.51     4.74    75.79
                      5SC      236.24    83.19     3.43     1.86     3.42    50.00
                      5SW      578.97    80.15    10.28     2.48     4.69    74.78
                           ========  ========  =======  =======  =======
                           Total     10052.61    46.75     0.00     2.70
                           Buoyancy  10052.60    46.75     0.00     2.21
```




```
                    ********************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 6 ---------                                 *
*                                                                                                        *
**********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 6: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
*********************************************************
*                                  ***  MOSES   ***                                    *
*                                  ----------------                 18 June, 2025     *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                    *
*        ---------     Intact Stability Check    -- PHASE 6 ---------                 . *
*                                                                                      *
****************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 6: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 2.70, and Wind Speed = 10 Knots

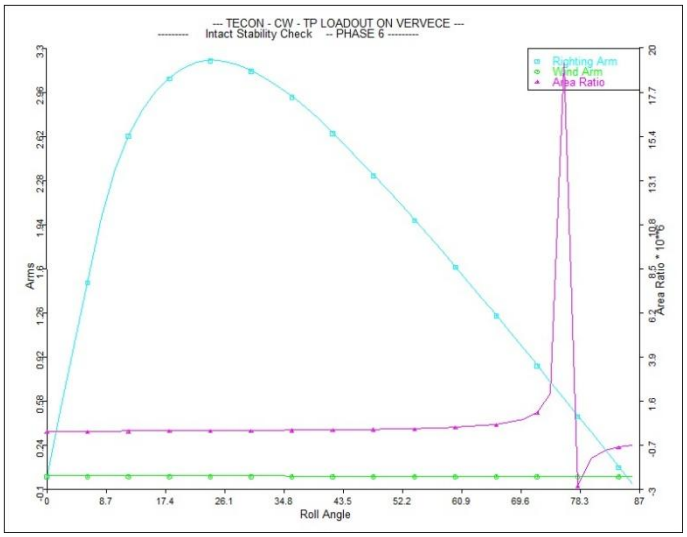
Initial: Roll = -0.00, Trim = -0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.39	0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.50	0.50	0.00	0.00	3103.10	0.496
4.29	4.00	0.00	9999.00	1.48	1.00	1.99	0.00	0.00	6379.58	0.995
4.27	6.00	0.00	9999.00	1.03	1.50	4.48	0.00	0.00	9999.00	1.497
4.25	8.00	0.00	9999.00	0.57	1.99	7.97	0.00	0.00	9999.00	1.992
4.26	10.00	0.00	9999.00	0.07	2.37	12.33	0.00	0.00	9999.00	2.366
4.31	12.00	0.00	9999.00	-0.47	2.63	17.32	0.00	0.00	9999.00	2.629
4.39	14.00	0.00	9999.00	-1.04	2.82	22.77	0.00	0.00	9999.00	2.821
4.49	16.00	0.00	9999.00	-1.63	2.96	28.56	0.00	0.00	9999.00	2.963
4.60	18.00	0.00	9999.00	-2.25	3.07	34.59	0.00	0.00	9999.00	3.069
4.72	20.00	0.00	9999.00	-2.88	3.15	40.80	0.00	0.00	9999.00	3.146
4.85	22.00	0.00	9999.00	-3.51	3.19	47.14	0.00	0.00	9999.00	3.192
4.98	24.00	0.00	9999.00	-4.15	3.21	53.54	0.00	0.00	9999.00	3.208
5.09	26.00	0.00	9999.00	-4.77	3.20	59.95	0.00	0.00	9999.00	3.198
5.20	28.00	0.00	9999.00	-5.40	3.17	66.32	0.00	0.00	9999.00	3.170
5.31	30.00	0.00	9999.00	-6.01	3.13	72.61	0.00	0.00	9999.00	3.127
5.41	32.00	0.00	9999.00	-6.62	3.07	78.81	0.00	0.00	9999.00	3.071
5.50	34.00	0.00	9999.00	-7.22	3.00	84.89	0.00	0.00	9999.00	3.005
5.59	36.00	0.00	9999.00	-7.81	2.93	90.82	-0.00	0.00	9999.00	2.928
5.66	38.00	0.00	9999.00	-8.39	2.84	96.59	-0.00	0.00	9999.00	2.842
5.74	40.00	0.00	9999.00	-8.96	2.75	102.18	-0.00	0.00	9999.00	2.748
5.80	42.00	0.00	9999.00	-9.52	2.65	107.58	-0.00	0.00	9999.00	2.646
5.86	44.00	0.00	9999.00	-10.07	2.54	112.76	-0.00	0.00	9999.00	2.540
5.91	46.00	0.00	9999.00	-10.61	2.43	117.74	-0.00	0.00	9999.00	2.432
5.95	48.00	0.00	9999.00	-11.13	2.32	122.49	-0.00	0.00	9999.00	2.322
5.99	50.00	0.00	9999.00	-11.64	2.21	127.02	-0.00	0.00	9999.00	2.210
6.02	52.00	0.00	9999.00	-12.14	2.10	131.33	-0.00	0.00	9999.00	2.095
6.04	54.00	0.00	9999.00	-12.62	1.98	135.40	-0.00	0.00	9999.00	1.979
6.05	56.00	0.00	9999.00	-13.09	1.86	139.24	-0.00	0.00	9999.00	1.860
6.06	58.00	0.00	9999.00	-13.54	1.74	142.84	-0.00	0.00	9999.00	1.739
6.06	60.00	0.00	9999.00	-13.97	1.62	146.19	-0.00	0.00	9999.00	1.616
6.05	62.00	0.00	9999.00	-14.38	1.49	149.30	-0.00	0.00	9999.00	1.492
6.03	64.00	0.00	9999.00	-14.78	1.37	152.16	-0.00	0.00	9999.00	1.367
6.01	66.00	0.00	9999.00	-15.16	1.24	154.77	-0.00	0.00	9999.00	1.240
5.98	68.00	0.00	9999.00	-15.53	1.11	157.12	-0.00	0.00	9999.00	1.113
5.94	70.00	0.00	9999.00	-15.87	0.98	159.22	-0.00	0.00	9999.00	0.985
5.90	72.00	0.00	9999.00	-16.19	0.86	161.06	-0.00	0.00	9999.00	0.856
5.85	74.00	0.00	9999.00	-16.50	0.73	162.64	-0.00	0.00	9999.00	0.726
5.79	76.00	0.00	9999.00	-16.78	0.60	163.96	-0.00	0.00	9999.00	0.596
5.72	78.00	0.00	9999.00	-17.05	0.47	165.02	-0.00	-0.00	-9999.00	0.465
5.65	80.00	0.00	9999.00	-17.29	0.33	165.82	-0.00	-0.00	-9999.00	0.334
5.57	82.00	0.00	9999.00	-17.51	0.20	166.36	-0.00	-0.00	-9999.00	0.203
5.48	84.00	0.00	9999.00	-17.71	0.07	166.63	-0.00	-0.00	-9999.00	0.071
5.39	86.00	0.00	9999.00	-17.89	-0.06	166.64	-0.00	-0.00	-9999.00	-0.061

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--- TECON - CW - TP LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 6
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^-6
Roll Angle
0
8.7
17.4
26.1
34.8
43.5
52.2
60.9
69.6
78.3
87

```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          18 June, 2025        *
*         --- TECON - CW - TP LOADOUT ON VERVECE ---                                 *
*         ------   Longitudinal Strength Analysis - Still Water  -- PHASE 6 ------  *
*                                                                                    *
**************************************************************************************************************
```

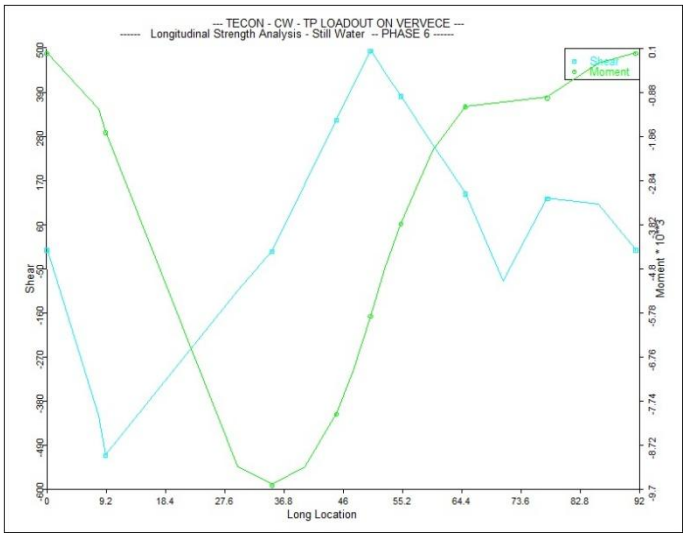
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 6: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-416	-1245	-0.0492	7.7992
9.14	-514	-1760	-0.0696	8.8996
29.72	-104	-9200	-0.3636	24.1661
35.00	-4	-9602	-0.3795	25.7515
40.00	159	-9216	-0.3642	26.1722
45.00	323	-8011	-0.3166	25.5844
47.50	404	-7102	-0.2807	24.9503
50.29	495	-5848	-0.2311	24.0128
52.50	441	-4814	-0.1903	23.1267
55.00	381	-3786	-0.1496	21.9994
60.00	260	-2183	-0.0863	19.4550
65.00	138	-1188	-0.0470	16.6641
70.87	-79	-1102	-0.0436	13.2137
77.72	126	-987	-0.0390	8.9652
85.70	111	-238	-0.0094	3.7847
91.44	-1	0	0.0000	0.0001



```
*********************************************************
*                                  ***  MOSES   ***                                    *
*                                  -----------------                 18 June, 2025    *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                    *
*        ---------     Intact Stability Check    -- PHASE 7 ---------                 *
*                                                                                     *
***************************************************************************************************************

                  +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                  ====================================================================

                   Process is 7: Units Are Degrees, Meters, and M-Tons Unless Specified

                                 Results Are Reported In Body System

                       Draft =     4.30 Roll Angle =    -0.00 Pitch Angle =    -0.00

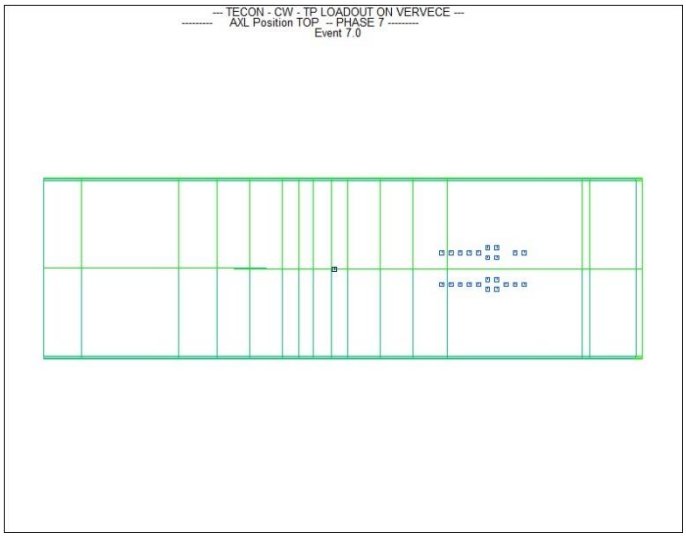
                                    Wet Radii Of Gyration About CG

                              K-X =     7.78 K-Y =    25.37 K-Z =    26.13

                                       GMT =    14.21 GML =   159.31

                              /-- Center of Gravity ---/  Sounding   % Full
                        Name   Weight    ---X---  ---Y---  ---Z---  -------- --------

                              ----------------  Part AXL7       ------------
                              LOAD_GRO    416.90    24.89     0.16     7.10
                              ----------------  Part CF         ------------
                              LOAD_GRO     28.00    69.38    11.22     8.10
                              ----------------  Part GRI&SF-B   ------------
                              LOAD_GRO     75.00    30.86    -1.14     7.35
                              ----------------  Part GRI&SF-C   ------------
                              LOAD_GRO      0.50    67.44    11.22     7.10
                              ----------------  Part GRI&SF-T   ------------
                              LOAD_GRO     45.00    65.20    -2.92     7.40
                              ----------------  Part VERVECE    ------------
                              LOAD_GRO   1832.80    47.02     0.00     3.52
                                           --- Contents ---
                        1PC       224.31     5.62    -3.43     3.77     6.02    98.00
                        1PW       206.33     5.71   -10.28     3.59     5.70    90.00
                        1SC       224.80     5.62     3.43     3.77     6.02    98.00
                        1SW       206.33     5.71    10.28     3.59     5.70    90.00
                        2PC       426.19    19.43    -3.43     1.52     3.05    50.00
                        2PW       240.05    19.43   -10.27     0.86     1.72    28.16
                        2SC       426.19    19.43     3.43     1.52     3.05    50.00
                        2SW       232.31    19.43    10.27     0.84     1.67    27.26
                        3PC       255.71    40.00    -3.43     0.91     1.83    30.00
                        3PW       426.16    40.00   -10.28     1.53     3.05    50.00
                        3SC       255.71    40.00     3.43     0.91     1.83    30.00
                        3SW       426.16    40.00    10.28     1.53     3.05    50.00
                        4PC       835.34    60.58    -3.43     2.99     5.97    98.00
                        4PW       426.16    60.58   -10.28     1.53     3.05    50.00
                        4SC       835.34    60.58     3.43     2.99     5.97    98.00
                        4SW       426.16    60.58    10.28     1.53     3.05    50.00
                        5PC       240.01    83.19    -3.43     1.86     3.42    50.00
                        5PW       556.37    80.11   -10.28     2.40     4.52    71.86
                        5SC       236.24    83.19     3.43     1.86     3.42    50.00
                        5SW       548.55    80.09    10.28     2.37     4.47    70.85
                              ========  ========  =======  =======  =======
                              Total     10052.61    46.75     0.00     2.68
                              Buoyancy  10052.60    46.75     0.00     2.21
```




```
                    ********************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 7 ---------                                  *
*                                                                                                        *
**********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 7: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
                    ******************************************************
*                                      ***  MOSES   ***                                                    *
*                                      ----------------                          18 June, 2025          *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                     *
*          ---------     Intact Stability Check    -- PHASE 7 ---------                                  . *
*                                                                                                         *
***********************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 7: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 2.68, and Wind Speed = 10 Knots

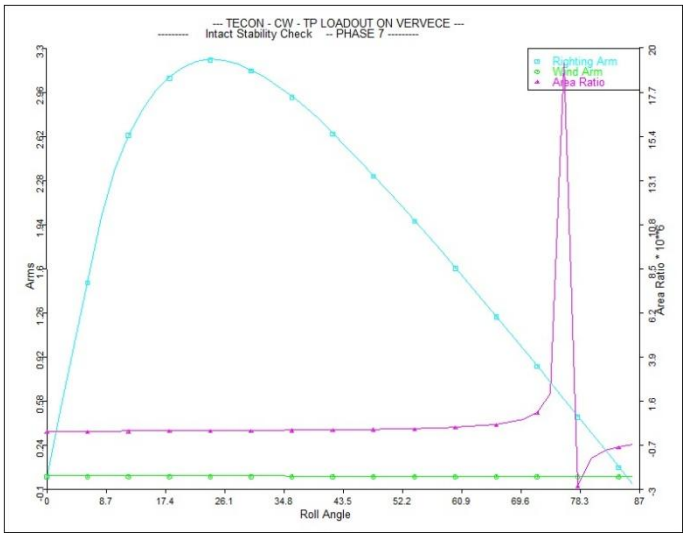
Initial: Roll = -0.00, Trim = -0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.39	-0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.50	0.50	0.00	0.00	3107.09	0.497
4.29	4.00	0.00	9999.00	1.48	1.00	1.99	0.00	0.00	6387.78	0.997
4.27	6.00	0.00	9999.00	1.03	1.50	4.49	0.00	0.00	9999.00	1.498
4.25	8.00	0.00	9999.00	0.57	1.99	7.98	0.00	0.00	9999.00	1.995
4.26	10.00	0.00	9999.00	0.07	2.37	12.34	0.00	0.00	9999.00	2.369
4.31	12.00	0.00	9999.00	-0.47	2.63	17.34	0.00	0.00	9999.00	2.633
4.39	14.00	0.00	9999.00	-1.04	2.83	22.80	0.00	0.00	9999.00	2.825
4.49	16.00	0.00	9999.00	-1.63	2.97	28.60	0.00	0.00	9999.00	2.968
4.60	18.00	0.00	9999.00	-2.25	3.08	34.64	0.00	0.00	9999.00	3.075
4.72	20.00	0.00	9999.00	-2.88	3.15	40.87	0.00	0.00	9999.00	3.152
4.85	22.00	0.00	9999.00	-3.51	3.20	47.22	0.00	0.00	9999.00	3.199
4.98	24.00	0.00	9999.00	-4.15	3.21	53.63	0.00	0.00	9999.00	3.214
5.09	26.00	0.00	9999.00	-4.77	3.20	60.05	0.00	0.00	9999.00	3.205
5.20	28.00	0.00	9999.00	-5.40	3.18	66.43	0.00	0.00	9999.00	3.175
5.31	30.00	0.00	9999.00	-6.01	3.13	72.74	0.00	0.00	9999.00	3.131
5.41	32.00	0.00	9999.00	-6.62	3.07	78.94	0.00	0.00	9999.00	3.074
5.50	34.00	0.00	9999.00	-7.22	3.01	85.02	0.00	0.00	9999.00	3.006
5.59	36.00	0.00	9999.00	-7.81	2.93	90.96	-0.00	0.00	9999.00	2.929
5.66	38.00	0.00	9999.00	-8.39	2.84	96.73	-0.00	0.00	9999.00	2.842
5.74	40.00	0.00	9999.00	-8.96	2.75	102.32	-0.00	0.00	9999.00	2.747
5.80	42.00	0.00	9999.00	-9.52	2.64	107.71	-0.00	0.00	9999.00	2.645
5.86	44.00	0.00	9999.00	-10.07	2.54	112.89	-0.00	0.00	9999.00	2.538
5.91	46.00	0.00	9999.00	-10.61	2.43	117.86	-0.00	0.00	9999.00	2.429
5.95	48.00	0.00	9999.00	-11.13	2.32	122.61	-0.00	0.00	9999.00	2.318
5.99	50.00	0.00	9999.00	-11.64	2.20	127.13	-0.00	0.00	9999.00	2.205
6.02	52.00	0.00	9999.00	-12.14	2.09	131.42	-0.00	0.00	9999.00	2.090
6.04	54.00	0.00	9999.00	-12.62	1.97	135.49	-0.00	0.00	9999.00	1.972
6.05	56.00	0.00	9999.00	-13.09	1.85	139.31	-0.00	0.00	9999.00	1.853
6.06	58.00	0.00	9999.00	-13.54	1.73	142.90	-0.00	0.00	9999.00	1.731
6.06	60.00	0.00	9999.00	-13.97	1.61	146.23	-0.00	0.00	9999.00	1.608
6.05	62.00	0.00	9999.00	-14.38	1.48	149.33	-0.00	0.00	9999.00	1.484
6.03	64.00	0.00	9999.00	-14.78	1.36	152.17	-0.00	0.00	9999.00	1.359
6.01	66.00	0.00	9999.00	-15.16	1.23	154.76	-0.00	0.00	9999.00	1.233
5.98	68.00	0.00	9999.00	-15.53	1.11	157.10	-0.00	0.00	9999.00	1.106
5.94	70.00	0.00	9999.00	-15.87	0.98	159.18	-0.00	0.00	9999.00	0.979
5.90	72.00	0.00	9999.00	-16.19	0.85	161.01	-0.00	0.00	9999.00	0.850
5.85	74.00	0.00	9999.00	-16.50	0.72	162.59	-0.00	0.00	9999.00	0.722
5.79	76.00	0.00	9999.00	-16.78	0.59	163.90	-0.00	0.00	9999.00	0.592
5.72	78.00	0.00	9999.00	-17.05	0.46	164.95	-0.00	-0.00	-9999.00	0.462
5.65	80.00	0.00	9999.00	-17.29	0.33	165.75	-0.00	-0.00	-9999.00	0.332
5.57	82.00	0.00	9999.00	-17.51	0.20	166.28	-0.00	-0.00	-9999.00	0.201
5.48	84.00	0.00	9999.00	-17.71	0.07	166.55	-0.00	-0.00	-9999.00	0.070
5.39	86.00	0.00	9999.00	-17.89	-0.06	166.56	-0.00	-0.00	-9999.00	-0.062

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--- TECON - CW - TP LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 7
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^-6
Roll Angle
0
8.7
17.4
26.1
34.8
43.5
52.2
60.9
69.6
78.3
87

```
*******************************************************
*                                *** MOSES ***                                *
*                                ---------------                 18 June, 2025 *
*       --- TECON - CW - TP LOADOUT ON VERVECE ---                             *
*       ------  Longitudinal Strength Analysis - Still Water  -- PHASE 7 ------ *
*                                                                              *
********************************************************************************************************************
```

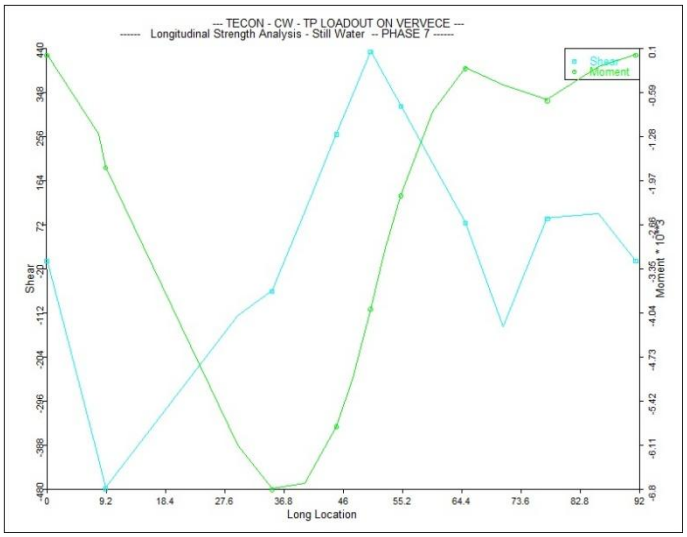
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 7: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-416	-1245	-0.0492	5.6097
9.14	-477	-1755	-0.0694	6.3970
29.72	-117	-6116	-0.2417	16.8414
35.00	-65	-6796	-0.2686	17.8826
40.00	98	-6714	-0.2653	18.1066
45.00	262	-5813	-0.2297	17.5981
47.50	343	-5056	-0.1998	17.0967
50.29	434	-3972	-0.1570	16.3735
52.50	381	-3072	-0.1214	15.7032
55.00	320	-2196	-0.0868	14.8650
60.00	199	-897	-0.0355	13.0262
65.00	77	-206	-0.0082	11.0826
70.87	-140	-476	-0.0189	8.7618
77.72	85	-709	-0.0281	5.9517
85.70	94	-189	-0.0075	2.5161
91.44	-1	0	0.0000	0.0001



```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  -----------------                 18 June, 2025   *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                  *
*        ---------     Intact Stability Check    -- PHASE 8 ---------               *
*                                                                                    *
**************************************************************************************************************
```

+++ B U O Y A N C Y A N D W E I G H T F O R V E R V E C E +++

Process is 8: Units Are Degrees, Meters, and M-Tons Unless Specified

Results Are Reported In Body System

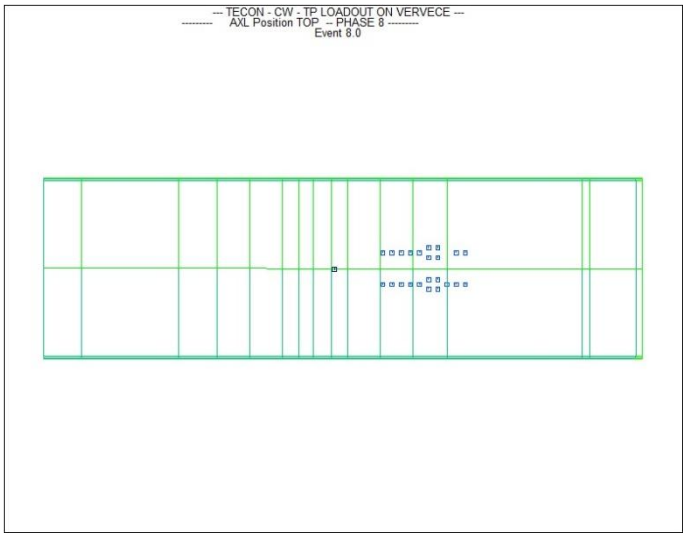
Draft = 4.30 Roll Angle = -0.00 Pitch Angle = -0.00

Wet Radii Of Gyration About CG

K-X = 7.78 K-Y = 25.06 K-Z = 25.82

GMT = 14.23 GML = 159.26

Name	Weight	/-- Center of Gravity ---/ ---X---	---Y---	---Z---	Sounding	% Full
		Part AXL8				
LOAD_GRO	416.90	33.89	0.16	7.10		
		Part CF				
LOAD_GRO	28.00	69.38	11.22	8.10		
		Part GRI&SF-B				
LOAD_GRO	75.00	30.86	-1.14	7.35		
		Part GRI&SF-C				
LOAD_GRO	0.50	67.44	11.22	7.10		
		Part GRI&SF-T				
LOAD_GRO	45.00	65.20	-2.92	7.40		
		Part VERVECE				
LOAD_GRO	1832.80	47.02	0.00	3.52		
		--- Contents ---				
1PC	224.31	5.62	-3.43	3.77	6.02	98.00
1PW	206.33	5.71	-10.28	3.59	5.70	90.00
1SC	224.80	5.62	3.43	3.77	6.02	98.00
1SW	206.33	5.71	10.28	3.59	5.70	90.00
2PC	426.19	19.43	-3.43	1.52	3.05	50.00
2PW	270.47	19.43	-10.27	0.97	1.94	31.73
2SC	426.19	19.43	3.43	1.52	3.05	50.00
2SW	262.73	19.43	10.27	0.94	1.88	30.83
3PC	255.71	40.00	-3.43	0.91	1.83	30.00
3PW	426.16	40.00	-10.28	1.53	3.05	50.00
3SC	255.71	40.00	3.43	0.91	1.83	30.00
3SW	426.16	40.00	10.28	1.53	3.05	50.00
4PC	835.34	60.58	-3.43	2.99	5.97	98.00
4PW	426.16	60.58	-10.28	1.53	3.05	50.00
4SC	835.34	60.58	3.43	2.99	5.97	98.00
4SW	426.16	60.58	10.28	1.53	3.05	50.00
5PC	240.01	83.19	-3.43	1.86	3.42	50.00
5PW	525.95	80.05	-10.28	2.28	4.30	67.93
5SC	236.24	83.19	3.43	1.86	3.42	50.00
5SW	518.13	80.03	10.28	2.25	4.25	66.92
Total	10052.61	46.75	0.00	2.67		
Buoyancy	10052.60	46.75	0.00	2.21		




```
                    ********************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 8 ---------                                  *
*                                                                                                        *
**********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 8: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
*********************************************************
*                                  ***  MOSES   ***                                    *
*                                  ----------------                 18 June, 2025     *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                    *
*        ---------     Intact Stability Check    -- PHASE 8 ---------                 . *
*                                                                                      *
****************************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 8: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 2.67, and Wind Speed = 10 Knots

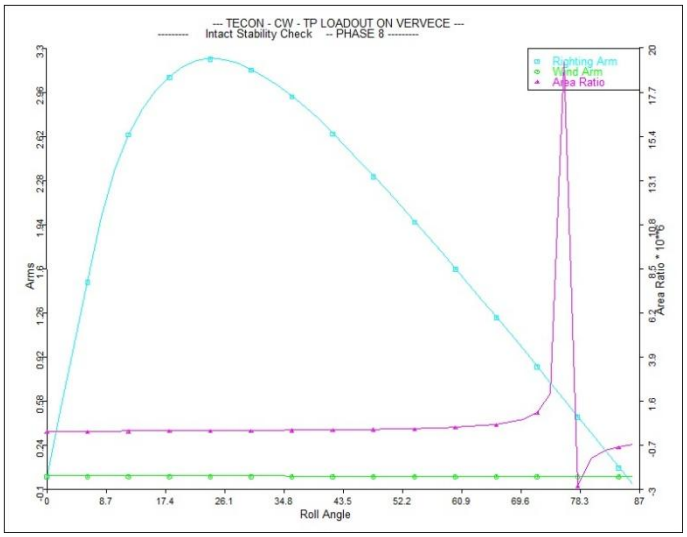
Initial: Roll = -0.00, Trim = -0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.39	-0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.50	0.50	0.00	0.00	3110.51	0.497
4.29	4.00	0.00	9999.00	1.48	1.00	1.99	0.00	0.00	6394.80	0.998
4.27	6.00	0.00	9999.00	1.03	1.50	4.49	0.00	0.00	9999.00	1.500
4.25	8.00	0.00	9999.00	0.57	2.00	7.99	0.00	0.00	9999.00	1.997
4.26	10.00	0.00	9999.00	0.07	2.37	12.36	0.00	0.00	9999.00	2.372
4.31	12.00	0.00	9999.00	-0.47	2.64	17.36	0.00	0.00	9999.00	2.636
4.39	14.00	0.00	9999.00	-1.04	2.83	22.83	0.00	0.00	9999.00	2.829
4.49	16.00	0.00	9999.00	-1.63	2.97	28.63	0.00	0.00	9999.00	2.972
4.60	18.00	0.00	9999.00	-2.25	3.08	34.68	0.00	0.00	9999.00	3.080
4.72	20.00	0.00	9999.00	-2.88	3.16	40.92	0.00	0.00	9999.00	3.158
4.85	22.00	0.00	9999.00	-3.51	3.21	47.28	0.00	0.00	9999.00	3.205
4.98	24.00	0.00	9999.00	-4.15	3.22	53.71	0.00	0.00	9999.00	3.221
5.09	26.00	0.00	9999.00	-4.77	3.21	60.14	0.00	0.00	9999.00	3.211
5.20	28.00	0.00	9999.00	-5.40	3.18	66.53	0.00	0.00	9999.00	3.182
5.31	30.00	0.00	9999.00	-6.01	3.14	72.85	0.00	0.00	9999.00	3.136
5.41	32.00	0.00	9999.00	-6.62	3.08	79.07	0.00	0.00	9999.00	3.078
5.50	34.00	0.00	9999.00	-7.22	3.01	85.15	0.00	0.00	9999.00	3.009
5.59	36.00	0.00	9999.00	-7.81	2.93	91.09	-0.00	0.00	9999.00	2.931
5.66	38.00	0.00	9999.00	-8.39	2.84	96.87	-0.00	0.00	9999.00	2.843
5.74	40.00	0.00	9999.00	-8.96	2.75	102.46	-0.00	0.00	9999.00	2.747
5.80	42.00	0.00	9999.00	-9.52	2.64	107.85	-0.00	0.00	9999.00	2.644
5.86	44.00	0.00	9999.00	-10.07	2.54	113.03	-0.00	0.00	9999.00	2.536
5.91	46.00	0.00	9999.00	-10.61	2.43	117.99	-0.00	0.00	9999.00	2.426
5.95	48.00	0.00	9999.00	-11.13	2.31	122.73	-0.00	0.00	9999.00	2.314
5.99	50.00	0.00	9999.00	-11.64	2.20	127.24	-0.00	0.00	9999.00	2.200
6.02	52.00	0.00	9999.00	-12.14	2.08	131.53	-0.00	0.00	9999.00	2.084
6.04	54.00	0.00	9999.00	-12.62	1.97	135.58	-0.00	0.00	9999.00	1.966
6.05	56.00	0.00	9999.00	-13.09	1.85	139.39	-0.00	0.00	9999.00	1.845
6.06	58.00	0.00	9999.00	-13.54	1.72	142.96	-0.00	0.00	9999.00	1.723
6.06	60.00	0.00	9999.00	-13.97	1.60	146.28	-0.00	0.00	9999.00	1.601
6.05	62.00	0.00	9999.00	-14.38	1.48	149.36	-0.00	0.00	9999.00	1.477
6.03	64.00	0.00	9999.00	-14.78	1.35	152.19	-0.00	0.00	9999.00	1.353
6.01	66.00	0.00	9999.00	-15.16	1.23	154.77	-0.00	0.00	9999.00	1.227
5.98	68.00	0.00	9999.00	-15.53	1.10	157.10	-0.00	0.00	9999.00	1.101
5.94	70.00	0.00	9999.00	-15.87	0.97	159.17	-0.00	0.00	9999.00	0.974
5.90	72.00	0.00	9999.00	-16.19	0.85	160.99	-0.00	0.00	9999.00	0.846
5.85	74.00	0.00	9999.00	-16.50	0.72	162.55	-0.00	0.00	9999.00	0.718
5.79	76.00	0.00	9999.00	-16.78	0.59	163.86	-0.00	0.00	9999.00	0.589
5.72	78.00	0.00	9999.00	-17.05	0.46	164.91	-0.00	-0.00	-9999.00	0.460
5.65	80.00	0.00	9999.00	-17.29	0.33	165.70	-0.00	-0.00	-9999.00	0.330
5.57	82.00	0.00	9999.00	-17.51	0.20	166.23	-0.00	-0.00	-9999.00	0.200
5.48	84.00	0.00	9999.00	-17.71	0.07	166.50	-0.00	-0.00	-9999.00	0.069
5.39	86.00	0.00	9999.00	-17.89	-0.06	166.51	-0.00	-0.00	-9999.00	-0.062

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                    ******************************************************
*                                  ***  MOSES   ***                                                  *
*                                  ----------------                          18 June, 2025        *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                               *
*          ------   Longitudinal Strength Analysis - Still Water  -- PHASE 8 ------                 *
*                                                                                                   *
*************************************************************************************************************
```

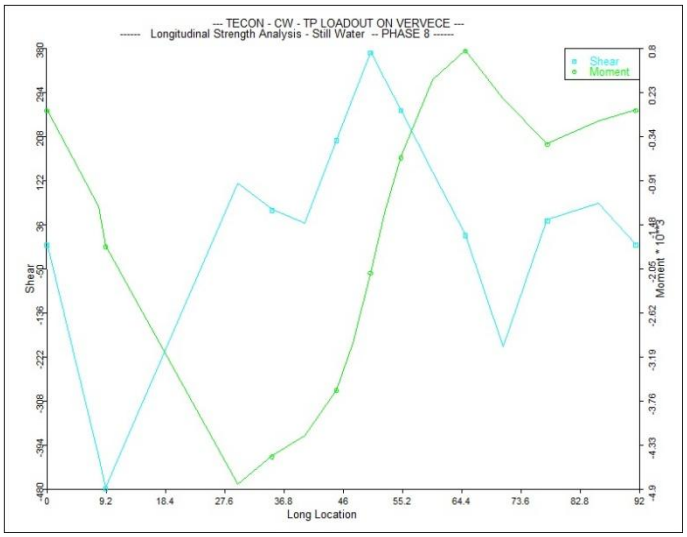
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 8: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-416	-1245	-0.0492	4.2871
9.14	-477	-1755	-0.0694	4.8853
29.72	117	-4832	-0.1910	11.9390
35.00	65	-4471	-0.1767	12.2955
40.00	38	-4212	-0.1665	12.1252
45.00	201	-3615	-0.1429	11.4935
47.50	282	-3010	-0.1190	11.0233
50.29	373	-2095	-0.0828	10.4016
52.50	320	-1330	-0.0526	9.8572
55.00	260	-606	-0.0240	9.2070
60.00	138	389	0.0154	7.8710
65.00	16	775	0.0306	6.5723
70.87	-201	148	0.0059	5.1434
77.72	45	-431	-0.0171	3.4938
85.70	77	-141	-0.0056	1.4800
91.44	-1	0	0.0000	0.0001


--- TECON - CW - TP LOADOUT ON VERVECE ---
------ Longitudinal Strength Analysis - Still Water -- PHASE 8 ------
Shear
Moment
Shear
Moment * 10^3
Long Location
0
9.2
18.4
27.6
36.8
46
55.2
64.4
73.6
82.8
92

```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                          18 June, 2025        *
*         --- TECON - CW - TP LOADOUT ON VERVECE ---                                                  *
*         ---------     Intact Stability Check    -- PHASE 9 ---------                               *
*                                                                                                     *
*******************************************************************************************************************

                +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                ======================================================================

                 Process is 9: Units Are Degrees, Meters, and M-Tons Unless Specified

                              Results Are Reported In Body System

                     Draft =     4.30 Roll Angle =     0.00 Pitch Angle =     0.00

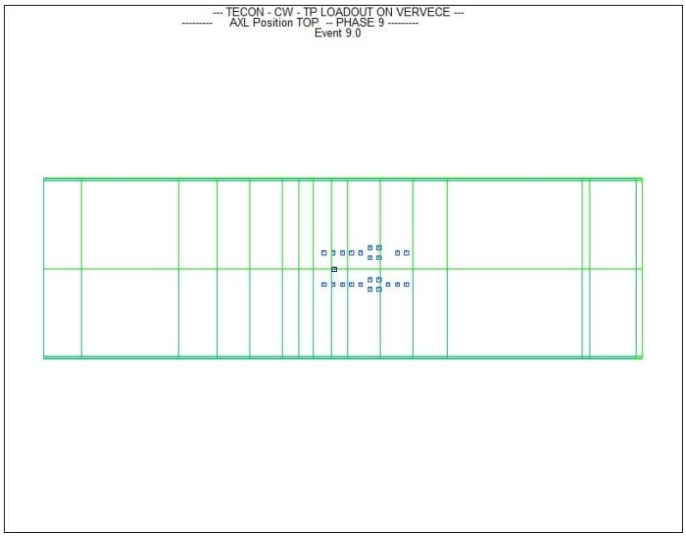
                                 Wet Radii Of Gyration About CG

                           K-X =     7.78 K-Y =    24.88 K-Z =    25.65

                                    GMT =    14.24 GML =   159.20

                           /-- Center of Gravity ---/  Sounding   % Full
                    Name    Weight    ---X---  ---Y---  ---Z---  -------- --------

                           ----------------  Part AXL9       ------------
                           LOAD_GRO    416.90    42.89     0.16     7.10
                           ----------------  Part CF         ------------
                           LOAD_GRO     28.00    69.38    11.22     8.10
                           ----------------  Part GRI&SF-B   ------------
                           LOAD_GRO     75.00    30.86    -1.14     7.35
                           ----------------  Part GRI&SF-C   ------------
                           LOAD_GRO      0.50    67.44    11.22     7.10
                           ----------------  Part GRI&SF-T   ------------
                           LOAD_GRO     45.00    65.20    -2.92     7.40
                           ----------------  Part VERVECE    ------------
                           LOAD_GRO   1832.80    47.02     0.00     3.52
                                        --- Contents ---
                      1PC      224.31     5.62    -3.43     3.77     6.02    98.00
                      1PW      206.33     5.71   -10.28     3.59     5.70    90.00
                      1SC      224.80     5.62     3.43     3.77     6.02    98.00
                      1SW      206.33     5.71    10.28     3.59     5.70    90.00
                      2PC      426.19    19.43    -3.43     1.52     3.05    50.00
                      2PW      300.34    19.43   -10.28     1.08     2.15    35.24
                      2SC      426.19    19.43     3.43     1.52     3.05    50.00
                      2SW      292.59    19.43    10.28     1.05     2.10    34.33
                      3PC      255.71    40.01    -3.43     0.91     1.83    30.00
                      3PW      426.16    40.01   -10.28     1.53     3.05    50.00
                      3SC      255.71    40.01     3.43     0.91     1.83    30.00
                      3SW      426.16    40.01    10.28     1.53     3.05    50.00
                      4PC      835.34    60.58    -3.43     2.99     5.97    98.00
                      4PW      426.16    60.58   -10.28     1.53     3.05    50.00
                      4SC      835.34    60.58     3.43     2.99     5.97    98.00
                      4SW      426.16    60.58    10.28     1.53     3.05    50.00
                      5PC      240.01    83.19    -3.43     1.86     3.42    50.00
                      5PW      496.08    79.98   -10.28     2.17     4.09    64.07
                      5SC      236.24    83.19     3.43     1.86     3.42    50.00
                      5SW      488.27    79.96    10.28     2.14     4.03    63.07
                           ========  ========  =======  =======  =======
                           Total     10052.61    46.75    -0.00     2.66
                           Buoyancy  10052.61    46.75    -0.00     2.21
```




```
                    ********************************************************
*                                       ***  MOSES   ***                                                  *
*                                       ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                     *
*          ---------     Intact Stability Check    -- PHASE 9 ---------                                  *
*                                                                                                         *
***********************************************************************************************************

                          +++ D R A F T   M A R K   R E A D I N G S +++
                          ============================================

                Process is 9: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
                    ******************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                          18 June, 2025        *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 9 ---------                                 . *
*                                                                                                       *
*************************************************************************************************************
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+++ R I G H T I N G A R M R E S U L T S +++

Process is 9: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 2.66, and Wind Speed = 10 Knots

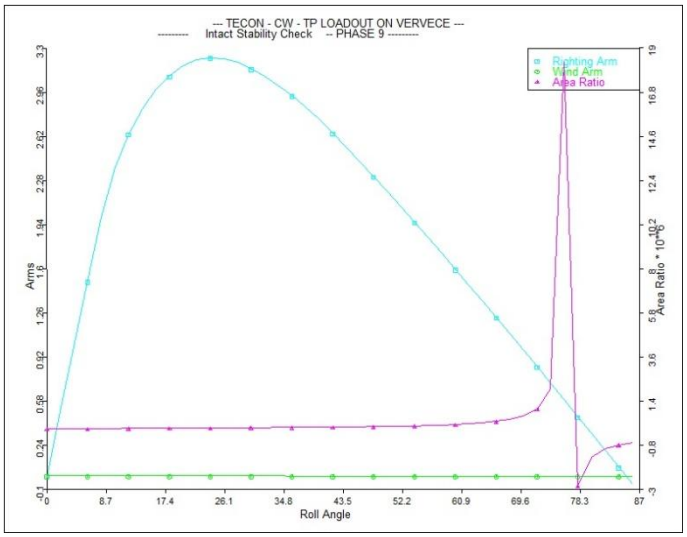
Initial: Roll = 0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	-0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.50	0.50	0.00	0.00	3113.11	0.498
4.29	4.00	0.00	9999.00	1.49	1.00	1.99	0.00	0.00	6400.17	0.999
4.27	6.00	0.00	9999.00	1.03	1.50	4.49	0.00	0.00	9999.00	1.501
4.25	8.00	0.00	9999.00	0.57	2.00	7.99	0.00	0.00	9999.00	1.999
4.26	10.00	0.00	9999.00	0.08	2.37	12.37	0.00	0.00	9999.00	2.374
4.31	12.00	0.00	9999.00	-0.46	2.64	17.38	0.00	0.00	9999.00	2.639
4.39	14.00	0.00	9999.00	-1.04	2.83	22.85	0.00	0.00	9999.00	2.832
4.48	16.00	0.00	9999.00	-1.63	2.98	28.66	0.00	0.00	9999.00	2.976
4.60	18.00	0.00	9999.00	-2.25	3.08	34.72	0.00	0.00	9999.00	3.084
4.72	20.00	0.00	9999.00	-2.88	3.16	40.97	0.00	0.00	9999.00	3.162
4.85	22.00	0.00	9999.00	-3.51	3.21	47.34	0.00	0.00	9999.00	3.210
4.97	24.00	0.00	9999.00	-4.14	3.23	53.77	0.00	0.00	9999.00	3.226
5.09	26.00	0.00	9999.00	-4.77	3.22	60.22	0.00	0.00	9999.00	3.217
5.20	28.00	0.00	9999.00	-5.39	3.19	66.62	0.00	0.00	9999.00	3.188
5.31	30.00	0.00	9999.00	-6.01	3.14	72.95	0.00	0.00	9999.00	3.142
5.41	32.00	0.00	9999.00	-6.62	3.08	79.18	0.00	0.00	9999.00	3.083
5.50	34.00	0.00	9999.00	-7.22	3.01	85.27	0.00	0.00	9999.00	3.013
5.58	36.00	0.00	9999.00	-7.81	2.93	91.22	-0.00	0.00	9999.00	2.933
5.66	38.00	0.00	9999.00	-8.39	2.84	97.00	-0.00	0.00	9999.00	2.845
5.73	40.00	0.00	9999.00	-8.96	2.75	102.59	-0.00	0.00	9999.00	2.747
5.80	42.00	0.00	9999.00	-9.52	2.64	107.98	-0.00	0.00	9999.00	2.643
5.86	44.00	0.00	9999.00	-10.07	2.53	113.16	-0.00	0.00	9999.00	2.534
5.91	46.00	0.00	9999.00	-10.61	2.42	118.12	-0.00	0.00	9999.00	2.423
5.95	48.00	0.00	9999.00	-11.13	2.31	122.85	-0.00	0.00	9999.00	2.310
5.99	50.00	0.00	9999.00	-11.64	2.19	127.35	-0.00	0.00	9999.00	2.195
6.02	52.00	0.00	9999.00	-12.14	2.08	131.63	-0.00	0.00	9999.00	2.078
6.04	54.00	0.00	9999.00	-12.62	1.96	135.66	-0.00	0.00	9999.00	1.959
6.05	56.00	0.00	9999.00	-13.08	1.84	139.46	-0.00	0.00	9999.00	1.839
6.06	58.00	0.00	9999.00	-13.53	1.72	143.02	-0.00	0.00	9999.00	1.717
6.06	60.00	0.00	9999.00	-13.97	1.59	146.33	-0.00	0.00	9999.00	1.595
6.05	62.00	0.00	9999.00	-14.38	1.47	149.39	-0.00	0.00	9999.00	1.472
6.03	64.00	0.00	9999.00	-14.78	1.35	152.21	-0.00	0.00	9999.00	1.348
6.01	66.00	0.00	9999.00	-15.16	1.22	154.78	-0.00	0.00	9999.00	1.223
5.98	68.00	0.00	9999.00	-15.53	1.10	157.10	-0.00	0.00	9999.00	1.097
5.94	70.00	0.00	9999.00	-15.87	0.97	159.17	-0.00	0.00	9999.00	0.970
5.90	72.00	0.00	9999.00	-16.19	0.84	160.98	-0.00	0.00	9999.00	0.843
5.85	74.00	0.00	9999.00	-16.50	0.72	162.54	-0.00	0.00	9999.00	0.715
5.79	76.00	0.00	9999.00	-16.78	0.59	163.85	-0.00	0.00	9999.00	0.587
5.72	78.00	0.00	9999.00	-17.05	0.46	164.89	-0.00	-0.00	-9999.00	0.458
5.65	80.00	0.00	9999.00	-17.29	0.33	165.68	-0.00	-0.00	-9999.00	0.329
5.57	82.00	0.00	9999.00	-17.51	0.20	166.20	-0.00	-0.00	-9999.00	0.199
5.48	84.00	0.00	9999.00	-17.71	0.07	166.47	-0.00	-0.00	-9999.00	0.069
5.39	86.00	0.00	9999.00	-17.89	-0.06	166.48	-0.00	-0.00	-9999.00	-0.062

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--- TECON - CW - TP LOADOUT ON VERVECE ---
--------- Intact Stability Check -- PHASE 9 ---------
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^-6
Roll Angle
0
8.7
17.4
26.1
34.8
43.5
52.2
60.9
69.6
78.3
87

```
**********************************************************
*                                  ***  MOSES    ***                                  *
*                                  ----------------                    18 June, 2025  *
*         --- TECON - CW - TP LOADOUT ON VERVECE ---                                  *
*         ------   Longitudinal Strength Analysis - Still Water  -- PHASE 9 ------   *
*                                                                                     *
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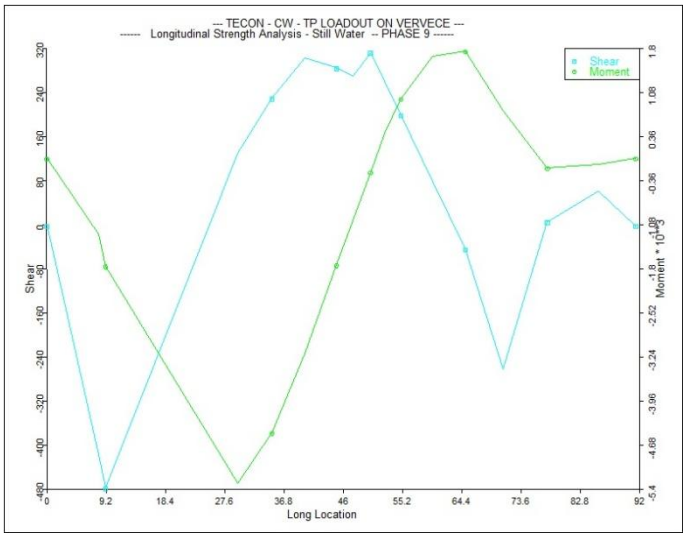
                    +++ L O N G I T U D I N A L   S T R E N G T H   R E S U L T S +++
                    ================================================================

                  Process is 9: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Allowable Stress =     155.00 Mpa

                                Allowable Deflection =       1.00 MM
```

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-417	-1246	-0.0493	3.7201
9.14	-477	-1757	-0.0695	4.2372
29.72	130	-5314	-0.2100	9.7319
35.00	230	-4476	-0.1769	9.5916
40.00	301	-3183	-0.1258	8.9549
45.00	284	-1739	-0.0688	7.9685
47.50	269	-1022	-0.0404	7.3935
50.29	312	-224	-0.0089	6.7190
52.50	259	406	0.0160	6.1786
55.00	199	978	0.0387	5.5776
60.00	78	1670	0.0660	4.4675
65.00	-43	1753	0.0693	3.5356
70.87	-261	771	0.0305	2.6723
77.72	5	-154	-0.0061	1.8009
85.70	60	-92	-0.0037	0.7641
91.44	-1	0	0.0000	0.0001



```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                          18 June, 2025        *
*         --- TECON - CW - TP LOADOUT ON VERVECE ---                                                  *
*         ---------     Intact Stability Check    -- PHASE 10 ---------                             *
*                                                                                                     *
*******************************************************************************************************************

                +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                ======================================================================

                Process is 10: Units Are Degrees, Meters, and M-Tons Unless Specified

                              Results Are Reported In Body System

                    Draft =     4.30 Roll Angle =     0.00 Pitch Angle =     0.00

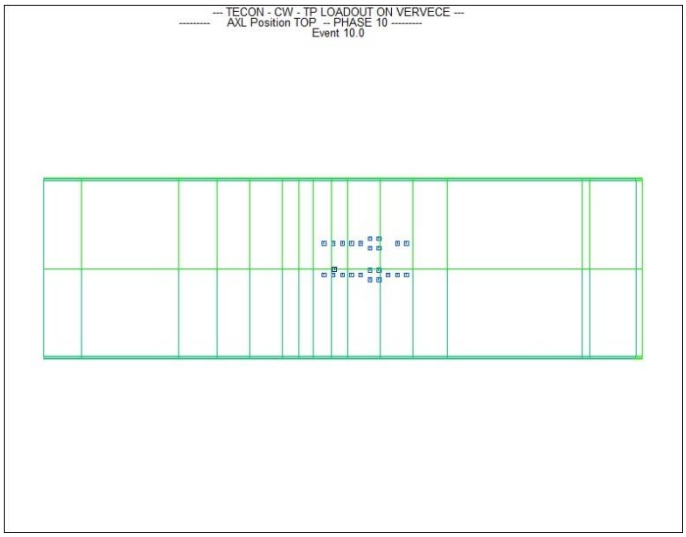
                                 Wet Radii Of Gyration About CG

                           K-X =     7.79 K-Y =    24.88 K-Z =    25.65

                                    GMT =    14.24 GML =   159.19

                           /-- Center of Gravity ---/  Sounding   % Full
                     Name   Weight    ---X---  ---Y---  ---Z---  -------- --------

                           ----------------  Part AXL10      ------------
                           LOAD_GRO    416.90    42.89    -1.24     7.10
                           ----------------  Part CF         ------------
                           LOAD_GRO     28.00    69.38    11.22     8.10
                           ----------------  Part GRI&SF-B   ------------
                           LOAD_GRO     75.00    30.86    -1.14     7.35
                           ----------------  Part GRI&SF-C   ------------
                           LOAD_GRO      0.50    67.44    11.22     7.10
                           ----------------  Part GRI&SF-T   ------------
                           LOAD_GRO     45.00    65.20    -2.92     7.40
                           ----------------  Part VERVECE    ------------
                           LOAD_GRO   1832.80    47.02     0.00     3.52
                                        --- Contents ---
                     1PC         224.31     5.62    -3.43     3.77     6.02    98.00
                     1PW         206.33     5.71   -10.28     3.59     5.70    90.00
                     1SC         224.80     5.62     3.43     3.77     6.02    98.00
                     1SW         206.33     5.71    10.28     3.59     5.70    90.00
                     2PC         426.19    19.43    -3.43     1.52     3.05    50.00
                     2PW         286.07    19.43   -10.27     1.03     2.05    33.56
                     2SC         426.19    19.43     3.43     1.52     3.05    50.00
                     2SW         306.88    19.43    10.28     1.10     2.20    36.00
                     3PC         255.71    40.01    -3.43     0.91     1.83    30.00
                     3PW         426.16    40.01   -10.28     1.53     3.05    50.00
                     3SC         255.71    40.01     3.43     0.91     1.83    30.00
                     3SW         426.16    40.01    10.28     1.53     3.05    50.00
                     4PC         835.34    60.58    -3.43     2.99     5.97    98.00
                     4PW         426.16    60.58   -10.28     1.53     3.05    50.00
                     4SC         835.34    60.58     3.43     2.99     5.97    98.00
                     4SW         426.16    60.58    10.28     1.53     3.05    50.00
                     5PC         240.01    83.19    -3.43     1.86     3.42    50.00
                     5PW         481.79    79.94   -10.28     2.11     3.99    62.23
                     5SC         236.24    83.19     3.43     1.86     3.42    50.00
                     5SW         502.54    79.99    10.28     2.19     4.14    64.91
                           ========  ========  =======  =======  =======
                           Total     10052.61    46.75     0.00     2.66
                           Buoyancy  10052.61    46.75    -0.00     2.21
```




```
                    ********************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 10 ---------                                 *
*                                                                                                        *
**********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 10: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
                    ******************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 10 ---------                                .*
*                                                                                                        *
**********************************************************************************************************

                              +++ R I G H T I N G   A R M   R E S U L T S +++
                              ==============================================

                    Process is 10: Units Are Degrees, Meters, and M-Tons Unless Specified

                    Moment Scaled By 10052.61, KG = 2.66, and Wind Speed = 10 Knots

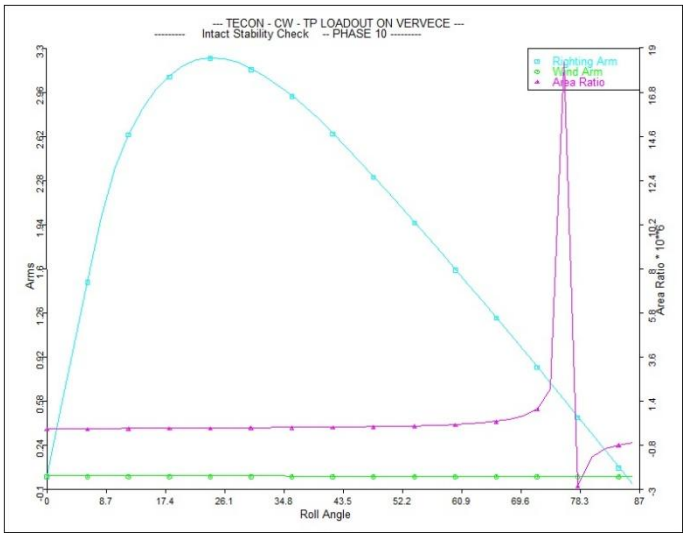
                              Initial: Roll = 0.00, Trim = 0.00 Deg.

                              Critical NWT Down Flooding Point Is *BOWPTWT

                              Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/   /-- Min. Height --/   /--- Righting ---/    /--- Heeling ---/    Area        Net
 Draft    Roll    Trim      W Tight  NW Tight        Arm      Area        Arm      Area     Ratio       Arm

  4.30    0.00    0.00     9999.00      2.40       0.00      0.00       0.00      0.00      0.00    -0.000
  4.30    2.00    0.00     9999.00      1.94       0.50      0.50       0.00      0.00   3113.75     0.498
  4.29    4.00    0.00     9999.00      1.49       1.00      1.99       0.00      0.00   6400.79     0.999
  4.27    6.00    0.00     9999.00      1.03       1.50      4.49       0.00      0.00   9999.00     1.501
  4.25    8.00    0.00     9999.00      0.57       2.00      7.99       0.00      0.00   9999.00     1.999
  4.26   10.00    0.00     9999.00      0.08       2.37     12.37       0.00      0.00   9999.00     2.374
  4.31   12.00    0.00     9999.00     -0.46       2.64     17.38       0.00      0.00   9999.00     2.639
  4.39   14.00    0.00     9999.00     -1.04       2.83     22.85       0.00      0.00   9999.00     2.832
  4.48   16.00    0.00     9999.00     -1.63       2.98     28.66       0.00      0.00   9999.00     2.976
  4.60   18.00    0.00     9999.00     -2.25       3.08     34.72       0.00      0.00   9999.00     3.084
  4.72   20.00    0.00     9999.00     -2.88       3.16     40.97       0.00      0.00   9999.00     3.162
  4.85   22.00    0.00     9999.00     -3.51       3.21     47.34       0.00      0.00   9999.00     3.210
  4.97   24.00    0.00     9999.00     -4.14       3.23     53.77       0.00      0.00   9999.00     3.226
  5.09   26.00    0.00     9999.00     -4.77       3.22     60.22       0.00      0.00   9999.00     3.217
  5.20   28.00    0.00     9999.00     -5.39       3.19     66.62       0.00      0.00   9999.00     3.188
  5.31   30.00    0.00     9999.00     -6.01       3.14     72.95       0.00      0.00   9999.00     3.142
  5.41   32.00    0.00     9999.00     -6.62       3.08     79.18       0.00      0.00   9999.00     3.083
  5.50   34.00    0.00     9999.00     -7.22       3.01     85.27       0.00      0.00   9999.00     3.013
  5.58   36.00    0.00     9999.00     -7.81       2.93     91.22      -0.00      0.00   9999.00     2.933
  5.66   38.00    0.00     9999.00     -8.39       2.84     97.00      -0.00      0.00   9999.00     2.845
  5.73   40.00    0.00     9999.00     -8.96       2.75    102.59      -0.00      0.00   9999.00     2.748
  5.80   42.00    0.00     9999.00     -9.52       2.64    107.98      -0.00      0.00   9999.00     2.643
  5.86   44.00    0.00     9999.00    -10.07       2.53    113.16      -0.00      0.00   9999.00     2.534
  5.91   46.00    0.00     9999.00    -10.61       2.42    118.12      -0.00      0.00   9999.00     2.423
  5.95   48.00    0.00     9999.00    -11.13       2.31    122.85      -0.00      0.00   9999.00     2.310
  5.99   50.00    0.00     9999.00    -11.64       2.19    127.35      -0.00      0.00   9999.00     2.195
  6.02   52.00    0.00     9999.00    -12.14       2.08    131.63      -0.00      0.00   9999.00     2.078
  6.04   54.00    0.00     9999.00    -12.62       1.96    135.66      -0.00      0.00   9999.00     1.959
  6.05   56.00    0.00     9999.00    -13.08       1.84    139.46      -0.00      0.00   9999.00     1.839
  6.06   58.00    0.00     9999.00    -13.53       1.72    143.02      -0.00      0.00   9999.00     1.717
  6.06   60.00    0.00     9999.00    -13.97       1.59    146.33      -0.00      0.00   9999.00     1.595
  6.05   62.00    0.00     9999.00    -14.38       1.47    149.40      -0.00      0.00   9999.00     1.472
  6.03   64.00    0.00     9999.00    -14.78       1.35    152.22      -0.00      0.00   9999.00     1.348
  6.01   66.00    0.00     9999.00    -15.16       1.22    154.79      -0.00      0.00   9999.00     1.223
  5.98   68.00    0.00     9999.00    -15.53       1.10    157.11      -0.00      0.00   9999.00     1.097
  5.94   70.00    0.00     9999.00    -15.87       0.97    159.17      -0.00      0.00   9999.00     0.970
  5.90   72.00    0.00     9999.00    -16.19       0.84    160.99      -0.00      0.00   9999.00     0.843
  5.85   74.00    0.00     9999.00    -16.50       0.72    162.55      -0.00      0.00   9999.00     0.715
  5.79   76.00    0.00     9999.00    -16.78       0.59    163.85      -0.00      0.00   9999.00     0.587
  5.72   78.00    0.00     9999.00    -17.05       0.46    164.89      -0.00     -0.00  -9999.00     0.458
  5.65   80.00    0.00     9999.00    -17.29       0.33    165.68      -0.00     -0.00  -9999.00     0.329
  5.57   82.00    0.00     9999.00    -17.51       0.20    166.21      -0.00     -0.00  -9999.00     0.199
  5.48   84.00    0.00     9999.00    -17.71       0.07    166.47      -0.00     -0.00  -9999.00     0.069
  5.39   86.00    0.00     9999.00    -17.89      -0.06    166.48      -0.00     -0.00  -9999.00    -0.062
```


--- TECON - CW - TP LOADOUT ON VERVECE ---
--------- Intact Stability Check -- PHASE 10 ---------
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10**6
Roll Angle
0
8.7
17.4
26.1
34.8
43.5
52.2
60.9
69.6
78.3
87

```
*******************************************************
*                                *** MOSES ***                                *
*                                ----------------          18 June, 2025      *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                            *
*        ------  Longitudinal Strength Analysis - Still Water  -- PHASE 10 ------ *
*                                                                              *
********************************************************************************************************************

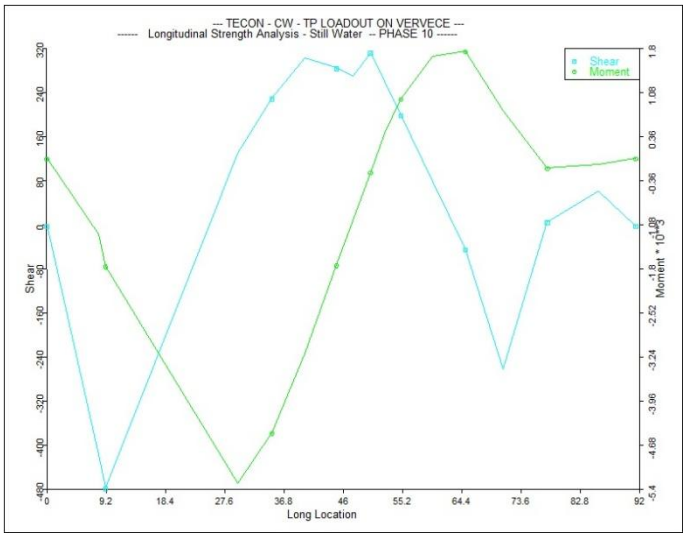
                    +++ L O N G I T U D I N A L   S T R E N G T H   R E S U L T S +++
                    ================================================================

                  Process is 10: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Allowable Stress =     155.00 Mpa

                                Allowable Deflection =       1.00 MM
```

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-417	-1246	-0.0493	3.7200
9.14	-477	-1757	-0.0695	4.2370
29.72	130	-5314	-0.2100	9.7315
35.00	230	-4476	-0.1769	9.5912
40.00	301	-3183	-0.1258	8.9545
45.00	284	-1739	-0.0687	7.9681
47.50	269	-1022	-0.0404	7.3932
50.29	312	-224	-0.0089	6.7187
52.50	259	406	0.0160	6.1783
55.00	199	978	0.0387	5.5774
60.00	78	1670	0.0660	4.4673
65.00	-43	1753	0.0693	3.5355
70.87	-261	771	0.0305	2.6722
77.72	5	-154	-0.0061	1.8008
85.70	60	-92	-0.0037	0.7641
91.44	-1	0	0.0000	0.0001



```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                          18 June, 2025        *
*         --- TECON - CW - TP LOADOUT ON VERVECE ---                                                  *
*         ---------     Intact Stability Check    -- PHASE 11 ---------                              *
*                                                                                                     *
*******************************************************************************************************

                +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                ======================================================================

                Process is 11: Units Are Degrees, Meters, and M-Tons Unless Specified

                              Results Are Reported In Body System

                    Draft =     4.30 Roll Angle =     0.00 Pitch Angle =    -0.00

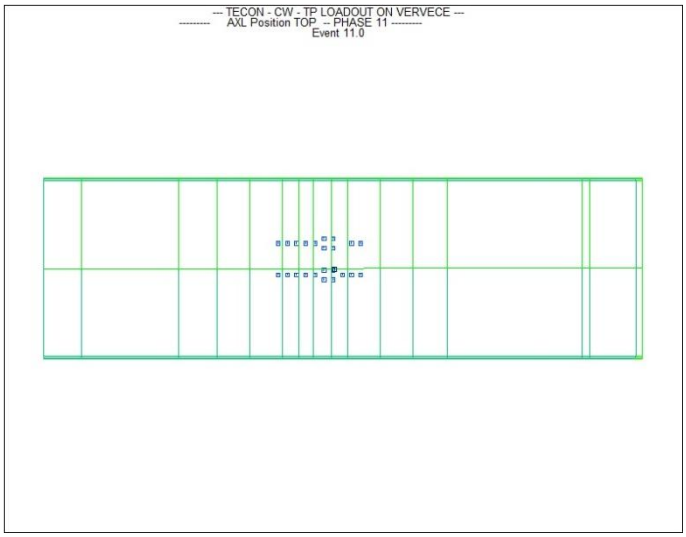
                                 Wet Radii Of Gyration About CG

                           K-X =     7.79 K-Y =    24.83 K-Z =    25.60

                                    GMT =    14.25 GML =   159.16

                           /-- Center of Gravity ---/  Sounding   % Full
                  Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                          ----------------  Part AXL11      ------------
                          LOAD_GRO    416.90    49.89    -1.24     7.10
                          ----------------  Part CF         ------------
                          LOAD_GRO     28.00    69.38    11.22     8.10
                          ----------------  Part GRI&SF-B   ------------
                          LOAD_GRO     75.00    30.86    -1.14     7.35
                          ----------------  Part GRI&SF-C   ------------
                          LOAD_GRO      0.50    67.44    11.22     7.10
                          ----------------  Part GRI&SF-T   ------------
                          LOAD_GRO     45.00    65.20    -2.92     7.40
                          ----------------  Part VERVECE    ------------
                          LOAD_GRO   1832.80    47.02     0.00     3.52
                                       --- Contents ---
                    1PC       224.31     5.62    -3.43     3.77     6.02    98.00
                    1PW       206.33     5.71   -10.28     3.59     5.70    90.00
                    1SC       224.80     5.62     3.43     3.77     6.02    98.00
                    1SW       206.33     5.71    10.28     3.59     5.70    90.00
                    2PC       426.19    19.43    -3.43     1.52     3.05    50.00
                    2PW       310.23    19.43   -10.28     1.11     2.22    36.40
                    2SC       426.19    19.43     3.43     1.52     3.05    50.00
                    2SW       330.92    19.43    10.28     1.19     2.37    38.83
                    3PC       255.71    40.00    -3.43     0.91     1.83    30.00
                    3PW       426.16    40.00   -10.28     1.53     3.05    50.00
                    3SC       255.71    40.00     3.43     0.91     1.83    30.00
                    3SW       426.16    40.00    10.28     1.53     3.05    50.00
                    4PC       835.34    60.58    -3.43     2.99     5.97    98.00
                    4PW       426.16    60.58   -10.28     1.53     3.05    50.00
                    4SC       835.34    60.58     3.43     2.99     5.97    98.00
                    4SW       426.16    60.58    10.28     1.53     3.05    50.00
                    5PC       240.01    83.19    -3.43     1.86     3.42    50.00
                    5PW       457.65    79.88   -10.28     2.02     3.81    59.11
                    5SC       236.24    83.19     3.43     1.86     3.42    50.00
                    5SW       478.47    79.94    10.28     2.10     3.96    61.80
                          ========  ========  =======  =======  =======
                          Total     10052.61    46.75    -0.00     2.65
                          Buoyancy  10052.60    46.75    -0.00     2.21
```




```
                    ********************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 11 ---------                                 *
*                                                                                                        *
**********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 11: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
                    ******************************************************
*                                       ***  MOSES   ***                                                  *
*                                       ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                     *
*          ---------     Intact Stability Check    -- PHASE 11 ---------                                 .*
*                                                                                                         *
***********************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 11: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 2.65, and Wind Speed = 10 Knots

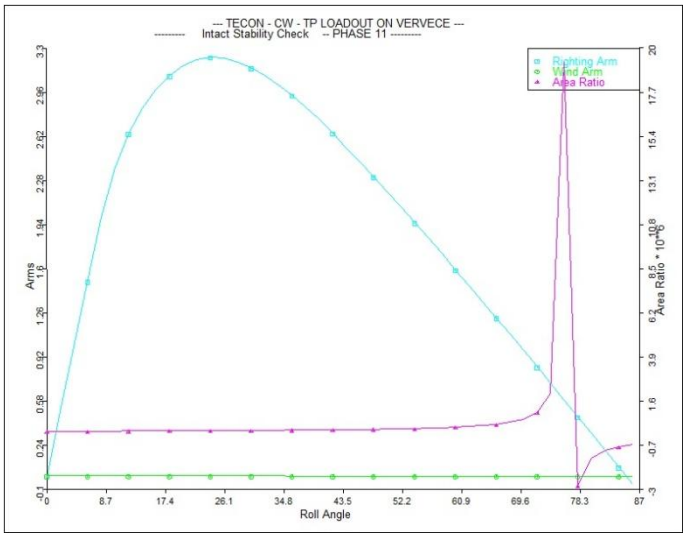
Initial: Roll = 0.00, Trim = -0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.39	-0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.50	0.50	0.00	0.00	3115.10	0.498
4.29	4.00	0.00	9999.00	1.48	1.00	2.00	0.00	0.00	6404.21	0.999
4.27	6.00	0.00	9999.00	1.03	1.50	4.50	0.00	0.00	9999.00	1.502
4.25	8.00	0.00	9999.00	0.57	2.00	8.00	0.00	0.00	9999.00	2.000
4.26	10.00	0.00	9999.00	0.07	2.38	12.37	0.00	0.00	9999.00	2.376
4.31	12.00	0.00	9999.00	-0.47	2.64	17.39	0.00	0.00	9999.00	2.640
4.39	14.00	0.00	9999.00	-1.04	2.83	22.87	0.00	0.00	9999.00	2.834
4.49	16.00	0.00	9999.00	-1.63	2.98	28.68	0.00	0.00	9999.00	2.978
4.60	18.00	0.00	9999.00	-2.25	3.09	34.74	0.00	0.00	9999.00	3.087
4.72	20.00	0.00	9999.00	-2.88	3.17	41.00	0.00	0.00	9999.00	3.165
4.85	22.00	0.00	9999.00	-3.51	3.21	47.37	0.00	0.00	9999.00	3.213
4.98	24.00	0.00	9999.00	-4.15	3.23	53.82	0.00	0.00	9999.00	3.230
5.09	26.00	0.00	9999.00	-4.77	3.22	60.27	0.00	0.00	9999.00	3.221
5.20	28.00	0.00	9999.00	-5.40	3.19	66.68	0.00	0.00	9999.00	3.192
5.31	30.00	0.00	9999.00	-6.01	3.15	73.02	0.00	0.00	9999.00	3.147
5.41	32.00	0.00	9999.00	-6.62	3.09	79.25	0.00	0.00	9999.00	3.088
5.50	34.00	0.00	9999.00	-7.22	3.02	85.36	0.00	0.00	9999.00	3.017
5.59	36.00	0.00	9999.00	-7.81	2.94	91.31	-0.00	0.00	9999.00	2.936
5.66	38.00	0.00	9999.00	-8.39	2.85	97.09	-0.00	0.00	9999.00	2.846
5.74	40.00	0.00	9999.00	-8.96	2.75	102.69	-0.00	0.00	9999.00	2.748
5.80	42.00	0.00	9999.00	-9.52	2.64	108.08	-0.00	0.00	9999.00	2.643
5.86	44.00	0.00	9999.00	-10.07	2.53	113.26	-0.00	0.00	9999.00	2.533
5.91	46.00	0.00	9999.00	-10.61	2.42	118.21	-0.00	0.00	9999.00	2.421
5.95	48.00	0.00	9999.00	-11.13	2.31	122.94	-0.00	0.00	9999.00	2.307
5.99	50.00	0.00	9999.00	-11.64	2.19	127.43	-0.00	0.00	9999.00	2.191
6.02	52.00	0.00	9999.00	-12.14	2.07	131.70	-0.00	0.00	9999.00	2.073
6.04	54.00	0.00	9999.00	-12.62	1.95	135.73	-0.00	0.00	9999.00	1.955
6.05	56.00	0.00	9999.00	-13.09	1.83	139.52	-0.00	0.00	9999.00	1.835
6.06	58.00	0.00	9999.00	-13.54	1.71	143.06	-0.00	0.00	9999.00	1.713
6.06	60.00	0.00	9999.00	-13.97	1.59	146.37	-0.00	0.00	9999.00	1.591
6.05	62.00	0.00	9999.00	-14.38	1.47	149.43	-0.00	0.00	9999.00	1.469
6.03	64.00	0.00	9999.00	-14.78	1.34	152.24	-0.00	0.00	9999.00	1.345
6.01	66.00	0.00	9999.00	-15.16	1.22	154.81	-0.00	0.00	9999.00	1.220
5.98	68.00	0.00	9999.00	-15.53	1.09	157.12	-0.00	0.00	9999.00	1.095
5.94	70.00	0.00	9999.00	-15.87	0.97	159.18	-0.00	0.00	9999.00	0.968
5.90	72.00	0.00	9999.00	-16.19	0.84	160.99	-0.00	0.00	9999.00	0.841
5.85	74.00	0.00	9999.00	-16.50	0.71	162.55	-0.00	0.00	9999.00	0.714
5.79	76.00	0.00	9999.00	-16.78	0.59	163.85	-0.00	0.00	9999.00	0.586
5.72	78.00	0.00	9999.00	-17.05	0.46	164.89	-0.00	-0.00	-9999.00	0.457
5.65	80.00	0.00	9999.00	-17.29	0.33	165.67	-0.00	-0.00	-9999.00	0.328
5.57	82.00	0.00	9999.00	-17.51	0.20	166.20	-0.00	-0.00	-9999.00	0.198
5.48	84.00	0.00	9999.00	-17.71	0.07	166.47	-0.00	-0.00	-9999.00	0.069
5.39	86.00	0.00	9999.00	-17.89	-0.06	166.47	-0.00	-0.00	-9999.00	-0.062

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--- TECON - CW - TP LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 11 ---
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^6
Roll Angle
0
8.7
17.4
26.1
34.8
43.5
52.2
60.9
69.6
78.3
87

```
**********************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------                  18 June, 2025  *
*         --- TECON - CW - TP LOADOUT ON VERVECE ---                                 *
*         ------   Longitudinal Strength Analysis - Still Water  -- PHASE 11 ------ *
*                                                                                    *
**************************************************************************************************************

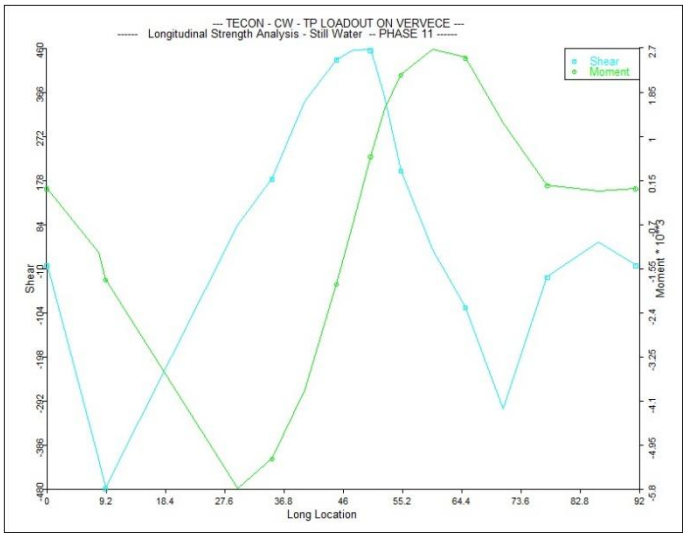
                    +++ L O N G I T U D I N A L   S T R E N G T H   R E S U L T S +++
                    ================================================================

                  Process is 11: Units Are Degrees, Meters, and M-Tons Unless Specified

                                    Allowable Stress =     155.00 Mpa

                                  Allowable Deflection =       1.00 MM
```

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-416	-1245	-0.0492	3.7131
9.14	-477	-1755	-0.0694	4.2291
29.72	83	-5796	-0.2291	9.6338
35.00	182	-5209	-0.2059	9.3783
40.00	347	-3886	-0.1536	8.5523
45.00	436	-1841	-0.0728	7.3051
47.50	456	-693	-0.0274	6.5909
50.29	456	622	0.0246	5.7721
52.50	356	1519	0.0600	5.1373
55.00	199	2190	0.0865	4.4581
60.00	30	2674	0.1057	3.2880
65.00	-91	2521	0.0996	2.4069
70.87	-309	1260	0.0498	1.7092
77.72	-26	62	0.0024	1.1232
85.70	47	-54	-0.0022	0.4747
91.44	-1	0	-0.0000	0.0001



```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                          18 June, 2025        *
*         --- TECON - CW - TP LOADOUT ON VERVECE ---                                                  *
*         ---------     Intact Stability Check    -- PHASE 12 ---------                              *
*                                                                                                     *
*******************************************************************************************************************

                +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                ======================================================================

                Process is 12: Units Are Degrees, Meters, and M-Tons Unless Specified

                                Results Are Reported In Body System

                    Draft =     4.30 Roll Angle =     0.00 Pitch Angle =     0.00

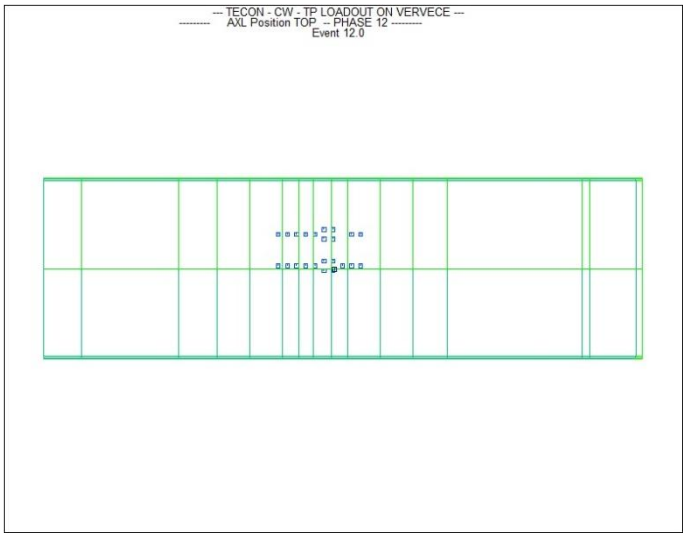
                                Wet Radii Of Gyration About CG

                           K-X =     7.80 K-Y =    24.83 K-Z =    25.61

                                    GMT =    14.25 GML =   159.14

                           /-- Center of Gravity ---/  Sounding   % Full
                    Name    Weight    ---X---  ---Y---  ---Z---  -------- --------

                           ----------------  Part AXL12      ------------
                           LOAD_GRO    416.90    49.89    -2.65     7.10
                           ----------------  Part CF         ------------
                           LOAD_GRO     28.00    69.38    11.22     8.10
                           ----------------  Part GRI&SF-B   ------------
                           LOAD_GRO     75.00    30.86    -1.14     7.35
                           ----------------  Part GRI&SF-C   ------------
                           LOAD_GRO      0.50    67.44    11.22     7.10
                           ----------------  Part GRI&SF-T   ------------
                           LOAD_GRO     45.00    65.20    -2.92     7.40
                           ----------------  Part VERVECE    ------------
                           LOAD_GRO   1832.80    47.02     0.00     3.52
                                       --- Contents ---
                      1PC      224.31     5.62    -3.43     3.77     6.02    98.00
                      1PW      206.33     5.71   -10.28     3.59     5.70    90.00
                      1SC      224.80     5.62     3.43     3.77     6.02    98.00
                      1SW      206.33     5.71    10.28     3.59     5.70    90.00
                      2PC      426.19    19.43    -3.43     1.52     3.05    50.00
                      2PW      295.50    19.43   -10.28     1.06     2.12    34.67
                      2SC      426.19    19.43     3.43     1.52     3.05    50.00
                      2SW      344.73    19.43    10.28     1.24     2.47    40.45
                      3PC      255.71    40.01    -3.43     0.91     1.83    30.00
                      3PW      426.16    40.01   -10.28     1.53     3.05    50.00
                      3SC      255.71    40.01     3.43     0.91     1.83    30.00
                      3SW      426.16    40.01    10.28     1.53     3.05    50.00
                      4PC      835.34    60.58    -3.43     2.99     5.97    98.00
                      4PW      426.16    60.58   -10.28     1.53     3.05    50.00
                      4SC      835.34    60.58     3.43     2.99     5.97    98.00
                      4SW      426.16    60.58    10.28     1.53     3.05    50.00
                      5PC      240.01    83.19    -3.43     1.86     3.42    50.00
                      5PW      443.83    79.84   -10.28     1.96     3.71    57.33
                      5SC      236.24    83.19     3.43     1.86     3.42    50.00
                      5SW      493.22    79.97    10.28     2.15     4.07    63.71
                           ========  ========  =======  =======  =======
                           Total     10052.61    46.75     0.00     2.65
                           Buoyancy  10052.61    46.75    -0.00     2.21
```




```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                  *
*          ---------     Intact Stability Check    -- PHASE 12 ---------                              *
*                                                                                                      *
********************************************************************************************************

                          +++ D R A F T   M A R K   R E A D I N G S +++
                          ============================================

                Process is 12: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
                    ******************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                          18 June, 2025        *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 12 ---------                                .*
*                                                                                                        *
**********************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 12: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 2.65, and Wind Speed = 10 Knots

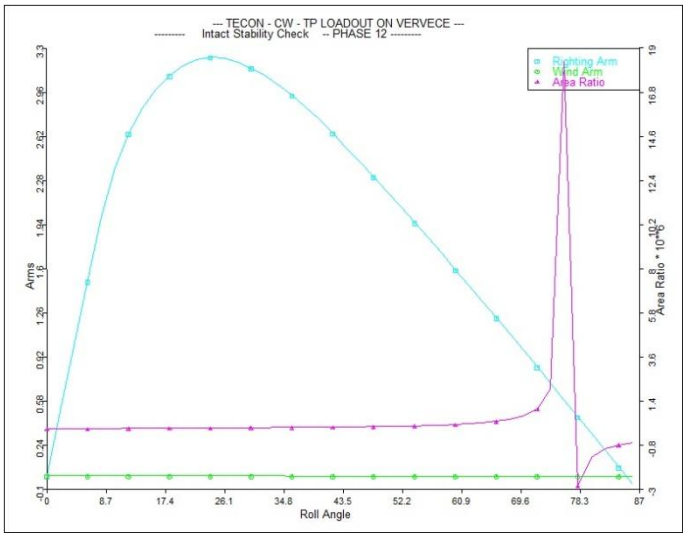
Initial: Roll = 0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.50	0.50	0.00	0.00	3115.38	0.498
4.29	4.00	0.00	9999.00	1.49	1.00	2.00	0.00	0.00	6404.17	0.999
4.27	6.00	0.00	9999.00	1.03	1.50	4.50	0.00	0.00	9999.00	1.502
4.25	8.00	0.00	9999.00	0.57	2.00	8.00	0.00	0.00	9999.00	2.000
4.26	10.00	0.00	9999.00	0.08	2.38	12.37	0.00	0.00	9999.00	2.376
4.31	12.00	0.00	9999.00	-0.46	2.64	17.39	0.00	0.00	9999.00	2.640
4.39	14.00	0.00	9999.00	-1.04	2.83	22.86	0.00	0.00	9999.00	2.834
4.48	16.00	0.00	9999.00	-1.63	2.98	28.68	0.00	0.00	9999.00	2.978
4.60	18.00	0.00	9999.00	-2.25	3.09	34.74	0.00	0.00	9999.00	3.086
4.72	20.00	0.00	9999.00	-2.88	3.17	40.99	0.00	0.00	9999.00	3.165
4.85	22.00	0.00	9999.00	-3.51	3.21	47.37	0.00	0.00	9999.00	3.213
4.97	24.00	0.00	9999.00	-4.14	3.23	53.81	0.00	0.00	9999.00	3.230
5.09	26.00	0.00	9999.00	-4.77	3.22	60.26	0.00	0.00	9999.00	3.221
5.20	28.00	0.00	9999.00	-5.39	3.19	66.68	0.00	0.00	9999.00	3.192
5.31	30.00	0.00	9999.00	-6.01	3.15	73.01	0.00	0.00	9999.00	3.146
5.41	32.00	0.00	9999.00	-6.62	3.09	79.25	0.00	0.00	9999.00	3.087
5.50	34.00	0.00	9999.00	-7.22	3.02	85.35	0.00	0.00	9999.00	3.017
5.58	36.00	0.00	9999.00	-7.81	2.94	91.31	-0.00	0.00	9999.00	2.936
5.66	38.00	0.00	9999.00	-8.39	2.85	97.09	-0.00	0.00	9999.00	2.847
5.73	40.00	0.00	9999.00	-8.96	2.75	102.68	-0.00	0.00	9999.00	2.748
5.80	42.00	0.00	9999.00	-9.52	2.64	108.07	-0.00	0.00	9999.00	2.643
5.86	44.00	0.00	9999.00	-10.07	2.53	113.25	-0.00	0.00	9999.00	2.533
5.91	46.00	0.00	9999.00	-10.61	2.42	118.20	-0.00	0.00	9999.00	2.421
5.95	48.00	0.00	9999.00	-11.13	2.31	122.93	-0.00	0.00	9999.00	2.307
5.99	50.00	0.00	9999.00	-11.64	2.19	127.43	-0.00	0.00	9999.00	2.191
6.02	52.00	0.00	9999.00	-12.14	2.07	131.69	-0.00	0.00	9999.00	2.074
6.04	54.00	0.00	9999.00	-12.62	1.96	135.72	-0.00	0.00	9999.00	1.955
6.05	56.00	0.00	9999.00	-13.08	1.84	139.51	-0.00	0.00	9999.00	1.835
6.06	58.00	0.00	9999.00	-13.53	1.71	143.06	-0.00	0.00	9999.00	1.714
6.06	60.00	0.00	9999.00	-13.97	1.59	146.37	-0.00	0.00	9999.00	1.592
6.05	62.00	0.00	9999.00	-14.38	1.47	149.43	-0.00	0.00	9999.00	1.469
6.03	64.00	0.00	9999.00	-14.78	1.35	152.24	-0.00	0.00	9999.00	1.345
6.01	66.00	0.00	9999.00	-15.16	1.22	154.81	-0.00	0.00	9999.00	1.220
5.98	68.00	0.00	9999.00	-15.53	1.09	157.12	-0.00	0.00	9999.00	1.095
5.94	70.00	0.00	9999.00	-15.87	0.97	159.19	-0.00	0.00	9999.00	0.969
5.90	72.00	0.00	9999.00	-16.19	0.84	161.00	-0.00	0.00	9999.00	0.842
5.85	74.00	0.00	9999.00	-16.50	0.71	162.55	-0.00	0.00	9999.00	0.714
5.79	76.00	0.00	9999.00	-16.78	0.59	163.85	-0.00	0.00	9999.00	0.586
5.72	78.00	0.00	9999.00	-17.05	0.46	164.90	-0.00	-0.00	-9999.00	0.457
5.65	80.00	0.00	9999.00	-17.29	0.33	165.68	-0.00	-0.00	-9999.00	0.328
5.57	82.00	0.00	9999.00	-17.51	0.20	166.21	-0.00	-0.00	-9999.00	0.199
5.48	84.00	0.00	9999.00	-17.71	0.07	166.48	-0.00	-0.00	-9999.00	0.069
5.39	86.00	0.00	9999.00	-17.89	-0.06	166.48	-0.00	-0.00	-9999.00	-0.061

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--- TECON - CW - TP LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 12 ---
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^-6
Roll Angle
0
8.7
17.4
26.1
34.8
43.5
52.2
60.9
69.6
78.3
87

```
*******************************************************
*                                *** MOSES ***                                *
*                                ----------------          18 June, 2025      *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                            *
*        ------  Longitudinal Strength Analysis - Still Water  -- PHASE 12 ------ *
*                                                                              *
********************************************************************************************************************
```

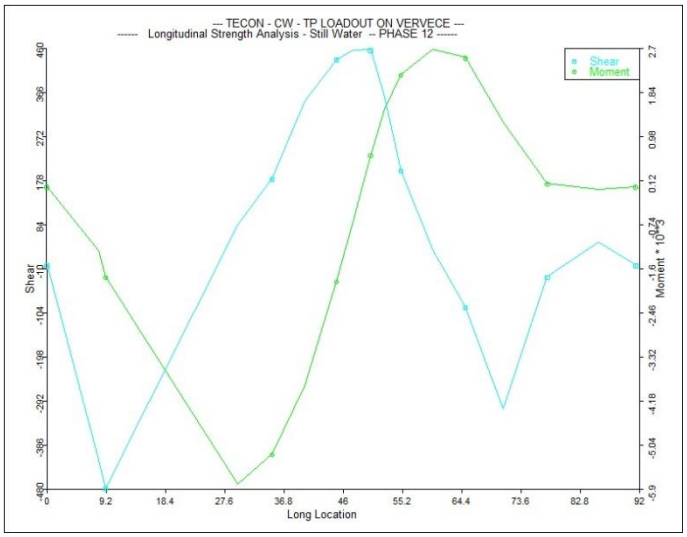
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 12: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-417	-1246	-0.0493	3.7180
9.14	-477	-1757	-0.0695	4.2347
29.72	83	-5800	-0.2292	9.6483
35.00	182	-5213	-0.2060	9.3939
40.00	347	-3890	-0.1538	8.5685
45.00	436	-1844	-0.0729	7.3214
47.50	456	-697	-0.0276	6.6071
50.29	456	618	0.0244	5.7882
52.50	356	1515	0.0599	5.1530
55.00	199	2186	0.0864	4.4732
60.00	30	2670	0.1055	3.3021
65.00	-91	2517	0.0995	2.4195
70.87	-309	1258	0.0497	1.7192
77.72	-26	61	0.0024	1.1300
85.70	47	-54	-0.0022	0.4776
91.44	-1	0	0.0000	0.0001



```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                          18 June, 2025        *
*         --- TECON - CW - TP LOADOUT ON VERVECE ---                                                  *
*         ---------     Intact Stability Check    -- PHASE 13 ---------                              *
*                                                                                                     *
*******************************************************************************************************

                +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                ======================================================================

                Process is 13: Units Are Degrees, Meters, and M-Tons Unless Specified

                                Results Are Reported In Body System

                    Draft =     4.30 Roll Angle =     0.00 Pitch Angle =     0.00

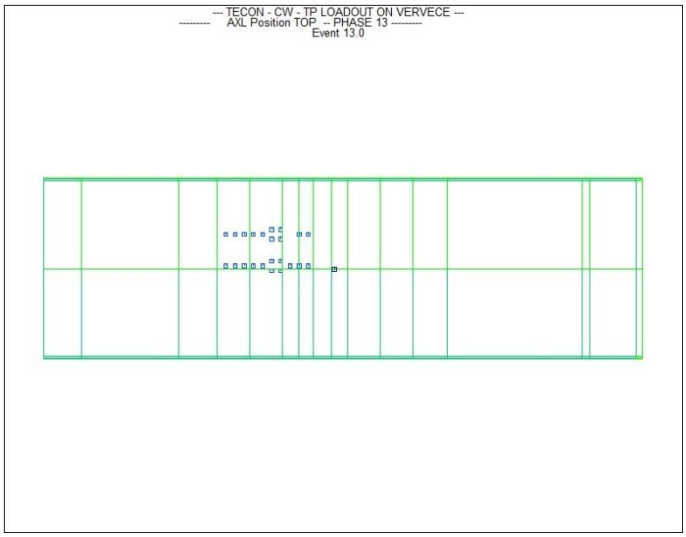
                                Wet Radii Of Gyration About CG

                           K-X =     7.80 K-Y =    24.87 K-Z =    25.65

                                    GMT =    14.25 GML =   159.12

                           /-- Center of Gravity ---/  Sounding   % Full
                    Name    Weight    ---X---  ---Y---  ---Z---  -------- --------

                           ----------------  Part AXL13      ------------
                           LOAD_GRO    416.90    57.89    -2.65     7.10
                           ----------------  Part CF         ------------
                           LOAD_GRO     28.00    69.38    11.22     8.10
                           ----------------  Part GRI&SF-B   ------------
                           LOAD_GRO     75.00    30.86    -1.14     7.35
                           ----------------  Part GRI&SF-C   ------------
                           LOAD_GRO      0.50    67.44    11.22     7.10
                           ----------------  Part GRI&SF-T   ------------
                           LOAD_GRO     45.00    65.20    -2.92     7.40
                           ----------------  Part VERVECE    ------------
                           LOAD_GRO   1832.80    47.02     0.00     3.52
                                       --- Contents ---
                      1PC      224.31     5.62    -3.43     3.77     6.02    98.00
                      1PW      206.33     5.71   -10.28     3.59     5.70    90.00
                      1SC      224.80     5.62     3.43     3.77     6.02    98.00
                      1SW      206.33     5.71    10.28     3.59     5.70    90.00
                      2PC      426.19    19.43    -3.43     1.52     3.05    50.00
                      2PW      322.54    19.43   -10.28     1.16     2.31    37.84
                      2SC      426.19    19.43     3.43     1.52     3.05    50.00
                      2SW      371.71    19.43    10.28     1.33     2.66    43.61
                      3PC      255.71    40.01    -3.43     0.91     1.83    30.00
                      3PW      426.16    40.01   -10.28     1.53     3.05    50.00
                      3SC      255.71    40.01     3.43     0.91     1.83    30.00
                      3SW      426.16    40.01    10.28     1.53     3.05    50.00
                      4PC      835.34    60.58    -3.43     2.99     5.97    98.00
                      4PW      426.16    60.58   -10.28     1.53     3.05    50.00
                      4SC      835.34    60.58     3.43     2.99     5.97    98.00
                      4SW      426.16    60.58    10.28     1.53     3.05    50.00
                      5PC      240.01    83.19    -3.43     1.86     3.42    50.00
                      5PW      416.81    79.76   -10.28     1.85     3.52    53.84
                      5SC      236.24    83.19     3.43     1.86     3.42    50.00
                      5SW      466.22    79.90    10.28     2.05     3.87    60.22
                           ========  ========  =======  =======  =======
                           Total     10052.61    46.75    -0.00     2.64
                           Buoyancy  10052.61    46.75    -0.00     2.21
```




```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                      18 June, 2025              *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                  *
*          ---------     Intact Stability Check    -- PHASE 13 ---------                             *
*                                                                                                     *
*******************************************************************************************************

                          +++ D R A F T   M A R K   R E A D I N G S +++
                          ============================================

                Process is 13: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
                    ******************************************************
*                                       ***  MOSES   ***                                                  *
*                                       ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                     *
*          ---------     Intact Stability Check    -- PHASE 13 ---------                                 .*
*                                                                                                        *
**********************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 13: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 2.64, and Wind Speed = 10 Knots

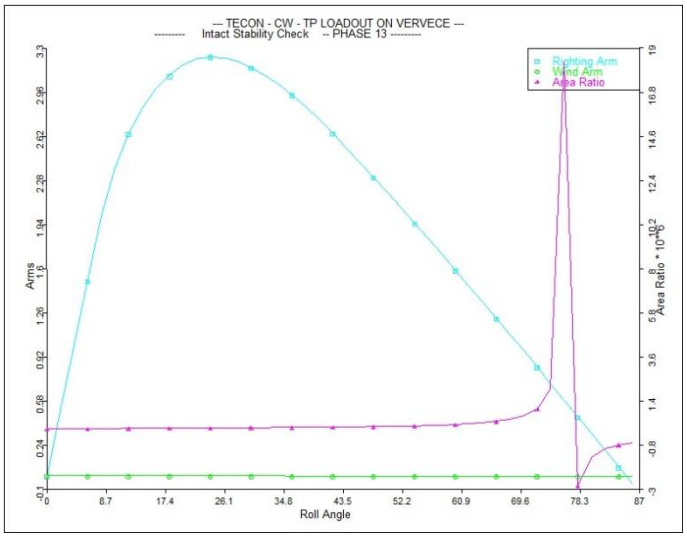
Initial: Roll = 0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	-0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.50	0.50	0.00	0.00	3116.47	0.498
4.29	4.00	0.00	9999.00	1.49	1.00	2.00	0.00	0.00	6407.07	1.000
4.27	6.00	0.00	9999.00	1.03	1.50	4.50	0.00	0.00	9999.00	1.503
4.25	8.00	0.00	9999.00	0.57	2.00	8.00	0.00	0.00	9999.00	2.001
4.26	10.00	0.00	9999.00	0.08	2.38	12.38	0.00	0.00	9999.00	2.377
4.31	12.00	0.00	9999.00	-0.46	2.64	17.40	0.00	0.00	9999.00	2.642
4.39	14.00	0.00	9999.00	-1.04	2.84	22.88	0.00	0.00	9999.00	2.836
4.48	16.00	0.00	9999.00	-1.63	2.98	28.69	0.00	0.00	9999.00	2.980
4.60	18.00	0.00	9999.00	-2.25	3.09	34.76	0.00	0.00	9999.00	3.089
4.72	20.00	0.00	9999.00	-2.88	3.17	41.02	0.00	0.00	9999.00	3.168
4.85	22.00	0.00	9999.00	-3.51	3.22	47.40	0.00	0.00	9999.00	3.216
4.97	24.00	0.00	9999.00	-4.14	3.23	53.85	0.00	0.00	9999.00	3.233
5.09	26.00	0.00	9999.00	-4.77	3.22	60.31	0.00	0.00	9999.00	3.224
5.20	28.00	0.00	9999.00	-5.39	3.20	66.73	0.00	0.00	9999.00	3.196
5.31	30.00	0.00	9999.00	-6.01	3.15	73.08	0.00	0.00	9999.00	3.150
5.41	32.00	0.00	9999.00	-6.62	3.09	79.32	0.00	0.00	9999.00	3.092
5.50	34.00	0.00	9999.00	-7.22	3.02	85.43	0.00	0.00	9999.00	3.021
5.58	36.00	0.00	9999.00	-7.81	2.94	91.39	-0.00	0.00	9999.00	2.940
5.66	38.00	0.00	9999.00	-8.39	2.85	97.18	-0.00	0.00	9999.00	2.849
5.73	40.00	0.00	9999.00	-8.96	2.75	102.78	-0.00	0.00	9999.00	2.750
5.80	42.00	0.00	9999.00	-9.52	2.64	108.17	-0.00	0.00	9999.00	2.643
5.86	44.00	0.00	9999.00	-10.07	2.53	113.35	-0.00	0.00	9999.00	2.532
5.91	46.00	0.00	9999.00	-10.61	2.42	118.30	-0.00	0.00	9999.00	2.418
5.95	48.00	0.00	9999.00	-11.13	2.30	123.02	-0.00	0.00	9999.00	2.304
5.99	50.00	0.00	9999.00	-11.64	2.19	127.51	-0.00	0.00	9999.00	2.188
6.02	52.00	0.00	9999.00	-12.14	2.07	131.77	-0.00	0.00	9999.00	2.070
6.04	54.00	0.00	9999.00	-12.62	1.95	135.79	-0.00	0.00	9999.00	1.952
6.05	56.00	0.00	9999.00	-13.08	1.83	139.57	-0.00	0.00	9999.00	1.832
6.06	58.00	0.00	9999.00	-13.53	1.71	143.11	-0.00	0.00	9999.00	1.711
6.06	60.00	0.00	9999.00	-13.97	1.59	146.41	-0.00	0.00	9999.00	1.589
6.05	62.00	0.00	9999.00	-14.38	1.47	149.47	-0.00	0.00	9999.00	1.466
6.03	64.00	0.00	9999.00	-14.78	1.34	152.28	-0.00	0.00	9999.00	1.343
6.01	66.00	0.00	9999.00	-15.16	1.22	154.84	-0.00	0.00	9999.00	1.218
5.98	68.00	0.00	9999.00	-15.53	1.09	157.15	-0.00	0.00	9999.00	1.093
5.94	70.00	0.00	9999.00	-15.87	0.97	159.21	-0.00	0.00	9999.00	0.967
5.90	72.00	0.00	9999.00	-16.19	0.84	161.02	-0.00	0.00	9999.00	0.840
5.85	74.00	0.00	9999.00	-16.50	0.71	162.57	-0.00	0.00	9999.00	0.713
5.79	76.00	0.00	9999.00	-16.78	0.58	163.87	-0.00	0.00	9999.00	0.585
5.72	78.00	0.00	9999.00	-17.05	0.46	164.91	-0.00	-0.00	-9999.00	0.456
5.65	80.00	0.00	9999.00	-17.29	0.33	165.69	-0.00	-0.00	-9999.00	0.328
5.57	82.00	0.00	9999.00	-17.51	0.20	166.22	-0.00	-0.00	-9999.00	0.198
5.48	84.00	0.00	9999.00	-17.71	0.07	166.49	-0.00	-0.00	-9999.00	0.069
5.39	86.00	0.00	9999.00	-17.89	-0.06	166.50	-0.00	-0.00	-9999.00	-0.061

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--- TECON - CW - TP LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 13 ---
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^-6
Roll Angle
0
8.7
17.4
26.1
34.8
43.5
52.2
60.9
69.6
78.3
87

```
*********************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------                    18 June, 2025 *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                  *
*        ------   Longitudinal Strength Analysis - Still Water  -- PHASE 13 ------  *
*                                                                                    *
**************************************************************************************************************
```

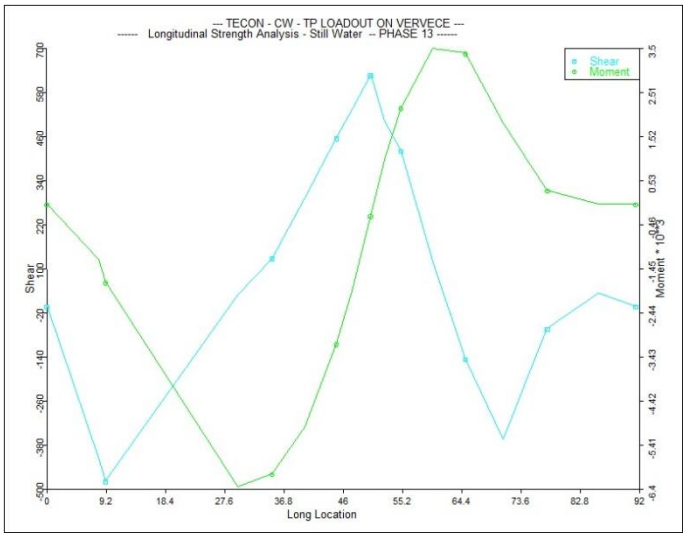
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 13: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-417	-1246	-0.0493	4.1136
9.14	-477	-1757	-0.0695	4.6869
29.72	29	-6356	-0.2512	11.0315
35.00	128	-6054	-0.2393	10.9094
40.00	292	-5002	-0.1977	10.1145
45.00	456	-3131	-0.1238	8.7755
47.50	537	-1890	-0.0747	7.9630
50.29	628	-263	-0.0104	6.9964
52.50	501	1005	0.0397	6.2225
55.00	422	2159	0.0853	5.3729
60.00	120	3495	0.1381	3.8737
65.00	-145	3390	0.1339	2.7464
70.87	-363	1813	0.0716	1.8771
77.72	-62	308	0.0122	1.1947
85.70	32	-11	-0.0005	0.4981
91.44	-1	0	0.0000	0.0001



```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                          18 June, 2025        *
*         --- TECON - CW - TP LOADOUT ON VERVECE ---                                                  *
*         ---------     Intact Stability Check    -- PHASE 14 ---------                              *
*                                                                                                     *
*******************************************************************************************************************

                +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                ======================================================================

                Process is 14: Units Are Degrees, Meters, and M-Tons Unless Specified

                                Results Are Reported In Body System

                    Draft =     4.30 Roll Angle =     0.00 Pitch Angle =     0.00

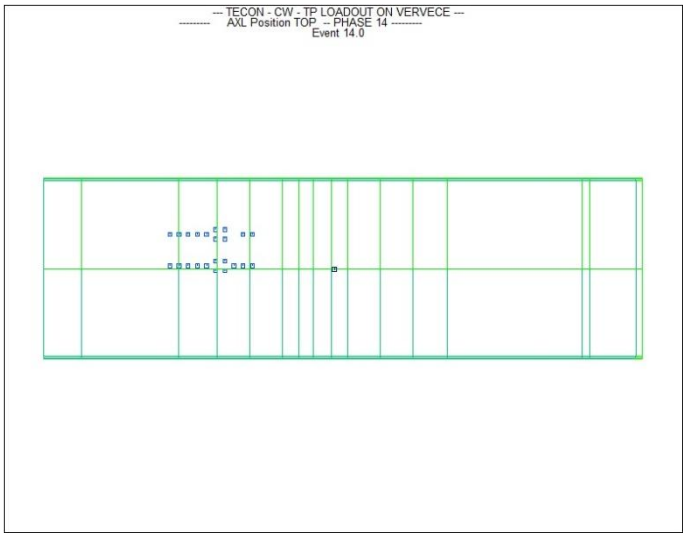
                                Wet Radii Of Gyration About CG

                           K-X =     7.80 K-Y =    25.04 K-Z =    25.82

                                    GMT =    14.26 GML =   159.16

                           /-- Center of Gravity ---/  Sounding   % Full
                  Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                           ----------------  Part AXL14      ------------
                           LOAD_GRO    416.90    66.46    -2.65     7.10
                           ----------------  Part CF         ------------
                           LOAD_GRO     28.00    69.38    11.22     8.10
                           ----------------  Part GRI&SF-B   ------------
                           LOAD_GRO     75.00    30.86    -1.14     7.35
                           ----------------  Part GRI&SF-C   ------------
                           LOAD_GRO      0.50    67.44    11.22     7.10
                           ----------------  Part GRI&SF-T   ------------
                           LOAD_GRO     45.00    65.20    -2.92     7.40
                           ----------------  Part VERVECE    ------------
                           LOAD_GRO   1832.80    47.02     0.00     3.52
                                        --- Contents ---
                    1PC         224.31     5.62    -3.43     3.77     6.02    98.00
                    1PW         206.33     5.71   -10.28     3.59     5.70    90.00
                    1SC         224.80     5.62     3.43     3.77     6.02    98.00
                    1SW         206.33     5.71    10.28     3.59     5.70    90.00
                    2PC         426.19    19.43    -3.43     1.52     3.05    50.00
                    2PW         351.48    19.43   -10.28     1.26     2.52    41.24
                    2SC         426.19    19.43     3.43     1.52     3.05    50.00
                    2SW         400.72    19.43    10.28     1.44     2.87    47.02
                    3PC         255.71    40.01    -3.43     0.91     1.83    30.00
                    3PW         426.16    40.01   -10.28     1.53     3.05    50.00
                    3SC         255.71    40.01     3.43     0.91     1.83    30.00
                    3SW         426.16    40.01    10.28     1.53     3.05    50.00
                    4PC         835.34    60.58    -3.43     2.99     5.97    98.00
                    4PW         426.16    60.58   -10.28     1.53     3.05    50.00
                    4SC         835.34    60.58     3.43     2.99     5.97    98.00
                    4SW         426.16    60.58    10.28     1.53     3.05    50.00
                    5PC         240.01    83.19    -3.43     1.86     3.42    50.00
                    5PW         387.87    79.67   -10.28     1.74     3.30    50.10
                    5SC         236.24    83.19     3.43     1.86     3.42    50.00
                    5SW         437.21    79.82    10.28     1.94     3.66    56.47
                           ========  ========  =======  =======  =======
                           Total     10052.61    46.75    -0.00     2.63
                           Buoyancy  10052.61    46.75    -0.00     2.21
```




```
                    ********************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                    18 June, 2025                *
*          --- TECON - CW - TP LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 14 ---------                                 *
*                                                                                                        *
**********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 14: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
*********************************************************
*                                   ***  MOSES   ***                                  *
*                                   ----------------                 18 June, 2025    *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                   *
*        ---------     Intact Stability Check    -- PHASE 14 ---------              .*
*                                                                                     *
***************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 14: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 2.63, and Wind Speed = 10 Knots

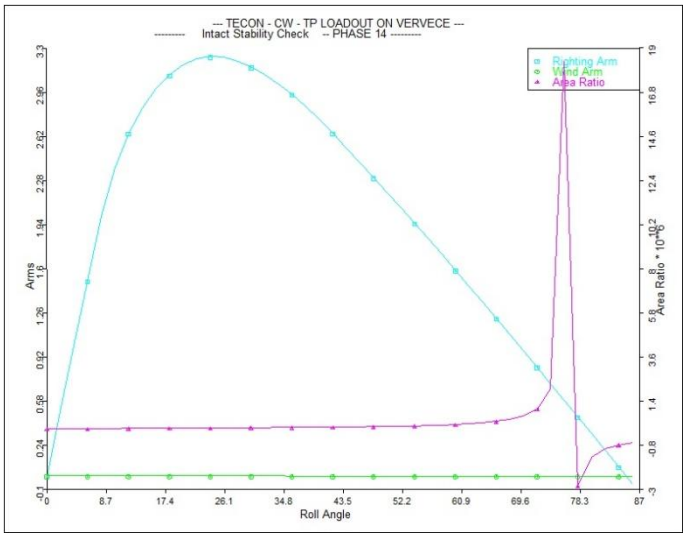
Initial: Roll = 0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	-0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.50	0.50	0.00	0.00	3117.93	0.498
4.29	4.00	0.00	9999.00	1.49	1.00	2.00	0.00	0.00	6410.08	1.000
4.27	6.00	0.00	9999.00	1.03	1.50	4.50	0.00	0.00	9999.00	1.504
4.25	8.00	0.00	9999.00	0.57	2.00	8.01	0.00	0.00	9999.00	2.002
4.26	10.00	0.00	9999.00	0.08	2.38	12.39	0.00	0.00	9999.00	2.378
4.31	12.00	0.00	9999.00	-0.46	2.64	17.41	0.00	0.00	9999.00	2.643
4.39	14.00	0.00	9999.00	-1.04	2.84	22.89	0.00	0.00	9999.00	2.837
4.48	16.00	0.00	9999.00	-1.63	2.98	28.71	0.00	0.00	9999.00	2.982
4.60	18.00	0.00	9999.00	-2.25	3.09	34.78	0.00	0.00	9999.00	3.091
4.72	20.00	0.00	9999.00	-2.88	3.17	41.04	0.00	0.00	9999.00	3.170
4.85	22.00	0.00	9999.00	-3.51	3.22	47.43	0.00	0.00	9999.00	3.219
4.97	24.00	0.00	9999.00	-4.14	3.24	53.89	0.00	0.00	9999.00	3.236
5.09	26.00	0.00	9999.00	-4.77	3.23	60.35	0.00	0.00	9999.00	3.227
5.20	28.00	0.00	9999.00	-5.39	3.20	66.78	0.00	0.00	9999.00	3.199
5.31	30.00	0.00	9999.00	-6.01	3.15	73.13	0.00	0.00	9999.00	3.154
5.41	32.00	0.00	9999.00	-6.62	3.10	79.38	0.00	0.00	9999.00	3.095
5.50	34.00	0.00	9999.00	-7.22	3.02	85.50	0.00	0.00	9999.00	3.025
5.58	36.00	0.00	9999.00	-7.81	2.94	91.47	-0.00	0.00	9999.00	2.943
5.66	38.00	0.00	9999.00	-8.39	2.85	97.26	-0.00	0.00	9999.00	2.852
5.73	40.00	0.00	9999.00	-8.96	2.75	102.86	-0.00	0.00	9999.00	2.751
5.80	42.00	0.00	9999.00	-9.52	2.64	108.26	-0.00	0.00	9999.00	2.643
5.86	44.00	0.00	9999.00	-10.07	2.53	113.43	-0.00	0.00	9999.00	2.531
5.91	46.00	0.00	9999.00	-10.61	2.42	118.38	-0.00	0.00	9999.00	2.417
5.95	48.00	0.00	9999.00	-11.13	2.30	123.10	-0.00	0.00	9999.00	2.301
5.99	50.00	0.00	9999.00	-11.64	2.19	127.58	-0.00	0.00	9999.00	2.185
6.02	52.00	0.00	9999.00	-12.14	2.07	131.84	-0.00	0.00	9999.00	2.068
6.04	54.00	0.00	9999.00	-12.62	1.95	135.85	-0.00	0.00	9999.00	1.950
6.05	56.00	0.00	9999.00	-13.08	1.83	139.63	-0.00	0.00	9999.00	1.830
6.06	58.00	0.00	9999.00	-13.53	1.71	143.17	-0.00	0.00	9999.00	1.709
6.06	60.00	0.00	9999.00	-13.97	1.59	146.47	-0.00	0.00	9999.00	1.587
6.05	62.00	0.00	9999.00	-14.38	1.46	149.52	-0.00	0.00	9999.00	1.465
6.03	64.00	0.00	9999.00	-14.78	1.34	152.33	-0.00	0.00	9999.00	1.341
6.01	66.00	0.00	9999.00	-15.16	1.22	154.88	-0.00	0.00	9999.00	1.217
5.98	68.00	0.00	9999.00	-15.53	1.09	157.19	-0.00	0.00	9999.00	1.092
5.94	70.00	0.00	9999.00	-15.87	0.97	159.25	-0.00	0.00	9999.00	0.966
5.90	72.00	0.00	9999.00	-16.19	0.84	161.06	-0.00	0.00	9999.00	0.840
5.85	74.00	0.00	9999.00	-16.50	0.71	162.61	-0.00	0.00	9999.00	0.712
5.79	76.00	0.00	9999.00	-16.78	0.58	163.91	-0.00	0.00	9999.00	0.585
5.72	78.00	0.00	9999.00	-17.05	0.46	164.95	-0.00	-0.00	-9999.00	0.456
5.65	80.00	0.00	9999.00	-17.29	0.33	165.73	-0.00	-0.00	-9999.00	0.328
5.57	82.00	0.00	9999.00	-17.51	0.20	166.26	-0.00	-0.00	-9999.00	0.199
5.48	84.00	0.00	9999.00	-17.71	0.07	166.53	-0.00	-0.00	-9999.00	0.069
5.39	86.00	0.00	9999.00	-17.89	-0.06	166.53	-0.00	-0.00	-9999.00	-0.060

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--- TECON - CW - TP LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 14 ---
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^-6
Roll Angle
0
8.7
17.4
26.1
34.8
43.5
52.2
60.9
69.6
78.3
87

```
*********************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------                  18 June, 2025  *
*        --- TECON - CW - TP LOADOUT ON VERVECE ---                                  *
*        ------   Longitudinal Strength Analysis - Still Water  -- PHASE 14 ------  *
*                                                                                    *
**************************************************************************************************************
```

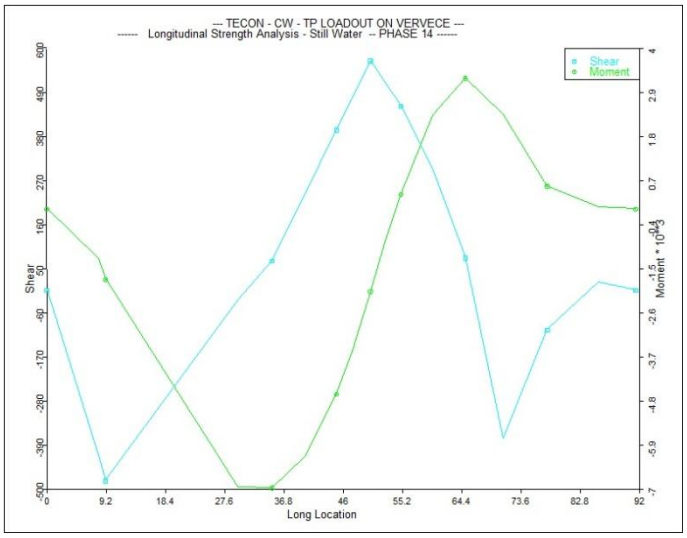
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 14: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-417	-1247	-0.0493	4.9197
9.14	-477	-1757	-0.0695	5.6083
29.72	-28	-6952	-0.2748	13.9332
35.00	70	-6956	-0.2749	14.2052
40.00	235	-6194	-0.2448	13.6816
45.00	398	-4613	-0.1823	12.4825
47.50	479	-3516	-0.1390	11.6808
50.29	570	-2052	-0.0811	10.6730
52.50	517	-852	-0.0337	9.8234
55.00	456	363	0.0144	8.8402
60.00	298	2327	0.0920	6.9327
65.00	78	3265	0.1290	5.2713
70.87	-373	2342	0.0925	3.7576
77.72	-100	569	0.0225	2.4055
85.70	16	34	0.0013	0.9978
91.44	-1	0	0.0000	0.0001



9 BALLASTING SYSTEM CHECKS

9.1 BALLAST TANK CAPACITY

The tanks filling was included in a range from 3% to 98% during all the Load-out and satisfies the requirement of table 4-1, section 4.5.3 of Ref. /2/ for Loadout class 2.

9.2 BALLAST PUMPING CAPACITY

Ballast pumps must be tried (turning on and off the pumps) to ensure perfect functioning of system/item within 24h of the start of load-out.

Pumping capacity of the external pumps consists of 8 pumps, with a rated capacity of min 300 m3/h + 2 x 600 m3/h internal barge pumps.

Load out weight:	417 t
Cross over estimated duration:	1 Hours
Capacity required for the load compensation	420 t/h

Capacity required for tide compensation:

- @max tide speed: 0.16 m/h x (2.52 t/mmx1000mm) = 403 t/h
- Average: 0.80 m x 91.4x27.4 = 2000 t / 6 hours = 334 t/h

a) Normal operation - Load transfer as planned: 130% capacity with intact system and 100% with 1 pump failed.

Capacity with intact system = 2*300 + 2*600 m3/h = 1800 m3/h

Intact system ratio = 1800/(420+403) = 2.18 > 1.3 (OK)

Capacity with 1 pump failed = 2*300 + 1*600 m3/h = 1200 m3/h

Damaged system ratio = 1200/(420+403) = 1.45 > 1.0 (OK)

b) Load transfer stopped: 150% capacity with intact system and 100% capacity with one pump failed.

Capacity with intact system = 4x300 = 1200 m3/h

Intact system ratio = 1200/403 = 3.00 > 1.5 (OK)

Capacity with 1 pump failed = replaced by 1 spare or 1 not used for load transfer being stopped

Base Load Power Hub (BLPH)

APPENDIX P – Ballast Sequence for BLPH

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00	23/04/2025	Issued for Review (IFR)	A.Balzarotti	F.Ceroni	D.LoSterzo
Rev.	Date	Description	Prepared	Reviewed	Approved

TECON

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Revision / Change Log

Rev.	Description
00	Issued for Review (IFR)
01	Issued for Approval (IFA)
02	Accepted for construction (AFU)

HOLDS LIST

No.	Description
1	
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3	
4	

Table of contents

1 INTRODUCTION 6
1.1 PROJECT OVERVIEW 6
1.1.1 Project Location 6
1.1.2 Project Concept 7
2 SCOPE 9
3 REFERENCES 10
3.1 CODES AND STANDARDS 10
3.2 PROJECT DOCUMENTS 10
3.3 SOFTWARE 10
4 TRANSPORTATION ARRANGMENT 11
5 CARGO BARGE 12
5.1 MOSES MODEL 12
5.2 LIGHTSHIP 18
5.3 DOWNFLOODING POINTS 18
5.4 ALLOWABLE LONG. BENDING MOMENT AND SHEAR IN STILL WATER 18
6 LOAD-OUT SIMULATION 19
6.1 LOAD DESCRIPTION 20
6.2 BALLAST WATER MANAGEMENT 25
6.3 LOADOUT SEQUENCE 25
6.4 MOSES OUTPUT SUMMARY 28
6.4.1 Step 0: barge ready for loadout. Barge is with 4.30m draft evenkeel 29
6.4.2 Step 1 30
6.4.3 Step 2 31
6.4.4 Step 3 32
6.4.5 Step 4 33
6.4.6 Step 5 34
6.4.7 Step 6 35
6.4.8 Step 7 36

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6.4.9 Step 8 37
6.4.10 Step 9 38
6.4.11 Step 10 39
6.4.12 Step 11 40
6.4.13 Step 12 41
6.4.14 Step 13: All the axles on board. 42
6.4.15 Step 14: Shifting phase of 5.0m 43
6.4.16 Step 15: Shifting phase of 4.36m. Topside reaches the transport position. 44
6.5 BALLAST CORRECTION FOR TIDE 45
6.5.1 Tide -40cm Phase 0 45
6.5.2 Tide +40cm Phase 0 46
7 BARGE LONGITUDINAL STRUCTURAL CHECKS 48
8 BARGE INTACT STABILITY – COMPLETE MOSES OUTPUT 49
9 BALLASTING SYSTEM CHECKS 133
9.1 BALLAST TANK CAPACITY 133
9.2 BALLAST PUMPING CAPACITY 133

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List of Figures

Figure 1.1 HOLLANDSE KUST NOORD WIND PARK Location Map 6
Figure 1.2 - Wind Park Details 7
Figure 1.3 – BLPH Concept 7
Figure 4.1 – Barge layout 11
Figure 5.1 – Barge MOSES model and ref. system 13
Figure 5.2 – Barge Compartments 16
Figure 6.1 – Grillage arrangement – Top view 19
Figure 6.2 – BLPH loadout scheme 21
Figure 6.3 – Loads 22
Figure 6.4 – Loadout Phases 26
Figure 6.5 – Loadout Phase 0 29

List of tables

Table 6.1 – Axles loads 25
Table 6.2 – Loadout summary Tables 27
Table 6.3 – Loadout summary Tables - Detailed 28

List of Attachments

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1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

1.1.1 Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

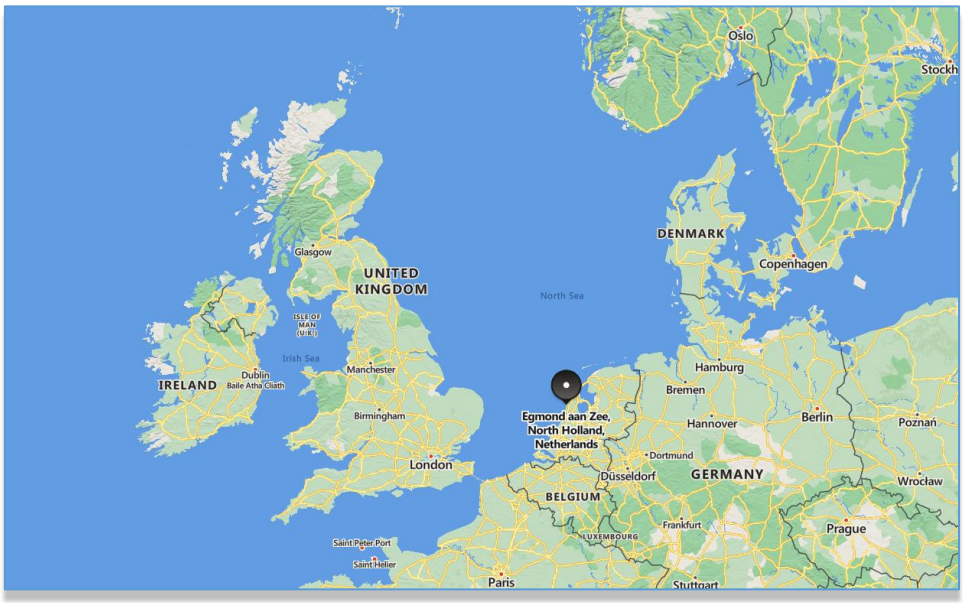


Figure 1.1 HOLLANDSE KUST NOORD WIND PARK Location Map

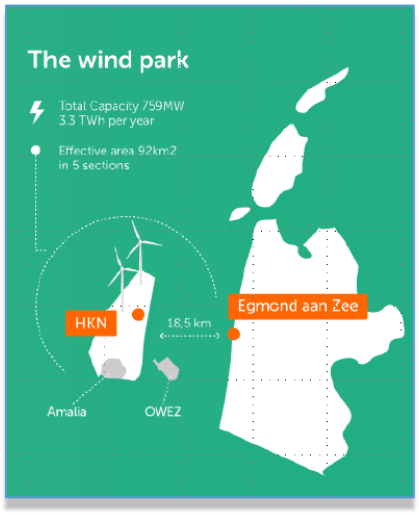


Figure 1.2 - Wind Park Details

The wind farm consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

1.1.2 Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

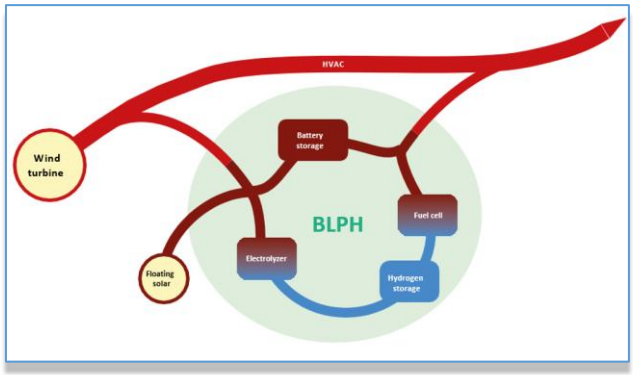


Figure 1.3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH is to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

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2 SCOPE

This report presents the results of the load-out simulation of the BLPH topside on board of VERVECE barge.

The selected cargo barge has the following main dimensions:

- Barge Name: Vervece
- LOA: 91.44 m
- Breadth: 27.43 m
- Depth: 6.1 m
- Frame Spacing: 2.286 m

The quay elevation above the mean sea level is 1.75 m.

The operation is planned to be performed on 19th of July 2025; the tide variation shall therefore be -30cm / +30cm.

Normal operation is planned in the rising tide phase.

Load out operation is classified type 2, given the possibility for water level differences due to environmental effects, as per section 10.2.1 of Ref./2/.

The analysis is performed in accordance with the design requirements, criteria and parameters reported in the Structural Design Premises, Ref./4/.

The International System of units (SI) is used in all engineering assessments and calculations.

The hull of the barge and the ballast compartments were modelled using Moses language, Ref./16/.

The Multi-Operational Structural Engineering Simulator (MOSES) offshore engineering software package, developed by Ultramarine Inc., was used to simulate intact stability, and assess the longitudinal strength of the transportation barge during load-out operations.

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3 REFERENCES

3.1 CODES AND STANDARDS

Doc. No.	Description
/1/ API RP 2A-WSD	Recommended practice for planning, designing and constructing fixed offshore platforms – Working stress design – 22nd edition – 2014
/2/ DNV-ST-N001	DNV - Marine operation and marine warranty - 2023

3.2 PROJECT DOCUMENTS

Doc. No.	Description
/3/ 123A90-DDL-MD-RE-01006	Monthly Weight Report
/4/ 123A90-DDL-ST-SP-90017	Structural Design Basis
/5/ 123A90-DDL-ST-SP-90018	Structural Material Specification for Topside & TP
/6/ 123A90-DDL-ST-SP-90118	Structural Material Specification for Flange & Bolts
/7/ 123A90-DDL-ST-TN-90119	Evaluating ISO and DNV approaches
/8/ 123A90-DDL-TI-SP-99014	Specification for TP, Topside and Caissons Transportation and Installation
/9/ 123A90-DDL-ST-RE-90001	Topside loadout analysis
/10/ 123A90-DDL-TI-RE-99001	Topside Gr&SF report
/11/ 123A90-DDL-TI-DD-99021	Topside – Grillage Assembly
/12/ 123A90-DDL-TI-DD-99023	Topside – Grillage – Plan and Section
/13/ 123A90-DDL-TI-RE-99012	Topside – Yard Checklist
/14/ 123A90-DDL-TI-RE-99013	Topside – internal seafastening report
/15/	Vervece Stability booklet

3.3 SOFTWARE

Doc. No.	Description
/16/ MOSES	Hydrostatic and Hydrodynamic Analysis Software for Offshore Installation and Platform Design– BENTLEY Inc, v.12

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4 TRANSPORTATION ARRANGMENT

The BLPH will be supported by spacers installed directly below the lower deck main beams. It is assumed to be located on the barge deck as follows:

- with respect to the barge longitudinal axis an offset of 1142mm.
- Row 1 is located 50861 mm from the barge stern.

The following figure shows the arrangement of the BLPH module on the barge.

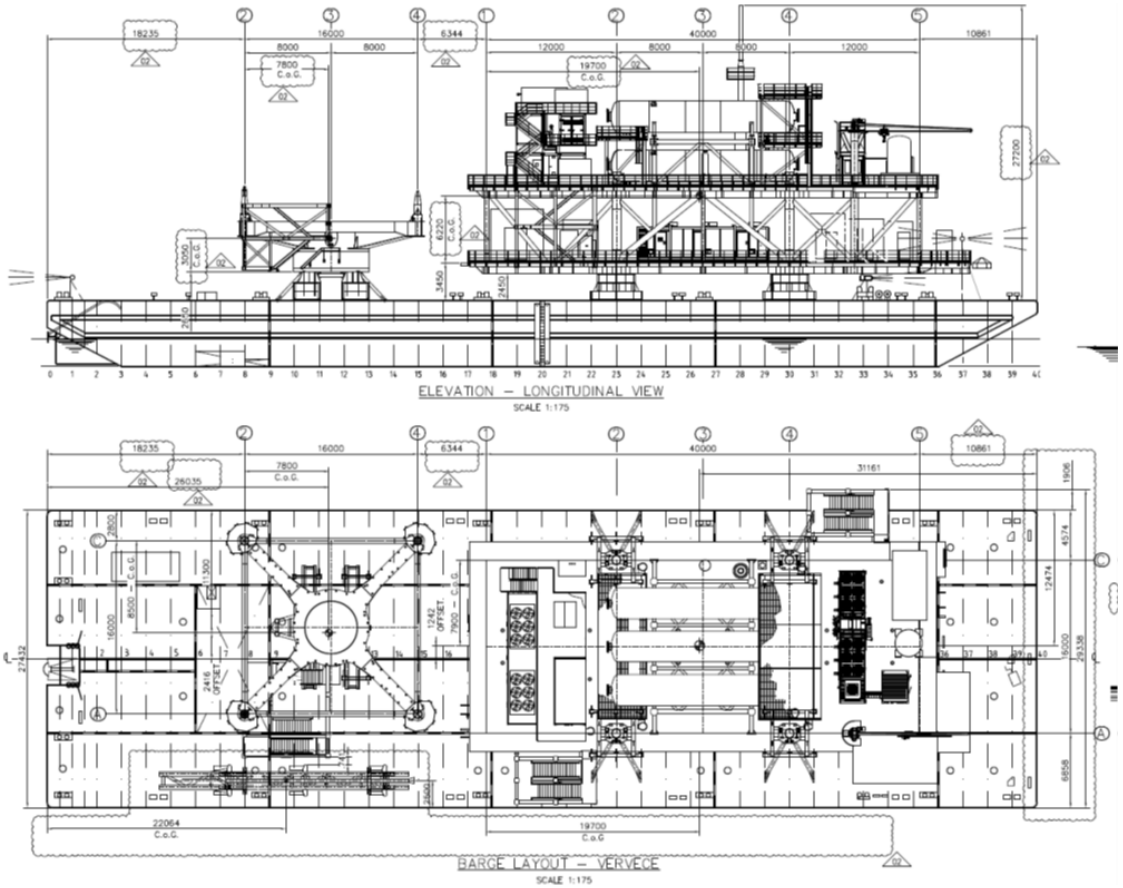


Figure 4.1 – Barge layout

Once the topside is loaded-out onto the barge by means of the hydraulic trailers SPMT, it is lowered and it is supported on the lower grillage beams.

The transportation restraint scheme is finally completed with the seafastenings.

Considering the depth of the lower grillage (including shim plates mm), the bottom ends of deck legs are located at elevation +2.45 m above the barge deck.

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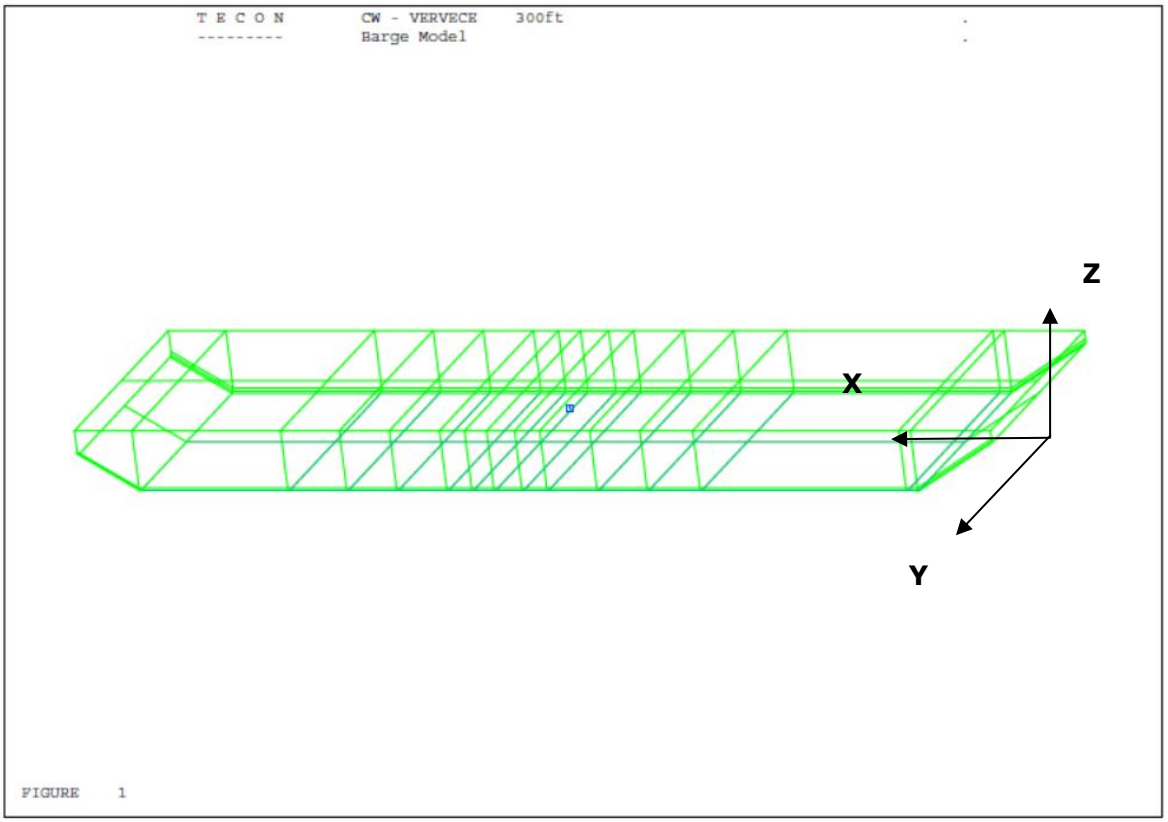
5 CARGO BARGE

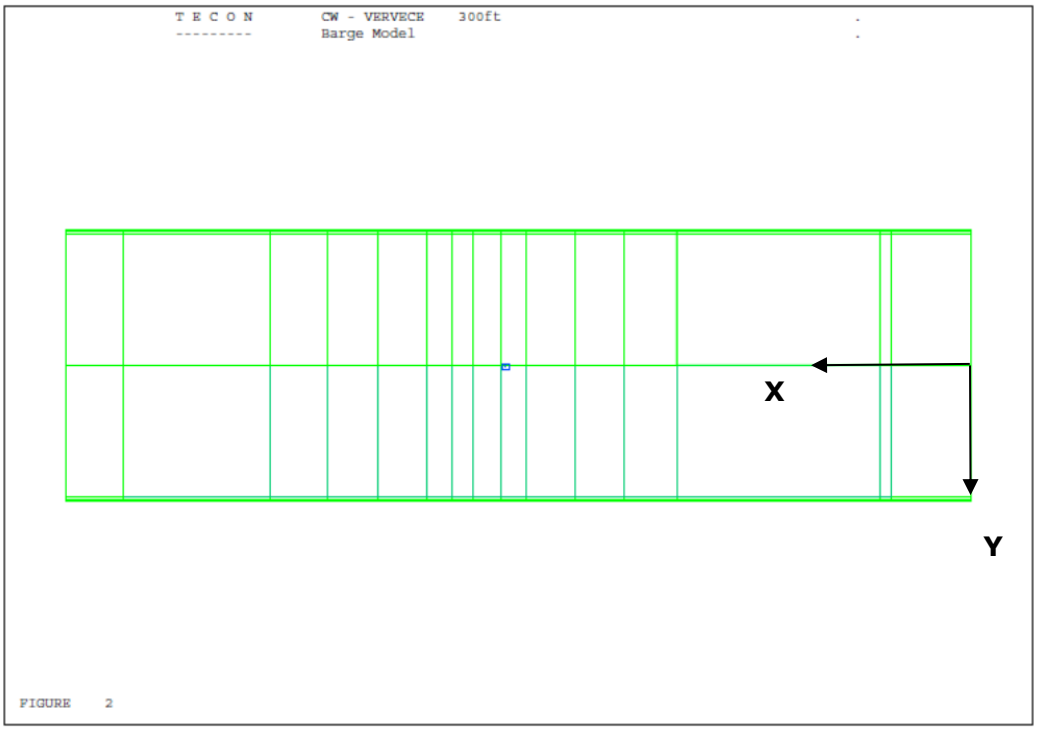
5.1 MOSES MODEL

VERVECE model was set out in MOSES language based on the hull drawings and on the tanks capacities and weight distribution included in the barge documents.

The standard Moses reference system has the origin at the bow of the barge, on the centreline and at keel elevation, the X axis positive from bow to stern, the Y axis positive to starboard and the Z axis positive upwards.

The Moses barge hull model is shown in the following figures:





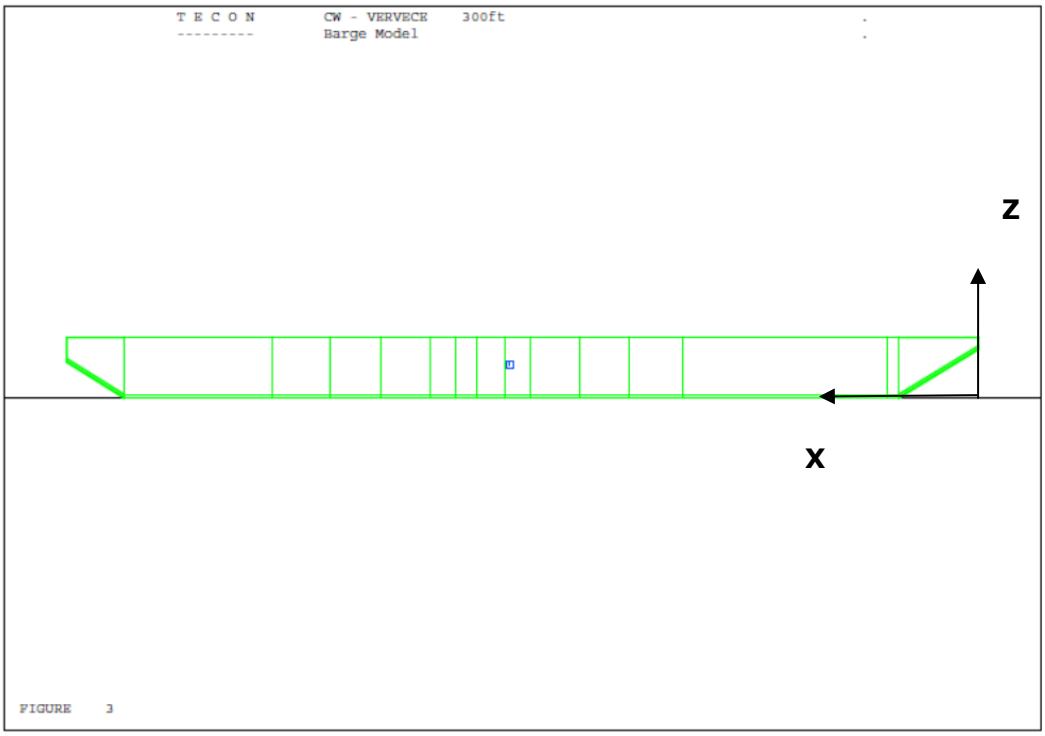


Figure 5.1 – Barge MOSES model and ref. system

The Barge hydrostatic properties are summarised in the following tables.

The density used for sea water is 1.025 t/m3.

```
**********************************************************************************************************
*                                          ***  MOSES   ***                                              *
*                                          ----------------                    25 March, 2025            *
*          T E C O N       CW - VERVECE    300ft                               .                         *
*          ---------       Hydrostatic Curves                                  .                         *
*                                                                                                        *
**********************************************************************************************************

                              +++ H Y D R O S T A T I C   P R O P E R T I E S +++
                              ==================================================

                    Process = DEFAULT: Units = Degrees, Meters, M-Tons, and MPa Unless Stated

                                        Results are in the Body System

                                              For Body VERVECE
```

/--- Condition ---			//- Displac-/	/-- Center Of Buoyancy --/			/ W.P. /	/C. Flotation /		/---- Metacentric Heights ----/			
Draft	Trim	Roll	M-Tons	---X---	---Y---	---Z---	Area	---X---	---Y---	-KMT-	-KML-	-BMT-	-BML-
0.10	0.00	0.00	211.04	46.85	0.00	0.05	2081.674	46.85	0.00	619.45	5128.82	619.40	5128.77
0.20	0.00	0.00	425.67	46.85	-0.00	0.10	2101.925	46.85	-0.00	313.63	2588.77	313.53	2588.67
0.30	0.00	0.00	641.89	46.85	0.00	0.15	2116.956	46.84	0.00	210.82	1743.33	210.67	1743.18
0.40	0.00	0.00	859.65	46.85	0.00	0.20	2132.015	46.84	0.00	159.57	1321.77	159.37	1321.57
0.50	0.00	0.00	1078.63	46.84	-0.00	0.25	2140.752	46.84	0.00	127.79	1066.52	127.54	1066.27
0.60	0.00	0.00	1298.50	46.84	0.00	0.30	2149.490	46.84	0.00	106.68	896.91	106.37	896.61
0.70	0.00	0.00	1519.27	46.84	-0.00	0.35	2158.227	46.83	0.00	91.64	776.06	91.29	775.70
0.80	0.00	0.00	1740.94	46.84	0.00	0.40	2166.965	46.83	0.00	80.39	685.59	79.99	685.19
0.90	0.00	0.00	1963.50	46.84	-0.00	0.45	2175.702	46.83	0.00	71.66	615.36	71.20	614.90
1.00	0.00	0.00	2186.96	46.84	0.00	0.50	2184.439	46.83	0.00	64.69	559.26	64.19	558.75
1.10	0.00	0.00	2411.31	46.84	-0.00	0.56	2193.177	46.83	0.00	59.00	513.42	58.45	512.87
1.20	0.00	0.00	2636.56	46.84	-0.00	0.61	2201.914	46.82	0.00	54.27	475.29	53.67	474.68
1.30	0.00	0.00	2862.70	46.84	-0.00	0.66	2210.652	46.82	0.00	50.28	443.07	49.62	442.41
1.40	0.00	0.00	3089.74	46.83	0.00	0.71	2219.389	46.82	0.00	46.87	415.49	46.16	414.78
1.50	0.00	0.00	3317.68	46.83	0.00	0.76	2228.126	46.82	0.00	43.92	391.62	43.16	390.86
1.60	0.00	0.00	3546.51	46.83	-0.00	0.81	2236.864	46.81	0.00	41.34	370.77	40.53	369.96
1.70	0.00	0.00	3776.23	46.83	-0.00	0.86	2245.601	46.81	0.00	39.07	352.40	38.21	351.54
1.80	0.00	0.00	4006.86	46.83	-0.00	0.91	2254.339	46.81	0.00	37.07	336.10	36.15	335.19
1.90	0.00	0.00	4238.37	46.83	-0.00	0.96	2263.076	46.81	0.00	35.28	321.54	34.31	320.58
2.00	0.00	0.00	4470.79	46.83	0.00	1.01	2271.813	46.81	0.00	33.67	308.46	32.65	307.45
2.10	0.00	0.00	4704.09	46.83	0.00	1.07	2280.551	46.80	0.00	32.22	296.65	31.15	295.58
2.20	0.00	0.00	4938.30	46.83	0.00	1.12	2289.288	46.80	0.00	30.91	285.93	29.79	284.81
2.30	0.00	0.00	5173.40	46.82	0.00	1.17	2298.026	46.80	0.00	29.71	276.17	28.54	275.00
2.40	0.00	0.00	5409.40	46.82	-0.00	1.22	2306.763	46.80	0.00	28.62	267.23	27.40	266.01
2.50	0.00	0.00	5646.29	46.82	-0.00	1.27	2315.500	46.79	0.00	27.63	259.03	26.35	257.76
2.60	0.00	0.00	5884.07	46.82	0.00	1.32	2324.238	46.79	0.00	26.71	251.48	25.38	250.15
2.70	0.00	0.00	6122.75	46.82	-0.00	1.38	2332.975	46.79	0.00	25.86	244.50	24.49	243.12
2.80	0.00	0.00	6362.33	46.82	0.00	1.43	2341.713	46.79	0.00	25.08	238.03	23.65	236.60
2.90	0.00	0.00	6602.80	46.82	0.00	1.48	2350.450	46.79	0.00	24.35	232.03	22.88	230.55
3.00	0.00	0.00	6844.17	46.82	0.00	1.53	2359.188	46.78	0.00	23.68	226.44	22.15	224.91
3.10	0.00	0.00	7086.44	46.81	0.00	1.58	2367.925	46.78	0.00	23.06	221.22	21.47	219.64
3.20	0.00	0.00	7329.60	46.81	0.00	1.63	2376.663	46.78	-0.00	22.47	216.35	20.84	214.71
3.30	0.00	0.00	7573.65	46.81	0.00	1.69	2385.400	46.78	0.00	21.93	211.78	20.24	210.10
3.40	0.00	0.00	7818.61	46.81	-0.00	1.74	2394.138	46.77	0.00	21.42	207.50	19.68	205.76
3.50	0.00	0.00	8064.45	46.81	0.00	1.79	2402.875	46.77	-0.00	20.94	203.47	19.15	201.68
3.60	0.00	0.00	8311.19	46.81	0.00	1.84	2411.444	46.77	-0.00	20.49	199.63	18.65	197.79
3.70	0.00	0.00	8558.60	46.81	0.00	1.90	2415.958	46.69	-0.00	20.04	195.05	18.14	193.15
3.80	0.00	0.00	8806.47	46.80	0.00	1.95	2420.419	46.61	-0.00	19.61	190.71	17.66	188.76
3.90	0.00	0.00	9054.78	46.80	0.00	2.00	2424.867	46.52	-0.00	19.21	186.60	17.21	184.60
4.00	0.00	0.00	9303.56	46.79	0.00	2.05	2429.302	46.44	-0.00	18.83	182.70	16.78	180.65
4.10	0.00	0.00	9552.79	46.78	-0.00	2.10	2433.730	46.36	0.00	18.48	179.00	16.37	176.90
4.20	0.00	0.00	9802.47	46.77	-0.00	2.16	2438.159	46.28	0.00	18.14	175.49	15.99	173.34
4.30	0.00	0.00	10052.61	46.75	0.00	2.21	2442.588	46.20	-0.00	17.82	172.15	15.62	169.95
4.40	0.00	0.00	10303.21	46.74	0.00	2.26	2447.017	46.11	0.00	17.52	168.98	15.26	166.72
4.50	0.00	0.00	10554.25	46.72	-0.00	2.31	2451.446	46.03	-0.00	17.24	165.95	14.93	163.64
4.60	0.00	0.00	10805.76	46.70	-0.00	2.36	2455.874	45.95	-0.00	16.97	163.06	14.61	160.69
4.70	0.00	0.00	11057.71	46.69	-0.00	2.42	2460.303	45.87	-0.00	16.72	160.30	14.30	157.88
4.80	0.00	0.00	11310.12	46.67	0.00	2.47	2464.732	45.79	-0.00	16.47	157.66	14.01	155.20
4.90	0.00	0.00	11562.96	46.65	0.00	2.52	2468.126	45.72	-0.00	16.24	154.95	13.72	152.43
5.00	0.00	0.00	11815.95	46.63	-0.00	2.57	2468.198	45.72	-0.00	16.00	151.75	13.43	149.18
5.10	0.00	0.00	12068.95	46.61	0.00	2.62	2468.228	45.72	-0.00	15.77	148.68	13.15	146.06
5.20	0.00	0.00	12321.94	46.59	-0.00	2.68	2468.245	45.72	0.00	15.55	145.74	12.88	143.06
5.30	0.00	0.00	12574.93	46.57	-0.00	2.73	2468.249	45.72	-0.00	15.34	142.91	12.62	140.18
5.40	0.00	0.00	12827.93	46.56	0.00	2.78	2468.249	45.72	-0.00	15.15	140.20	12.37	137.42
5.50	0.00	0.00	13080.93	46.54	0.00	2.83	2468.249	45.72	-0.00	14.96	137.59	12.13	134.76
5.60	0.00	0.00	13333.92	46.52	-0.00	2.88	2468.249	45.72	-0.00	14.78	135.09	11.90	132.20
5.70	0.00	0.00	13586.92	46.51	-0.00	2.93	2468.249	45.72	-0.00	14.61	132.68	11.68	129.74
5.80	0.00	0.00	13839.91	46.49	-0.00	2.99	2468.249	45.72	-0.00	14.45	130.36	11.46	127.37

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5.90	0.00	0.00	14092.91	46.48	0.00	3.04	2468.249	45.72	-0.00	14.30	128.12	11.26	125.08
6.00	0.00	0.00	14345.91	46.47	-0.00	3.09	2468.249	45.72	-0.00	14.15	125.97	11.06	122.88

+++ H Y D R O S T A T I C C O E F F I C I E N T S +++

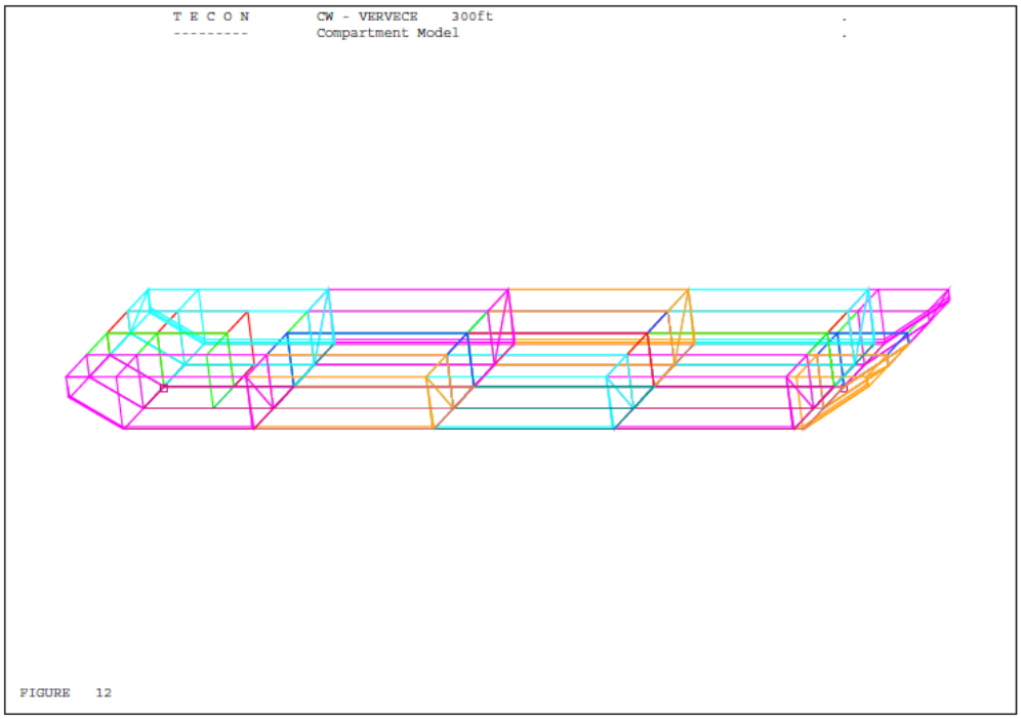
Process = DEFAULT: Units = Degrees, Meters, M-Tons, and MPa Unless Stated

Results are in the Body System

For Body VERVECE

/--- Condition ---/			Displacement	Wetted Surface	Load To Change Draft 1 MM	/--- For KG = KB ----/ Moment To Change .01 Deg	
Draft	Trim	Roll				--- Heel ---	--- Trim ---
0.10	0.00	0.00	211.04	2120.1	2.13	22.81	188.91
0.20	0.00	0.00	425.67	2151.4	2.15	23.29	192.32
0.30	0.00	0.00	641.89	2178.7	2.17	23.60	195.29
0.40	0.00	0.00	859.65	2206.1	2.19	23.91	198.28
0.50	0.00	0.00	1078.63	2232.2	2.19	24.01	200.73
0.60	0.00	0.00	1298.50	2258.4	2.20	24.11	203.20
0.70	0.00	0.00	1519.27	2284.7	2.21	24.21	205.69
0.80	0.00	0.00	1740.94	2311.0	2.22	24.30	208.20
0.90	0.00	0.00	1963.50	2337.4	2.23	24.40	210.72
1.00	0.00	0.00	2186.96	2363.9	2.24	24.50	213.27
1.10	0.00	0.00	2411.31	2390.4	2.25	24.60	215.84
1.20	0.00	0.00	2636.56	2417.0	2.26	24.70	218.43
1.30	0.00	0.00	2862.70	2443.6	2.27	24.79	221.04
1.40	0.00	0.00	3089.74	2470.3	2.27	24.89	223.67
1.50	0.00	0.00	3317.68	2497.1	2.28	24.99	226.33
1.60	0.00	0.00	3546.51	2524.0	2.29	25.09	229.00
1.70	0.00	0.00	3776.23	2550.9	2.30	25.19	231.69
1.80	0.00	0.00	4006.86	2577.9	2.31	25.28	234.41
1.90	0.00	0.00	4238.37	2604.9	2.32	25.38	237.15
2.00	0.00	0.00	4470.79	2632.0	2.33	25.48	239.90
2.10	0.00	0.00	4704.09	2659.2	2.34	25.58	242.68
2.20	0.00	0.00	4938.30	2686.4	2.35	25.68	245.48
2.30	0.00	0.00	5173.40	2713.7	2.36	25.77	248.30
2.40	0.00	0.00	5409.40	2741.1	2.36	25.87	251.15
2.50	0.00	0.00	5646.29	2768.5	2.37	25.97	254.01
2.60	0.00	0.00	5884.07	2796.0	2.38	26.07	256.90
2.70	0.00	0.00	6122.75	2823.6	2.39	26.17	259.80
2.80	0.00	0.00	6362.33	2851.2	2.40	26.26	262.73
2.90	0.00	0.00	6602.80	2878.9	2.41	26.36	265.69
3.00	0.00	0.00	6844.17	2906.7	2.42	26.46	268.66
3.10	0.00	0.00	7086.44	2934.5	2.43	26.56	271.66
3.20	0.00	0.00	7329.60	2962.4	2.44	26.66	274.67
3.30	0.00	0.00	7573.65	2990.3	2.45	26.75	277.71
3.40	0.00	0.00	7818.61	3018.4	2.45	26.85	280.78
3.50	0.00	0.00	8064.45	3046.4	2.46	26.95	283.86
3.60	0.00	0.00	8311.19	3074.5	2.47	27.05	286.91
3.70	0.00	0.00	8558.60	3100.3	2.48	27.10	288.53
3.80	0.00	0.00	8806.47	3126.2	2.48	27.15	290.13
3.90	0.00	0.00	9054.78	3152.1	2.49	27.20	291.73
4.00	0.00	0.00	9303.56	3178.0	2.49	27.25	293.33
4.10	0.00	0.00	9552.79	3204.0	2.49	27.30	294.94
4.20	0.00	0.00	9802.47	3230.0	2.50	27.35	296.55
4.30	0.00	0.00	10052.61	3256.0	2.50	27.40	298.17
4.40	0.00	0.00	10303.21	3282.0	2.51	27.45	299.80
4.50	0.00	0.00	10554.25	3308.1	2.51	27.50	301.43
4.60	0.00	0.00	10805.76	3334.3	2.52	27.55	303.06
4.70	0.00	0.00	11057.71	3360.4	2.52	27.60	304.71
4.80	0.00	0.00	11310.12	3386.6	2.53	27.65	306.35
4.90	0.00	0.00	11562.96	3412.3	2.53	27.69	307.62
5.00	0.00	0.00	11815.95	3436.0	2.53	27.69	307.65
5.10	0.00	0.00	12068.95	3459.8	2.53	27.69	307.66
5.20	0.00	0.00	12321.94	3483.6	2.53	27.69	307.67
5.30	0.00	0.00	12574.93	3507.3	2.53	27.69	307.67
5.40	0.00	0.00	12827.93	3531.1	2.53	27.69	307.67
5.50	0.00	0.00	13080.93	3554.9	2.53	27.69	307.67
5.60	0.00	0.00	13333.92	3578.7	2.53	27.69	307.67
5.70	0.00	0.00	13586.92	3602.4	2.53	27.69	307.67
5.80	0.00	0.00	13839.91	3626.2	2.53	27.69	307.67
5.90	0.00	0.00	14092.91	3650.0	2.53	27.69	307.67
6.00	0.00	0.00	14345.91	3673.8	2.53	27.69	307.67

The modelled compartment codes are shown in the following figure



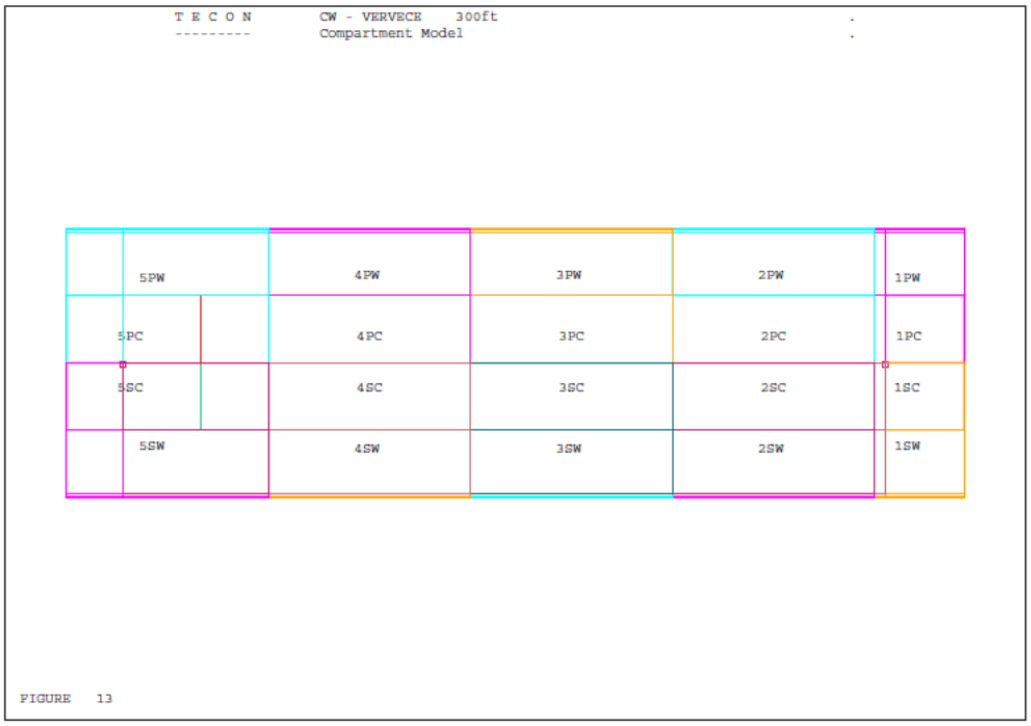


Figure 5.2 – Barge Compartments

The capacity plan for ballast compartments is presented in the Moses output.

The density used for ballast water is 1.025 t/m3 (same of sea water).

```
*****************************************************************************************************************
*                                          ***  MOSES   ***                                                     *
*          T E C O N       CW - VERVECE    300ft                                    .                          *
*          ---------       Capacity Plan                                            .                          *
*****************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ======================================================================
                Process = DEFAULT: Units = Degrees, Meters, M-Tons, and MPa Unless Stated

                                  Results Are Reported In Body System

                       Draft =     0.00 Roll Angle =     0.00 Pitch Angle =     0.00

                                     Wet Radii Of Gyration About CG

                              K-X =     7.95 K-Y =    24.53 K-Z =    25.56

                                        /-- Center of Gravity ---/  Sounding   % Full
                       Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                       ----------------  Part VERVECE    ------------
                       LOAD_GRO   1832.80    47.02     0.00     3.52
                       --- Contents ---
                       1PC         234.61     5.60    -3.43     3.81     6.10   100.00
                       1PW         234.98     5.60   -10.28     3.82     6.10   100.00
                       1SC         235.12     5.60     3.43     3.81     6.10   100.00
                       1SW         234.98     5.60    10.28     3.82     6.10   100.00
                       2PC         873.69    19.43    -3.43     3.05     6.10   100.00
                       2PW         873.63    19.43   -10.28     3.05     6.10   100.00
                       2SC         873.69    19.43     3.43     3.05     6.10   100.00
                       2SW         873.63    19.43    10.28     3.05     6.10   100.00
                       3PC         873.69    40.01    -3.43     3.05     6.10   100.00
                       3PW         873.63    40.00   -10.28     3.05     6.10   100.00
                       3SC         873.69    40.01     3.43     3.05     6.10   100.00
                       3SW         873.63    40.01    10.28     3.05     6.10   100.00
                       4PC         873.69    60.58    -3.43     3.05     6.10   100.00
                       4PW         873.63    60.58   -10.28     3.05     6.10   100.00
                       4SC         873.69    60.58     3.43     3.05     6.10   100.00
                       4SW         873.63    60.58    10.28     3.05     6.10   100.00
                       5PC         492.02    83.89    -3.43     3.31     6.10   100.00
                       5PW         793.58    80.40   -10.28     3.22     6.10   100.00
                       5SC         484.29    83.89     3.43     3.31     6.10   100.00
                       5SW         793.58    80.40    10.28     3.22     6.10   100.00
                       ========  ========  =======  =======  =======
                       Total     15819.89    45.53    -0.00     3.18
                       Buoyancy      0.00     0.00     0.00     0.00

                            +++ C O M P A R T M E N T   P R O P E R T I E S +++
                            ===================================================
                                      Results Are Reported In Body System

                          Process = DEFAULT: Units = Degrees, Meters, M-Tons, and MPa Unless Stated

                                    Fill   Specific /--- Ballast ---/ /------ % Full --------/ Sounding
                            Name    Type    Gravity  Maximum  Current   Max.    Min.    Curr.  --------

                          1PC     CORRECT     1.0250    234.6    234.6  100.00    0.00  100.00     6.096
                          1PW     CORRECT     1.0250    235.0    235.0  100.00    0.00  100.00     6.096
                          1SC     CORRECT     1.0250    235.1    235.1  100.00    0.00  100.00     6.096
                          1SW     CORRECT     1.0250    235.0    235.0  100.00    0.00  100.00     6.096
                          2PC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                          2PW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                          2SC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                          2SW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                          3PC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                          3PW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                          3SC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                          3SW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                          4PC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                          4PW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                          4SC     CORRECT     1.0250    873.7    873.7  100.00    0.00  100.00     6.096
                          4SW     CORRECT     1.0250    873.6    873.6  100.00    0.00  100.00     6.096
                          5PC     CORRECT     1.0250    492.0    492.0  100.00    0.00  100.00     6.096
                          5PW     CORRECT     1.0250    793.6    793.6  100.00    0.00  100.00     6.096
                          5SC     CORRECT     1.0250    484.3    484.3  100.00    0.00  100.00     6.096
                          5SW     CORRECT     1.0250    793.6    793.6  100.00    0.00  100.00     6.096
```

5.2 LIGHTSHIP

As indicated in the barge Stability booklet the barge has the following properties:

- Lightweight = 1833 t
- LCG = 44.42 m
- VCG = 3.524 m
- TCG = 0.0 m

5.3 DOWNFLOODING POINTS

Down flooding points have been modelled at barge edges and at deck elevation+600mm, Ref./15/.

Following FloodingPoints are included in the calculations:

No.	Type	Fr.AP(M)	Fr.CL(M)	Ab/BASE(M)	Description
1	3	90.000	-13.000	6.700	Ventilator, Tk. 1 PW
2	3	90.000	13.000	6.700	Ventilator, Tk. 1 SW
3	3	1.000	-13.000	6.700	Ventilator, Tk. 5 PW
4	3	1.000	13.000	6.700	Ventilator, TK. 5 SW

5.4 ALLOWABLE LONG. BENDING MOMENT AND SHEAR IN STILL WATER

Section 13 of Ref./15/, indicates the following values of bending moment and shear in still water:

	Max B.M.	W
Hogging	26700 tm	3.24 m^3
Sagging	26130 tm	3.24 m^3
Max shear midship	6150 ton	

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6 LOAD-OUT SIMULATION

The load-out was fully simulated using the software MOSES.

The transportation layout of BLPH on Vervece barge is shown below.

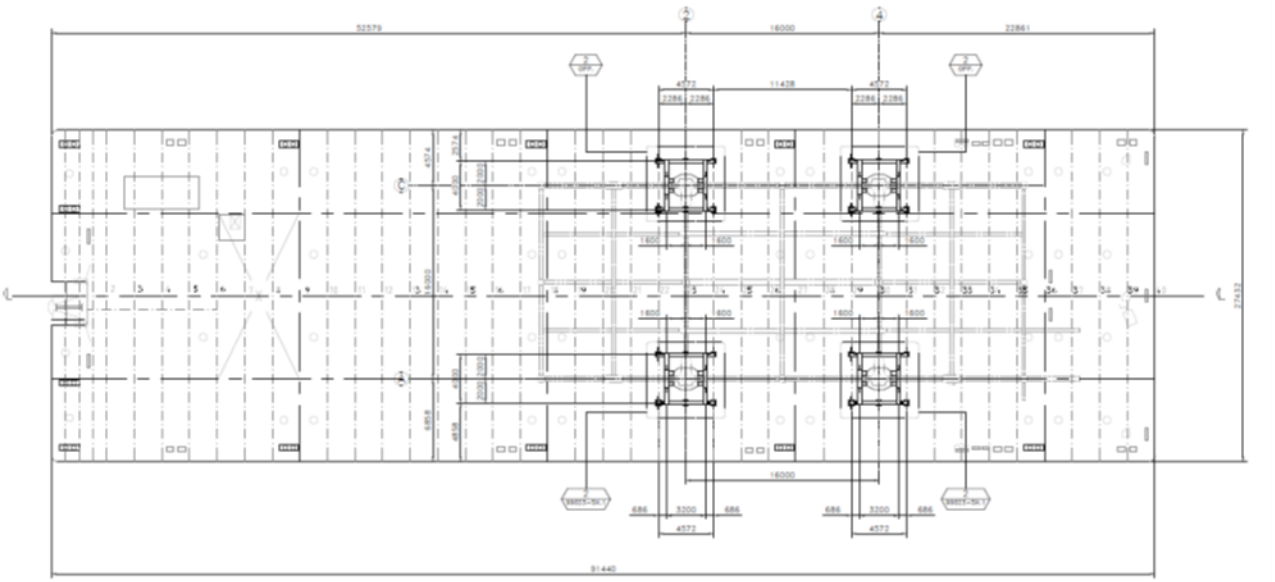


Figure 6.1 – Grillage arrangement – Top view

The operation was divided in 19 steps plus the initial step 0 that shows the initial ballast pattern. In recognition of the physical limitations of the ballasting system, the following criteria have been applied in the load-out analyses:

- At 3% volume ballast tanks are considered empty.
- at 98% volume ballast tanks are considered full.

The load-out simulation was performed according to the following premises:

Load-out date: 19th of July 2025

Starting hour: 7:00 AM

Trailer speed: 9 to 20 m / hour

6.1 LOAD DESCRIPTION

The SPMT drawing, Ref. Appendix H, shows all data for the load-out on board of the cargo barge. Drawing is included in Appendix 2 for easy reference.

The following figures show parts of the above-mentioned drawing.

CoG position is taken from ref. /3/,. according to the last issued WCR revision, Topside has the following CoG and weight position relevant to loadout condition:

- Loadout Expected Weight 2280 ton including Spacers and SPMTs;
- X_G = 19.70 m;
- Y_G = 7.90 m;
- Z_G = 29.30 m.

BLPH loadout scheme with CoG position is shown in the next figure.

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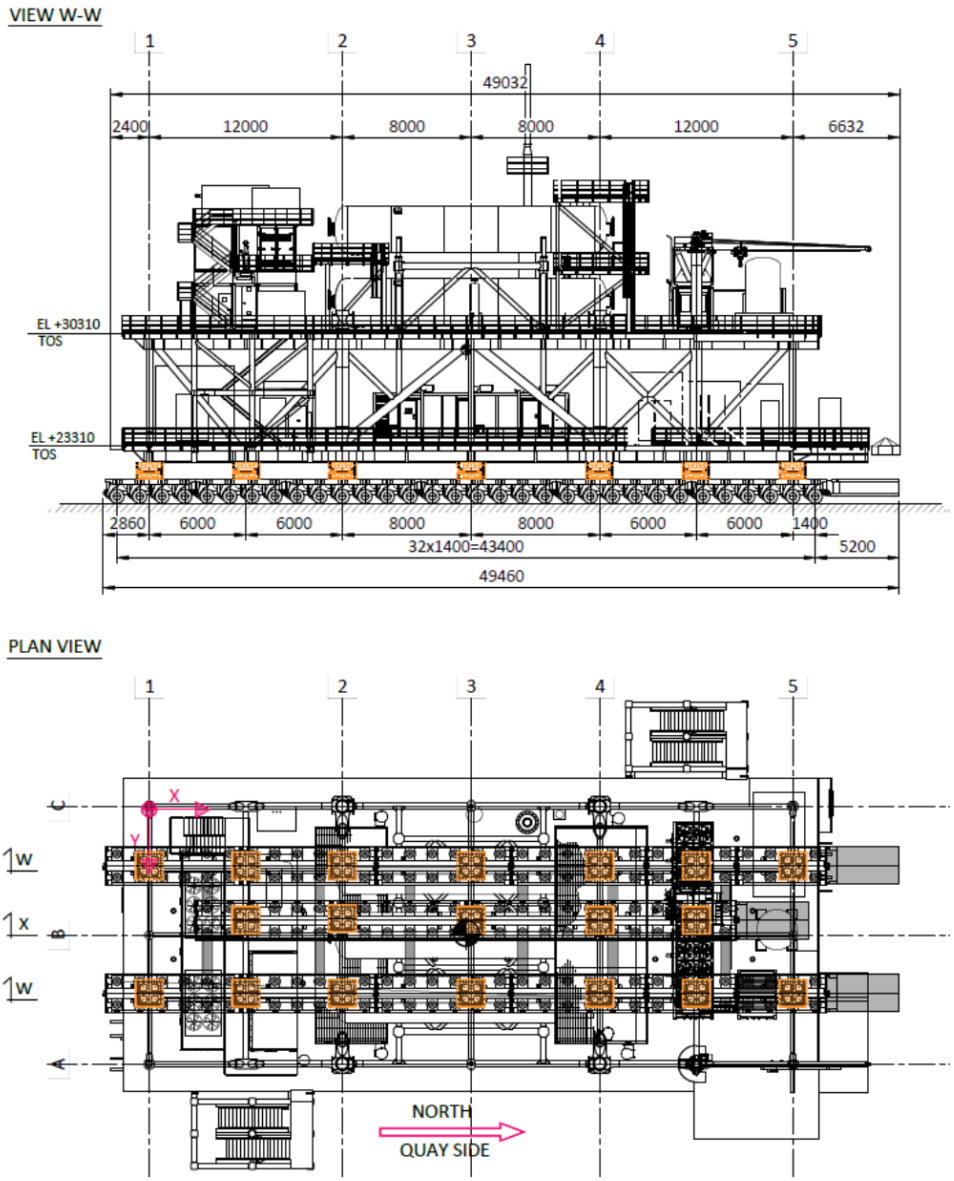


Figure 6.2 – BLPH loadout scheme

Before loadout operation, the final physical weighing operation will be performed in order to confirm the expected Weight and CoG. In case of the discrepancy in terms of weight and CoG position will be significant, the SPMT loads and ballasting sequence will be updated accordingly.

The following weights have been applied as external loads to the barge model.

- TP LOW-GRIL WEIGHT = 45 t
- BLPH GRILLAGE WEIGHT = 75 t

- CF WEIGHT = 28 t
- CF GRILLAGE WEIGHT = 0.5 t
- TP WEIGHT = 254.5 t

TRANSPORT CONFIGURATION: 88 AXLES			
ITEM weight (contingency included)			**1802 t**
SPMT dead weight			392,1 t
EQUIPMENT weight			87,9 t
TOTAL weight			2282 t
		BASE VALUES	**MAX VALUES**
Group A 20 Axles	Weight per axles	31,0 t	38,5 t
	Capacity per axles	48,0 t	48,0 t
	Cylinder pressure	189 bar	234 bar
	Contact pressure under the wheel	8,8 kg/cm^2	9,8 kg/cm^2
	Average Ground pressure	9,1 t/m^2	11,3 t/m^2
Group B 20 Axles	Weight per axles	31,0 t	38,5 t
	Capacity per axles	48,0 t	48,0 t
	Cylinder pressure	189 bar	234 bar
	Contact pressure under the wheel	8,8 kg/cm^2	9,8 kg/cm^2
	Average Ground pressure	9,1 t/m^2	11,3 t/m^2
Group C-D 48 Axles	Weight per axles	21,7 t	26,0 t
	Capacity per axles	48,0 t	48,0 t
	Cylinder pressure	132 bar	158 bar
	Contact pressure under the wheel	7,5 kg/cm^2	8,2 kg/cm^2
	Average Ground pressure	6,4 t/m^2	7,6 t/m^2

Figure 6.3 – Loads

For load out simulation the loads have been described as a set of concentrated forces, one per each trailer axle, i.e. at 1.4m interval. The following tables report the complete set of loads applied, with ref to the above fig. 6.2.

LoadNam	Weight	Xw	Yw	Zw
GC-1-01	21.7	0.000	-5.542	1.000
GC-1-02	21.7	-1.400	-5.542	1.000
GC-1-03	21.7	-2.800	-5.542	1.000
GC-1-04	21.7	-4.200	-5.542	1.000
GC-1-05	21.7	-5.600	-5.542	1.000
GC-1-06	21.7	-7.000	-5.542	1.000
GC-1-07	21.7	-8.400	-5.542	1.000

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GC-1-08	21.7	-9.800	-5.542	1.000
GC-1-09	21.7	-11.200	-5.542	1.000
GC-1-10	21.7	-12.600	-5.542	1.000
GC-1-11	21.7	-14.000	-5.542	1.000
GC-1-12	21.7	-15.400	-5.542	1.000
GC-1-13	21.7	-16.800	-5.542	1.000
GC-1-14	21.7	-18.200	-5.542	1.000
GC-1-15	21.7	-19.600	-5.542	1.000
GC-1-16	21.7	-21.000	-5.542	1.000
GC-1-17	21.7	-22.400	-5.542	1.000
GC-1-18	21.7	-23.800	-5.542	1.000
GC-1-19	21.7	-25.200	-5.542	1.000
GC-1-20	21.7	-26.600	-5.542	1.000
GC-1-21	21.7	-28.000	-5.542	1.000
GC-1-22	21.7	-29.400	-5.542	1.000
GC-1-23	21.7	-30.800	-5.542	1.000
GC-1-24	21.7	-32.200	-5.542	1.000
GC-1-25	21.7	-33.600	-5.542	1.000
GC-1-26	21.7	-35.000	-5.542	1.000
GC-1-27	21.7	-36.400	-5.542	1.000
GC-1-28	21.7	-37.800	-5.542	1.000
GC-1-29	21.7	-39.200	-5.542	1.000
GC-1-30	21.7	-40.600	-5.542	1.000
GC-1-31	21.7	-42.000	-5.542	1.000
GC-1-32	21.7	-43.400	-5.542	1.000
GC-2-01	10.85	-5.600	-2.967	1.000
GC-2-02	10.85	-7.000	-2.967	1.000
GC-2-03	10.85	-8.400	-2.967	1.000
GC-2-04	10.85	-9.800	-2.967	1.000
GC-2-05	10.85	-11.200	-2.967	1.000
GC-2-06	10.85	-12.600	-2.967	1.000
GC-2-07	10.85	-14.000	-2.967	1.000
GC-2-08	10.85	-15.400	-2.967	1.000
GC-2-09	10.85	-16.800	-2.967	1.000
GC-2-10	10.85	-18.200	-2.967	1.000
GC-2-11	10.85	-19.600	-2.967	1.000
GC-2-12	10.85	-21.000	-2.967	1.000
GC-2-13	10.85	-22.400	-2.967	1.000
GC-2-14	10.85	-23.800	-2.967	1.000

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GC-2-15	10.85	-25.200	-2.967	1.000
GC-2-16	10.85	-26.600	-2.967	1.000
GC-2-17	10.85	-28.000	-2.967	1.000
GC-2-18	10.85	-29.400	-2.967	1.000
GC-2-19	10.85	-30.800	-2.967	1.000
GC-2-20	10.85	-32.200	-2.967	1.000
GC-2-21	10.85	-33.600	-2.967	1.000
GC-2-22	10.85	-35.000	-2.967	1.000
GC-2-23	10.85	-36.400	-2.967	1.000
GC-2-24	10.85	-37.800	-2.967	1.000
GB-1-01	31.0	0.000	2.258	1.000
GB-1-02	31.0	-1.400	2.258	1.000
GB-1-03	31.0	-2.800	2.258	1.000
GB-1-04	31.0	-4.200	2.258	1.000
GB-1-05	31.0	-5.600	2.258	1.000
GB-1-06	31.0	-7.000	2.258	1.000
GB-1-07	31.0	-8.400	2.258	1.000
GB-1-08	31.0	-9.800	2.258	1.000
GB-1-09	31.0	-11.200	2.258	1.000
GB-1-10	31.0	-12.600	2.258	1.000
GB-1-11	31.0	-14.000	2.258	1.000
GB-1-12	31.0	-15.400	2.258	1.000
GB-1-13	31.0	-16.800	2.258	1.000
GB-1-14	31.0	-18.200	2.258	1.000
GB-1-15	31.0	-19.600	2.258	1.000
GB-1-16	31.0	-21.000	2.258	1.000
GB-2-01	15.5	-5.600	-1.517	1.000
GB-2-02	15.5	-7.000	-1.517	1.000
GB-2-03	15.5	-8.400	-1.517	1.000
GB-2-04	15.5	-9.800	-1.517	1.000
GB-2-05	15.5	-11.200	-1.517	1.000
GB-2-06	15.5	-12.600	-1.517	1.000
GB-2-07	15.5	-14.000	-1.517	1.000
GB-2-08	15.5	-15.400	-1.517	1.000
GB-2-09	15.5	-16.800	-1.517	1.000
GB-2-10	15.5	-18.200	-1.517	1.000
GB-2-11	15.5	-19.600	-1.517	1.000
GB-2-12	15.5	-21.000	-1.517	1.000
GA-1-17	31.0	-22.400	2.258	1.000

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GA-1-18	31.0	-23.800	2.258	1.000
GA-1-19	31.0	-25.200	2.258	1.000
GA-1-20	31.0	-26.600	2.258	1.000
GA-1-21	31.0	-28.000	2.258	1.000
GA-1-22	31.0	-29.400	2.258	1.000
GA-1-23	31.0	-30.800	2.258	1.000
GA-1-24	31.0	-32.200	2.258	1.000
GA-1-25	31.0	-33.600	2.258	1.000
GA-1-26	31.0	-35.000	2.258	1.000
GA-1-27	31.0	-36.400	2.258	1.000
GA-1-28	31.0	-37.800	2.258	1.000
GA-1-29	31.0	-39.200	2.258	1.000
GA-1-30	31.0	-40.600	2.258	1.000
GA-1-31	31.0	-42.000	2.258	1.000
GA-1-32	31.0	-43.400	2.258	1.000
GA-2-13	15.5	-22.400	-1.517	1.000
GA-2-14	15.5	-23.800	-1.517	1.000
GA-2-15	15.5	-25.200	-1.517	1.000
GA-2-16	15.5	-26.600	-1.517	1.000
GA-2-17	15.5	-28.000	-1.517	1.000
GA-2-18	15.5	-29.400	-1.517	1.000

Table 6.1 – Axles loads

6.2 BALLAST WATER MANAGEMENT

Barge is equipped with an internal ballast management system; therefore, water can be both moved to other tanks or discharged to the sea.

6.3 LOADOUT SEQUENCE

The above-described operation sequence was divided into the following steps:

Step 0 Barge ready for starting load-out of the topside. The ballast pattern is selected in order of having the barge deck at the same elevation as the quay.

Step 1 The first 2 axles of group C and B enter the barge bow.

Step 2 Trailers advance 4.2 m: next 3+3 axles of trailers of group C and B on board. Total axles on board: 8.

Step 3 Trailers advance 1.40 m: next 1+1 axles of trailers of group C and B on board plus first axle of internal train on board. Total axles on board: 11.

Step 4 Trailers advance 4.20 m: next 3+3 axles of trailers of group C and B and 3 axles of trailers

of group C/B on board. Total axles on board: C/B-20.

Step 5 Trailers advance 4.2 m: Total axles on board: C/B-29.

Step 6 Trailers advance 4.2 m: Total axles on board: C/B-38.

Step 7 Trailers advance 4.2 m: Total axles on board: C/B-44 and first axles of group A

Step 8 Trailers advance 4.2 m: Total axles on board: 56.

Step 9 Trailers advance 4.2 m: Total axles on board: 65.

Step 10 Trailers advance 4.2 m: Total axles on board: 74.

Step 11 Trailers advance 2.8 m: Total axles on board: 80.

Step 12 Trailers advance 2.8 m: Total axles on board: 84.

Step 13 Trailers advance 2.8 m: All trailers on board the barge.

Step 14 Trailers advance 5 m. shifting towards stern

Step 15 Trailers advance 4.36 m: topside reaches the transport position.

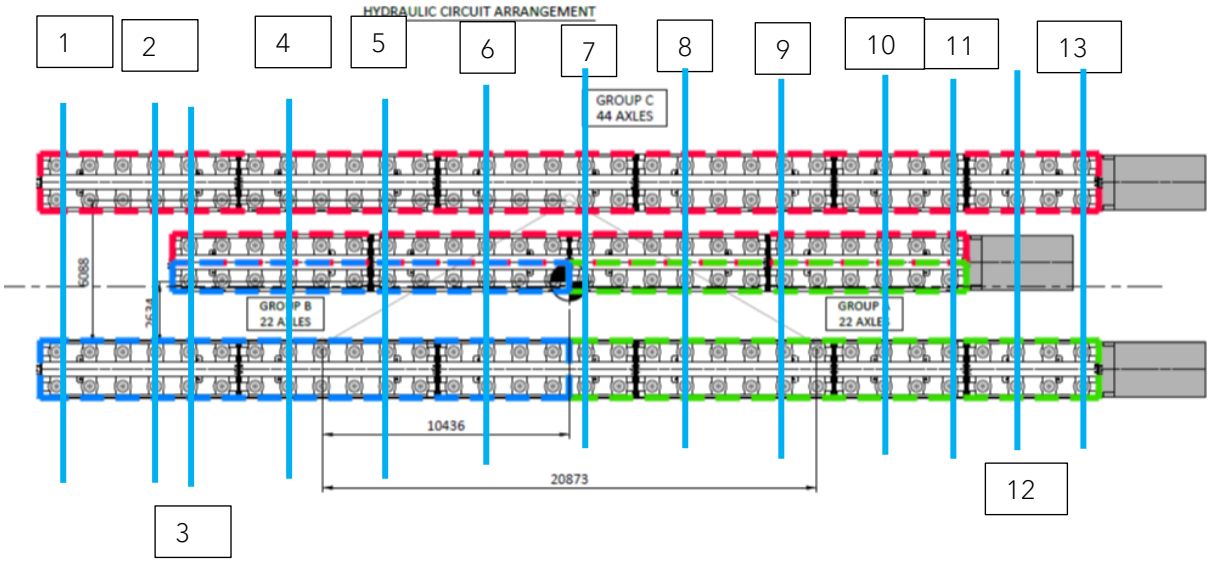
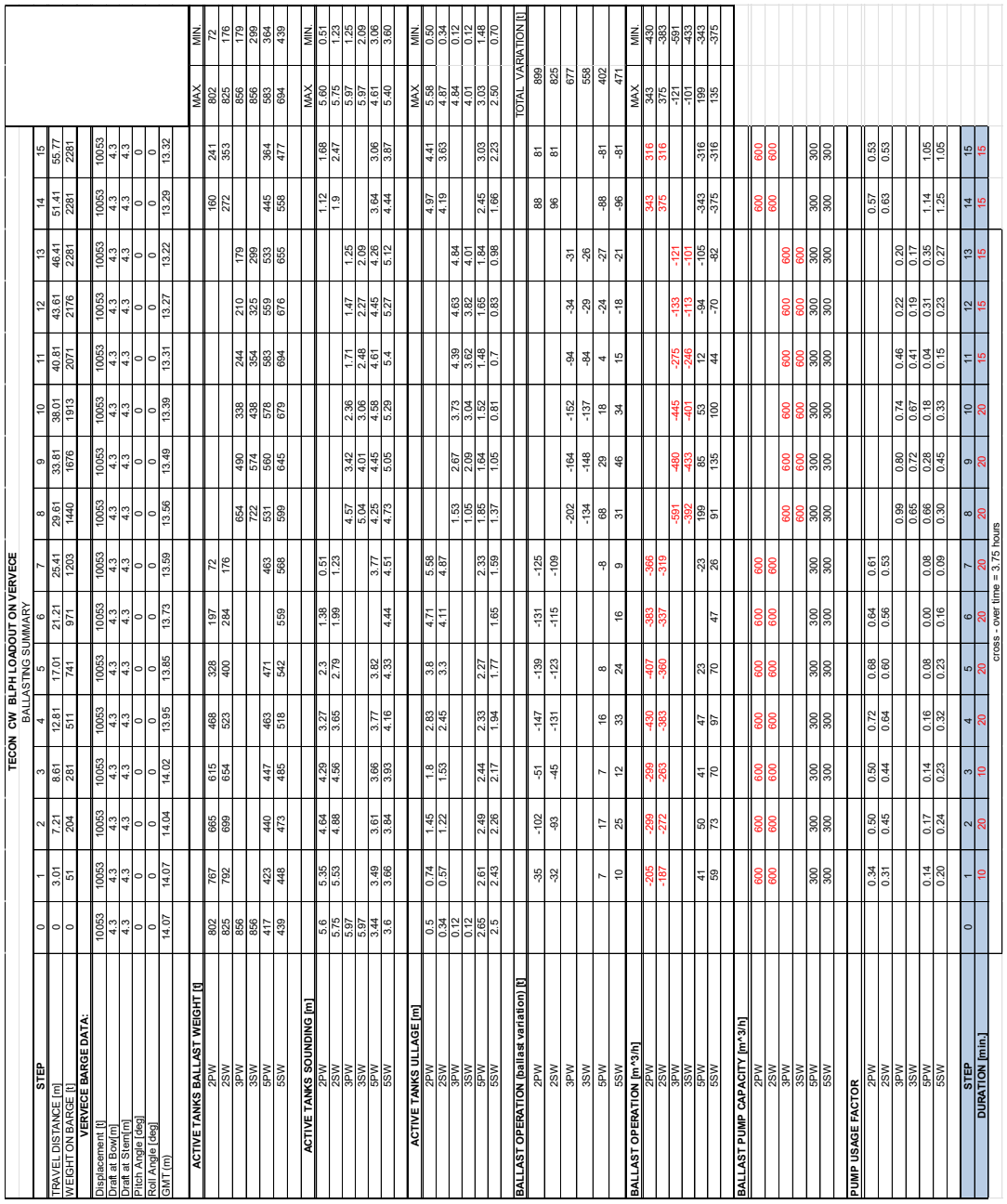


Figure 6.4 – Loadout Phases

Load out will be considered complete with BLPH in the final position.

The here below tables summarize the ballast variations.



TECON CW_BLPH LOADOUT ON VERVECE

BALLASTING SUMMARY

STEP	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
TRAVEL DISTANCE [m]	0	3.01	7.21	8.61	12.81	17.01	21.21	25.41	29.61	33.81	38.01	40.81	43.61	46.41	51.41	55.77		
WEIGHT ON BARGE [t]	0	51	204	281	511	741	971	1203	1440	1676	1913	2071	2176	2281	2281	2281		
VERVECE BARGE DATA:																		
Displacement [t]	10053	10053	10053	10053	10053	10053	10053	10053	10053	10053	10053	10053	10053	10053	10053	10053		
Draft at Bow[m]	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3		
Draft at Stern[m]	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3		
Pitch Angle [deg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Roll Angle [deg]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
GMT (m)	14.07	14.07	14.04	14.02	13.95	13.85	13.73	13.59	13.56	13.49	13.39	13.31	13.27	13.22	13.29	13.32		
ACTIVE TANKS BALLAST WEIGHT [t]																	MAX	MIN
2PW	802	767	665	615	468	328	197	72							160	241	802	72
2SW	825	792	699	654	523	400	284	176							272	353	825	176
3PW	856								654	490	338	244	210	179			856	179
3SW	856								722	574	438	354	325	299			856	299
5PW	417	423	440	447	463	471		463	531	560	578	583	559	533	445	364	583	364
5SW	439	448	473	485	518	542	559	568	599	645	679	694	676	655	558	477	694	439
ACTIVE TANKS SOUNDING [m]																	MAX	MIN
2PW	5.6	5.35	4.64	4.29	3.27	2.3	1.38	0.51							1.12	1.68	5.60	0.51
2SW	5.75	5.53	4.88	4.56	3.65	2.79	1.99	1.23							1.9	2.47	5.75	1.23
3PW	5.97								4.57	3.42	2.36	1.71	1.47	1.25			5.97	1.25
3SW	5.97								5.04	4.01	3.06	2.48	2.27	2.09			5.97	2.09
5PW	3.44	3.49	3.61	3.66	3.77	3.82		3.77	4.25	4.45	4.58	4.61	4.45	4.26	3.64	3.06	4.61	3.06
5SW	3.6	3.66	3.84	3.93	4.16	4.33	4.44	4.51	4.73	5.05	5.29	5.4	5.27	5.12	4.44	3.87	5.40	3.60
ACTIVE TANKS ULLAGE [m]																	MAX	MIN
2PW	0.5	0.74	1.45	1.8	2.83	3.8	4.71	5.58							4.97	4.41	5.58	0.50
2SW	0.34	0.57	1.22	1.53	2.45	3.3	4.11	4.87							4.19	3.63	4.87	0.34
3PW	0.12								1.53	2.67	3.73	4.39	4.63	4.84			4.84	0.12
3SW	0.12								1.05	2.09	3.04	3.82	4.01				4.01	0.12
5PW	2.65	2.61	2.49	2.44	2.33	2.27	2.33	1.85	1.64	1.92	1.48	1.65	1.84	2.45	3.03	1.48		
5SW	2.5	2.43	2.26	2.17	1.94	1.77	1.65	1.59	1.37	1.05	0.81	0.7	0.83	0.98	1.66	2.23	3.03	0.70
BALLAST OPERATION (ballast variation) [t]																	2.50	TOTAL VARIATION [t]
2PW		-35	-102	-51	-147	-139	-131	-125							88	81	899	
2SW		-32	-93	-45	-131	-123	-115	-109							96	81	825	
3PW									-202	-164	-152	-94	-34	-31			677	
3SW									-134	-148	-137	-84	-29	-26			558	
5PW		7	17	7	16	8		-8	68	29	18	4	-24	-27	-88	-81	402	
5SW		10	25	12	33	24	16	9	31	46	34	15	-18	-21	-96	-81	471	
BALLAST OPERATION [m^3/h]																	MAX	MIN
2PW		-205	-299	-299	-430	-407	-383	-366							343	316	343	-430
2SW		-187	-272	-283	-383	-360	-337	-319							375	316	375	-383
3PW									-591	-480	-445	-275	-133	-121			121	-591
3SW									-392	-433	-401	-246	-113	-101			-101	-433
5PW		41	50	41	47	23		-23	199	85	53	12	-94	-105	-343	-316	-316	-343
5SW		59	73	70	97	70	47	26	91	135	100	44	-70	-82	-375	-316	135	-375
BALLAST PUMP CAPACITY [m^3/h]																		
2PW		600	600	600	600	600	600	600							600	600		
2SW		600	600	600	600	600	600	600							600	600		
3PW									600	600	600	600	600	600				
3SW									600	600	600	600	600	600				
5PW		300	300	300	300	300	300	300	300	300	300	300	300	300	300	300		
5SW		300	300	300	300	300	300	300	300	300	300	300	300	300	300	300		
PUMP USAGE FACTOR																		
2PW		0.34	0.50	0.50	0.72	0.68	0.64	0.61							0.57	0.53		
2SW		0.31	0.45	0.44	0.64	0.60	0.56	0.53							0.63	0.53		
3PW									0.99	0.80	0.74	0.46	0.22	0.20				
3SW									0.65	0.72	0.67	0.41	0.19	0.17				
5PW		0.14	0.17	0.14	0.16	0.08	0.00	0.08	0.66	0.28	0.18	0.04	0.31	0.35	1.14	1.05		
5SW		0.20	0.24	0.23	0.32	0.23	0.16	0.09	0.30	0.45	0.33	0.15	0.23	0.27	1.25	1.05		
STEP	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
DURATION [min.]		10	20	10	20	20	20	20	20	20	20	15	15	15	15	15		

cross - over time = 3.75 hours

Table 6.2 – Loadout summary Tables

From the above table the total amount of moved water is 2282 t.

6.4 MOSES OUTPUT SUMMARY

Weight ballast (t)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Barge draft [m]	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
2PW	767	665	615	468	328	197	72							160	241
2SW	792	699	654	523	400	284	176							272	353
3PW								654	490	338	244	210	179		
3SW								722	574	438	354	325	299		
5PW	423	440	447	463	471	471	463	531	560	578	583	559	533	445	364
5SW	448	473	485	518	542	559	568	599	645	679	694	676	655	558	477

Ballast Sounding (m)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Barge draft [m]	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
2PW	5.35	4.64	4.29	3.27	2.3	1.38	0.51							1.12	1.68
2SW	5.53	4.88	4.56	3.65	2.79	1.99	1.23							1.9	2.47
3PW								4.57	3.42	2.36	1.71	1.47	1.25		
3SW								5.04	4.01	3.06	2.48	2.27	2.09		
5PW	3.49	3.61	3.66	3.77	3.82	3.82	3.77	4.25	4.45	4.58	4.61	4.45	4.26	3.64	3.06
5SW	3.66	3.84	3.93	4.16	4.33	4.44	4.51	4.73	5.05	5.29	5.4	5.27	5.12	4.44	3.87

Weight ballast Variation (t)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Barge draft [m]	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
2PW	-35	-102	-51	-147	-139	-131	-125							88	81
2SW	-32	-93	-45	-131	-123	-115	-109							96	81
3PW								-202	-164	-152	-94	-34	-31		
3SW								-134	-148	-137	-84	-29	-26		
5PW	7	17	7	16	8		-8	68	29	18	4	-24	-27	-88	-81
5SW	10	25	12	33	24	16	9	31	46	34	15	-18	-21	-96	-81

Ballast Ullage (t)

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Barge draft [m]	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
2PW	0.74	1.45	1.8	2.83	3.8	4.71	5.58							4.97	4.41
2SW	0.57	1.22	1.53	2.45	3.3	4.11	4.87							4.19	3.63
3PW								1.53	2.67	3.73	4.39	4.63	4.84		
3SW								1.05	2.09	3.04	3.62	3.82	4.01		
5PW	2.61	2.49	2.44	2.33	2.27	2.27	2.33	1.85	1.64	1.52	1.48	1.65	1.84	2.45	3.03
5SW	2.43	2.26	2.17	1.94	1.77	1.65	1.59	1.37	1.05	0.81	0.7	0.83	0.98	1.66	2.23

Table 6.3 – Loadout summary Tables - Detailed

Ballast variation lower than 15 ton are to be considered for numerical stability only.

6.4.1 Step 0: barge ready for loadout. Barge is with 4.30m draft evenkeel

Being the distance between quay and barge stern <= 1.0m, the load of the axles is considered onshore on onboard.

Barge is with 4.30m draft even keel

VERVECE - BALLAST PLAN - load-out BLPH - Ph.0 - Draft = 4.30m evenkeel

STERN						BOW
	52.5% 5PW u=2.65m		full 4PW	full 3PW	92.0% 2PW u=0.50m	50% 1PW
	53% 5PC		30.0% 4PC u=4.30m	empty 3PC	empty 2PC	full 1PC
	55% 5SC		30.0% 4SC u=4.30m	empty 3SC	empty 2SC	full 1SC
	55.6% 5SW u=2.50m		full 4SW	full 3SW	94.5% 2SW u=0.35m	50% 1SW

Figure 6.5 – Loadout Phase 0

--- TECON - CW - BLPH LOADOUT ON VERVECE ---
BALLASTING SUMMARY

	5PW 417 t	4PW Full	3PW Full	2PW 802 t	1PW 117 t
	5PC 295 t	4PC Empty	3PC Empty	2PC Empty	1PC Full
	5SC 291 t	4SC Empty	3SC Empty	2SC Empty	1SC Full
	5SW 439 t	4SW Full	3SW Full	2SW 825 t	1SW 117 t

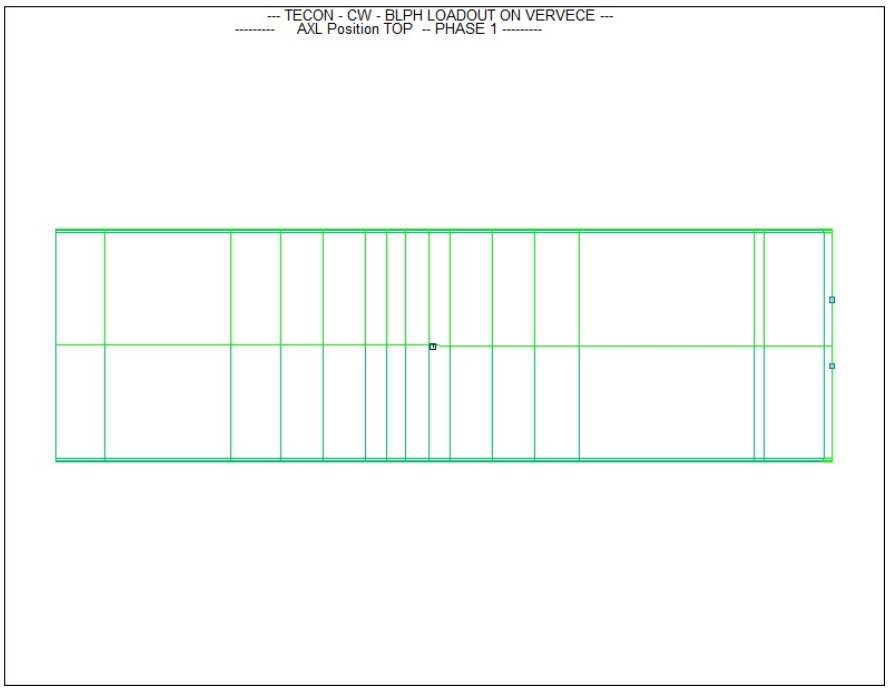
LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)

PHASE: 0 STRUCTURE WEIGHT ON BARGE(t): 0 DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00

Phase -0-

Tank No	Ballast	Sounding	Ullage	Tank No	Ballast	Sounding	Ullage
1PC	230	6,02	,08	3SC	26	,18	5,91
1PW	117	4,06	2,04	3SW	856	5,97	,12
1SC	230	6,02	,08	4PC	262	1,83	4,27
1SW	117	4,06	2,04	4PW	856	5,97	,12
2PC	26	,18	5,91	4SC	262	1,83	4,27
2PW	802	5,60	,50	4SW	856	5,97	,12
2SC	26	,18	5,91	5PC	295	3,96	2,14
2SW	825	5,75	,34	5PW	417	3,44	2,65
3PC	26	,18	5,91	5SC	291	3,96	2,14
3PW	856	5,97	,12	5SW	439	3,60	2,50

6.4.2 Step 1



--- TECON - CW - BLPH LOADOUT ON VERVECE ---
BALLASTING SUMMARY

Barge pump
PS - OUT

	5PW 7 t	4PW	3PW	2PW -35 t	1PW
	5PC	4PC	3PC	2PC	1PC
	5SC	4SC	3SC	2SC	1SC
	5SW 10 t	4SW	3SW	2SW -32 t	1SW

Barge pump
STB - OUT

PHASE: 1
TRAVEL DISTANCE: 3,01

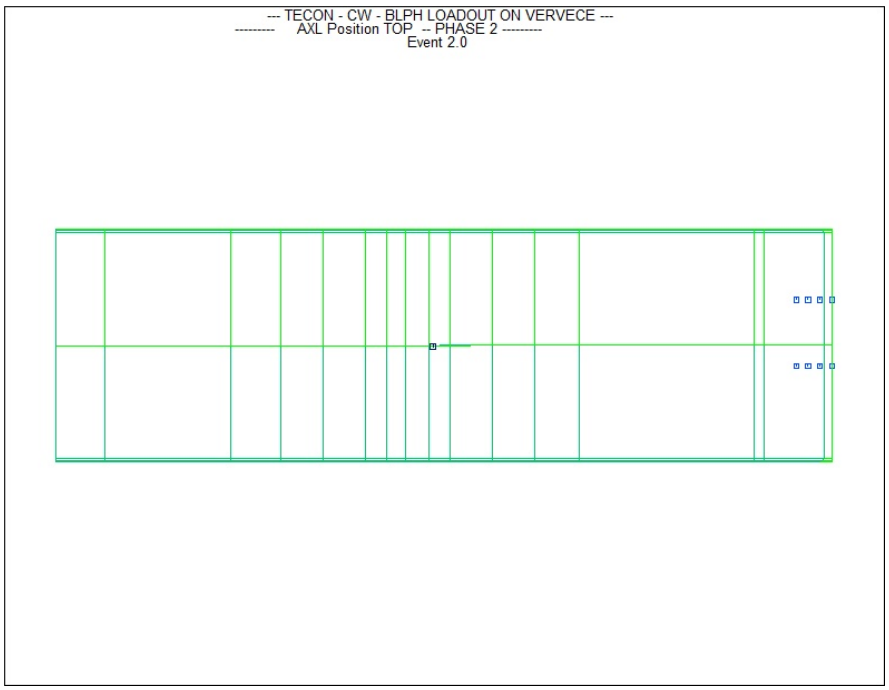
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 51,1

Phase -1-

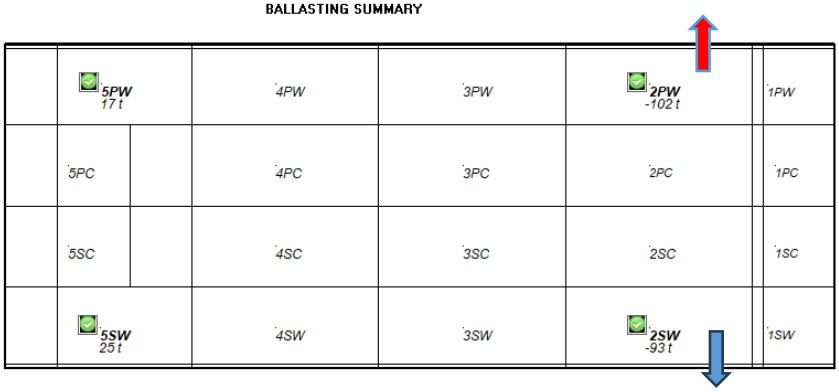
Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	-35	5,35	-,24	,74	,24	205,
2SW	-32	5,53	-,23	,57	,23	187,
5PW	7	3,49	,05	2,61	-,05	41,
5SW	10	3,66	,07	2,43	-,07	59,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.3 Step 2



--- TECON - CW - BLPH LOADOUT ON VERVECE ---
BALLASTING SUMMARY



Barge pump PS - OUT

Barge pump STB - OUT

PHASE: 2
TRAVEL DISTANCE: 7,21

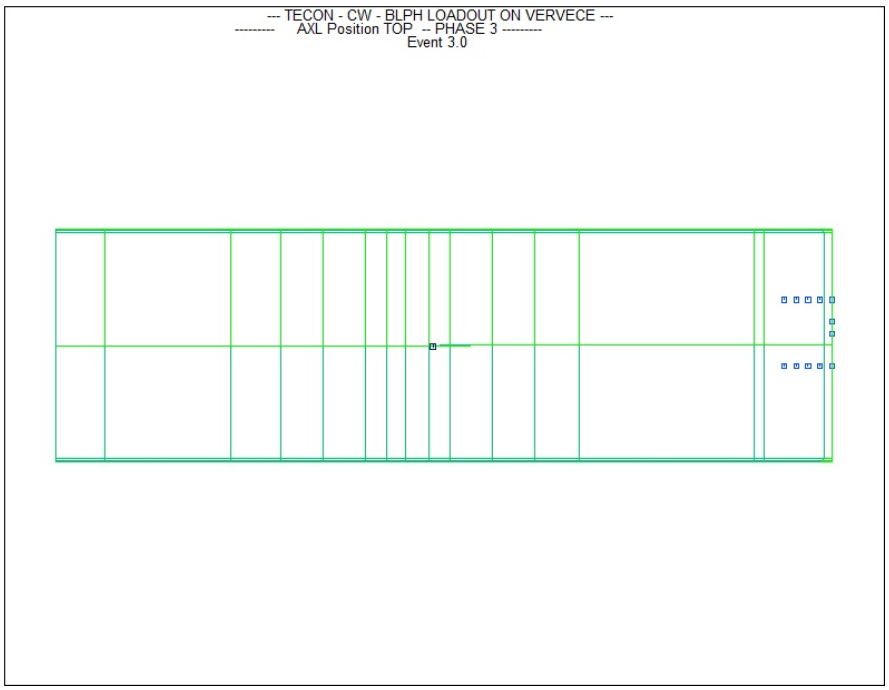
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 204,4

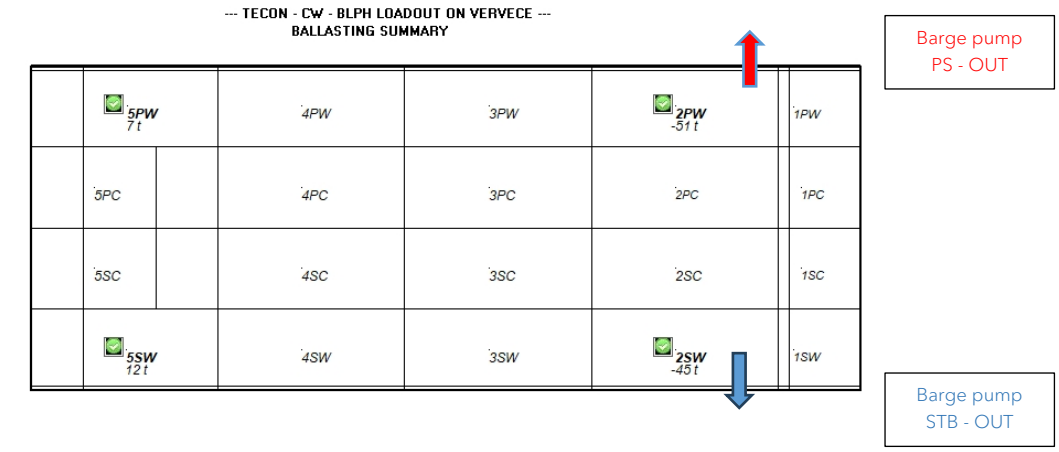
Phase -2-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	-102	4,64	-,71	1,45	,71	299,
2SW	-93	4,88	-,65	1,22	,65	272,
5PW	17	3,61	,12	2,49	-,12	50,
5SW	25	3,84	,18	2,26	-,18	73,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.4 Step 3





PHASE: 3
TRAVEL DISTANCE: 8,61

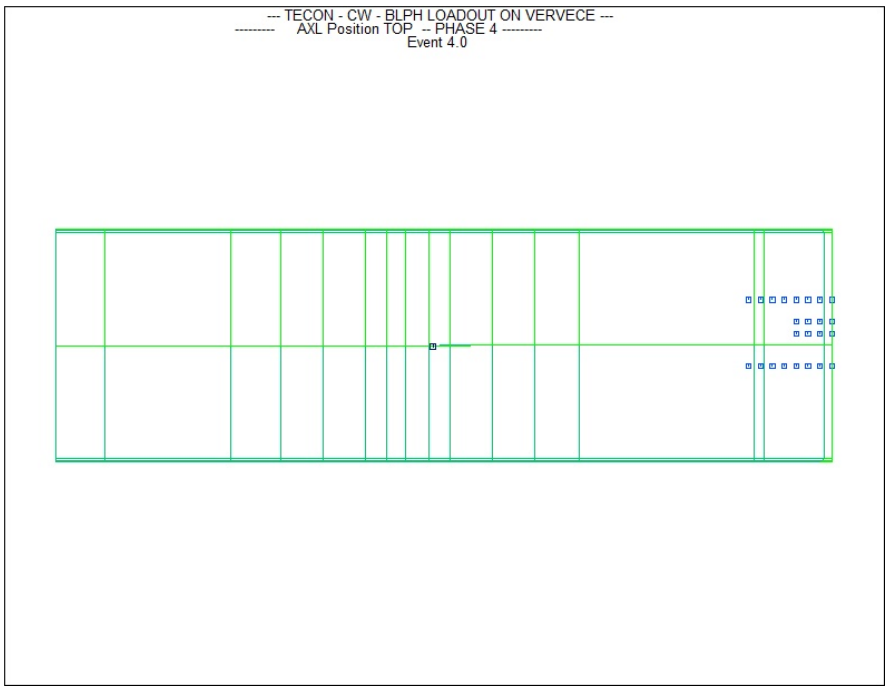
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 281

Phase -3-

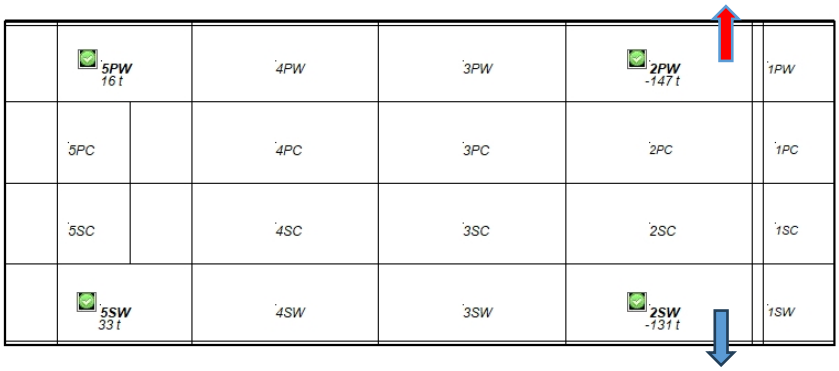
Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	-51	4,29	-,35	1,80	,35	299,
2SW	-45	4,56	-,31	1,53	,31	263,
5PW	7	3,66	,05	2,44	-,05	41,
5SW	12	3,93	,09	2,17	-,09	70,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.5 Step 4



--- TECON - CW - BLPH LOADOUT ON VERVECE ---
BALLASTING SUMMARY



Barge pump
PS - OUT

Barge pump
STB - OUT

PHASE: 4
TRAVEL DISTANCE: 12,81

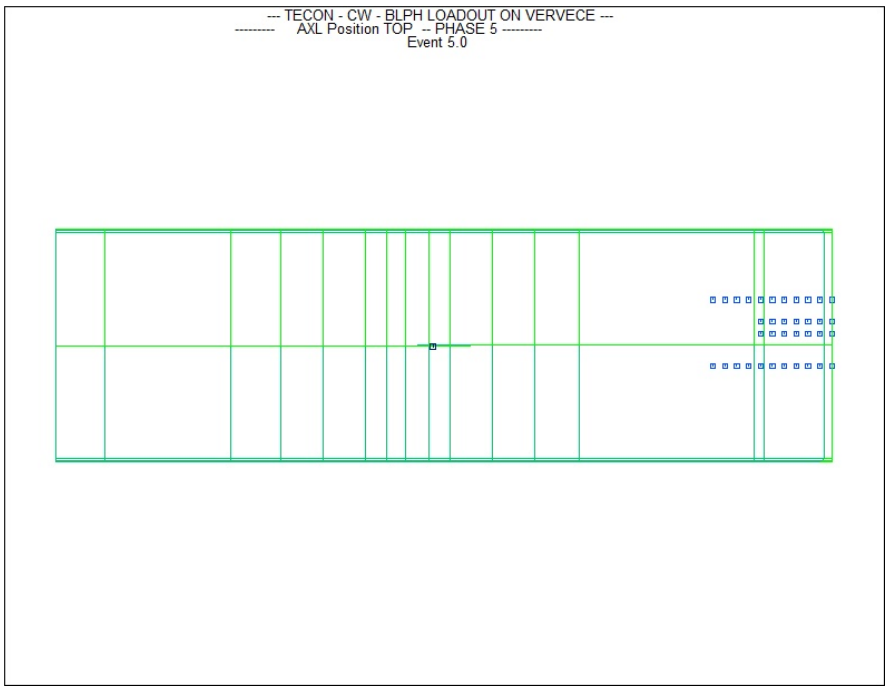
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 511

Phase -4-

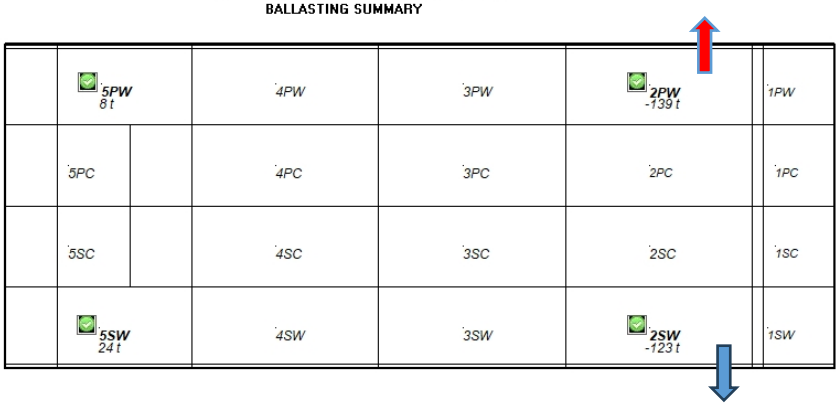
Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	-147	3,27	-1,03	2,83	1,03	430,
2SW	-131	3,65	-,91	2,45	,91	383,
5PW	16	3,77	,11	2,33	-,11	47,
5SW	33	4,16	,23	1,94	-,23	97,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.6 Step 5



--- TECON - CW - BLPH LOADOUT ON VERVECE ---
BALLASTING SUMMARY



Barge pump PS - OUT

Barge pump STB - OUT

PHASE: 5
TRAVEL DISTANCE: 17,01

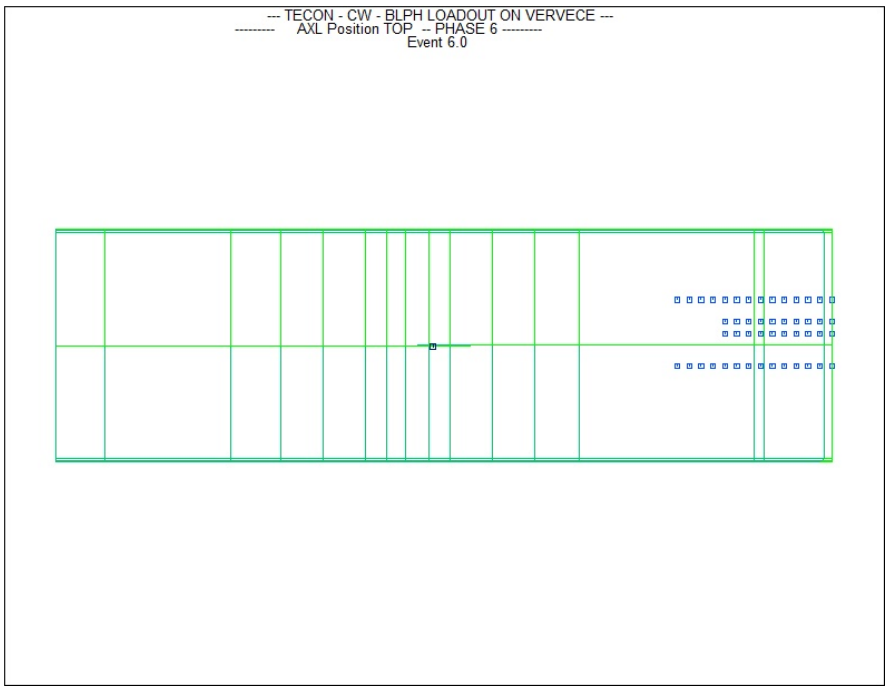
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 740,9

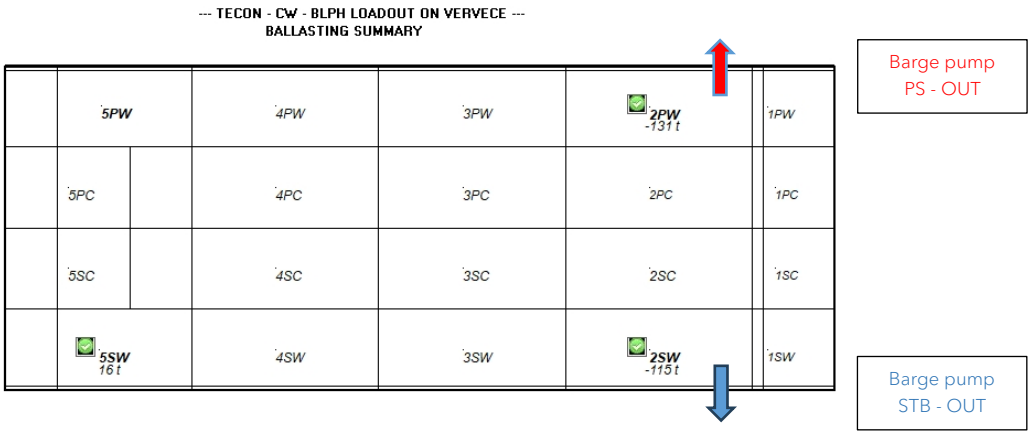
Phase -5-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	-139	2,30	-,97	3,80	,97	407,
2SW	-123	2,79	-,86	3,30	,86	360,
5PW	8	3,82	,05	2,27	-,05	23,
5SW	24	4,33	,17	1,77	-,17	70,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.7 Step 6





PHASE: 6
TRAVEL DISTANCE: 21,21

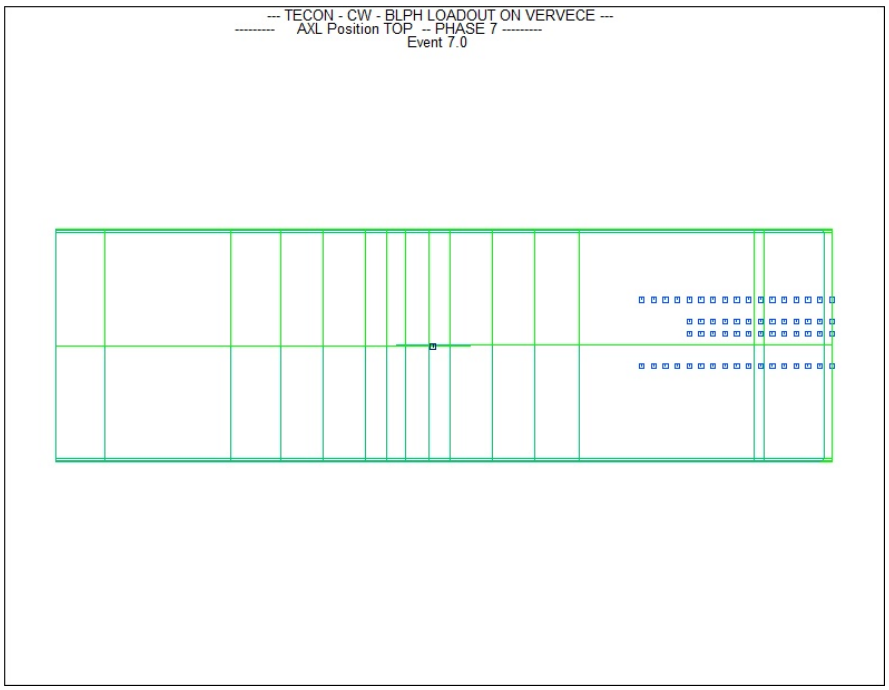
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 970,9

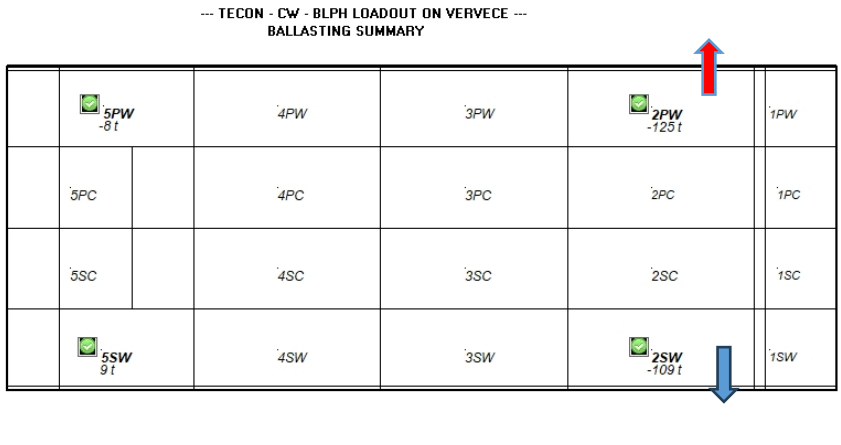
Phase -6-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	-131	1,38	-,91	4,71	,91	383,
2SW	-115	1,99	-,80	4,11	,80	337,
5SW	16	4,44	,12	1,65	-,12	47,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.8 Step 7





PHASE: 7
TRAVEL DISTANCE: 25,41

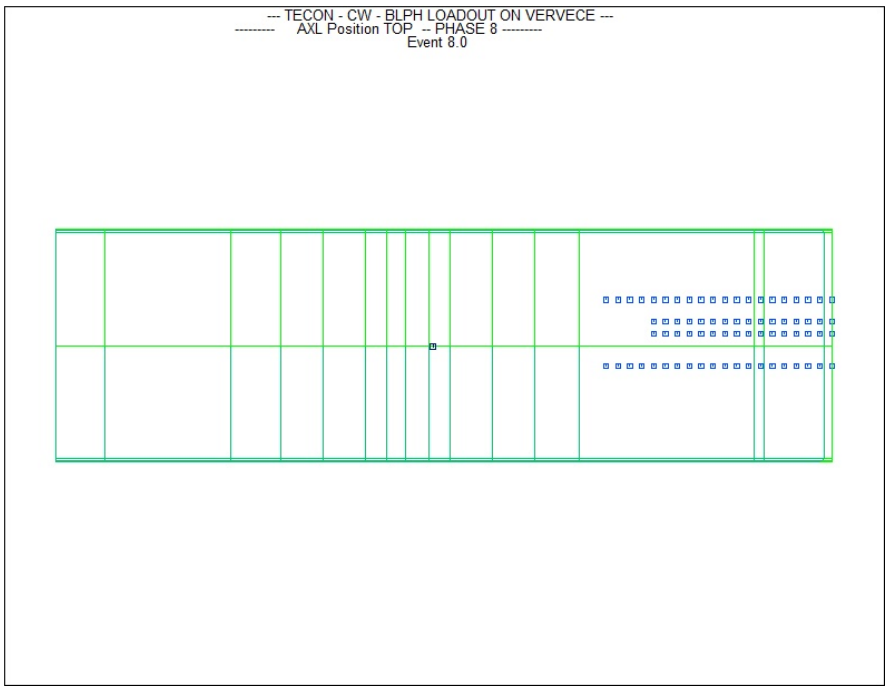
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 1203,1

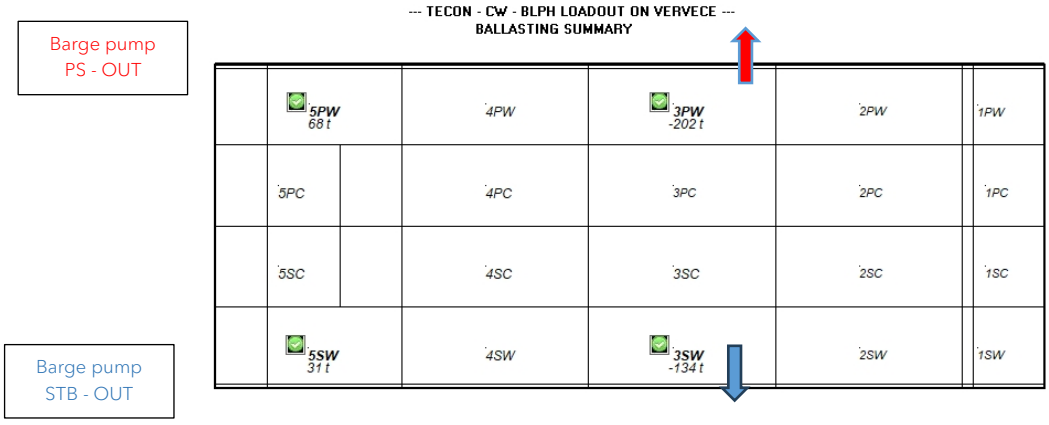
Phase -7-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	-125	,51	-,87	5,58	,87	366,
2SW	-109	1,23	-,76	4,87	,76	319,
5PW	-8	3,77	-,05	2,33	,05	23,
5SW	9	4,51	,06	1,59	-,06	26,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.9 Step 8





PHASE: 8
TRAVEL DISTANCE: 29,61

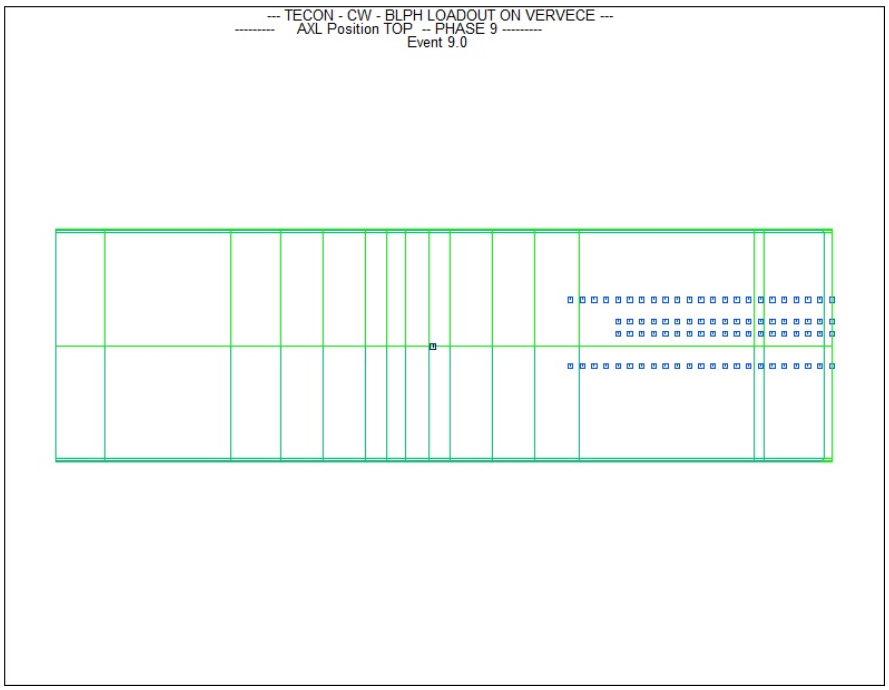
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 1439,8

Phase -8-

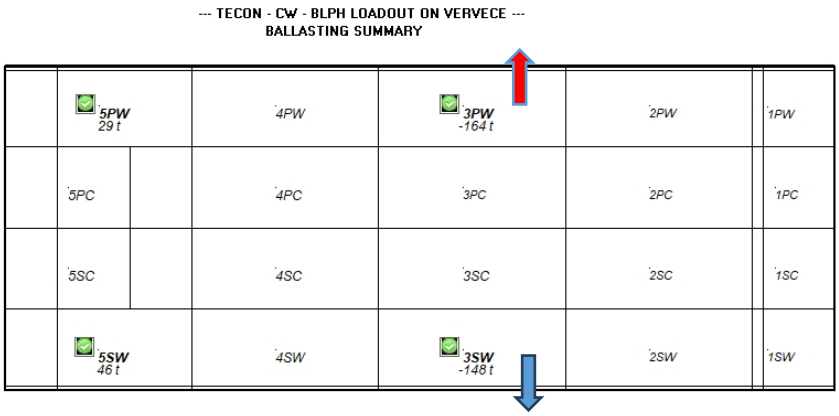
Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
3PW	-202	4,57	-1,41	1,53	1,41	591,
3SW	-134	5,04	-,93	1,05	,93	392,
5PW	68	4,25	,48	1,85	-,48	199,
5SW	31	4,73	,22	1,37	-,22	91,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.10 Step 9



Barge pump PS - OUT



Barge pump STB - OUT

PHASE: 9
TRAVEL DISTANCE: 33,81

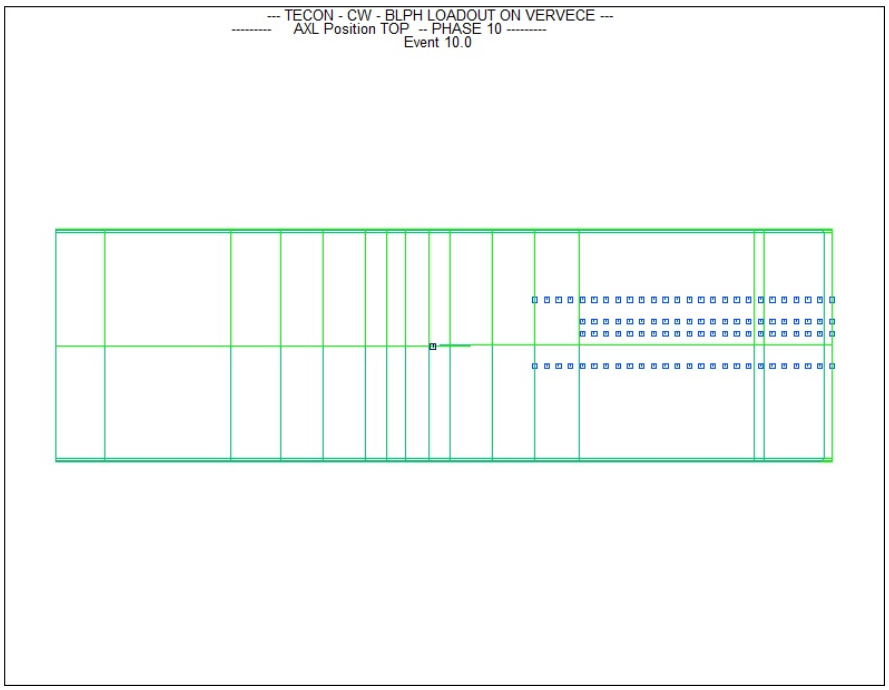
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 1676,5

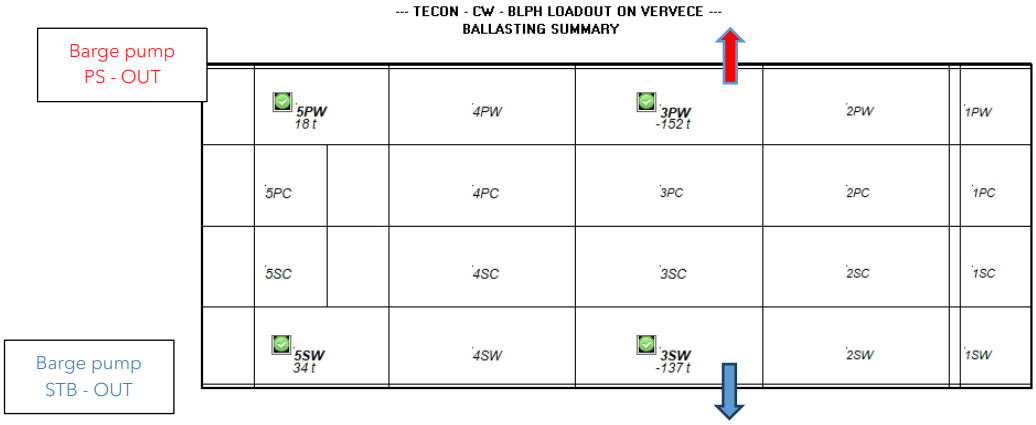
Phase -9-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
3PW	-164	3,42	-1,14	2,67	1,14	480,
3SW	-148	4,01	-1,03	2,09	1,03	433,
5PW	29	4,45	,21	1,64	-,21	85,
5SW	46	5,05	,32	1,05	-,32	135,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.11 Step 10





PHASE: 10
TRAVEL DISTANCE: 38,01

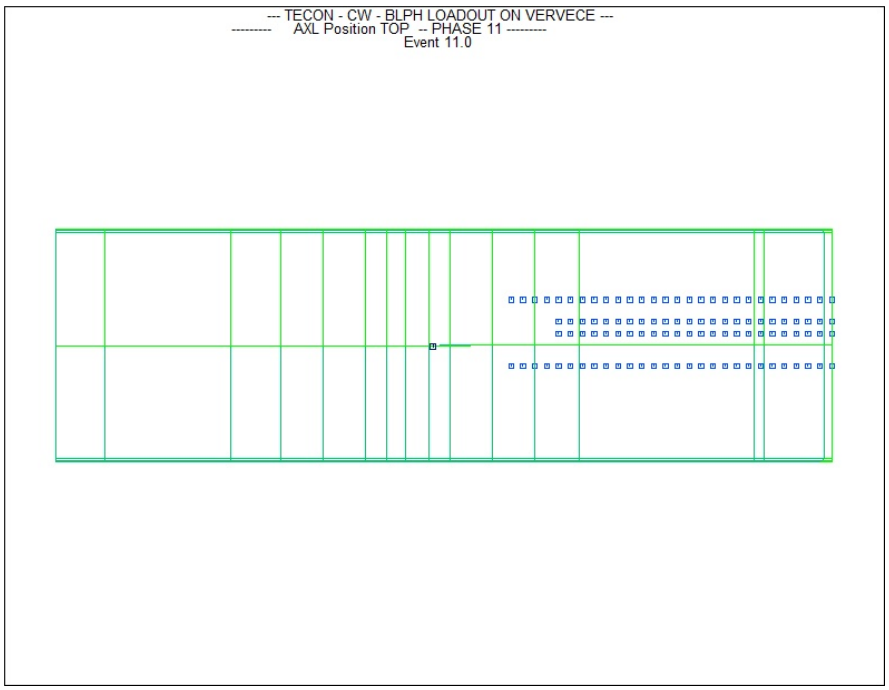
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 1913,2

Phase -10-

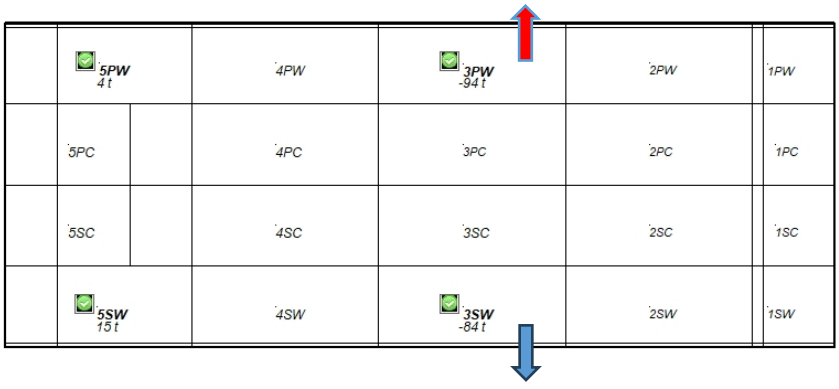
Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
3PW	-152	2,36	-1,06	3,73	1,06	445,
3SW	-137	3,06	-,95	3,04	,95	401,
5PW	18	4,58	,13	1,52	-,13	53,
5SW	34	5,29	,24	,81	-,24	100,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.12 Step 11



Barge pump PS - OUT



Barge pump STB - OUT

PHASE: 11
TRAVEL DISTANCE: 40,81

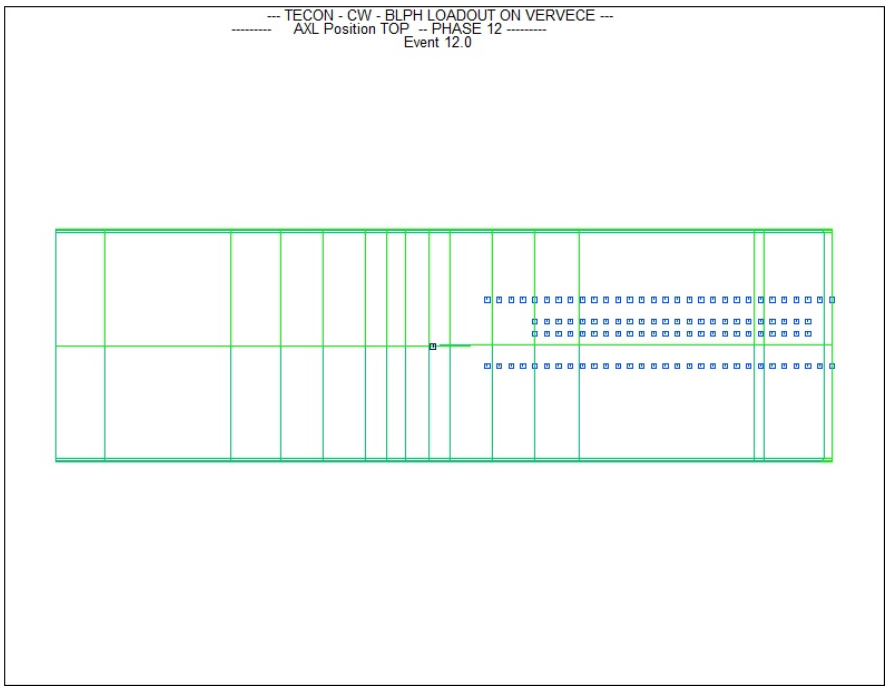
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 2071

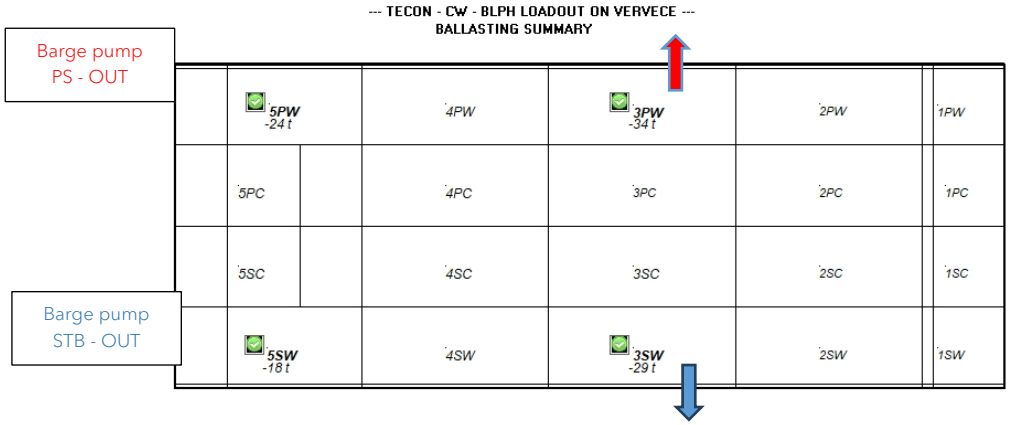
Phase -11-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
3PW	-94	1,71	-,65	4,39	,65	275,
3SW	-84	2,48	-,58	3,62	,58	246,
5PW	4	4,61	,03	1,48	-,03	12,
5SW	15	5,40	,11	,70	-,11	44,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.13 Step 12





PHASE: 12
TRAVEL DISTANCE: 43,61

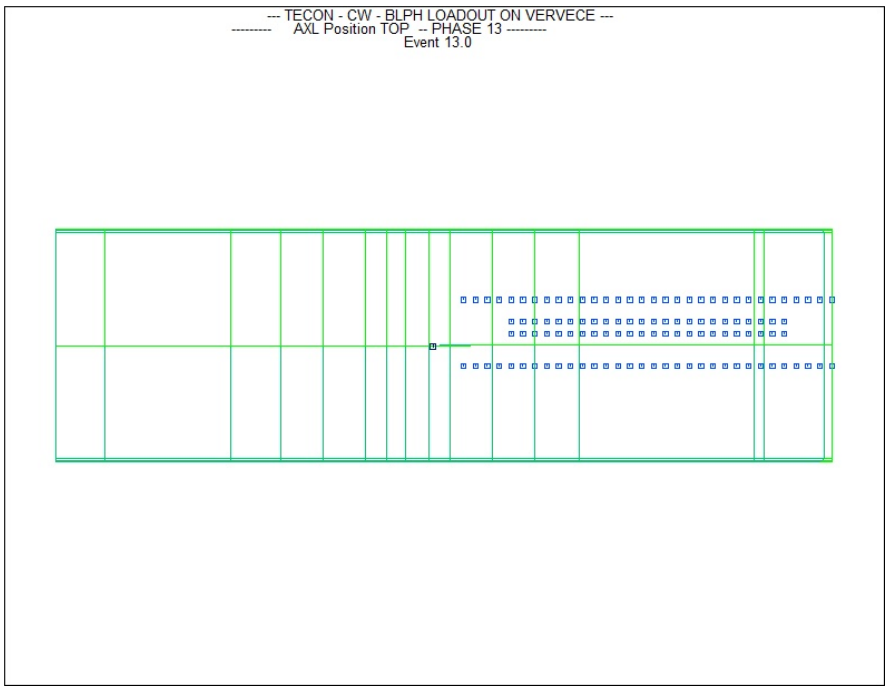
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 2176,2

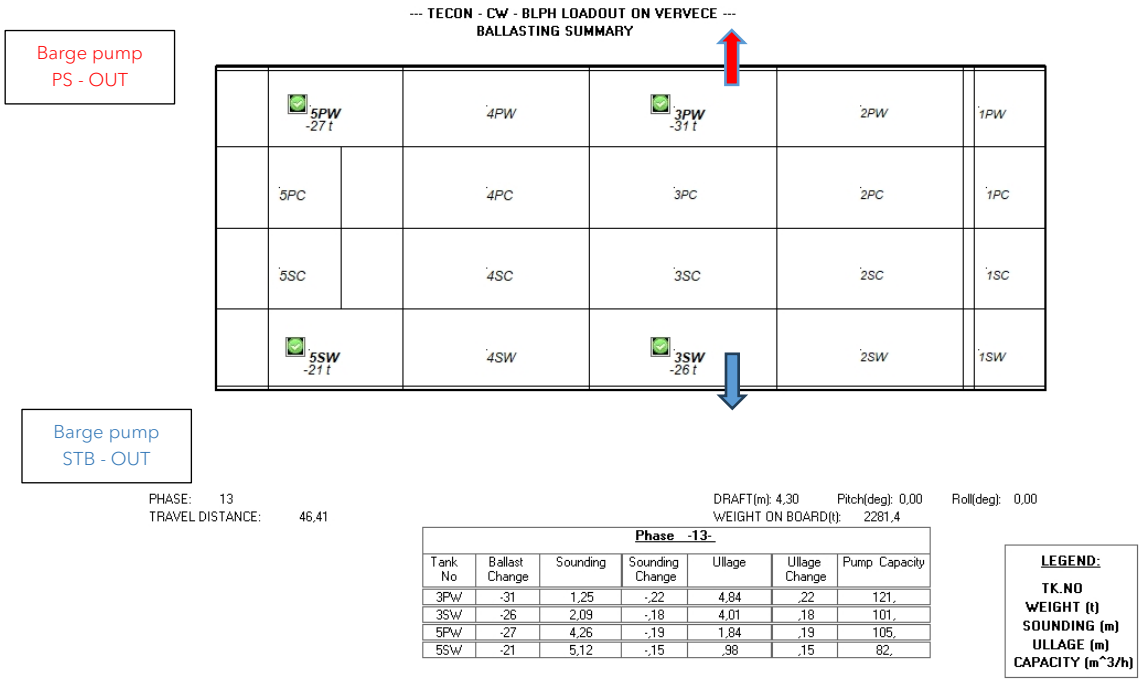
Phase -12-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
3PW	-34	1,47	-,24	4,63	,24	133,
3SW	-29	2,27	-,20	3,82	,20	113,
5PW	-24	4,45	-,17	1,65	,17	94,
5SW	-18	5,27	-,13	,83	,13	70,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.14 Step 13: All the axles on board.





PHASE: 13
TRAVEL DISTANCE: 46,41

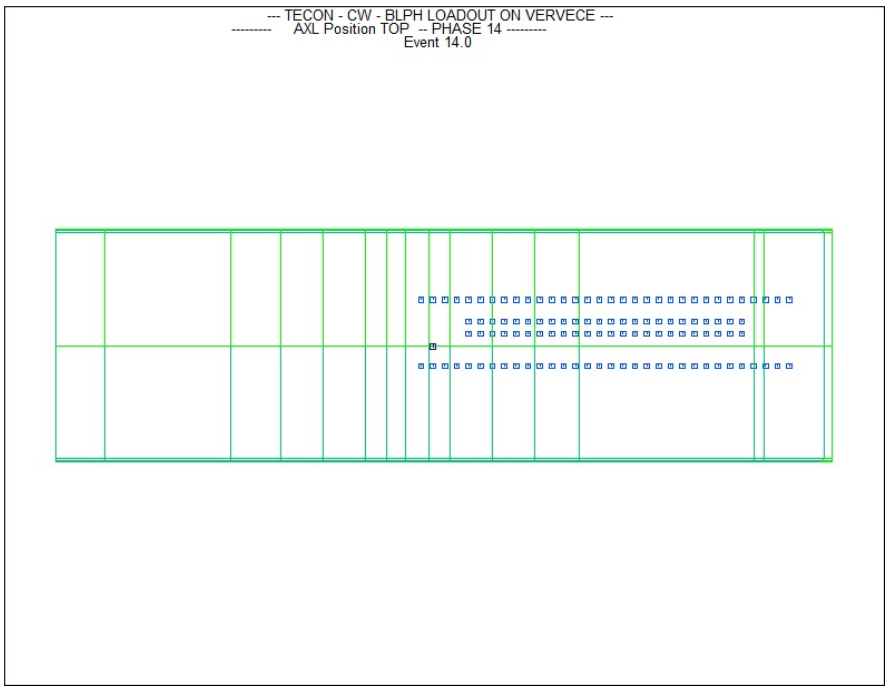
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 2281,4

Phase -13-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
3PW	-31	1,25	-,22	4,84	,22	121,
3SW	-26	2,09	-,18	4,01	,18	101,
5PW	-27	4,26	-,19	1,84	,19	105,
5SW	-21	5,12	-,15	,98	,15	82,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

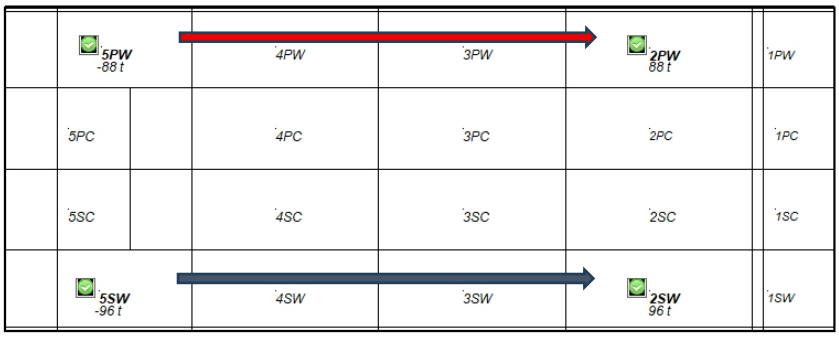
6.4.15 Step 14: Shifting phase of 5.0m



--- TECON - CW - BLPH LOADOUT ON VERVECE ---
BALLASTING SUMMARY

Barge pump PS

Barge pump STB



PHASE: 14
TRAVEL DISTANCE: 51,41

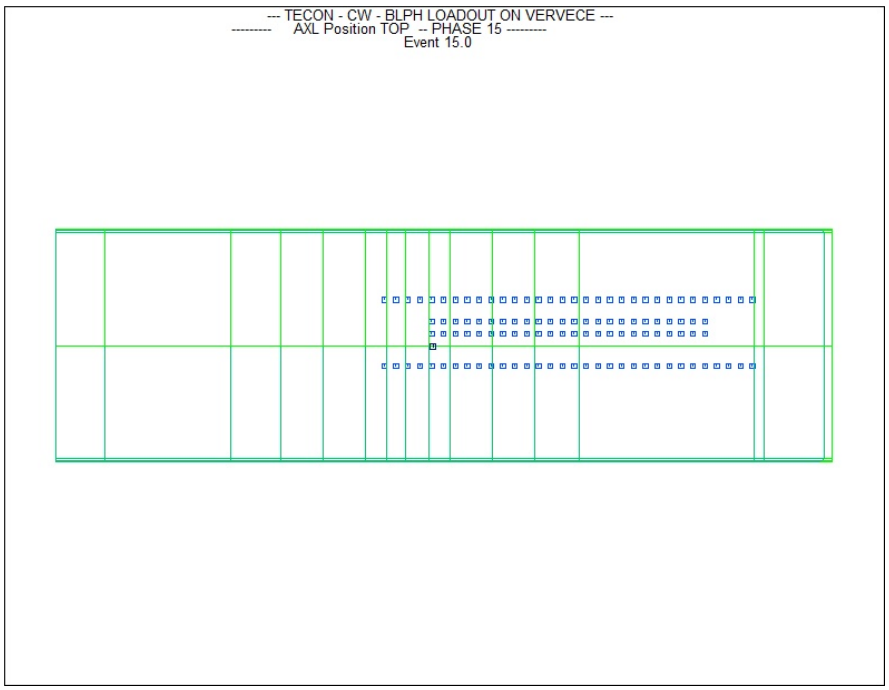
DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 2281,4

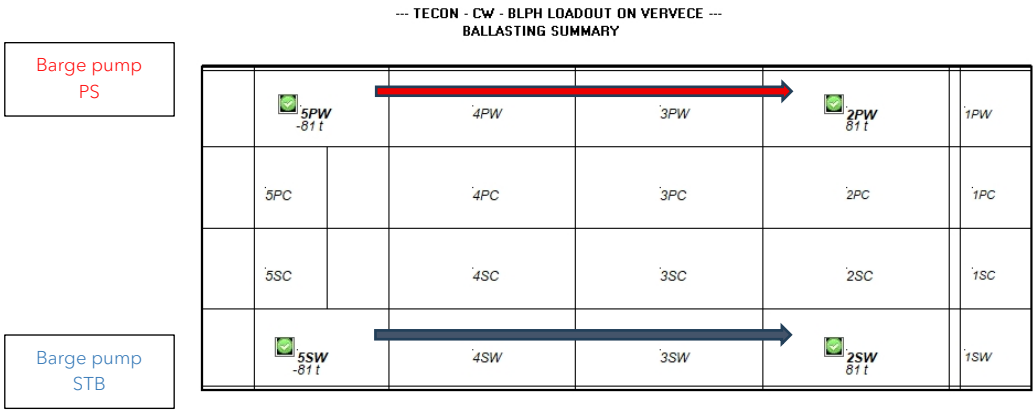
Phase -14-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	88	1,12	,61	4,97	-,61	343,
2SW	96	1,90	,67	4,19	-,67	375,
5PW	-88	3,64	-,62	2,45	,62	343,
5SW	-96	4,44	-,68	1,66	,68	375,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.4.16 Step 15: Shifting phase of 4.36m. Topside reaches the transport position.





PHASE: 15
TRAVEL DISTANCE: 55,77

DRAFT(m): 4,30 Pitch(deg): 0,00 Roll(deg): 0,00
WEIGHT ON BOARD(t): 2281,4

Phase -15-

Tank No	Ballast Change	Sounding	Sounding Change	Ullage	Ullage Change	Pump Capacity
2PW	81	1,68	,56	4,41	-,56	316,
2SW	81	2,47	,56	3,63	-,56	316,
5PW	-81	3,06	-,58	3,03	,58	316,
5SW	-81	3,87	-,57	2,23	,57	316,

LEGEND:
TK.NO
WEIGHT (t)
SOUNDING (m)
ULLAGE (m)
CAPACITY (m^3/h)

6.5 BALLAST CORRECTION FOR TIDE

The correction to compensate for sea level variation at start of LO operation is shown below.

VERVECE - BALLAST PLAN - load-out Ph.0. - HIGH TIDE, D=4.70m trim -0.44deg

	52.5% **5PW** u=2.65m	full **4PW**	full **3PW**	92.0% **2PW** u=0.50m	full **1PW**
STERN	50% **5PC** u=2.67m	30.0% **4PC** u=4.30m	empty **3PC**	empty **2PC**	full **1PC**
	51% **5SC** u=2.63m	30.0% **4SC** u=4.30m	empty **3SC**	empty **2SC**	full **1SC**
	55.6% **5SW** u=2.50m	full **4SW**	full **3SW**	94.5% **2SW** u=0.35m	full **1SW**

BOW

d=4.00m **d=4.70m**

VERVECE - BALLAST PLAN - load-out Ph.0. - LOW TIDE D=3.90m, trim 0.42deg

	52.5% **5PW** u=2.65m	full **4PW**	full **3PW**	92.0% **2PW** u=0.50m	empty **1PW**
STERN	72% **5PC** u=1.50	30.0% **4PC** u=4.30m	empty **3PC**	empty **2PC**	full **1PC**
	73% **5SC** u=1.45m	30.0% **4SC** u=4.30m	empty **3SC**	empty **2SC**	full **1SC**
	55.6% **5SW** u=2.50m	full **4SW**	full **3SW**	94.5% **2SW** u=0.35m	empty **1SW**

BOW

d=4.60m **d=3.90m**

6.5.1 Tide -40cm Phase 0

```
**********************************************************************************************************
*                                          *** MOSES ***                                                 *
*                                          ---------------                          1 July, 2025         *
*          T E C O N                                                        .                            *
*          ---------     Barge Configuration                                .                            *
*                                                                                                        *
**********************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                    Results Are Reported In Body System

                          Draft =     3.90 Roll Angle =     0.00 Pitch Angle =     0.45
```

```
                    Wet Radii Of Gyration About CG

                 K-X =     9.09 K-Y =    24.43 K-Z =    25.78

                    GMT =    13.85 GML =   154.87

                          /-- Center of Gravity ---/  Sounding   % Full
Name      Weight     ---X---  ---Y---  ---Z---  -------- --------

----------------  Part CF          ------------
LOAD_GRO     28.00    69.38    11.22     8.10
----------------  Part GRI&SF-B    ------------
LOAD_GRO     75.00    30.86    -1.14     7.35
----------------  Part GRI&SF-C    ------------
LOAD_GRO      0.50    67.44    11.22     7.10
----------------  Part GRI&SF-T    ------------
LOAD_GRO     45.00    65.20    -2.92     7.40
----------------  Part TP          ------------
LOAD_GRO    254.50    65.54    -2.14     9.35
----------------  Part VERVECE     ------------
LOAD_GRO   1832.80    47.02     0.00     3.52
--- Contents ---
1PC          229.92     5.63    -3.43     3.77     6.02    98.00
1PW           27.11     7.77   -10.27     0.99     1.65    11.54
1SC          230.42     5.63     3.43     3.77     6.02    98.00
1SW           25.95     7.80    10.26     0.96     1.60    11.04
2PC           17.47    21.70    -3.43     0.07     0.12     2.00
2PW          803.74    19.48   -10.28     2.81     5.61    92.00
2SC           17.47    21.70     3.43     0.07     0.12     2.00
2SW          825.58    19.48    10.28     2.88     5.76    94.50
3PC           17.47    42.27    -3.43     0.07     0.12     2.00
3PW          856.16    40.05   -10.28     2.99     5.97    98.00
3SC           17.47    42.27     3.43     0.07     0.12     2.00
3SW          856.16    40.05    10.28     2.99     5.97    98.00
4PC          262.11    60.73    -3.43     0.91     1.83    30.00
4PW          856.16    60.63   -10.28     2.99     5.97    98.00
4SC          262.11    60.73     3.43     0.91     1.83    30.00
4SW          856.16    60.63    10.28     2.99     5.97    98.00
5PC          353.09    83.64    -3.43     2.51     4.59    71.76
5PW          419.01    79.82   -10.28     1.82     3.46    52.80
5SC          352.72    83.66     3.43     2.54     4.64    72.83
5SW          441.23    79.89    10.28     1.91     3.62    55.60
========  ========  =======  =======  =======
Total       9963.29    48.08    -0.00     3.06
Buoyancy    9963.30    48.09    -0.00     2.20

*****************************************************************************************************
*                                        ***  MOSES   ***                                           *
*                                        ----------------                    1 July, 2025           *
*          T E C O N                                                .                                 *
*          ---------     Barge Configuration                                .                       *
*                                                                                                    *
*****************************************************************************************************

                           +++ D R A F T   M A R K   R E A D I N G S +++
                           ============================================

                Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

   Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

  BOWPO        3.90 BOWST        3.90 MIDPO        4.26 MIDST        4.26 STEPO        4.62 STEST        4.62
```

6.5.2 Tide +40cm Phase 0

```
*****************************************************************************************************
*                                        ***  MOSES   ***                                           *
*                                        ----------------                    1 July, 2025           *
*          T E C O N                                                .                                 *
*          ---------     Barge Configuration                                .                       *
*                                                                                                    *
*****************************************************************************************************

                  +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                  ====================================================================

               Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

                                Results Are Reported In Body System

                     Draft =     4.70 Roll Angle =    -0.00 Pitch Angle =    -0.44
```

```
                 Wet Radii Of Gyration About CG

          K-X =      9.23 K-Y =     25.35 K-Z =    26.40

                 GMT =     13.81 GML =    162.86

                   /-- Center of Gravity ---/  Sounding   % Full
Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

----------------  Part CF          ------------
LOAD_GRO     28.00    69.38    11.22     8.10
----------------  Part GRI&SF-B   ------------
LOAD_GRO     75.00    30.86    -1.14     7.35
----------------  Part GRI&SF-C   ------------
LOAD_GRO      0.50    67.44    11.22     7.10
----------------  Part GRI&SF-T   ------------
LOAD_GRO     45.00    65.20    -2.92     7.40
----------------  Part TP          ------------
LOAD_GRO    254.50    65.54    -2.14     9.35
----------------  Part VERVECE     ------------
LOAD_GRO   1832.80    47.02     0.00     3.52
--- Contents ---
1PC         229.92     5.60    -3.43     3.77     6.02    98.00
1PW         234.98     5.60   -10.28     3.82     6.10   100.00
1SC         230.42     5.60     3.43     3.77     6.02    98.00
1SW         234.98     5.60    10.28     3.82     6.10   100.00
2PC          17.47    17.22    -3.43     0.07     0.12     2.00
2PW         803.74    19.38   -10.28     2.81     5.61    92.00
2SC          17.47    17.22     3.43     0.07     0.12     2.00
2SW         825.58    19.38    10.28     2.88     5.76    94.50
3PC          17.47    37.79    -3.43     0.07     0.12     2.00
3PW         856.16    39.96   -10.28     2.99     5.97    98.00
3SC          17.47    37.79     3.43     0.07     0.12     2.00
3SW         856.16    39.96    10.28     2.99     5.97    98.00
4PC         262.11    60.43    -3.43     0.91     1.83    30.00
4PW         856.16    60.53   -10.28     2.99     5.97    98.00
4SC         262.11    60.43     3.43     0.91     1.83    30.00
4SW         856.16    60.53    10.28     2.99     5.97    98.00
5PC         247.14    83.16    -3.43     1.86     3.43    50.23
5PW         419.01    79.64   -10.28     1.82     3.46    52.80
5SC         246.76    83.18     3.43     1.89     3.47    50.95
5SW         441.23    79.71    10.28     1.91     3.61    55.60
========  ========  =======  =======  =======
Total     10168.29    45.45     0.00     3.08
Buoyancy  10168.37    45.45     0.00     2.24

*************************************************************************************************************
*                                         ***  MOSES  ***                                                   *
*                                         ----------------                              1 July, 2025        *
*          T E C O N                                                .                                       *
*          ---------     Barge Configuration                                           .                    *
*                                                                                                           *
*************************************************************************************************************

                         +++ D R A F T   M A R K   R E A D I N G S +++
                         =============================================

              Process is DEFAULT: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
 -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

 BOWPO        4.70 BOWST        4.70 MIDPO        4.35 MIDST        4.35 STEPO        4.00 STEST        4.00
```

7 BARGE LONGITUDINAL STRUCTURAL CHECKS

The longitudinal strength analysis was carried out for the still water condition. The complete MOSES output is reported in section 9.

The allowable stresses were assumed as follows:

- Fy = 235 N/mm^2 yield stress
- σ_{all} = 0.66 x Fy = 155 N/mm^2
- τ_{all} = 0.4 x Fy = 94 N/mm^2

For normal stress, the maximum usage factor, i.e. the maximum bending / allowable stress ratio, is 0.46 in phase 11 of loadout operation.

- UF = 17351/26130 = 0.66

For shear stress, the maximum usage factor is:

- UF_{shear} = 863/6150 = 0.14

in phase 10 of loadout.

Values of BM and Shear along the longitudinal section of the cargo barge were compared with the admissible values shown in section 5.4. All the values are within allowable ones.

The maximum deflection results 5.26 cm (ph.11).

8 BARGE INTACT STABILITY – COMPLETE MOSES OUTPUT

In the following tables, the allowable deflection was conventionally set equal to unity, therefore the values indicated under the columns with heading Deflection / Allowable are actually the computed deflections.

```
                                  ********************************
*                                         ***  MOSES   ***                                                    *
*                                         ----------------                          1 July, 2025             *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                       *
*          ---------     Intact Stability Check    -- PHASE 0 ---------                                      *
*                                                                                                            *
**************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ======================================================================

                     Process is 0: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Results Are Reported In Body System

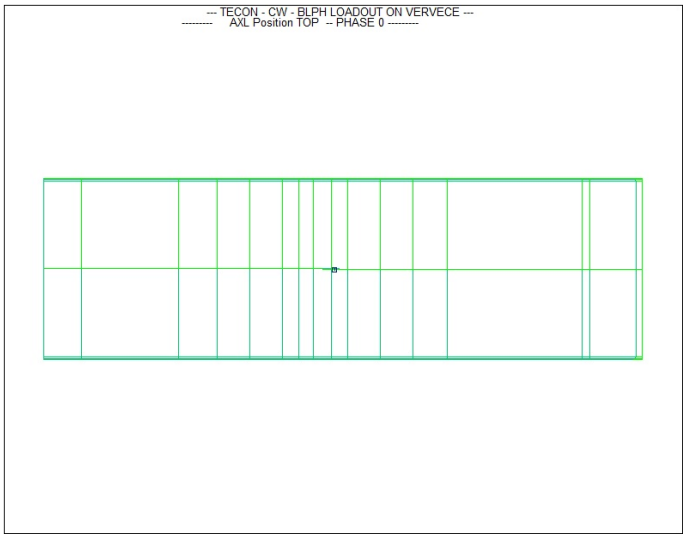
                         Draft =     4.30 Roll Angle =    -0.00 Pitch Angle =     0.00

                                  Wet Radii Of Gyration About CG

                                K-X =     9.14 K-Y =    24.73 K-Z =    25.94

                                        GMT =    14.07 GML =   160.56

                                /-- Center of Gravity ---/  Sounding   % Full
                          Name   Weight    ---X---  ---Y---  ---Z---  -------- --------
                                ----------------  Part CF          ------------
                                LOAD_GRO     28.00    69.38    11.22     8.10
                                ----------------  Part GRI&SF-B    ------------
                                LOAD_GRO     75.00    30.86    -1.14     7.35
                                ----------------  Part GRI&SF-C    ------------
                                LOAD_GRO      0.50    67.44    11.22     7.10
                                ----------------  Part GRI&SF-T    ------------
                                LOAD_GRO     45.00    65.20    -2.92     7.40
                                ----------------  Part TP          ------------
                                LOAD_GRO    254.50    65.54    -2.14     9.35
                                ----------------  Part VERVECE     ------------
                                LOAD_GRO   1832.80    47.02     0.00     3.52
                                             --- Contents ---
                            1PC         229.92     5.62    -3.43     3.77     6.02    98.00
                            1PW         117.49     6.50   -10.28     2.53     4.06    50.00
                            1SC         230.42     5.62     3.43     3.77     6.02    98.00
                            1SW         117.49     6.50    10.28     2.53     4.06    50.00
                            2PC          26.21    19.43    -3.43     0.09     0.18     3.00
                            2PW         802.16    19.43   -10.28     2.80     5.60    91.82
                            2SC          26.21    19.43     3.43     0.09     0.18     3.00
                            2SW         824.55    19.43    10.28     2.88     5.75    94.38
                            3PC          26.21    40.00    -3.43     0.09     0.18     3.00
                            3PW         856.16    40.01   -10.28     2.99     5.97    98.00
                            3SC          26.21    40.01     3.43     0.09     0.18     3.00
                            3SW         856.16    40.01    10.28     2.99     5.97    98.00
                            4PC         262.11    60.58    -3.43     0.91     1.83    30.00
                            4PW         856.16    60.58   -10.28     2.99     5.97    98.00
                            4SC         262.11    60.58     3.43     0.91     1.83    30.00
                            4SW         856.16    60.58    10.28     2.99     5.97    98.00
                            5PC         295.21    83.42    -3.43     2.16     3.96    60.00
                            5PW         416.68    79.73   -10.28     1.81     3.44    52.51
                            5SC         290.58    83.42     3.43     2.16     3.96    60.00
                            5SW         438.62    79.79    10.28     1.90     3.60    55.27
                                ========  ========  =======  =======  =======
                                Total     10052.62    46.75     0.00     3.03
                                Buoyancy  10052.62    46.75     0.00     2.21
```




```
                    ********************************************************
*                                       ***  MOSES   ***                                                  *
*                                       ----------------                    1 July, 2025                 *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 0 ---------                                   *
*                                                                                                         *
***********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 0: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
**********************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025          *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                               *
*         ---------     Intact Stability Check    -- PHASE 0 ---------             . *
*                                                                                    *
**********************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 0: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.62, KG = 3.03, and Wind Speed = 10 Knots

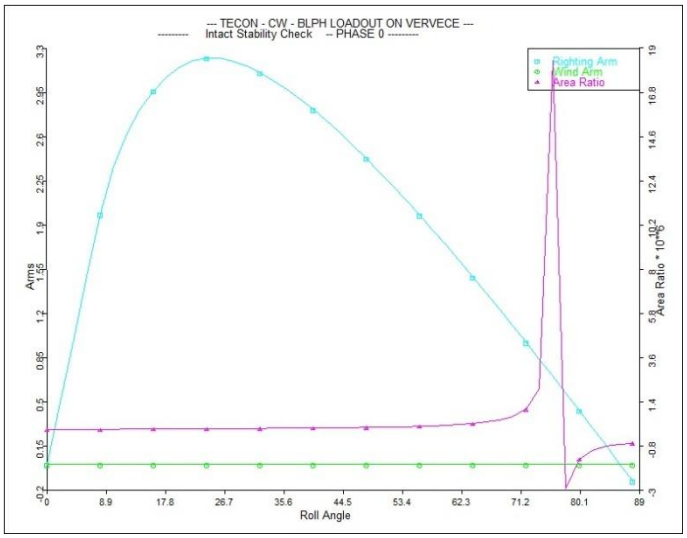
Initial: Roll = -0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	-0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.49	0.49	0.00	0.00	3076.04	0.492
4.29	4.00	0.00	9999.00	1.49	0.99	1.97	0.00	0.00	6329.47	0.989
4.27	6.00	0.00	9999.00	1.03	1.49	4.45	0.00	0.00	9950.45	1.488
4.25	8.00	0.00	9999.00	0.57	1.98	7.92	0.00	0.00	9999.00	1.984
4.26	10.00	0.00	9999.00	0.07	2.36	12.26	0.00	0.00	9999.00	2.358
4.31	12.00	0.00	9999.00	-0.46	2.62	17.24	0.00	0.00	9999.00	2.622
4.39	14.00	0.00	9999.00	-1.04	2.82	22.68	0.00	0.00	9999.00	2.816
4.48	16.00	0.00	9999.00	-1.63	2.96	28.46	0.00	0.00	9999.00	2.961
4.60	18.00	0.00	9999.00	-2.25	3.07	34.49	0.00	0.00	9999.00	3.071
4.72	20.00	0.00	9999.00	-2.88	3.15	40.71	0.00	0.00	9999.00	3.151
4.85	22.00	0.00	9999.00	-3.51	3.20	47.07	0.00	0.00	9999.00	3.202
4.97	24.00	0.00	9999.00	-4.14	3.22	53.49	0.00	0.00	9999.00	3.222
5.09	26.00	0.00	9999.00	-4.77	3.22	59.93	0.00	0.00	9999.00	3.218
5.20	28.00	0.00	9999.00	-5.39	3.19	66.35	0.00	0.00	9999.00	3.195
5.31	30.00	0.00	9999.00	-6.01	3.16	72.70	0.00	0.00	9999.00	3.156
5.41	32.00	0.00	9999.00	-6.62	3.11	78.96	0.00	0.00	9999.00	3.106
5.50	34.00	0.00	9999.00	-7.22	3.04	85.11	0.00	0.00	9999.00	3.045
5.58	36.00	0.00	9999.00	-7.81	2.97	91.13	-0.00	0.00	9999.00	2.975
5.66	38.00	0.00	9999.00	-8.39	2.90	97.00	-0.00	0.00	9999.00	2.897
5.73	40.00	0.00	9999.00	-8.96	2.81	102.71	-0.00	0.00	9999.00	2.814
5.80	42.00	0.00	9999.00	-9.52	2.72	108.25	-0.00	0.00	9999.00	2.724
5.86	44.00	0.00	9999.00	-10.07	2.63	113.60	-0.00	0.00	9999.00	2.629
5.91	46.00	0.00	9999.00	-10.61	2.53	118.76	-0.00	0.00	9999.00	2.530
5.95	48.00	0.00	9999.00	-11.13	2.43	123.72	-0.00	0.00	9999.00	2.426
5.99	50.00	0.00	9999.00	-11.64	2.32	128.46	-0.00	0.00	9999.00	2.318
6.02	52.00	0.00	9999.00	-12.14	2.21	132.99	-0.00	0.00	9999.00	2.208
6.04	54.00	0.00	9999.00	-12.62	2.09	137.29	-0.00	0.00	9999.00	2.094
6.05	56.00	0.00	9999.00	-13.08	1.98	141.36	-0.00	0.00	9999.00	1.977
6.06	58.00	0.00	9999.00	-13.53	1.86	145.19	-0.00	0.00	9999.00	1.858
6.06	60.00	0.00	9999.00	-13.97	1.74	148.79	-0.00	0.00	9999.00	1.736
6.05	62.00	0.00	9999.00	-14.38	1.61	152.14	-0.00	0.00	9999.00	1.613
6.03	64.00	0.00	9999.00	-14.78	1.49	155.24	-0.00	0.00	9999.00	1.487
6.01	66.00	0.00	9999.00	-15.16	1.36	158.08	-0.00	0.00	9999.00	1.360
5.98	68.00	0.00	9999.00	-15.53	1.23	160.67	-0.00	0.00	9999.00	1.231
5.94	70.00	0.00	9999.00	-15.87	1.10	163.00	-0.00	0.00	9999.00	1.101
5.90	72.00	0.00	9999.00	-16.19	0.97	165.07	-0.00	0.00	9999.00	0.969
5.85	74.00	0.00	9999.00	-16.50	0.84	166.88	-0.00	0.00	9999.00	0.836
5.79	76.00	0.00	9999.00	-16.78	0.70	168.41	-0.00	0.00	9999.00	0.701
5.72	78.00	0.00	9999.00	-17.05	0.57	169.68	-0.00	-0.00	-9999.00	0.565
5.65	80.00	0.00	9999.00	-17.29	0.43	170.68	-0.00	-0.00	-9999.00	0.429
5.57	82.00	0.00	9999.00	-17.51	0.29	171.39	-0.00	-0.00	-9999.00	0.291
5.48	84.00	0.00	9999.00	-17.71	0.15	171.84	-0.00	-0.00	-9999.00	0.152
5.39	86.00	0.00	9999.00	-17.89	0.01	172.00	-0.00	-0.00	-9999.00	0.012
5.29	88.00	0.00	9999.00	-18.05	-0.13	171.88	-0.00	-0.00	-9999.00	-0.131

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--- TECON - CW - BLPH LOADOUT ON VERVECE ---
--------- Intact Stability Check -- PHASE 0 ---------
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^-6
Roll Angle
0
8.9
17.8
26.7
35.6
44.5
53.4
62.3
71.2
80.1
89

```
                                    ******************************************************
        *                                       ***  MOSES   ***                                  *
        *                                       ----------------                  1 July, 2025    *
        *          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                    *
        *          ------ Wind Exposed Areas ------                                               *
        *                                                                                         *
        ***********************************************************************************************************

                          +++ L O A D   G R O U P   A T T R I B U T E S   F O R   P A R T   C F +++
                          ========================================================================

                            Process is 0: Units Are Degrees, Meters, and M-Tons Unless Specified

 LOAD              CONT.            /---------- FACTOR ---------/ /----------- AREA ----------/ /--------- LOCATION --------/
  GROUP     WEIGHT    NAME      DISPL     WIND   ADD. MASS    DRAG        X         Y         Z         X         Y         Z
-------- --------- -------- --------- --------- --------- --------- --------- --------- --------- --------- --------- ---------

CF          28.00                                                                            69.38     11.22      8.10
                                              #WEI|010 #Weight


                                    ******************************************************
        *                                       ***  MOSES   ***                                  *
        *                                       ----------------                  1 July, 2025    *
        *          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                    *
        *          ------ Wind Exposed Areas ------                                               *
        *                                                                                         *
        ***********************************************************************************************************

                        +++ L O A D   G R O U P   A T T R I B U T E S   F O R   P A R T   G R I & S F - B +++
                        ====================================================================================

                            Process is 0: Units Are Degrees, Meters, and M-Tons Unless Specified

 LOAD              CONT.            /---------- FACTOR ---------/ /----------- AREA ----------/ /--------- LOCATION --------/
  GROUP     WEIGHT    NAME      DISPL     WIND   ADD. MASS    DRAG        X         Y         Z         X         Y         Z
-------- --------- -------- --------- --------- --------- --------- --------- --------- --------- --------- --------- ---------

GRI&SF-B    75.00                                                                            30.86     -1.14      7.35
                                              #WEI|004 #Weight


                                    ******************************************************
        *                                       ***  MOSES   ***                                  *
        *                                       ----------------                  1 July, 2025    *
        *          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                    *
        *          ------ Wind Exposed Areas ------                                               *
        *                                                                                         *
        ***********************************************************************************************************

                        +++ L O A D   G R O U P   A T T R I B U T E S   F O R   P A R T   G R I & S F - C +++
                        ====================================================================================

                            Process is 0: Units Are Degrees, Meters, and M-Tons Unless Specified

 LOAD              CONT.            /---------- FACTOR ---------/ /----------- AREA ----------/ /--------- LOCATION --------/
  GROUP     WEIGHT    NAME      DISPL     WIND   ADD. MASS    DRAG        X         Y         Z         X         Y         Z
-------- --------- -------- --------- --------- --------- --------- --------- --------- --------- --------- --------- ---------

GRI&SF-C     0.50                                                                            67.44     11.22      7.10
                                              #WEI|008 #Weight


                                    ******************************************************
        *                                       ***  MOSES   ***                                  *
        *                                       ----------------                  1 July, 2025    *
        *          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                    *
        *          ------ Wind Exposed Areas ------                                               *
        *                                                                                         *
        ***********************************************************************************************************

                        +++ L O A D   G R O U P   A T T R I B U T E S   F O R   P A R T   G R I & S F - T +++
                        ====================================================================================

                            Process is 0: Units Are Degrees, Meters, and M-Tons Unless Specified

 LOAD              CONT.            /---------- FACTOR ---------/ /----------- AREA ----------/ /--------- LOCATION --------/
  GROUP     WEIGHT    NAME      DISPL     WIND   ADD. MASS    DRAG        X         Y         Z         X         Y         Z
-------- --------- -------- --------- --------- --------- --------- --------- --------- --------- --------- --------- ---------

GRI&SF-T    45.00                                                                            65.20     -2.92      7.40
                                              #WEI|006 #Weight


                                    ******************************************************
        *                                       ***  MOSES   ***                                  *
```

```
*                                                 ----------------                          1 July, 2025        *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                        *
*          ------ Wind Exposed Areas ------                                                                    *
*                                                                                                             *
***************************************************************************************************************

                    +++ L O A D   G R O U P   A T T R I B U T E S   F O R   P A R T   T P +++
                    ========================================================================

                       Process is 0: Units Are Degrees, Meters, and M-Tons Unless Specified

 LOAD              CONT.            /---------- FACTOR ---------/ /----------- AREA ----------/ /--------- LOCATION --------/
  GROUP     WEIGHT    NAME      DISPL     WIND   ADD. MASS    DRAG        X         Y         Z         X         Y         Z
-------- --------- -------- --------- --------- --------- --------- --------- --------- --------- --------- --------- ---------

TP          254.50                                                                                  65.54     -2.14      9.35
                                                #WEI|012 #Weight


                                 ******************************************************
*                                    ***  MOSES   ***                                                       *
*                                    ----------------                          1 July, 2025        *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                        *
*          ------ Wind Exposed Areas ------                                                                    *
*                                                                                                             *
***************************************************************************************************************

                +++ L O A D   G R O U P   A T T R I B U T E S   F O R   P A R T   V E R V E C E +++
                ================================================================================

                       Process is 0: Units Are Degrees, Meters, and M-Tons Unless Specified

 LOAD              CONT.            /---------- FACTOR ---------/ /----------- AREA ----------/ /--------- LOCATION --------/
  GROUP     WEIGHT    NAME      DISPL     WIND   ADD. MASS    DRAG        X         Y         Z         X         Y         Z
-------- --------- -------- --------- --------- --------- --------- --------- --------- --------- --------- --------- ---------

VERVECE    1832.80                                                                                  47.02      0.00      3.52
                                                #WEI|002 #Weight
```

```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025         *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ------   Longitudinal Strength Analysis - Still Water  -- PHASE 0 ------   *
*                                                                                    *
**************************************************************************************************************
```

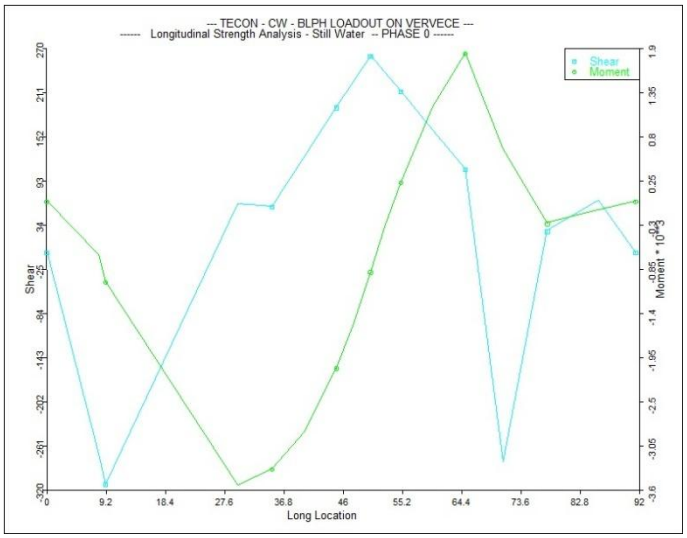
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 0: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-272	-670	-0.0265	2.6311
9.14	-311	-1003	-0.0397	2.9999
29.72	62	-3543	-0.1400	7.2611
35.00	59	-3334	-0.1318	7.3421
40.00	126	-2872	-0.1135	7.0434
45.00	192	-2078	-0.0821	6.4312
47.50	224	-1557	-0.0616	6.0332
50.29	260	-881	-0.0348	5.5393
52.50	238	-330	-0.0131	5.1260
55.00	213	233	0.0092	4.6497
60.00	161	1168	0.0462	3.7303
65.00	109	1843	0.0728	2.9369
70.87	-281	644	0.0254	2.2315
77.72	26	-276	-0.0109	1.5248
85.70	67	-108	-0.0043	0.6514
91.44	-1	0	0.0000	0.0001



```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  -----------------                 1 July, 2025    *
*       --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                 *
*       ---------     Intact Stability Check    -- PHASE 1 ---------                *
*                                                                                    *
**************************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                     Process is 1: Units Are Degrees, Meters, and M-Tons Unless Specified

                                   Results Are Reported In Body System

                         Draft =     4.30 Roll Angle =    -0.00 Pitch Angle =     0.00

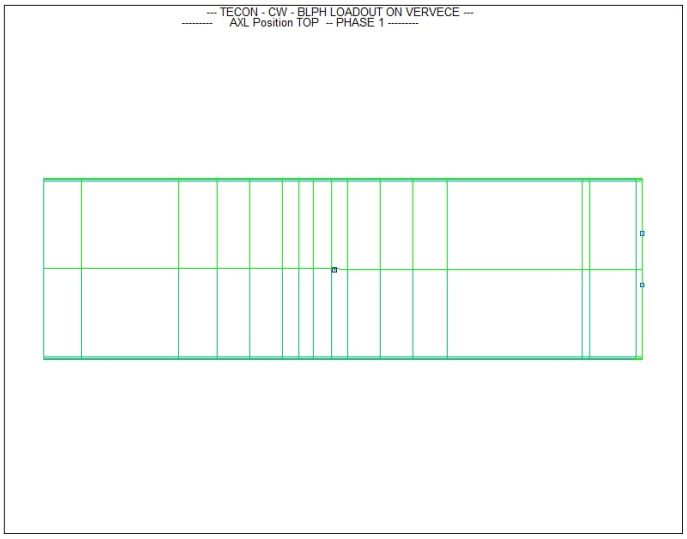
                                    Wet Radii Of Gyration About CG

                                K-X =     9.12 K-Y =    24.89 K-Z =    26.09

                                        GMT =    14.07 GML =   160.55

                                /-- Center of Gravity ---/  Sounding   % Full
                          Name   Weight    ---X---  ---Y---  ---Z---  -------- --------

                                ----------------  Part AXL1       ------------
                                LOAD_GRO     51.10     0.01    -1.12     7.10
                                ----------------  Part CF         ------------
                                LOAD_GRO     28.00    69.38    11.22     8.10
                                ----------------  Part GRI&SF-B   ------------
                                LOAD_GRO     75.00    30.86    -1.14     7.35
                                ----------------  Part GRI&SF-C   ------------
                                LOAD_GRO      0.50    67.44    11.22     7.10
                                ----------------  Part GRI&SF-T   ------------
                                LOAD_GRO     45.00    65.20    -2.92     7.40
                                ----------------  Part TP         ------------
                                LOAD_GRO    254.50    65.54    -2.14     9.35
                                ----------------  Part VERVECE    ------------
                                LOAD_GRO   1832.80    47.02     0.00     3.52
                                             --- Contents ---
                          1PC      229.92     5.62    -3.43     3.77     6.02    98.00
                          1PW      117.49     6.50   -10.28     2.53     4.06    50.00
                          1SC      230.42     5.62     3.43     3.77     6.02    98.00
                          1SW      117.49     6.50    10.28     2.53     4.06    50.00
                          2PC       26.21    19.43    -3.43     0.09     0.18     3.00
                          2PW      767.12    19.43   -10.28     2.68     5.35    87.81
                          2SC       26.21    19.43     3.43     0.09     0.18     3.00
                          2SW      792.25    19.43    10.28     2.77     5.53    90.69
                          3PC       26.21    40.00    -3.43     0.09     0.18     3.00
                          3PW      856.16    40.01   -10.28     2.99     5.97    98.00
                          3SC       26.21    40.01     3.43     0.09     0.18     3.00
                          3SW      856.16    40.01    10.28     2.99     5.97    98.00
                          4PC      262.11    60.58    -3.43     0.91     1.83    30.00
                          4PW      856.16    60.58   -10.28     2.99     5.97    98.00
                          4SC      262.11    60.58     3.43     0.91     1.83    30.00
                          4SW      856.16    60.58    10.28     2.99     5.97    98.00
                          5PC      295.21    83.42    -3.43     2.16     3.96    60.00
                          5PW      423.41    79.75   -10.28     1.84     3.49    53.35
                          5SC      290.58    83.42     3.43     2.16     3.96    60.00
                          5SW      448.14    79.82    10.28     1.94     3.66    56.47
                                ========  ========  =======  =======  =======
                                Total     10052.61    46.75     0.00     3.04
                                Buoyancy  10052.62    46.75     0.00     2.21
```




```
                    ********************************************************
*                                       ***  MOSES   ***                                                  *
*                                       ----------------                    1 July, 2025                 *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 1 ---------                                   *
*                                                                                                         *
***********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 1: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
*********************************************************
*                                  ***  MOSES   ***                                    *
*                                  ----------------                 1 July, 2025      *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                 *
*         ---------     Intact Stability Check    -- PHASE 1 ---------               . *
*                                                                                      *
****************************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 1: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 3.04, and Wind Speed = 10 Knots

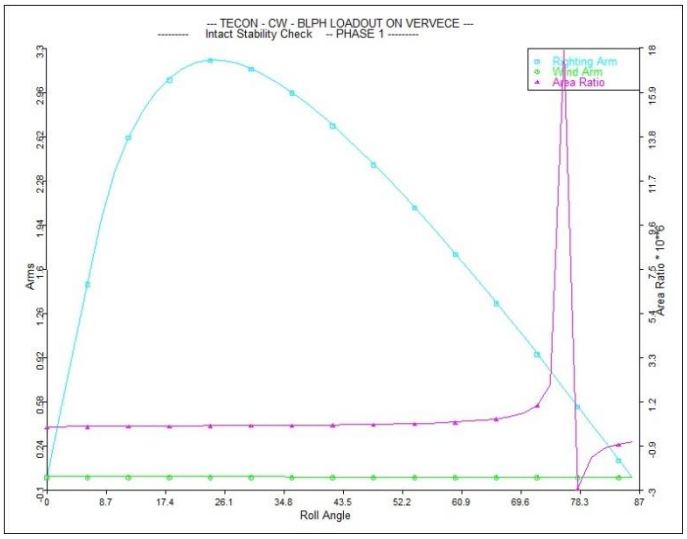
Initial: Roll = -0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	-0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.49	0.49	0.00	0.00	3074.93	0.492
4.29	4.00	0.00	9999.00	1.49	0.99	1.97	0.00	0.00	6327.19	0.988
4.27	6.00	0.00	9999.00	1.03	1.49	4.45	0.00	0.00	9946.86	1.488
4.25	8.00	0.00	9999.00	0.57	1.98	7.92	0.00	0.00	9999.00	1.982
4.26	10.00	0.00	9999.00	0.07	2.36	12.26	0.00	0.00	9999.00	2.356
4.31	12.00	0.00	9999.00	-0.46	2.62	17.23	0.00	0.00	9999.00	2.618
4.39	14.00	0.00	9999.00	-1.04	2.81	22.66	0.00	0.00	9999.00	2.810
4.48	16.00	0.00	9999.00	-1.63	2.95	28.42	0.00	0.00	9999.00	2.954
4.60	18.00	0.00	9999.00	-2.25	3.06	34.44	0.00	0.00	9999.00	3.062
4.72	20.00	0.00	9999.00	-2.88	3.14	40.64	0.00	0.00	9999.00	3.142
4.85	22.00	0.00	9999.00	-3.51	3.19	46.97	0.00	0.00	9999.00	3.192
4.97	24.00	0.00	9999.00	-4.14	3.21	53.38	0.00	0.00	9999.00	3.211
5.09	26.00	0.00	9999.00	-4.77	3.21	59.79	0.00	0.00	9999.00	3.206
5.20	28.00	0.00	9999.00	-5.39	3.18	66.18	0.00	0.00	9999.00	3.182
5.31	30.00	0.00	9999.00	-6.01	3.14	72.51	0.00	0.00	9999.00	3.143
5.41	32.00	0.00	9999.00	-6.62	3.09	78.74	0.00	0.00	9999.00	3.091
5.50	34.00	0.00	9999.00	-7.22	3.03	84.86	0.00	0.00	9999.00	3.030
5.58	36.00	0.00	9999.00	-7.81	2.96	90.85	-0.00	0.00	9999.00	2.960
5.66	38.00	0.00	9999.00	-8.39	2.88	96.69	-0.00	0.00	9999.00	2.882
5.73	40.00	0.00	9999.00	-8.96	2.80	102.37	-0.00	0.00	9999.00	2.798
5.80	42.00	0.00	9999.00	-9.52	2.71	107.88	-0.00	0.00	9999.00	2.708
5.86	44.00	0.00	9999.00	-10.07	2.61	113.20	-0.00	0.00	9999.00	2.613
5.91	46.00	0.00	9999.00	-10.61	2.51	118.32	-0.00	0.00	9999.00	2.513
5.95	48.00	0.00	9999.00	-11.13	2.41	123.25	-0.00	0.00	9999.00	2.409
5.99	50.00	0.00	9999.00	-11.64	2.30	127.96	-0.00	0.00	9999.00	2.301
6.02	52.00	0.00	9999.00	-12.14	2.19	132.45	-0.00	0.00	9999.00	2.190
6.04	54.00	0.00	9999.00	-12.62	2.08	136.71	-0.00	0.00	9999.00	2.076
6.05	56.00	0.00	9999.00	-13.08	1.96	140.75	-0.00	0.00	9999.00	1.959
6.06	58.00	0.00	9999.00	-13.53	1.84	144.55	-0.00	0.00	9999.00	1.839
6.06	60.00	0.00	9999.00	-13.97	1.72	148.10	-0.00	0.00	9999.00	1.718
6.05	62.00	0.00	9999.00	-14.38	1.59	151.42	-0.00	0.00	9999.00	1.594
6.03	64.00	0.00	9999.00	-14.78	1.47	154.48	-0.00	0.00	9999.00	1.468
6.01	66.00	0.00	9999.00	-15.16	1.34	157.29	-0.00	0.00	9999.00	1.340
5.98	68.00	0.00	9999.00	-15.53	1.21	159.84	-0.00	0.00	9999.00	1.211
5.94	70.00	0.00	9999.00	-15.87	1.08	162.13	-0.00	0.00	9999.00	1.080
5.90	72.00	0.00	9999.00	-16.19	0.95	164.16	-0.00	0.00	9999.00	0.948
5.85	74.00	0.00	9999.00	-16.50	0.81	165.92	-0.00	0.00	9999.00	0.814
5.79	76.00	0.00	9999.00	-16.78	0.68	167.41	-0.00	0.00	9999.00	0.679
5.72	78.00	0.00	9999.00	-17.05	0.54	168.63	-0.00	-0.00	-9999.00	0.543
5.65	80.00	0.00	9999.00	-17.29	0.41	169.58	-0.00	-0.00	-9999.00	0.405
5.57	82.00	0.00	9999.00	-17.51	0.27	170.25	-0.00	-0.00	-9999.00	0.268
5.48	84.00	0.00	9999.00	-17.71	0.13	170.65	-0.00	-0.00	-9999.00	0.129
5.39	86.00	0.00	9999.00	-17.89	-0.01	170.77	-0.00	-0.00	-9999.00	-0.010

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--- TECON - CW - BLPH LOADOUT ON VERVECE ---
--------- Intact Stability Check -- PHASE 1 ---------
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^-6
Roll Angle
0
8.7
17.4
26.1
34.8
43.5
52.2
60.9
69.6
78.3
87

```
*********************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025         *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ------   Longitudinal Strength Analysis - Still Water  -- PHASE 1 ------   *
*                                                                                    *
**************************************************************************************************************
```

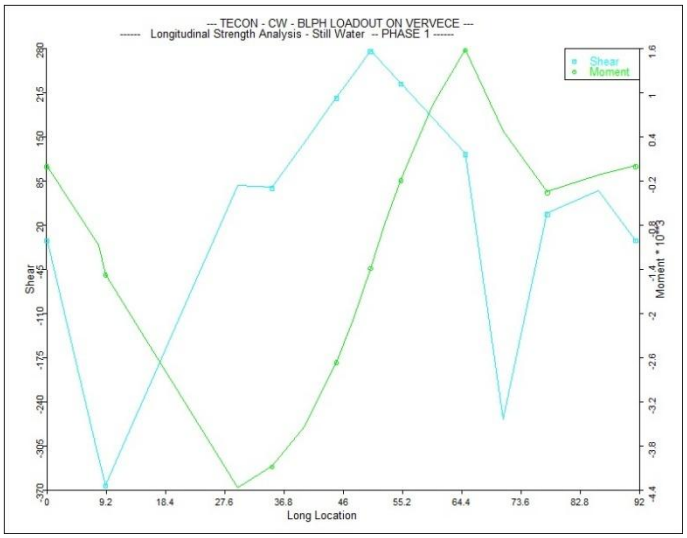
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 1: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-323	-1079	-0.0427	3.4801
9.14	-362	-1470	-0.0581	3.9636
29.72	79	-4371	-0.1727	9.6085
35.00	75	-4077	-0.1611	9.7985
40.00	142	-3534	-0.1397	9.5187
45.00	208	-2659	-0.1051	8.8523
47.50	240	-2099	-0.0830	8.4028
50.29	277	-1377	-0.0545	7.8334
52.50	254	-791	-0.0313	7.3484
55.00	229	-187	-0.0074	6.7791
60.00	177	828	0.0327	5.6396
65.00	125	1583	0.0626	4.5889
70.87	-265	478	0.0189	3.5457
77.72	37	-349	-0.0138	2.4130
85.70	71	-121	-0.0048	1.0250
91.44	-1	0	0.0000	0.0001



```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                          1 July, 2025          *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                               *
*         ---------     Intact Stability Check    -- PHASE 2 ---------                              *
*                                                                                                    *
******************************************************************************************************************

                +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                ======================================================================

                 Process is 2: Units Are Degrees, Meters, and M-Tons Unless Specified

                              Results Are Reported In Body System

                     Draft =     4.30 Roll Angle =    -0.00 Pitch Angle =     0.00

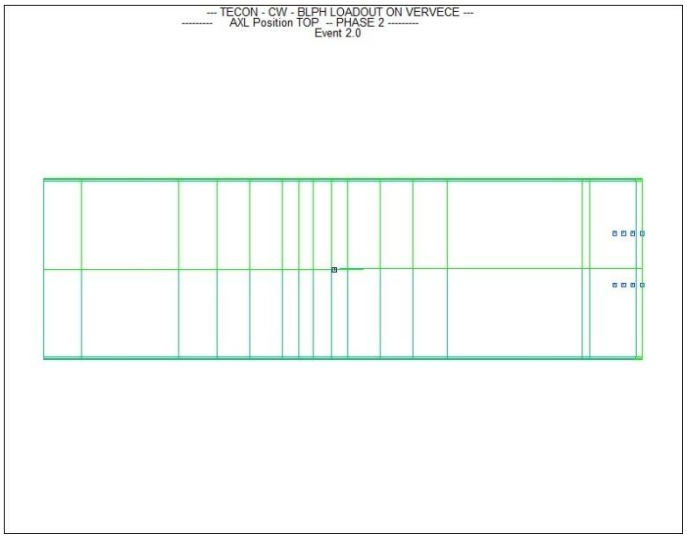
                                 Wet Radii Of Gyration About CG

                           K-X =     9.06 K-Y =    25.29 K-Z =    26.44

                                    GMT =    14.04 GML =   160.51

                           /-- Center of Gravity ---/  Sounding   % Full
                    Name    Weight    ---X---  ---Y---  ---Z---  -------- --------

                           ----------------  Part AXL2       ------------
                           LOAD_GRO    204.40     2.11    -1.12     7.10
                           ----------------  Part CF         ------------
                           LOAD_GRO     28.00    69.38    11.22     8.10
                           ----------------  Part GRI&SF-B   ------------
                           LOAD_GRO     75.00    30.86    -1.14     7.35
                           ----------------  Part GRI&SF-C   ------------
                           LOAD_GRO      0.50    67.44    11.22     7.10
                           ----------------  Part GRI&SF-T   ------------
                           LOAD_GRO     45.00    65.20    -2.92     7.40
                           ----------------  Part TP         ------------
                           LOAD_GRO    254.50    65.54    -2.14     9.35
                           ----------------  Part VERVECE    ------------
                           LOAD_GRO   1832.80    47.02     0.00     3.52
                                        --- Contents ---
                      1PC      229.92     5.62    -3.43     3.77     6.02    98.00
                      1PW      117.49     6.50   -10.28     2.53     4.06    50.00
                      1SC      230.42     5.62     3.43     3.77     6.02    98.00
                      1SW      117.49     6.50    10.28     2.53     4.06    50.00
                      2PC       26.21    19.43    -3.43     0.09     0.18     3.00
                      2PW      665.41    19.43   -10.28     2.33     4.64    76.17
                      2SC       26.21    19.43     3.43     0.09     0.18     3.00
                      2SW      698.81    19.43    10.28     2.44     4.88    79.99
                      3PC       26.21    40.00    -3.43     0.09     0.18     3.00
                      3PW      856.16    40.01   -10.28     2.99     5.97    98.00
                      3SC       26.21    40.01     3.43     0.09     0.18     3.00
                      3SW      856.16    40.01    10.28     2.99     5.97    98.00
                      4PC      262.11    60.58    -3.43     0.91     1.83    30.00
                      4PW      856.16    60.58   -10.28     2.99     5.97    98.00
                      4SC      262.11    60.58     3.43     0.91     1.83    30.00
                      4SW      856.16    60.58    10.28     2.99     5.97    98.00
                      5PC      295.21    83.42    -3.43     2.16     3.96    60.00
                      5PW      440.15    79.80   -10.28     1.90     3.61    55.46
                      5SC      290.58    83.42     3.43     2.16     3.96    60.00
                      5SW      473.25    79.89    10.28     2.03     3.84    59.64
                           ========  ========  =======  =======  =======
                           Total     10052.61    46.76     0.00     3.06
                           Buoyancy  10052.62    46.76     0.00     2.21
```




```
                    ********************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                    1 July, 2025                 *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                               *
*          ---------     Intact Stability Check    -- PHASE 2 ---------                              *
*                                                                                                     *
*******************************************************************************************************

                          +++ D R A F T   M A R K   R E A D I N G S +++
                          ============================================

                Process is 2: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
*********************************************************
*                                  ***  MOSES   ***                                    *
*                                  -----------------          1 July, 2025          *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*         ---------     Intact Stability Check    -- PHASE 2 ---------              . *
*                                                                                     *
***************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 2: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 3.06, and Wind Speed = 10 Knots

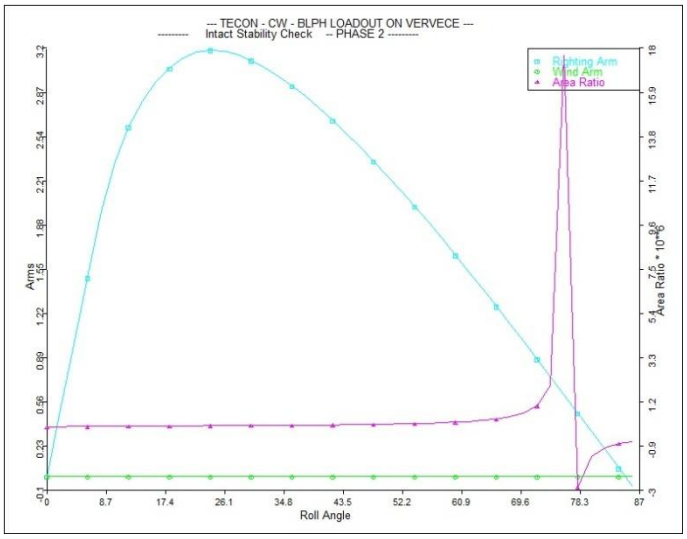
Initial: Roll = -0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.39	0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.49	0.49	0.00	0.00	3069.38	0.491
4.29	4.00	0.00	9999.00	1.48	0.99	1.97	0.00	0.00	6315.79	0.986
4.27	6.00	0.00	9999.00	1.03	1.49	4.44	0.00	0.00	9929.01	1.485
4.25	8.00	0.00	9999.00	0.57	1.98	7.90	0.00	0.00	9999.00	1.979
4.26	10.00	0.00	9999.00	0.07	2.35	12.23	0.00	0.00	9999.00	2.351
4.31	12.00	0.00	9999.00	-0.47	2.61	17.20	0.00	0.00	9999.00	2.612
4.39	14.00	0.00	9999.00	-1.04	2.80	22.61	0.00	0.00	9999.00	2.802
4.48	16.00	0.00	9999.00	-1.63	2.94	28.36	0.00	0.00	9999.00	2.943
4.60	18.00	0.00	9999.00	-2.25	3.05	34.35	0.00	0.00	9999.00	3.049
4.72	20.00	0.00	9999.00	-2.88	3.13	40.52	0.00	0.00	9999.00	3.125
4.85	22.00	0.00	9999.00	-3.51	3.17	46.82	0.00	0.00	9999.00	3.171
4.97	24.00	0.00	9999.00	-4.15	3.19	53.18	0.00	0.00	9999.00	3.187
5.09	26.00	0.00	9999.00	-4.77	3.18	59.54	0.00	0.00	9999.00	3.179
5.20	28.00	0.00	9999.00	-5.40	3.15	65.87	0.00	0.00	9999.00	3.151
5.31	30.00	0.00	9999.00	-6.01	3.11	72.13	0.00	0.00	9999.00	3.109
5.41	32.00	0.00	9999.00	-6.62	3.06	78.30	0.00	0.00	9999.00	3.055
5.50	34.00	0.00	9999.00	-7.22	2.99	84.35	0.00	0.00	9999.00	2.991
5.58	36.00	0.00	9999.00	-7.81	2.92	90.25	-0.00	0.00	9999.00	2.918
5.66	38.00	0.00	9999.00	-8.39	2.84	96.01	-0.00	0.00	9999.00	2.839
5.73	40.00	0.00	9999.00	-8.96	2.75	101.60	-0.00	0.00	9999.00	2.753
5.80	42.00	0.00	9999.00	-9.52	2.66	107.02	-0.00	0.00	9999.00	2.662
5.86	44.00	0.00	9999.00	-10.07	2.56	112.24	-0.00	0.00	9999.00	2.565
5.91	46.00	0.00	9999.00	-10.61	2.46	117.27	-0.00	0.00	9999.00	2.464
5.95	48.00	0.00	9999.00	-11.13	2.36	122.09	-0.00	0.00	9999.00	2.358
5.99	50.00	0.00	9999.00	-11.64	2.25	126.70	-0.00	0.00	9999.00	2.248
6.01	52.00	0.00	9999.00	-12.14	2.14	131.08	-0.00	0.00	9999.00	2.135
6.04	54.00	0.00	9999.00	-12.62	2.02	135.24	-0.00	0.00	9999.00	2.019
6.05	56.00	0.00	9999.00	-13.09	1.90	139.16	-0.00	0.00	9999.00	1.900
6.06	58.00	0.00	9999.00	-13.53	1.78	142.84	-0.00	0.00	9999.00	1.779
6.06	60.00	0.00	9999.00	-13.97	1.66	146.27	-0.00	0.00	9999.00	1.655
6.05	62.00	0.00	9999.00	-14.38	1.53	149.46	-0.00	0.00	9999.00	1.529
6.03	64.00	0.00	9999.00	-14.78	1.40	152.39	-0.00	0.00	9999.00	1.402
6.01	66.00	0.00	9999.00	-15.16	1.27	155.06	-0.00	0.00	9999.00	1.273
5.98	68.00	0.00	9999.00	-15.53	1.14	157.48	-0.00	0.00	9999.00	1.142
5.94	70.00	0.00	9999.00	-15.87	1.01	159.63	-0.00	0.00	9999.00	1.010
5.90	72.00	0.00	9999.00	-16.19	0.88	161.51	-0.00	0.00	9999.00	0.877
5.85	74.00	0.00	9999.00	-16.50	0.74	163.13	-0.00	0.00	9999.00	0.743
5.79	76.00	0.00	9999.00	-16.78	0.61	164.49	-0.00	0.00	9999.00	0.608
5.72	78.00	0.00	9999.00	-17.05	0.47	165.57	-0.00	-0.00	-9999.00	0.473
5.65	80.00	0.00	9999.00	-17.29	0.34	166.38	-0.00	-0.00	-9999.00	0.337
5.57	82.00	0.00	9999.00	-17.51	0.20	166.91	-0.00	-0.00	-9999.00	0.200
5.48	84.00	0.00	9999.00	-17.71	0.06	167.18	-0.00	-0.00	-9999.00	0.063
5.39	86.00	0.00	9999.00	-17.89	-0.08	167.16	-0.00	-0.00	-9999.00	-0.076

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--- TECON - CW - BLPH LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 2
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^-6
Roll Angle
0
8.7
17.4
26.1
34.8
43.5
52.2
60.9
69.6
78.3
87

```
*******************************************************
*                                *** MOSES ***                                *
*                                ----------------          1 July, 2025       *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                          *
*        ------  Longitudinal Strength Analysis - Still Water  -- PHASE 2 ------*
*                                                                              *
********************************************************************************************************************
```

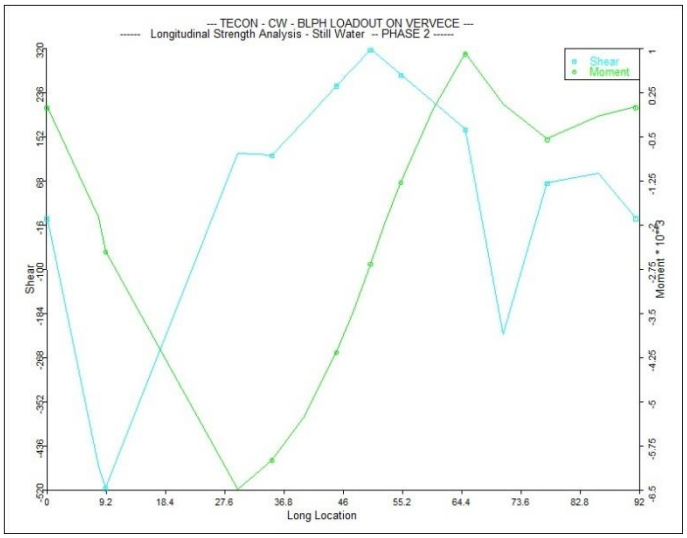
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 2: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-476	-1876	-0.0742	5.5694
9.14	-516	-2442	-0.0965	6.3410
29.72	120	-6496	-0.2567	15.5395
35.00	116	-5984	-0.2365	16.0183
40.00	183	-5235	-0.2069	15.7953
45.00	249	-4154	-0.1642	14.9983
47.50	282	-3490	-0.1380	14.4202
50.29	318	-2653	-0.1049	13.6620
52.50	296	-1976	-0.0781	12.9965
55.00	270	-1269	-0.0502	12.1921
60.00	219	-47	-0.0019	10.4958
65.00	166	915	0.0362	8.7920
70.87	-223	53	0.0021	6.8902
77.72	64	-538	-0.0213	4.6737
85.70	82	-154	-0.0061	1.9761
91.44	-1	0	0.0000	0.0001



```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                          1 July, 2025          *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                               *
*         ---------     Intact Stability Check    -- PHASE 3 ---------                              *
*                                                                                                    *
******************************************************************************************************

                +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                ======================================================================

                 Process is 3: Units Are Degrees, Meters, and M-Tons Unless Specified

                              Results Are Reported In Body System

                     Draft =     4.30 Roll Angle =    -0.00 Pitch Angle =     0.00

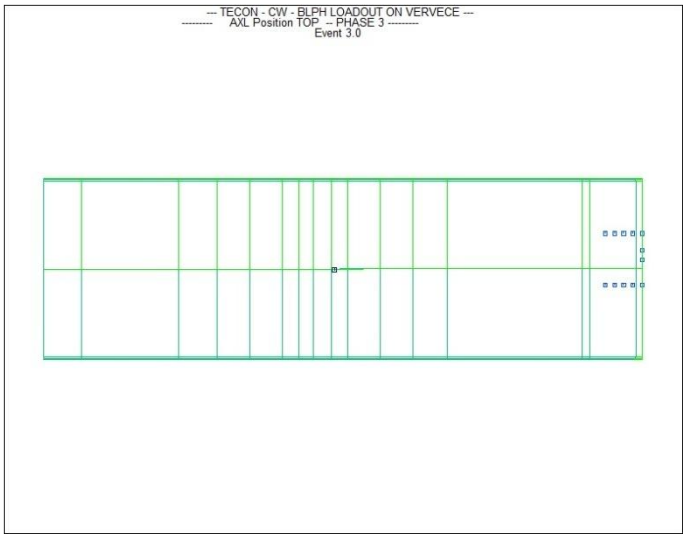
                                 Wet Radii Of Gyration About CG

                           K-X =     9.03 K-Y =    25.48 K-Z =    26.60

                                    GMT =    14.02 GML =   160.53

                           /-- Center of Gravity ---/  Sounding   % Full
                    Name    Weight    ---X---  ---Y---  ---Z---  -------- --------

                           ----------------  Part AXL3       ------------
                           LOAD_GRO    281.05     2.56    -1.21     7.10
                           ----------------  Part CF         ------------
                           LOAD_GRO     28.00    69.38    11.22     8.10
                           ----------------  Part GRI&SF-B   ------------
                           LOAD_GRO     75.00    30.86    -1.14     7.35
                           ----------------  Part GRI&SF-C   ------------
                           LOAD_GRO      0.50    67.44    11.22     7.10
                           ----------------  Part GRI&SF-T   ------------
                           LOAD_GRO     45.00    65.20    -2.92     7.40
                           ----------------  Part TP         ------------
                           LOAD_GRO    254.50    65.54    -2.14     9.35
                           ----------------  Part VERVECE    ------------
                           LOAD_GRO   1832.80    47.02     0.00     3.52
                                        --- Contents ---
                      1PC      229.92     5.62    -3.43     3.77     6.02    98.00
                      1PW      117.49     6.50   -10.28     2.53     4.06    50.00
                      1SC      230.42     5.62     3.43     3.77     6.02    98.00
                      1SW      117.49     6.50    10.28     2.53     4.06    50.00
                      2PC       26.21    19.43    -3.43     0.09     0.18     3.00
                      2PW      614.89    19.43   -10.28     2.15     4.29    70.38
                      2SC       26.21    19.43     3.43     0.09     0.18     3.00
                      2SW      653.71    19.43    10.28     2.28     4.56    74.83
                      3PC       26.21    40.00    -3.43     0.09     0.18     3.00
                      3PW      856.16    40.01   -10.28     2.99     5.97    98.00
                      3SC       26.21    40.01     3.43     0.09     0.18     3.00
                      3SW      856.16    40.01    10.28     2.99     5.97    98.00
                      4PC      262.11    60.58    -3.43     0.91     1.83    30.00
                      4PW      856.16    60.58   -10.28     2.99     5.97    98.00
                      4SC      262.11    60.58     3.43     0.91     1.83    30.00
                      4SW      856.16    60.58    10.28     2.99     5.97    98.00
                      5PC      295.21    83.42    -3.43     2.16     3.96    60.00
                      5PW      446.91    79.82   -10.28     1.93     3.66    56.32
                      5SC      290.58    83.42     3.43     2.16     3.96    60.00
                      5SW      485.46    79.92    10.28     2.08     3.93    61.17
                           ========  ========  =======  =======  =======
                           Total     10052.61    46.75     0.00     3.08
                           Buoyancy  10052.62    46.75     0.00     2.21
```




```
                    ********************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                    1 July, 2025                 *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                               *
*          ---------     Intact Stability Check    -- PHASE 3 ---------                              *
*                                                                                                     *
*******************************************************************************************************

                          +++ D R A F T   M A R K   R E A D I N G S +++
                          ============================================

                Process is 3: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
*********************************************************
*                                  ***  MOSES   ***                                    *
*                                  -----------------                  1 July, 2025    *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                  *
*        ---------     Intact Stability Check    -- PHASE 3 ---------                 . *
*                                                                                      *
****************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 3: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 3.08, and Wind Speed = 10 Knots

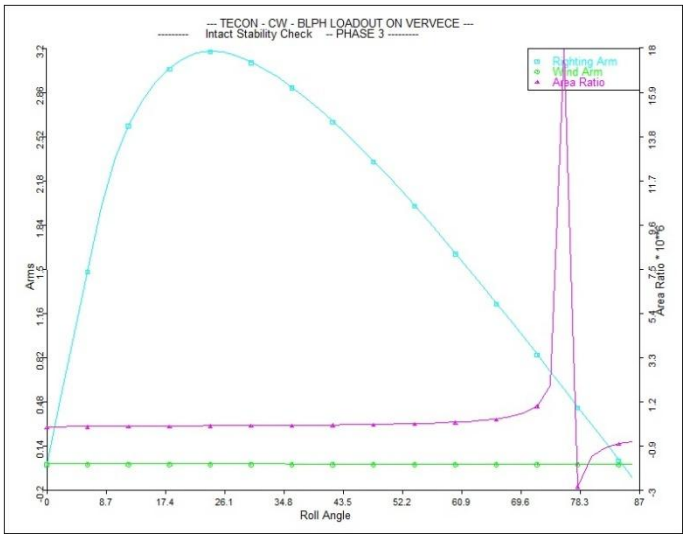
Initial: Roll = -0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.49	0.49	0.00	0.00	3065.60	0.490
4.29	4.00	0.00	9999.00	1.49	0.99	1.97	0.00	0.00	6308.02	0.985
4.27	6.00	0.00	9999.00	1.03	1.48	4.43	0.00	0.00	9916.80	1.483
4.25	8.00	0.00	9999.00	0.57	1.98	7.89	0.00	0.00	9999.00	1.976
4.26	10.00	0.00	9999.00	0.07	2.35	12.22	0.00	0.00	9999.00	2.348
4.31	12.00	0.00	9999.00	-0.46	2.61	17.18	0.00	0.00	9999.00	2.609
4.39	14.00	0.00	9999.00	-1.04	2.80	22.58	0.00	0.00	9999.00	2.798
4.48	16.00	0.00	9999.00	-1.63	2.94	28.32	0.00	0.00	9999.00	2.939
4.60	18.00	0.00	9999.00	-2.25	3.04	34.30	0.00	0.00	9999.00	3.043
4.72	20.00	0.00	9999.00	-2.88	3.12	40.46	0.00	0.00	9999.00	3.119
4.85	22.00	0.00	9999.00	-3.51	3.16	46.75	0.00	0.00	9999.00	3.164
4.97	24.00	0.00	9999.00	-4.14	3.18	53.09	0.00	0.00	9999.00	3.179
5.09	26.00	0.00	9999.00	-4.77	3.17	59.44	0.00	0.00	9999.00	3.169
5.20	28.00	0.00	9999.00	-5.39	3.14	65.75	0.00	0.00	9999.00	3.140
5.31	30.00	0.00	9999.00	-6.01	3.10	71.98	0.00	0.00	9999.00	3.096
5.41	32.00	0.00	9999.00	-6.62	3.04	78.12	0.00	0.00	9999.00	3.040
5.50	34.00	0.00	9999.00	-7.22	2.97	84.13	0.00	0.00	9999.00	2.974
5.58	36.00	0.00	9999.00	-7.81	2.90	90.00	-0.00	0.00	9999.00	2.900
5.66	38.00	0.00	9999.00	-8.39	2.82	95.72	-0.00	0.00	9999.00	2.819
5.73	40.00	0.00	9999.00	-8.96	2.73	101.27	-0.00	0.00	9999.00	2.732
5.80	42.00	0.00	9999.00	-9.52	2.64	106.64	-0.00	0.00	9999.00	2.639
5.86	44.00	0.00	9999.00	-10.07	2.54	111.82	-0.00	0.00	9999.00	2.541
5.91	46.00	0.00	9999.00	-10.61	2.44	116.80	-0.00	0.00	9999.00	2.439
5.95	48.00	0.00	9999.00	-11.13	2.33	121.57	-0.00	0.00	9999.00	2.332
5.99	50.00	0.00	9999.00	-11.64	2.22	126.13	-0.00	0.00	9999.00	2.221
6.02	52.00	0.00	9999.00	-12.14	2.11	130.45	-0.00	0.00	9999.00	2.107
6.04	54.00	0.00	9999.00	-12.62	1.99	134.55	-0.00	0.00	9999.00	1.989
6.05	56.00	0.00	9999.00	-13.08	1.87	138.41	-0.00	0.00	9999.00	1.869
6.06	58.00	0.00	9999.00	-13.53	1.75	142.02	-0.00	0.00	9999.00	1.746
6.06	60.00	0.00	9999.00	-13.97	1.62	145.39	-0.00	0.00	9999.00	1.622
6.05	62.00	0.00	9999.00	-14.38	1.50	148.51	-0.00	0.00	9999.00	1.495
6.03	64.00	0.00	9999.00	-14.78	1.37	151.37	-0.00	0.00	9999.00	1.367
6.01	66.00	0.00	9999.00	-15.16	1.24	153.98	-0.00	0.00	9999.00	1.238
5.98	68.00	0.00	9999.00	-15.53	1.11	156.32	-0.00	0.00	9999.00	1.107
5.94	70.00	0.00	9999.00	-15.87	0.98	158.40	-0.00	0.00	9999.00	0.976
5.90	72.00	0.00	9999.00	-16.19	0.84	160.22	-0.00	0.00	9999.00	0.843
5.85	74.00	0.00	9999.00	-16.50	0.71	161.77	-0.00	0.00	9999.00	0.709
5.79	76.00	0.00	9999.00	-16.78	0.57	163.06	-0.00	0.00	9999.00	0.574
5.72	78.00	0.00	9999.00	-17.05	0.44	164.07	-0.00	-0.00	-9999.00	0.439
5.65	80.00	0.00	9999.00	-17.29	0.30	164.81	-0.00	-0.00	-9999.00	0.303
5.57	82.00	0.00	9999.00	-17.51	0.17	165.28	-0.00	-0.00	-9999.00	0.167
5.48	84.00	0.00	9999.00	-17.71	0.03	165.48	-0.00	-0.00	-9999.00	0.030
5.39	86.00	0.00	9999.00	-17.89	-0.11	165.40	-0.00	-0.00	-9999.00	-0.108

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                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                    1 July, 2025                 *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                               *
*          ------   Longitudinal Strength Analysis - Still Water  -- PHASE 3 ------                  *
*                                                                                                     *
*******************************************************************************************************

                  +++ L O N G I T U D I N A L   S T R E N G T H   R E S U L T S +++
                  ================================================================

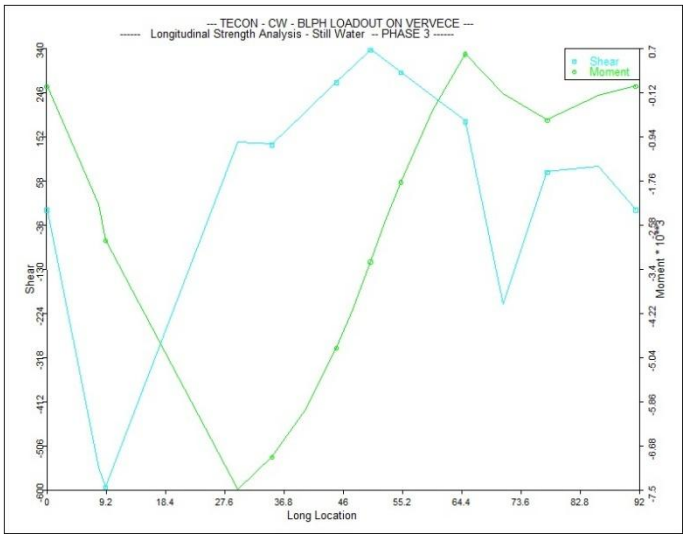
              Process is 3: Units Are Degrees, Meters, and M-Tons Unless Specified

                                Allowable Stress =     155.00 Mpa

                              Allowable Deflection =       1.00 MM

      Longitudinal       Shear          Bending         B. Stress/     Deflection/
        Location         Force           Moment         Allowable      Allowable
     --------------  --------------  --------------  --------------  --------------

           0.00            -1              0          0.0000          0.0000
           8.00          -553          -2201          -0.0870          6.5372
           9.14          -592          -2855          -0.1129          7.4427
          29.72           139          -7496          -0.2962         18.3093
          35.00           136          -6881          -0.2720         18.9251
          40.00           203          -6034          -0.2385         18.7298
          45.00           269          -4856          -0.1919         17.8722
          47.50           301          -4144          -0.1638         17.2342
          50.29           337          -3252          -0.1285         16.3879
          52.50           315          -2532          -0.1001         15.6381
          55.00           290          -1776          -0.0702         14.7239
          60.00           238           -456          -0.0181         12.7673
          65.00           186            602           0.0238         10.7578
          70.87          -204           -145          -0.0058          8.4545
          77.72            77           -626          -0.0248          5.7311
          85.70            88           -169          -0.0067          2.4210
          91.44            -1              0          0.0000          0.0001
```


--- TECON - CW - BLPH LOADOUT ON VERVECE ---
------ Longitudinal Strength Analysis - Still Water -- PHASE 3 ------
Shear
Moment
Shear
Moment * 10^3
Long Location
0
9.2
18.4
27.6
36.8
46
55.2
64.4
73.6
82.8
92

```
*                                                                                                                      *
*                                        ***  MOSES   ***                                                          *
*                                        ----------------                                  1 July, 2025         *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                             *
*          ---------     Intact Stability Check    -- PHASE 4 ---------                                            *
*                                                                                                                      *
**********************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                     Process is 4: Units Are Degrees, Meters, and M-Tons Unless Specified

                                   Results Are Reported In Body System

                        Draft =     4.30 Roll Angle =    -0.00 Pitch Angle =     0.00

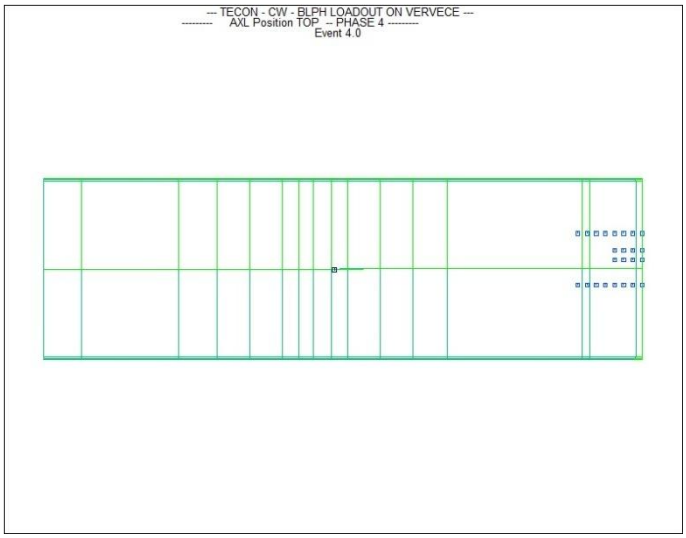
                                     Wet Radii Of Gyration About CG

                                K-X =     8.93 K-Y =    25.92 K-Z =    26.98

                                        GMT =    13.95 GML =   160.50

                                /-- Center of Gravity ---/  Sounding   % Full
                          Name   Weight    ---X---  ---Y---  ---Z---  -------- --------

                                ----------------  Part AXL4        ------------
                                LOAD_GRO    511.00     4.35    -1.32     7.10
                                ----------------  Part CF          ------------
                                LOAD_GRO     28.00    69.38    11.22     8.10
                                ----------------  Part GRI&SF-B    ------------
                                LOAD_GRO     75.00    30.86    -1.14     7.35
                                ----------------  Part GRI&SF-C    ------------
                                LOAD_GRO      0.50    67.44    11.22     7.10
                                ----------------  Part GRI&SF-T    ------------
                                LOAD_GRO     45.00    65.20    -2.92     7.40
                                ----------------  Part TP          ------------
                                LOAD_GRO    254.50    65.54    -2.14     9.35
                                ----------------  Part VERVECE     ------------
                                LOAD_GRO   1832.80    47.02     0.00     3.52
                                             --- Contents ---
                          1PC      229.92     5.62    -3.43     3.77     6.02    98.00
                          1PW      117.49     6.50   -10.28     2.53     4.06    50.00
                          1SC      230.42     5.62     3.43     3.77     6.02    98.00
                          1SW      117.49     6.50    10.28     2.53     4.06    50.00
                          2PC       26.21    19.43    -3.43     0.09     0.18     3.00
                          2PW      467.52    19.43   -10.28     1.64     3.27    53.51
                          2SC       26.21    19.43     3.43     0.09     0.18     3.00
                          2SW      522.52    19.43    10.28     1.83     3.65    59.81
                          3PC       26.21    40.00    -3.43     0.09     0.18     3.00
                          3PW      856.16    40.01   -10.28     2.99     5.97    98.00
                          3SC       26.21    40.01     3.43     0.09     0.18     3.00
                          3SW      856.16    40.01    10.28     2.99     5.97    98.00
                          4PC      262.11    60.58    -3.43     0.91     1.83    30.00
                          4PW      856.16    60.58   -10.28     2.99     5.97    98.00
                          4SC      262.11    60.58     3.43     0.91     1.83    30.00
                          4SW      856.16    60.58    10.28     2.99     5.97    98.00
                          5PC      295.21    83.42    -3.43     2.16     3.96    60.00
                          5PW      463.00    79.86   -10.28     1.99     3.77    58.34
                          5SC      290.58    83.42     3.43     2.16     3.96    60.00
                          5SW      517.98    80.00    10.28     2.20     4.16    65.27
                                ========  ========  =======  =======  =======
                                Total     10052.61    46.76     0.00     3.15
                                Buoyancy  10052.62    46.76     0.00     2.21
```




```
                    ********************************************************
*                                       ***  MOSES   ***                                                  *
*                                       ----------------                    1 July, 2025                 *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 4 ---------                                   *
*                                                                                                         *
***********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                    Process is 4: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
*********************************************************
*                                  ***  MOSES   ***                                    *
*                                  ----------------                 1 July, 2025      *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                 *
*         ---------     Intact Stability Check    -- PHASE 4 ---------               . *
*                                                                                      *
****************************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 4: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 3.15, and Wind Speed = 10 Knots

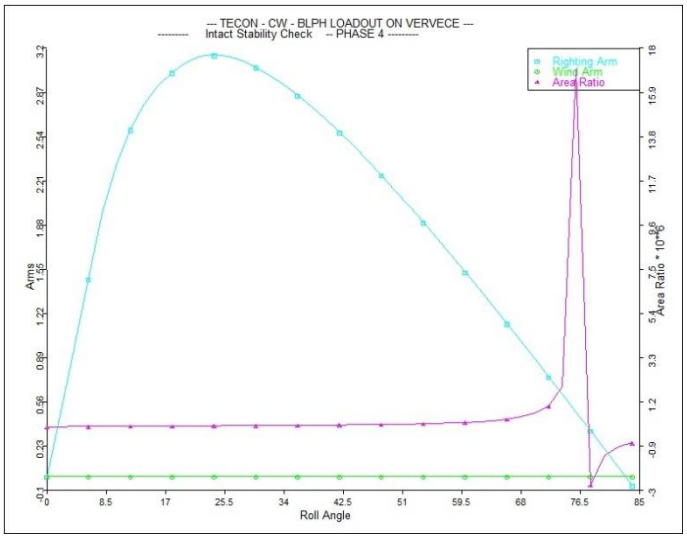
Initial: Roll = -0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.39	0.00	0.00	0.00	0.00	0.00	-0.000
4.29	2.00	0.00	9999.00	1.94	0.49	0.49	0.00	0.00	3049.69	0.488
4.29	4.00	0.00	9999.00	1.48	0.98	1.96	0.00	0.00	6275.34	0.980
4.27	6.00	0.00	9999.00	1.03	1.48	4.41	0.00	0.00	9865.57	1.476
4.25	8.00	0.00	9999.00	0.57	1.97	7.85	0.00	0.00	9999.00	1.966
4.26	10.00	0.00	9999.00	0.07	2.34	12.16	0.00	0.00	9999.00	2.335
4.31	12.00	0.00	9999.00	-0.47	2.59	17.08	0.00	0.00	9999.00	2.593
4.39	14.00	0.00	9999.00	-1.04	2.78	22.46	0.00	0.00	9999.00	2.780
4.48	16.00	0.00	9999.00	-1.63	2.92	28.16	0.00	0.00	9999.00	2.918
4.60	18.00	0.00	9999.00	-2.25	3.02	34.10	0.00	0.00	9999.00	3.021
4.72	20.00	0.00	9999.00	-2.88	3.09	40.21	0.00	0.00	9999.00	3.094
4.85	22.00	0.00	9999.00	-3.51	3.14	46.44	0.00	0.00	9999.00	3.137
4.97	24.00	0.00	9999.00	-4.15	3.15	52.73	0.00	0.00	9999.00	3.149
5.09	26.00	0.00	9999.00	-4.77	3.14	59.01	0.00	0.00	9999.00	3.136
5.20	28.00	0.00	9999.00	-5.40	3.10	65.25	0.00	0.00	9999.00	3.105
5.31	30.00	0.00	9999.00	-6.01	3.06	71.42	0.00	0.00	9999.00	3.057
5.41	32.00	0.00	9999.00	-6.62	3.00	77.47	0.00	0.00	9999.00	2.998
5.50	34.00	0.00	9999.00	-7.22	2.93	83.40	0.00	0.00	9999.00	2.928
5.58	36.00	0.00	9999.00	-7.81	2.85	89.17	-0.00	0.00	9999.00	2.849
5.66	38.00	0.00	9999.00	-8.39	2.76	94.79	-0.00	0.00	9999.00	2.764
5.73	40.00	0.00	9999.00	-8.96	2.67	100.22	-0.00	0.00	9999.00	2.672
5.80	42.00	0.00	9999.00	-9.52	2.57	105.47	-0.00	0.00	9999.00	2.574
5.86	44.00	0.00	9999.00	-10.07	2.47	110.51	-0.00	0.00	9999.00	2.471
5.91	46.00	0.00	9999.00	-10.61	2.36	115.35	-0.00	0.00	9999.00	2.364
5.95	48.00	0.00	9999.00	-11.13	2.25	119.97	-0.00	0.00	9999.00	2.253
5.99	50.00	0.00	9999.00	-11.64	2.14	124.36	-0.00	0.00	9999.00	2.139
6.01	52.00	0.00	9999.00	-12.14	2.02	128.52	-0.00	0.00	9999.00	2.021
6.04	54.00	0.00	9999.00	-12.62	1.90	132.44	-0.00	0.00	9999.00	1.902
6.05	56.00	0.00	9999.00	-13.09	1.78	136.12	-0.00	0.00	9999.00	1.779
6.06	58.00	0.00	9999.00	-13.54	1.65	139.56	-0.00	0.00	9999.00	1.655
6.06	60.00	0.00	9999.00	-13.97	1.53	142.74	-0.00	0.00	9999.00	1.529
6.05	62.00	0.00	9999.00	-14.38	1.40	145.67	-0.00	0.00	9999.00	1.402
6.03	64.00	0.00	9999.00	-14.78	1.27	148.34	-0.00	0.00	9999.00	1.273
6.01	66.00	0.00	9999.00	-15.16	1.14	150.76	-0.00	0.00	9999.00	1.143
5.98	68.00	0.00	9999.00	-15.53	1.01	152.92	-0.00	0.00	9999.00	1.012
5.94	70.00	0.00	9999.00	-15.87	0.88	154.81	-0.00	0.00	9999.00	0.880
5.90	72.00	0.00	9999.00	-16.19	0.75	156.43	-0.00	0.00	9999.00	0.746
5.85	74.00	0.00	9999.00	-16.50	0.61	157.79	-0.00	0.00	9999.00	0.612
5.79	76.00	0.00	9999.00	-16.78	0.48	158.88	-0.00	0.00	9999.00	0.478
5.72	78.00	0.00	9999.00	-17.05	0.34	159.70	-0.00	-0.00	-9999.00	0.343
5.65	80.00	0.00	9999.00	-17.29	0.21	160.25	-0.00	-0.00	-9999.00	0.207
5.57	82.00	0.00	9999.00	-17.51	0.07	160.53	-0.00	-0.00	-9999.00	0.071
5.48	84.00	0.00	9999.00	-17.71	-0.07	160.54	-0.00	-0.00	-9999.00	-0.065

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--- TECON - CW - BLPH LOADOUT ON VERVECE ---
--------- Intact Stability Check -- PHASE 4 ---------
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10**6
Roll Angle
0
8.5
17
25.5
34
42.5
51
59.5
68
76.5
85

```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025         *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ------   Longitudinal Strength Analysis - Still Water  -- PHASE 4 ------   *
*                                                                                    *
**************************************************************************************************************
```

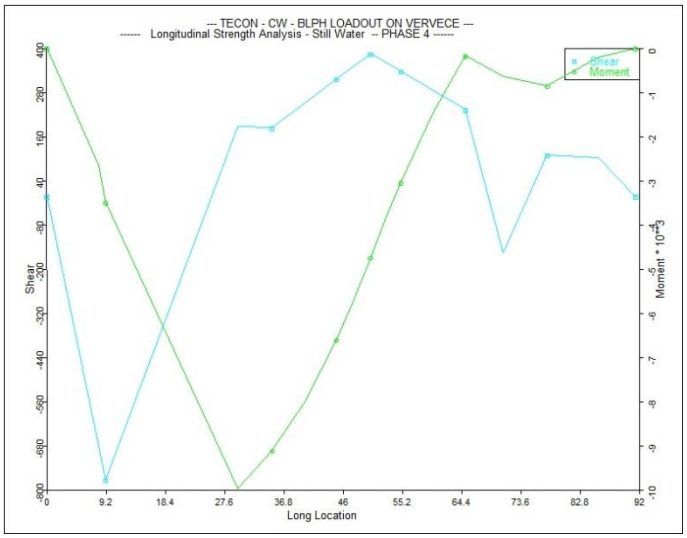
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 4: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-681	-2650	-0.1048	8.8067
9.14	-771	-3488	-0.1379	10.0309
29.72	187	-9968	-0.3939	25.0132
35.00	184	-9100	-0.3596	25.9817
40.00	251	-8013	-0.3167	25.8682
45.00	317	-6594	-0.2606	24.8745
47.50	349	-5762	-0.2277	24.0950
50.29	385	-4737	-0.1872	23.0380
52.50	363	-3910	-0.1546	22.0851
55.00	338	-3035	-0.1200	20.9054
60.00	286	-1475	-0.0583	18.3171
65.00	234	-174	-0.0069	15.5638
70.87	-156	-641	-0.0253	12.2803
77.72	109	-847	-0.0335	8.3177
85.70	101	-208	-0.0082	3.5094
91.44	-1	0	0.0000	0.0001



```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025         *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ---------     Intact Stability Check    -- PHASE 5 ---------               *
*                                                                                    *
**************************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                     Process is 5: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Results Are Reported In Body System

                        Draft =     4.30 Roll Angle =    -0.00 Pitch Angle =     0.00

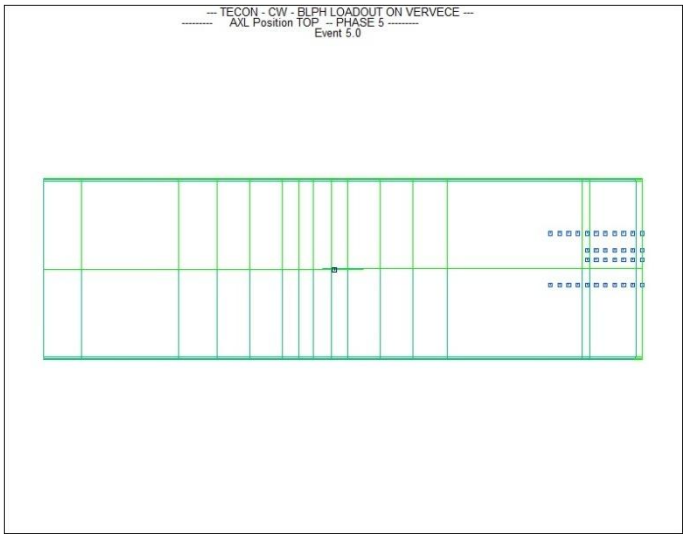
                                    Wet Radii Of Gyration About CG

                               K-X =     8.83 K-Y =    26.20 K-Z =    27.20

                                        GMT =    13.85 GML =   160.45

                               /-- Center of Gravity ---/  Sounding   % Full
                          Name  Weight    ---X---  ---Y---  ---Z---  -------- --------

                               ----------------  Part AXL5       ------------
                               LOAD_GRO    740.95     6.33    -1.36     7.10
                               ----------------  Part CF         ------------
                               LOAD_GRO     28.00    69.38    11.22     8.10
                               ----------------  Part GRI&SF-B   ------------
                               LOAD_GRO     75.00    30.86    -1.14     7.35
                               ----------------  Part GRI&SF-C   ------------
                               LOAD_GRO      0.50    67.44    11.22     7.10
                               ----------------  Part GRI&SF-T   ------------
                               LOAD_GRO     45.00    65.20    -2.92     7.40
                               ----------------  Part TP         ------------
                               LOAD_GRO    254.50    65.54    -2.14     9.35
                               ----------------  Part VERVECE    ------------
                               LOAD_GRO   1832.80    47.02     0.00     3.52
                                            --- Contents ---
                          1PC      229.92     5.62    -3.43     3.77     6.02    98.00
                          1PW      117.49     6.50   -10.28     2.53     4.06    50.00
                          1SC      230.42     5.62     3.43     3.77     6.02    98.00
                          1SW      117.49     6.50    10.28     2.53     4.06    50.00
                          2PC       26.21    19.43    -3.43     0.09     0.18     3.00
                          2PW      328.49    19.43   -10.28     1.15     2.30    37.60
                          2SC       26.21    19.43     3.43     0.09     0.18     3.00
                          2SW      399.62    19.43    10.28     1.40     2.79    45.74
                          3PC       26.21    40.00    -3.43     0.09     0.18     3.00
                          3PW      856.16    40.01   -10.28     2.99     5.97    98.00
                          3SC       26.21    40.01     3.43     0.09     0.18     3.00
                          3SW      856.16    40.01    10.28     2.99     5.97    98.00
                          4PC      262.11    60.58    -3.43     0.91     1.83    30.00
                          4PW      856.16    60.58   -10.28     2.99     5.97    98.00
                          4SC      262.11    60.58     3.43     0.91     1.83    30.00
                          4SW      856.16    60.58    10.28     2.99     5.97    98.00
                          5PC      295.21    83.42    -3.43     2.16     3.96    60.00
                          5PW      470.76    79.89   -10.28     2.02     3.82    59.32
                          5SC      290.58    83.42     3.43     2.16     3.96    60.00
                          5SW      542.21    80.05    10.28     2.29     4.33    68.32
                               ========  ========  =======  =======  =======
                               Total     10052.61    46.76     0.00     3.25
                               Buoyancy  10052.61    46.76     0.00     2.21
```




```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                    1 July, 2025                 *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                               *
*          ---------     Intact Stability Check    -- PHASE 5 ---------                              *
*                                                                                                    *
******************************************************************************************************

                          +++ D R A F T   M A R K   R E A D I N G S +++
                          ============================================

                Process is 5: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
                    ******************************************************
*                                      ***  MOSES   ***                                                    *
*                                      ----------------                          1 July, 2025             *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 5 ---------                                  . *
*                                                                                                         *
***********************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 5: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 3.25, and Wind Speed = 10 Knots

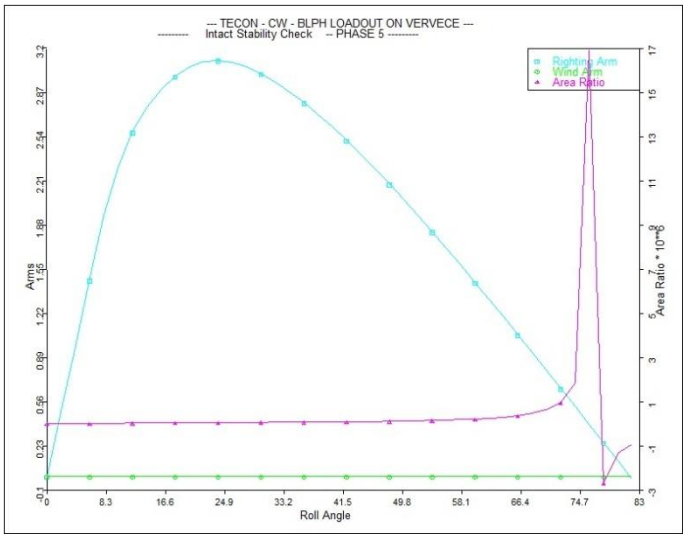
Initial: Roll = -0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.39	0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.48	0.48	0.00	0.00	3028.43	0.484
4.29	4.00	0.00	9999.00	1.49	0.97	1.94	0.00	0.00	6231.70	0.973
4.27	6.00	0.00	9999.00	1.03	1.47	4.38	0.00	0.00	9797.15	1.466
4.25	8.00	0.00	9999.00	0.57	1.95	7.80	0.00	0.00	9999.00	1.953
4.26	10.00	0.00	9999.00	0.07	2.32	12.07	0.00	0.00	9999.00	2.318
4.31	12.00	0.00	9999.00	-0.46	2.57	16.96	0.00	0.00	9999.00	2.573
4.39	14.00	0.00	9999.00	-1.04	2.76	22.29	0.00	0.00	9999.00	2.757
4.48	16.00	0.00	9999.00	-1.63	2.89	27.94	0.00	0.00	9999.00	2.891
4.60	18.00	0.00	9999.00	-2.25	2.99	33.82	0.00	0.00	9999.00	2.990
4.72	20.00	0.00	9999.00	-2.88	3.06	39.87	0.00	0.00	9999.00	3.060
4.85	22.00	0.00	9999.00	-3.51	3.10	46.03	0.00	0.00	9999.00	3.100
4.97	24.00	0.00	9999.00	-4.15	3.11	52.24	0.00	0.00	9999.00	3.109
5.09	26.00	0.00	9999.00	-4.77	3.09	58.45	0.00	0.00	9999.00	3.093
5.20	28.00	0.00	9999.00	-5.39	3.06	64.60	0.00	0.00	9999.00	3.059
5.31	30.00	0.00	9999.00	-6.01	3.01	70.67	0.00	0.00	9999.00	3.009
5.41	32.00	0.00	9999.00	-6.62	2.95	76.62	0.00	0.00	9999.00	2.946
5.50	34.00	0.00	9999.00	-7.22	2.87	82.44	0.00	0.00	9999.00	2.874
5.58	36.00	0.00	9999.00	-7.81	2.79	88.11	-0.00	0.00	9999.00	2.793
5.66	38.00	0.00	9999.00	-8.39	2.71	93.61	-0.00	0.00	9999.00	2.706
5.73	40.00	0.00	9999.00	-8.96	2.61	98.92	-0.00	0.00	9999.00	2.612
5.80	42.00	0.00	9999.00	-9.52	2.51	104.05	-0.00	0.00	9999.00	2.512
5.86	44.00	0.00	9999.00	-10.07	2.41	108.97	-0.00	0.00	9999.00	2.408
5.91	46.00	0.00	9999.00	-10.61	2.30	113.68	-0.00	0.00	9999.00	2.299
5.95	48.00	0.00	9999.00	-11.13	2.19	118.16	-0.00	0.00	9999.00	2.186
5.99	50.00	0.00	9999.00	-11.64	2.07	122.42	-0.00	0.00	9999.00	2.070
6.02	52.00	0.00	9999.00	-12.14	1.95	126.44	-0.00	0.00	9999.00	1.951
6.04	54.00	0.00	9999.00	-12.62	1.83	130.22	-0.00	0.00	9999.00	1.829
6.05	56.00	0.00	9999.00	-13.08	1.70	133.75	-0.00	0.00	9999.00	1.705
6.06	58.00	0.00	9999.00	-13.53	1.58	137.04	-0.00	0.00	9999.00	1.579
6.06	60.00	0.00	9999.00	-13.97	1.45	140.06	-0.00	0.00	9999.00	1.451
6.05	62.00	0.00	9999.00	-14.38	1.32	142.84	-0.00	0.00	9999.00	1.322
6.03	64.00	0.00	9999.00	-14.78	1.19	145.35	-0.00	0.00	9999.00	1.191
6.01	66.00	0.00	9999.00	-15.16	1.06	147.60	-0.00	0.00	9999.00	1.060
5.98	68.00	0.00	9999.00	-15.53	0.93	149.59	-0.00	0.00	9999.00	0.927
5.94	70.00	0.00	9999.00	-15.87	0.79	151.31	-0.00	0.00	9999.00	0.794
5.90	72.00	0.00	9999.00	-16.19	0.66	152.76	-0.00	0.00	9999.00	0.659
5.85	74.00	0.00	9999.00	-16.50	0.52	153.95	-0.00	0.00	9999.00	0.524
5.79	76.00	0.00	9999.00	-16.78	0.39	154.86	-0.00	0.00	9999.00	0.389
5.72	78.00	0.00	9999.00	-17.05	0.25	155.50	-0.00	-0.00	-9999.00	0.253
5.65	80.00	0.00	9999.00	-17.29	0.12	155.87	-0.00	-0.00	-9999.00	0.116
5.57	82.00	0.00	9999.00	-17.51	-0.02	155.96	-0.00	-0.00	-9999.00	-0.021

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--- TECON - CW - BLPH LOADOUT ON VERVECE ---
--------- Intact Stability Check -- PHASE 5 ---------
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10**6
Roll Angle
0
8.3
16.6
24.9
33.2
41.5
49.8
58.1
66.4
74.7
83

```
**********************************************************
*                                  ***  MOSES    ***                                  *
*                                  ----------------                  1 July, 2025    *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*         ------   Longitudinal Strength Analysis - Still Water  -- PHASE 5 ------   *
*                                                                                     *
***************************************************************************************************************
```

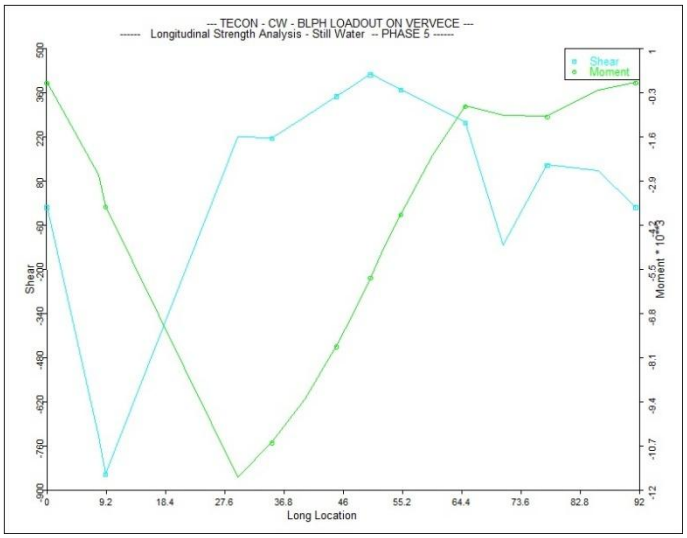
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 5: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-732	-2736	-0.1082	10.1819
9.14	-848	-3651	-0.1443	11.6021
29.72	220	-11631	-0.4597	29.3077
35.00	216	-10592	-0.4186	30.5310
40.00	283	-9343	-0.3692	30.4895
45.00	349	-7763	-0.3068	29.4211
47.50	382	-6850	-0.2707	28.5547
50.29	418	-5734	-0.2266	27.3655
52.50	395	-4836	-0.1911	26.2836
55.00	370	-3879	-0.1533	24.9339
60.00	318	-2158	-0.0853	21.9379
65.00	266	-696	-0.0275	18.7017
70.87	-124	-972	-0.0385	14.7797
77.72	131	-994	-0.0393	10.0082
85.70	110	-234	-0.0093	4.2209
91.44	-1	0	0.0000	0.0001



```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                          1 July, 2025          *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                               *
*         ---------     Intact Stability Check    -- PHASE 6 ---------                              *
*                                                                                                    *
******************************************************************************************************

                +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                ======================================================================

                 Process is 6: Units Are Degrees, Meters, and M-Tons Unless Specified

                              Results Are Reported In Body System

                     Draft =     4.30 Roll Angle =    -0.00 Pitch Angle =     0.00

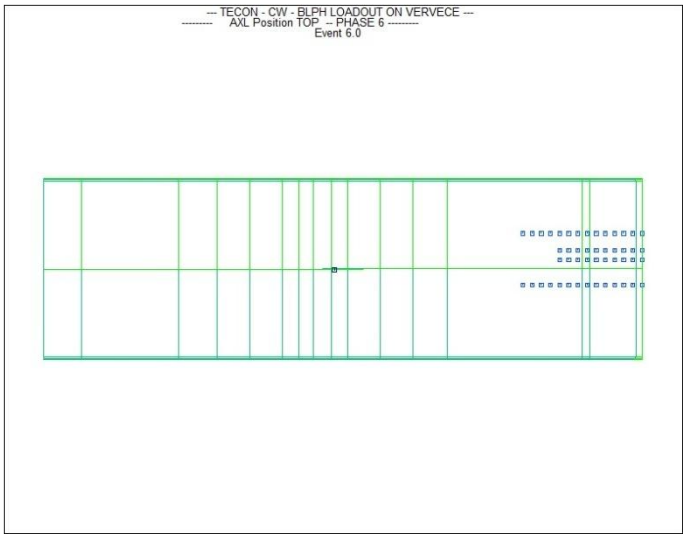
                                 Wet Radii Of Gyration About CG

                           K-X =     8.73 K-Y =    26.34 K-Z =    27.29

                                    GMT =    13.73 GML =   160.35

                           /-- Center of Gravity ---/  Sounding   % Full
                    Name    Weight    ---X---  ---Y---  ---Z---  -------- --------

                           ----------------  Part AXL6       ------------
                           LOAD_GRO    970.90     8.37    -1.39     7.10
                           ----------------  Part CF         ------------
                           LOAD_GRO     28.00    69.38    11.22     8.10
                           ----------------  Part GRI&SF-B   ------------
                           LOAD_GRO     75.00    30.86    -1.14     7.35
                           ----------------  Part GRI&SF-C   ------------
                           LOAD_GRO      0.50    67.44    11.22     7.10
                           ----------------  Part GRI&SF-T   ------------
                           LOAD_GRO     45.00    65.20    -2.92     7.40
                           ----------------  Part TP         ------------
                           LOAD_GRO    254.50    65.54    -2.14     9.35
                           ----------------  Part VERVECE    ------------
                           LOAD_GRO   1832.80    47.02     0.00     3.52
                                        --- Contents ---
                     1PC         229.92     5.62    -3.43     3.77     6.02    98.00
                     1PW         117.49     6.50   -10.28     2.53     4.06    50.00
                     1SC         230.42     5.62     3.43     3.77     6.02    98.00
                     1SW         117.49     6.50    10.28     2.53     4.06    50.00
                     2PC          26.21    19.43    -3.43     0.09     0.18     3.00
                     2PW         197.28    19.43   -10.27     0.69     1.38    22.58
                     2SC          26.21    19.43     3.43     0.09     0.18     3.00
                     2SW         284.48    19.43    10.27     1.00     1.99    32.56
                     3PC          26.21    40.00    -3.43     0.09     0.18     3.00
                     3PW         856.16    40.01   -10.28     2.99     5.97    98.00
                     3SC          26.21    40.01     3.43     0.09     0.18     3.00
                     3SW         856.16    40.01    10.28     2.99     5.97    98.00
                     4PC         262.11    60.58    -3.43     0.91     1.83    30.00
                     4PW         856.16    60.58   -10.28     2.99     5.97    98.00
                     4SC         262.11    60.58     3.43     0.91     1.83    30.00
                     4SW         856.16    60.58    10.28     2.99     5.97    98.00
                     5PC         295.21    83.42    -3.43     2.16     3.96    60.00
                     5PW         470.69    79.89   -10.28     2.02     3.82    59.31
                     5SC         290.58    83.42     3.43     2.16     3.96    60.00
                     5SW         558.68    80.09    10.28     2.35     4.44    70.40
                           ========  ========  =======  =======  =======
                           Total     10052.61    46.75     0.00     3.37
                           Buoyancy  10052.61    46.75     0.00     2.21
```




```
                    ********************************************************
*                                       ***  MOSES   ***                                                  *
*                                       ----------------                    1 July, 2025                 *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 6 ---------                                   *
*                                                                                                         *
***********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                    Process is 6: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
*********************************************************
*                                  ***  MOSES   ***                                    *
*                                  ----------------                 1 July, 2025      *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                  *
*        ---------     Intact Stability Check    -- PHASE 6 ---------                 . *
*                                                                                      *
****************************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 6: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 3.37, and Wind Speed = 10 Knots

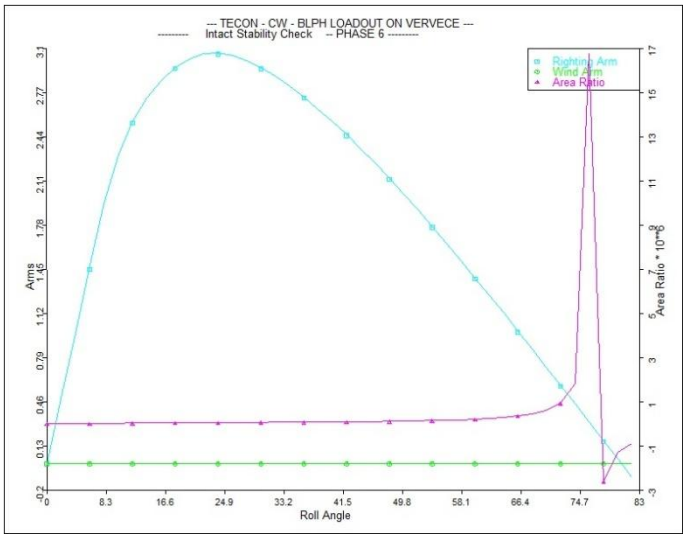
Initial: Roll = -0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.48	0.48	0.00	0.00	3002.68	0.480
4.29	4.00	0.00	9999.00	1.49	0.97	1.93	0.00	0.00	6178.86	0.965
4.27	6.00	0.00	9999.00	1.03	1.45	4.34	0.00	0.00	9714.31	1.453
4.25	8.00	0.00	9999.00	0.57	1.94	7.73	0.00	0.00	9999.00	1.936
4.26	10.00	0.00	9999.00	0.07	2.30	11.97	0.00	0.00	9999.00	2.298
4.31	12.00	0.00	9999.00	-0.46	2.55	16.81	0.00	0.00	9999.00	2.548
4.39	14.00	0.00	9999.00	-1.04	2.73	22.09	0.00	0.00	9999.00	2.728
4.48	16.00	0.00	9999.00	-1.63	2.86	27.68	0.00	0.00	9999.00	2.859
4.60	18.00	0.00	9999.00	-2.25	2.95	33.49	0.00	0.00	9999.00	2.954
4.72	20.00	0.00	9999.00	-2.88	3.02	39.47	0.00	0.00	9999.00	3.020
4.85	22.00	0.00	9999.00	-3.51	3.06	45.54	0.00	0.00	9999.00	3.056
4.97	24.00	0.00	9999.00	-4.14	3.06	51.66	0.00	0.00	9999.00	3.061
5.09	26.00	0.00	9999.00	-4.77	3.04	57.76	0.00	0.00	9999.00	3.042
5.20	28.00	0.00	9999.00	-5.39	3.00	63.81	0.00	0.00	9999.00	3.005
5.31	30.00	0.00	9999.00	-6.01	2.95	69.77	0.00	0.00	9999.00	2.953
5.41	32.00	0.00	9999.00	-6.62	2.89	75.61	0.00	0.00	9999.00	2.889
5.50	34.00	0.00	9999.00	-7.22	2.82	81.31	0.00	0.00	9999.00	2.815
5.58	36.00	0.00	9999.00	-7.81	2.73	86.86	-0.00	0.00	9999.00	2.734
5.66	38.00	0.00	9999.00	-8.39	2.65	92.24	-0.00	0.00	9999.00	2.646
5.73	40.00	0.00	9999.00	-8.96	2.55	97.44	-0.00	0.00	9999.00	2.552
5.80	42.00	0.00	9999.00	-9.52	2.45	102.45	-0.00	0.00	9999.00	2.453
5.86	44.00	0.00	9999.00	-10.07	2.35	107.25	-0.00	0.00	9999.00	2.349
5.91	46.00	0.00	9999.00	-10.61	2.24	111.84	-0.00	0.00	9999.00	2.241
5.95	48.00	0.00	9999.00	-11.13	2.13	116.21	-0.00	0.00	9999.00	2.128
5.99	50.00	0.00	9999.00	-11.64	2.01	120.35	-0.00	0.00	9999.00	2.011
6.02	52.00	0.00	9999.00	-12.14	1.89	124.25	-0.00	0.00	9999.00	1.891
6.04	54.00	0.00	9999.00	-12.62	1.77	127.91	-0.00	0.00	9999.00	1.768
6.05	56.00	0.00	9999.00	-13.08	1.64	131.32	-0.00	0.00	9999.00	1.642
6.06	58.00	0.00	9999.00	-13.53	1.51	134.47	-0.00	0.00	9999.00	1.514
6.06	60.00	0.00	9999.00	-13.97	1.38	137.37	-0.00	0.00	9999.00	1.384
6.05	62.00	0.00	9999.00	-14.38	1.25	140.01	-0.00	0.00	9999.00	1.253
6.03	64.00	0.00	9999.00	-14.78	1.12	142.38	-0.00	0.00	9999.00	1.120
6.01	66.00	0.00	9999.00	-15.16	0.99	144.49	-0.00	0.00	9999.00	0.987
5.98	68.00	0.00	9999.00	-15.53	0.85	146.33	-0.00	0.00	9999.00	0.852
5.94	70.00	0.00	9999.00	-15.87	0.72	147.89	-0.00	0.00	9999.00	0.716
5.90	72.00	0.00	9999.00	-16.19	0.58	149.19	-0.00	0.00	9999.00	0.580
5.85	74.00	0.00	9999.00	-16.50	0.44	150.21	-0.00	0.00	9999.00	0.443
5.79	76.00	0.00	9999.00	-16.78	0.31	150.96	-0.00	0.00	9999.00	0.305
5.72	78.00	0.00	9999.00	-17.05	0.17	151.43	-0.00	-0.00	-9999.00	0.168
5.65	80.00	0.00	9999.00	-17.29	0.03	151.63	-0.00	-0.00	-9999.00	0.030
5.57	82.00	0.00	9999.00	-17.51	-0.11	151.55	-0.00	-0.00	-9999.00	-0.109

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--- TECON - CW - BLPH LOADOUT ON VERVECE ---
--------- Intact Stability Check -- PHASE 6 ---------
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10**6
Roll Angle
0
8.3
16.6
24.9
33.2
41.5
49.8
58.1
66.4
74.7
83

```
*********************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------                  1 July, 2025    *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                               *
*         ------   Longitudinal Strength Analysis - Still Water  -- PHASE 6 ------  *
*                                                                                    *
**************************************************************************************************************
```

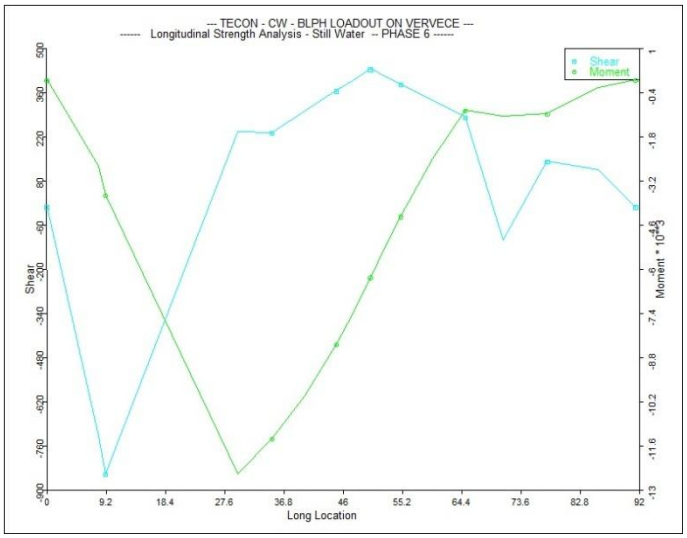
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 6: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-731	-2736	-0.1081	10.7862
9.14	-848	-3650	-0.1443	12.2929
29.72	236	-12490	-0.4936	31.3396
35.00	233	-11362	-0.4490	32.7102
40.00	300	-10030	-0.3964	32.7208
45.00	366	-8366	-0.3306	31.6285
47.50	398	-7411	-0.2929	30.7247
50.29	434	-6248	-0.2469	29.4757
52.50	412	-5314	-0.2100	28.3336
55.00	387	-4315	-0.1705	26.9037
60.00	335	-2510	-0.0992	23.7124
65.00	283	-965	-0.0382	20.2419
70.87	-107	-1144	-0.0452	16.0079
77.72	142	-1070	-0.0423	10.8395
85.70	115	-247	-0.0098	4.5708
91.44	-1	0	0.0000	0.0001



```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  -----------------          1 July, 2025         *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ---------     Intact Stability Check    -- PHASE 7 ---------               *
*                                                                                    *
**************************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                     Process is 7: Units Are Degrees, Meters, and M-Tons Unless Specified

                                   Results Are Reported In Body System

                         Draft =     4.30 Roll Angle =    -0.00 Pitch Angle =     0.00

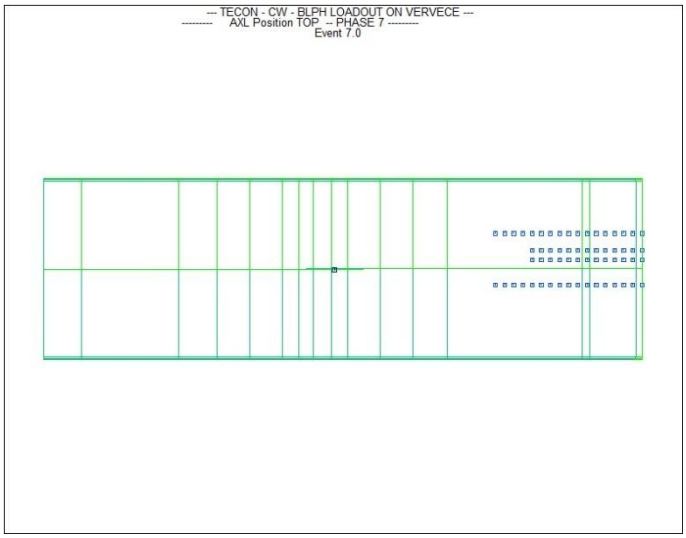
                                    Wet Radii Of Gyration About CG

                                K-X =     8.61 K-Y =    26.37 K-Z =    27.27

                                        GMT =    13.59 GML =   160.22

                                /-- Center of Gravity ---/  Sounding   % Full
                          Name   Weight    ---X---  ---Y---  ---Z---  -------- --------

                                ----------------  Part AXL7       ------------
                                LOAD_GRO   1203.10    10.42    -1.40     7.10
                                ----------------  Part CF         ------------
                                LOAD_GRO     28.00    69.38    11.22     8.10
                                ----------------  Part GRI&SF-B   ------------
                                LOAD_GRO     75.00    30.86    -1.14     7.35
                                ----------------  Part GRI&SF-C   ------------
                                LOAD_GRO      0.50    67.44    11.22     7.10
                                ----------------  Part GRI&SF-T   ------------
                                LOAD_GRO     45.00    65.20    -2.92     7.40
                                ----------------  Part TP         ------------
                                LOAD_GRO    254.50    65.54    -2.14     9.35
                                ----------------  Part VERVECE    ------------
                                LOAD_GRO   1832.80    47.02     0.00     3.52
                                          --- Contents ---
                          1PC      229.92     5.62    -3.43     3.77     6.02    98.00
                          1PW      117.49     6.50   -10.28     2.53     4.06    50.00
                          1SC      230.42     5.62     3.43     3.77     6.02    98.00
                          1SW      117.49     6.50    10.28     2.53     4.06    50.00
                          2PC       26.21    19.43    -3.43     0.09     0.18     3.00
                          2PW       72.47    19.43   -10.24     0.26     0.51     8.30
                          2SC       26.21    19.43     3.43     0.09     0.18     3.00
                          2SW      175.60    19.43    10.27     0.62     1.23    20.10
                          3PC       26.21    40.00    -3.43     0.09     0.18     3.00
                          3PW      856.16    40.01   -10.28     2.99     5.97    98.00
                          3SC       26.21    40.01     3.43     0.09     0.18     3.00
                          3SW      856.16    40.01    10.28     2.99     5.97    98.00
                          4PC      262.11    60.58    -3.43     0.91     1.83    30.00
                          4PW      856.16    60.58   -10.28     2.99     5.97    98.00
                          4SC      262.11    60.58     3.43     0.91     1.83    30.00
                          4SW      856.16    60.58    10.28     2.99     5.97    98.00
                          5PC      295.21    83.42    -3.43     2.16     3.96    60.00
                          5PW      463.18    79.87   -10.28     1.99     3.77    58.37
                          5SC      290.58    83.42     3.43     2.16     3.96    60.00
                          5SW      567.68    80.10    10.28     2.39     4.51    71.53
                                 ========  ========  =======  =======  =======
                                 Total     10052.61    46.75     0.00     3.50
                                 Buoyancy  10052.61    46.75     0.00     2.21
```




```
                    ********************************************************
*                                       ***  MOSES   ***                                                  *
*                                       ----------------                    1 July, 2025                 *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 7 ---------                                   *
*                                                                                                         *
***********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 7: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
                    ******************************************************
*                                      ***  MOSES   ***                                                    *
*                                      ----------------                          1 July, 2025             *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 7 ---------                                  . *
*                                                                                                         *
**********************************************************************************************************

                              +++ R I G H T I N G   A R M   R E S U L T S +++
                              ==============================================

                    Process is 7: Units Are Degrees, Meters, and M-Tons Unless Specified

                    Moment Scaled By 10052.61, KG = 3.50, and Wind Speed = 10 Knots

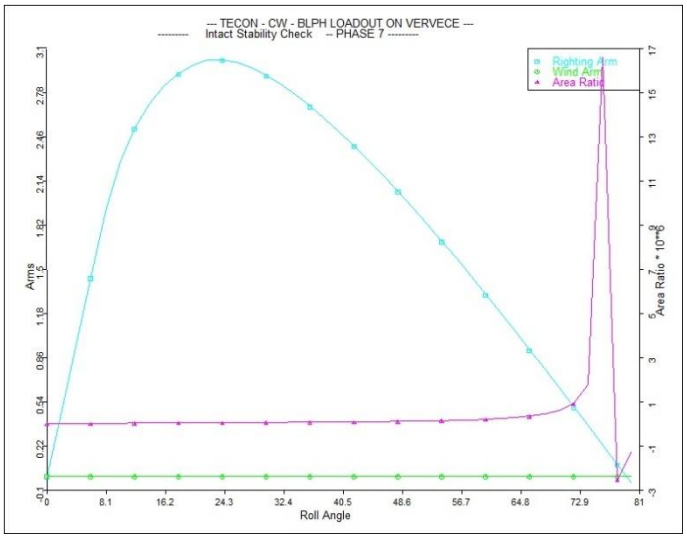
                              Initial: Roll = -0.00, Trim = 0.00 Deg.

                    Critical NWT Down Flooding Point Is *BOWPTWT

                    Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/   /-- Min. Height --/   /--- Righting ---/    /--- Heeling ---/    Area        Net
 Draft    Roll    Trim      W Tight  NW Tight        Arm      Area        Arm      Area     Ratio       Arm

 4.30    0.00    0.00     9999.00      2.40       0.00      0.00       0.00      0.00      0.00    -0.000
 4.30    2.00    0.00     9999.00      1.94       0.48      0.48       0.00      0.00   2973.06     0.475
 4.29    4.00    0.00     9999.00      1.49       0.96      1.91       0.00      0.00   6117.97     0.956
 4.27    6.00    0.00     9999.00      1.03       1.44      4.30       0.00      0.00   9618.79     1.439
 4.25    8.00    0.00     9999.00      0.57       1.92      7.66       0.00      0.00   9999.00     1.917
 4.26   10.00    0.00     9999.00      0.08       2.27     11.85       0.00      0.00   9999.00     2.275
 4.31   12.00    0.00     9999.00     -0.46       2.52     16.65       0.00      0.00   9999.00     2.521
 4.39   14.00    0.00     9999.00     -1.04       2.70     21.86       0.00      0.00   9999.00     2.697
 4.48   16.00    0.00     9999.00     -1.63       2.82     27.39       0.00      0.00   9999.00     2.825
 4.60   18.00    0.00     9999.00     -2.25       2.92     33.13       0.00      0.00   9999.00     2.917
 4.72   20.00    0.00     9999.00     -2.87       2.98     39.02       0.00      0.00   9999.00     2.980
 4.85   22.00    0.00     9999.00     -3.51       3.01     45.02       0.00      0.00   9999.00     3.014
 4.97   24.00    0.00     9999.00     -4.14       3.02     51.05       0.00      0.00   9999.00     3.017
 5.09   26.00    0.00     9999.00     -4.77       3.00     57.06       0.00      0.00   9999.00     2.996
 5.20   28.00    0.00     9999.00     -5.39       2.96     63.01       0.00      0.00   9999.00     2.957
 5.31   30.00    0.00     9999.00     -6.01       2.90     68.88       0.00      0.00   9999.00     2.904
 5.41   32.00    0.00     9999.00     -6.62       2.84     74.62       0.00      0.00   9999.00     2.839
 5.50   34.00    0.00     9999.00     -7.22       2.76     80.22       0.00      0.00   9999.00     2.764
 5.58   36.00    0.00     9999.00     -7.81       2.68     85.66      -0.00      0.00   9999.00     2.681
 5.66   38.00    0.00     9999.00     -8.39       2.59     90.94      -0.00      0.00   9999.00     2.592
 5.73   40.00    0.00     9999.00     -8.96       2.50     96.02      -0.00      0.00   9999.00     2.496
 5.80   42.00    0.00     9999.00     -9.52       2.40    100.92      -0.00      0.00   9999.00     2.396
 5.86   44.00    0.00     9999.00    -10.07       2.29    105.60      -0.00      0.00   9999.00     2.290
 5.91   46.00    0.00     9999.00    -10.61       2.18    110.07      -0.00      0.00   9999.00     2.180
 5.95   48.00    0.00     9999.00    -11.13       2.07    114.32      -0.00      0.00   9999.00     2.066
 5.99   50.00    0.00     9999.00    -11.64       1.95    118.33      -0.00      0.00   9999.00     1.948
 6.02   52.00    0.00     9999.00    -12.14       1.83    122.11      -0.00      0.00   9999.00     1.827
 6.04   54.00    0.00     9999.00    -12.62       1.70    125.64      -0.00      0.00   9999.00     1.703
 6.05   56.00    0.00     9999.00    -13.08       1.58    128.92      -0.00      0.00   9999.00     1.576
 6.06   58.00    0.00     9999.00    -13.53       1.45    131.94      -0.00      0.00   9999.00     1.448
 6.06   60.00    0.00     9999.00    -13.97       1.32    134.71      -0.00      0.00   9999.00     1.317
 6.05   62.00    0.00     9999.00    -14.38       1.18    137.21      -0.00      0.00   9999.00     1.184
 6.03   64.00    0.00     9999.00    -14.78       1.05    139.44      -0.00      0.00   9999.00     1.051
 6.01   66.00    0.00     9999.00    -15.16       0.92    141.41      -0.00      0.00   9999.00     0.915
 5.98   68.00    0.00     9999.00    -15.53       0.78    143.10      -0.00      0.00   9999.00     0.779
 5.94   70.00    0.00     9999.00    -15.87       0.64    144.52      -0.00      0.00   9999.00     0.642
 5.90   72.00    0.00     9999.00    -16.19       0.50    145.67      -0.00      0.00   9999.00     0.504
 5.85   74.00    0.00     9999.00    -16.50       0.36    146.54      -0.00      0.00   9999.00     0.365
 5.79   76.00    0.00     9999.00    -16.78       0.23    147.13      -0.00      0.00   9999.00     0.226
 5.72   78.00    0.00     9999.00    -17.05       0.09    147.44      -0.00     -0.00  -9999.00     0.086
 5.65   80.00    0.00     9999.00    -17.29      -0.05    147.47      -0.00     -0.00  -9999.00    -0.054
```


--- TECON - CW - BLPH LOADOUT ON VERVECE ---
--------- Intact Stability Check -- PHASE 7 ---------
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10**6
Roll Angle
0
8.1
16.2
24.3
32.4
40.5
48.6
56.7
64.8
72.9
81

```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025         *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ------   Longitudinal Strength Analysis - Still Water  -- PHASE 7 ------   *
*                                                                                    *
**************************************************************************************************************
```

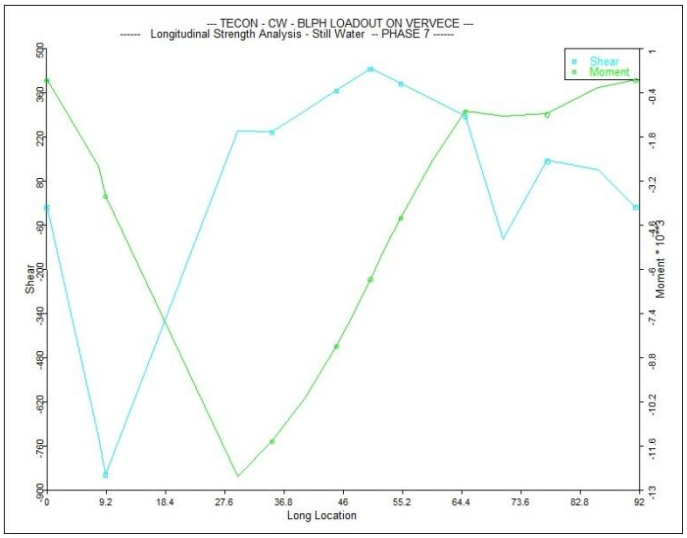
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 7: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-734	-2753	-0.1088	10.7764
9.14	-850	-3670	-0.1451	12.2814
29.72	238	-12580	-0.4971	31.3919
35.00	235	-11443	-0.4522	32.7917
40.00	302	-10102	-0.3992	32.8204
45.00	367	-8429	-0.3331	31.7386
47.50	400	-7469	-0.2952	30.8374
50.29	436	-6302	-0.2491	29.5892
52.50	414	-5363	-0.2120	28.4466
55.00	389	-4360	-0.1723	27.0146
60.00	337	-2546	-0.1006	23.8158
65.00	284	-992	-0.0392	20.3337
70.87	-105	-1161	-0.0459	16.0825
77.72	143	-1078	-0.0426	10.8905
85.70	115	-248	-0.0098	4.5923
91.44	-1	0	0.0000	0.0002



```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  -----------------          1 July, 2025         *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ---------     Intact Stability Check    -- PHASE 8 ---------               *
*                                                                                    *
**************************************************************************************************************
```

+++ B U O Y A N C Y A N D W E I G H T F O R V E R V E C E +++

Process is 8: Units Are Degrees, Meters, and M-Tons Unless Specified

Results Are Reported In Body System

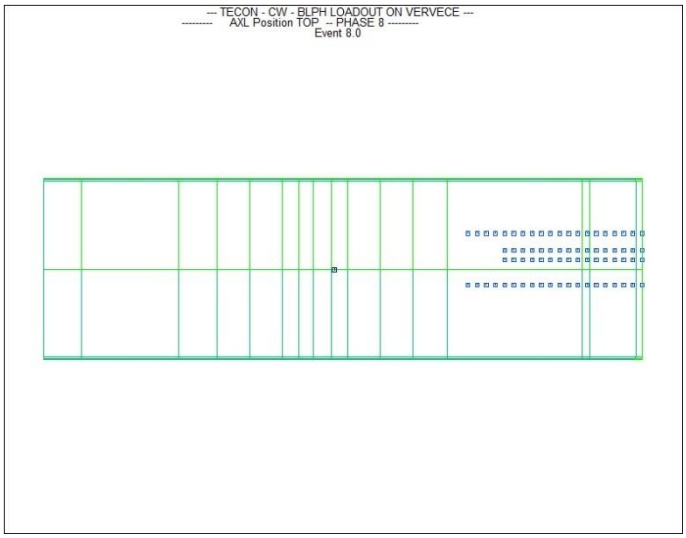
Draft = 4.30 Roll Angle = 0.00 Pitch Angle = 0.00

Wet Radii Of Gyration About CG

K-X = 8.51 K-Y = 26.83 K-Z = 27.67

GMT = 13.56 GML = 160.30

Name	Weight	/-- Center of Gravity ---/ ---X---	---Y---	---Z---	Sounding	% Full
		Part AXL8				
LOAD_GRO	1439.80	12.44	-1.39	7.10		
		Part CF				
LOAD_GRO	28.00	69.38	11.22	8.10		
		Part GRI&SF-B				
LOAD_GRO	75.00	30.86	-1.14	7.35		
		Part GRI&SF-C				
LOAD_GRO	0.50	67.44	11.22	7.10		
		Part GRI&SF-T				
LOAD_GRO	45.00	65.20	-2.92	7.40		
		Part TP				
LOAD_GRO	254.50	65.54	-2.14	9.35		
		Part VERVECE				
LOAD_GRO	1832.80	47.02	0.00	3.52		
		--- Contents ---				
1PC	229.92	5.62	-3.43	3.77	6.02	98.00
1PW	117.49	6.50	-10.28	2.53	4.06	50.00
1SC	230.42	5.62	3.43	3.77	6.02	98.00
1SW	117.49	6.50	10.28	2.53	4.06	50.00
2PC	26.21	19.43	-3.43	0.09	0.18	3.00
2PW	72.47	19.43	-10.24	0.26	0.51	8.30
2SC	26.21	19.43	3.43	0.09	0.18	3.00
2SW	175.60	19.43	10.27	0.62	1.23	20.10
3PC	26.21	40.00	-3.43	0.09	0.18	3.00
3PW	654.06	40.00	-10.28	2.29	4.57	74.87
3SC	26.21	40.01	3.43	0.09	0.18	3.00
3SW	722.43	40.01	10.28	2.52	5.04	82.69
4PC	262.11	60.58	-3.43	0.91	1.83	30.00
4PW	856.16	60.58	-10.28	2.99	5.97	98.00
4SC	262.11	60.58	3.43	0.91	1.83	30.00
4SW	856.16	60.58	10.28	2.99	5.97	98.00
5PC	295.21	83.42	-3.43	2.16	3.96	60.00
5PW	531.01	80.03	-10.28	2.25	4.25	66.91
5SC	290.58	83.42	3.43	2.16	3.96	60.00
5SW	598.98	80.16	10.28	2.50	4.73	75.48
Total	10052.61	46.75	0.00	3.53		
Buoyancy	10052.61	46.75	-0.00	2.21		




```
                    ********************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                    1 July, 2025                 *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                               *
*          ---------     Intact Stability Check    -- PHASE 8 ---------                              *
*                                                                                                     *
*******************************************************************************************************

                          +++ D R A F T   M A R K   R E A D I N G S +++
                          ============================================

                Process is 8: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
**********************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025          *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                               *
*         ---------     Intact Stability Check    -- PHASE 8 ---------             . *
*                                                                                    *
**************************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 8: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 3.53, and Wind Speed = 10 Knots

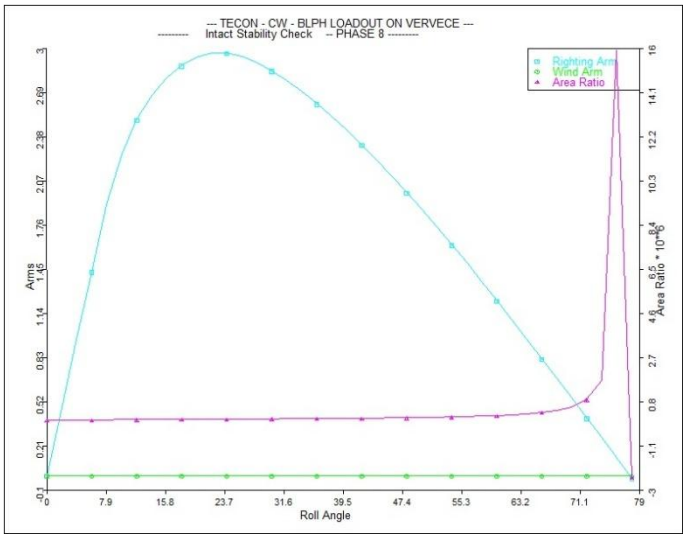
Initial: Roll = 0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.47	0.47	0.00	0.00	2966.60	0.474
4.29	4.00	0.00	9999.00	1.49	0.95	1.90	0.00	0.00	6099.78	0.952
4.27	6.00	0.00	9999.00	1.03	1.43	4.28	0.00	0.00	9581.25	1.431
4.25	8.00	0.00	9999.00	0.57	1.91	7.62	0.00	0.00	9999.00	1.905
4.26	10.00	0.00	9999.00	0.08	2.26	11.78	0.00	0.00	9999.00	2.258
4.31	12.00	0.00	9999.00	-0.46	2.50	16.54	0.00	0.00	9999.00	2.500
4.39	14.00	0.00	9999.00	-1.04	2.67	21.71	0.00	0.00	9999.00	2.671
4.48	16.00	0.00	9999.00	-1.63	2.79	27.18	0.00	0.00	9999.00	2.793
4.60	18.00	0.00	9999.00	-2.25	2.88	32.85	0.00	0.00	9999.00	2.880
4.72	20.00	0.00	9999.00	-2.88	2.94	38.67	0.00	0.00	9999.00	2.938
4.85	22.00	0.00	9999.00	-3.51	2.97	44.57	0.00	0.00	9999.00	2.967
4.97	24.00	0.00	9999.00	-4.14	2.97	50.51	0.00	0.00	9999.00	2.966
5.09	26.00	0.00	9999.00	-4.77	2.94	56.41	0.00	0.00	9999.00	2.941
5.20	28.00	0.00	9999.00	-5.39	2.90	62.25	0.00	0.00	9999.00	2.899
5.31	30.00	0.00	9999.00	-6.01	2.84	67.99	0.00	0.00	9999.00	2.842
5.41	32.00	0.00	9999.00	-6.62	2.77	73.61	0.00	0.00	9999.00	2.774
5.50	34.00	0.00	9999.00	-7.22	2.70	79.08	0.00	0.00	9999.00	2.697
5.58	36.00	0.00	9999.00	-7.81	2.61	84.39	-0.00	0.00	9999.00	2.612
5.66	38.00	0.00	9999.00	-8.39	2.52	89.52	-0.00	0.00	9999.00	2.521
5.73	40.00	0.00	9999.00	-8.96	2.42	94.47	-0.00	0.00	9999.00	2.424
5.80	42.00	0.00	9999.00	-9.52	2.32	99.22	-0.00	0.00	9999.00	2.322
5.86	44.00	0.00	9999.00	-10.07	2.22	103.75	-0.00	0.00	9999.00	2.216
5.91	46.00	0.00	9999.00	-10.61	2.10	108.07	-0.00	0.00	9999.00	2.104
5.95	48.00	0.00	9999.00	-11.13	1.99	112.17	-0.00	0.00	9999.00	1.989
5.99	50.00	0.00	9999.00	-11.64	1.87	116.03	-0.00	0.00	9999.00	1.870
6.02	52.00	0.00	9999.00	-12.14	1.75	119.64	-0.00	0.00	9999.00	1.747
6.04	54.00	0.00	9999.00	-12.62	1.62	123.01	-0.00	0.00	9999.00	1.622
6.05	56.00	0.00	9999.00	-13.08	1.49	126.13	-0.00	0.00	9999.00	1.494
6.06	58.00	0.00	9999.00	-13.53	1.36	128.98	-0.00	0.00	9999.00	1.363
6.06	60.00	0.00	9999.00	-13.97	1.23	131.58	-0.00	0.00	9999.00	1.230
6.05	62.00	0.00	9999.00	-14.38	1.10	133.90	-0.00	0.00	9999.00	1.096
6.03	64.00	0.00	9999.00	-14.78	0.96	135.96	-0.00	0.00	9999.00	0.960
6.01	66.00	0.00	9999.00	-15.16	0.82	137.74	-0.00	0.00	9999.00	0.823
5.98	68.00	0.00	9999.00	-15.53	0.68	139.25	-0.00	0.00	9999.00	0.684
5.94	70.00	0.00	9999.00	-15.87	0.55	140.48	-0.00	0.00	9999.00	0.545
5.90	72.00	0.00	9999.00	-16.19	0.41	141.43	-0.00	0.00	9999.00	0.406
5.85	74.00	0.00	9999.00	-16.50	0.27	142.10	-0.00	0.00	9999.00	0.266
5.79	76.00	0.00	9999.00	-16.78	0.13	142.49	-0.00	0.00	9999.00	0.125
5.72	78.00	0.00	9999.00	-17.05	-0.02	142.60	-0.00	-0.00	-9999.00	-0.015

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--- TECON - CW - BLPH LOADOUT ON VERVECE ---
--------- Intact Stability Check -- PHASE 8 ---------
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^6
Roll Angle
0
7.9
15.8
23.7
31.6
39.5
47.4
55.3
63.2
71.1
79

```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025         *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ------   Longitudinal Strength Analysis - Still Water  -- PHASE 8 ------   *
*                                                                                    *
**************************************************************************************************************
```

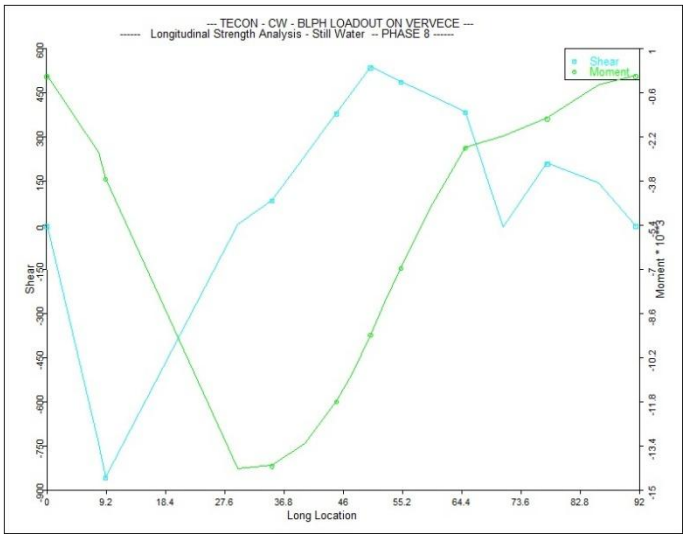
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 8: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-740	-2788	-0.1102	12.7280
9.14	-856	-3713	-0.1468	14.5116
29.72	1	-14226	-0.5622	38.4754
35.00	84	-14112	-0.5577	40.8521
40.00	233	-13319	-0.5263	41.5089
45.00	380	-11786	-0.4658	40.7041
47.50	454	-10743	-0.4246	39.8034
50.29	535	-9363	-0.3700	38.4494
52.50	513	-8205	-0.3243	37.1484
55.00	488	-6954	-0.2748	35.4636
60.00	436	-4644	-0.1836	31.5515
65.00	384	-2594	-0.1026	27.1248
70.87	-6	-2182	-0.0862	21.5441
77.72	209	-1532	-0.0606	14.6061
85.70	143	-328	-0.0130	6.1595
91.44	-1	0	0.0000	0.0002



```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------                 1 July, 2025    *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ---------     Intact Stability Check    -- PHASE 9 ---------              *
*                                                                                    *
**************************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                     Process is 9: Units Are Degrees, Meters, and M-Tons Unless Specified

                                   Results Are Reported In Body System

                         Draft =     4.30 Roll Angle =     0.00 Pitch Angle =     0.00

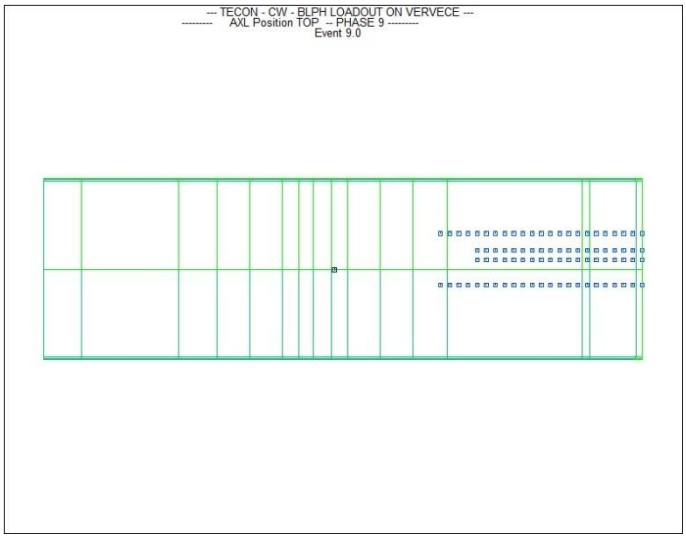
                                    Wet Radii Of Gyration About CG

                                K-X =     8.40 K-Y =    27.16 K-Z =    27.94

                                        GMT =    13.49 GML =   160.29

                                /-- Center of Gravity ---/  Sounding   % Full
                          Name   Weight    ---X---  ---Y---  ---Z---  -------- --------

                                ----------------  Part AXL9       ------------
                                LOAD_GRO   1676.50    14.49    -1.39     7.10
                                ----------------  Part CF         ------------
                                LOAD_GRO     28.00    69.38    11.22     8.10
                                ----------------  Part GRI&SF-B   ------------
                                LOAD_GRO     75.00    30.86    -1.14     7.35
                                ----------------  Part GRI&SF-C   ------------
                                LOAD_GRO      0.50    67.44    11.22     7.10
                                ----------------  Part GRI&SF-T   ------------
                                LOAD_GRO     45.00    65.20    -2.92     7.40
                                ----------------  Part TP         ------------
                                LOAD_GRO    254.50    65.54    -2.14     9.35
                                ----------------  Part VERVECE    ------------
                                LOAD_GRO   1832.80    47.02     0.00     3.52
                                             --- Contents ---
                          1PC       229.92     5.62    -3.43     3.77     6.02    98.00
                          1PW       117.49     6.50   -10.28     2.53     4.06    50.00
                          1SC       230.42     5.62     3.43     3.77     6.02    98.00
                          1SW       117.49     6.50    10.28     2.53     4.06    50.00
                          2PC        26.21    19.43    -3.43     0.09     0.18     3.00
                          2PW        72.47    19.43   -10.24     0.26     0.51     8.30
                          2SC        26.21    19.43     3.43     0.09     0.18     3.00
                          2SW       175.60    19.43    10.27     0.62     1.23    20.10
                          3PC        26.21    40.00    -3.43     0.09     0.18     3.00
                          3PW       490.34    40.01   -10.28     1.72     3.42    56.13
                          3SC        26.21    40.01     3.43     0.09     0.18     3.00
                          3SW       574.36    40.01    10.28     2.01     4.01    65.74
                          4PC       262.11    60.58    -3.43     0.91     1.83    30.00
                          4PW       856.16    60.58   -10.28     2.99     5.97    98.00
                          4SC       262.11    60.58     3.43     0.91     1.83    30.00
                          4SW       856.16    60.58    10.28     2.99     5.97    98.00
                          5PC       295.21    83.42    -3.43     2.16     3.96    60.00
                          5PW       560.40    80.09   -10.28     2.36     4.45    70.62
                          5SC       290.58    83.42     3.43     2.16     3.96    60.00
                          5SW       644.67    80.23    10.28     2.67     5.05    81.24
                                ========  ========  =======  =======  =======
                                Total     10052.61    46.75     0.00     3.60
                                Buoyancy  10052.61    46.75    -0.00     2.21
```




```
                    ********************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                    1 July, 2025                 *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                               *
*          ---------     Intact Stability Check    -- PHASE 9 ---------                              *
*                                                                                                     *
*******************************************************************************************************

                          +++ D R A F T   M A R K   R E A D I N G S +++
                          ============================================

                Process is 9: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
**********************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025          *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                               *
*         ---------     Intact Stability Check    -- PHASE 9 ---------             . *
*                                                                                    *
**************************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 9: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 3.60, and Wind Speed = 10 Knots

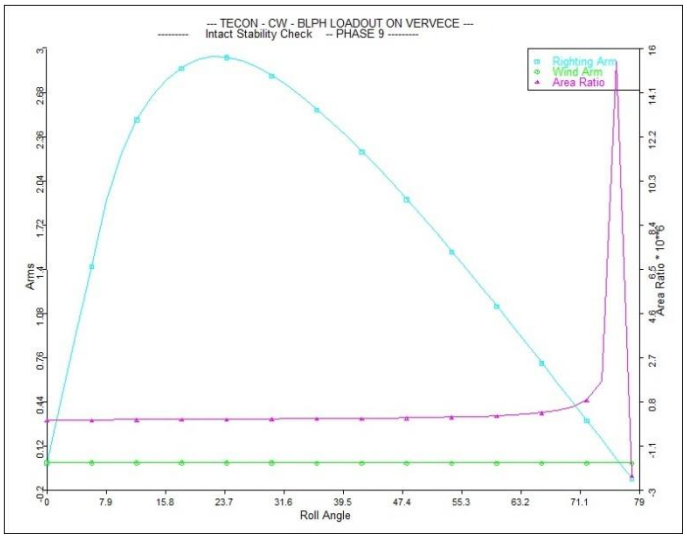
Initial: Roll = 0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.47	0.47	0.00	0.00	2951.24	0.472
4.29	4.00	0.00	9999.00	1.49	0.95	1.89	0.00	0.00	6068.26	0.947
4.27	6.00	0.00	9999.00	1.03	1.42	4.26	0.00	0.00	9531.84	1.424
4.25	8.00	0.00	9999.00	0.57	1.90	7.58	0.00	0.00	9999.00	1.896
4.26	10.00	0.00	9999.00	0.08	2.25	11.72	0.00	0.00	9999.00	2.246
4.31	12.00	0.00	9999.00	-0.46	2.49	16.45	0.00	0.00	9999.00	2.485
4.39	14.00	0.00	9999.00	-1.04	2.65	21.59	0.00	0.00	9999.00	2.654
4.48	16.00	0.00	9999.00	-1.63	2.77	27.02	0.00	0.00	9999.00	2.774
4.60	18.00	0.00	9999.00	-2.25	2.86	32.65	0.00	0.00	9999.00	2.858
4.72	20.00	0.00	9999.00	-2.88	2.91	38.43	0.00	0.00	9999.00	2.914
4.85	22.00	0.00	9999.00	-3.51	2.94	44.28	0.00	0.00	9999.00	2.941
4.97	24.00	0.00	9999.00	-4.14	2.94	50.16	0.00	0.00	9999.00	2.937
5.09	26.00	0.00	9999.00	-4.77	2.91	56.00	0.00	0.00	9999.00	2.909
5.20	28.00	0.00	9999.00	-5.39	2.86	61.78	0.00	0.00	9999.00	2.863
5.31	30.00	0.00	9999.00	-6.01	2.80	67.44	0.00	0.00	9999.00	2.803
5.41	32.00	0.00	9999.00	-6.62	2.73	72.98	0.00	0.00	9999.00	2.731
5.50	34.00	0.00	9999.00	-7.22	2.65	78.36	0.00	0.00	9999.00	2.649
5.58	36.00	0.00	9999.00	-7.81	2.56	83.57	-0.00	0.00	9999.00	2.560
5.66	38.00	0.00	9999.00	-8.39	2.46	88.59	-0.00	0.00	9999.00	2.464
5.73	40.00	0.00	9999.00	-8.96	2.36	93.42	-0.00	0.00	9999.00	2.362
5.80	42.00	0.00	9999.00	-9.52	2.26	98.03	-0.00	0.00	9999.00	2.255
5.86	44.00	0.00	9999.00	-10.07	2.14	102.43	-0.00	0.00	9999.00	2.143
5.91	46.00	0.00	9999.00	-10.61	2.03	106.60	-0.00	0.00	9999.00	2.028
5.95	48.00	0.00	9999.00	-11.13	1.91	110.54	-0.00	0.00	9999.00	1.908
5.99	50.00	0.00	9999.00	-11.64	1.79	114.23	-0.00	0.00	9999.00	1.785
6.02	52.00	0.00	9999.00	-12.14	1.66	117.68	-0.00	0.00	9999.00	1.659
6.04	54.00	0.00	9999.00	-12.62	1.53	120.87	-0.00	0.00	9999.00	1.531
6.05	56.00	0.00	9999.00	-13.08	1.40	123.80	-0.00	0.00	9999.00	1.400
6.06	58.00	0.00	9999.00	-13.53	1.27	126.46	-0.00	0.00	9999.00	1.267
6.06	60.00	0.00	9999.00	-13.97	1.13	128.86	-0.00	0.00	9999.00	1.133
6.05	62.00	0.00	9999.00	-14.38	1.00	130.99	-0.00	0.00	9999.00	0.997
6.03	64.00	0.00	9999.00	-14.78	0.86	132.85	-0.00	0.00	9999.00	0.860
6.01	66.00	0.00	9999.00	-15.16	0.72	134.43	-0.00	0.00	9999.00	0.723
5.98	68.00	0.00	9999.00	-15.53	0.58	135.74	-0.00	0.00	9999.00	0.584
5.94	70.00	0.00	9999.00	-15.87	0.44	136.77	-0.00	0.00	9999.00	0.445
5.90	72.00	0.00	9999.00	-16.19	0.30	137.52	-0.00	0.00	9999.00	0.305
5.85	74.00	0.00	9999.00	-16.50	0.16	137.99	-0.00	0.00	9999.00	0.165
5.79	76.00	0.00	9999.00	-16.78	0.02	138.18	-0.00	0.00	9999.00	0.025
5.72	78.00	0.00	9999.00	-17.05	-0.12	138.09	-0.00	-0.00	-9999.00	-0.116

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--- TECON - CW - BLPH LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 9
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^6
Roll Angle
0
7.9
15.8
23.7
31.6
39.5
47.4
55.3
63.2
71.1
79

```
**********************************************************
*                                  ***  MOSES    ***                                  *
*                                  ----------------                  1 July, 2025    *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*         ------   Longitudinal Strength Analysis - Still Water  -- PHASE 9 ------   *
*                                                                                     *
***************************************************************************************************************
```

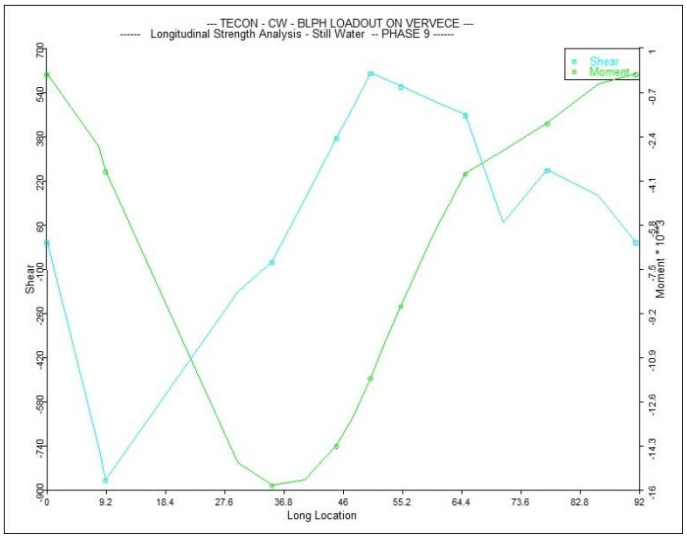
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 9: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-745	-2795	-0.1105	14.0442
9.14	-863	-3727	-0.1473	16.0160
29.72	-183	-14936	-0.5902	43.2930
35.00	-71	-15805	-0.6246	46.3995
40.00	152	-15605	-0.6167	47.5606
45.00	375	-14288	-0.5646	47.0118
47.50	486	-13210	-0.5221	46.1367
50.29	610	-11679	-0.4615	44.7314
52.50	588	-10356	-0.4093	43.3332
55.00	563	-8917	-0.3524	41.4827
60.00	511	-6232	-0.2463	37.0822
65.00	459	-3807	-0.1505	31.9920
70.87	68	-2954	-0.1168	25.4657
77.72	259	-1875	-0.0741	17.2768
85.70	164	-388	-0.0154	7.2863
91.44	-1	0	0.0000	0.0002



```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------                  1 July, 2025    *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ---------     Intact Stability Check    -- PHASE 10 ---------              *
*                                                                                    *
**************************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                    Process is 10: Units Are Degrees, Meters, and M-Tons Unless Specified

                                   Results Are Reported In Body System

                        Draft =     4.30 Roll Angle =    -0.00 Pitch Angle =     0.00

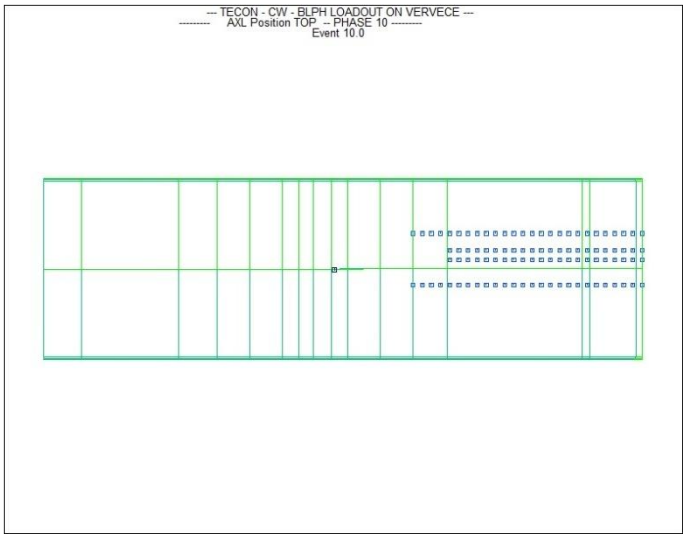
                                     Wet Radii Of Gyration About CG

                                K-X =     8.28 K-Y =    27.37 K-Z =    28.10

                                      GMT =    13.39 GML =   160.21

                                /-- Center of Gravity ---/  Sounding   % Full
                           Name  Weight    ---X---  ---Y---  ---Z---  -------- --------

                                ----------------  Part AXL10      ------------
                                LOAD_GRO   1913.20    16.56    -1.39     7.10
                                ----------------  Part CF         ------------
                                LOAD_GRO     28.00    69.38    11.22     8.10
                                ----------------  Part GRI&SF-B   ------------
                                LOAD_GRO     75.00    30.86    -1.14     7.35
                                ----------------  Part GRI&SF-C   ------------
                                LOAD_GRO      0.50    67.44    11.22     7.10
                                ----------------  Part GRI&SF-T   ------------
                                LOAD_GRO     45.00    65.20    -2.92     7.40
                                ----------------  Part TP         ------------
                                LOAD_GRO    254.50    65.54    -2.14     9.35
                                ----------------  Part VERVECE    ------------
                                LOAD_GRO   1832.80    47.02     0.00     3.52
                                           --- Contents ---
                           1PC      229.92     5.62    -3.43     3.77     6.02    98.00
                           1PW      117.49     6.50   -10.28     2.53     4.06    50.00
                           1SC      230.42     5.62     3.43     3.77     6.02    98.00
                           1SW      117.49     6.50    10.28     2.53     4.06    50.00
                           2PC       26.21    19.43    -3.43     0.09     0.18     3.00
                           2PW       72.47    19.43   -10.24     0.26     0.51     8.30
                           2SC       26.21    19.43     3.43     0.09     0.18     3.00
                           2SW      175.60    19.43    10.27     0.62     1.23    20.10
                           3PC       26.21    40.00    -3.43     0.09     0.18     3.00
                           3PW      338.06    40.01   -10.28     1.18     2.36    38.70
                           3SC       26.21    40.01     3.43     0.09     0.18     3.00
                           3SW      437.76    40.01    10.28     1.53     3.06    50.11
                           4PC      262.11    60.58    -3.43     0.91     1.83    30.00
                           4PW      856.16    60.58   -10.28     2.99     5.97    98.00
                           4SC      262.11    60.58     3.43     0.91     1.83    30.00
                           4SW      856.16    60.58    10.28     2.99     5.97    98.00
                           5PC      295.21    83.42    -3.43     2.16     3.96    60.00
                           5PW      578.35    80.12   -10.28     2.43     4.58    72.88
                           5SC      290.58    83.42     3.43     2.16     3.96    60.00
                           5SW      678.90    80.27    10.28     2.80     5.29    85.55
                                ========  ========  =======  =======  =======
                                Total     10052.61    46.76     0.00     3.70
                                Buoyancy  10052.61    46.76     0.00     2.21
```




```
                    ********************************************************
*                                       ***  MOSES   ***                                                  *
*                                       ----------------                    1 July, 2025                 *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 10 ---------                                  *
*                                                                                                         *
***********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 10: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
                    ******************************************************
*                                      ***  MOSES   ***                                                    *
*                                      ----------------                          1 July, 2025             *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 10 ---------                                  .*
*                                                                                                         *
***********************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 10: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 3.70, and Wind Speed = 10 Knots

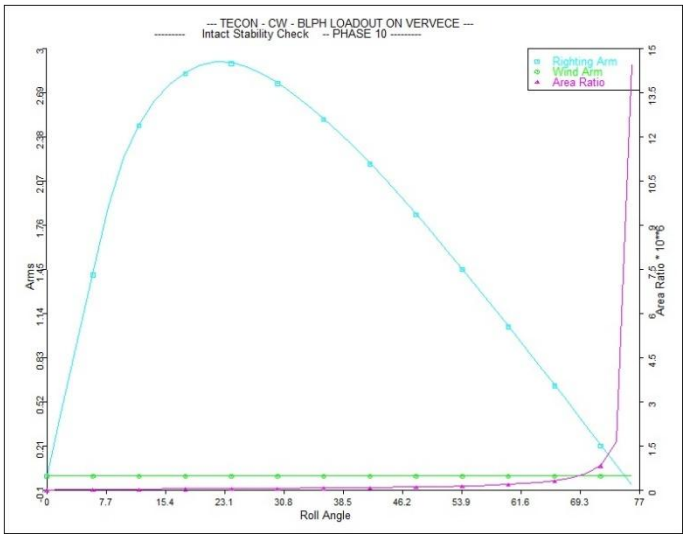
Initial: Roll = -0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.39	0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.47	0.47	0.00	0.00	2929.12	0.468
4.29	4.00	0.00	9999.00	1.48	0.94	1.88	0.00	0.00	6022.81	0.940
4.27	6.00	0.00	9999.00	1.03	1.41	4.23	0.00	0.00	9460.61	1.414
4.25	8.00	0.00	9999.00	0.57	1.88	7.53	0.00	0.00	9999.00	1.882
4.26	10.00	0.00	9999.00	0.07	2.23	11.64	0.00	0.00	9999.00	2.228
4.31	12.00	0.00	9999.00	-0.47	2.46	16.33	0.00	0.00	9999.00	2.464
4.39	14.00	0.00	9999.00	-1.04	2.63	21.42	0.00	0.00	9999.00	2.630
4.48	16.00	0.00	9999.00	-1.63	2.75	26.80	0.00	0.00	9999.00	2.746
4.60	18.00	0.00	9999.00	-2.25	2.83	32.37	0.00	0.00	9999.00	2.828
4.72	20.00	0.00	9999.00	-2.88	2.88	38.08	0.00	0.00	9999.00	2.881
4.85	22.00	0.00	9999.00	-3.51	2.91	43.87	0.00	0.00	9999.00	2.905
4.97	24.00	0.00	9999.00	-4.15	2.90	49.67	0.00	0.00	9999.00	2.899
5.09	26.00	0.00	9999.00	-4.77	2.87	55.44	0.00	0.00	9999.00	2.868
5.20	28.00	0.00	9999.00	-5.40	2.82	61.13	0.00	0.00	9999.00	2.820
5.31	30.00	0.00	9999.00	-6.01	2.76	66.70	0.00	0.00	9999.00	2.757
5.41	32.00	0.00	9999.00	-6.62	2.68	72.14	0.00	0.00	9999.00	2.682
5.50	34.00	0.00	9999.00	-7.22	2.60	77.42	0.00	0.00	9999.00	2.598
5.58	36.00	0.00	9999.00	-7.81	2.51	82.53	-0.00	0.00	9999.00	2.506
5.66	38.00	0.00	9999.00	-8.39	2.41	87.44	-0.00	0.00	9999.00	2.407
5.73	40.00	0.00	9999.00	-8.96	2.30	92.15	-0.00	0.00	9999.00	2.302
5.80	42.00	0.00	9999.00	-9.52	2.19	96.64	-0.00	0.00	9999.00	2.192
5.86	44.00	0.00	9999.00	-10.07	2.08	100.91	-0.00	0.00	9999.00	2.077
5.91	46.00	0.00	9999.00	-10.61	1.96	104.95	-0.00	0.00	9999.00	1.959
5.95	48.00	0.00	9999.00	-11.13	1.84	108.74	-0.00	0.00	9999.00	1.836
5.99	50.00	0.00	9999.00	-11.64	1.71	112.29	-0.00	0.00	9999.00	1.711
6.01	52.00	0.00	9999.00	-12.14	1.58	115.58	-0.00	0.00	9999.00	1.583
6.04	54.00	0.00	9999.00	-12.62	1.45	118.62	-0.00	0.00	9999.00	1.453
6.05	56.00	0.00	9999.00	-13.08	1.32	121.39	-0.00	0.00	9999.00	1.320
6.06	58.00	0.00	9999.00	-13.53	1.19	123.90	-0.00	0.00	9999.00	1.186
6.06	60.00	0.00	9999.00	-13.97	1.05	126.14	-0.00	0.00	9999.00	1.050
6.05	62.00	0.00	9999.00	-14.38	0.91	128.10	-0.00	0.00	9999.00	0.913
6.03	64.00	0.00	9999.00	-14.78	0.77	129.79	-0.00	0.00	9999.00	0.775
6.01	66.00	0.00	9999.00	-15.16	0.64	131.20	-0.00	0.00	9999.00	0.636
5.98	68.00	0.00	9999.00	-15.53	0.50	132.33	-0.00	0.00	9999.00	0.496
5.94	70.00	0.00	9999.00	-15.87	0.36	133.18	-0.00	0.00	9999.00	0.356
5.90	72.00	0.00	9999.00	-16.19	0.21	133.75	-0.00	0.00	9999.00	0.215
5.85	74.00	0.00	9999.00	-16.50	0.07	134.04	-0.00	0.00	9999.00	0.074
5.79	76.00	0.00	9999.00	-16.78	-0.07	134.05	-0.00	0.00	9999.00	-0.067

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--- TECON - CW - BLPH LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 10
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10**6
Roll Angle
0
7.7
15.4
23.1
30.8
38.5
46.2
53.9
61.6
69.3
77

```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025         *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ------   Longitudinal Strength Analysis - Still Water  -- PHASE 10 ------   *
*                                                                                    *
**************************************************************************************************************
```

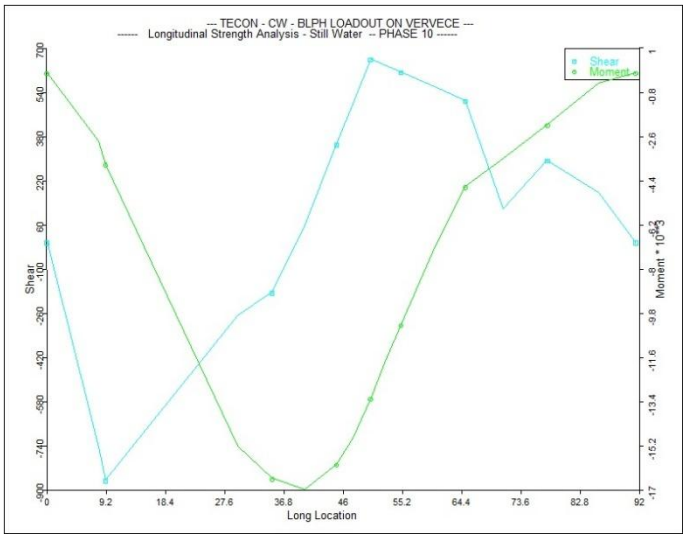
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 10: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-745	-2797	-0.1106	14.8403
9.14	-863	-3729	-0.1474	16.9258
29.72	-267	-15205	-0.6009	46.2128
35.00	-184	-16536	-0.6535	49.7862
40.00	59	-16977	-0.6709	51.3039
45.00	352	-15950	-0.6303	50.9636
47.50	499	-14887	-0.5883	50.1256
50.29	662	-13267	-0.5243	48.7078
52.50	639	-11830	-0.4675	47.2608
55.00	614	-10263	-0.4056	45.3169
60.00	563	-7321	-0.2893	40.6216
65.00	510	-4639	-0.1834	35.1171
70.87	119	-3484	-0.1377	27.9895
77.72	294	-2110	-0.0834	18.9980
85.70	178	-429	-0.0170	8.0129
91.44	-1	0	0.0000	0.0001



```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  -----------------                 1 July, 2025    *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ---------     Intact Stability Check    -- PHASE 11 ---------              *
*                                                                                    *
**************************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                    Process is 11: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Results Are Reported In Body System

                        Draft =     4.30 Roll Angle =    -0.00 Pitch Angle =     0.00

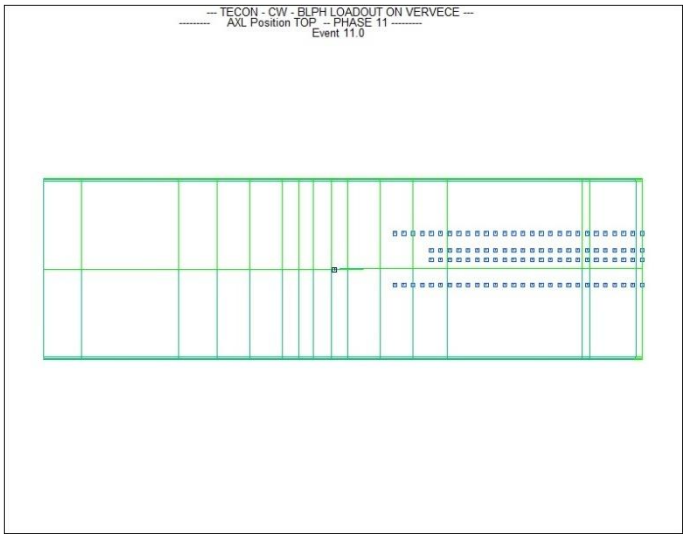
                                    Wet Radii Of Gyration About CG

                               K-X =     8.20 K-Y =    27.45 K-Z =    28.15

                                       GMT =    13.31 GML =   160.16

                               /-- Center of Gravity ---/  Sounding   % Full
                          Name  Weight    ---X---  ---Y---  ---Z---  -------- --------

                               ----------------  Part AXL11      ------------
                               LOAD_GRO   2071.00    17.93    -1.39     7.10
                               ----------------  Part CF         ------------
                               LOAD_GRO     28.00    69.38    11.22     8.10
                               ----------------  Part GRI&SF-B   ------------
                               LOAD_GRO     75.00    30.86    -1.14     7.35
                               ----------------  Part GRI&SF-C   ------------
                               LOAD_GRO      0.50    67.44    11.22     7.10
                               ----------------  Part GRI&SF-T   ------------
                               LOAD_GRO     45.00    65.20    -2.92     7.40
                               ----------------  Part TP         ------------
                               LOAD_GRO    254.50    65.54    -2.14     9.35
                               ----------------  Part VERVECE    ------------
                               LOAD_GRO   1832.80    47.02     0.00     3.52
                                            --- Contents ---
                          1PC      229.92     5.62    -3.43     3.77     6.02    98.00
                          1PW      117.49     6.50   -10.28     2.53     4.06    50.00
                          1SC      230.42     5.62     3.43     3.77     6.02    98.00
                          1SW      117.49     6.50    10.28     2.53     4.06    50.00
                          2PC       26.21    19.43    -3.43     0.09     0.18     3.00
                          2PW       72.47    19.43   -10.24     0.26     0.51     8.30
                          2SC       26.21    19.43     3.43     0.09     0.18     3.00
                          2SW      175.60    19.43    10.27     0.62     1.23    20.10
                          3PC       26.21    40.00    -3.43     0.09     0.18     3.00
                          3PW      244.10    40.01   -10.27     0.86     1.71    27.94
                          3SC       26.21    40.01     3.43     0.09     0.18     3.00
                          3SW      354.21    40.01    10.28     1.24     2.48    40.55
                          4PC      262.11    60.58    -3.43     0.91     1.83    30.00
                          4PW      856.16    60.58   -10.28     2.99     5.97    98.00
                          4SC      262.11    60.58     3.43     0.91     1.83    30.00
                          4SW      856.16    60.58    10.28     2.99     5.97    98.00
                          5PC      295.21    83.42    -3.43     2.16     3.96    60.00
                          5PW      582.76    80.13   -10.28     2.44     4.61    73.43
                          5SC      290.58    83.42     3.43     2.16     3.96    60.00
                          5SW      694.20    80.29    10.28     2.85     5.40    87.48
                               ========  ========  =======  =======  =======
                               Total     10052.61    46.75     0.00     3.78
                               Buoyancy  10052.61    46.75     0.00     2.21
```




```
                    ********************************************************
*                                      ***  MOSES   ***                                                  *
*                                      ----------------                    1 July, 2025                 *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                  *
*          ---------     Intact Stability Check    -- PHASE 11 ---------                                *
*                                                                                                       *
*************************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 11: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
**********************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025         *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                               *
*         ---------     Intact Stability Check    -- PHASE 11 ---------            .*
*                                                                                    *
**************************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 11: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 3.78, and Wind Speed = 10 Knots

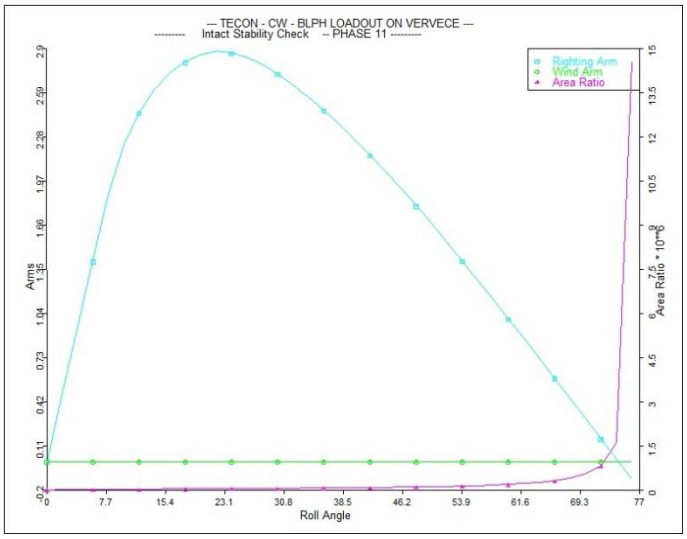
Initial: Roll = -0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *STEPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.47	0.47	0.00	0.00	2911.83	0.465
4.29	4.00	0.00	9999.00	1.49	0.93	1.87	0.00	0.00	5987.33	0.934
4.27	6.00	0.00	9999.00	1.03	1.41	4.21	0.00	0.00	9404.99	1.405
4.25	8.00	0.00	9999.00	0.57	1.87	7.48	0.00	0.00	9999.00	1.871
4.26	10.00	0.00	9999.00	0.07	2.21	11.57	0.00	0.00	9999.00	2.214
4.31	12.00	0.00	9999.00	-0.46	2.45	16.23	0.00	0.00	9999.00	2.448
4.39	14.00	0.00	9999.00	-1.04	2.61	21.29	0.00	0.00	9999.00	2.611
4.48	16.00	0.00	9999.00	-1.63	2.73	26.62	0.00	0.00	9999.00	2.725
4.60	18.00	0.00	9999.00	-2.25	2.80	32.15	0.00	0.00	9999.00	2.804
4.72	20.00	0.00	9999.00	-2.88	2.86	37.81	0.00	0.00	9999.00	2.855
4.85	22.00	0.00	9999.00	-3.51	2.88	43.54	0.00	0.00	9999.00	2.877
4.97	24.00	0.00	9999.00	-4.14	2.87	49.29	0.00	0.00	9999.00	2.868
5.09	26.00	0.00	9999.00	-4.77	2.84	54.99	0.00	0.00	9999.00	2.835
5.20	28.00	0.00	9999.00	-5.39	2.78	60.61	0.00	0.00	9999.00	2.785
5.31	30.00	0.00	9999.00	-6.01	2.72	66.12	0.00	0.00	9999.00	2.720
5.41	32.00	0.00	9999.00	-6.62	2.64	71.48	0.00	0.00	9999.00	2.644
5.50	34.00	0.00	9999.00	-7.22	2.56	76.68	0.00	0.00	9999.00	2.559
5.58	36.00	0.00	9999.00	-7.81	2.47	81.71	-0.00	0.00	9999.00	2.466
5.66	38.00	0.00	9999.00	-8.39	2.37	86.54	-0.00	0.00	9999.00	2.367
5.73	40.00	0.00	9999.00	-8.96	2.26	91.17	-0.00	0.00	9999.00	2.261
5.80	42.00	0.00	9999.00	-9.52	2.15	95.58	-0.00	0.00	9999.00	2.151
5.86	44.00	0.00	9999.00	-10.07	2.04	99.77	-0.00	0.00	9999.00	2.037
5.91	46.00	0.00	9999.00	-10.61	1.92	103.72	-0.00	0.00	9999.00	1.918
5.95	48.00	0.00	9999.00	-11.13	1.80	107.44	-0.00	0.00	9999.00	1.795
5.99	50.00	0.00	9999.00	-11.64	1.67	110.90	-0.00	0.00	9999.00	1.669
6.02	52.00	0.00	9999.00	-12.14	1.54	114.11	-0.00	0.00	9999.00	1.541
6.04	54.00	0.00	9999.00	-12.62	1.41	117.06	-0.00	0.00	9999.00	1.409
6.05	56.00	0.00	9999.00	-13.08	1.28	119.75	-0.00	0.00	9999.00	1.275
6.06	58.00	0.00	9999.00	-13.53	1.14	122.16	-0.00	0.00	9999.00	1.140
6.06	60.00	0.00	9999.00	-13.97	1.00	124.30	-0.00	0.00	9999.00	1.002
6.05	62.00	0.00	9999.00	-14.38	0.86	126.17	-0.00	0.00	9999.00	0.864
6.03	64.00	0.00	9999.00	-14.78	0.72	127.76	-0.00	0.00	9999.00	0.724
6.01	66.00	0.00	9999.00	-15.16	0.58	129.07	-0.00	0.00	9999.00	0.584
5.98	68.00	0.00	9999.00	-15.53	0.44	130.09	-0.00	0.00	9999.00	0.443
5.94	70.00	0.00	9999.00	-15.87	0.30	130.84	-0.00	0.00	9999.00	0.301
5.90	72.00	0.00	9999.00	-16.19	0.16	131.30	-0.00	0.00	9999.00	0.159
5.85	74.00	0.00	9999.00	-16.50	0.02	131.47	-0.00	0.00	9999.00	0.017
5.79	76.00	0.00	9999.00	-16.78	-0.13	131.37	-0.00	0.00	9999.00	-0.125

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--- TECON - CW - BLPH LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 11
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10**6
Roll Angle
0
7.7
15.4
23.1
30.8
38.5
46.2
53.9
61.6
69.3
77

```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025         *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                               *
*         ------   Longitudinal Strength Analysis - Still Water  -- PHASE 11 ------ *
*                                                                                    *
**************************************************************************************************************
```

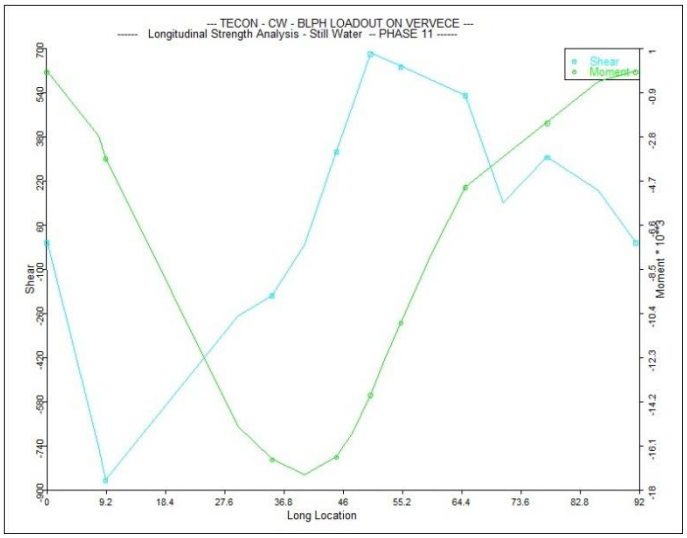
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 11: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-745	-2796	-0.1105	15.1046
9.14	-863	-3728	-0.1474	17.2279
29.72	-271	-15264	-0.6032	47.1863
35.00	-193	-16674	-0.6589	50.9196
40.00	-9	-17351	-0.6857	52.5730
45.00	327	-16559	-0.6544	52.3280
47.50	495	-15532	-0.6138	51.5141
50.29	682	-13889	-0.5489	50.1022
52.50	660	-12408	-0.4903	48.6447
55.00	634	-10790	-0.4264	46.6739
60.00	583	-7747	-0.3062	41.8832
65.00	530	-4964	-0.1962	36.2358
70.87	140	-3691	-0.1459	28.8959
77.72	307	-2202	-0.0871	19.6174
85.70	184	-445	-0.0176	8.2746
91.44	-1	0	0.0000	0.0002



```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------                  1 July, 2025    *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ---------     Intact Stability Check    -- PHASE 12 ---------              *
*                                                                                    *
**************************************************************************************************************

                +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                ======================================================================

                Process is 12: Units Are Degrees, Meters, and M-Tons Unless Specified

                                Results Are Reported In Body System

                    Draft =     4.30 Roll Angle =    -0.00 Pitch Angle =    -0.00

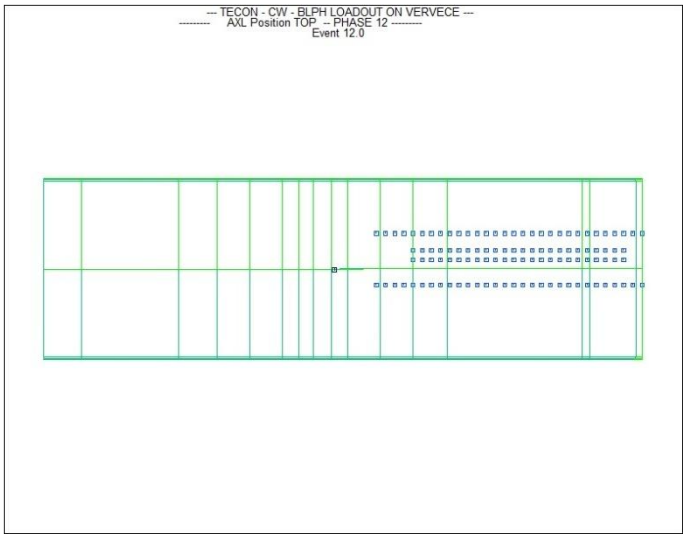
                                Wet Radii Of Gyration About CG

                              K-X =     8.15 K-Y =    27.18 K-Z =    27.87

                                       GMT =    13.27 GML =   160.10

                              /-- Center of Gravity ---/  Sounding   % Full
                        Name   Weight    ---X---  ---Y---  ---Z---  -------- --------

                              ----------------  Part AXL12      ------------
                              LOAD_GRO   2176.20    19.77    -1.37     7.10
                              ----------------  Part CF         ------------
                              LOAD_GRO     28.00    69.38    11.22     8.10
                              ----------------  Part GRI&SF-B   ------------
                              LOAD_GRO     75.00    30.86    -1.14     7.35
                              ----------------  Part GRI&SF-C   ------------
                              LOAD_GRO      0.50    67.44    11.22     7.10
                              ----------------  Part GRI&SF-T   ------------
                              LOAD_GRO     45.00    65.20    -2.92     7.40
                              ----------------  Part TP         ------------
                              LOAD_GRO    254.50    65.54    -2.14     9.35
                              ----------------  Part VERVECE    ------------
                              LOAD_GRO   1832.80    47.02     0.00     3.52
                                           --- Contents ---
                        1PC      229.92     5.62    -3.43     3.77     6.02    98.00
                        1PW      117.49     6.50   -10.28     2.53     4.06    50.00
                        1SC      230.42     5.62     3.43     3.77     6.02    98.00
                        1SW      117.49     6.50    10.28     2.53     4.06    50.00
                        2PC       26.21    19.43    -3.43     0.09     0.18     3.00
                        2PW       72.47    19.43   -10.24     0.26     0.51     8.30
                        2SC       26.21    19.43     3.43     0.09     0.18     3.00
                        2SW      175.60    19.43    10.27     0.62     1.23    20.10
                        3PC       26.21    40.00    -3.43     0.09     0.18     3.00
                        3PW      209.88    40.00   -10.27     0.74     1.47    24.02
                        3SC       26.21    40.01     3.43     0.09     0.18     3.00
                        3SW      325.11    40.00    10.28     1.14     2.27    37.21
                        4PC      262.11    60.58    -3.43     0.91     1.83    30.00
                        4PW      856.16    60.58   -10.28     2.99     5.97    98.00
                        4SC      262.11    60.58     3.43     0.91     1.83    30.00
                        4SW      856.16    60.58    10.28     2.99     5.97    98.00
                        5PC      295.21    83.42    -3.43     2.16     3.96    60.00
                        5PW      559.17    80.09   -10.28     2.36     4.45    70.46
                        5SC      290.58    83.42     3.43     2.16     3.96    60.00
                        5SW      675.91    80.27    10.28     2.79     5.27    85.17
                              ========  ========  =======  =======  =======
                              Total     10052.61    46.75     0.00     3.83
                              Buoyancy  10052.61    46.75     0.00     2.21
```




```
                    ********************************************************
*                                       ***  MOSES   ***                                                  *
*                                       ----------------                    1 July, 2025                 *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                    *
*          ---------     Intact Stability Check    -- PHASE 12 ---------                                  *
*                                                                                                         *
***********************************************************************************************************

                              +++ D R A F T   M A R K   R E A D I N G S +++
                              ============================================

                  Process is 12: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                          1 July, 2025          *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                               *
*         ---------     Intact Stability Check    -- PHASE 12 ---------                             .*
*                                                                                                    *
******************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 12: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 3.83, and Wind Speed = 10 Knots

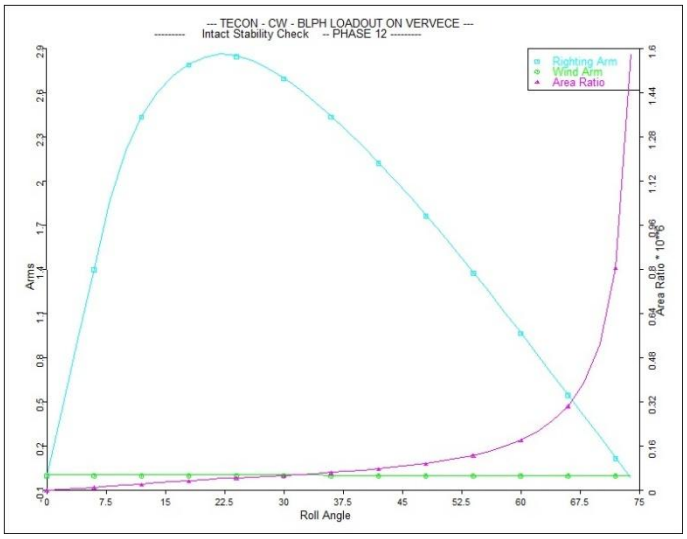
Initial: Roll = -0.00, Trim = -0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.39	0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.46	0.46	0.00	0.00	2902.86	0.464
4.29	4.00	0.00	9999.00	1.48	0.93	1.86	0.00	0.00	5968.94	0.932
4.27	6.00	0.00	9999.00	1.03	1.40	4.19	0.00	0.00	9376.14	1.401
4.25	8.00	0.00	9999.00	0.57	1.86	7.46	0.00	0.00	9999.00	1.865
4.26	10.00	0.00	9999.00	0.07	2.21	11.53	0.00	0.00	9999.00	2.207
4.31	12.00	0.00	9999.00	-0.47	2.44	16.18	0.00	0.00	9999.00	2.439
4.39	14.00	0.00	9999.00	-1.04	2.60	21.22	0.00	0.00	9999.00	2.600
4.49	16.00	0.00	9999.00	-1.63	2.71	26.53	0.00	0.00	9999.00	2.713
4.60	18.00	0.00	9999.00	-2.25	2.79	32.03	0.00	0.00	9999.00	2.790
4.72	20.00	0.00	9999.00	-2.88	2.84	37.66	0.00	0.00	9999.00	2.840
4.85	22.00	0.00	9999.00	-3.51	2.86	43.36	0.00	0.00	9999.00	2.859
4.97	24.00	0.00	9999.00	-4.15	2.85	49.07	0.00	0.00	9999.00	2.849
5.09	26.00	0.00	9999.00	-4.77	2.82	54.73	0.00	0.00	9999.00	2.815
5.20	28.00	0.00	9999.00	-5.40	2.76	60.31	0.00	0.00	9999.00	2.763
5.31	30.00	0.00	9999.00	-6.01	2.70	65.77	0.00	0.00	9999.00	2.697
5.41	32.00	0.00	9999.00	-6.62	2.62	71.09	0.00	0.00	9999.00	2.620
5.50	34.00	0.00	9999.00	-7.22	2.53	76.24	0.00	0.00	9999.00	2.534
5.59	36.00	0.00	9999.00	-7.81	2.44	81.22	-0.00	0.00	9999.00	2.440
5.66	38.00	0.00	9999.00	-8.39	2.34	86.00	-0.00	0.00	9999.00	2.340
5.74	40.00	0.00	9999.00	-8.96	2.23	90.57	-0.00	0.00	9999.00	2.234
5.80	42.00	0.00	9999.00	-9.52	2.12	94.93	-0.00	0.00	9999.00	2.123
5.86	44.00	0.00	9999.00	-10.07	2.01	99.06	-0.00	0.00	9999.00	2.008
5.91	46.00	0.00	9999.00	-10.61	1.89	102.95	-0.00	0.00	9999.00	1.889
5.95	48.00	0.00	9999.00	-11.13	1.77	106.61	-0.00	0.00	9999.00	1.765
5.99	50.00	0.00	9999.00	-11.64	1.64	110.01	-0.00	0.00	9999.00	1.639
6.02	52.00	0.00	9999.00	-12.14	1.51	113.16	-0.00	0.00	9999.00	1.509
6.04	54.00	0.00	9999.00	-12.62	1.38	116.04	-0.00	0.00	9999.00	1.377
6.05	56.00	0.00	9999.00	-13.09	1.24	118.66	-0.00	0.00	9999.00	1.242
6.06	58.00	0.00	9999.00	-13.54	1.11	121.01	-0.00	0.00	9999.00	1.106
6.06	60.00	0.00	9999.00	-13.97	0.97	123.08	-0.00	0.00	9999.00	0.968
6.05	62.00	0.00	9999.00	-14.38	0.83	124.88	-0.00	0.00	9999.00	0.828
6.03	64.00	0.00	9999.00	-14.78	0.69	126.40	-0.00	0.00	9999.00	0.688
6.01	66.00	0.00	9999.00	-15.16	0.55	127.63	-0.00	0.00	9999.00	0.547
5.98	68.00	0.00	9999.00	-15.53	0.40	128.58	-0.00	0.00	9999.00	0.405
5.94	70.00	0.00	9999.00	-15.87	0.26	129.25	-0.00	0.00	9999.00	0.262
5.90	72.00	0.00	9999.00	-16.19	0.12	129.63	-0.00	0.00	9999.00	0.120
5.85	74.00	0.00	9999.00	-16.50	-0.02	129.73	-0.00	0.00	9999.00	-0.023

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--- TECON - CW - BLPH LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 12 ---
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^-6
Roll Angle
0
7.5
15
22.5
30
37.5
45
52.5
60
67.5
75

```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025         *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                               *
*         ------   Longitudinal Strength Analysis - Still Water  -- PHASE 12 ------ *
*                                                                                    *
**************************************************************************************************************
```

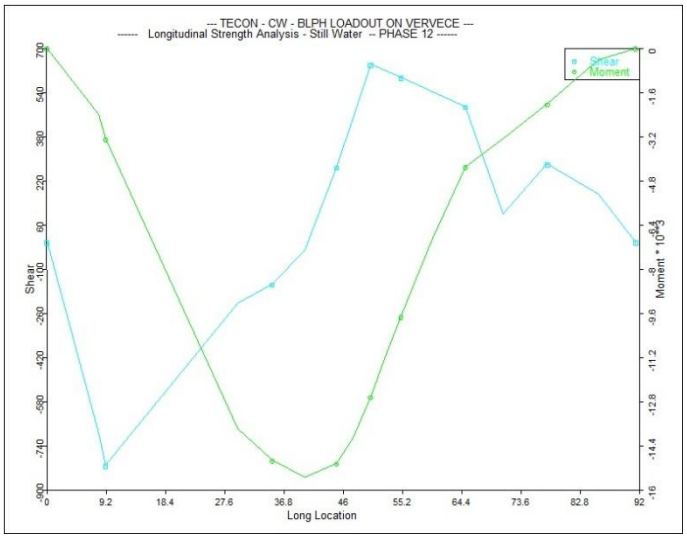
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 12: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-692	-2411	-0.0953	13.6131
9.14	-810	-3283	-0.1298	15.5293
29.72	-222	-13780	-0.5445	42.5330
35.00	-153	-14923	-0.5897	45.8798
40.00	-30	-15531	-0.6137	47.3625
45.00	270	-15032	-0.5940	47.1426
47.50	445	-14138	-0.5587	46.4064
50.29	641	-12621	-0.4988	45.1263
52.50	619	-11230	-0.4438	43.8046
55.00	593	-9715	-0.3839	42.0179
60.00	542	-6877	-0.2718	37.6808
65.00	489	-4299	-0.1699	32.5832
70.87	98	-3267	-0.1291	25.9802
77.72	280	-2014	-0.0796	17.6427
85.70	173	-412	-0.0163	7.4431
91.44	-1	0	0.0000	0.0002



```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  -----------------          1 July, 2025         *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ---------     Intact Stability Check    -- PHASE 13 ---------              *
*                                                                                    *
**************************************************************************************************************

                  +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                  ====================================================================

                  Process is 13: Units Are Degrees, Meters, and M-Tons Unless Specified

                                 Results Are Reported In Body System

                      Draft =     4.30 Roll Angle =    -0.00 Pitch Angle =    -0.00

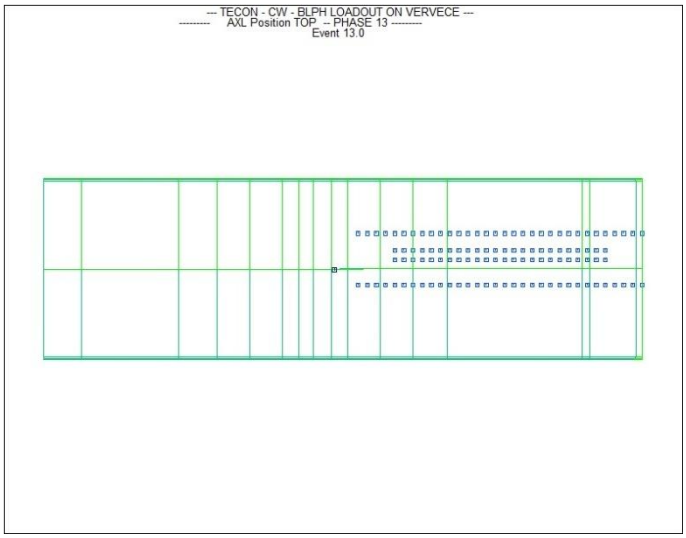
                                   Wet Radii Of Gyration About CG

                               K-X =     8.10 K-Y =    26.91 K-Z =    27.58

                                        GMT =    13.22 GML =   160.02

                               /-- Center of Gravity ---/  Sounding   % Full
                          Name  Weight    ---X---  ---Y---  ---Z---  -------- --------

                               ----------------  Part AXL13      ------------
                               LOAD_GRO   2281.40    21.56    -1.36     7.10
                               ----------------  Part CF         ------------
                               LOAD_GRO     28.00    69.38    11.22     8.10
                               ----------------  Part GRI&SF-B   ------------
                               LOAD_GRO     75.00    30.86    -1.14     7.35
                               ----------------  Part GRI&SF-C   ------------
                               LOAD_GRO      0.50    67.44    11.22     7.10
                               ----------------  Part GRI&SF-T   ------------
                               LOAD_GRO     45.00    65.20    -2.92     7.40
                               ----------------  Part TP         ------------
                               LOAD_GRO    254.50    65.54    -2.14     9.35
                               ----------------  Part VERVECE    ------------
                               LOAD_GRO   1832.80    47.02     0.00     3.52
                                             --- Contents ---
                          1PC      229.92     5.62    -3.43     3.77     6.02    98.00
                          1PW      117.49     6.50   -10.28     2.53     4.06    50.00
                          1SC      230.42     5.62     3.43     3.77     6.02    98.00
                          1SW      117.49     6.50    10.28     2.53     4.06    50.00
                          2PC       26.21    19.43    -3.43     0.09     0.18     3.00
                          2PW       72.47    19.43   -10.24     0.26     0.51     8.30
                          2SC       26.21    19.43     3.43     0.09     0.18     3.00
                          2SW      175.60    19.43    10.27     0.62     1.23    20.10
                          3PC       26.21    40.00    -3.43     0.09     0.18     3.00
                          3PW      178.62    40.00   -10.27     0.63     1.25    20.45
                          3SC       26.21    40.01     3.43     0.09     0.18     3.00
                          3SW      298.96    40.00    10.28     1.05     2.09    34.22
                          4PC      262.11    60.58    -3.43     0.91     1.83    30.00
                          4PW      856.16    60.58   -10.28     2.99     5.97    98.00
                          4SC      262.11    60.58     3.43     0.91     1.83    30.00
                          4SW      856.16    60.58    10.28     2.99     5.97    98.00
                          5PC      295.21    83.42    -3.43     2.16     3.96    60.00
                          5PW      532.62    80.03   -10.28     2.26     4.26    67.12
                          5SC      290.58    83.42     3.43     2.16     3.96    60.00
                          5SW      654.67    80.24    10.28     2.71     5.12    82.50
                               ========  ========  =======  =======  =======
                               Total     10052.61    46.75     0.00     3.87
                               Buoyancy  10052.61    46.75     0.00     2.21
```




```
                    ********************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                    1 July, 2025                 *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                               *
*          ---------     Intact Stability Check    -- PHASE 13 ---------                             *
*                                                                                                     *
*******************************************************************************************************

                          +++ D R A F T   M A R K   R E A D I N G S +++
                          ============================================

                Process is 13: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                          1 July, 2025          *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                               *
*         ---------     Intact Stability Check    -- PHASE 13 ---------                             .*
*                                                                                                    *
******************************************************************************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 13: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 3.87, and Wind Speed = 10 Knots

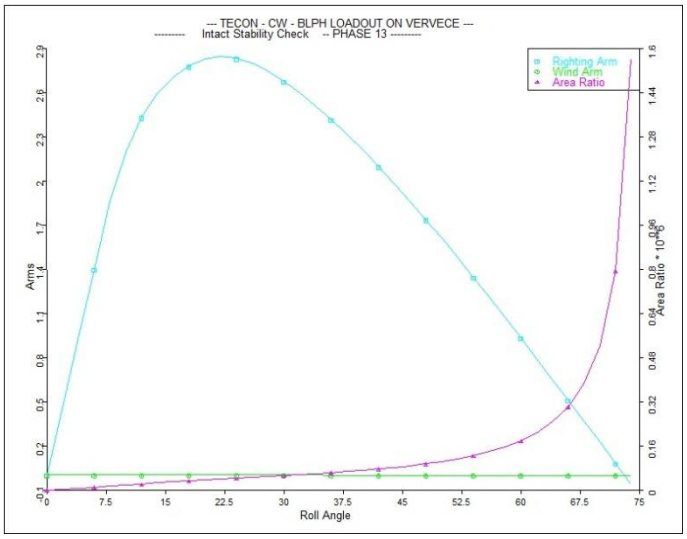
Initial: Roll = -0.00, Trim = -0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.39	0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.46	0.46	0.00	0.00	2893.72	0.463
4.29	4.00	0.00	9999.00	1.48	0.93	1.85	0.00	0.00	5950.19	0.929
4.27	6.00	0.00	9999.00	1.03	1.40	4.18	0.00	0.00	9346.74	1.397
4.25	8.00	0.00	9999.00	0.57	1.86	7.43	0.00	0.00	9999.00	1.859
4.26	10.00	0.00	9999.00	0.07	2.20	11.49	0.00	0.00	9999.00	2.200
4.31	12.00	0.00	9999.00	-0.47	2.43	16.12	0.00	0.00	9999.00	2.430
4.39	14.00	0.00	9999.00	-1.04	2.59	21.14	0.00	0.00	9999.00	2.590
4.49	16.00	0.00	9999.00	-1.63	2.70	26.43	0.00	0.00	9999.00	2.701
4.60	18.00	0.00	9999.00	-2.25	2.78	31.91	0.00	0.00	9999.00	2.777
4.72	20.00	0.00	9999.00	-2.88	2.82	37.51	0.00	0.00	9999.00	2.824
4.85	22.00	0.00	9999.00	-3.51	2.84	43.18	0.00	0.00	9999.00	2.842
4.98	24.00	0.00	9999.00	-4.15	2.83	48.85	0.00	0.00	9999.00	2.831
5.09	26.00	0.00	9999.00	-4.77	2.80	54.48	0.00	0.00	9999.00	2.796
5.20	28.00	0.00	9999.00	-5.40	2.74	60.02	0.00	0.00	9999.00	2.743
5.31	30.00	0.00	9999.00	-6.01	2.68	65.44	0.00	0.00	9999.00	2.675
5.41	32.00	0.00	9999.00	-6.62	2.60	70.71	0.00	0.00	9999.00	2.597
5.50	34.00	0.00	9999.00	-7.22	2.51	75.82	0.00	0.00	9999.00	2.509
5.59	36.00	0.00	9999.00	-7.81	2.41	80.74	-0.00	0.00	9999.00	2.414
5.66	38.00	0.00	9999.00	-8.39	2.31	85.47	-0.00	0.00	9999.00	2.313
5.74	40.00	0.00	9999.00	-8.96	2.21	89.99	-0.00	0.00	9999.00	2.207
5.80	42.00	0.00	9999.00	-9.52	2.10	94.29	-0.00	0.00	9999.00	2.095
5.86	44.00	0.00	9999.00	-10.07	1.98	98.36	-0.00	0.00	9999.00	1.979
5.91	46.00	0.00	9999.00	-10.61	1.86	102.20	-0.00	0.00	9999.00	1.859
5.95	48.00	0.00	9999.00	-11.13	1.73	105.79	-0.00	0.00	9999.00	1.735
5.99	50.00	0.00	9999.00	-11.64	1.61	109.14	-0.00	0.00	9999.00	1.607
6.02	52.00	0.00	9999.00	-12.14	1.48	112.22	-0.00	0.00	9999.00	1.477
6.04	54.00	0.00	9999.00	-12.62	1.34	115.04	-0.00	0.00	9999.00	1.344
6.05	56.00	0.00	9999.00	-13.09	1.21	117.59	-0.00	0.00	9999.00	1.208
6.06	58.00	0.00	9999.00	-13.54	1.07	119.87	-0.00	0.00	9999.00	1.071
6.06	60.00	0.00	9999.00	-13.97	0.93	121.87	-0.00	0.00	9999.00	0.932
6.05	62.00	0.00	9999.00	-14.38	0.79	123.60	-0.00	0.00	9999.00	0.793
6.03	64.00	0.00	9999.00	-14.78	0.65	125.04	-0.00	0.00	9999.00	0.652
6.01	66.00	0.00	9999.00	-15.16	0.51	126.20	-0.00	0.00	9999.00	0.509
5.98	68.00	0.00	9999.00	-15.53	0.37	127.08	-0.00	0.00	9999.00	0.367
5.94	70.00	0.00	9999.00	-15.87	0.22	127.67	-0.00	0.00	9999.00	0.224
5.90	72.00	0.00	9999.00	-16.19	0.08	127.98	-0.00	0.00	9999.00	0.080
5.85	74.00	0.00	9999.00	-16.50	-0.06	127.99	-0.00	0.00	9999.00	-0.063

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--- TECON - CW - BLPH LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 13 ---
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^-6
Roll Angle
0
7.5
15
22.5
30
37.5
45
52.5
60
67.5
75

```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025         *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                               *
*         ------   Longitudinal Strength Analysis - Still Water  -- PHASE 13 ------ *
*                                                                                    *
**************************************************************************************************************
```

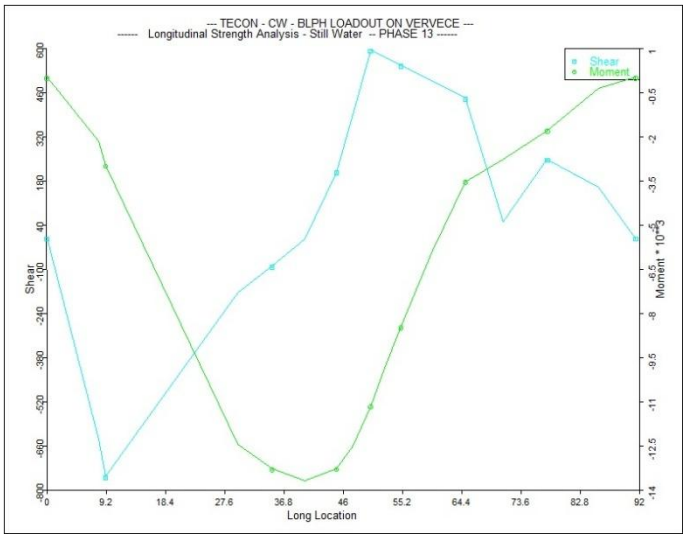
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 13: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-639	-2175	-0.0860	12.1769
9.14	-758	-2986	-0.1180	13.8907
29.72	-174	-12442	-0.4917	37.8792
35.00	-90	-13292	-0.5253	40.7800
40.00	-5	-13697	-0.5413	42.0245
45.00	207	-13268	-0.5243	41.7672
47.50	390	-12522	-0.4949	41.0868
50.29	593	-11149	-0.4406	39.9215
52.50	571	-9864	-0.3898	38.7265
55.00	546	-8468	-0.3346	37.1187
60.00	494	-5868	-0.2319	33.2394
65.00	442	-3529	-0.1395	28.7107
70.87	51	-2776	-0.1097	22.8815
77.72	248	-1796	-0.0710	15.5412
85.70	159	-374	-0.0148	6.5578
91.44	-1	0	0.0000	0.0001



```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                          1 July, 2025          *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                               *
*         ---------     Intact Stability Check    -- PHASE 14 ---------                             *
*                                                                                                    *
******************************************************************************************************

                +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                ======================================================================

                Process is 14: Units Are Degrees, Meters, and M-Tons Unless Specified

                              Results Are Reported In Body System

                    Draft =     4.30 Roll Angle =     0.00 Pitch Angle =     0.00

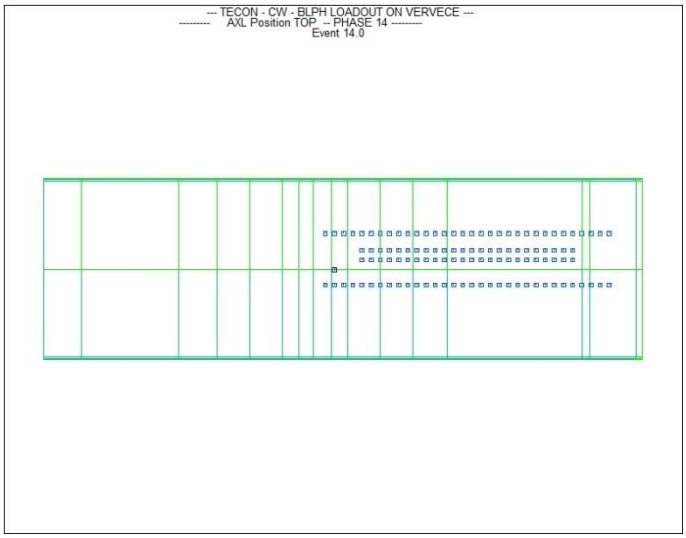
                                 Wet Radii Of Gyration About CG

                           K-X =     8.11 K-Y =    25.77 K-Z =    26.48

                                    GMT =    13.29 GML =   159.88

                           /-- Center of Gravity ---/  Sounding   % Full
                  Name      Weight    ---X---  ---Y---  ---Z---  -------- --------

                           ----------------  Part AXL14      ------------
                           LOAD_GRO   2281.40    26.56    -1.36     7.10
                           ----------------  Part CF         ------------
                           LOAD_GRO     28.00    69.38    11.22     8.10
                           ----------------  Part GRI&SF-B   ------------
                           LOAD_GRO     75.00    30.86    -1.14     7.35
                           ----------------  Part GRI&SF-C   ------------
                           LOAD_GRO      0.50    67.44    11.22     7.10
                           ----------------  Part GRI&SF-T   ------------
                           LOAD_GRO     45.00    65.20    -2.92     7.40
                           ----------------  Part TP         ------------
                           LOAD_GRO    254.50    65.54    -2.14     9.35
                           ----------------  Part VERVECE    ------------
                           LOAD_GRO   1832.80    47.02     0.00     3.52
                                        --- Contents ---
                    1PC         229.92     5.62    -3.43     3.77     6.02    98.00
                    1PW         117.49     6.50   -10.28     2.53     4.06    50.00
                    1SC         230.42     5.62     3.43     3.77     6.02    98.00
                    1SW         117.49     6.50    10.28     2.53     4.06    50.00
                    2PC          26.21    19.43    -3.43     0.09     0.18     3.00
                    2PW         160.09    19.43   -10.26     0.56     1.12    18.32
                    2SC          26.21    19.43     3.43     0.09     0.18     3.00
                    2SW         271.97    19.43    10.27     0.95     1.90    31.13
                    3PC          26.21    40.00    -3.43     0.09     0.18     3.00
                    3PW         178.62    40.01   -10.27     0.63     1.25    20.45
                    3SC          26.21    40.01     3.43     0.09     0.18     3.00
                    3SW         298.96    40.01    10.28     1.05     2.09    34.22
                    4PC         262.11    60.58    -3.43     0.91     1.83    30.00
                    4PW         856.16    60.58   -10.28     2.99     5.97    98.00
                    4SC         262.11    60.58     3.43     0.91     1.83    30.00
                    4SW         856.16    60.58    10.28     2.99     5.97    98.00
                    5PC         295.21    83.42    -3.43     2.16     3.96    60.00
                    5PW         445.01    79.81   -10.28     1.92     3.64    56.08
                    5SC         290.58    83.42     3.43     2.16     3.96    60.00
                    5SW         558.29    80.08    10.28     2.35     4.44    70.35
                           ========  ========  =======  =======  =======
                           Total     10052.61    46.75     0.00     3.81
                           Buoyancy  10052.61    46.75    -0.00     2.21
```




```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                        1 July, 2025             *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                               *
*          ---------     Intact Stability Check    -- PHASE 14 ---------                             *
*                                                                                                     *
*******************************************************************************************************

                          +++ D R A F T   M A R K   R E A D I N G S +++
                          ============================================

                Process is 14: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
**********************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025          *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                               *
*         ---------     Intact Stability Check    -- PHASE 14 ---------            .*
*                                                                                    *
**********************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 14: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 3.81, and Wind Speed = 10 Knots

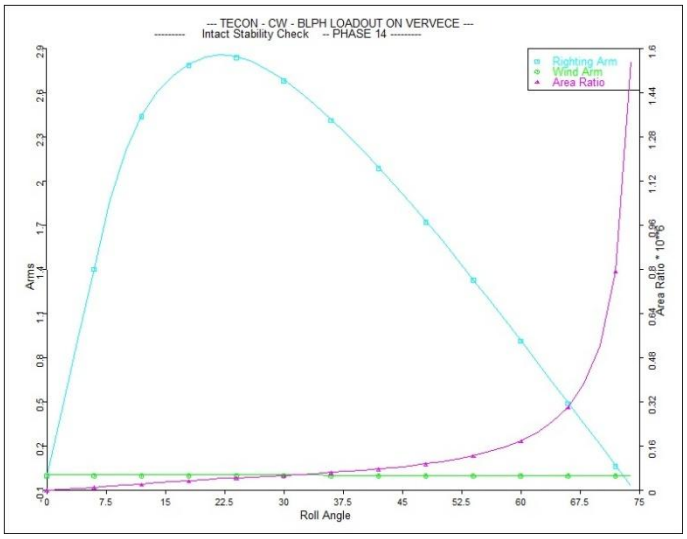
Initial: Roll = 0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.46	0.46	0.00	0.00	2906.27	0.465
4.29	4.00	0.00	9999.00	1.49	0.93	1.86	0.00	0.00	5976.07	0.933
4.27	6.00	0.00	9999.00	1.03	1.40	4.20	0.00	0.00	9387.45	1.403
4.25	8.00	0.00	9999.00	0.57	1.87	7.47	0.00	0.00	9999.00	1.867
4.26	10.00	0.00	9999.00	0.08	2.21	11.54	0.00	0.00	9999.00	2.210
4.31	12.00	0.00	9999.00	-0.46	2.44	16.20	0.00	0.00	9999.00	2.441
4.39	14.00	0.00	9999.00	-1.04	2.60	21.24	0.00	0.00	9999.00	2.602
4.48	16.00	0.00	9999.00	-1.63	2.71	26.56	0.00	0.00	9999.00	2.714
4.60	18.00	0.00	9999.00	-2.25	2.79	32.06	0.00	0.00	9999.00	2.790
4.72	20.00	0.00	9999.00	-2.88	2.84	37.69	0.00	0.00	9999.00	2.837
4.85	22.00	0.00	9999.00	-3.51	2.86	43.38	0.00	0.00	9999.00	2.855
4.97	24.00	0.00	9999.00	-4.14	2.84	49.08	0.00	0.00	9999.00	2.843
5.09	26.00	0.00	9999.00	-4.77	2.81	54.73	0.00	0.00	9999.00	2.806
5.20	28.00	0.00	9999.00	-5.39	2.75	60.28	0.00	0.00	9999.00	2.752
5.31	30.00	0.00	9999.00	-6.01	2.68	65.72	0.00	0.00	9999.00	2.683
5.41	32.00	0.00	9999.00	-6.62	2.60	71.00	0.00	0.00	9999.00	2.603
5.50	34.00	0.00	9999.00	-7.22	2.51	76.12	0.00	0.00	9999.00	2.513
5.58	36.00	0.00	9999.00	-7.81	2.42	81.05	-0.00	0.00	9999.00	2.416
5.66	38.00	0.00	9999.00	-8.39	2.31	85.78	-0.00	0.00	9999.00	2.313
5.73	40.00	0.00	9999.00	-8.96	2.20	90.29	-0.00	0.00	9999.00	2.204
5.80	42.00	0.00	9999.00	-9.52	2.09	94.59	-0.00	0.00	9999.00	2.090
5.86	44.00	0.00	9999.00	-10.07	1.97	98.65	-0.00	0.00	9999.00	1.972
5.91	46.00	0.00	9999.00	-10.61	1.85	102.47	-0.00	0.00	9999.00	1.850
5.95	48.00	0.00	9999.00	-11.13	1.72	106.05	-0.00	0.00	9999.00	1.724
5.99	50.00	0.00	9999.00	-11.64	1.60	109.37	-0.00	0.00	9999.00	1.595
6.02	52.00	0.00	9999.00	-12.14	1.46	112.42	-0.00	0.00	9999.00	1.463
6.04	54.00	0.00	9999.00	-12.62	1.33	115.22	-0.00	0.00	9999.00	1.329
6.05	56.00	0.00	9999.00	-13.08	1.19	117.74	-0.00	0.00	9999.00	1.192
6.06	58.00	0.00	9999.00	-13.53	1.05	119.98	-0.00	0.00	9999.00	1.054
6.06	60.00	0.00	9999.00	-13.97	0.92	121.95	-0.00	0.00	9999.00	0.915
6.05	62.00	0.00	9999.00	-14.38	0.78	123.64	-0.00	0.00	9999.00	0.775
6.03	64.00	0.00	9999.00	-14.78	0.63	125.05	-0.00	0.00	9999.00	0.634
6.01	66.00	0.00	9999.00	-15.16	0.49	126.18	-0.00	0.00	9999.00	0.493
5.98	68.00	0.00	9999.00	-15.53	0.35	127.02	-0.00	0.00	9999.00	0.350
5.94	70.00	0.00	9999.00	-15.87	0.21	127.58	-0.00	0.00	9999.00	0.208
5.90	72.00	0.00	9999.00	-16.19	0.07	127.85	-0.00	0.00	9999.00	0.066
5.85	74.00	0.00	9999.00	-16.50	-0.08	127.84	-0.00	0.00	9999.00	-0.076

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--- TECON - CW - BLPH LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 14 ---
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^-6
Roll Angle
0
7.5
15
22.5
30
37.5
45
52.5
60
67.5
75

```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025         *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ------   Longitudinal Strength Analysis - Still Water  -- PHASE 14 ------   *
*                                                                                    *
**************************************************************************************************************
```

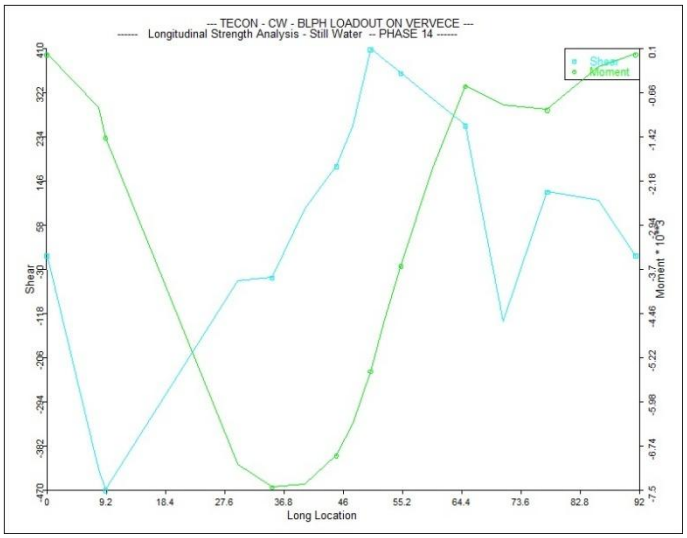
+++ L O N G I T U D I N A L S T R E N G T H R E S U L T S +++

Process is 14: Units Are Degrees, Meters, and M-Tons Unless Specified

Allowable Stress = 155.00 Mpa

Allowable Deflection = 1.00 MM

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-429	-921	-0.0364	6.4035
9.14	-469	-1434	-0.0567	7.3096
29.72	-52	-7056	-0.2789	19.7886
35.00	-45	-7446	-0.2943	21.1395
40.00	91	-7401	-0.2925	21.5796
45.00	176	-6899	-0.2726	21.2071
47.50	256	-6353	-0.2511	20.7320
50.29	409	-5450	-0.2154	19.9960
52.50	386	-4572	-0.1807	19.2799
55.00	361	-3638	-0.1438	18.3512
60.00	309	-1962	-0.0776	16.2170
65.00	257	-546	-0.0216	13.8638
70.87	-133	-877	-0.0347	10.9985
77.72	125	-951	-0.0376	7.4804
85.70	108	-226	-0.0090	3.1618
91.44	-1	0	0.0000	0.0001



```
*******************************************************
*                                  ***  MOSES   ***                                  *
*                                  -----------------                 1 July, 2025    *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ---------     Intact Stability Check    -- PHASE 15 ---------              *
*                                                                                    *
**************************************************************************************************************************

                    +++ B U O Y A N C Y   A N D   W E I G H T   F O R   V E R V E C E +++
                    ====================================================================

                    Process is 15: Units Are Degrees, Meters, and M-Tons Unless Specified

                                  Results Are Reported In Body System

                        Draft =     4.30 Roll Angle =     0.00 Pitch Angle =     0.00

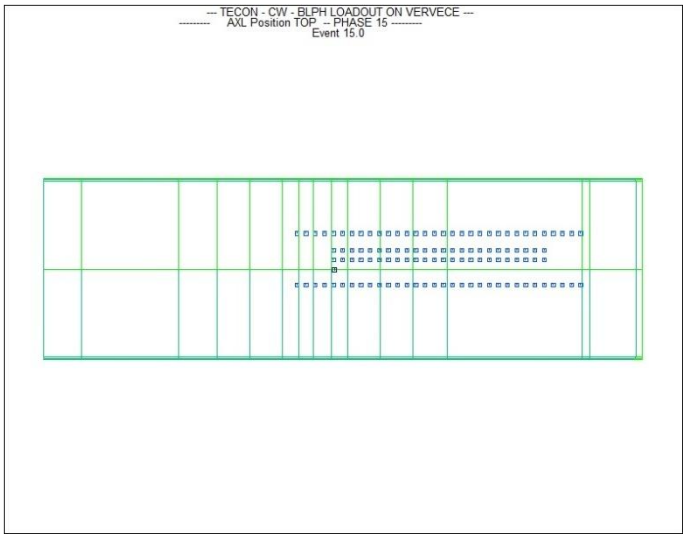
                                    Wet Radii Of Gyration About CG

                                K-X =     8.12 K-Y =    24.92 K-Z =    25.65

                                    GMT =    13.32 GML =   160.00

                                /-- Center of Gravity ---/  Sounding   % Full
                          Name   Weight    ---X---  ---Y---  ---Z---  -------- --------

                                ----------------  Part AXL15      ------------
                                LOAD_GRO   2281.40    30.92    -1.36     7.10
                                ----------------  Part CF         ------------
                                LOAD_GRO     28.00    69.38    11.22     8.10
                                ----------------  Part GRI&SF-B   ------------
                                LOAD_GRO     75.00    30.86    -1.14     7.35
                                ----------------  Part GRI&SF-C   ------------
                                LOAD_GRO      0.50    67.44    11.22     7.10
                                ----------------  Part GRI&SF-T   ------------
                                LOAD_GRO     45.00    65.20    -2.92     7.40
                                ----------------  Part TP         ------------
                                LOAD_GRO    254.50    65.54    -2.14     9.35
                                ----------------  Part VERVECE    ------------
                                LOAD_GRO   1832.80    47.02     0.00     3.52
                                             --- Contents ---
                          1PC       229.92     5.62    -3.43     3.77     6.02    98.00
                          1PW       117.49     6.50   -10.28     2.53     4.06    50.00
                          1SC       230.42     5.62     3.43     3.77     6.02    98.00
                          1SW       117.49     6.50    10.28     2.53     4.06    50.00
                          2PC        26.21    19.43    -3.43     0.09     0.18     3.00
                          2PW       240.63    19.43   -10.27     0.84     1.68    27.54
                          2SC        26.21    19.43     3.43     0.09     0.18     3.00
                          2SW       352.84    19.43    10.28     1.24     2.47    40.39
                          3PC        26.21    40.00    -3.43     0.09     0.18     3.00
                          3PW       178.62    40.01   -10.27     0.63     1.25    20.45
                          3SC        26.21    40.01     3.43     0.09     0.18     3.00
                          3SW       298.96    40.01    10.28     1.05     2.09    34.22
                          4PC       262.11    60.58    -3.43     0.91     1.83    30.00
                          4PW       856.16    60.58   -10.28     2.99     5.97    98.00
                          4SC       262.11    60.58     3.43     0.91     1.83    30.00
                          4SW       856.16    60.58    10.28     2.99     5.97    98.00
                          5PC       295.21    83.42    -3.43     2.16     3.96    60.00
                          5PW       364.46    79.56   -10.28     1.61     3.06    45.93
                          5SC       290.58    83.42     3.43     2.16     3.96    60.00
                          5SW       477.42    79.90    10.28     2.05     3.87    60.16
                                ========  ========  =======  =======  =======
                                Total     10052.61    46.75    -0.00     3.78
                                Buoyancy  10052.61    46.75    -0.00     2.21
```




```
                    ******************************************************
*                                   ***  MOSES   ***                                                  *
*                                   ----------------                        1 July, 2025             *
*          --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                                *
*          ---------     Intact Stability Check    -- PHASE 15 ---------                             *
*                                                                                                      *
********************************************************************************************************

                          +++ D R A F T   M A R K   R E A D I N G S +++
                          ============================================

                Process is 15: Units Are Degrees, Meters, and M-Tons Unless Specified

  Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft    Name     Draft
-------- -------- -------- -------- -------- -------- -------- -------- -------- -------- -------- --------

BOWPO        4.30 BOWST        4.30 MIDPO        4.30 MIDST        4.30 STEPO        4.30 STEST        4.30
```

```
**********************************************************
*                                  ***  MOSES   ***                                  *
*                                  ----------------          1 July, 2025          *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                               *
*         ---------     Intact Stability Check    -- PHASE 15 ---------            .*
*                                                                                    *
**********************************************************
```

+++ R I G H T I N G A R M R E S U L T S +++

Process is 15: Units Are Degrees, Meters, and M-Tons Unless Specified

Moment Scaled By 10052.61, KG = 3.78, and Wind Speed = 10 Knots

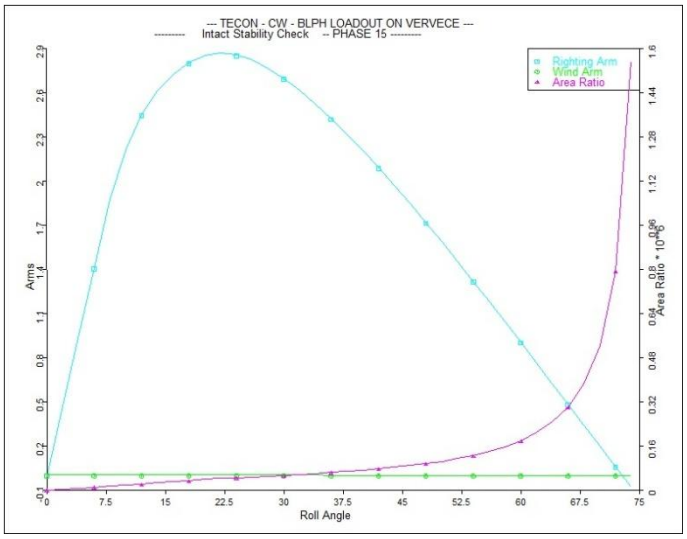
Initial: Roll = 0.00, Trim = 0.00 Deg.

Critical NWT Down Flooding Point Is *BOWPTWT

Arms About Axis Yawed 0.0 Deg From Vessel X

/----- Condition -----/			/-- Min. Height --/		/--- Righting ---/		/--- Heeling ---/		Area	Net
Draft	Roll	Trim	W Tight	NW Tight	Arm	Area	Arm	Area	Ratio	Arm
4.30	0.00	0.00	9999.00	2.40	-0.00	0.00	0.00	0.00	0.00	-0.000
4.30	2.00	0.00	9999.00	1.94	0.47	0.47	0.00	0.00	2913.63	0.466
4.29	4.00	0.00	9999.00	1.49	0.94	1.87	0.00	0.00	5991.18	0.935
4.27	6.00	0.00	9999.00	1.03	1.41	4.21	0.00	0.00	9411.11	1.406
4.25	8.00	0.00	9999.00	0.57	1.87	7.49	0.00	0.00	9999.00	1.872
4.26	10.00	0.00	9999.00	0.08	2.22	11.57	0.00	0.00	9999.00	2.216
4.31	12.00	0.00	9999.00	-0.46	2.45	16.24	0.00	0.00	9999.00	2.448
4.39	14.00	0.00	9999.00	-1.04	2.61	21.30	0.00	0.00	9999.00	2.610
4.48	16.00	0.00	9999.00	-1.63	2.72	26.63	0.00	0.00	9999.00	2.723
4.60	18.00	0.00	9999.00	-2.25	2.80	32.15	0.00	0.00	9999.00	2.800
4.72	20.00	0.00	9999.00	-2.88	2.85	37.80	0.00	0.00	9999.00	2.849
4.85	22.00	0.00	9999.00	-3.51	2.87	43.52	0.00	0.00	9999.00	2.867
4.97	24.00	0.00	9999.00	-4.14	2.86	49.24	0.00	0.00	9999.00	2.855
5.09	26.00	0.00	9999.00	-4.77	2.82	54.91	0.00	0.00	9999.00	2.819
5.20	28.00	0.00	9999.00	-5.39	2.76	60.50	0.00	0.00	9999.00	2.764
5.31	30.00	0.00	9999.00	-6.01	2.69	65.96	0.00	0.00	9999.00	2.694
5.41	32.00	0.00	9999.00	-6.62	2.61	71.26	0.00	0.00	9999.00	2.613
5.50	34.00	0.00	9999.00	-7.22	2.52	76.40	0.00	0.00	9999.00	2.521
5.58	36.00	0.00	9999.00	-7.81	2.42	81.34	-0.00	0.00	9999.00	2.422
5.66	38.00	0.00	9999.00	-8.39	2.32	86.08	-0.00	0.00	9999.00	2.317
5.73	40.00	0.00	9999.00	-8.96	2.21	90.60	-0.00	0.00	9999.00	2.206
5.80	42.00	0.00	9999.00	-9.52	2.09	94.90	-0.00	0.00	9999.00	2.089
5.86	44.00	0.00	9999.00	-10.07	1.97	98.96	-0.00	0.00	9999.00	1.969
5.91	46.00	0.00	9999.00	-10.61	1.84	102.77	-0.00	0.00	9999.00	1.844
5.95	48.00	0.00	9999.00	-11.13	1.72	106.33	-0.00	0.00	9999.00	1.716
5.99	50.00	0.00	9999.00	-11.64	1.59	109.63	-0.00	0.00	9999.00	1.586
6.02	52.00	0.00	9999.00	-12.14	1.45	112.67	-0.00	0.00	9999.00	1.453
6.04	54.00	0.00	9999.00	-12.62	1.32	115.44	-0.00	0.00	9999.00	1.317
6.05	56.00	0.00	9999.00	-13.08	1.18	117.94	-0.00	0.00	9999.00	1.181
6.06	58.00	0.00	9999.00	-13.53	1.04	120.16	-0.00	0.00	9999.00	1.042
6.06	60.00	0.00	9999.00	-13.97	0.90	122.11	-0.00	0.00	9999.00	0.903
6.05	62.00	0.00	9999.00	-14.38	0.76	123.77	-0.00	0.00	9999.00	0.763
6.03	64.00	0.00	9999.00	-14.78	0.62	125.16	-0.00	0.00	9999.00	0.623
6.01	66.00	0.00	9999.00	-15.16	0.48	126.26	-0.00	0.00	9999.00	0.482
5.98	68.00	0.00	9999.00	-15.53	0.34	127.09	-0.00	0.00	9999.00	0.341
5.94	70.00	0.00	9999.00	-15.87	0.20	127.63	-0.00	0.00	9999.00	0.200
5.90	72.00	0.00	9999.00	-16.19	0.06	127.89	-0.00	0.00	9999.00	0.059
5.85	74.00	0.00	9999.00	-16.50	-0.08	127.86	-0.00	0.00	9999.00	-0.082

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--- TECON - CW - BLPH LOADOUT ON VERVECE ---
Intact Stability Check -- PHASE 15 ---
Righting Arm
Wind Arm
Area Ratio
Arms
Area Ratio * 10^-6
Roll Angle
0
7.5
15
22.5
30
37.5
45
52.5
60
67.5
75

```
**********************************************************
*                                  ***  MOSES    ***                                  *
*                                  -----------------                  1 July, 2025    *
*         --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*         ------   Longitudinal Strength Analysis - Still Water  -- PHASE 15 ------  *
*                                                                                     *
***************************************************************************************************************

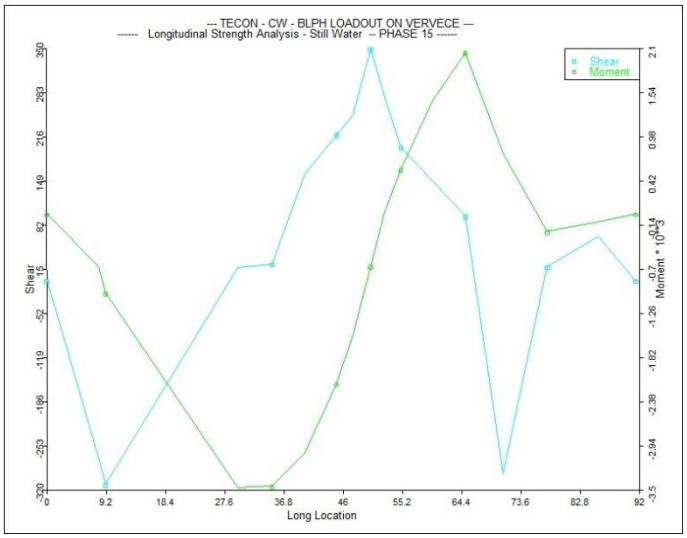
                    +++ L O N G I T U D I N A L   S T R E N G T H   R E S U L T S +++
                    ================================================================

                Process is 15: Units Are Degrees, Meters, and M-Tons Unless Specified

                                    Allowable Stress =     155.00 Mpa

                                  Allowable Deflection =       1.00 MM
```

Longitudinal Location	Shear Force	Bending Moment	B. Stress/ Allowable	Deflection/ Allowable
0.00	-1	0	0.0000	0.0000
8.00	-271	-670	-0.0265	2.5079
9.14	-311	-1003	-0.0397	2.8592
29.72	17	-3476	-0.1374	6.9097
35.00	22	-3454	-0.1365	6.9806
40.00	159	-3029	-0.1197	6.6608
45.00	219	-2155	-0.0852	6.0107
47.50	248	-1538	-0.0608	5.5903
50.29	349	-666	-0.0264	5.0720
52.50	276	22	0.0009	4.6441
55.00	199	567	0.0224	4.1604
60.00	148	1435	0.0567	3.2525
65.00	95	2044	0.0808	2.5003
70.87	-294	767	0.0303	1.8708
77.72	18	-225	-0.0089	1.2761
85.70	64	-100	-0.0040	0.5460
91.44	-1	0	0.0000	0.0001



```
*********************************************************
*                                  ***  MOSES   ***                                  *
*                                  -----------------                 1 July, 2025    *
*        --- TECON - CW - BLPH LOADOUT ON VERVECE ---                                *
*        ---------     Intact Stability Check    -- Buoyancy and Ballast ---------  *
*                                                                                    *
**************************************************************************************************************
```

+++ T N K S B A L L A S T P E R C E N T +++

Event Num	2PW %Full	2SW %Full	3PW %Full	3SW %Full	5PW %Full	5SW %Full
0.00	91.82	94.38	98.00	98.00	52.51	55.27
1.00	87.81	90.69	98.00	98.00	53.35	56.47
2.00	76.17	79.99	98.00	98.00	55.46	59.64
3.00	70.38	74.83	98.00	98.00	56.32	61.17
4.00	53.51	59.81	98.00	98.00	58.34	65.27
5.00	37.60	45.74	98.00	98.00	59.32	68.32
6.00	22.58	32.56	98.00	98.00	59.31	70.40
7.00	8.30	20.10	98.00	98.00	58.37	71.53
8.00	8.30	20.10	74.87	82.69	66.91	75.48
9.00	8.30	20.10	56.13	65.74	70.62	81.24
10.00	8.30	20.10	38.70	50.11	72.88	85.55
11.00	8.30	20.10	27.94	40.55	73.43	87.48
12.00	8.30	20.10	24.02	37.21	70.46	85.17
13.00	8.30	20.10	20.45	34.22	67.12	82.50
14.00	18.32	31.13	20.45	34.22	56.08	70.35
15.00	27.54	40.39	20.45	34.22	45.93	60.16

+++ T N K S B A L L A S T A M O U N T +++

Event Num	2PW Amount	2SW Amount	3PW Amount	3SW Amount	5PW Amount	5SW Amount
0.00	802.16	824.55	856.16	856.16	416.68	438.62
1.00	767.12	792.25	856.16	856.16	423.41	448.14
2.00	665.41	698.81	856.16	856.16	440.15	473.25
3.00	614.89	653.71	856.16	856.16	446.91	485.46
4.00	467.52	522.52	856.16	856.16	463.00	517.98
5.00	328.49	399.62	856.16	856.16	470.76	542.21
6.00	197.28	284.48	856.16	856.16	470.69	558.68
7.00	72.47	175.60	856.16	856.16	463.18	567.68
8.00	72.47	175.60	654.06	722.43	531.01	598.98
9.00	72.47	175.60	490.34	574.36	560.40	644.67
10.00	72.47	175.60	338.06	437.76	578.35	678.90
11.00	72.47	175.60	244.10	354.21	582.76	694.20
12.00	72.47	175.60	209.88	325.11	559.17	675.91
13.00	72.47	175.60	178.62	298.96	532.62	654.67
14.00	160.09	271.97	178.62	298.96	445.01	558.29
15.00	240.63	352.84	178.62	298.96	364.46	477.42

+++ T N K S B A L L A S T S O U N D I N G +++

Event Num	2PW Sounding	2SW Sounding	3PW Sounding	3SW Sounding	5PW Sounding	5SW Sounding
0.00	5.60	5.75	5.97	5.97	3.44	3.60
1.00	5.35	5.53	5.97	5.97	3.49	3.66
2.00	4.64	4.88	5.97	5.97	3.61	3.84
3.00	4.29	4.56	5.97	5.97	3.66	3.93
4.00	3.27	3.65	5.97	5.97	3.77	4.16
5.00	2.30	2.79	5.97	5.97	3.82	4.33
6.00	1.38	1.99	5.97	5.97	3.82	4.44
7.00	0.51	1.23	5.97	5.97	3.77	4.51
8.00	0.51	1.23	4.57	5.04	4.25	4.73
9.00	0.51	1.23	3.42	4.01	4.45	5.05
10.00	0.51	1.23	2.36	3.06	4.58	5.29
11.00	0.51	1.23	1.71	2.48	4.61	5.40
12.00	0.51	1.23	1.47	2.27	4.45	5.27
13.00	0.51	1.23	1.25	2.09	4.26	5.12
14.00	1.12	1.90	1.25	2.09	3.64	4.44
15.00	1.68	2.47	1.25	2.09	3.06	3.87

+++ T N K S B A L L A S T U L L A G E +++

Event Num	2PW Ullage	2SW Ullage	3PW Ullage	3SW Ullage	5PW Ullage	5SW Ullage

0.00	0.50	0.34	0.12	0.12	2.65	2.50
1.00	0.74	0.57	0.12	0.12	2.61	2.43
2.00	1.45	1.22	0.12	0.12	2.49	2.26
3.00	1.80	1.53	0.12	0.12	2.44	2.17
4.00	2.83	2.45	0.12	0.12	2.33	1.94
5.00	3.80	3.30	0.12	0.12	2.27	1.77
6.00	4.71	4.11	0.12	0.12	2.27	1.65
7.00	5.58	4.87	0.12	0.12	2.33	1.59
8.00	5.58	4.87	1.53	1.05	1.85	1.37
9.00	5.58	4.87	2.67	2.09	1.64	1.05
10.00	5.58	4.87	3.73	3.04	1.52	0.81
11.00	5.58	4.87	4.39	3.62	1.48	0.70
12.00	5.58	4.87	4.63	3.82	1.65	0.83
13.00	5.58	4.87	4.84	4.01	1.84	0.98
14.00	4.97	4.19	4.84	4.01	2.45	1.66
15.00	4.41	3.63	4.84	4.01	3.03	2.23

9 BALLASTING SYSTEM CHECKS

9.1 BALLAST TANK CAPACITY

The tanks filling was included in a range from 3% to 98% during all the Load-out and satisfies the requirement of table 4-1, section 4.5.3 of Ref. /2/ for Loadout class 2.

9.2 BALLAST PUMPING CAPACITY

Ballast pumps must be tried (turning on and off the pumps) to ensure perfect functioning of system/item within 24h of the start of load-out.

Pumping capacity of the external pumps consists of 8 pumps, with a rated capacity of min 300 m3/h + 2 x 600 m3/h internal barge pumps.

Load out weight:	2300 t
Cross over estimated duration:	3.5 Hours
Capacity required for the load compensation	660 t/h

Capacity required for tide compensation:

- @max tide speed: 0.16 m/h x (2.52 t/mmx1000mm) = 403 t/h
- Average: 0.80 m x 91.4x27.4 = 2000 t / 6 hours = 334 t/h

a) Normal operation - Load transfer as planned: 130% capacity with intact system and 100% with 1 pump failed.

Capacity with intact system = 2*300 + 2*600 m3/h = 1800 m3/h

Intact system ratio = 1800/(660+403) = 1.70 > 1.3 (OK)

Capacity with 1 pump failed = 2*300 + 1*600 m3/h = 1200 m3/h

Damaged system ratio = 1200/(660+403) = 1.12 > 1.0 (OK)

b) Load transfer stopped: 150% capacity with intact system and 100% capacity with one pump failed.

Capacity with intact system = 4x300 = 1200 m3/h

Intact system ratio = 1200/403 = 3.00 > 1.5 (OK)

Capacity with 1 pump failed = replaced by 1 spare or 1 not used for load transfer being stopped

ROSETTI MARINO SPA

CW - BLPH loadout

SAFETY CHECK LIST

Date: _____

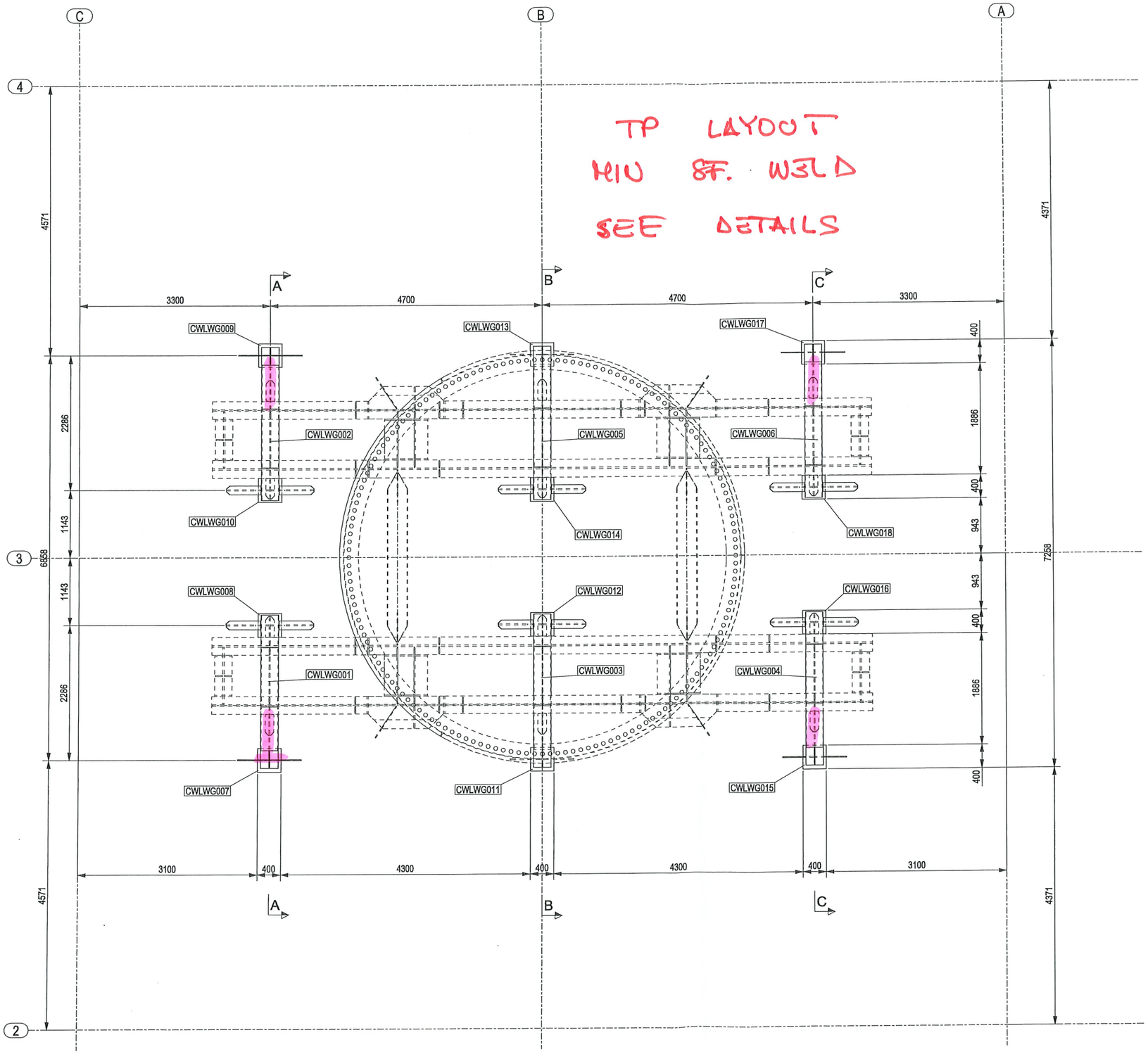
LOAD OUT OPERATION

Location: Marina di Ravenna (RA)

N°	TOPIC	CHECKED
	MOORING ARRANGEMENT	
1	Check winch engines and trial start	
2	Check lubricant levels	
3	Inspect and grease-up wire ropes and block sheaves	
4	Control positions and elevations of quay fenders	
	BARGE BALLASTING	
5	Instruct ballast superintendent to perform all checks on ballast pumps	
6	Ballast the barge according to the pattern defined for the initial phase	
7	Check and report ballast tank levels by manual sounding	
	BARGE TRIM AND ALIGNMENT	
8	Check position of all targets on barge	
9	Check position and readings of survey instrument	
10	Check and report the barge trim and alignment	

	SPMT	
11	Travel path inspected /cleaned	
12	Check plate covering holes in the ground	
13	No loose or not secured material, loose items survey with MWS	
14	Correct configuration of SPMT trailers as per attached drawings	
15	Functioning of every SPMT trailer	
16	Functioning of radio communications between SPMT trailer operator and lifting supervisor	
17	Briefing with personnel involved in the operation	
18	Area to be used cordoned off and access forbidden to unauthorized personnel	
	TIDE READINGS	
19	Check that the tide reading instrument is in place and perfectly working	
	WEATHER FORECAST	
20	In the week before load-out require every day official weather forecast and report to load-out Manager	
	COMMUNICATION EQUIPMENTS	
21	Available communication equipments and spare units and batteries	
	CONTINGENCY	

22	Cutting equipment	
23	Contingency plans (ballasting pumps, power supply, trailers, mooring winch and mooring lines) in place	
	APPROVAL	
24	Check warranty surveyor approval before topside lift off	
25	After load out and before removal of SPMT, check if necessary additional steelwork (shims).	



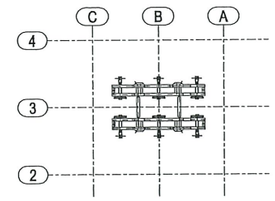
TP -LOWER GRILLAGE

MARKS	DRAWING NUMBER	NOTES
CWLWG001	123A90-FDL-ST-DD-90794	
CWLWG002	123A90-FDL-ST-DD-90795	
CWLWG003	123A90-FDL-ST-DD-90796	
CWLWG004	123A90-FDL-ST-DD-90797	
CWLWG005	123A90-FDL-ST-DD-90798	
CWLWG006	123A90-FDL-ST-DD-90799	
CWLWG007	123A90-FDL-ST-DD-90800	
CWLWG008	123A90-FDL-ST-DD-90800	
CWLWG009	123A90-FDL-ST-DD-90800	
CWLWG010	123A90-FDL-ST-DD-90800	
CWLWG011	123A90-FDL-ST-DD-90800	
CWLWG012	123A90-FDL-ST-DD-90800	
CWLWG013	123A90-FDL-ST-DD-90800	
CWLWG014	123A90-FDL-ST-DD-90800	
CWLWG015	123A90-FDL-ST-DD-90800	
CWLWG016	123A90-FDL-ST-DD-90800	
CWLWG017	123A90-FDL-ST-DD-90800	
CWLWG018	123A90-FDL-ST-DD-90800	

NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.
2 – ALL ELEVATIONS ARE REFERED TO C.D.
3 – FOR SECTIONS A–A, B–B SEE DWG 123A90–FDL–ST–DD–90817
4 – FOR SECTIONS C–C SEE DWG 123A90–FDL–ST–DD–90818

KEY PLAN



UPPER GRILLAGE

HOLDS

REFERENCE DRAWINGS

DWG No.	DESCRIPTION
123A90-DDL-TI-DD-99039	TP - LOWER GRILLAGE ASSEMBLY
123A90-DDL-TI-DD-99040-001/002	TP - LOWER GRILLAGE - SECTION AND DETAILS

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
0	25/02/2025	CM–TS	MR	DC	ISSUED FOR CONSTRUCTION

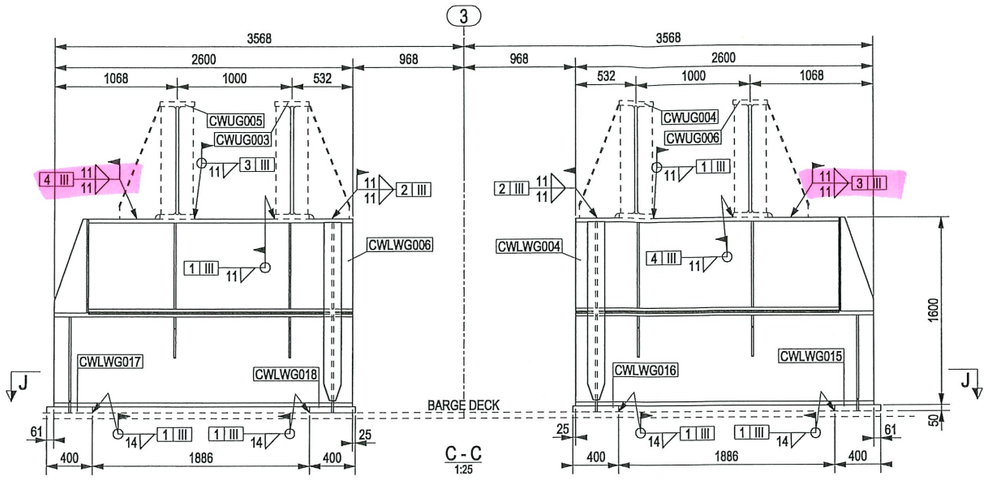
CROSSWIND

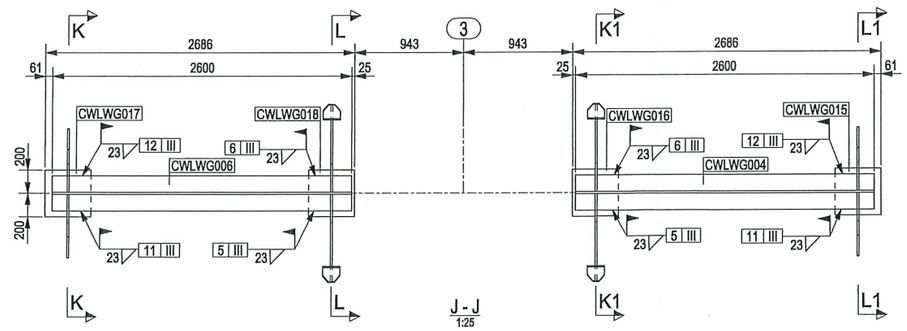
ROSETTI MARINO

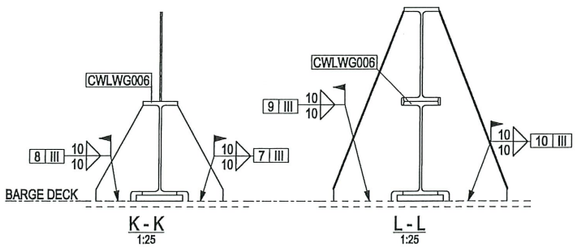
TITLE :
BASE LOAD POWER HUB (BLPH)
TP – LOWER GRILLAGE
ASSEMBLY

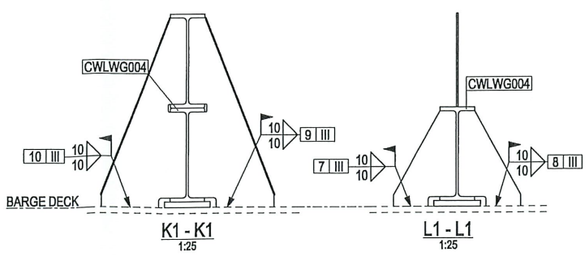
CONTRACT NO./TITLE CW–I–WP4–2023–05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:35
DRAWN CM–TS	CHECKED M.ROSSI	APPROVED D.CASADIO	DATE 25/02/2025

A1	DRAWING NO. 123A90–FDL–ST–DD–90816	SHEET 001	REV. 0









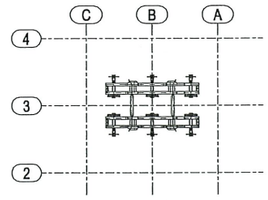
MIN SF WELD

20/06/2025

NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.
2 – ALL ELEVATIONS ARE REFERED TO C.D.
3 – FOR PLAN VIEW AND MARKS LIST SEE DWG 123A90-FDL-ST-DD-90816

KEY PLAN



UPPER GRILLAGE

HOLDS

REFERENCE DRAWINGS

DWG No.	DESCRIPTION
123A90-DDL-TI-DD-99039	TP - LOWER GRILLAGE ASSEMBLY
123A90-DDL-TI-DD-99040-001/002	TP - LOWER GRILLAGE - SECTION AND DETAILS

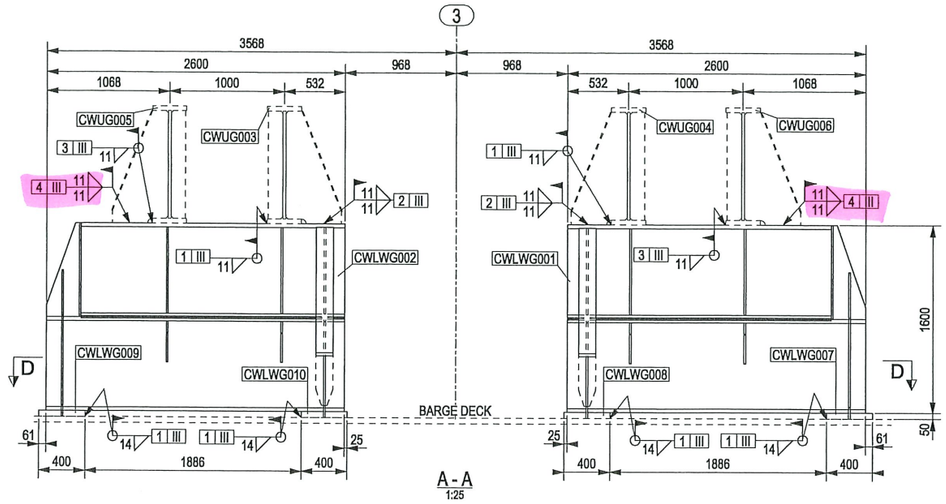
REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
0	25/02/2025	CM-TS	MR	DC	ISSUED FOR CONSTRUCTION

CROSSWIND

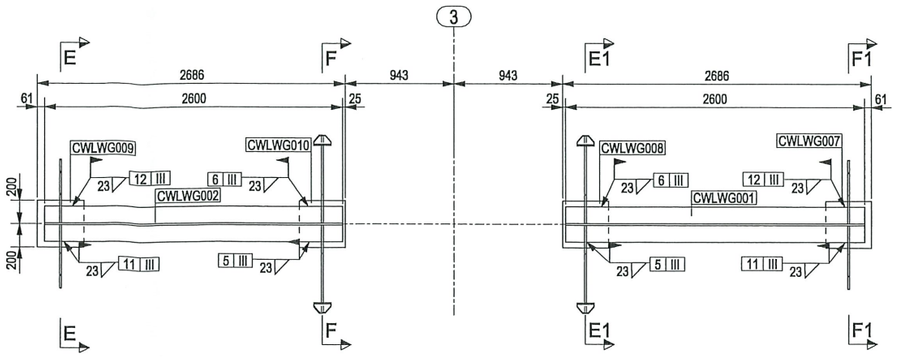
ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TP – LOWER GRILLAGE
ASSEMBLY

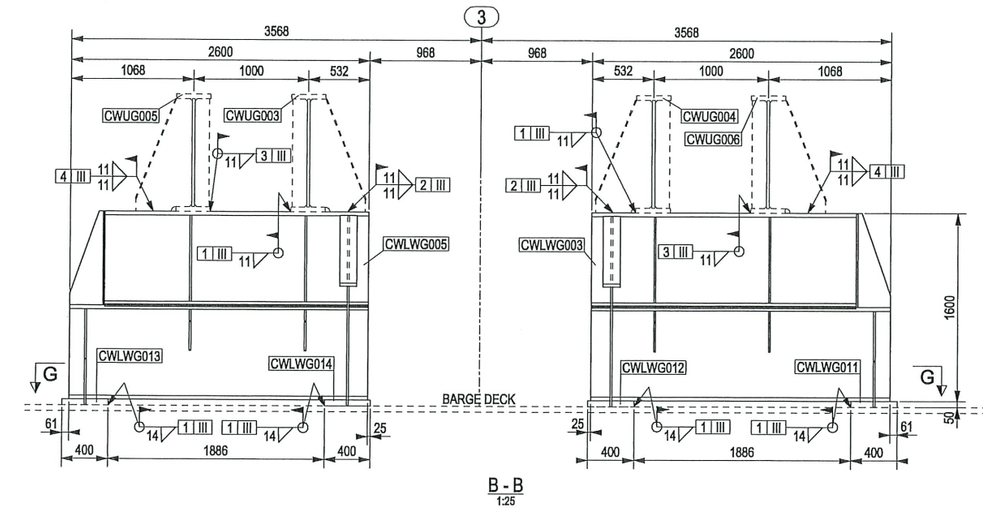
CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:25
DRAWN CM-TS	CHECKED M.ROSSI	APPROVED D.CASADIO	DATE 25/02/2025
A1	DRAWING NO. 123A90-FDL-ST-DD-90818	SHEET 001	REV. 0



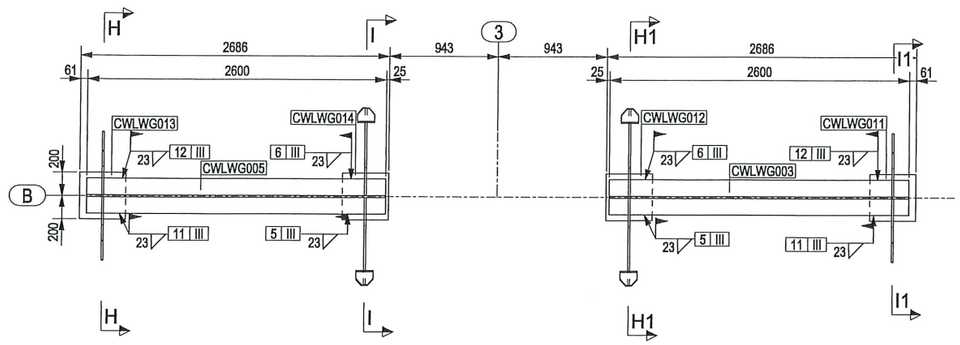
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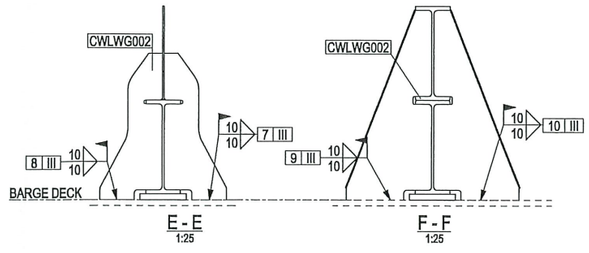
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B - B
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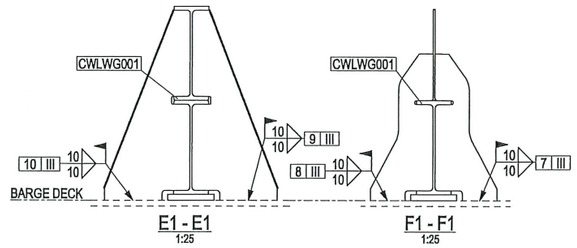


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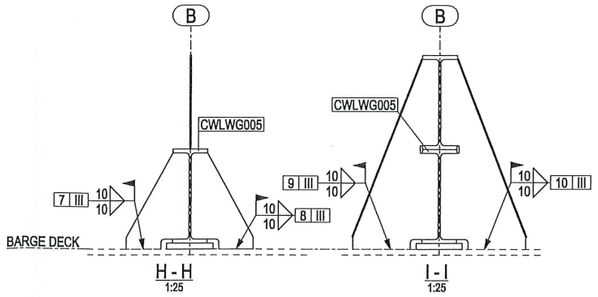
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F - F
1:25



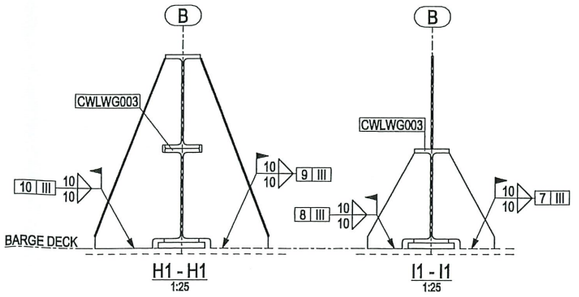
E1 - E1
1:25

F1 - F1
1:25



H - H
1:25

I - I
1:25



H1 - H1
1:25

I1 - I1
1:25

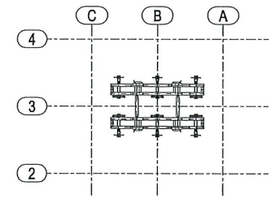
MIN 8F WELD

20/06/2025

NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.
2 – ALL ELEVATIONS ARE REFERED TO C.D.
3 – FOR PLAN VIEW AND MARKS LIST SEE DWG 123A90-FDL-ST-DD-90816

KEY PLAN



UPPER GRILLAGE

HOLDS

REFERENCE DRAWINGS

DWG No.	DESCRIPTION
123A90-DDL-TI-DD-99039	TP - LOWER GRILLAGE ASSEMBLY
123A90-DDL-TI-DD-99040-001/002	TP - LOWER GRILLAGE - SECTION AND DETAILS

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
0	25/02/2025	CM-TS	MR	DC	ISSUED FOR CONSTRUCTION

CROSSWIND

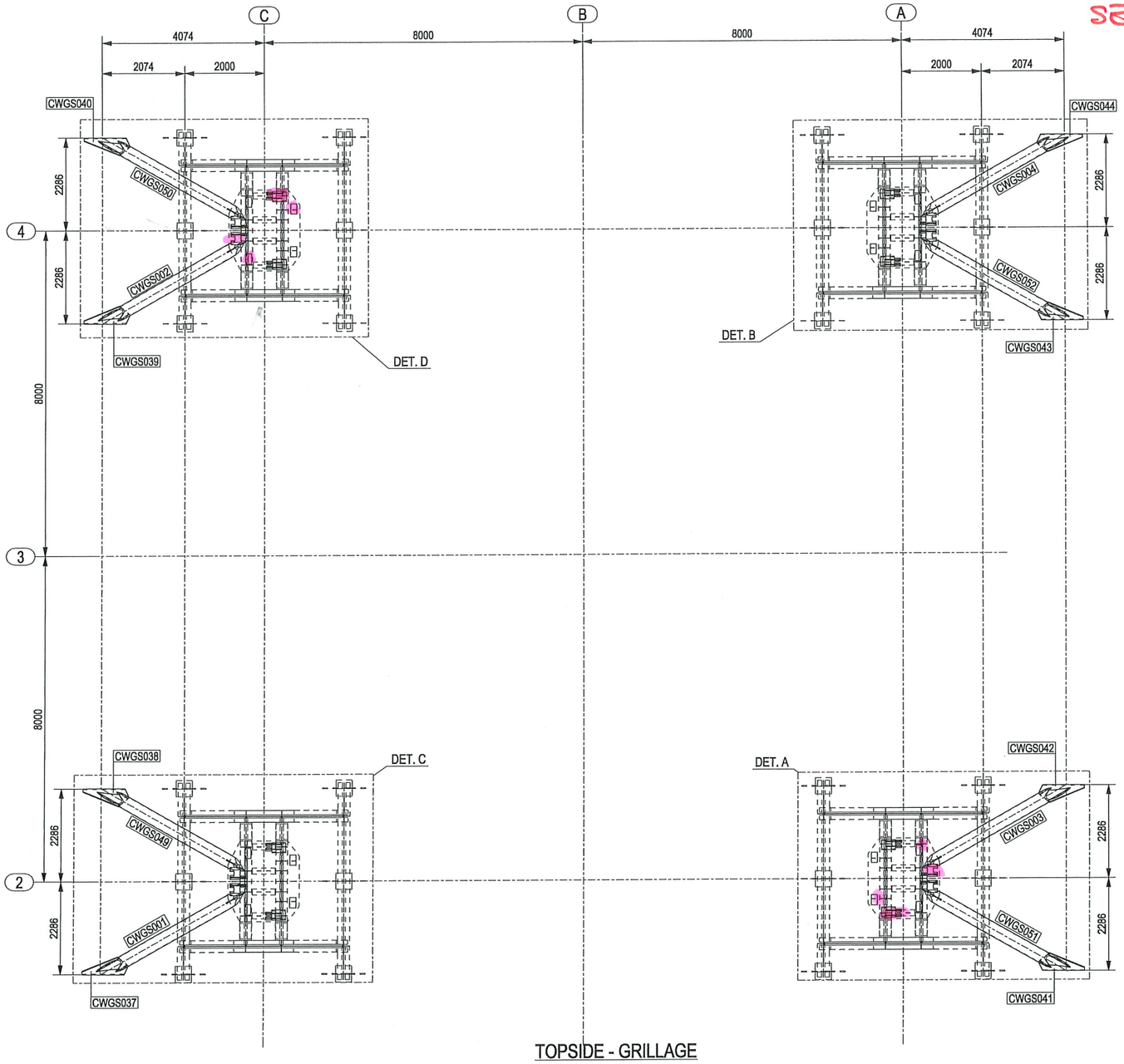
ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
TP – LOWER GRILLAGE
ASSEMBLY

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:25
DRAWN CM-TS	CHECKED M.ROSSI	APPROVED D.CASADIO	DATE 25/02/2025
A1	DRAWING NO. 123A90-FDL-ST-DD-90817		SHEET 001 / REV. 0

MARKS	DRAWING NUMBER	NOTES
CWGS001	123A90-FDL-ST-DD-90828	
CWGS002	123A90-FDL-ST-DD-90828	
CWGS003	123A90-FDL-ST-DD-90828	
CWGS004	123A90-FDL-ST-DD-90828	
CWGS005	123A90-FDL-ST-DD-90829	
CWGS006	123A90-FDL-ST-DD-90829	
CWGS007	123A90-FDL-ST-DD-90829	
CWGS008	123A90-FDL-ST-DD-90829	
CWGS009	123A90-FDL-ST-DD-90829	
CWGS010	123A90-FDL-ST-DD-90829	
CWGS011	123A90-FDL-ST-DD-90829	
CWGS012	123A90-FDL-ST-DD-90829	
CWGS013	123A90-FDL-ST-DD-90829	
CWGS014	123A90-FDL-ST-DD-90829	
CWGS015	123A90-FDL-ST-DD-90829	
CWGS016	123A90-FDL-ST-DD-90829	
CWGS017	123A90-FDL-ST-DD-90830	
CWGS018	123A90-FDL-ST-DD-90830	
CWGS019	123A90-FDL-ST-DD-90831	
CWGS020	123A90-FDL-ST-DD-90831	
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CWGS025	123A90-FDL-ST-DD-90829	
CWGS026	123A90-FDL-ST-DD-90829	
CWGS027	123A90-FDL-ST-DD-90829	
CWGS028	123A90-FDL-ST-DD-90829	
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CWGS063	123A90-FDL-ST-DD-90836	
CWGS064	123A90-FDL-ST-DD-90836	

TOPSIDE LAYOUT
MIN SF WELD
SEE DETAILS

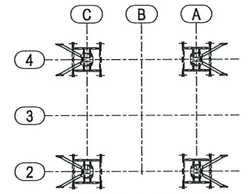


TOPSIDE - GRILLAGE

NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.
2 – ALL ELEVATIONS ARE REFERED TO C.D.
3 – FOR DETAIL A SEE DWG 123A90–FDL–ST–DD–90838
4 – FOR DETAIL B SEE DWG 123A90–FDL–ST–DD–90840
5 – FOR DETAIL C SEE DWG 123A90–FDL–ST–DD–90842
6 – FOR DETAIL D SEE DWG 123A90–FDL–ST–DD–90844

KEY PLAN



SEA FASTENING GRILLAGE

HOLDS

REFERENCE DRAWINGS

DWG No.	DESCRIPTION
123A90-DDL-TI-DD-99024	TOPSIDE SEA FASTENING - ASSEMBLY
123A90-DDL-TI-DD-99025-001/002	TOPSIDE SEA FASTENING - DETAILS

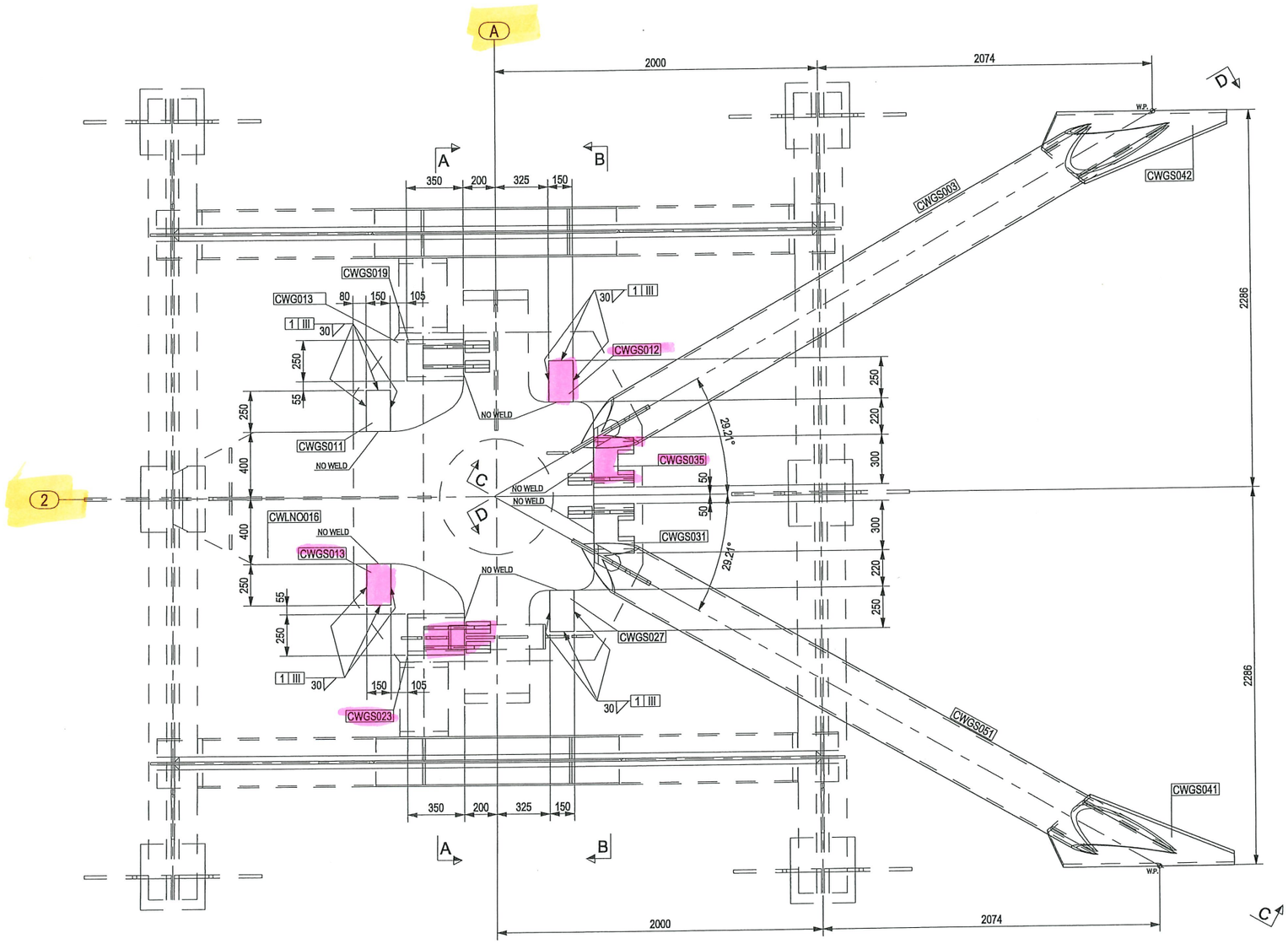
REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
0	06/03/2025	CM–TS	MR	DC	ISSUED FOR CONSTRUCTION

CROSSWIND

ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
TOPSIDE SEAFASTENING GRILLAGE
ASSEMBLY

CONTRACT NO./TITLE CW–I–WP4–2023–05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:60
DRAWN CM–TS	CHECKED M.ROSSI	APPROVED D.CASADIO	DATE 06/03/2025
A1	DRAWING NO. 123A90–FDL–ST–DD–90837	SHEET 001	REV. 0



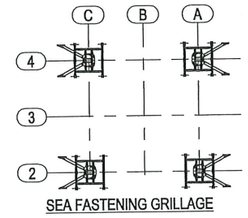
DETAIL A
SCALE 1:15

HIN OF WELD

NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.
2 – ALL ELEVATIONS ARE REFERED TO C.D.
3 – FOR PLAN VIEW & DRAWING LIST SEE DWG 123A90-FDL-ST-DD-90837
4 – FOR SECTIONS LIST SEE DWG 123A90-FDL-ST-DD-90839

KEY PLAN



SEA FASTENING GRILLAGE

HOLDS

REFERENCE DRAWINGS

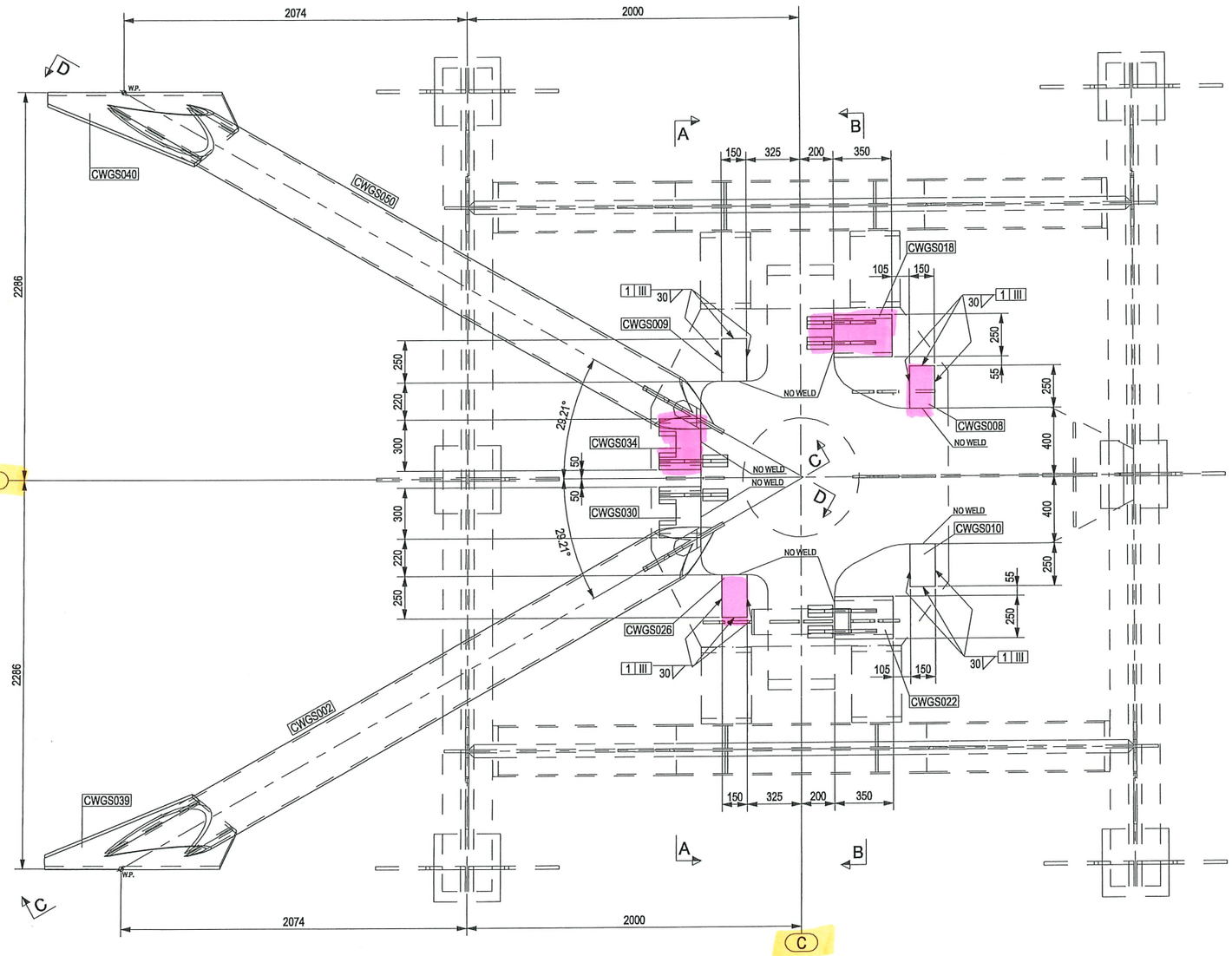
DWG No.	DESCRIPTION
123A90-DDL-TI-DD-99024	TOPSIDE SEA FASTENING - ASSEMBLY
123A90-DDL-TI-DD-99025-001/002	TOPSIDE SEA FASTENING - DETAILS

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
0	06/03/2025	CM-TS	MR	DC	ISSUED FOR CONSTRUCTION

CROSSWIND | ROSETTI MARINO

TITLE : BASE LOAD POWER HUB (BLPH)
TOPSIDE SEAFASTENING GRILLAGE
ASSEMBLY

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:15
DRAWN CM-TS	CHECKED M.ROSSI	APPROVED D.CASADIO	DATE 06/03/2025
A1	DRAWING NO. 123A90-FDL-ST-DD-90838	SHEET 001	REV. 0



DETAIL D
SCALE 1:15

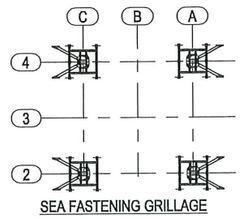
MIN 8F WELD

20/06/2025

NOTES

1 – ALL DIMENSIONS AND ELEVATIONS ARE IN MILLIMETERS U.N.O.
2 – ALL ELEVATIONS ARE REFERED TO C.D.
3 – FOR PLAN VIEW & DRAWING LIST SEE DWG 123A90-FDL-ST-DD-90837
4 – FOR SECTIONS LIST SEE DWG 123A90-FDL-ST-DD-90845

KEY PLAN



SEA FASTENING GRILLAGE

HOLDS

REFERENCE DRAWINGS

DWG No.	DESCRIPTION
123A90-DDL-TI-DD-99024	TOPSIDE SEA FASTENING - ASSEMBLY
123A90-DDL-TI-DD-99025-001/002	TOPSIDE SEA FASTENING - DETAILS

REV.	DATE	DRN	CHKD	APPD	DESCRIPTION
0	06/03/2025	CM-TS	MR	DC	ISSUED FOR CONSTRUCTION

CROSSWIND

ROSETTI MARINO

TITLE :
BASE LOAD POWER HUB (BLPH)
TOPSIDE SEAFASTENING GRILLAGE
ASSEMBLY

CONTRACT NO./TITLE CW-I-WP4-2023-05/HOLLANDSE KUST NOORD WIND PARK			SCALE 1:15
DRAWN CM-TS	CHECKED M.ROSSI	APPROVED D.CASADIO	DATE 06/03/2025
A1	DRAWING NO. 123A90-FDL-ST-DD-90844	SHEET 001	REV. 0

CROSSWIND

ROSETTI MARINO

MANAGEMENT OF CHANGE Hollandse Kust Noord			
No. TQ :	123A90-PML-PM-MOC-00001	**Rev:**	0

Originating Party	Rosetti Marino – STR dept.					
Subject	Loadout Operation					
Author	A.Balzarotti	TQ Aconex unique number:				
Interface TQ - from		TQ interface source Aconex unique number:				
Type	Query		x	Interface		
	Deviation			Derogation (SHALL[PS])		
	Note: No deviations nor derogations which have an adverse effect on HSSE will be granted					
Workpackage						
Area(s) of application	Design & Eng.		Procurement		Construction	
	Commissioning		Operations	x	Other	
Issue date	17/07/2025		Urgent reply 5 days	x	Routine reply 10 days	
Close-out date						
Closed-out by			MOC status:		Open	

1. Description

Reference documents / Aconex unique numbers:

Based on the cargo barge pumps performance recorded during the loadout of TP, Contractor intends to use external ballast pumps to support the barge pumps.

The reason is to perform the cross-over according to the loadout manual with respect to the planned timing in order to reduce the risk of the operation, remaining in the rising tide curve.

No variation in the ballast sequence for load transfer is required.

ORIGINAL PLAN:

The original plan considers, in addition to the 2x600 mc/h barge pumps, n. 8 external ballast pumps (4 x 300mc/h + 4x400mc/h). n. 4 external ballast, out of 8 pumps, were considered spare pumps dedicated to load transfer, to be used in case of failure of the barge pumps.

The other 4 pumps were dedicated to tide compensation.

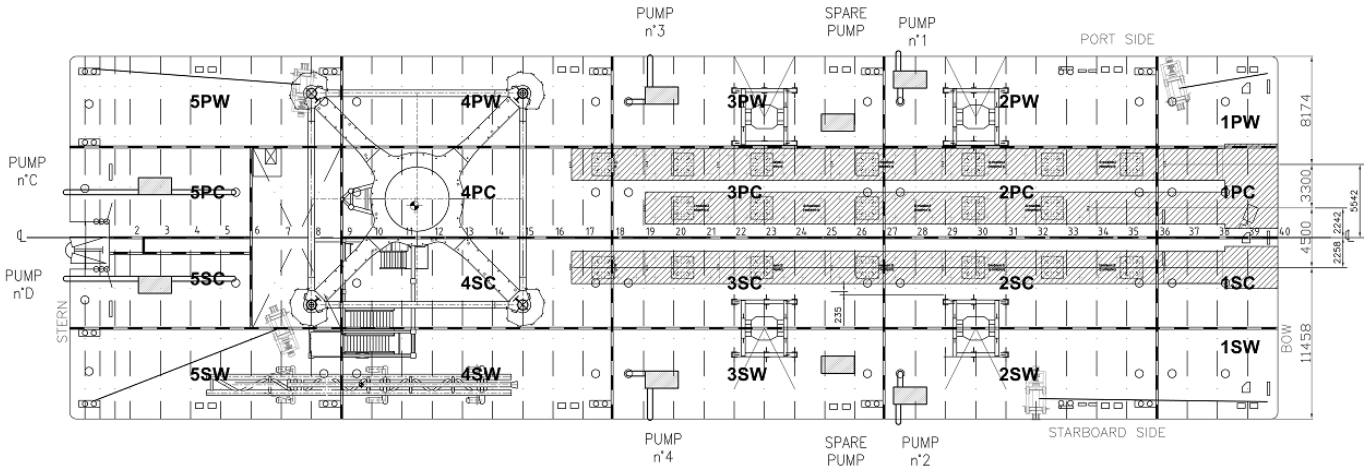
PORTABLE BALLAST PUMP TABLE - BLPH loadout				
PUMP N.	CAPACITY [M3/H]	BARGE TANK	BALLAST ARRANGEMENT	NOTE
1	300	2PW / 3PW	IN & OUT	LOAD TRANSFER - cont.
2	300	2SW / 3SW	IN & OUT	LOAD TRANSFER - cont.
3	300	5PW	IN & OUT	LOAD TRANSFER - cont.
4	300	5SW	IN & OUT	LOAD TRANSFER - cont.
A	300	1PW	IN & OUT	TIDE

This communication is issued for the recipient's information and to facilitate the obligations of the Parties under the Contract. This communication has no authority to amend or vary the Contract nor relieve either Party of any duties, obligations or responsibilities.

B	300	1SW	IN & OUT	TIDE
C	300	5PC	IN & OUT	TIDE
D	300	5SC	IN & OUT	TIDE

MOC:

The new scenario is presented in the next figure:



PORTABLE BALLAST PUMP TABLE - BLPH loadout - MOC				
PUMP N.	CAPACITY [M3/H]	BARGE TANK	BALLAST ARRANGEMENT	NOTE
1	300	2PW	IN & OUT	LOAD TRANSFER + TIDE
2	300	2SW	IN & OUT	LOAD TRANSFER + TIDE
3	300	3PW	OUT	LOAD TRANSFER
4	300	3SW	OUT	LOAD TRANSFER
A	300	2PW and 3PW	IN & OUT	SPARE
B	300	2PW and 3PW	IN & OUT	SPARE
C	300	5PC	IN & OUT	LOAD TRANSFER + TIDE
D	300	5SC	IN & OUT	LOAD TRANSFER + TIDE

2. Response

Reference documents / Aconex unique numbers

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