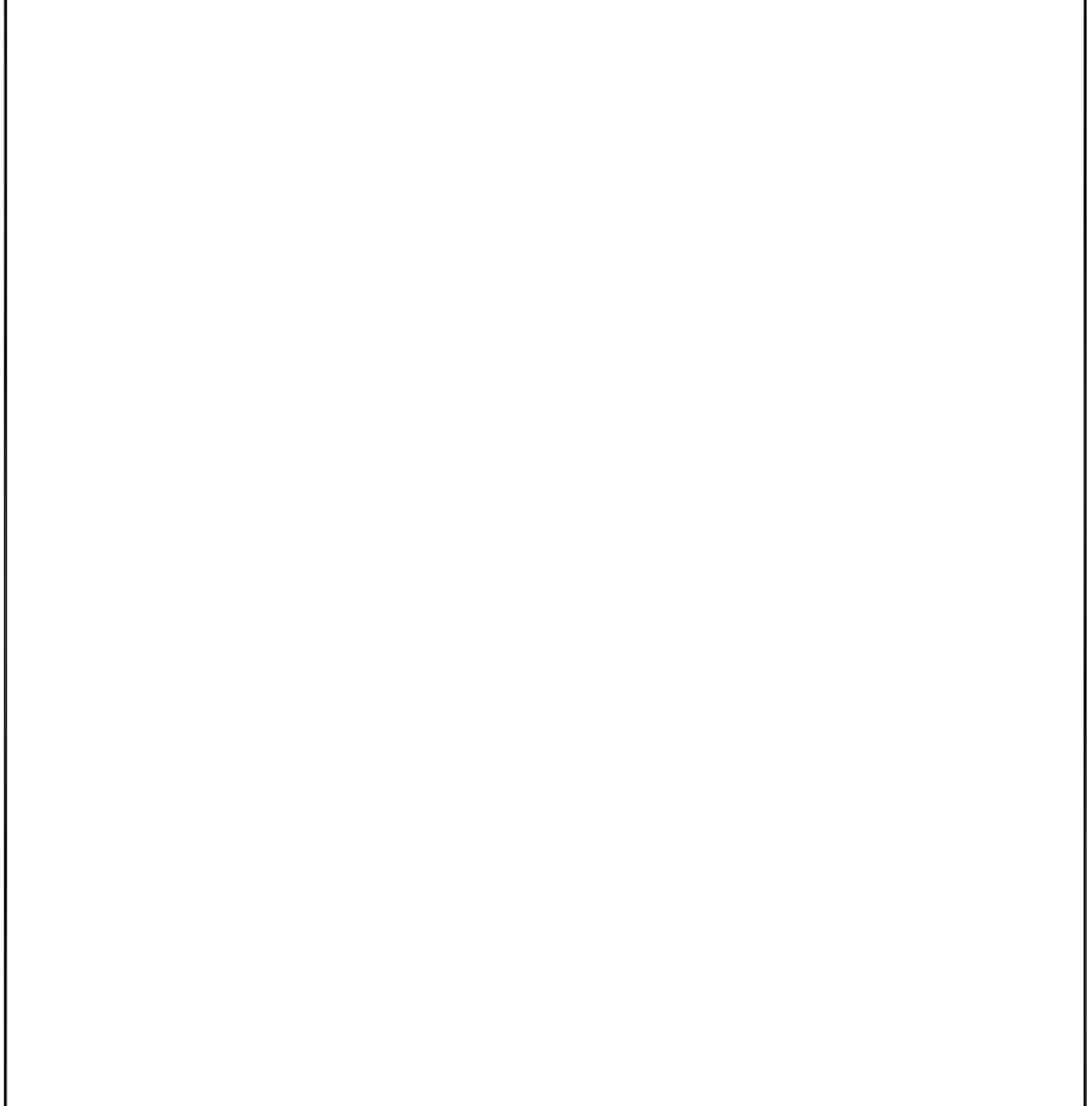


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<b>BASIC DESIGN</b> 送审设计		<b>28.6M TUG BOAT</b> 28.6M 拖船		OWNER 船东		
				FLAG 挂旗		
DESIGNED 设计	Zhang Chuangxin	<b>HULL SPECIFICATIONS</b> 船体说明书		HULL No.船号		
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AREA: 0. 0625m<sup>2</sup>

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## 1 总体 General

### 1.1 船舶总述 Ship summary

#### 1.1.1 用途与航区 Purpose and navigation area

本船主要用于海上拖带适合本船拖力大小的各种船型。

The vessel is designed as TUG for towing ships under safe-towing-load.

设计航区：印尼国内沿海航区

Navigation area: Coastal Services in Indonesia

#### 1.1.2 船型 Ship form

本船为钢质、单甲板、尾机型、双桨、双舵，由柴油机驱动两个定螺距螺旋桨推进的拖船。设有首升高甲板、主甲板以上设有两层甲板室。

The vessel is designed as steel welded, single deck, double fixed pitch propeller, double double-protection rudder, aft single screw diesel engine direct driven Tug and with raised deck, two tiers of deckhouses located on the main deck.

### 1.2 船级、规则和规范 Classifications, regulations and rules

本船船体结构、舾装设备、轮机电气及所有装置的设计和建造由 RINA 审核与检验。

The design and construction of the Hull structure, outfitting of deck and accommodation, machinery, electrical and other unit should be reviewed and inspected by the RINA.

船旗 Flag of Registry

印度尼西亚 Indonesia

入级符号 Characters of Classification :

C ~~X~~HULL ~~X~~MACH

TUG

COASTAL NAVIGATION

本船的船体、机械、设备的设计和制造主要是基于下述规则、规范，包括任何在建造合同签订生效日强制执行的修改通报/通函对沿海航区航行货船的要求进行：

The Vessel, including hull, machinery and equipment, to be built in compliance with the following rules and regulations: including any enforced modification notification / circular for Coastal Navigation going vessel construction after contract comes into effect:

意大利船级社 (RINA) 《船舶入级规范》 (2023)

*RINA Rules for the Classification of Ships, 2023;*

国际海事组织 (IMO) 《国际海上人命安全公约》 (2012)

*IMO The International Convention for the Safety of Life at Sea (SOLAS), 2012;*

国际海事组织 (IMO) 《2008 国际完整稳性规则》 (MSC.267 (85))

*IMO MSC.267(85), 2008 and it's Amendments.*

国际海事组织 (IMO) 《防污公约》 (2011)

*MARPOL issued by IMO in 2011;*

《国际载重线公约》 (1966) 及 1988 修订案

*International Convention on Load Lines issued in 1966 and Amendments in 1988;*

《国际船舶吨位丈量公约》 (1969)

*International Convention on Tonnage Measurement of Ships issued in 1969;*

BKI 认可的相关规范、法规

*Relevant rules by BKI.*

### 1.3 主要尺度 Principal dimensions

#### 1.3.1 主尺度 Principal dimensions

总 长 L <sub>OA</sub>	Length of O.A.	28.630 m
设计水线长 L <sub>WL</sub>	Length of Water line	27.720 m
垂 线 间 长 L <sub>PP</sub>	Length of B.P.	25.920 m
型 宽 B	Breadth Mld.	8.50 m
型 深 D	Depth	3.80 m
设计吃水 d	Design draft	3.00 m

#### 1.3.2 甲板间中心高度 Height between decks

上甲板至首升高甲板	Upper deck to Raised deck	2.40 m
上甲板至驾驶甲板	Upper deck to Bridge deck	2.35 m
首升高甲板至驾驶甲板	Raised deck to Bridge deck	~2.40 m
驾驶甲板至罗经甲板	Bridge deck to Compass deck	2.30 m

#### 1.3.3 舷弧、梁拱 Sheer and Camber

首舷弧 Sheer forward	0.240 m
尾舷弧 Sheer aft	0.122 m

梁拱（主船体） Camber(Hull) 0.15 m

梁拱（甲板室） Camber(Deckhouse) 0.15 m

#### 1.4 舱容 Capacity

本船货舱和液体舱柜的净容积系采用 COMPASS-RULES（Ver.2023）计算。

The net capacity of cargo hold and liquid hold shall be calculated by COMPASS-RULES（Ver.2023）.

##### （1）淡水舱 Fresh water tank

序号 S.N.	舱名 Name	肋位 Name	净容积(m <sup>3</sup> ) Net capacity
1	淡水舱（左） Fresh water tank(P/S)	Fr36~Fr46	51.81
	淡水舱（右） Fresh water tank(S)	Fr36~Fr46	51.81
	Σ		103.62

##### （2）油舱 Oil tank

序号 S.N.	舱名 name	肋位 frame	净容积(m <sup>3</sup> ) net volume (m <sup>3</sup> )
1	NO.1 燃油舱（左/中/右） NO.1 Fuel oil tank(P/C/S)	Fr28~Fr33	26.37×2+30.87
2	NO.2 燃油舱（左/中/右） NO.2 Fuel oil tank(P/C/S)	Fr7~Fr15	25.23×2+28.73
3	F.O.D.TK (P/S) 日用油舱（左/右）	FR12~FR15	3.85x2
	Σ		170.51

##### （3）冷却水舱等 Miscellaneous Tanks

序号 S.N.	舱名 Name	肋位 Frame	净容积(m <sup>3</sup> ) Net capacity
1	污油舱 D.O.T	Fr21~Fr24	2.89
2	污水舱 SEWAGE TK.	Fr21~Fr24	2.89
	Σ		5.78

##### （4）调节淡水舱 Balance fresh water tank

1	BALANCE F.W. TK.(P) 调节淡水舱（左）	Fr+~Fr5	10.23
2	BALANCE F.W. TK.(S) 调节淡水舱（右）	Fr+~Fr5	10.23
	Σ		20.46

### 1.5 吨位 Tonnage

本船吨位根据《国际船舶吨位丈量公约》(1969)的规定计算。

Tonnage to be calculated in compliance with the requirements of *International Convention on Tonnage Measurement of Ships, 1969*.

总吨位 Gross Tonnage (GT)      284

净吨位 Net Tonnage (NT)        85

请详见《吨位计算书》

Please see *TONNAGE CALCULATION*

### 1.6 干舷 Freeboard

本船在吃水 3.00m(即夏季载重线)时的干舷为 808mm,最小船首高度为 2640mm,满足《国际载重线公约》(1966)和 1988 修订案对 B 型船舶要求。

The freeboard is 808 mm at designed draft 3.00m (summer load waterline) and the min bow height is to be 2640 mm, meeting the requirements of *International Convention on Load Lines, 1966* and Amendments to annex B to the protocol of 1988 for the calculation of type .B. ship's freeboard minimum.

请详见《干舷计算书》

Please see *FREEBOARD CALCULATION*

### 1.7 载重量 Deadweight

本船在海水密度为 1.025t/m<sup>3</sup> 情况下,在设计吃水 (3.00m) 时,载重量约为 262.8t,相应排水量约为 498.2t。

The deadweight of this ship is 262.8t at design draft and corresponding displacement to be 498.2t in density of seawater shall be 1.025t/m<sup>3</sup>.

本船实际最大载重量应是经过船舶完工倾斜试验,并测定空船重量后确定。

The actual maximum deadweight of this ship shall be obtained after the inclining test and determined the light weight.

### 1.8 系柱拖力(BP) Bollard pull

主机运行于额定转速及 100%持续功率时,本船系柱拖力约为 24t。

The BP of this ship is about 24t, with the main engine to issue the rated speed and 100% continuous power (Maximum continuous power).

**1.9 动力装置 Power equipment****1.9.1 主推进装置 Main propulsion****1.9.1.1 主机 Main engine**

型号和数量	Model and number	8170ZC1000-5	2 Sets
-------	------------------	--------------	--------

最大持续功率及转速	Maximum continuous power and Rated speed	735kW×1500 r/min
-----------	--	------------------

**1.9.1.2 齿轮箱 Gear box**

型号	Model	HCT800
----	-------	--------

减速比	Speed ratio	6.86:1
-----	-------------	--------

**1.9.1.3 推进器 Thruster**

本船推进器采用定螺距螺旋桨。

The thruster of this vessel shall be Fixed pitch propeller.

螺旋桨形式	Model	MAU
-------	-------	-----

叶数	Number of blades	5 叶
----	------------------	-----

桨数	Number of propellers	2 sets
----	----------------------	--------

直径	Diameter	2.20 m
----	----------	--------

材料	Material	Cu4 锰铝青铜	Cu4 MN-Al-Bronze
----	----------	----------	------------------

**1.9.2 发电机组 Generator group****1.9.2.1 主发电机组 Main Generator**

发电机组型号和数量	Generator group type and number	CCFJ75J-WR	2 Sets
-----------	---------------------------------	------------	--------

柴油机型号	Diesel engine type	WP4CD100E200
-------	--------------------	--------------

输出功率及转速	Output power and speed	90kW×1500r/min
---------	------------------------	----------------

发电机型号	Generator type	MP-H-75-4
-------	----------------	-----------

额定功率	Rated power	75 kW
------	-------------	-------

**1.10 航速、续航力及自持力 Speed, enduranc & self-supportability****1.10.1 航速 Speed****1.10.1.1 设计航速 Design speed**

在 3.00m 设计吃水和如下条件下，本船设计航速约为 11.5 kn:

At the design draft of 3.00m and the following conditions, the Design Speed shall be about 11.5

kn.

—设计状态下 Under the design condition

—主机运行于额定转速及 100%持续功率 The main engine to issue the rated speed and 100% continuous power (Maximum continuous power)

—船体光洁无污底 With clean bottom

—在风力不大于蒲氏风级 3 级，浪高不大于 2 级的平静、开阔深海中航行

Navigation in the calm and open deep sea and the wind is less than beaufort wind scale 3 grade, wave is less than 2 grade.

#### 1.10.2 续航力及自持力 Endurance and self-supportability

本船在平静、开阔的深海中航行，设计航速（ $V_S \approx 11.5$  kn）时的续航力约为 320 小时；自持力 30 天。

In the conditions: Navigation in the calm and open deep sea, design speed about 11.5 kn. The endurance shall be 320 h, and the self-supportability shall be 30 days.

#### 1.11 纵倾和稳性 Trim and stability

本船在各载况下的纵倾和完整稳性以及分舱与破损稳性均满足国际海事组织(IMO)《2008 年国际完整稳性规则》及其修正案对拖船的要求。

Under various loading condition, trim and intact stability, subdivision and damage stability are to be in compliance with the requirements for cargo ship of *International Code on Intact Stability, 2008*, as contained in *IMO Resolution MSC.267(85) and Resolution MSC.415(97)*.

#### 1.12 船员定额 Complements

全船船员定额 11 人。Total complements rated 11 persons

类别 Sort	级别 Class	人数 Number	职务 Duty	人数 Number	职务 Duty	人数 Number	职务 Duty	人数 Number
高级 船员 Officer	1 级 Class	2	船 长 Captain	1	轮机长 C/Engineer	1		
	2 级 Class	2	大 副 C/Officer	1	大管轮 2/Engineer	1		
	3 级 Class	1	三 副 3/Officer	1				
	共计	5						
普通 船员 Crew	4 级 Class	6	水手长 Bosun	1				
			水 手 Sailor	3	机 匠 Oiler	2		



共计 Total

11P

**1.13 总布置概况 General arrangement**

全船共设 6 道水密横舱壁，分别位于 Fr7、Fr15、Fr28、FR33、Z 型舱壁(FR34-FR36)、FR46 肋位。

The vessel to be arranged 6 transverse watertight bulkheads at Fr7、Fr15、Fr28、FR33、Z-shaped bulkhead(FR34 to FR36)、FR46。

**1.13.1 包括机舱在内的尾部区域 Middle region including engine room**

中部上甲板尾 Fr22 至 Fr42 肋位上甲板以上设有两层甲板室。

To be arranged with 2 tiers deckhouse at middle region of upper deck (Fr22~Fr42) .

上甲板（含首升高甲板）（Fr22~Fr42）Upper deck including Raised fore deck (Fr22~Fr42)

上甲板尾楼内设有机舱棚，储藏室，卫生间，餐厅，厨房&干货间，船长室，轮机长室，楼梯间等。

To be arranged with engine casing, store, toilet, mess room, galley&prov. storage, changing room, captain room, chief engineer room, staircase.

**驾驶甲板（Fr29~Fr43） Bridge Deck (Fr29~Fr43)**

甲板室内设有驾驶室。

To be arranged with wheelhouse, navigation equipment store on bridge deck.

**1.13.2 首部区域 Fore area**

首部上甲板（Fr42~至首）设置锚机控制区域。

Fore upper deck of Fr42 to stem area provides windlass control area.

**1.13.3 拖曳作业区域（尾~FR22） Towing-operating Area (stern~FR22)**

本船设有 30T 拖钩，并在左右两舷均设有护舷材及轮胎靠垫。

请详见《拖带设备布置图》&《护舷材布置及结构图》

The vessel is equipped with 30T tow hooks, fenders and tire cushions on the both sides, Please see Towing equipment Arrangement & Fender Arrangement & Structure.

本船的建筑特征和具体布置情况详见“总布置图”。

For the feature of architecture and general layout of the vessel please see the General Arrangement

**1.14 备品和属具 Spares and Stores**

本船配齐规范和法规所规定的备品和属具。符合规范要求的机电产品及其随机备件和船东指定的备品备件由承建船厂安放在相应的适当位置。

To be supplied with adequate spares in compliance with requirements of the rule, the spares supplied with the equipment and spares specified by owner which meet the requirements of the rule shall be placed at the proper place by builder.

### 1.15 标准及计量单位 Standard and Unit

#### 1.15.1 标准 Standard

除了特别规定的设备外，只要适用，以下标准可以被用于本船的建造。

Unless otherwise stated, the following standard shall be used for building this vessel.

- 1) ISO 标准 *ISO Standard*
- 2) 意大利船级社认可的标准 *RINA Standard*
- 3) 建造方的工程标准 *Engineering standard of builder*

#### 1.15.2 计量单位 Unit

在本船设计建造中均采用国际法定计量单位，即国际 ISO 标准或意大利船级社认可的标准。

When design and manufacture the hull, the domestic statutory unit system shall be as measuring unit. That is the *ISO Standard* or *RINA Standard*.

### 1.16 检验、试验和试航 Inspection, Test and Trials

#### 1.16.1 总则 General

本船的建造、机械、舾装和设备都要在船东代表和验船师在场的情况下进行检验、试验。在设备运行前，所有的阀门、管路和监测设备都要做出标记以便识别。

The vessel's construction, machinery, outfits and equipment shall be inspected and tested under the presence of the owner's representative and surveyor. Before operating, all valve, pipes and monitoring equipment shall be marked in order to identification.

检验和试验都要符合建造方的标准和验船机构的要求。检验、试验和试航项目要提交船东认可。计划通常应提前几天提交给船东。各项检验和试验由建造方负责组织安排，作好记录，整理后提交相应的检验、试验报告。

Inspect and test shall be in accordance with the requirements of classification society and builder's standard. Program of inspect, test and trials should be submitted to owner in advance of several days. Each inspection and test shall be organized by builder; making record and submitting corresponding inspect and test reports.

#### 1.16.2 建造和安装检验 Construction and installations inspect

所有船体结构及安装项目的检验，应按照相应规范及有关主管部门及建造厂和 CSQS 的要求

进行。

The inspection of all hull structure and installations shall be in accordance with the requirements of classification society and regulatory bodies and builder and CSQS.

#### 1.16.2.1 船体结构 Hull structure

所有船体结构均应按建造规范要求进行检查，并对舱柜、舱壁、上层建筑、甲板及其他潮湿空间进行密性试验。

All hull structure shall be inspected as per the requirements of classification society. Tightness test shall be provided for tank, bulkhead, superstructure, deck and the other wetted space.

#### 1.16.2.2 车间试验 Workshop test

主机、辅助机械、甲板机械、电动机等应根据规范要求 and/或制造厂的标准进行车间试验。

Workshop test shall be provided for main engine, accessory machinery, deck machinery, electromotor etc as per the requirements of Rules or builder's standard.

#### 1.16.2.3 装置与设备 Appliance and equipment

装置及设备的船上试验，应按船级社和/或主管部门的要求及建造厂标准进行。

The test of appliance and equipment on board shall be in accordance with the requirements of classification society or regulatory bodies and builder's standard.

试验大纲应提交给船东认可。

Program of test should be submitted to the owner for approval.

结构、附件、机械和电气设备在船上安装后均需试验，以便证明施工工艺的好坏、工作的正确性、运动部件的校中情况、设备的功能和满足规范规则的情况。

When the structure, attachment, machinery, electric equipment are fitted, test is also to be carried out for them, in order to know the workmanship is good or bad, correctness of working, calibration conditions of component, whether the function of equipment is in accordance with the requirements of Rules etc.

#### 1.16.2.4 管系试验 Pipes test

管系安装完成后需进行工作试验。管系的压力试验应根据船检要求及船厂的惯例在车间和船上进行。

When the pipes are fitted, working test shall be carried out for them. The pressure test of pipes shall be carried out in workshop and board according to the requirements of classification society and builder's routine.

### 1.16.3 倾斜试验 Inclining Test

船舶除一些细小项目外，已充分完工时，建造方应在码头旁进行倾斜试验。倾斜试验大纲应提交船东认可。倾斜试验应在无强烈水流及强风的平静水域内进行。

When the ship is primarily accomplished, the inclining test is to be carried out by builder. Program of inclining test should be submitted to owner for approval. The inclining test is to be carried out at static sea without strong stream and wind.

空船重量的测定系通过读取船舶吃水、测定水的密度以及确定不足和多余重量，经测量试验数据而得出，并且应在船东代表或船东授权人员以及验船师和设计方代表在场时进行。

The light weight shall be measured by lift draft and density of water and ensure the scant weight and redundant weight with ship-owner representative, surveyor, and designer on site.

### 1.16.4 系泊试验 Dock Tests

系泊试验应按照船级社的要求在船舶充分完工后及海上试航之前进行，系泊试验大纲可根据建造方的标准并经验船机构和船东认可

Dock tests should be done after primarily accomplished and before trial at sea according to the requirements of classification society. Program of dock tests shall be base on the builder's standard and should be approved by classification society and owner.

### 1.16.5 海上试航及试验 Sea trial and test

当船舶充分完成时，即系泊试验已结束，缺陷已纠正，所有设备及舾装均已进入航行状态，涂装工作将近结束，建造方应组织进行试航。

When the vessel is substantially completed that is dock test is finished, defect is corrected, all equipment and outfitting are to be navigation condition, painting is finished generally, sea trial tests shall be performed by the Builder.

详细的试航大纲在试航前应提交给船东认可。

Particular program of trial tests should be submitted to owner for approval before trial.

试航试验报告要提交给船东。

Trial tests report should be submitted to owner.

试航应在常规的压载状态，根据相应规范要求和国家标准的规定，通常有船东代表或船东授权人员以及验船师和设计方代表参与下进行如下试验：

Trial tests shall be carried out with ship-owner representative, surveyor, and designer on site under the conventional ballast condition, according to corresponding rules and national standard.

- 1) 续航力试验 Endurance Trial
- 2) 测速试验 Speed Trial(Free Running Speed and towing speed)
- 3) 惯性测试,全速前进时急停船试验, 全速后退时急停船试验  
Inertia trial: Full speed ahead crash stop trial and Full speed aback crash stop trial
- 4) 回转性试验 Turning testing
- 5) Z形操纵试验 (仅做系列船中首制船) Zigzag testing (just for leading ship in the series)
- 6) 航向稳定性试验 Course-keeping ability trial
- 7) 操舵试验 Steering trial
- 8) 抛锚试验 Anchoring testing
- 9) 系柱拖力试验 Bollard pull testing
- 10) 其它试验 Other testing

诸如, 救生、消防、轴系扭振、通风、测深、罗经的校准以及无线电信设备等船舶舾装设备、轮机电气及通信导航设备系统的功能试验。

Such as life-saving rescue test, firefighting test, Shaft thrash test, ventilation test, depth sounding test , adjustment of the compass, wireless communication device and other functional test of outfit of deck and accommodation, electromechanical, navigation & communication equipment .

## 2 船体结构和涂装 Hull Structure and Painting

### 2.1 船体结构 Hull structure

#### 2.1.1 概述 General

##### 2.1.1.1 设计依据 Design basis

本船船体结构材料、结构形式、骨材间距、构件尺寸、连接方式以及焊接规格等均按照意大利船级社 (RINA) 《船舶入级规范》 (2023) 的相关要求进行设计。

The hull structure materials, structural configuration, Structural member spacing, connecting type, welding standard etc. should be in compliance with the requirement of *RINA Rules for the Classification of Ships, 2023*;

##### 2.1.1.2 结构型式 Structural configuration

本船主船体及上层建筑和甲板室均为钢质全焊接结构。船体结构采用横骨架式。

The hull and superstructure and deckhouse should be all welded steel structure. Hull structure is transverse framing system.

### 2.1.1.3 骨材间距 Structural member spacing

#### 1) 肋骨间距 Frame spacing

全船 Whole Ship 550 mm

### 2.1.1.4 建造材料 Construction materials

本船船体结构材料采用船用低碳钢，构件厚度以及工作环境、温度等条件依照意大利船级社（RINA）《船舶入级规范》（2023）对材料的要求确定。材料的生产厂应由验船部门认可，并且其产品应盖有验船部门的印记。

Hull structure materials shall be marine low-carbon steel , thickness of structural members and the working environment, temperature etc according to the requirements of *RINA Rules for the Classification of Ships, 2023*. Materials manufacturers must be approved by the department of survey, and stamped with the imprint of survey departments.

主船体板材和型材均采用 RINA-A 船用低碳钢。

The main hull plates and bars are carbon steel with RINA-A class.

本船首柱和尾柱为钢板焊接而成。舱壁均为平面舱壁。

The stem post and stern post are welded by steel plates. Bulkheads are all to be flat bulkhead.

### 2.1.1.5 建造工艺 Workmanship

采用的工艺要符合建造方的建造标准，并且要接受验船师的检验以及船东的监督。

The workmanship that used shall be in accordance with the construction standard of builder and shall be inspected by surveyor and ship-owner.

意大利造船质量标准和/或建造方质量标准可以用于船体建造的工艺中。

Italy shipbuilding quality standard and/or builder's quality standard may be used in the workmanship of hull construction.

纵骨架式结构部分，纵骨应保持连续，在与横舱壁或横隔壁相交处，纵骨贯穿，对水密壁处应按相关规范（或标准）要求加设水密补板；横骨架式结构部分，除中桁材或中内龙骨以及甲板中纵桁外，其余纵向构件与横向构件相交处，在不违背规范要求的前提下，纵向构件间断而横向构件连续。

The longitudinal from longitudinal frame system shall be continuous and shall penetrate the transverse bulkhead or bulkhead where they intersect .Watertight patch shall be established according to concerning regulations (or standards). AS the transverse framing , exclusive of center girder, center inner keel or deck center line girder, the longitudinal shall be open and transverse member be continues

where longitudinal and transverse member intersect subject to regulatory requirements.

#### 2.1.1.6 船体结构焊接 Hull structure welding

船体结构的焊接，要求按“船体结构焊接规格表”进行。建造厂应按标准和惯例编制合理可行的建造工艺手册及焊接工艺和规程，并按此进行建造，以便尽量减少焊接引起的变形。焊接船体结构的焊接材料应符合意大利船级社(RINA)《船舶入级规范》（2023）的相关要求。对于重要的工艺程序应征得验船师和船东的认可。

Welding of hull structure is according to *WELDING SPECIFICATION OF STRUCTURE*. Shipyard should plait reasonable and feasible welding procedures to reduce the distortion caused by welding. The welding material of the hull structure should be consistent with the requirement of *RINA Rules for the Classification of Ships, 2023*. As to the important technology proceedings must be the approval of the surveyor and ship-owner must be obtained.

#### 2.1.1.7 切口、通焊孔和其他开孔 Cantaliver, clearance hole and other perforate

在可图上未明确的切口、通焊孔、透气孔和流水孔可根据意大利造船标准的相关规定，或根据所需按建造方的常规标准设置。应特别注意为压载舱和油舱设置良好的排泄孔以保证泵的高效运行。要在横向结构部件上设置适当的流水孔和透气孔。

Slots, welding holes, air holes and drain holes which shall not be indicated in drawing shall be fitted according to Italy shipbuilding standard or routine standard of builder. Attention shall be paid to fit favorable drain holes for ballast tank and oil tank in order to ensure the operation of pump is effective. Suitable air holes and drain holes shall be fitted on transverse structural members.

凡在建造中临时开设的出入孔、通风孔或工艺孔在完工前均应封闭，且保证达到认可图纸和文件规定的相应强度和水/油密要求。

All temporary pigeonhole, wind hole or workmanship hole shall be closed before the work is completed and the strength, water/oil tight shall be in accordance with the requirement of plans and documents.

#### 2.1.2 主要构件尺寸 Primary structural members dimension

所有船体结构构件的尺寸均基于设计吃水（3.00m）进行计算，并得到船检审图机构认可。

The dimension of all hull structural members shall be calculated base on design draft (3.00m) and shall be approved by the ship plan survey agency.

在建造时，要特别注意将船上的振动和噪声等级降低到通常可以接受的范围，既不能损坏主推进系统，也不能造成船上其他机械设备的损坏和故障。

Attention shall be paid to vibration and noise and the class shall be reduced to acceptable region. The main propulsion system and other machinery on board shall not be damaged.

如果船东在除了说明书和认可图中特别提到的以外,还有高于规范的船板厚度或构件尺寸要求,在不影响建造方的建造计划的前提下,建造方在由此带来的价格和载重量调整的基础上可以接受这些要求,但须征得设计方的同意。

Some requirements for plate thickness or structural members dimension that have exceeded Rules (except that have mentioned in specification or plans), builder may accept it as long as it do not affect the construction program and the price and weight of ship may be adjusted. However, it may be approved by designer.

船体结构主要构件尺寸详见“基本结构图”和“主要横剖面图”等相关图纸。

Hull primary structural members please see and *ESSENTIAL STRUCTURE PLAN and PRIMARY TRANSVERSE SECTION*.

## **2.2 表面预处理和涂装 Surface pretreatment and painting**

所有钢结构构件在实施涂漆前都要经过预处理,除锈、上底漆,除锈和涂漆按照下面的概要进行,并符合油漆厂商要求和建造方的标准。

All steel structural members before painting should be pretreated such as rust removal, priming. Rust removal shall be in accordance with the following summary and in accordance with the requirements of paint manufacturer and builder's standards.

所有锐利的边界,小孔的边界,例如切口、通焊孔和排水孔等,和结构的切割自由边都要磨光。所有分段的抛丸或喷砂处理和涂装作业都要在具备合适环境条件下完成,并符合油漆厂商的规定。

All sharp edge, edge of small holes, such as cut, welding holes, draining holes, etc and cut free edges of structure shall be grounded smooth. Shot blasting or sand blasting and painting operation of all section shall be in complete with the appropriate environmental conditions, and in accordance with the provisions of the paint manufacturers.

所有的低于水线以上 1m 处的外板,压载水舱的内部结构,花钢板下的机舱及空舱,这些部分的涂装作业要在新船下水前完成。

The painting of parts which is below 1m of the waterline including all plate, the internal structure of ballast tank, empty room and the engine room below flower plates, is to be completed before the new boat is launched.



所有的喷漆要满足船体阴极保护的要求。

All the paint should meet the requirements of ship cathodic protection.

通常，超过 6mm 厚的船体结构板要抛丸处理至 Sa2.5 级。在抛丸处理不可行的情况下，也可喷砂或手工和动力工具除锈处理至 Sa2.5 或 st3 级。管材、小型零部件及 6mm 以下的船体结构板，可采用酸洗方式除锈或喷砂或手工和动力工具除锈处理至 Sa2.5 或 St3 级，表面粗糙度应达到“涂装前钢材表面粗糙度等级的评定”规定的中级标准。分段接缝处的表面的预处理通过打磨来完成。

Generally, shot blasting treatment for more than 6mm hull plate should be Sa2.5 level. If shot blasting is not feasible, de-rusting operation by sand blasting or hand and power tools should be Sa2.5 or st3 level. Acid or sand blasting or manual and power tools can be used for treatment of Tubes, small parts and hull structure plate that less than 6mm, the treatment should be Sa2.5 or St3 level, surface roughness should be intermediate standard of“ steel surface roughness level assessment before painting”. Surface pretreatment for sectional seams is to be completed by grinding.

经过抛丸或喷砂或手工和动力工具除锈的初步表面预处理之后，应及时涂上车间底漆予以保护。在第一次涂装前要用电动钢刷对预涂底漆进行除锌做第二次表面处理，并进行涂漆前的表面清洁，达到要求后再实施涂装。

After initial surface preparation of parts which are rusted by shot blasting or sand blasting, or hand and power tools, these parts should be painted primer in time. Before the first painting, using electric steel brush to clean zinc in primer as a second preparation, and cleaning the surface must meet the requirements and then implement the coating.

### 3 外舾装设备 Ship outfitting

#### 3.1 锚泊设备及系泊设备 Anchoring and mooring outfits

本船舾装数为 195，按意大利船级社《船舶入级规范》（2023）第 B 篇第 10 章第 4 节的要求配备锚泊及系泊设备。

The outfitting number of this vessel is to be 195. Anchoring and mooring outfits shall be provided as the requirements of *RINA Rules for the Classification of Ships, 2023 in Section 4, Chapter10, Part B*.

##### 3.1.1 锚泊设备 Anchoring Equipment

(1) 锚：首锚采用短杆霍尔锚 2 口，每口锚重 570kg。

Two sets of Hall Stockless Anchor anchor shall be provided, each anchor is to be 570kg.

(2) 锚链: U2 级有档电焊首锚链, 直径  $\Phi 20.5\text{mm}$ , 总长度 302.5m(共计 11 节)。

Anchor Chain: U2 stud welded anchor chain, Dia.:  $\Phi 20.5\text{mm}$ , Total length: 302.5m (11 sections in total) .

(3) 锚机: 液压卧式双链轮锚机 (带双卷筒) 1 台; 适配锚链直径: U2- $\phi 20.5\text{mm}$ ;

Anchor windlass: 1 set hydraulic horizontal double sprocket windlass, which if suited to the anchor chain of U2- $\phi 20.5\text{mm}$ ;

(4) 锚链筒: 船首部设有内径为  $\phi 250$  锚链筒一对, 锚链筒由钢板制成, 下端设有锚穴, 锚链筒的出口及锚爪接触处的锚穴板厚度应加厚。由组成锚链筒的位置、尺寸可结合锚机和船体线型作适当的调整, 要求在收紧锚时, 锚头能与锚穴很好贴合, 对首制船, 锚链筒应用实样模型试验, 以确定最佳布置角度。

Hawse Pipe: on the bow a pair of hawse pipe consisting of steel plate, inside diameter  $\phi 250$  under which anchor recess established. The shell thickness shall be thickened at the outlet of hawse pipe and shell plate where touching with anchor fluke. The position, dimension of the hawse pipe can be regulated combined with the windlass and hull lines in order to make sure the anchor head fit very well with the shell when bring home the anchor. According to the lead vessel, hawse pipe shall be tested in mold to obtain the optimum arrangement angle .

(5) 掣链器及导链滚轮: 本船采用铸钢闸刀掣链器 19~20.5 一对和导链滚轮 20.5 一对, 位于锚机与锚链筒入口之间。布置时应拉线确定其高低位置, 掣链器及导链滚轮底座处甲板应加强。

Chain Stopper and Chain cable fair leader: to be provided a pair of cast steel sluice chain stopper 19~20.5 and a pair of chain cable fairleader 20.5, which are located between the windlass and hawse pipe mouth. To determinate the height when arrange the location, tying line is essential .The deck under chain stopper and chain cable fairleader shall be strengthened.

(6) 弃锚器: 本船采用螺旋弃锚器 25~34 一对, 弃锚器设于首尖舱内, 其位置应方便操作, 锚链直接与弃锚器钩件相连, 在操作手轮处应设有弃锚操作方向标志。

Cable releaser: a pair of screw type cable releaser 25~34 is to be provided and established in the F.P.TK the location shall suitable for operation. The anchor chain is to be connect with the cable releaser directly and direction sign is to be made besides the manipulations hand wheel.

(7) 锚链管: 锚链管内径为  $\phi 160$  且为无缝钢管结构, 下端应制成喇叭口, 以保证锚链顺利进入锚链舱。锚链管喇叭口上焊有圆钢, 锚链管上口按实际情况设置不锈钢盖板。

Chain pipe: chain pipe, inside diameter  $\phi 160$ , seamless steel tube structure, the toe of which is to be pipe socket to make sure anchor chain going well to the chain locker .On the toe of the chain pipe, round bar shall be welded and upper mouth of the chain pipe is to be established stainless steel cover board according to practical condition.

(8) 锚机基座为钢板焊接结构，基座的安装应使锚机与船体基平面平行，基座的高度应在满足安装和锚链轮包角的要求下尽量低，基座的前后方向及两侧应设有防止锚机水平移动的限位块和楔块。

锚机基座处的甲板结构应特别给予加强。

The seat of windlass is to be welded steel plate structure, and the fitting is to keep the windlass and hull base plane parallel. The height of the seat shall be as low as possible in accordance with the requirement for cable lifter wrap angle fitting.

The deck construction of the windlass seat shall be strengthened carefully.

其他备品如连接链环、锚卸扣、锥形销、锚链钩、浮筒卸扣、浮筒钩、掣锚索等适量配齐。

Other stock such as detachable link, anchor shackle, cable hook, buoy shackle, buoy hook, anchor cable shall be provided accordingly.

本船锚泊及系泊设备布置的具体情况详见“锚泊设备布置图”（PN6057-210-01）。

The detailed arrangements of anchoring equipment see *Anchoring Equipment Arrangement (PN6057-210-01)*.

### 3.1.2 系泊设备 Mooring Equipment

(1) 拖索 3 根， $\phi 28 \times 8$  股丙纶长丝绳拖索，长 180m。

Tow lines: Three ( $\phi 28 \times 8$ ) polypropylene lines, length 180m.

(2) 系船索 3 根， $\phi 24 \times 8$  股丙纶长丝绳系船索，每根长 120m。

Mooring lines : Three ( $\phi 24 \times 8$ ) polypropylene lines, Length (each line): 120m

(3) 引缆 1 根， $\phi 24 \times 8$  股丙纶长丝绳系船索，每根长 140m。

Heaving lines : one set ( $\phi 24 \times 8$ ) polypropylene lines, Length (each line): 240m

(4) 系泊属具：带缆桩、导缆孔、导缆滚轮采用国家有关标准。

Mooring fittings: Bollard, mooring pipe, fairlead shall be provided meeting the requirements of concerned standard.

(5) 带缆桩、导缆器、导缆滚轮等下方甲板均局部加强。

The decks under bollard, mooring pipe, and fairlead shall be sub strengthened.

本船锚泊及系泊设备布置的具体情况详见“系泊设备布置图”。

The detailed arrangements of mooring equipment see *Mooring Equipment Arrangement*.

### 3.2 拖带绞车 Towing Winch

#### (1) 主拖带绞车 Main towing winch

本船应配置一台 30T 的主拖曳绞车。

The vessel shall be equipped with a main towing winch (TWL=30T).

#### (2) 主拖索 Main Towing Wire Rope

One set 24 ZAB 6X37S+FC 1670-ZS-317 steel wire ropes (each line: 180m)

本船拖曳设备及主拖索布置的具体情况详见“拖带设备布置图”。

The detailed arrangements of anchoring and mooring equipment see *Towing Equipment Arrangement*.

### 3.3 舵设备 Rudder

舵叶的结构尺寸满足规范要求。铸钢件与钢板焊接时铸钢件需预热，钢板与铸钢件焊接处开坡口。舵叶内部设水平和垂直隔板，隔板上开有排水孔以保证良好的内部泄水。舵叶的顶板和底板上设有三个不锈钢的注入和放水旋塞。舵叶上还装有穿绳起吊孔。舵叶内部涂焦油环氧漆。

The scantling of structure of rudder blade will be consistent with the requirement of rules. Steel casting shall be preheated before being welded with steel plate and both of them are to be cutting groove at the welding connection. Inside of the rudder blade, horizontal and vertical diaphragm plate shall be established and the diaphragm shall establish drain hole to make sure inside drainage. The ceiling and bed plate of the rudder blade shall established 3 stainless steel in-out water cocks.

#### 3.3.1 舵叶 Rudder blade

舵类型	Type of Rudder	普通双支点舵	Ordinary double fulcrum rudder
数量	Number		2 sets
舵面积	Area A		1.978 m <sup>2</sup> (each)
展舷比	Aspect ratio $\lambda$		2.337
平衡比	Balance coefficient $\beta$		0.217

#### 3.3.2 舵杆 Rudder stock

舵杆为船用结构锻钢件，按规范要求设计，舵杆与舵叶之间采用平键锥形连接。舵杆上端用双键与舵柄连接。

The rudder stock shall be marine forged steel and flat key bit connection with rudder blade. Upper

the rudder stock, it is connected with tiller by double keys .

舵柄处舵杆直径为 100mm;

下舵承处舵杆直径为 130mm;

Diameter of rudder stock at tiller to be 100mm;

Diameter of rudder stock at lower rudder bearing to be 130mm;

### 3.3.3 舵机 Steering gear

本船采用电动液压舵机 1 台。公称扭矩：30kN·m；转舵角度：±35°。

One set of Electro- Hydraulic Gear . Nominal torque: 30kN·m. Angle of helm:±35°.

驾驶室内设有舵机操纵系统，亦可在舵机舱内机旁应急操舵。

The navigation room shall be establishing steering gear maneuvering system. There will be emergency steering beside steering gear.

## 3.4 救生设备 Life-saving appliance

本船救生设备按国际海事组织《国际海上人命安全公约》(2012)对拖船的要求配备。

Life-saving equipments to be equipped per the requirements for Tug of *The International Convention for the Safety of Life at Sea (SOLAS), 2012.*

### 3.4.1 救生筏及登乘绳梯 lifeboat and rope ladder

本船救生甲板左右舷各设有抛投式气胀救生筏（20 人）1 艘,登乘梯及梯箱左右舷各 1 部。

One set throwing inflatable life raft(20P) and one set embarkation ladder & box were arranged on port of bridge deck. The starboard of bridge deck ditto.

### 3.4.2 救生衣和救生圈 Life jacket and life buoy

全船配备 14 件救生衣，每件救生衣配备 1 盏救生衣灯

To be provided 14 sets of life jacket (with rescue light and rescue whistle rope-securely)。

全船配置救生圈 6 只，分别布置在主甲板左右舷栏杆各 2 只、驾驶甲板左右舷栏杆各 1 只；其中，带自亮灯的 2 只，带可浮救生索的 2 只，带灯及烟雾信号的 2 只。

The ship is equipped with 6 lifebuoys, two with self-igniting light, two with floating lifeline, two with light and smoke signals. 4 sets lifebuoys are arranged on the both side railings of main deck and 2 sets lifebuoys are arranged on the both side railings of bridge deck

### 3.4.3 抛绳设备 Line-throwing apparatus

全船配置手提式抛绳器 4 具。

To be provided 4 sets portable line-throwing appliance.

#### 3.4.4 烟火信号设备 Pyrotechnic Signal equipment

全船共配置经认可的火箭降落伞火焰信号 6 枚。

To be provided 6 sets of approved rocket parachute flare signal.

3.4.5 救生筏双向甚高频无线电 2 部和搜救雷达应答器 1 个, 卫星紧急无线示位标 1 个(见电气设备)。

Two-way VHF Radio Telephone 2sets

Radar Transponder 1 set

Satellite Epirb 1 set

(Please see *LIST OF ELECTRICAL EQUIPMENT*)

本船救生设备布置的具体情况详见“救生设备布置图”。

Life-saving equipment refer to the *Life-saving & Fire-Fighting Equipment Arrangement*.

### 3.5 消防设备 Fire-Fighting Equipment

消防设备按国际海事组织《国际海上人命安全公约》(2012)对拖船的要求配备。全船配有水灭火系统及二氧化碳灭火系统各 1 套。

Firefighting equipment is to be equipped as per the requirement for tug of IMO *SOLAS*, 2012; One set of water fire-extinguishing system and one set of CO<sub>2</sub> fire-fighting system shall be provided.

#### 3.5.1 消火栓、水龙带箱及水龙带和水枪 Fire hydrant、hose locker and hose and squirt

全船设有 6 个消火栓和配 6 个水龙带箱。

The vessel to be equipped with 6 sets Fire Hydrants and 6 sets hose lockers.

#### 3.5.2 灭火器 Fire extinguisher

全船配备 9L 手提式泡沫灭火器 3 只, 手提式干粉灭火器 5kg 的 13 只。机舱内配手提式 9L 泡沫枪 2 支, 手提式干粉灭火器 5kg 的 2 只。

To be provided 3 sets of portable 9L foam fire extinguishers, 13 sets of 5kg portable dry powder fire extinguishers. Engine room is to be equipped with 2 sets of portable 9L foam fire extinguishers, 2 sets of 5kg portable dry powder fire extinguishers.

#### 3.5.3 二氧化碳钢瓶组 1 套

To be provided 1 set of CO<sub>2</sub> bottle.

3.5.4 全船配备另配 16 只备用手提式灭火器, 其中手提式干粉灭火器(5kg)13 只, 手提式泡沫灭火器(9L)3 只。

16 sets spare portable fire extinguishers, 13 sets of portable 9L foam fire extinguishers, 3 sets of

5kg portable dry powder fire extinguishers.

本船消防设备布置的具体情况详见“救生设备布置图”。

Fire-Fighting equipment refer to the *Life-saving & Fire-Fighting Equipment Arrangement*.

### 3.6 金属门、窗、盖 Metal doors, Window, Cover

#### 3.6.1 金属门 Metal Door

本船所有舱室与外部相通的出入口以及作为采光或通风的窗均设置风雨密单扇钢质门和窗。所有外部的门均朝舷外开启。主甲板甲板室外围壁上的门其门槛高度均为 600mm；驾驶甲板室门槛高为 380mm；各甲板室内部门的门槛高均为 100/200mm。

All compartments of the ship connected with the outside entrance as well as the lighting or the ventilation windows are fitted weather tight single-leaf steel doors and windows. All external doors can be opened towards outboard, the door on outside wall of deck houses can be opened towards forward. The height of threshold of engineer casing, forecastle, the Front and rear side wall and the external wall of deck deckhouse of upper deck are 600mm; The height of outside threshold of the rest deckhouses: bridge deck 380mm ; The height of inside threshold of each deckhouse is 100mm/200mm.

上甲板甲板室外围壁上装设透光尺寸  $\Phi 300$  焊接固定式钢铝组合舷窗（带棘爪式风暴盖）；其余各层甲板室（驾驶室前端壁除外）外围壁上均装设螺栓安装可开启的铝质船用普通矩形窗；驾驶室前端壁上装设较宽大尺寸的螺栓安装固定式钢质船用矩形窗。

On the deckhouse external wall of upper deck is to be fitted side-scuttle of  $\Phi 300$ (with a pawl-type storm cover). The external wall of the rest deckhouse (the front wall of wheelhouse excluded) are installed ordinary aluminum rectangular windows which is bolt fixed and can be opened. The front bulkhead of wheelhouse is to be installed large and wide size steel marine rectangular window which are bolts fixed.

本船金属门、窗的具体规格和布置情况详见“全船门窗布置图”。

The layout and specifications of metal doors, windows refers to the *DOOR& WINDOW ARRANGEMENT*.

#### 3.6.2 小舱口盖及人孔盖 Hatch cover and the manhole cover

进入所有油水舱均设有油密或水密人孔盖。

Enter the slop tanks by oil-tight or watertight manhole covers.

上甲板设有 600×600 风雨密舱口盖 3 只（围板高度 600mm），水密人孔盖 2 只。

To be arrange with 3 sets 600 × 600 weathertight hatches(coaming's height 600 mm) and 1 set

600 × 400 watertight manhole covers on upper deck.

本船舱口盖及人孔盖的具体规格和布置情况详见"全船梯盖布置图"。

The specifications and layout of hatch covers and manhole covers see *LADDER & COVER ARRANGEMENT*.

### 3.7 扶梯、栏杆和扶手 Stair, Guardrail and handrail

3.7.1 各层甲板室内设有环围主梯道，从首楼内可通达各上层甲板室。主梯道采用倾斜角度不大于 55°，净宽度不小于 600mm 的钢质结构斜梯，并配以钢管扶手。直梯宽度为 400mm。

Each tier of deck house shall be provided ring ladder road and from the inside of forecastle it shall be possible lead to each upper deck house. The main ladder is to be steel structure with steel pipe hand rail and shall adopt inclination angle which is less than 50° and breadth is no less than 800mm. The traffic stair of compartment of upper deck

vertical ladder breadth 400mm.

本船梯子的具体规格和布置情况详见"全船梯盖布置图"。

The specifications and layout of ladder see *LADDER & COVER ARRANGEMENT*.

### 3.7.2 栏杆、风暴扶手 Railing and Storm Rail

驾驶甲板、罗经甲板设置 1000mm 高栏杆,栏杆撑柱采用 60×16 的扁钢，横杆采用 φ20×3 的钢管，扶手采用 φ42.3×3.25 的钢管。全船沿甲板室外围壁的外侧设镀锌钢管制成的风暴扶手。

The bridge deck and compass deck are provided with 1000mm high railings. Railing shoring are flat steel of 60×16, stock stabilizer is round bar of φ20×3, guardrail is galvanized water gas pipe of φ42.3×3.25. The outside of the external wall around deck houses shall be installed galvanized steel pipe storm rails.

栏杆、扶手的具体结构型式、规格、材料及布置情况详见"全船栏杆扶手布置图"。

The structure, specifications, material and layout of Railing and Storm Rail see *RAILING HANDRAILS ARRANGEMENT*.

### 3.7.3 舷墙 Bulwark

舷墙的具体结构型式、规格、材料及布置情况详见"全船栏杆扶手布置及舷墙结构图"。

The structure, specifications, material and layout of bulwark see *BULWARK STRUCTURE PLAN*.

### 3.8 航行及信号设备 Navigation and signal equipment

航行及信号设备按国际海事组织（IMO）《国际海上人命安全公约》(2012)对货船的要求配备。



Navigation and signal equipment shall be equipped as per the requirements for cargo ship of SOLAS issued by IMO in 2012.

### 3.8.1 桅 mast

罗经甲板上 Fr35 处设桅 1 座，钢板焊接结构，其上设有桅灯和锚灯等。

Mast welded by steel shall be installed on compass deck at Fr35, on which mast light, anchor light to be installed.

### 3.8.3 号型、号旗及声响信号器具 Shape, flag and Sound Signal Fittings

信号设备除号灯、闪光灯设于指定位置外，号型（如锚球）、号旗、声响信号器具等按法规要求配齐。

本船信号设备布置的具体情况详见“声光信号设备布置图”。

主要航行设备，诸如雷达、标准磁罗经、电罗经、AIS、卫星导航仪 GPS、测深仪、尾轴转速表、探照灯、测深手锤、倾斜仪、望远镜、温度计、气压计、航海仪器等依法规要求按需配齐。

电子导航设备和仪器的具体配置情况详见“电气设备明细表”。

In addition to the lights and flash at the specified location, signal equipment such as shape (such as the anchor ball), flag and Sound signaling apparatus and other equipment is installed according to regulations

The layout of signal equipment refers to *ARRANGEMENT OF ARRANGEMENT OF ACOUSTIC & LIGHT SIGNALS*.

Main navigation equipment such as radar, standard magnetic compass, AIS, gyrocompass, satellite navigator GPS, sound machine, stern shaft tachometer, search light, sounding hammers, gradiometers, binoculars, thermometers, barometers, charts and navigation instruments is installed in accordance with requirements of regulations.

The allocation of electronic navigation equipment and instrument please see *LIST OF ELECTRICAL EQUIPMENT* in detail.

## 4 舱室舾装部分 Accommodation outfitting

### 4.1 防火结构 Fireproofing structure

本船防火结构按国际海事组织《国际海上人命安全公约》(2012)对拖船的要求实施。

Fireproof structure is in accordance with the requirement for cargo ship of SOLAS issued by IMO in 2012.

本船在起居处所和服务处所内采用的保护方法为 IC 法，以不燃的 B 级或 C 级分隔作为内部

分隔舱壁；且在起居处所和服务处所与 A 类机器处所相邻的舱壁和甲板采用 A-60 级耐火分隔；所有脱险通道内采用 A 级环围保护。在起居处所、服务处所和控制站内所有的衬板、天花板及其附属的衬档均应为不燃材料。

In accommodation and service space protection methods is IC. Take noncombustible B grade or C grade separation as internal separation bulkheads; The bulkhead and deck of accommodation and service space adjacent to machinery spaces of A type shall take A-60 Class fire resistant separation; All escape take around protection of A Class. In the accommodation and service space and control station, all backing strip, the ceiling and attached files should be non-combustible material.

#### 4.2 木作绝缘 Wood insulation

耐火完整性在 A-0 级以上的舱壁和（或）甲板的防火绝缘采用岩棉板或陶瓷棉毡作绝缘材料；对耐火完整性在 B-0 级以上的作为起居处所和服务处所内部分隔的围壁和（或）甲板敷设泡沫矿棉作防火绝缘，衬板或天花板采用不燃防火板材。对于与露天相邻的围壁和甲板均敷设 50mm 厚超细玻璃棉毡进行隔热绝缘。

Fire insulation of bulkhead and (or) deck whose fire integrity level above A-0 grade shall take rock wool or ceramics wool as insulation materials; Fire insulation of separation bulkhead and (or) deck of accommodation and service space whose fire integrity level above B-0 grade take foam mineral cotton as fire insulation, backing strip or ceiling using noncombustible fire proof board. For the wall and deck which are open-air shall lay 50mm super fine glass wool blanket for heat insulation.

#### 4.3 防火门 Fire doors

防火门的设置应与所处的舱壁的防火分隔等级要求一致，防火门应为船舶检验机构认可的型式，且具备相应的产品证书。应急出入口、机舱棚和梯道环围处的防火门均应装设闭门器。

Fire rating of fire doors should be the same with separation bulkhead where the fire doors located, fire doors should be approved by survey department, and have corresponding product certification. The fire doors of emergency exits, engine casing and stair encircled should be installed door closer.

#### 4.4 舱室舾装 Accommodation outfitting

供船员居住居住舱室 6 间,各居室内均相应设有床、衣橱、写字台、椅子等。

6 single crew's room. Bed, wardrobe, writing desk, chairs etc shall be provided for crew's room.

舱室家俱和设备的布置或图册应提交船东审查认可。视需要，木质家俱均由水曲柳和（或）杂木或高密度板或木芯板制成，各种抽屉均设置止滑块。家俱与地板、围壁之间的固定方式可按建造厂的施工惯例确定。

Arrangement and atlas of furniture and apparatus should be provided to the owner (representative) for approval. Wood furniture shall be made from high density plate or wood core plate and each king of drawers shall be fitted slipper stopper .The fixing of furniture between floors, casing wall shall be settled according to execution convention of the builder.

上甲板进门口的走道侧壁上设有消静电板。在适当处所，配置有关防污染的标语。

The sideboard of aisle besides the door of upper deck shall establish statically electricity cleaner. Concerning signers of pollution prevention shall be allocated.

小五金为铜镀铬或不锈钢材料制造，并尽量采用标准船用小五金。

Hardware is made of copper chrome plating or stainless steel and shall be standard marine hardware as possible .

各居住舱室、公共处所、工作处所等都配有门锁，每把锁配有三把钥匙，且有一把总钥匙（船长用），三把分总钥匙（大副、轮机长、大管用），并在每把钥匙上须标记有舱室名牌。

Each cabin, public space, working space ect shall be provided lock, each lock with 3 keys and 1 general key for captain, 3 for chief, chief engineer, 2/engineer. Space name shall be marked on each keys .

所有居住舱室配有门钩和门碰钩。

All the cabin shall be fitted with door hook and door crashing hook.

舱室门把手采用不锈钢。

The door dog is made of stainless steel.

#### 4.4.1

船员居住舱室的窗户配有窗帘，窗帘均为双层的，并配有窗套盒。

The window of crew cabin shall be provided with double hangings with box .

窗帘采用不燃化纤织物制成。

The hangings is made of unburnable chemical fiber tissue.

#### 4.4.2

卧具按全船铺位位数的双份配备。共计 20 套。

The number of bedding is fitted as 2 times of the beds of the whole ship .Total 20 sets.

每套卧具包括：床垫、床单、羽绒枕头、枕头套、羽绒被、羽绒被套、全羊毛毯、枕巾、床席、枕席、毛巾被。

Each bedding consists of mattress, bedspread, feather pillow, wool blanket etc.

#### 4.4.3

舱室小五金等设备，如镜面箱、毛巾架、烟灰缸、热水瓶架、窗帘轨、门钩、肥皂架、卫生纸架等按需配齐。

Hardware of the cabin, such as mirror plate, towel shelf, ash cylinder, thermos shelf, curtain rod, door hook ect shall be provided as per requirements.

### 5 标志和铭牌 Marks and nameplates

#### 5.1 船体标志 Ship's marks

a. 采用厚 6mm 钢板割制成型，牢靠地焊接在船体壳板或上层建筑外侧壁上，成凸起的永久性标志。字母和数字则采用在船壳板上堆焊的办法。

Steel plate, thickness 6mm, is adopted in the marks and welded on the hull or the outboard of the superstructure to be perpetual saddle backed signs. Letters and number shall be overlaying on the shell plate .

b. 标志有：船舳部左、右舷的载重线；首、舳、尾左右舷的水尺；首部或上层建筑侧壁上的船名，尾部船名和登记港名以及烟囱侧壁上的公司徽标等。

Marking: load line on port and starboard side of the midship ;the rule on port and starboard side of the bow, midship, stern; the ship name ,stern name on the sideboard of the bow or superstructure ,port name of registry and company sign on the sideboard of funnel .

#### 5.2 肋位号标志 Frame marks

在船舶舳部每隔 5 个肋位设置并焊牢肋位号标志，标志采用 4mm 钢板做成。

Frame marks to be fitted and welded in bilge at every five frames, marks are made of 4mm steel plate.

#### 5.3 设备标志 Equipment marks

所有机械、电气设备应有不锈钢铭牌标志。

All machinery, electrical equipment should be marked with corrosion resistant nameplates.

#### 5.4 舱室标志 Accommodation marks

各舱室门上方设置采用不锈钢板制成的舱室名称标志。

Accommodation marks to be fitted in the top of the cabin door with corrosion resistant plate

#### 5.5 应急标志 Emergency signs

船上应按 *RINA* 的有关要求张贴救生、消防的应急行动标志。

Emergency signs of life-saving and firefighting shall be fitted according to the relevant requirements of *RINA*.

### **5.6 管系标志 Piping marks**

船上各种管系，按相关船舶标准涂刷色漆或包扎色带。

Various piping systems on board shall be painted by color or wrapped ribbon according to relevant ship's standard.

## **6 其他 Others**

### **6.1 防腐蚀设施 Anti-corrosion equipment**

本船钢质船体浸水表面除采用有效涂料涂装外，对船体外板、舵、海底阀箱、螺旋桨、艀龙骨、压载水舱等部位还需采用牺牲阳极阴极保护法予以保护，以防止电化学腐蚀。设计使用年限：有效期限至少为 3 年。

The flooding surface of the vessel takes an effective paint coating. The shell plate, rudder, suction box, propellers, bilge keel, ballast tanks and other parts shall use cathodic protection to protect against electrical chemical corrosion. Design life: 3 years at least

### **6.2 帆布罩 Canvas cover**

露天的甲板机械，救生艇及罗经等设备应设帆布罩加以保护。

Weather deck machinery, compass should have a canvas cover to protect.