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## SIGNIFICANT SHIPS of 2012

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# SIGNIFICANT SHIPS OF 2012

Traditionally at New Year in the UK we make resolutions to improve the way we behave. Often those resolutions are broken within a few days of the start of the year and sometimes they are deferred to next year's list.

This is not too dissimilar to the 2012 order book, which may have started on a steady course (well hopeful for the publications team to get the full 50 ships quota), but by the end of the year we saw the push back of more orders and delays in delivery times.

However, the shipping industry has been far from idle with new green regulations pushing ships to be cleaner and leaner in an effort to combat global warming. This has meant that environmentally friendly designs have dominated the new ship horizon this year; whether these have included ballast water treatment systems, fuel saver fins/stern appendages, air lubrication, dual fuel or vessel design optimisation, the industry is getting to grips with solving the emissions problem.

The expansion of the Panama Canal has also made a change to vessel design with a number of Post Panamax vessels coming onto the market. The Panama Canal was originally opened in 1914 making it no longer necessary for ships to sail the Cape Horn route around the southernmost tip of South America (via the Drake Passage) or to navigate the Strait of Magellan, creating a shortcut between the Atlantic and Pacific Oceans.

The Panama Canal's breadth when built was 33.52m, which allowed vessels with a beam of 32.31m to transit the locks. With the expansion of the canal it will see the size parameters for vessels increase from 289.6m x 32.31m x 12.04m (draught) x 57.91m (air draught) to 366m x 49.00m x 15.02m x 57.91m. The expansion programme has cost US\$5.8 billion.

The earliest recorded Panamax products tanker was *Tanja Dan* built in 1964 by Mitsui Tamano for an un-recorded owner. The first dedicated Panamax dry bulk carrier was the

58,000dwt *Pacific Maru* built for NYK lines by Kawasaki. The 2,450TEU *Kamakura Maru* was the first Panamax container ship built by Mitsubishi Kobe for NYK Mariner Shipping in 1971. Today's Panamaxes may dwarf the first of their generations in size and capacity as the demand for transporting larger capacities increases. (see *The Naval Architect*, November 2012, Pg 21-24)

The changes in the Post Panamax design can be seen in vessels that are featured in Significant Ships 2012, such as *Hamburg Express*, *APL Southampton*, and *CMA CGM Marco Polo*. The trend has led in essence to fatter vessels, which also is a benefit when it comes to ship stability, compared to that of a long and thinner design. However, in March DNV held a seminar where it cautioned owners about these new leviathans of the seas that for them to be truly efficient they will need to operate at almost full capacity on all journeys for them to be cost effective.

We have seen container ship capacity increase drastically over the last two years as the vessels have become larger. *CMA CGM Marco Polo* a 16,000TEU container vessel is also one the largest capacity container ships that was delivered in 2012. This title will be a short-lived one though as the first of the Maersk 18,000TEU Triple E ships is expected to be delivered in 2013.

However, the 2012 edition has lacked in one particular segment, which has been cruise ship market, this has not been for a lack of trying, but, the slowing of orders has seen many sister vessels being delivered throughout 2012. One particular vessel that has stood out though and is featured is *AIDamar*, which has a waste heat recovery system installed onboard that is claimed to be the first for a cruise vessel. The system uses heat from the ship's machinery to operate the air conditioning and water treatment systems, which allows the vessel to save 1tonne of fuel per day.

Finally the Royal Institution of Naval Architects would like to thank all of those who have made this publication possible, especially the builders and owners who have given their time to supply the information found in this magazine. We thank you all for your support and look forward to contacting you again for Significant Ships 2013.

Samantha Fisk  
Associate Editor  
January 2013

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## Notes:

In the tables which form part of each ship description, all dimensions, also deadweight and displacement tonnages, are metric unless otherwise stated. Machinery powers have been specified as 'bhp' or 'kW' in accordance with information received from the shipbuilder or owner. Emergency alternators are not normally included in the number of alternators. When a dash (-) has been included against an item, this generally denotes lack of information but where it is known that features have not been included, this is indicated by 'nil'. The number of sister ships completed or on order does not include the ship presented. Some ships shown as 'on order' may have been delivered by the time this publication appears.

Further information on certain vessels included in *Significant Ships of 2011* can be found in the following editions of The Royal Institution of Naval Architects' publication, *The Naval Architect*:

<i>BBC Amethyst</i>	April 2012
<i>Innovation</i>	April 2012
<i>JS Amazon</i>	September 2012
<i>Stolt Rhine</i>	November 2012





## AIDAMAR: cruise ship with EGR

Shipbuilder: ..... **Meyer Werft**  
 Vessel's name: ..... **AIDAMAR**  
 Hull No: ..... **S690**  
 Owner/operator: ..... **AIDA Cruises**  
 Country: ..... **Germany**  
 Designer: ..... **AIDA Cruises**  
 Country: ..... **Germany**  
 Flag: ..... **Italy**  
 IMO number: ..... **9490052**  
 Total number of sister ships already completed (excluding ship presented): ..... **2**  
 Total number of sister ships still on order: ..... **1**

**AIDAMAR** is a Sphinx class cruise ship that was constructed at German Shipyard Meyer Werft and delivered to its operator AIDA Cruises in May, where it joined its sister vessels.

Although **AIDAMAR** is identical in construction to **AIDABLU** one unique feature of this vessel is that it has a waste heat recovery system (WHRS) installed. **AIDAMAR** is the world's first cruise ship to be equipped with the unique WHRS, which uses heat from the ship's machinery to operate the air conditioning and water treatment systems. The Rostock-based company has been progressively lowering its ships' fuel consumption and emissions by installing energy efficient technology and carefully planning routes that will give the greatest fuel-saving.

The WHRS on **AIDAMAR** is expected to reduce the vessel's power consumption for heating and cooling purposes, by one metric tonne of fuel per day. Waste heat from the engines will be converted to cooling energy, which will then be used for the ship's air conditioning. The heat energy left over from this will be used to generate drinking water. For this, the system uses vacuum generation to vaporize and desalinate sea water at just 50°C. The waste heat energy from the engines will be used to generate steam for the air conditioning, laundry rooms and kitchens (galley).

**AIDAMAR** is powered by a Caterpillar 9M43C diesel-electric engine. The power that is created goes towards supplying the ship's hotel services and also powering the propulsion. Electric motors, unlike diesel engines, are just as efficient at all capacities, which means that regardless of whether the ship is sailing quickly or slowly, its efficiency will remain at the same level. In addition, the separation of the drive system and diesel engine means that the diesel can function at optimal efficiency. The engine only produces as much power as is needed.

**AIDAMAR** is also fitted with two, five wing, 5.2m propellers that each has a weight of 12,800kg. Two electric motors are used to operate the 35m drive shafts, which power the two propellers. With the use of flow-optimised propellers and rudders the company has succeeded in reducing fuel consumption further. The rudders are asymmetrically twisted at the height of the propeller hub. This design also creates a sail effect that adds better efficiency to the vessel's propulsion. The propellers were manufactured in the propeller works in Waren (Müritz) in Mecklenburg-Vorpommern. In model experiments, the propellers were tested in the Hamburg Ship Model Basin on its performance and its efficiency.

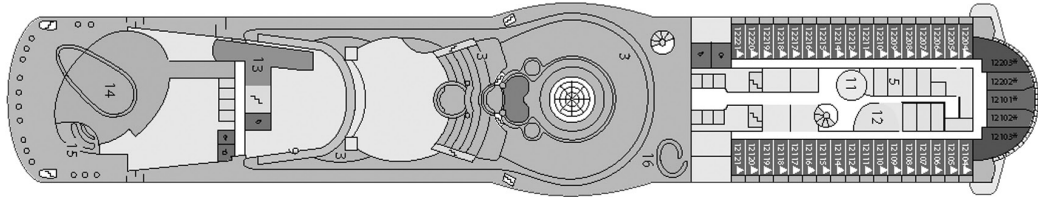
**AIDAMAR** features 1,097 staterooms. Of these, 39 cabins have direct access to the spa. The Wellness Oasis spa has been built in the Indonesian style. Visitors can relax in a Balinese jungle with sandstone reliefs and two large tropical trees with aerial roots.

One of the many innovations onboard is the virtual ocean view sea cabins, which is achieved by 42-inch LED flat screens that show a live view of the sea or the destinations. The infotainment system can also be used on the flat screen iTV. In the a la carte restaurants come, iPads are used as electronic menu. The virtual guide gives guests plenty of additional information such as the origin of the steaks. An 8 x 4.5m LED screen on the wall on the pool deck shows movies and scenes, which are shown in the original Cinema 16:9 aspect ratio.

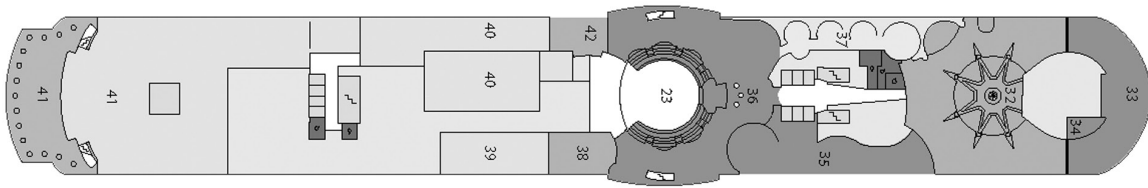
### TECHNICAL PARTICULARS

Length oa: ..... 253.30m  
 Length bp: ..... 230.50m  
 Breadth moulded: ..... 32.20m  
 Depth moulded  
 To main deck: ..... 12.40m  
 Draught  
 Scantling: ..... 7.2m  
 Gross: ..... 71,304dwt  
 Displacement: ..... 37,375tonnes  
 Deadweight  
 Scantling: ..... 7,757dwt  
 Speed, service: ..... 21.8knots  
 Classification society and notations: ..... GL 100 A5- IW ERS  
 BWM MC AUT RP3-50% EP  
 Main engine  
 Design: ..... Caterpillar  
 Model: ..... 9M43C  
 Manufacturer: ..... MaK  
 Number: ..... 4

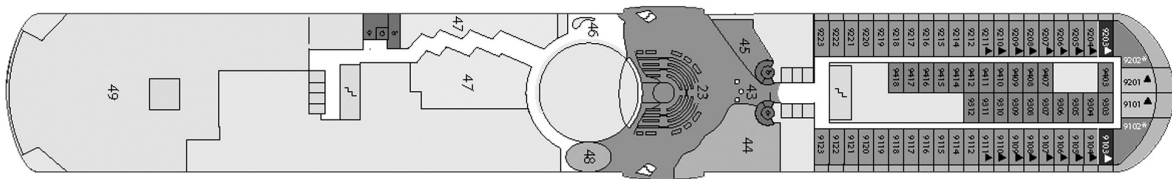
Type of fuel used: ..... HFO  
 Output of each engine: ..... 9,000kW  
 Propellers  
 Material: ..... Cu-Zn  
 Designer/manufacturer: ..... MMG  
 Number: ..... 2  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 5.2m  
 Main-engine driven alternators  
 Number: ..... 2  
 Make/type: ..... VEM  
 Output/speed of each set: ..... 12,500kW  
 Boilers  
 Number: ..... 2  
 Type: ..... oil/exhaust gas  
 Make: ..... TPK Nova d.o  
 Output, each boiler: ..... 10bar/ 107m<sup>2</sup>, 190m<sup>2</sup>  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 x 1,820persons  
 Make: ..... Viking  
 Type: ..... MES  
 Vertical or sloping chutes: ..... vertical  
 Complement  
 Crew: ..... 620  
 Passengers  
 Total: ..... 2,686  
 Number of cabins: ..... 1,607  
 Percentage/number outboard: ..... 510  
 Bow thrusters  
 Make: ..... Brunvoll  
 Number: ..... 2  
 Output: ..... 2,300kW  
 Stern thrusters  
 Make: ..... Brunvoll  
 Number: ..... 2  
 Output: ..... 1,500kW  
 Bridge control system  
 Make: ..... SAM Electronics  
 Type: ..... NACOS Platinum  
 One-man operation: ..... yes  
 Integrated bridge system  
 Make: ..... SAM Electronics  
 Type: ..... NACOS Platinum  
 Contract date: ..... 13 December 2007  
 Launch/float-out date: ..... 1 April 2012  
 Delivery date: ..... 3 May 2012



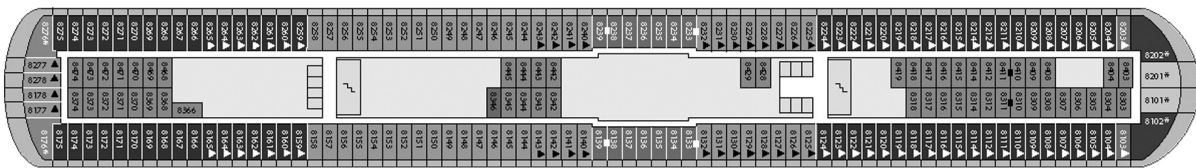
Deck 12



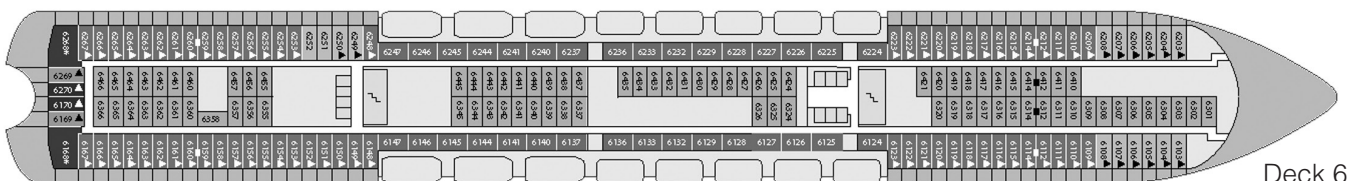
Deck 10



Deck 9



Deck 8



Deck 6



Deck 5





# AL-IDRISI: hopper suction dredger

Shipbuilder: ..... **STX Offshore & Shipbuilding Co., Ltd**  
 Vessel's name: ..... **Al-Idrisi**  
 Hull No: ..... **B-5055**  
 Owner/Operator: ..... **Jan De Nul**  
 Country: ..... **Belgium**  
 Flag: ..... **Luxembourg**  
 IMO number: ..... **9572707**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **1**

**J**AN de Nul Group (JDN) originally signed a contract with the South-Korean yard Heun Woo Steel Co. Ltd. to construct two 7,500m<sup>3</sup> trailing suction hopper dredgers, *Al-Idrisi* the second in the series and *Vinus Bering*. One of the vessels will also be a replacement for the 7,000m<sup>3</sup> *Cristoforo Colombo*, which was lost during a typhoon in September 2004.

The Netherlands-based naval architects Vuyk Engineering Rotterdam designed *Al-Idrisi*. Before ordering the vessels, Vuyk Engineering prepared the main construction drawings as well as the diagrams for the dredging, machinery and general service systems onboard.

However, the vessels were scheduled for delivery in 2008 and 2009, but due to delays the vessel was delivered in 2012 from STX Offshore & Shipbuilding in Korea. JDN says that delays from the original shipyard meant that it was unable to deliver the vessels, which meant that they opted to have these two vessels constructed at STX in Korea. The vessels were ordered along with a 6,000tonne side stone-dumping vessel as part of JDN's investment programme into its fleet that is valued at €1.8 billion (US\$2.31 billion).

The 7,500m<sup>3</sup> trailing suction hopper dredger *Al-Idrisi* has been specially designed for operation in shallow and confined waters. The vessel has a 1,000mm suction pipe for a dredging depth of 46.4m, and a 4,000kW dredge pump. The vessel is also fitted with rudder propellers, a 750kW bow thruster and a Class 1 dynamic positioning system that gives the vessel better manoeuvrability.

The vessel trails the trailing suction pipe at the starboard side of the vessel when working, and loads the dredge spoil from the seabed in to the hopper on the vessel. When the hoppers are full, the vessel sails to a disposal area and dumps the spoil through its boxed-shaped four bottom doors in the bottom of the hull or pumps the spoil from the hopper to the shore through bow connection or bow jetting installation on the foreship.

Each of the twin controllable pitch azimuthing propellers is driven by a non-reversible diesel engine, which have an output of 4,000kW at 750rpm and allows the dredger to have a service speed of 13.7knots.

The vessel has DP system which can control all thrusters (rudder propellers, bowthruster) in such a way that the vessel operates in the selected mode in an optimal way. Wind data and forces in the suction pipe are used to calculate ("feed-forward") the required counterforces.

Two electrically driven bow thrusters of each 750kW, with speed control by means of a frequency converter.

The vessel has an automated engine room, suitable for unattended operation, according to the requirements of Bureau Veritas AUT-UMS and Luxembourg Maritime Authorities.

## TECHNICAL PARTICULARS

Length oa: ..... 119.10m  
 Length bp: ..... 104.25m  
 Breadth moulded: ..... 23.00m  
 Depth moulded  
 To main deck: ..... 10.75m  
 To upper deck: ..... 10.75m  
 To other decks: ..... tween deck 6.25m  
 Width of double skin  
 Side: ..... 2.50m  
 Bottom: ..... 1.20m  
 Draught  
 Scantling: ..... dredging draught 8.15m  
 Design: ..... summer draught 6.30m  
 Gross: 8,082gt  
 Displacement: ..... 16,811tonnes  
 Lightweight: ..... 5,170tonnes  
 Deadweight  
 Design: ..... 7,387dwt  
 Scantling: ..... 11,641dwt  
 Block co-efficient: ..... 0.8393  
 Speed, service: ..... 13.7knots  
 Cargo capacity  
 Hopper: ..... 7,500m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 866m<sup>3</sup>  
 Diesel oil: ..... 181m<sup>3</sup>  
 Water ballast: ..... 404m<sup>3</sup>  
 Daily fuel consumption  
 Main engine: ..... 17.3tonnes/day  
 Auxiliary: ..... 4.95tonnes/day  
 Classification society and notations: ..... Bureau Veritas I, + HULL, +MACH, +AUT-UMS, +DYNAPOS, AM/AT, Hopper Dredger, Unrestricted  
 Navigation Operating area notation: dredging over 15 miles from shore +  
 Main engine  
 Design: ..... 4 stroke  
 Model: ..... 8L32/40  
 Manufacturer: ..... MAN Diesel  
 Output of each engine: ..... 3,300kW  
 Rudder-propeller  
 Material: ..... Gi-Cu-Al10-Ni  
 Designer/manufacturer: ..... Schottel  
 Fixed/controllable pitch: ..... Controllable  
 Diameter: ..... 3.1m  
 Speed: ..... 176.8rpm

Main-engine driven alternators  
 Make/type: ..... Indar/synchronous generator  
 Output/speed of each set: ..... 4,815kVA x 750rpm  
 Thermal oil heater  
 Type: ..... THM/V 1500  
 Make: ..... S-MAN  
 Output, each boiler: ..... 1500kW  
 Cargo cranes  
 Make: ..... JDN  
 Type: ..... Hydraulic  
 Performance: ..... Dredging equipment  
 Other cranes  
 Make: ..... TTS energy  
 Type: ..... Electro-hydraulic driven, cylinder luffing type  
 Performance: ..... Spare equipment handling and provision handling  
 Mooring equipment  
 Number: ..... 2 x windlasses 1 x capstan  
 Make: ..... Brusselle Marine  
 Type: ..... Hydraulic/electric  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 25persons  
 Make: ..... DSB Engineering  
 Type: ..... Free-fall lifeboats  
 Cargo tanks  
 Coated tanks make: ..... Jotun  
 Ballast control system  
 Make: ..... Panasia  
 Type: ..... Electric pressure sensor  
 Complement  
 Officers: ..... 6  
 Crew: ..... 15  
 Bow thruster  
 Make: ..... HRP thruster systems  
 Number: ..... HRP 6001TT/WM  
 Output: ..... 750kW  
 Bridge control system  
 Make: ..... IHC  
 Type: ..... DP I Class  
 Fire detection system  
 Make: ..... Autronica  
 Type: ..... BS-320M  
 Fire extinguishing systems  
 Engine room: ..... NK/high pressure CO<sub>2</sub>, seawater  
 Radars  
 Make: ..... JRC  
 Model: ..... JMA-91332-SA, JMA-9122-6XA  
 Waste disposal plant  
 Incinerator: ..... HMMCO/ MAXI T50SL WS  
 Sewage plant: ..... Il Seung/ ISS-25N  
 Contract date: ..... 30 September 2009  
 Launch/float-out date: ..... 18 May 2011  
 Delivery date: ..... 27 March 2012







# APL SOUTHAMPTON: eco-box ship

Shipbuilder: ..... **Daewoo Shipbuilding & marine Engineering Co., Ltd**  
 Vessel's name: ..... **APL Southampton**  
 Hull No: ..... **4191**  
 Owner/operator: ..... **Neptune Orient Lines**  
 Country: ..... **Singapore**  
 Designer: ..... **Daewoo Shipbuilding & marine Engineering Co., Ltd**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **HSVA**  
 Flag: ..... **Singapore**  
 IMO number: ..... **9462017**  
 Total number of sister ships completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **3**

**I**N a time where saving money counts and fuel costs are a major part of shipowner expenditure, Neptune Orient Lines latest vessel *APL Southampton* was built with lower fuel consumption in mind. Daewoo Shipbuilding & Marine Engineering delivered the vessel to its owner in April 2012.

The container carrier, APL, plans to reduce its carbon emissions by 30% by 2015 from its global shipping operations. The Singapore-based line will be gaining an influx of new vessels, which will run at a reduced speed and will put the target within reach claim the company.

By 2015, APL says that its fleet will produce 130 grams of carbon exhaust for every TEU of cargo transported one nautical mile. Going by that calculation the company would expect a 30% reduction in emissions levels from the 2009 levels.

APL will be deploying 32 new vessels over three years, which will be significantly more fuel efficient than its existing fleet.

The APL designs include optimised vessel trim, speed and routing; improved maintenance on vessel hulls to reduce drag in the water; and, to aid turn around times, upgrading of cargo handling equipment at APL terminals.

To give *APL Southampton* better fuel consumption it has been fitted with a derated electronically-controlled MAN B&W 12K98ME-C7.1 that has 54,120kW at 97rpm, giving the vessel a service speed of 23.3knots at a design draught of 13.5m on an even keel at 85% MCR. The vessel's hull has been optimised for its future operational profile and as such is expected to consume significantly less fuel. Further, it has been optimised for a range of speed/draft conditions, known as the 'off-design', which the vessel is likely to encounter in its daily operation.

The vessel can carry 10,640TEU including 800FEU of reefer containers and the homogenous intake, based

on the unit weight of 14tonnes/TEU, is more than 7,700TEU. The vessel has 10 double skinned cargo holds that have 21 bays, which can carry 40ft containers with 20 hatches.

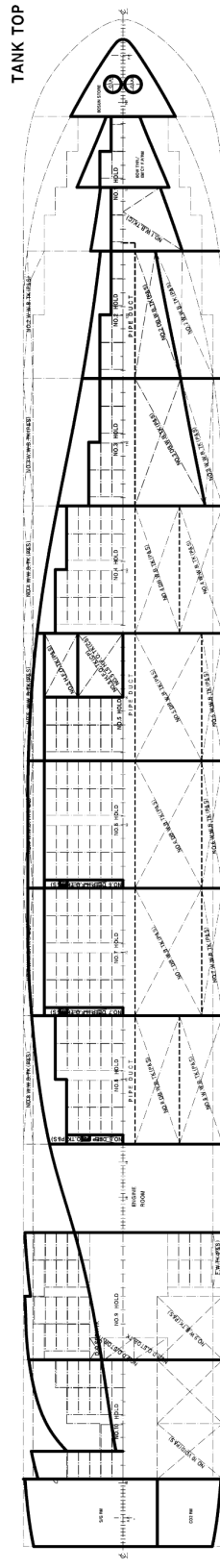
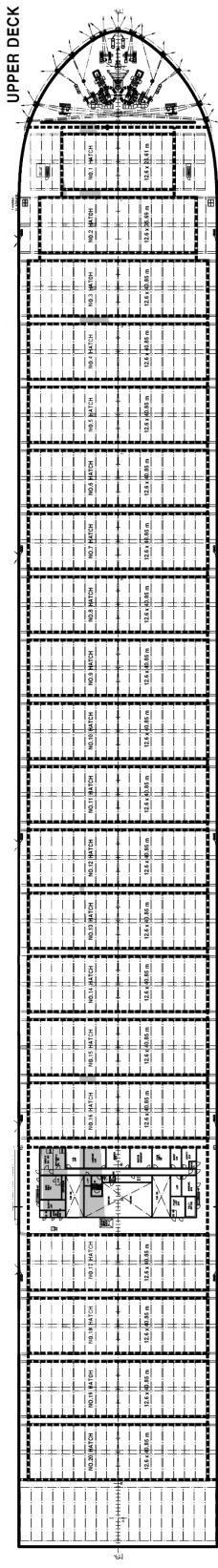
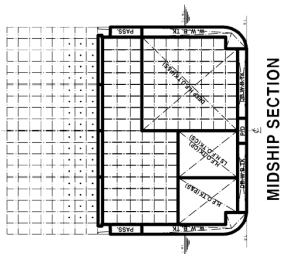
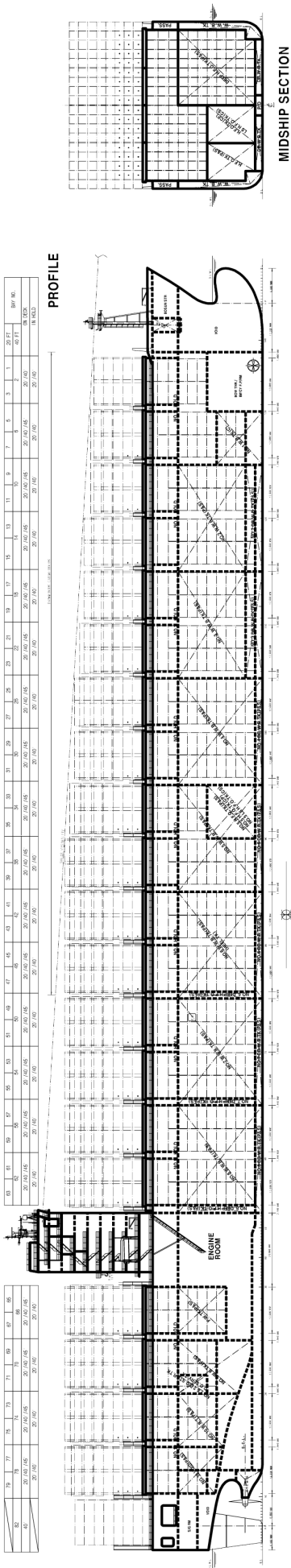
*APL Southampton* is fully welded with a flush deck and bulbous bow, a transom stern with an open water type stern frame. Fixed cell guides have been fitted on the transom end to ensure that heavier containers can be loaded higher. *APL Southampton* also has an enlarged grey water holding tank and full double hull protection of the oil tanks. Provisions for anti-piracy have also been catered for with a protection cover for the lower accommodation deck, security doors, net securing fittings and crew shelter.

APL has also taken the step of installing ballast water treatment technology on its ships in line with the framework provided in the IMO's Ballast Water Management Convention. *APL Southampton* has been fitted with a Techcross system that has a capacity of 1,000m<sup>3</sup>/h.

## TECHNICAL PARTICULARS

Length oa: ..... 347.0m  
 Length bp: ..... 331.0m  
 Breadth moulded: ..... 45.2m  
 Depth moulded  
 To freeboard deck: ..... 22.59m  
 To upper deck: ..... 29.7m  
 Width of double skin  
 Side: ..... 2.17m  
 Bottom: ..... 2.0m  
 Draught  
 Scantling: ..... 15.5m  
 Bottom: ..... 13.5m  
 Gross: ..... 128,929gt  
 Deadweight  
 Design: ..... 102,140dwt  
 Scantling: ..... 129,240dwt  
 Speed, service: ..... 23.4knots  
 Bunkers  
 Heavy oil: ..... 12,300m<sup>3</sup>  
 Classification society and notations: ..... GL + 100A5E, Container Ship, +MC E, AUT, IW, DG, NAV-O, RSD, STAR, EP, CM (shaft monitoring)  
 Heel control equipment: ..... One pair of anti-heeling tanks  
 Main engines  
 Design: ..... 1 x MAN B&W  
 Model: ..... 12K98ME-C7.1  
 Manufacturer: ..... Doosan Engine Co., Ltd  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 54,120kW x 97rpm  
 Propeller  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... 1 x DSME/MMG  
 Fixed/controllable pitch: ..... Fixed

Diameter: ..... 8.9m  
 Diesel-driven alternators  
 Engine make/type: ..... 4 x Hyundai HiMSEN 7H32/40  
 Type of fuel: ..... HFO, MDO  
 Output, speed of each set: ..... 3,500kW x 720rpm  
 Alternator make/type: ..... Hyundai  
 Output/speed of each set: ..... 3,300kW  
 Boilers  
 Type: ..... 1 x vertical, water tube  
 Make: ..... Kangrim  
 Output, each boiler: ..... 5,500kg/h  
 Other cranes  
 Make: ..... 1 x DMC  
 Type: ..... Monorail  
 Tasks: ..... Provisions  
 Performance: ..... SWL 13tonnes  
 Mooring equipment  
 Make: ..... 12 x Rolls-Royce  
 Type: ..... Electric  
 Hatch covers  
 Manufacturer: ..... DSME/MacGregor  
 Type: ..... Pontoon  
 Containers  
 Cell guides: ..... Arranged in holds  
 Total TEU capacity: ..... 10,642  
 On deck: ..... 5,220  
 In holds: ..... 5,422  
 Homogeneously loaded: ..... 7,760TEU  
 Reefer plugs: ..... 800 units  
 Tiers/rows  
 On deck: ..... 8 tiers  
 In holds: ..... 11 tiers/16 rows  
 Water ballast treatment system  
 Make: ..... Techcross  
 Capacity: ..... 1,000m<sup>3</sup>/h  
 Complement  
 Officers: ..... 18  
 Crew: ..... 12  
 Bow thrusters  
 Make: ..... 1 x HHI  
 Output: ..... 3,000kW  
 Bridge control system  
 Make: ..... Sperry  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Addressable  
 Fire extinguishing systems  
 Cargo holds: ..... NK/ CO<sub>2</sub>  
 Engine room: ..... NK/ CO<sub>2</sub>  
 Radars  
 Make: ..... 2 x Sperry  
 Contract date: ..... 17 July 2007  
 Launch/float-out date: ..... 11 February 2012  
 Delivery date: ..... 30 April 2012







# ARKADIA: 56,000dwt handymax built in Vietnam

Shipbuilder: ..... **Hyundai-Vinashin Shipyard**  
 Vessel's name: ..... **Arkadia**  
 Hull No: ..... **S042**  
 Owner/operator: ..... **ESL Shipping**  
 Country: ..... **Finland**  
 Designer: ..... **Hyundai Mipo**  
 Country: ..... **Korea**  
 Mosel test establishment used: ..... **Hyundai Maritime Research Institute/ Aker Arctic Technology Inc.**  
 Flag: ..... **Finland**  
 IMO number: ..... **9590797**  
 Total number of sister ships already completed (excluding vessel presented): ..... **1**  
 Total number of sister ships on order: ..... **nil**

**ARKADIA** is the first Ice Class dry bulk vessel built in the Hyundai-Vinashin yard for shipowner ESL shipping and it was delivered at the beginning of 2012.

With financial decline and lack of stability in the economy Vietnamese shipbuilding has fallen away in recent years. However, Korean shipyards such as Hyundai have teamed up with Vietnamese yards to build more vessels. The vessel *Arkadia* signals that all may not be lost for Vietnamese shipbuilding and will mean that we will see more projects coming from this region in the future.

*Arkadia* is tailor-made for operations in demanding conditions such as those met in the Baltic Sea area. *Arkadia* is the first of two Supramax class bulk carriers that is 197m in length overall and has a maximum draft of 13.0m fully laden. The vessel also features built-in cranes and a ballast water treatment system (BWTS). The BWTS installed onboard *Arkadia* consists of two treatment plants from Panasia that have a capacity of 1,000m<sup>3</sup>/h.

The vessel is an ocean going bulk carrier with bulbous bow, transom stern, flush deck with forecastle and open water type stern frame, single rudder and single screw propeller driven by a slow speed diesel engine. The propulsion machinery and living quarters including navigation bridge are located at the aft of the vessel.

For the vessel to have a continuous deck from stern, transverse bulkheads and double bottom and double side in way of the cargo space has the following subdivisions of fore peak tank, void space, chain lockers, bow thruster and emergency fire pump space and bosun store.

The cargo space is divided into five cargo holds and five pairs of water ballast tanks. No.3 cargo hold may be used for water ballast tank at heavy weather ballast voyage. Four sets of deck cranes are installed on upper deck between each cargo holds. Heavy fuel oil storage tanks are arranged in cargo hold double bottom, engine room and diesel oil storage tanks in engine room double bottom in compliance with MARPOL Annex I-Ch.3-Reg.12A-Ph.11 "Accidental oil fuel outflow performance standard".

After peak tank, steering gear compartment, fresh water tanks and stern tube cooling water tank. The notation of NAUT-OC is applied for the one-man operation of the bridge control.

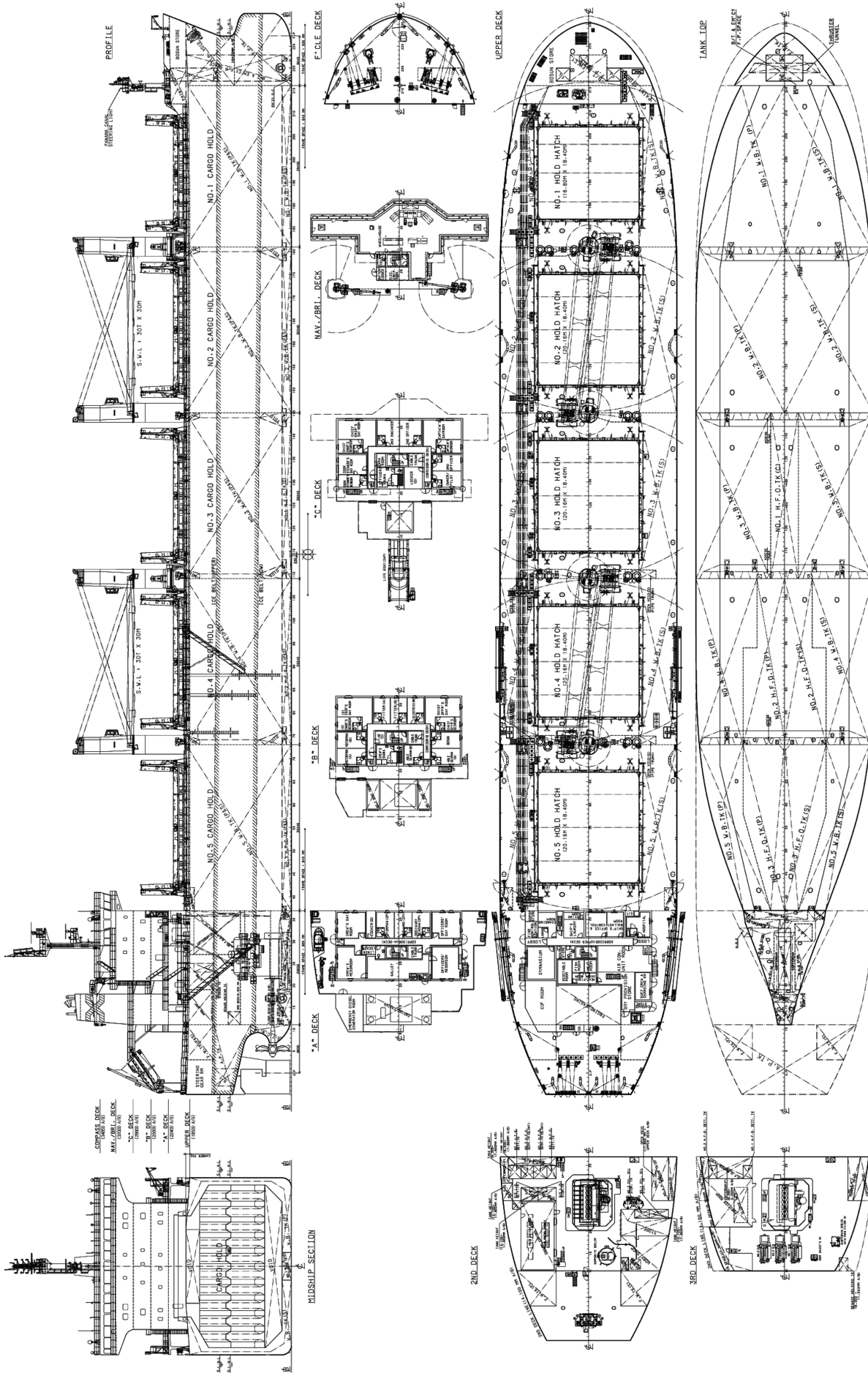
The vessel is painted to the PSPC specification and has a double-hull structure, with Ice-1A which has been applied to the vessel so that it can sail through polar regions.

It is expected that the new vessel will further strengthen ESL Shipping's position as the leading dry cargo transport company. *Arkadia*'s sister vessel was also completed and introduced in the summer 2012.

## TECHNICAL PARTICULARS

Length oa: ..... 197.08m  
 Length bp: ..... 189.00m  
 Breadth moulded: ..... 32.26m  
 Depth moulded .....  
 To main deck: ..... 18.50m  
 To upper deck: ..... 18.50m  
 Width of double skin  
 Side: ..... 1.3m  
 Bottom: ..... 1.7m  
 Draught  
 Scantling: ..... 13.00m  
 Design: ..... 11.00m  
 Gross: ..... 33,958gt  
 Displacement: ..... 68,418tonnes  
 Lightweight: ..... 12,070tonnes  
 Deadweight  
 Design: ..... 45,161dwt  
 Scantling: ..... 56,348dwt  
 Speed, service: ..... 14.5knots  
 Cargo capacity  
 Grain: ..... 70,055m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 2,010m<sup>3</sup>  
 Diesel oil: ..... 115m<sup>3</sup>  
 Water ballast: ..... 19,200m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 33.6tonnes/day  
 Classification society and notations: ..... DNV, +1A1, Bulk Carrier, ESP, CSR, BC-A [Holds 2&4 may be empty], GRAB[20], E0, COAT-PSPC(B), NAUT-OC, ICE-1A, BIS, TMON, BWM-T  
 Main engine  
 Design: ..... Hyundai Heavy Industry Co., Ltd  
 Model: ..... 7S50MC-C8  
 Manufacturer: ..... Hyundai Heavy Industry Co., Ltd  
 Number: ..... 1  
 Type of fuel: ..... HFO  
 Output of each engine: ..... 11,620kW x 127rpm  
 Propeller  
 Material: ..... Stainless Steel (SUS)  
 Designer/manufacturer: ..... Rolls-Royce  
 Number: ..... 4  
 Fixed/controllable pitch: ..... Controllable  
 Diameter: ..... 6.2m  
 Speed: ..... 127rpm  
 Boilers  
 Number: ..... 1  
 Type: ..... Composite boiler  
 Make: ..... SAAKE  
 Output, each boiler: ..... 1,600kg/h (oil fired)/ 1,200kg/h (exhaust gas section)  
 Cargo cranes/cargo gear  
 Number: ..... 4  
 Make: ..... Cargotec

Type: ..... Electro-Hydraulic  
 Other cranes  
 Number: ..... 1/ 1  
 Make: ..... DMC  
 Type: ..... Motor driven/ Electro-hydraulic  
 Tasks: ..... E/R overhead crane/ provision handling  
 Performance: ..... SWL 2tonnes  
 Mooring equipment  
 Number: ..... 4  
 Make: ..... Rolls-Royce  
 Type: ..... Electro-hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 25persons  
 Make: ..... Hyundai Lifeboat Co., Ltd  
 Type: ..... Electro-hydraulic freefall type  
 Hatch covers  
 Design: ..... Cargotec  
 Manufacturer: ..... Cargotec  
 Type: ..... Folding type  
 Cargo tanks  
 Number: ..... 5  
 Grades of cargo carried: ..... Bulk  
 Product range: ..... Grain, iron ore, hot coil, limestone, steel pipe, fertiliser  
 Water ballast treatment system  
 Make: ..... Panasia  
 Capacity: ..... 2 x 1,000m<sup>3</sup>/h  
 Complement  
 Officers: ..... 11  
 Crew: ..... 13  
 Bow thruster  
 Make: ..... Hyundai Heavy Industries Co., Ltd  
 Number: ..... 1  
 Output: ..... 117kN  
 Stern thruster  
 Make: ..... Hyundai Heavy Industries Co., Ltd  
 Number: ..... 1  
 Output: ..... 117kN  
 Bridge control system  
 Make: ..... Hyundai Heavy Industries Co., Ltd  
 Type: ..... Self standing  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... 715\_FC Cargo/4L  
 Radars  
 Number: ..... 2  
 Make: ..... Furuno  
 Model: ..... FAR-2837S, FAR-2826  
 Integrated bridge system  
 Make: ..... Furuno  
 Model: ..... FEA2807  
 Waste disposal plant  
 Incinerator: ..... Hyundai-Atlas  
 Sewage plant: ..... IISeung  
 Contract date: ..... 06 May 2010  
 Launch/float-out date: ..... 15 June 2011  
 Delivery date: ..... 02 January 2012







# ASTOMOS EARTH: 83,000m<sup>3</sup> LPG carrier from Japan

Shipbuilder: **Mitsubishi Heavy Industries Ltd**  
 Vessel's name: **Astomos Earth**  
 Hull No: **2283**  
 Operator: **Idemitsu Tanker Co., Ltd**  
 Country: **Japan**  
 Designer: **Mitsubishi Heavy Industries Ltd**  
 Country: **Japan**  
 Model test establishment used: **MHI Nagasaki R&D Center**  
 Flag: **Panama**  
 IMO number: **9607069**  
 Total number of sister ships already completed (excluding ship presented): **nil**  
 Total number of sister ships still on order: **1**

Unbalanced cargo capacity is allocated to each cargo tank to achieve the flexible cargo transportation. The fuel oil tanks are also protected by double hull construction to reduce the risk of oil pollution in the event of an accident.

## TECHNICAL PARTICULARS

Length oa: 230.00m  
 Length bp: 219.00m  
 Breadth moulded: 36.60m  
 Depth moulded  
 To upper deck: 21.65m  
 Draught  
 Scantling: 11.55m  
 Design: 11.10m  
 Gross: 47,950gt  
 Deadweight  
 Scantling: 55,260dwt  
 Speed, service: 17knots  
 Cargo capacity  
 Liquid volume: 83,426m<sup>3</sup>  
 Bunkers  
 Heavy oil: 3,200m<sup>3</sup>  
 Diesel oil: 300m<sup>3</sup>  
 Water ballast: 22,700m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: 46.6tonnes/day  
 Classification society and notations: NK NS\* (Liquefied Gas Carrier Type 2G), (PS-DA & FA, design fatigue life of 50 years), MNS\* and (M0)  
 Main engine  
 Design: Mitsubishi Heavy Industries Ltd  
 Model: 7UEC60LSII  
 Manufacturer: Mitsubishi Heavy Industries Ltd  
 Number: 1  
 Type of fuel: HFO  
 Output of each engine: 13,000kW x 100rpm  
 Propeller  
 Material: Ni-Al-Bronze  
 Designer/manufacturer: Mitsubishi Heavy Industries Ltd  
 Number: 1  
 Fixed/controllable pitch: Fixed  
 Speed: 100rpm  
 Diesel-driven alternators  
 Number: 3  
 Engine make/type: Yanmar Co., Ltd  
 Type of fuel: HFO  
 Output/speed of each set: 3 x 1,020kW x 900rpm  
 Alternator make/type: Taiyo Electric Co., Ltd  
 Output/speed of each set: 950kW x 900rpm

Boilers  
 Number: 1  
 Type: Composite  
 Make: Osaka Boiler Mfg Co., Ltd  
 Output, each boiler: 2,300kg/h  
 Other cranes  
 Number: 1 x hose handling crane  
 Make: Oriental precision & engineering Co., Ltd  
 Type: Electro-hydraulic  
 Mooring equipment  
 Number: 2 x mooring winch/windlass, 6 x mooring winches  
 Make: Manabe Zoki Co., Ltd  
 Type: Electro-hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: 2 x 39 persons  
 Make: Shigi Shipbuilding Co., Ltd  
 Type: FRP enclosed type lifeboat  
 Cargo tanks  
 Number: 4  
 Grades of cargo carried: 4  
 Product range: Propane, butane, propane/butane mixture  
 Cargo pump  
 Number: 8 + 4  
 Type: Submerged type  
 Make: Ebara Corporation  
 Capacity: 8 x 550m<sup>3</sup>/h, 4 x 250m<sup>3</sup>/h  
 Cargo control system  
 Make: Mitsubishi Heavy Industries., Ltd  
 Ballast control systems  
 Make: Nakakita Seisakusho Co., Ltd  
 Complement  
 Officers: 9  
 Crew: 16  
 Stern appendages/special rudders: Reaction fin  
 Fire detection system  
 Make: Autronica  
 Type: Optical type  
 Fire extinguishing systems  
 Upper deck: Seaplus Co., Ltd/ dry chemical  
 Engine room: Eaplus Co., Ltd/ CO<sub>2</sub>  
 Radars  
 Number: 2  
 Make: japan Radio Co., Ltd  
 Waste disposal plant  
 Sewage plant: Sasakura Engineering Co., Ltd  
 Contract date: 02 October 2010  
 Launch/float-out date: 24 May 2012  
 Delivery date: 31 August 2012

MITSUBISHI Heavy Industries, Ltd. (MHI) completed construction of *Astomos Earth*, an LPG carrier with a tank capacity of 83,426m<sup>3</sup>, and delivered the vessel to Astomos Energy Corporation at the Nagasaki Shipyard & Machinery Works in August. This vessel is the first vessel in a series of two of the latest MHI third-generation LPG carrier (LPGC), which was developed from MHI's first and second generation LPGC series.

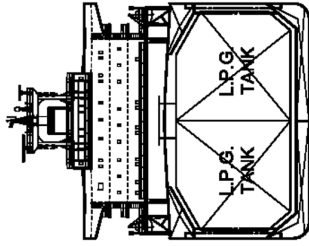
The construction of the vessels is part of Astomos Energy's expansion programme in the LPG market. The vessel's higher reliability was achieved by looking to the IMO IGC-code type B for independent tanks. The newly developed design for an LPGC was based on the experience accumulated through construction of MOSS type LNG carriers and structural analysis system MHI-DILAM (Direct Loading Analysis Method).

This LPGC has been designed from a concept design that emphasised the environmentally-friendly operations that are easy and flexible and allow for easy maintenance and high reliability. *Astomos Earth* has higher propulsive performance with less vibration compared with conventional LPGCs, which was achieved by the sophisticated hull form, optimum design of the propeller and the Mitsubishi-Reaction fin, which were developed by MHI Nagasaki R & D Center.

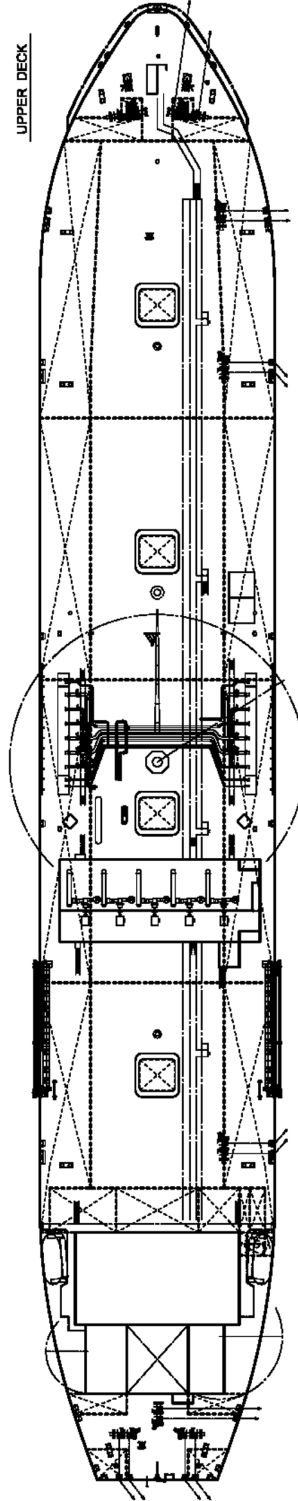
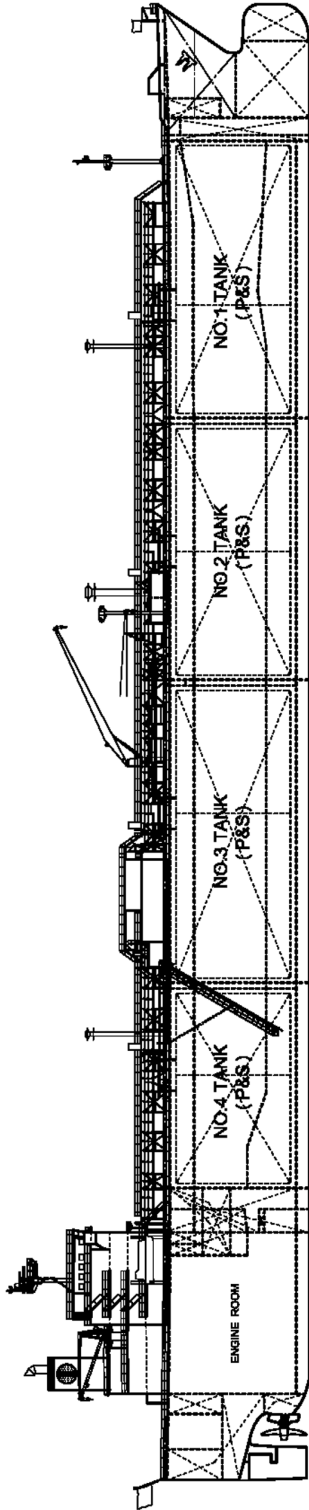
The main engine complies with NOx limitation Tier II. Low sulphur fuel can be also used to comply with SOx emission limitations in SOx Emission Control Areas (SECA). In addition the ship has also been fitted out so that a ballast water treatment system can be installed in the future.

Various improvements are incorporated for efficient and flexible cargo operations such as the increase in the unloading rate by the auxiliary cargo pumps, elimination of loading restrictions while the cargo manifold arrangement allows the vessel to fit at various terminals.

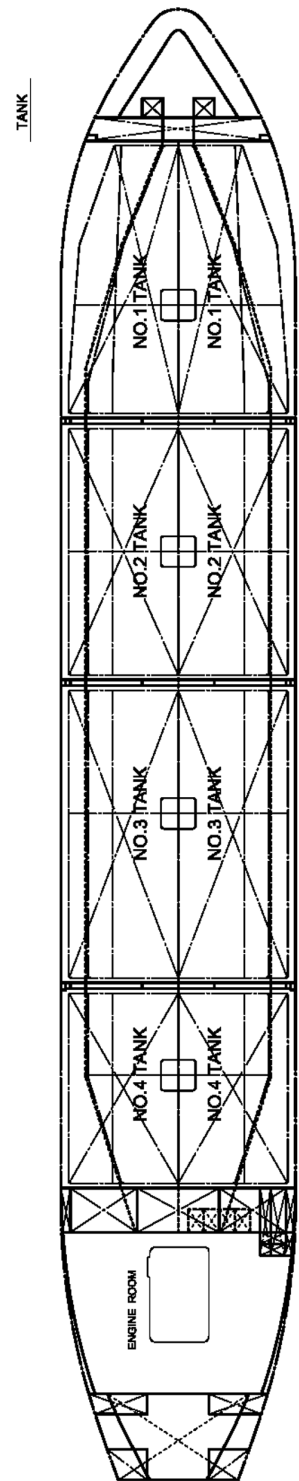




VIEW OF BRIDGE FRONT AND TANK SECTION



UPPER DECK



TANK



# BAIE ST PAUL: first Trillium class bulker

Shipbuilder: ..CSSC Chengxi Shipyard Co., Ltd  
 Vessel's name:..... **Baie St. Paul**  
 Hull No:..... **CX9301**  
 Owner/operator: ..... **Canada Steamship Lines**  
 Country:..... **Canada**  
 Designers: ..... **Cooke Naval Architect Consultants Inc (CNAC)/ SDARI**  
 Country:..... **Canada/China**  
 Model test establishment used:..... **Shanghai Ship & Shipping Research Institute (SSRI)**  
 Flag:..... **Canada**  
 IMO number:..... **9601027**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order:..... **3**

Lakes trades routes. Eight deck winches ensure the efficient securing of the vessel in locks and also along customer docks fitted with simple loading installations.

## TECHNICAL PARTICULARS

Length oa: ..... 225.5m  
 Length bp: ..... 222.6m  
 Breadth moulded: ..... 23.76m  
 Depth moulded  
 To main deck:..... 14.75m  
 Draught  
 Summer:..... 9m  
 Design:..... 8.07m  
 Gross:..... 24,430gt  
 Deadweight  
 Design:..... 29,700dwt  
 Scantling:..... 34,500dwt  
 Speed, service: ..... 13knots  
 Cargo capacity  
 Bale:..... 41,708m<sup>3</sup>  
 Grain:..... 41,708m<sup>3</sup>  
 Bunkers  
 Heavy oil:..... 677m<sup>3</sup>  
 Diesel oil:..... 130m<sup>3</sup>  
 Water ballast:..... 18,118m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only:..... 29tonnes/day  
 Classification society and notations: ..... LR +100A1, Great Lakes Bulk Carrier (self-unloader) for service on the Great Lakes and River St Lawrence, ShipRight, ACS(B), LI, ECO, +LMC, UMS, NAV1, IBS, descriptive notation: part higher tensile steel, self-unloader, double skin, BWMP (S) (SERS), green passport  
 Main engine make and model:..... 1 x MAN B&W  
 Model:..... 6S50ME-B9 Tier II  
 Manufacturer:..... Hudong Heavy Machinery  
 Type of fuel:..... HFO, MDO  
 Output of each engine: ..... 8,750kW  
 Gearboxes  
 Make:..... Renk  
 Model:..... 1 x BW111S50/GCR 2600  
 Propeller  
 Material:..... Bronze  
 Designer/manufacturer: ..... MAN  
 Number:..... 1  
 Fixed/controllable pitch:..... Controllable  
 Diameter:..... 5.2m  
 Speed:..... 109rpm  
 Special adaptations: ..... Ducted steering nozzle  
 Main-engine driven alternators  
 Make/type:..... 1 x SAM  
 Output/speed of each set: ..... 2,750kW x 1,800rpm  
 Diesel-driven alternators  
 Engine make/type:..... 3 x ZCME-MAN 2 x 6L21/31/ 1 x 5L21/31  
 Type of fuel:..... HFO, MDO  
 Output/speed of each set: ..... 1,320kW/ 1,000kW  
 Alternator make/type:..... CME-Hyundai HFJ6-564, HFJ5-632  
 Output/speed of each set: ..... 1,250kW x 938kW  
 Boilers  
 Type: ..... 3 x Thermal oil fired/ Exhaust gas heater  
 Make:..... Gesab  
 Output, each boiler: ..... 1,500kW, 585kW, 400kW

Cargo gear  
 Type: ..... five hoppers cargo holds with cargo discharge gates, two tunnel conveyors below cargo holds, two thwartship transfer conveyors, 'C' loop type elevator, discharge boom conveyor  
 Make: ..... EMS-Type  
 Type: ..... Gravity-type  
 Performance: ..... up to 5,000tonnes/h  
 Mooring equipment  
 Make: ..... 8 x Dilts Electro-hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 30persons  
 Make: ..... Neptune Freefall  
 Hatch covers  
 Design: Single panel, lifted and lowered via gantry crane  
 Manufacturer: ..... TTS  
 Type: ..... Main deck  
 Cargo tanks  
 Number: ..... 5  
 Grade of cargo carried: ..... Dry bulk  
 Product range: ..... Cargos with RHO up to 2,4tonnes/m<sup>3</sup> and grain  
 Coated tanks:..... IP Intersheid 300 & Interzone 1000  
 Ballast pumps  
 Type: ..... 4 x Centrifugal  
 Make: ..... Taiko  
 Stainless steel: ..... Shafts  
 Capacity:..... 2 x 2,500m<sup>3</sup>/h + 2 x 500m<sup>3</sup>/h  
 Cargo control system  
 Make: ..... EMS-Tech  
 Type: ..... Self-unloading equipment  
 Ballast control system  
 Make: ..... Pleiger  
 Type: Electro-hydraulic remote control valves, pneumatic/ electronic tank level..... measuring system  
 Complement  
 Officers Crew: ..... 8/26  
 Stern appendages/special rudders: ..... Steering nozzle  
 Bow thruster  
 Make: ..... 1 x Wärtsilä  
 Output: ..... 1,000kW  
 Stern thruster  
 Make: ..... 1 x Wärtsilä  
 Output: ..... 800kW  
 Bridge control system  
 Make: ..... Sperry  
 Type: ..... IBS  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Tyco  
 Fire extinguishing systems  
 Cargo holds: ..... Sprinkler iwo conveyors systems  
 Engine room: ..... NK/ CO<sub>2</sub>  
 Cabins/public spaces: ..... Firemain  
 Radars  
 Make: ..... Sperry  
 Model: ..... VisionMaster FT  
 Integrated bridge system  
 Make: ..... Sperry  
 Waste disposal plant  
 Incinerator: ..... Teamtec/ OGS 400C  
 Sewage plant: ..... RWO/ WWT-LC4  
 Contract date: ..... 12 June 2010  
 Launch/float-out date: ..... 26 March 2012  
 Delivery date: ..... 27 September 2012

**B**AIE St. Paul is the first of a new generation of Trillium class self-unloading bulk carriers that was delivered to Canada Steamship Lines in September from CSSC Chengxi Shipyard Co., Ltd.

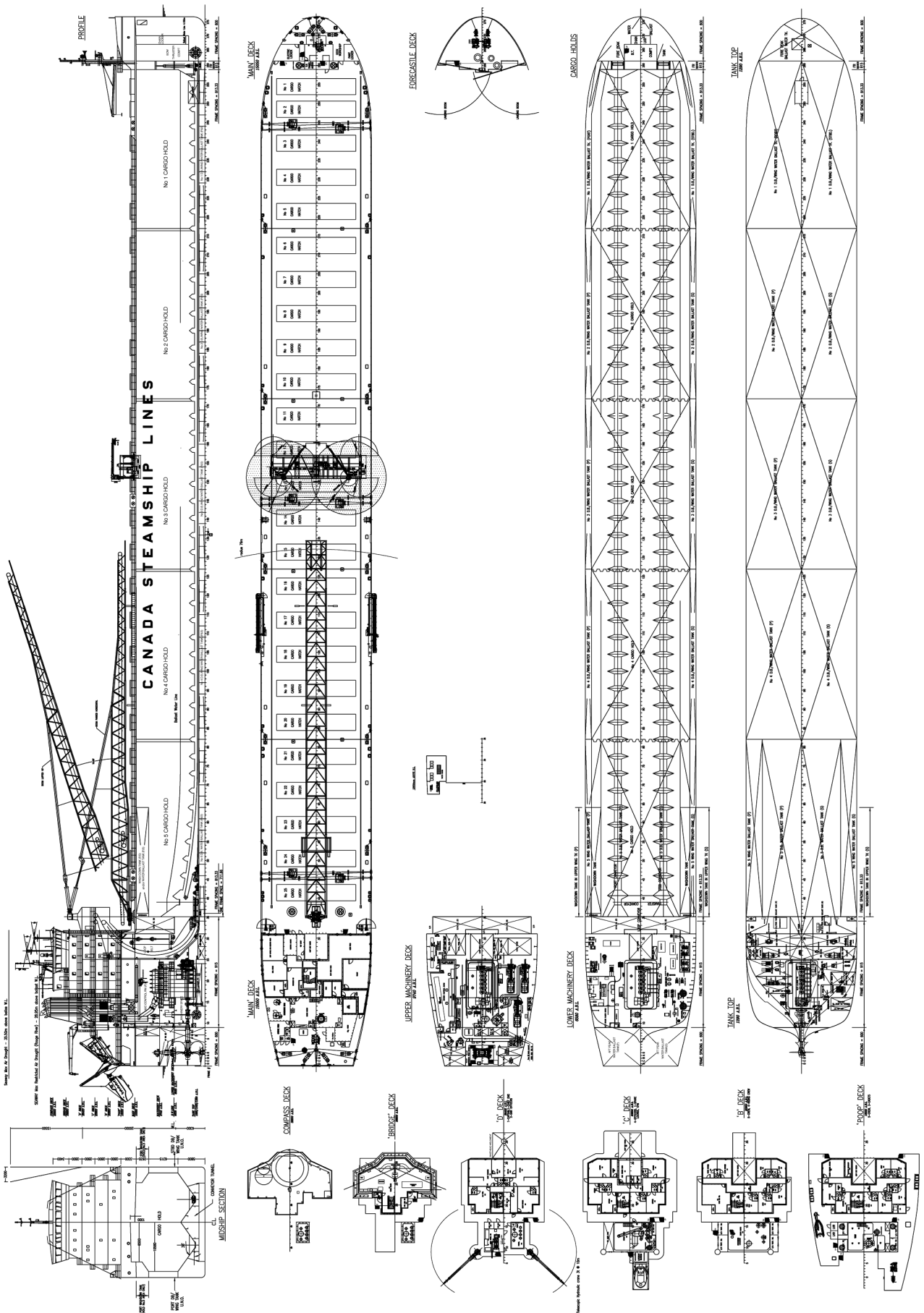
The vessel incorporates a number of innovative features. As a self-unloader, it is specifically designed to excel in short sea shipping trades where it can compete advantageously against other forms of transportation. Its high performance cargo unloading system can deliver over 5000tonnes of cargo hour at open dock facilities, which allows the vessel to deliver 30,000tonnes of cargo in less than six hours.

The vessel has been adapted for sensitive operations in the Canadian Great Lakes, *Baie St. Paul* offers outstanding environmental performance thanks to technological developments such as: a water lubricated stern tube; better air emission performance per tonne-mile; reduced dust and noise (from control, equipment enclosures and equipment performance), and; innovative cargo residue control. The vessel even has the capability to collect, treat and discharge ashore cargo residues, wash water and dust collected during the loading operation of the vessel. A thermal oil heat recovery system allows the recovery and use of heat that would otherwise be wasted as well as the safe winterisation of sensitive components.

The vessel's manoeuvrability is obtained from a bow thruster, stern thruster and propeller steering nozzle all of which are integrated into a dynamic positioning system, which is a first for a vessel of this class. The ship can be operated in "position keeping" mode while waiting in congested areas, typical of the Great Lakes. It also has the ability to enter and exit canal locks more efficiently than any vessel of its size.

Crew comfort and performance have been improved by designing the ship around the operating profile of the vessel. Common areas are grouped to maximise the effectiveness of the interface between the crew and visitors, contractors, agents and officials attending the vessel.

Twenty-two high quality remotely controlled video cameras ensure maximum coverage from a number of control positions. Areas such as the generator flat, the cargo tunnels, the ship's access points and many others are easily monitored from multiple stations. The "one man" bridge operation and integrated bridge systems provide the technology and ergonomic features adapted to the operation of bridge teams in restricted waters and simplified operation on busy







# BBC AMETHYST: fleet renewal for BBC Chartering

Shipbuilder: ..... **Jinagzhou Shipyard**  
 Vessel's name: ..... **BBC Amethyst**  
 Hull No: ..... **ZZ 1047**  
 Owner/operator: ..... **BBC Chartering**  
 Country: ..... **Germany**  
 Designer: ..... **abh Ingenieur-Technik GmbH**  
 Country: ..... **Germany**  
 Flag: ..... **Antjnn**  
 IMO number: ..... **9563706**  
 Total number of sister ships already completed (excluding ship presented): ..... **7**  
 Total number of sister ship still on order: ..... **14**

BBC Chartering placed a large order for 14 new heavy-lift vessels back in 2010 as part of a fleet renewal programme to update the BBC Chartering fleet. The first of the vessels *BBC Amber* was delivered in August 2011 with the second vessel *BBC Amethyst* delivered earlier in 2012, with the rest of the series of vessels being delivered up until 2014. We are featuring *BBC Amethyst* as we have not reviewed this series as yet.

BBC's 'New Wave' fleet renewal and expansion programme was initially started in 2008 when the economy was still buoyant and large orders for vessels were still frequent, highlights BBC Chartering. The latest vessels and deliveries on order allow the handling of heavier and bigger cargoes featuring increased lifting capacities. With that the company also aims to help the offshore and energy sector which continues to be a driver for maritime transport demand.

*BBC Amethyst* has a flush deck with forecastle, bulbous bow, open water type stern, single rudder and single CPP propeller driven by a slow speed diesel engine.

The vessel's cargo holds have been constructed with a double skin and a double bottom and side tanks. The cargo hold area is divided into two parts (hold 1 and 2) by vertical tanks containing HFO Tanks. Cargo Hold 1 is small box-shaped hold (12,75 x 19,00m) that has been designed to carry all necessary equipment like tweendeck hatch covers as well as loading beams etc, but it is also laid out for carriage of containers. Cargo Hold

2 is a large box-shaped hold (83,75 x 19,00 m) that is able to carry all kinds of heavy goods as well as containers. The surface loads of hatch covers and tweendeck hatch covers is 5tonnes/m<sup>2</sup>, in way of poopdeck the load is 15tonnes/m<sup>2</sup>. The inner bottom has a surface load of 20tonnes/m<sup>2</sup>.

There are two wire luffing heavy lift cargo cranes each having a lifting capacity of 200tonnes. Using the lifting beam the lifting capacity will be 400tonnes SWL at 18,00m outreach to 200tonnes SWL at 30,00m outreach. Additionally at aft end of vessel there is one wire luffing heavy lift crane to assist the crew with the stabilizing pontoon. The lifting capacity is 80tonnes SWL at 18,00m outreach. The stabilising pontoon will only be used for shallow draft crane operation.

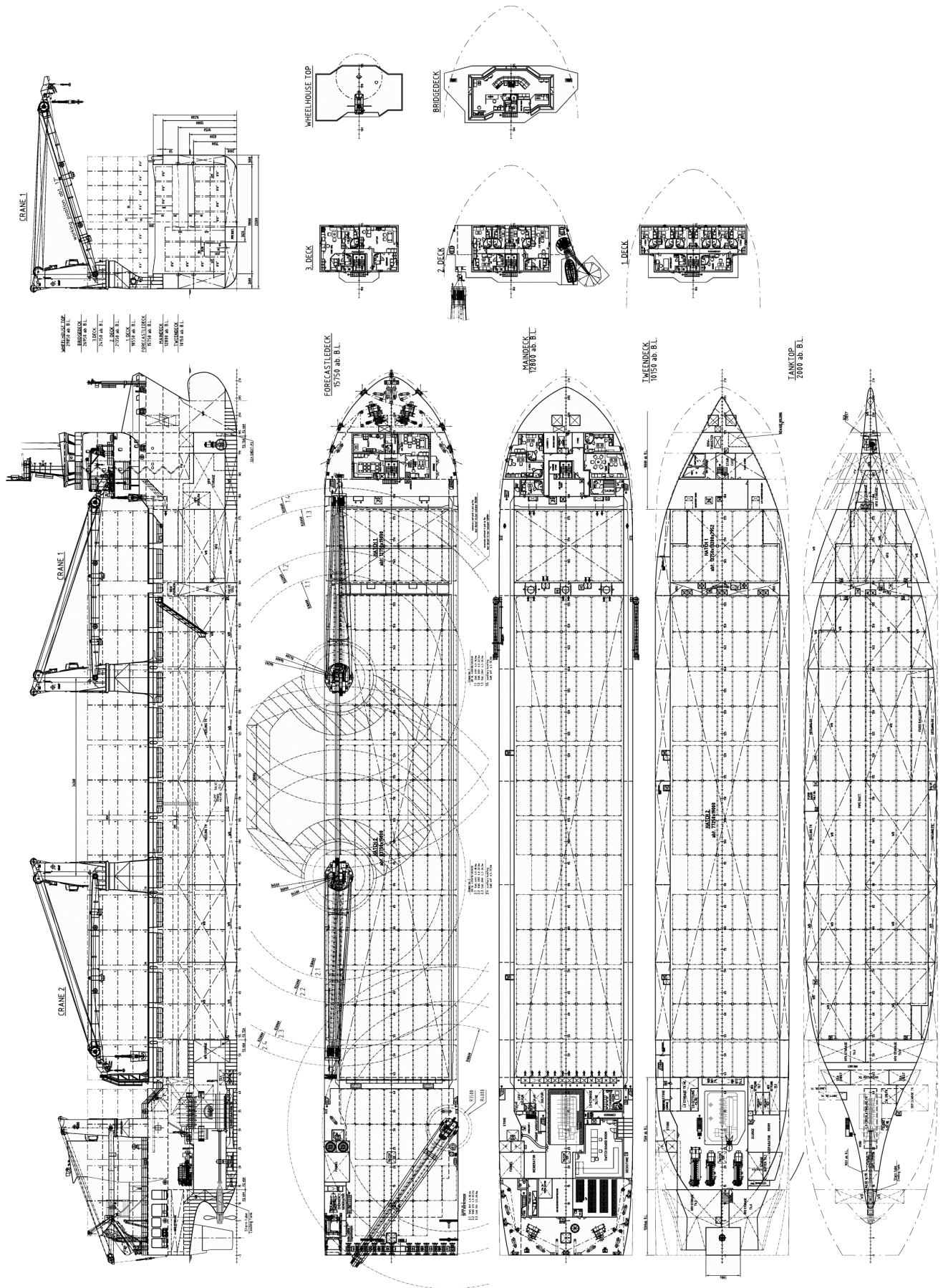
All classes of dangerous goods in closed freight containers according SOLAS II-2, Reg. 19 can be carried on deck. Dangerous goods (without flammable and poisonous gases) in closed freight containers of the classes 1.4S, 2, 3, 4, 5.1, 6.1 and 8 can be carried in all cargo holds. Furthermore all classes of dangerous goods class 1 and 7 can be carried in hold 1 only.

The vessels are being constructed at China's Jiangzhou Shipyard with *BBC Amethyst* and *BBC Amber*, are now servicing both Asia and European charters. Some of the new vessels are also planned to offer 2 x 450tonne cranes, allowing a combined lifting capacity of 900tonnes. The vessels feature an additional starboard crane which can lift to 800tonnes.

## TECHNICAL PARTICULARS

Length oa: ..... 153.80m  
 Length bp: ..... 145.50m  
 Breadth moulded: ..... 23.20m  
 Depth moulded  
 To main deck: ..... 12.80m  
 Width of double skin  
 Side: ..... 2.60/1.60m  
 Bottom: ..... 2.00m  
 Draught  
 Scantling: ..... 9.10m  
 Design: ..... 8.20m  
 Gross: ..... 12,800gt

Displacement: ..... 23,596tonnes  
 Lightweight: ..... 8,586tonnes  
 Deadweight  
 Scantling: ..... 14,320dwt  
 Speed, service: ..... 17.7knots  
 Cargo capacity: ..... 20,848m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 1,350m<sup>3</sup>  
 Diesel oil: ..... 303m<sup>3</sup>  
 Water ballast: ..... 6,470m<sup>3</sup>  
 Classification society and notations: ..... GL 100A5,  
 E3, DNV 1, IW, DG, MCIInt, E3,  
 "Equipment for carriage of containers"  
 "Strengthened for heavy cargo"  
 Main engine  
 Model: ..... 6S46MC-C8  
 Manufacturer: ..... STX Engine Co., Ltd  
 Number: ..... 1  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 8,280kW  
 Propellers  
 Material: ..... Ni-Al-Bronze  
 Number: ..... 1  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 5.4m  
 Speed: ..... 127rpm  
 Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... 2 x 6L23/30, 1 x 8L23/30  
 Type of fuel: ..... HFO, MDO  
 Alternator make/type: ..... HFC6 506-14K/ HFC6 565-14K  
 Output/speed of each set: ..... 740kW/990kW  
 Boilers  
 Number: ..... 1 exhaust gas, 1 oil fired  
 Type: ..... TOH1000V40\_V/ EGH850VLL0-DF  
 Make: ..... Gesab  
 Output, each boiler: ..... 1,000kW/ 850kW  
 Cargo cranes/cargo gear  
 Number: ..... 2  
 Make: ..... NMF  
 Type: ..... DK SL 400  
 Performance: ..... 400tonnes x 6-18m,  
 200tonnes x 4.5-30m, +40tonnes x 33m  
 Other cranes  
 Number: ..... 1  
 Make: ..... NMF  
 Type: ..... DK V 80  
 Performance: ..... 80tonnes x 18m  
 Mooring equipment  
 Number: ..... 4  
 Type: ..... Hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 22 persons  
 Type: ..... Freefall  
 Hatch covers  
 Design/manufacturer: ..... McGregor  
 Type: ..... Pontoon  
 Containers  
 Lengths: ..... 30/40'  
 Heights: ..... 4 +9.6  
 Total TEU capacity: ..... 985  
 On deck: ..... 598  
 In holds: ..... 387  
 Homogenously loaded to 14tonnes: ..... 706  
 Reefer plugs: ..... 30  
 Tiers/rows  
 On deck: ..... 4  
 In holds: ..... 4  
 Ballast control system  
 Make: ..... Sander & Co  
 Type: ..... Electro-hydraulic  
 Complement  
 Officers: ..... 7  
 Crew: ..... 13  
 Bow thrusters  
 Make: ..... Brunvoll  
 Number: ..... 1  
 Output: ..... 900kW  
 Fire extinguishing systems  
 Cargo holds: ..... NK/ CO2  
 Waste disposal plant  
 Incinerator: ..... Teamtec/ OGS 200/400L  
 Sewage plant: ..... RWO  
 Delivery date ..... January 2012







## BRIGHTOIL GLORY: first 318,000dwt tanker for Brightoil

Shipbuilder: ..... **Hyundai Heavy Industries**  
 Vessel's name: ..... **Brightoil Glory**  
 Hull No: ..... **2587**  
 Owner/operator: ..... **Brightoil**  
 Country: ..... **Hong Kong**  
 Designer: ..... **HHI**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **HMRI**  
 Flag: ..... **Hong Kong**  
 IMO number: ..... **9602631**  
 Total number of sister ships already completed (excluding ship presented): ..... **2**  
 Total number of sister ships still on order: ..... **2**

WITH a designed capacity of 318,000dwt, *Brightoil Glory* was constructed by Hyundai Heavy Industries for Brightoil and delivered in July. The Group currently owns five very large crude carriers (VLCCs), with delivery of two more VLCCs in 2012 and the last two of the series expected in 2013.

Upon delivery of all five vessels by the first half of 2013, the Group will boast a sizable marine fleet with a total capacity that exceeds 2,000,000 dwt. The fleet will be able to carry approximately 20,000,000tonnes of oil each year.

*Brightoil Glory's* fuel oil tanks are constructed with a double hull structure to protect the fuel oil tanks from external damage. The vessel has five pairs of side cargo oil tanks, five centre cargo oil tanks and one pair of slop tanks with double bottom and double side structure, five pairs of water ballast tanks and peak tanks.

A unique feature of *Brightoil Glory* is that it is able to load and discharge three different kinds of cargo oils simultaneously without contamination. This is achieved by a blending facility that has been installed onboard that allows for the mixing of different cargo oils whilst in transport. The cargo pump system has a maximum unloading rate of 15,000m<sup>3</sup>/h with three main cargo pumps, which are driven by three 3-stage steam turbines.

The vessel is powered by a Hyundai - B&W 6S90ME-C8.2 engine with MCR of 30,423kW at 75.6rpm, enabling it to sail at a service speed of 16.4knots at design draft when running at 90% MCR with a 15% sea

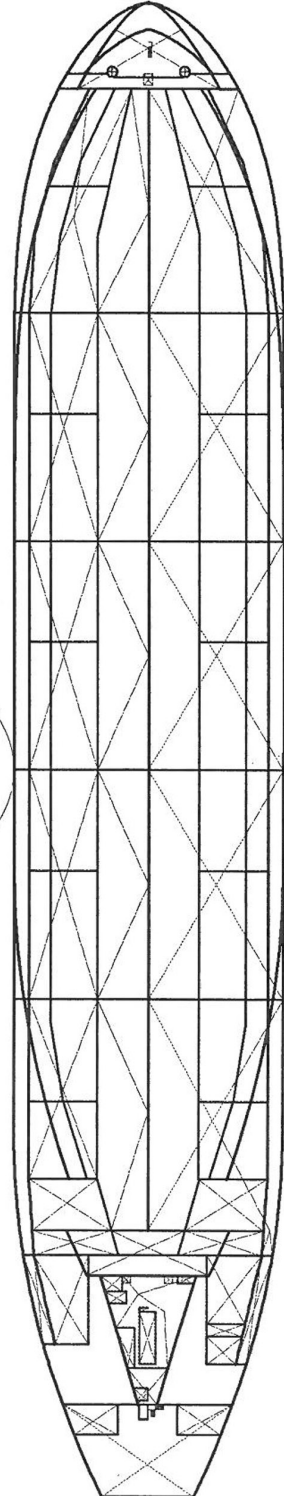
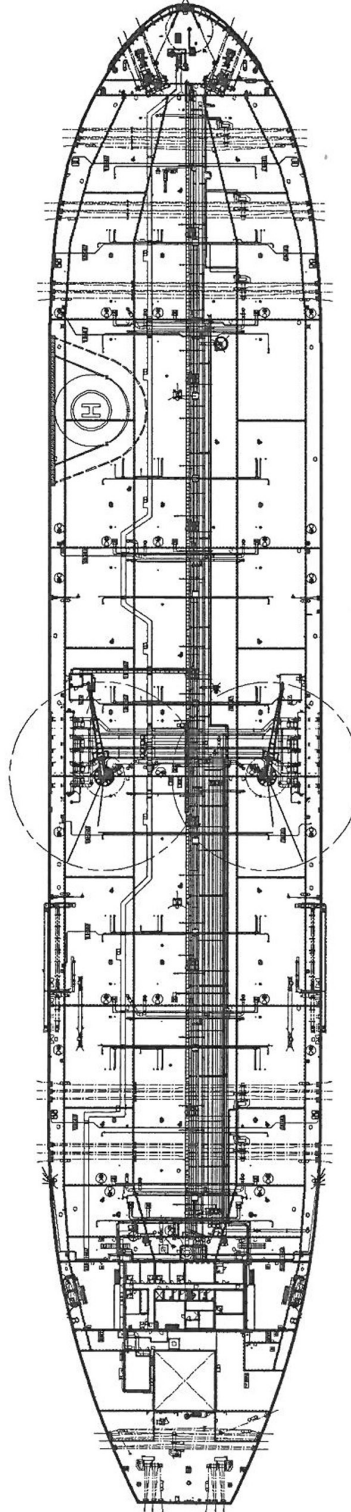
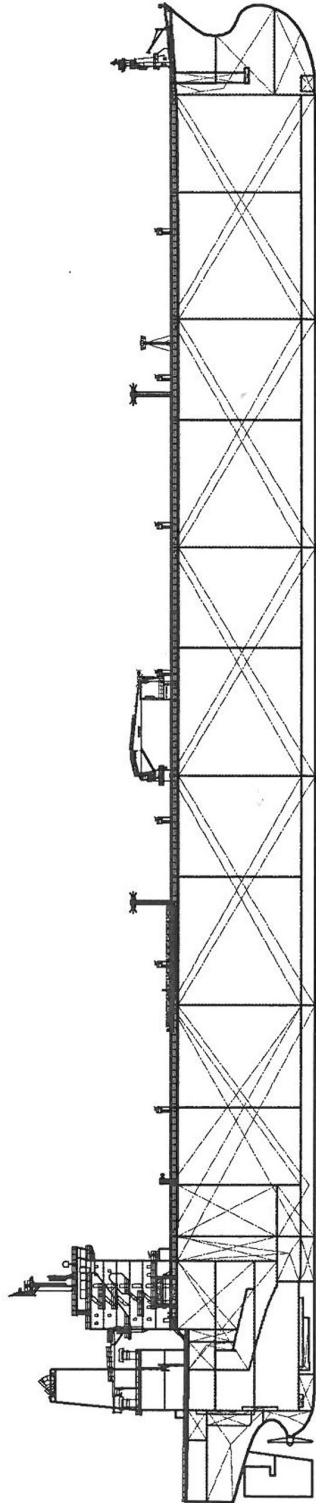
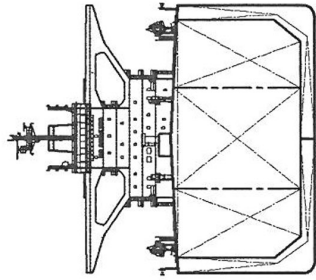
margin. As the engine is electronically controlled it is expected that the vessel will burn less fuel and will see a fuel consumption level of around 108.8tonnes per day by adopting this form of propulsion.

*Brightoil Glory* is equipped with the highly advanced navigation system which supports integrated bridge operation such as route planning, manoeuvring for collision and grounding avoidance and navigation monitoring. It is classed by Lloyd's Register of Shipping, +100A1 Double hull oil Tanker, CSR, ESP, ShipRight (CM, ACS(B)), \*TWS, LI, DSPM4, +LMC, IGS, UMS, COW(LR), ShipRight (BWMP(S), SCM).

### TECHNICAL PARTICULARS

Length oa: ..... 333m  
 Length bp: ..... 319m  
 Breadth moulded: ..... 60m  
 Depth moulded  
 To main deck: ..... 30.4m  
 To upper deck: ..... 30.4m  
 To other decks: ..... 27.654m  
 Width of double skin  
 Side: ..... 3.4m  
 Bottom: ..... 3.00m  
 Draught  
 Scantling: ..... 22.60m  
 Design: ..... 21.00m  
 Gross: ..... 161,269gt  
 Deadweight  
 Design: ..... 291,061dwt  
 Scantling: ..... 319,743dwt  
 Speed, service: ..... 16.4knots  
 Cargo capacity  
 Liquid volume: ..... 353,626m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 8,397m<sup>3</sup>  
 Diesel oil: ..... 599m<sup>3</sup>  
 Water ballast: ..... 97,983m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 108.8tonnes/day

Auxiliaries: ..... 4.67tonnes/day  
 Main engine  
 Design: ..... 2-stroke  
 Model: ..... 6S90ME-C8.2  
 Manufacturer: ..... Hyundai  
 Number: ..... 1  
 Type of fuel: ..... HFO, MDO, MGO  
 Output of each engine: ..... 30,423kW  
 Propellers  
 Material: ..... Ni-Al-bronze  
 Designer/manufacturer: ..... Hyundai  
 Number: ..... 1  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 10.1m  
 Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Hyundai 6H21/32  
 Type of fuel: ..... HFO, MDO, MGO  
 Output, speed of each set: ..... 1,277kW x 900rpm  
 Alternator make/type: ..... Hyundai HFC7 566-84K  
 Output, speed of each set: ..... 1,200kW x 900rpm  
 Boilers  
 Number: ..... 2  
 Type: ..... Mission OL  
 Make: ..... Aalborg  
 Output, each boiler: ..... 45,000kg/h  
 Hose handling crane  
 Number: ..... 2  
 Make: ..... Oriental  
 Type: ..... Single jib crane with self-contained hydraulic power unit  
 Performance: ..... SWL 20tonnes x 7m  
 Provision handling crane  
 Number: ..... 2  
 Make: ..... Oriental  
 Type: ..... Single jib crane with self-contained hydraulic power unit  
 Performance: ..... SWL 10/3tonnes x 4m  
 Mooring equipment  
 Number: ..... 2 x combined windlass/mooring winch, 8 x mooring winches  
 Make: ..... TTS Marine  
 Type: ..... Electro-hydraulic, high pressure  
 Special lifesaving equipment  
 Number or each and capacity: ..... 2 x 30persons  
 Make: ..... Hyundai Lifeboat  
 Type: ..... Conventional  
 Cargo tanks  
 Number: ..... 15 cargo tanks + 2 slop tanks  
 Stainless steel: ..... Piping ERW steel  
 Cargo pumps  
 Number: ..... 3  
 Type: ..... Vertical centrifugal single stage  
 Make: ..... Hyundai  
 Capacity: ..... 5,000m<sup>3</sup>/h x 150mTH  
 Cargo control system  
 Make: ..... Ace Valve  
 Type: Hydraulic operated valves/ piano type control console  
 Ballast control system  
 Make: ..... Ace Valves  
 Type: Hydraulic operated valves/ piano type control console  
 Complement  
 Officers: ..... 12  
 Crew: ..... 18  
 Bridge control system  
 Make: ..... Kongsberg  
 Type: ..... Autochief C20  
 Fire detection system  
 Make: ..... Tyco Marine  
 Type: ..... T2000  
 Fire extinguishing system  
 Engine room: ..... NK/ High expansion foam  
 Cabins/public spaces: ..... Seawater, portable extinguishers  
 Radars  
 Number: ..... 2  
 Make: ..... JRC  
 Models: ..... JMA-9132-SA, JMA-9122-6XA  
 Integrated bridge system  
 Make: ..... JRC  
 Model: ..... JAN-901B  
 Waste disposal plant  
 Incinerator: ..... HMMCO/ MAXI 1500SL WS  
 Sewage plant: ..... Il Seung ISS-35N  
 Contract date: ..... 31 August 2010  
 Launch/float-out date: ..... 20 July 2012  
 Delivery date: ..... 26 November 2012







## BRIGHTWAY: Suezmax tanker from HHIC-Phil

Shipbuilder: ..... **Hanjin Heavy Industry & Construction Co., Ltd**  
 Vessel's name: ..... **Brightway**  
 Hull No: ..... **NTP0059**  
 Owner/operator: .. **Tanker Pacific Management**  
 Country: ..... **Singapore, India, UK**  
 Designer: ..... **Hanjin Heavy Industry & Construction Co., Ltd**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **MOERI**  
 Flag: ..... **Singapore**  
 IMO number: ..... **9588146**  
 Total number of sister ship already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **4**

**BRIGHTWAY** is the first in the series of four crude oil carriers that are to be constructed at HHIC-Phil, in the Philippines, for Tanker Pacific Management with *Brightway* was delivered in April with its sister vessels delivered later in the year.

The vessel has been designed and constructed according to Agip & Chevron Texaco requirements, Maritime Labour Convention 2006 and to ExxonMobil terms and conditions. The vessel is the first to have applied silicon paint on the propeller in HHIC-Phil. The vessel is classified by DNV with the special notation of CLEAN, which means that the vessels operation meets with the class' environmental standards.

The hull form takes advantage of the vessel's double skin configuration and has particularly fine lines aft of the vessel, which gives it a smooth flow through the water. *Brightway* is powered by a low speed MAN 6S70MC-C8 engine, also reducing the vessel's emissions and giving the vessel a service speed of 15.7knots.

The ship has a bulbous bow, transom stern and a continuous deck. The cargo areas has three longitudinal bulkheads with a double bottom and double hull, and consists of six pairs of cargo oil tanks, one pair of slop tanks and six pairs of water ballast tanks. All fuel oil tanks are of double skin and fully comply with the MARPOL 12A regulation for fuel oil tanks protection. The vessel also has a five-tiered deckhouse complying with the SOLAS visibility regulation and provides accommodation for a complement of 28 persons excluding Suez crew. The vessel also has two lifeboats installed with a capacity for 28 persons each.

The vessel has a cargo loading capacity of 176,500m<sup>3</sup> and fuel oil tank capacity of 3,500m<sup>3</sup>. *Brightway's* cruising range is about 17,000 nautical miles on the basis of 15.7knots considering three reserve days.

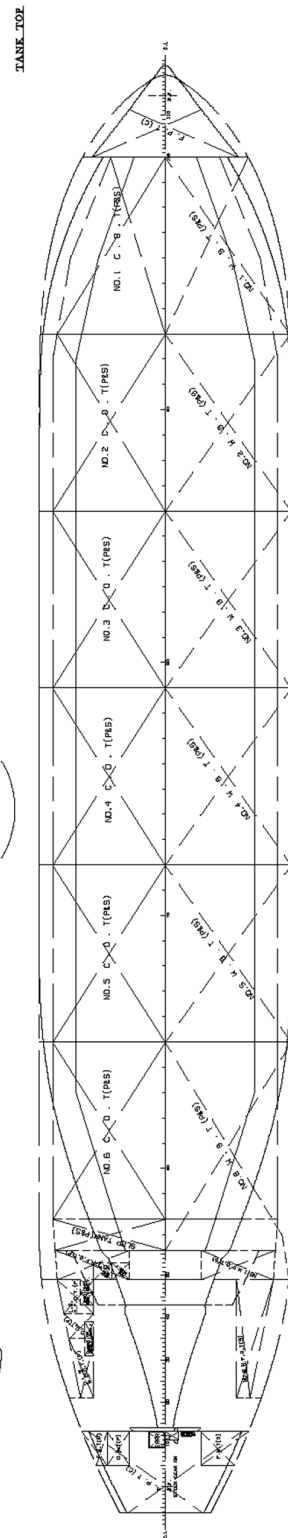
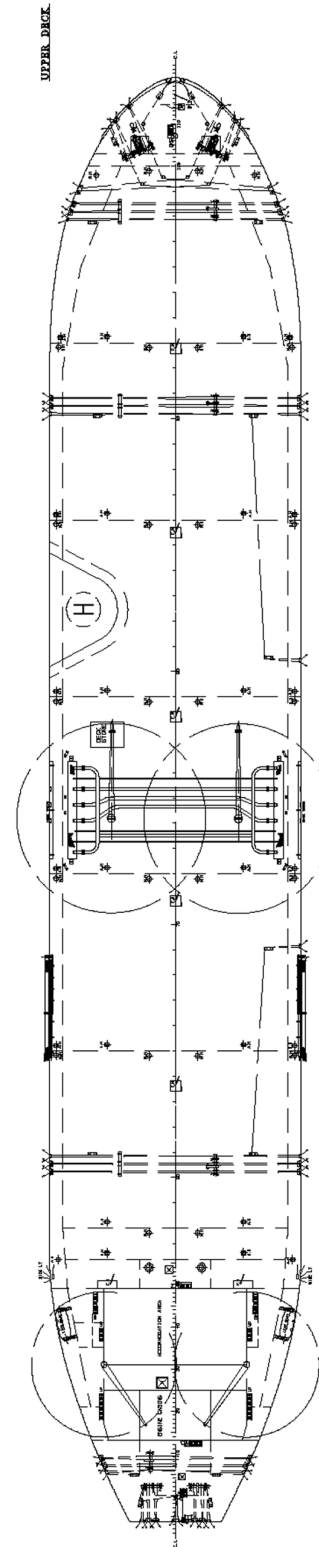
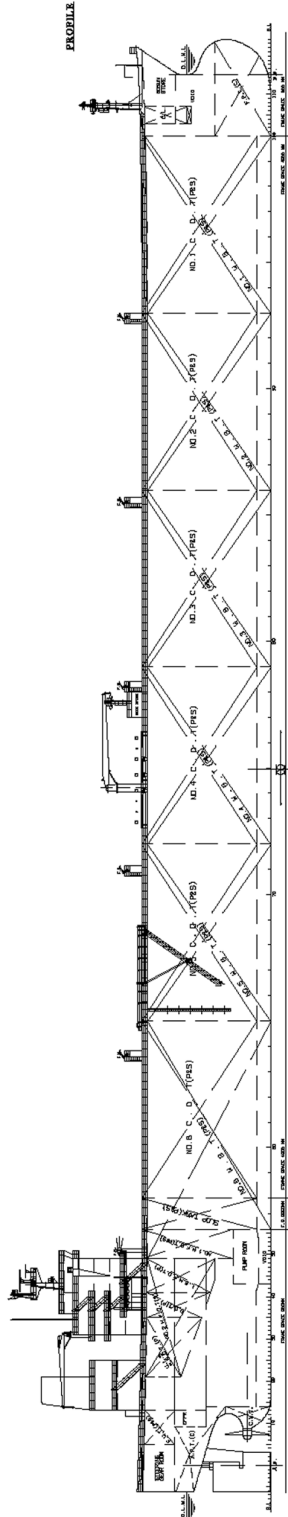
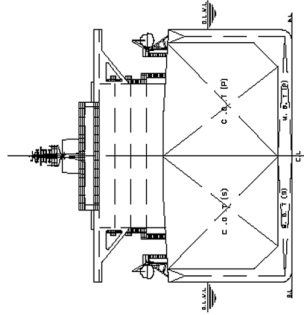
Accommodation including the navigation bridge and engine room are located aft of the vessel, with the cargo area consisting of triple cargo oil tanks (port, starboard and centre)

and one pair of slop tanks (port and starboard) with double bottom and double hull. Ultra low sulphur marine gas oil (ULSMGO) storage tanks, chiller unit and cooler have been installed to meet with the EU Directive/2005/33/EC. The dual ECDIS system provides the crew with continuous position and navigational safety information.

### TECHNICAL PARTICULARS

Length oa: ..... 274.00m  
 Length bp: ..... 264.00m  
 Breath moulded: ..... 48.00m  
 Depth moulded  
 To main deck: ..... 23.50m  
 Width of double skin  
 Side: ..... 2.55m  
 Bottom: ..... 2.70m  
 Draught  
 Scantling: ..... 17.20m  
 Design: ..... 16.00m  
 Gross: ..... 83,830gt  
 Displacement: ..... 185,000tonnes  
 Deadweight  
 Design: ..... 145,800dwt  
 Scantling: ..... 160,000dwt  
 Speed, service: ..... 15.7knots  
 Cargo capacity  
 Liquid volume: ..... 176,500m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 3,600m<sup>3</sup>  
 Diesel oil: ..... 580m<sup>3</sup>  
 Water ballast: ..... 56,000m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 75tonnes/day  
 Auxiliaries: ..... 4.5tonnes/day  
 Classification society and notations: ..... DNV + 1A1, "Tanker for oil ESP", E0, CSR, SPM, BIS, VCS-2B, BWM-E(S), COAT-PSP (B), CLEAN  
 Main engine  
 Design: ..... MAN Turbo Diesel  
 Model: ..... 6S70MC-C8  
 Manufacturer: ..... Hyundai Heavy Industries  
 Type of fuel: ..... HFO  
 Output of each engine: ..... 18,100kW  
 Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... HHIC (TMS)/MMG  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 8.3m  
 Speed: ..... 89rpm  
 Diesel-driven alternators  
 Engine make/type: ..... Hyundai/Himsen 5H21/32  
 Type of fuel: ..... HFO  
 Output/speed of each set: ..... 960kW x 900rpm  
 Alternator make/type: ..... Hyundai/HFC7 506-84K  
 Output/speed of each set: ..... 900kVA x 900rpm

Boilers  
 Type: ..... Oil-fired boiler  
 Make: ..... Aalborg  
 Output, each boiler: ..... 45,000gh/h x 16Bar  
 Cargo cranes/cargo gear  
 Make: ..... MCT  
 Type: ..... Electro-hydraulic cylinder luffing type  
 Performance: ..... SWL 20tonnes  
 Other cranes  
 Make: ..... Haean  
 Type: ..... Electric driven wire luffing type  
 Tasks: ..... Provision & engine part handling  
 Performance: ..... SWL 6.5tonnes/ 2tonnes  
 Mooring equipment  
 Make: ..... Pusnes  
 Type: ..... Electro-hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 x 32 persons  
 Make: ..... DSB  
 Cargo tanks  
 Number: ..... 12 x cargo tanks + 2 slop tanks  
 Grades of cargo carried: ..... Crude oil having a flash point below 60°C  
 Coated tanks: ..... PPG SSC's epoxy (Sigmaprime 700) for crown area & bottom & slop tanks (full area)  
 Cargo pumps  
 Type: ..... Steam driven, vertical, reciprocating, duplex double acting  
 Make: ..... Shinko  
 Stainless steel: ..... Shaft  
 Capacity: ..... 3,800m<sup>3</sup>/h x 150mTH  
 Cargo control system  
 Make: ..... KSB Seil  
 Ballast control system  
 Make: ..... KSB Seil  
 Bridge control system  
 Make: ..... Hyundai Heavy Industries & construction Co., Ltd  
 Type: ..... Integrated navigation console  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salwico cargo  
 Fire extinguishing systems  
 Engine room: ..... NK/ high expansion foam  
 Radars  
 Make: ..... Japan Radio Co., Ltd  
 Model: ..... JMA-9133-SA, JMA-9123-9XA  
 Integrated bridge system  
 Make: ..... Japan Radio Co., Ltd  
 Waste disposal plant  
 Incinerator: ..... Hyundai/ MAXI NG100SL WS  
 Sewage plant: ..... Jonghap/ JMC-Bio Aerob-18N  
 Contract date: ..... 17 March 2012  
 Launch/Float-out date: ..... 28 October 2011  
 Delivery date: ..... 1 May 2012







# CMA CGM MARCO POLO: mega container ship from DSME

Shipbuilder: ..... **Daewoo Shipbuilding & Marine Engineering Co., Ltd**  
 Vessel's name: ..... **CMA CGM Marco Polo**  
 Hull No: ..... **4161**  
 Owner/operator: ..... **CMA CGM**  
 Country: ..... **France**  
 Designer: ..... **Daewoo Shipbuilding & Marine Engineering Co., Ltd**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **HSVA**  
 Flag: ..... **France**  
 IMO number: ..... **9454436**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships on order: ..... **2**

THE challenge to the container shipping industry by Maersk's Emma class ships has been met by CMA CGM with an order for its own 16,000TEU environmentally friendly ships.

Unfortunately for CMA CGM no sooner do they catch up with the Danes, Maersk move on to the next stage. Consequently Marco Polo's reign as the world's largest container ship will last only into summer 2013 when the first of Maersk's 18,000TEU Triple E Class vessels is delivered.

Nonetheless, CMA CGM's ships will be constructed at Daewoo Shipbuilding & Marine Engineering and the first of these vessels, *CMA CGM Marco Polo*, was delivered in October with the other two vessels expected in 2013.

These orders were originally for three 13,800TEU ships, but CMA CGM increased the capacity to 16,000TEU in June 2011. A further three 12,500TEU vessels also under construction have had their capacity increased to 16,000TEU.

The vessel has a fully welded flush deck and a bulbous bow, a transom stern with an open water type stern frame. The 186,000dwt vessel has a double skin surrounding its eight cargo holds that have 24 bays for 40ft container with 22 hatches.

The new vessels are also designed with the latest technology to give better levels of performance, safety and environmental protection. Other features of the vessel include a mid-ship deckhouse, an electronic-injection engine that will reduce the oil and fuel consumption, fuel tanks that are protected by a double hull and a Fast Oil Recovery System.

*CMA CGM Marco Polo* is fitted with two bow thrusters that afford the vessel better manoeuvrability when berthing, a full spade rudder and a fixed pitch propeller that is directly driven by a Wärtsilä 14RT-flex96C engine that has a maximum rating of 80,080kW at 102rpm, giving the vessel a speed of 25.1knots at a scantling draught of 16m at 90% MCR. A pre swirl stator has also been

fitted for increased energy savings and thereby improving fuel efficiency.

*CMA CGM Marco Polo* also has a chemical-free ballast water treatment system from Heinrich Behrens Pumpenfabric that will protect the marine ecosystems by limiting the transfer of micro-organisms from ocean to ocean.

The vessel will operate in CMA CGM's FAL1 Asia – Europe trade where it is expected that volumes will increase. Although there are larger vessels on the horizon CMA CGM has opted for the 16,000TEU vessels as at the moment they are better adapted to current port infrastructure and can operate in all of the major ports between Asia and Northern Europe.

## TECHNICAL PARTICULARS

Length oa: ..... 396.0m  
 Length bp: ..... 378.4m  
 Breadth moulded: ..... 53.6m  
 Depth moulded  
 To main deck: ..... 29.9m  
 Width of double skin  
 Side: ..... 2.59m  
 Bottom: ..... 2.2m  
 Draught  
 Scantling: ..... 16.0m  
 Design: ..... 14.0m  
 Gross: ..... 153,022gt  
 Deadweight  
 Design: ..... 149,470dwt  
 Scantling: ..... 186,470dwt  
 Speed, service: ..... 25.1knots  
 Bunkers  
 Heavy oil: ..... 14,500m<sup>3</sup>  
 Diesel oil: ..... 450m<sup>3</sup>  
 Water ballast: ..... 52,000m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 288.5tonnes/day  
 Classification society and notations: ..BV I, +HULL, +MACH, Container Ship, Unrestricted Navigation, VERISTAR HULL, +AUT-UMS, +AUT-PORT, Inwatersurvey, MON SHAFT, ALP, LASHING, CLEANSHIP(C), Green Passport  
 % high tensile steel used in construction: ..... 66.2%  
 Main engine  
 Design: ..... Wärtsilä 14RT-flex96C  
 Manufacturer: ..... Doosan Engine  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 80,080kW x 102rpm  
 Propeller  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... DSME/ Hyundai  
 Fixed/controllable pitch: ..... 9.1m  
 Diesel-driven alternators  
 Engine make/type: ..... Hyundai HIIMSEN

Type of fuel used: ..... HFO, MDO  
 Output/speed of each set: ..... 2 x 3,840kW, 2 x 3,300kW  
 Alternator make/type: ..... self-excited/brushless  
 Output/speed of each set: ..... 720rpm  
 Boilers  
 Type: ..... Vertical  
 Make: ..... Alfa Laval Aalborg  
 Output: ..... 5,500kg/h  
 Cranes  
 Make: ..... Oriental  
 Type: ..... Electric  
 Tasks: ..... Provisions, Suez mooring boats and FO hose handling  
 Mooring equipment  
 Number: ..... 2 x windlasses, 10 x mooring winches  
 Make: ..... Rolls-Royce  
 Type: ..... Electric  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 x 40 persons  
 Make: ..... 2 x 40 person Hyundai Lifeboat Conventional  
 Hatch covers  
 Design: ..... Cargotec Finland  
 Manufacturer: ..... DSME  
 Type: ..... Pontoon type  
 Containers  
 Lengths: ..... 40ft  
 Heights: ..... 8ft 6in or 9ft 6in  
 Cell guides: ..... Fixed cell guide  
 Total TEU capacity: ..... 16,000  
 On deck: ..... 8,600  
 In holds: ..... 7,400  
 Homogenously loaded to 14tonnes: ..... 12,000TEU  
 Reefer plugs: ..... 800 units  
 Tiers/rows  
 On deck: ..... 9/21  
 In holds: ..... 11/19  
 Ballast control system  
 Make: ..... Heinrich Behrens Pumpenfabric  
 Type: ..... Centrifugal, vertical, self-priming  
 Complement  
 Officers: ..... 15  
 Crew: ..... 14  
 Bow thruster  
 Make: ..... Kawasaki Heavy Industry  
 Output: ..... 1,800kW  
 Fire extinguishing systems  
 Cargo holds/Engine room: ..... CO<sub>2</sub>  
 Cabins: ..... Seawater from fire main  
 Radars  
 Number: ..... 1  
 Models: ..... Radar and integrated navigation system  
 Contract date: ..... 6 July 2007  
 Launch/float-out date: ..... 6 June 2012  
 Delivery date: ..... 16 October 2012







## CORAL ENERGY: dual-fuel LNG carrier

Shipbuilder: ..... **Neptun Werft**  
 Vessel's name: ..... **Coral Energy**  
 Hull No: ..... **S665**  
 Owner/operator: ..... **Anthony Veder Chartering B.V**  
 Country: ..... **The Netherlands**  
 Designer: ..... **Neptun Werft**  
 Country: ..... **Germany**  
 Flag: ..... **Dutch**  
 IMO number: ..... **9617698**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **nil**

**T**HE liquefied natural gas (LNG) carrier *Coral Energy* was launched in December 2012 from German Shipyard Neptun Werft and delivered to Anthony Veder.

This ship is world's first direct driven dual-fuel ice-class 1A LNG carrier. The development of the ship started in 2010 for client Skangass, Scandinavia's natural gas provider, for distribution of LNG in Scandinavia. Skangass was looking for a small to medium scale LNG carrier that would be able to carry out this task.

The suitable vessel size, depending on their plant and terminal demands, was determined after a process of logistical optimisation. With *Coral Energy* Skangass and Anthony Veder make it possible to deliver LNG in an environmentally friendly way as a cleaner energy source, to remote places and to smaller terminals where the LNG can be used as a bunker fuel for other ships, power generation or retail distribution.

One of the innovations applied on the vessel is the direct drive dual-fuel engine. In this way the propulsion system is efficient and with LNG as marine fuel the propulsion provides an eco-friendly ship operation. Besides this aspect, the vessel is an educational platform for Dutch seafarers on knowledge of LNG as cargo and as marine fuel.

Due to the vessel's size and the innovative compatibility package developed in-house, the ship is able to load LNG at all world scale terminals. The ship has the ice-class 1A notation, which opens possibilities for remote communities in the Nordic region.

This gas tanker has an overall length of 156m and a breadth of 22,70m as well as a cargo capacity of 15.600m<sup>3</sup> LNG, which is cooled during transport up to minus 164° C. Coral Energy is equipped with low-emission gas propulsion that meets the highest environmental standards.

### TECHNICAL PARTICULARS

Length oa: ..... 154.95m  
 Length bp: ..... 146.67m  
 Breadth moulded: ..... 22.70m  
 Depth moulded  
 To main deck: ..... 14.95m  
 Draught  
 Ballast: ..... 5.19m  
 LNG: ..... 7.35m  
 Summer: ..... 8.45m  
 Deadweight  
 LNG draught: ..... 8,710dwt  
 Summer draught: ..... 12,250dwt  
 Speed, service: ..... 15.80knots  
 Cargo capacity  
 Liquid Volume: ..... 15,600m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 1,400m<sup>3</sup>  
 Diesel oil: ..... 150m<sup>3</sup>  
 Water ballast: ..... 4,908m<sup>3</sup>  
 Classification society and notations: ..... BV I \*Hull, \*MACH, \*AUT-UMS Liquefied gas carrier, Unrestricted navigation, Ice Class 1A, MON SHAFT, CLEANSHIP 7+, SYS NEQ-1, AVM-DPS, Inwatersurvey, Green Passport Liquefied Gas Carrier Type 2G/IER S.P 4.2 barg/F.R. -163°C  
 Main engines  
 Design: ..... Wärtsilä  
 Model: ..... 8L50DF  
 Manufacturer: ..... Wärtsilä  
 Number: ..... 1  
 Type of fuel: ..... Natural gas, HFO, MGO  
 Output of each engine: ..... 7,800kW x 514rpm  
 Propellers  
 Material:  
 Designer/manufacturer: ..... Wärtsilä

Number: ..... 1  
 Fixed/controllable pitch: ..... Controllable  
 Diameter: ..... 5,4m  
 Speed: ..... 514rpm  
 Diesel-driven generators  
 Number: ..... 2  
 Engine make/type: ..... Wärtsilä 6L20DF  
 Type of fuel: ..... Natural gas, MGO  
 Output/speed of each set: ..... 1,056kw x 1,200rpm  
 Other cranes  
 Number: ..... 2  
 Tasks: ..... Hose handling, provision crane  
 Performance: ..... 5tonnes x 18.5m, 4tonnes x 8.3m  
 Mooring equipment  
 Number: ..... 7  
 Make: ..... Rolls-Royce  
 Type: ..... Hydraulic driven  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 30persons, 1 x 6persons, 3 x liferafts  
 Type: ..... free-fall, rigid boat with inboard motor  
 Cargo tanks  
 Number: ..... 3  
 Grade of cargo carried: ..... Methane, Liquefied Natural Gas (LNG)  
 Coated tanks: ..... Tank type C  
 Cargo pumps  
 Number: ..... 6  
 Make/type: ..... Hamworthy, Deepwell  
 Capacity: ..... 270m<sup>3</sup>/hr  
 Complement  
 Officers: ..... 6  
 Crew: ..... 15  
 Passengers  
 Total: ..... 22  
 Number of cabins: ..... 26  
 Bow thruster  
 Make: ..... Verheer Omega  
 Number: ..... 1  
 Output: ..... 850kW  
 Launch/float-out date: ..... 30 September 2012  
 Delivery date: ..... January 2013







# EAGLE SAN ANTONIO: eco-designed Suezmax from Samsung

Shipbuilder: ..... **Samsung Heavy Industries Co., Ltd**  
 Vessel's name: ..... **Eagle San Antonio**  
 Hull No: ..... **HN1962**  
 Owner/operator: ..... **AET/ AET Shipmanagement Pte Limited**  
 Country: ..... **Singapore**  
 Designer: ..... **Samsung Heavy Industries Co., Ltd**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **Samsung Ship Model Basin**  
 Flag: ..... **Singapore**  
 IMO number: ..... **9594822**  
 Total number of sister ships already completed (excluding ship presented): ..... **3**  
 Total number of sister ships still on order: ..... **4**

RECOGNISING the ever increasing demand for more fuel efficient and environmentally friendly vessels, tanker owner/operator, AET, took delivery of the first of its four "eco-design" Suezmax tankers in April last year. Constructed at Samsung Heavy Industries, Korea the remaining three sister ships were delivered during the course of 2012 and are the first Suezmax vessels to be owned by the company.

AET stated that it made a significant investment in these new "eco-design" vessels to maximise fuel efficiency and to minimise harmful emissions. Innovations include hull form optimisation and de-rating of the main engine power for low load optimisation. The application of energy saving devices such as saver fins, a star propeller and rudder bulb have also been fitted.

In addition, the vessel has obtained Lloyd's Register's "Environmental Protection" notation and a Letter of Compliance for a Green Passport. The Energy Efficiency Design Index (EEDI) attained by the vessel has been verified by Lloyd's Register and exceeds IMO's requirements. As a result, the vessel has also qualified for the "Green Ship Programme" under Maritime Singapore's Green Initiative.

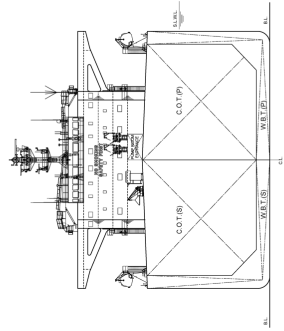
Going forward, AET insists that a feature of its fleet renewal programme is that all new vessels joining the fleet will be significantly more fuel-efficient than those they replace. Other recent innovations include the introduction of two newbuild DP shuttle tankers, two newly converted specialist marine capture vessels, a fleet of the world's first purpose built lightering support vessels and four newbuild VLCCs to replace older tonnage in 2013.

## TECHNICAL PARTICULARS

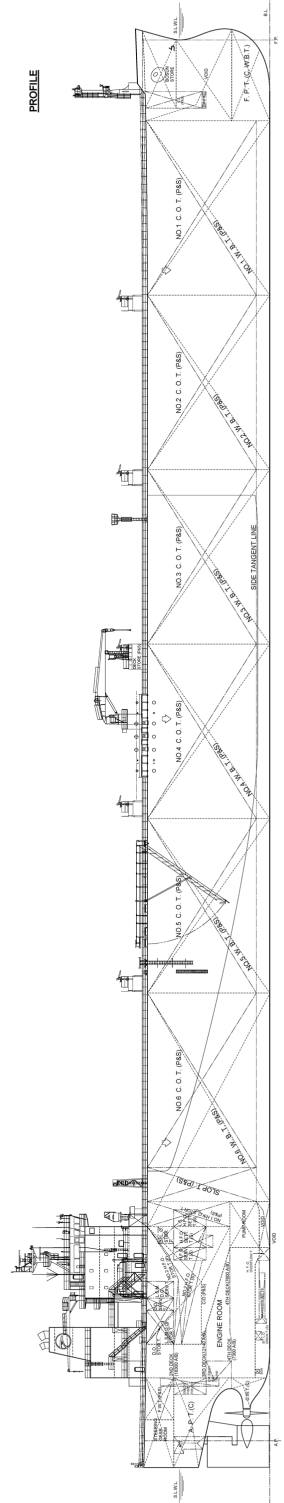
Length oa: ..... 274.29m  
 Length bp: ..... 267.0m  
 Breath moulded: ..... 49.0m  
 Depth moulded  
 To main deck: ..... 23.3m  
 To upper deck: ..... 23.3m  
 Width of double skin  
 Side: ..... 2.45m  
 Bottom: ..... 2.55m  
 Draught  
 Scantling: ..... 17.2m

Design: ..... 16.2m  
 Gross: ..... 80,783gt  
 Displacement: ..... 181,682tonnes  
 Lightweight: ..... 23,832tonnes  
 Deadweight  
 Design: ..... 145,946dwt  
 Scantling: ..... 157,849dwt  
 Block co-efficient: ..... 0.7860  
 Speed, service: ..... 15.97knots  
 Cargo capacity  
 Liquid volume: ..... 175,066m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 3,578m<sup>3</sup>  
 Diesel oil: ..... 437.8m<sup>3</sup>  
 Water ballast: ..... 50,943m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 60tonnes/day  
 Classification society and notations: ..... Lloyds Register 100A1, Double Hull Oil Tanker, CSR, ESP, ShipRight (ACS (B), CM), LI, LMC, UMS, ShipRight SCM, IWS (no searching blanking device), EP  
 Main engines  
 Design: ..... MAN Diesel & Turbo  
 Model: ..... 6S70MC-C8.1  
 Manufacturer: ..... Doosan Engine-MAN Diesel & Turbo Licensee  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 16,400kW x 82.8rpm  
 Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... MMG  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 8.45m  
 Speed: ..... 82.2rpm  
 Diesel-driven alternators  
 Engine make/type: ..... STX Engine-MAN Diesel & Turbo Licensee/ 6L23/30H  
 Type of fuel: ..... HFO, MDO  
 Output/speed of each set: ..... 960kW x 900rpm  
 Alternator make/type: ..... HHI/HFC7 508-84K  
 Output/speed of each set: ..... 900kW x 900rpm  
 Boilers  
 Number: ..... 2 x auxiliary boiler  
 Type: ..... Mission OL3500, Mission OC2000/1600  
 Make: ..... Aalborg  
 Output, each boiler: ..... 35tonnes/h x 1.6MPa, 2tonnes/h x 0.6MPa for oil fired side, 1.6tonnes/h x 0.6MPa for exhaust side  
 Cargo cranes/cargo gear  
 Make: ..... DMC  
 Type: ..... Electric-hydraulic  
 Performance: ..... 15tonnes x 17m  
 Other cranes  
 Make: ..... DMC  
 Type: ..... Electric-hydraulic

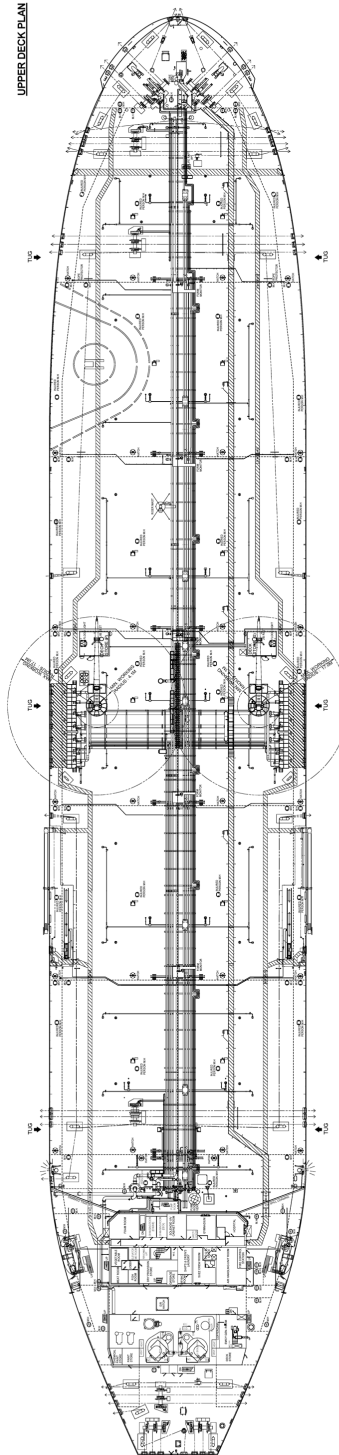
Tasks: ..... Provisions, machinery equipment handling  
 Performance: ..... 6.3tonnes x 14.5m, 2tonnes x 14.5m  
 Mooring equipment  
 Make: ..... Flutek-Kawasaki  
 Type: ..... Electric-hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 x 32 persons  
 Make: ..... Hyundai Lifeboat  
 Type: ..... Totally enclosed  
 Cargo tanks  
 Number: ..... 14  
 Grades of cargo carried: ..... Crude oil having a flash point below 60°C  
 Product range: ..... Crude oil  
 Coated tanks: ..... Epoxy anti-corrosive paint (Deckhead and 1.7m below x 1 + 200 micron. Bottom and 0.5m above x 2 = 250 micron)  
 Stainless steel: ..... Piping: Hydraulic line for valve control shall be of stainless steel  
 Cargo pumps  
 Type: ..... Vertical, single stage, centrifugal  
 Make: ..... shinko  
 Stainless steel: ..... Stainless steel is installed for the impeller shaft  
 Capacity: ..... 3,500m<sup>3</sup>/h x 135m at S.G 1.025  
 Cargo control system  
 Make: ..... Samsung - Amri Seil  
 Type: ..... Valve remote control system  
 Ballast control system  
 Make: ..... Samsung - Amri Seil  
 Type: ..... Valve remote control system  
 Complement  
 Officers: ..... 19  
 Crew: ..... 13  
 Stern appendages/special rudders: ..... Rudder bulb  
 Bridge control system  
 Make: ..... Tokyo Keiki  
 Type: ..... Auto Pilot with adaptive function  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Addressable type  
 Fire extinguishing systems  
 Engine room: ..... Kashiwa/ High expansion foam system  
 1 x compartment: ..... Seawater  
 Radars  
 Make: ..... SHI-JRC  
 Models: ..... JMA-9132-SA, JMA-9122-6XA  
 Integrated bridge system  
 Make: ..... SHI-JRC  
 Model: ..... JAN-901-B  
 Waste disposal plant  
 Incinerator: ..... Hyundai-Atlas/ Maxi T150SL  
 Contract date: ..... 25 June 2010  
 Launch/ float-out date: ..... 29 February 2012  
 Delivery date: ..... 26 April 2012



MIDSHIP SECTION



PROFILE



UPPER DECK PLAN





# ELKA LEBLON: STX's shuttle tanker

Shipbuilder: ..... **STX Offshore & Shipbuilding Co., Ltd**  
 Vessel's name: ..... **Elka Leblon**  
 Hull No: ..... **S1571**  
 Owner/operator: ..... **European Navigation Inc**  
 Country: ..... **Greece**  
 Designer: ..... **STX Offshore & Shipbuilding Co., Ltd**  
 Country: ..... **Korea**  
 Flag: ..... **Liberia**  
 IMO number: ..... **9625712**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **1**

## TECHNICAL PARTICULARS

Length oa: ..... 278.30m  
 Length bp: ..... 264.00m  
 Breadth moulded: ..... 48.70m  
 Depth moulded  
 To upper deck: ..... 23.60m  
 Draught  
 Scantling: ..... 16.60m  
 Design: ..... 15.00m  
 Displacement: ..... 182,644tonnes  
 Lightweight: ..... 27,800tonnes  
 Deadweight  
 Design: ..... 135,452dwt  
 Scantling: ..... 154,844dwt  
 Block co-efficient: ..... 0.8333  
 Speed, service: ..... 15.5knots  
 Cargo capacity  
 Liquid volume: ..... 170,220m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 4,553m<sup>3</sup>  
 Diesel oil: ..... 437m<sup>3</sup>  
 Water ballast: ..... 54,607m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 55.99tonnes/day  
 Auxiliaries: ..... 6.9tonnes/day  
 Classification society and notations: ... DNV, +1A1, Tanker for Oil esp. CSR, EO, DYNPOS-AUTR, Bow Loading, NAUT-OC, SPM, VCS-2, COAT-PSPC(B), HELDK-SH, CCO, F-AMC, ECA(SOX-A), CLEAN, TMON, OPP-F, Recyclable, AP-2(25%), BIS, BWM-T, BWM-E(s)  
 Main engine  
 Design: ..... STX-MAN B&W  
 Model: ..... 6S70ME-C8.1 (NOx Tier III)  
 Manufacturer: ..... STX Heavy Industry  
 Type of fuel: ..... HFO, MDO, MGO  
 Output of each engine: ..... 17,525kW x 82rpm  
 Propeller  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... Kawasaki  
 Fixed/controllable pitch: ..... Controllable pitch  
 Diameter: ..... 8.6m  
 Speed: ..... 82rpm  
 Diesel-driven alternators  
 Engine make/type: ..... 2 x STX-MAN 8L27 38 3 x STX-MAN 9L32 40  
 Type of fuel: ..... HFO, MDO, MGO  
 Output/ speed of each set: ..... 2,500kW x 72rpm 4,345kW x 720rpm  
 Alternator make/type: ..... Hyundai Heavy Industries  
 Boilers  
 Number: ..... 2 x Kangrim  
 Type: ..... Oil fired  
 Output, each boiler: ..... 10tonnes/h  
 Exhaust gas economiser  
 Number: ..... 1 x Kangrim

Type: ..... EM16DC12A2  
 Output, each boiler: ..... 1.6tonnes/h  
 Cargo cranes  
 Number: ..... 2 x DMC  
 Type: ..... Electro hydraulic driven cylinder luffing single jib type  
 Performance: ..... SWL 20tonnes  
 Other cranes  
 Number: ..... 1 x DMC Electro hydraulic  
 Tasks: ..... BLS equipment and hose handling  
 Performance: ..... SWL 5tonnes  
 Mooring equipment  
 Number: ..... 8 x Flutek-Kawasaki  
 Type: ..... Hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 x 40 persons  
 Make: ..... Hyundai  
 Cargo tanks  
 Number: ..... 12 cargo tanks & 2 slop tanks  
 Grades of cargo carried: ... Crude oil having a flash point below 60°C  
 Coated tanks make: ..... Jotun  
 Cargo pumps  
 Number: ..... 12 cargo pumps & 2 slop tanks  
 Type: ..... Centrifugal, hydraulic motor driven  
 Make: ..... Framo  
 Capacity: ..... 1,800m<sup>3</sup> x 130mcl (cargo pump) 600m<sup>3</sup> x 130mcl (slop tank pump)  
 Cargo control system  
 Make: ..... Scana(VRC) + Framo  
 Ballast control system  
 Make: ..... Scana (VRC) + Framo  
 Water ballast treatment system  
 Make: ..... Techcross  
 Capacity: ..... 2,600m<sup>3</sup>/h, 450m<sup>3</sup>/h  
 Complement  
 Officers: ..... 22  
 Crew: ..... 12  
 Bow thrusters ..... 3 x Kawasaki  
 Output: ..... 2,830kW(tunnel type), 2,200kW(azimuth type)  
 Stern thruster ..... 2 x Kawasaki  
 2,200kW(tunnel type), 2,200kW(azimuth type)  
 Bridge control system  
 Make: ..... KTE, T-Shape  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Consilium, Salwico Cargo  
 Fire extinguishing systems  
 Engine room/Cargo holds: ..... NK/CO<sub>2</sub>  
 Integrated bridge system/Radars: ..... 2 x Kongsberg K-bridge  
 Contract date: ..... 15 April 2011  
 Launch/float-out date: ..... 31 August 2012  
 Delivery date: ..... 23 December 2012

*ELKA Leblon* was designed by STX Offshore & Shipbuilding as a part of a research, design and construction project for a new shuttle tanker as a one-off for the owner. The ships will be employed on long-term charter to the state-owned oil company Petrobras of Brazil, to transport crude oil produced in Brazil.

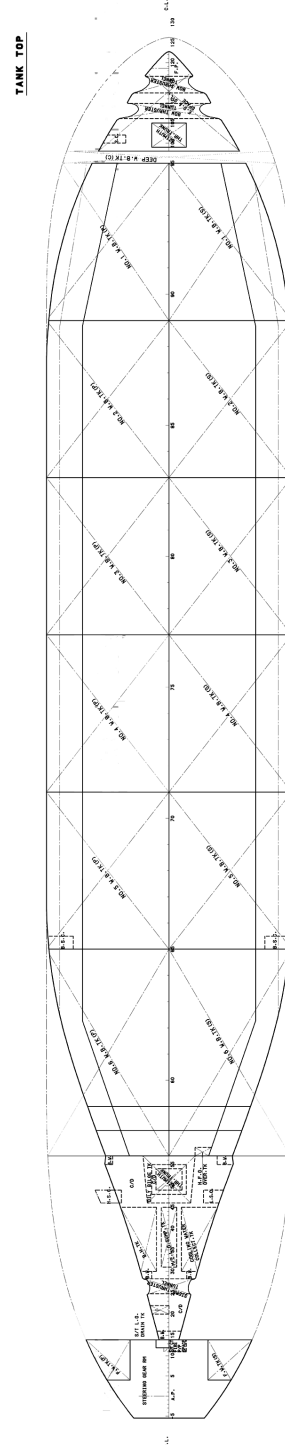
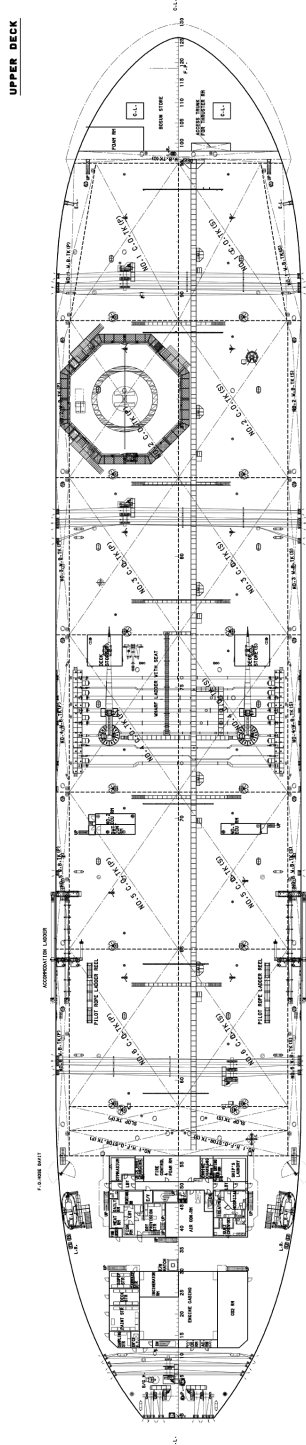
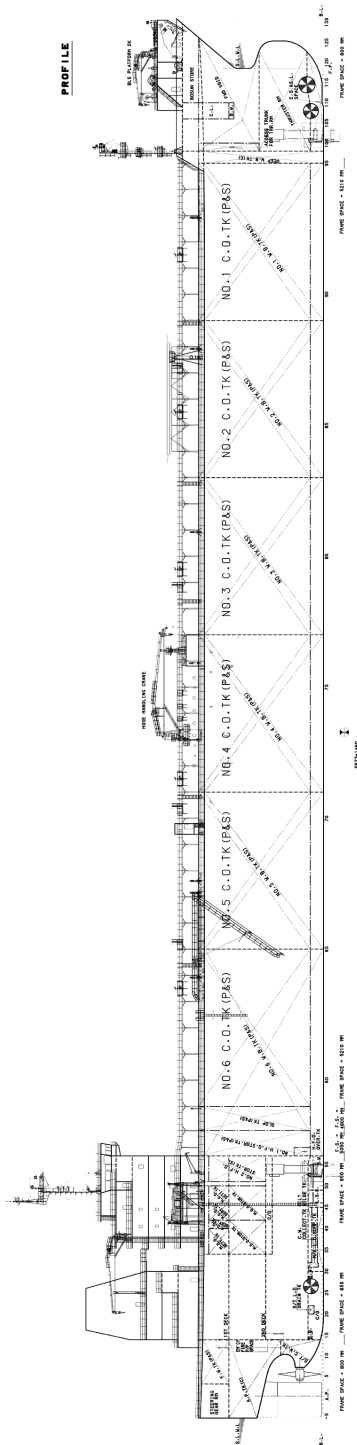
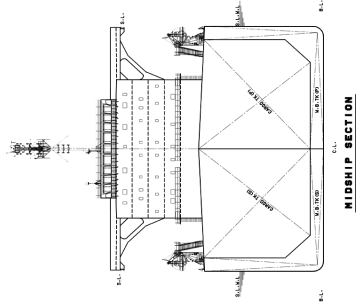
The 155,000dwt Shuttle tanker has been fitted with a dynamic positioning (DP) system at the Jin-hae Shipyard. The DP2 system has been installed to allow the vessels to keep their position fixed at sea using its azimuth thruster during loading operations.

Adding to the green credentials of the fuel efficient *Elka Leblon* is the Techcross ballast water system that is fitted on the upper deck, which has a capacity of 2,600m<sup>3</sup>/h, 450m<sup>3</sup>/h.

This vessel has an overall length of 278.3m, a moulded breadth of 48.7m and a moulded depth of 23.6m. Service speed at design draft is 15.5 knots at 85% MCR of main engine power, and maximum deadweight is about 154,844.8dwt on a scantling draft of 16.6m.

This vessel has a Heli deck for a Sikorsky S61N type helicopter and a bow loading system on the forward deck. The two controllable pitch azimuth bow thrusters have a power of 2,200kW, and 2,830kW. The stern tunnel thruster that has the power of 2,200kW, which is fitted in the vessel for the dynamic positioning system. All thrusters are driven by an electric motor. The azimuth Thrusters have been fitted to give the vessel better steering and propulsion, which also enables the ship to change its direction freely at both ends of bow and the stern in 360degs revolution.

The accommodation area including the navigation bridge room and engine room are located in the aft, and the cargo area consists of double cargo oil tanks (port and starboard) and one pair of slop tanks (port & starboard) with double bottom and double hull. The aft body with transom stern is used steering gear compartment, fresh water tanks and aft peak tank. The No.4 C.O.TK(P&S) can be used for ballast tank when Heavy weather ballast condition.







# EMERALD ACE: solar powered car carrier from Mitsubishi

Shipbuilder: ..... **Mitsubishi Heavy Industries**  
 Vessel's name: ..... **Emerald Ace**  
 Hull No: ..... **1296**  
 Owner/operator: ..... **Mitsui OSK Lines**  
 Country: ..... **Japan**  
 Designer: ..... **Mitsubishi Heavy Industries**  
 Country: ..... **Japan**  
 Model test establishment used: ..... **MHI Nagasaki R&D Centre, Japan**  
 Flag: ..... **Marshall Islands**  
 IMO number: ..... **9539236**  
 Total number of sister ships already completed (excluding ship presented): ..... **3**  
 Total number of sister ships still on order: ..... **nil**

*EMERALD Ace* is one of the most advanced and environmentally friendly car carriers and is equipped with a hybrid electric power supply system that combines a 160kW solar generation system with 2.2MWh lithium-ion batteries in order to reduce CO<sub>2</sub> emissions. The vessel was delivered from Mitsubishi in June to its owner Mitsui OSK Lines.

The solar generation system consists of 768 solar panels and a power conditioner. The electricity generated by the solar generation system is stored in the lithium-ion batteries while the vessel is under way.

Panasonic ran a R&D development project which was designated as part of the "Project to Develop Technologies for the Reduction of CO<sub>2</sub> Emissions from New Ships" by the Ministry of Land, Infrastructure, Transport and Tourism which is supported as a cooperative research programme to develop technology to reduce greenhouse gas emissions in international shipping by ClassNK.

*Emerald Ace* employs Panasonic's system consisting of its heterojunction with intrinsic thin layer (HIT) solar modules (160 KW) and lithium-ion batteries. With this system, Panasonic is aiming to establish a technology that enables a ship to reduce its total CO<sub>2</sub> emissions by supplementing the power generated by the ship's diesel power generator.

The power generated by the HIT solar modules and stored in the batteries is primarily used while the ship is at anchor, allowing the diesel power generator to be turned off, thereby helping to reduce the environmental impact of the ship in port. The batteries are located at the bottom of the ship and used as fixed ballast so that they do not affect the carrying capacity of the ship.

The hull form of the vessel under the waterline, the propeller and the Mitsubishi stator fin were developed by MHI Nagasaki R&D Center. These energy saving devices

will give the vessel lower fuel consumption. Above the water, the design of the vessel has been optimised to help reduce wind pressure to the upper deck of the bow which was developed by MOL. The wind channels along the sides at the top of the garage deck and fan rooms have bevelled roofs that help reduce pressure from side winds.

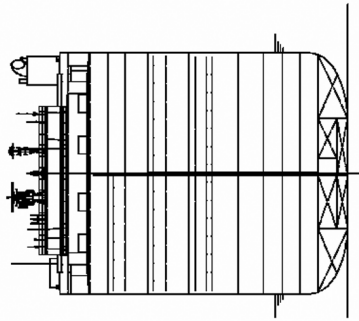
*Emerald Ace* also features double hull fuel tanks to help reduce the risk of oil spills. The vessel has straight hold ramp ways (Jumping slope for carrying from No.7 deck to No.3 deck) are adopted for efficient cargo handling and reducing the CO<sub>2</sub> emissions from vehicles during rolling on/off.

*Emerald Ace* is the last commercial ship to be constructed at the Mitsubishi Kobe shipyard, which will now focus on the construction of submarines. Reorganisation of the company will see commercial vessels now being constructed at its Nagasaki Shipyard & Machinery works and its Shimonoseki Shipyard & Machinery works.

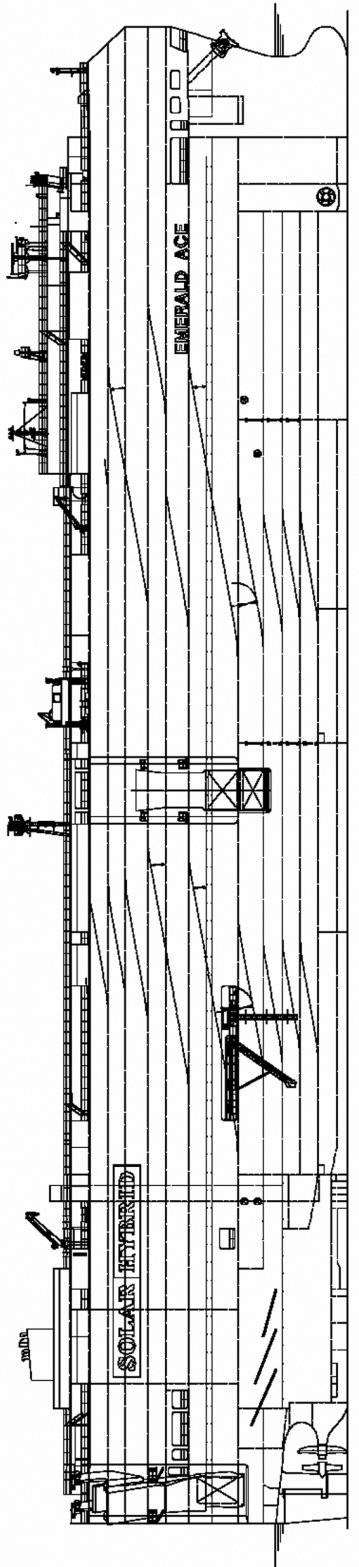
## TECHNICAL PARTICULARS

Length oa: ..... 199.99m  
 Length bp: ..... 192.00m  
 Breadth moulded: ..... 32.26m  
 Depth moulded  
 To main deck: ..... 14.70m  
 To upper deck: ..... 34.52m  
 Draught  
 Scantling: ..... 9.70m  
 Design: ..... 8.80m  
 Gross: ..... 60,154gt  
 Deadweight  
 Design: ..... 13,932dwt  
 Scantling: ..... 18,334dwt  
 Speed, service: ..... 20.65knots  
 Bunkers  
 Heavy oil: ..... 2,600m<sup>3</sup>  
 Diesel oil: ..... 240m<sup>3</sup>  
 Water ballast: ..... 8,500m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 49tonnes/day  
 Classification society and notations: ..... Nippon Kaiji Kyokai, NS\* (Vehicle Carrier), IWS, MNS\* (MO)  
 Main engine  
 Design: ..... Mitsubishi Heavy Industries  
 Model: ..... 7UEC60LSII (P/U)  
 Manufacturer: ..... Mitsubishi Heavy Industries  
 Number: ..... 1  
 Type of fuel: ..... HFO  
 Output of each engine: ..... 14,315kW x 105rpm

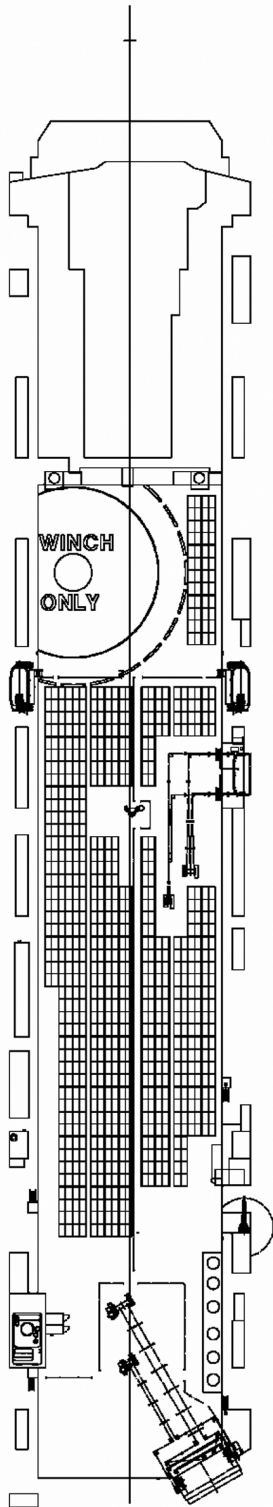
Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... Mitsubishi Heavy Industries  
 Number: ..... 1  
 Fixed/controllable pitch: ..... Fixed  
 Speed: ..... 105rpm  
 Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Daihatsu Diesel Mfg Co., Ltd  
 Type of fuel: ..... HFO  
 Output/speed of each set: ..... 1,250kW x 720rpm  
 Alternator make/type: ..... Nishishiba Electric Co., Ltd  
 Output/speed of each set: ..... 1,170kW x 720rpm  
 Boilers  
 Number: ..... 1  
 Make: ..... Osaka Boiler Mfg Co., Ltd  
 Mooring equipment  
 Number: ..... 2 x mooring winches, 4 x mooring winches  
 Make: ..... Manabe Zoki Co., Ltd  
 Type: ..... Electric  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 x 32 persons  
 Make: ..... Techno Alpha Co., Ltd  
 Type: ..... FRP enclosed type lifeboat  
 Vehicles  
 Number of vehicle decks: ..... 9.5 fixed, 2.5 hoistable  
 Total cars: ..... 6,400  
 Doors/ramps/lifts/movable car decks  
 Number of each: ..... 1 x stern ramp, 1 x side ramp  
 Designer: ..... Kyoritsu Kikai Co Ltd  
 Ballast control system  
 Make: ..... Nakakita Deisakusho Co Ltd  
 Complement  
 Officers: ..... 10  
 Crew: ..... 21  
 Stern appendages/special rudders: ..... Stator fin  
 Bow thruster  
 Make: ..... Kawasaki Heavy Industries  
 Number: ..... 1  
 Output: ..... 1,590kW  
 Fire detection system  
 Make: ..... Autronica  
 Fire extinguishing systems  
 Engine room: ..... Foam, water spray  
 Vehicle spaces: ..... Foam  
 Radars  
 Number: ..... 2  
 Make: ..... Japan Radio Co., Ltd  
 Launch/float-out date: ..... 9 March 2012  
 Delivery date: ..... 29 June 2012



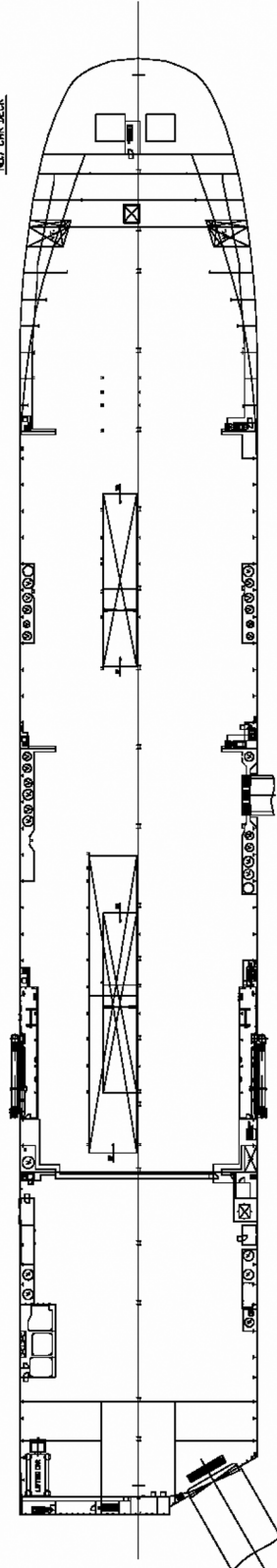
HOLD SECTION & FRONT VIEW



GARAGE TIP DECK



MID CAR DECK







## EPHESOS: EEDI rated oil tanker

Shipbuilder: ..... **Hyundai Samho Heavy Industries Co., Ltd**  
 Vessel's name: ..... **Ephesos**  
 Hull No: ..... **S570**  
 Owner/operator: ..... **N.J Goulandris**  
 Country: ..... **Greece**  
 Designer: ..... **Hyundai Samho Heavy Industries Co., Ltd**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **Hyundai Maritime Research Institute**  
 Flag: ..... **Greece**  
 IMO number: ..... **9607423**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **nil**

As vessels are now being built to meet an increasing range of environmental regulations *Ephesos* is the first vessel in the series of two 165,000dwt class crude oil carriers constructed at Hyundai Samho Heavy Industries for Greek shipowner N.J Goulandris that meets with the Energy Efficiency Design Index (EEDI). The ship was delivered early in 2012 and its sister vessel *Miltos* was delivered a few months later.

*Ephesos* achieved its EEDI Verification Statement from DNV, where the required EEDI for this design of vessel is 3.469, but the vessel attained an EEDI rating of 3.246, which equates to an EEDIa/EEDIreq of 93.57%. To achieve the EEDI the shipowner made the application for EEDI to classification society (DNV) before the vessel's sea trial.

The local DNV surveyor carried out the testing on the speed trial and draft reading during sea trials. Following the sea trials, the EEDI file was submitted to DNV, which then received approval from the classification society. The technical information provided for the EEDI certification comprises of the following items; a general particular, shop test for M/E and D/G, results of sea trials speed and speed correction report, system description and equipment particular and the calculation process.

The vessel is designed as an ocean-going crude oil tanker driven by a single screw diesel engine, B&W 6S70ME-C8, with a bulbous bow, transom stern and a continuous deck. The accommodation including navigation bridge and engine room are located aft of the vessel, with 14 cargo tanks and one pair of slop tanks (port & starboard) and nine bulkheads, a double bottom and a double hull. The vessel's cargo capacity is approximately 180,807m<sup>3</sup>. The aft body with transom stern is used as a steering gear room, fresh water tanks and aft peak tank. Fore body with bulbous bow is used for fore peak tanks, chain lockers, void space and bosun store.

Other distinctive features of the vessel are a cargo tank pressure monitoring unit with an alarm on the bridge; a double hull construction for lube oil tanks and anemometer display / monitoring repeater with recorder in the cargo control room.

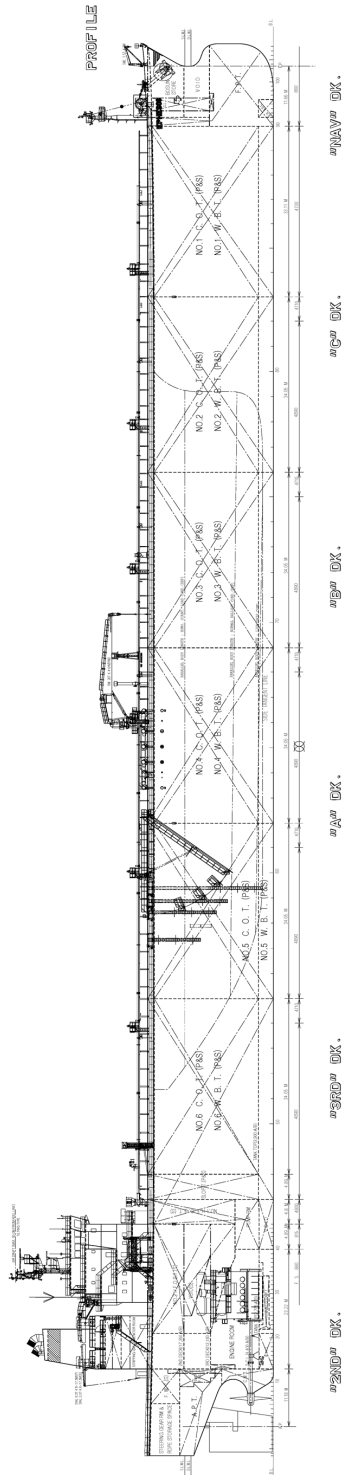
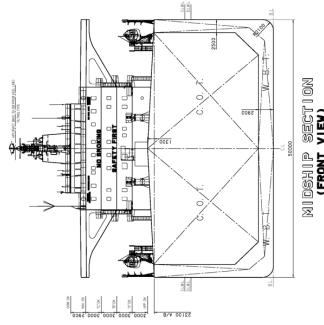
The vessel has a cargo tank Pressure monitoring unit with alarm on the bridge, an anemometer display / monitoring repeater with recorder in CCR and marking for Snap-back

zone. The ship also meets the Marine Environmental, Safety and Quality Assurance Criteria (MESQAC) for Seagoing vessels from the ExxonMobil Affiliate Service before delivery.

### TECHNICAL PARTICULARS

Length oa: ..... 274.18m  
 Length bp: ..... 264.00m  
 Breadth moulded: ..... 50.00m  
 Depth moulded  
 To main deck: ..... 23.10m  
 To upper deck: ..... 23.10m  
 Width of double skin  
 Side: ..... 2.50m  
 Bottom: ..... 2.90m  
 Draught  
 Scantling: ..... 17.15m  
 Design: ..... 16.00m  
 Gross: ..... 84,850gt  
 Displacement: ..... 191,050tonnes  
 Lightweight: ..... 26,300tonnes  
 Deadweight  
 Design: ..... 150,620dwt  
 Scantling: ..... 164,730dwt  
 Block co-efficient: ..... 0.8211  
 Speed, service: ..... 15.30knots  
 Cargo capacity: ..... 180,807m<sup>3</sup>  
 Liquid volume: ..... 177,191m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 4,321m<sup>3</sup>  
 Diesel oil: ..... 464m<sup>3</sup>  
 Water ballast: ..... 57,329m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 67.4tonnes/day  
 Classification society and notations: ..... DNV, +A1, Tanker of Oil, ESP, CSR, E0, VCS-2, TMON, BIS, BWM-E(s), SPM, COAT-PSPC(B)  
 Main engine  
 Design: ..... Hyundai B&W  
 Model: ..... 6S70ME-C8  
 Manufacturer: ..... Hyundai  
 Number: ..... 1  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 18,660kW x 91rpm  
 Propeller  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... Hyundai Heavy Industries Co., Ltd  
 Number: ..... 1  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 8.2m  
 Speed: ..... 91rpm  
 Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Hyundai/HIMSEN 5H21/32  
 Type of fuel: ..... HFO, MDO, MDO  
 Output/speed of each set: ..... 960kW x 900rpm  
 Alternator make/type: ..... HHI-EES/ cylindrical rotary filled

Output/speed of each set: ..... 900kW x 900rpm  
 Exhaust-gas scrubbing equipment  
 Manufacturer: ..... Kangrim  
 Type: ..... Forced circulating, surface extended, water tube  
 On main engine: ..... Yes  
 Boilers  
 Number: ..... 1  
 Type: ..... Automatic, forced draft, HFO, burning, marine boiler  
 Make: ..... Alfa Laval Aalborg  
 Output, each boiler: ..... 35,000kg/h x 16/6kg/cm<sub>2</sub>  
 Cargo cranes/ cargo gear  
 Number: ..... 2  
 Make: ..... Oriental Precision & Engineering Co., Ltd  
 Type: ..... Electro-hydraulic driven  
 Performance: ..... 20tonnes  
 Mooring equipment  
 Number: ..... 9  
 Make: ..... Aker Pusnes AS  
 Type: ..... Electro-hydraulic  
 Cargo tanks  
 Number: ..... 14  
 Grades of cargo carried: ..... Crude oil  
 Cargo pumps  
 Number: ..... 3  
 Type: ..... Vertical centrifugal single stage  
 Make: ..... Shinko Industry  
 Capacity: ..... 4,000m<sup>3</sup>/h x 135mTH  
 Cargo control system  
 Make: ..... Nakakita Seisakusho Co., Ltd  
 Type: ..... Remote control  
 Ballast control system  
 Make: ..... Nakakita Seisakusho Co., Ltd  
 Type: ..... Remote control  
 Complement  
 Officers: ..... 14  
 Crew: ..... 17  
 Bridge control system  
 Make: ..... HHI-EES  
 Type: ..... Self standing  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Riken Keiki  
 Fire extinguishing systems  
 Cargo holds: ..... NK/ low expansion foam/ seawater  
 Engine room: ..... Fain/ CO<sub>2</sub>  
 Cabins/public spaces: ..... Seawater  
 Radars  
 Number: ..... 2  
 Make: ..... Furuno  
 Model: ..... FAR-2837S, FAR-2827  
 Waste disposal plant  
 Incinerator: ..... Hyundai Marine/ Atlas  
 Sewage plant: ..... Hamworthy/ SD-3A  
 Contract date: ..... 9 July 2012  
 Launch/float-out date: ..... 6 January 2012  
 Delivery date: ..... 28 February 2012



#1<sup>ST</sup> DECK

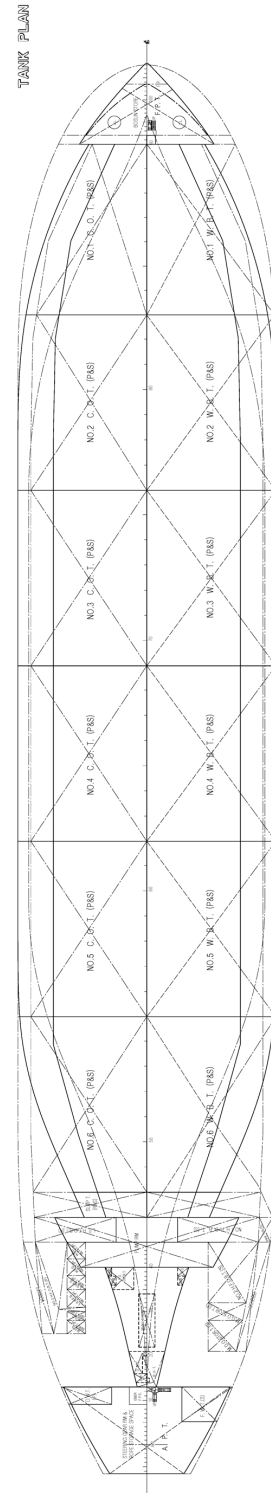
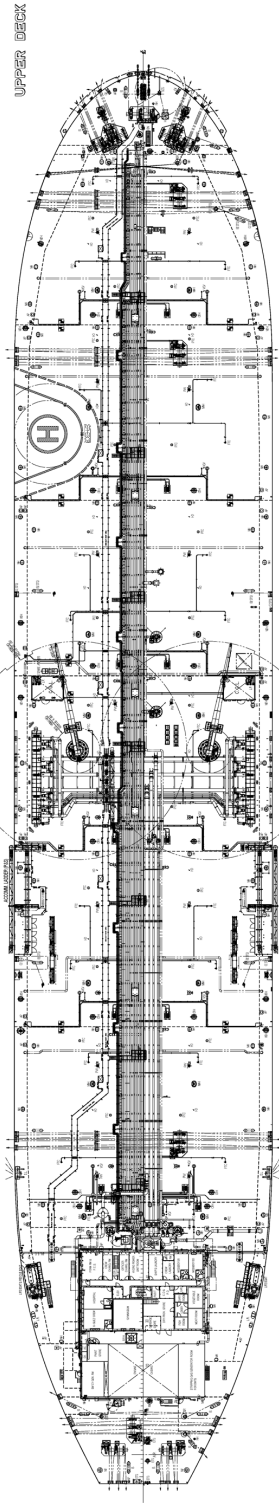
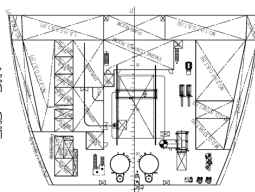
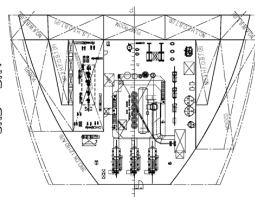
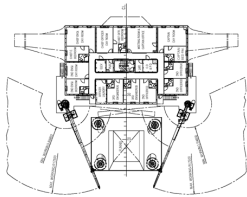
#2<sup>ND</sup> DECK

#3<sup>RD</sup> DECK

#4<sup>TH</sup> DECK

#5<sup>TH</sup> DECK

#6<sup>TH</sup> DECK







Ship represented in photo is Ever Laden, sister ship of Ever Lambert

# EVER LAMBENT: first 'L' Class for Evergreen

Shipbuilder: ..... **Samsung Heavy Industries**  
 Vessel's name: ..... **Ever Lambert**  
 Hull No: ..... **HN1980**  
 Owner/operator: ..... **Evergreen**  
 Country: ..... **Taiwan**  
 Designer: ..... **Samsung Heavy Industries**  
 Flag: ..... **UK**  
 IMO number: ..... **9595436**  
 Total number of sister ships already completed (excluding ship presented): ..... **5**  
 Total number of sister ships still on order: ..... **20**

*EVER Lambert* is the first L-type containership in the Evergreen Line fleet, constructed at Samsung Heavy Industries shipyard and delivered in July. *Ever Lambert* heralds the delivery of 30 new containerships from the Taiwanese shipper, which have a slot capacity of 8,500 TEU and will join the Far East - Europe route.

The vessel will be deployed on the CEM service that is operated jointly with the Korean shipping company Hanjin, which is comprised of 10 vessels of between 8,500 and 10,000TEU.

Evergreen Group's previous shipbuilding programme was concluded with the delivery of the S-type *Ever Salute* in January 2008. For fleet expansion and renovation, Evergreen Group commenced a new shipbuilding project in 2010 and ordered 20 L-type vessels from Samsung Heavy Industries, to be delivered by 2014. In 2011, Evergreen placed an order for another 10 vessels of the same specifications with Taiwan Shipbuilding Corp., to be delivered from 2013 to 2015.

In addition to the environmentally friendly features of S-series fleet, the L-type vessels are manufactured using high-tensile steel with an optimised hull form and minimum ballast water to save on fuel consumption and cut carbon emissions. The ships are to be equipped with an electronically-controlled fuel injection engine, enabling energy-efficient navigation for slow steaming.

## TECHNICAL PARTICULARS

Length oa: ..... 335m  
 Length bp: ..... 317m

Breadth moulded: ..... 45.8m  
 Depth moulded  
 To upper deck: ..... 25m  
 Width of double skin  
 Side: ..... 14.2m  
 Design: ..... 13.5m  
 Draught  
 Scantling: ..... 14.2m  
 Design: ..... 13.5m  
 Gross: ..... 97,500gt  
 Deadweight  
 Design: ..... 95,800dwt  
 Scantling: ..... 104,400dwt  
 Speed, service: ..... 24.7knots  
 Bunkers  
 Heavy oil: ..... 10,500m<sup>3</sup>  
 Diesel oil: ..... 700m<sup>3</sup>  
 Water ballast: ..... 40,000m<sup>3</sup>  
 Classification society and notations: ..... LR \* 100A1, Container Ship, ShipRight (SDA, FDA Plus (25, NA), CM, ACS (B)), \*IWS, LI, EP, \*LMC, UMS  
 Main engine  
 Design: ..... MAN Diesel & Turbo  
 Model: ..... 9K98ME7  
 Manufacturer: ..... Hyundai Heavy Industries  
 Number: ..... 1  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 56,070kW  
 Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... Samsung Heavy Industries/ Nakashima  
 Number: ..... 1  
 Fixed/controllable pitch: ..... Fixed  
 Special adaptations: ..... Tip Rake Design  
 Diesel-driven alternators  
 Number: ..... 4  
 Engine make/type: ..... Doosan-MAN/ 7L32/40  
 Type of fuel: ..... HFO, MDO  
 Output/speed of each set: ..... 3,500kW x 720rpm  
 Alternator make/type: ..... Nishishiba  
 Output/speed of each set: ..... 3,200kW x 720rpm  
 Boilers  
 Number: ..... 1  
 Type: ..... Oil fired

Make: ..... Kangrim  
 Output, each boiler: ..... 5tonnes/h x 7kg/cm<sub>2</sub>  
 Mooring equipment  
 Number: ..... 4  
 Make: ..... Manabe  
 Type: ..... Electric  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2  
 Make: ..... Hyundai  
 Type: ..... Totally enclosed, davit launching type  
 Hatch covers  
 Manufacturer: ..... Samsung Heavy Industries  
 Type: ..... Steel pontoon  
 Water ballast treatment system  
 Make: ..... Optimarin  
 Capacity: ..... 1,000m<sup>3</sup>/h  
 Complement  
 Officers: ..... 18  
 Crew: ..... 12  
 Bow thruster  
 Make: ..... KTE  
 Number: ..... 1  
 Output: ..... 3,000kW  
 Bridge control system  
 Make: ..... Kongsberg  
 Type: ..... Autochief C20  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... NK Fire Protection  
 Fire detection systems  
 Cargo holds: ..... NK/ CO<sub>2</sub>  
 Engine room: ..... NK/CO<sub>2</sub>  
 Cabins/public spaces: ..... Seawater  
 Radars  
 Number: ..... 2  
 Make: ..... Tokyo Keiki  
 Model: ..... BR-3200  
 Integrated bridge system  
 Make: ..... Samsung/Terasaki  
 Waste disposal plant  
 Incinerator: ..... Hyundai-Atlas/ MAXI 1200  
 Sewage plant: ..... Evac/ MBR 16C  
 Contract date: ..... 2 July 2010  
 Launch/float-out date: ..... 21 April 2012  
 Delivery date: ..... 25 July 2012







# FERRY NAMINOUE: 8,000gt passenger ferry with MALS

Shipbuilder: ..... **Mitsubishi Heavy Industries**  
 Vessel's name: ..... **Ferry Naminoue**  
 Owner/operator: ..... **A Line Ferry Co., Ltd**  
 Country: ..... **Japan**  
 Designer: ..... **Mitsubishi Heavy Industries, Ltd.**  
 Country: ..... **Japan**  
 Model test establishment used: .. **MHI Nagasaki R&D Centre, Japan**  
 Flag: ..... **JAPAN (Amami)**  
 IMO number: ..... **9608348**  
 Total number of sister ship already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **nil**

**F**ERRY *Naminoue* is an 8,000gt-class cargo and passenger ferry which is owned by the Japan Railway Construction, Transport and Technology Agency and A Line Ferry Co., Ltd. The vessel was designed and built at the Shimonoseki Shipyard & Machinery Works of Mitsubishi Heavy Industries, Ltd. (MHI), and delivered to the owners on 19 September. The vessel serves a domestic route between Kagoshima and Okinawa.

A distinguishing feature of this vessel is that MHI has installed its "Mitsubishi Air Lubrication System" (MALS) for the first time on a ferry - a ship with a slender hull form. A slender hull-form ship refers to a ship with relatively low block coefficient (Cb) of around 0.5.

The MALS is MHI's proprietary technology that reduces frictional resistance between the ship hull and seawater by introducing a layer of air bubbles blown from the ship's bottom. The verification experiment was conducted at sea using *Ferry Naminoue*. The experiment's results have verified that MALS is also applicable to high-speed, slender ships as an effective way to reduce fuel consumption and reduce environmental burdens, further extending the range of ship types for which MALS is suited.

During the speed trial test at sea, fuel consumption improvement (reduction in propulsion power required) exceeding 5% was confirmed even with waves as high as 2.5-3m. The level in the reduction of fuel consumption suffices to offset the fuel consumption increase due to the air bubble generator and complies with tightened controls on NOx emissions. As the air bubbles function as a cushion, noise and vibration are also reduced, enabling improvements in passenger comfort.

MHI will continue to monitor the operational conditions of *Ferry Naminoue* and verify MALS' effectiveness in both energy saving and CO<sub>2</sub> reduction. The verification experiment using *Ferry Naminoue* was supported by ClassNK as a joint research project.

*Ferry Naminoue* is powered by a single screw, two-engine propulsion system. This propulsion system also keeps the redundancy against main engine failure.

Vehicles are loaded onto the internal cargo space, while a two-tier loading of 10ft containers is achieved on the

forward exposed deck. The containers can also be loaded onto the internal cargo space with folk lift.

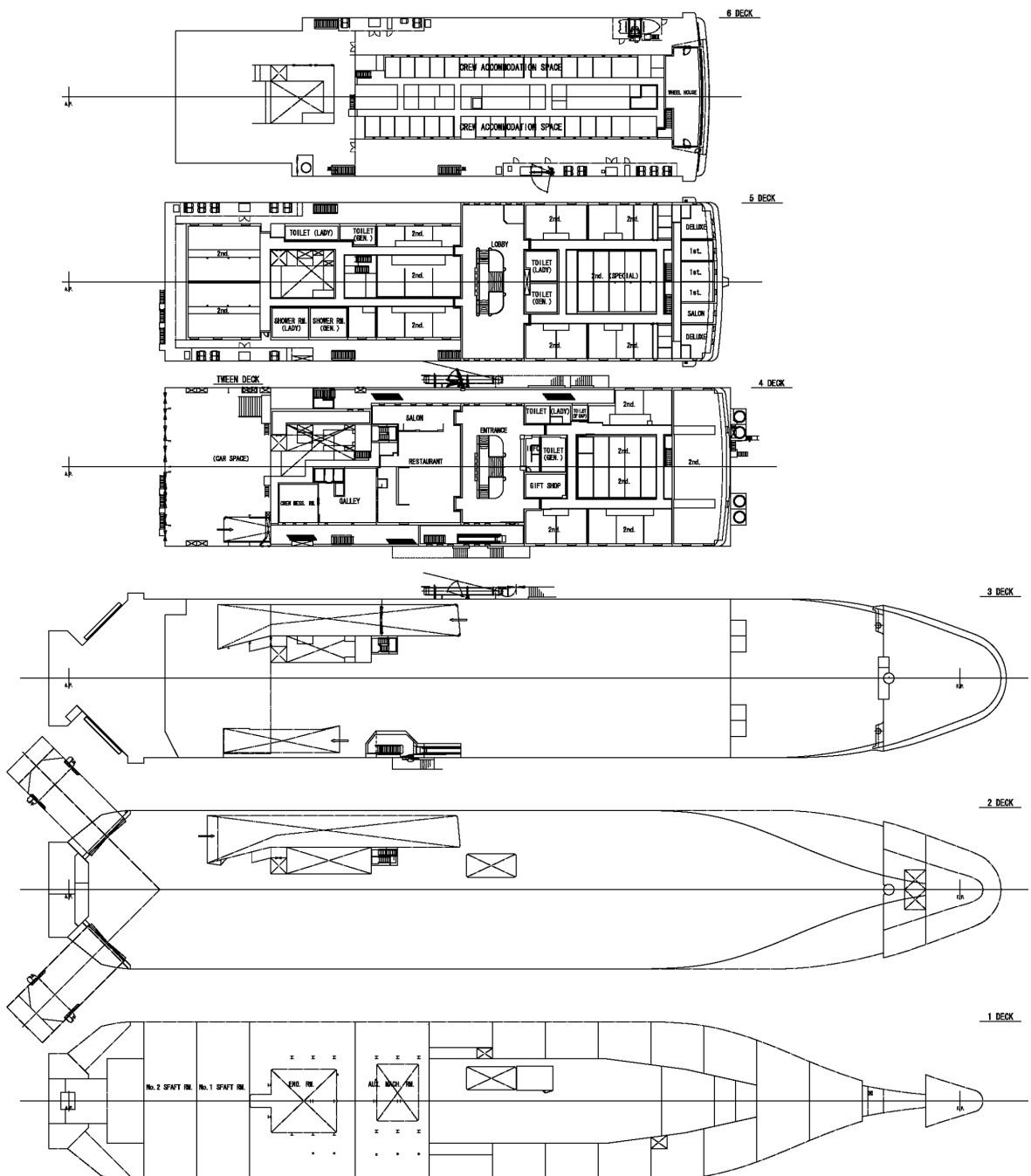
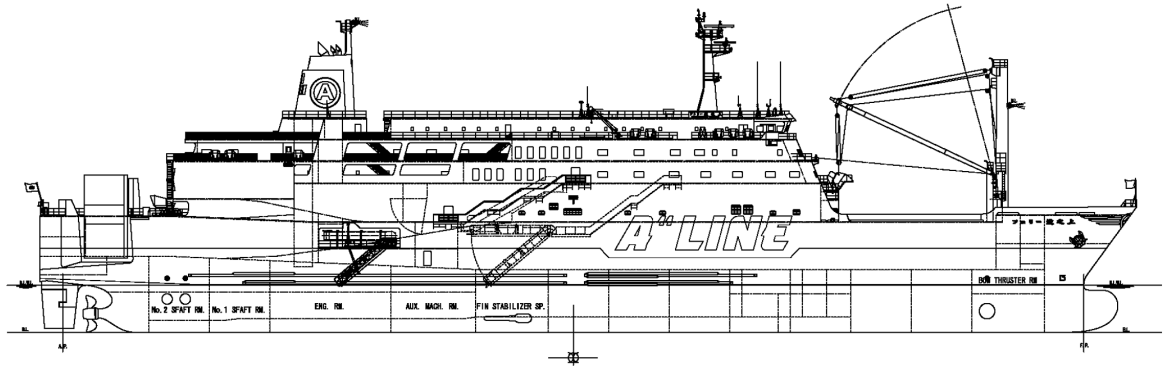
There are four types of passenger cabins, including a Japanese-style cabin and one for passengers with disabilities. All public and barrier-free facilities are on Deck 4 with the entrance, restaurant, salon, gift shop and external promenade deck, so that passengers have access to those facilities from their cabins.

## TECHNICAL PARTICULARS

Length oa: ..... 145.00m  
 Length bp: ..... 135.00m  
 Breadth moulded: ..... 24.00m  
 Depth moulded  
 To main deck: ..... 8.25m  
 To upper deck: ..... 14.50m  
 Draught  
 Scantling: ..... 6.25m  
 Design: ..... 6.20m  
 Gross: ..... 8,072gt  
 Deadweight  
 Design: ..... 3,711dwt  
 Scantling: ..... 3,833dwt  
 Speed service: ..... 21knots  
 Bunkers  
 Heavy oil: ..... 544.7m<sup>3</sup>  
 Diesel oil: ..... 148.9m<sup>3</sup>  
 Water ballast: ..... 2,394m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 52.6tonnes/day  
 Main engine  
 Design: ..... S.E.M.T - Pielstick  
 Model: ..... 12PC2-6V  
 Manufacturer: ..... JFE Engineering Corporation  
 Number: ..... 2  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 6,070kW  
 Gearboxes  
 Make: ..... Hitachi Nico Transmission Co., Ltd  
 Model: ..... MMGRP32043-91  
 Number: ..... 1  
 Propeller  
 Material: ..... CAC703  
 Designer/manufacturer: ..... Nakashima Propeller Co., Ltd  
 Number: ..... 1  
 Fixed/controllable pitch: ..... Controllable  
 Diameter: ..... 4.8m  
 Main-engine alternators  
 Number: ..... 1  
 Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Yanmar/ 6N21AL-EW  
 Type of fuel used: ..... HFO, MDO  
 Output/speed of each set: ..... 900rpm  
 Boilers  
 Number: ..... 1  
 Type: ..... HB-025

Make: ..... Muira Kogyo Co., Ltd  
 Output, each boiler: ..... 2,000kg/h  
 Cargo cranes/ cargo gear  
 Number: ..... 1  
 Make: ..... Teramoto Co., Ltd  
 Type: ..... K-7  
 Mooring equipment  
 Number: ..... 2 x mooring winch, 1 x windlass  
 Make: ..... Manabe Zoki Co., Ltd  
 Type: ..... Electric-hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... MES-4  
 Make: ..... Fujikura Rubber Ltd.  
 Type: ..... FSMES-200 N  
 Vertical or sloping chutes: ..... vertical  
 Containers  
 Total TEU capacity: ..... 312  
 On deck: ..... 56  
 In holds: ..... 256  
 Vehicles  
 Number of vehicle decks: ..... 3 fixed  
 Total cars: ..... 72  
 Total freight: ..... 48  
 Doors/ramps/lift/movable car decks  
 Number of each: ..... 1 x ramp door, 4 x ramp, 1 x lift  
 Designer: ..... Shimonoseki Ryoju Engineering Co., Ltd  
 Ballast control system  
 Make: ..... NYK Trading Corporation  
 Complement  
 Officers: ..... 10  
 Crew: ..... 15  
 Passengers  
 Total: ..... 707  
 Number of cabins: ..... 47  
 Bow thruster  
 Make: ..... Nakashima Propeller Co., Ltd  
 Number: ..... 1  
 Stern thrusters  
 Make: ..... Nakashima Propeller Co., Ltd  
 Number: ..... 2  
 Bridge control system  
 Make: ..... Nabtesco  
 Type: ..... electric  
 Fire detection system  
 Make: ..... Nippon Hakuyo Electronics  
 Type: ..... Smoke detector type & Temperature type  
 Fire extinguishing systems  
 Cargo holds: ..... Nohmi Bosai Ltd/sprinker  
 Engine room: ..... Air Water Safety Service/ CO<sub>2</sub>  
 Vehicle spaces: ..... Nohmi Bosai Ltd/ fixed  
 Cabins & public spaces: ..... Yamato Protec/ Portable  
 Radars  
 Number: ..... 2  
 Make: ..... JRC  
 Models: ..... JMA-5332-12, JMA-9122-9XA  
 Contract date: ..... 20 June 2011  
 Launch/float-out date: ..... 27 March 2012  
 Delivery date: ..... 19 September 2012

# FERRY NAMINOUE







# FS DILIGENCE: Japanese Aframax tanker

Shipbuilder: ..... **Namura Shipbuilding Co., Ltd**  
 Vessel's name: ..... **FS Diligence**  
 Hull No: ..... **324**  
 Owner/operator: ..... **J&K Shipping Company Limited**  
 Country: ..... **Hong Kong**  
 Designer: ..... **Namura Shipbuilding Co., Ltd**  
 Country: ..... **Japan**  
 Flag: ..... **Hong Kong**  
 IMO number: ..... **9532161**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **nil**

## TECHNICAL PARTICULARS

Length oa: ..... 249.97m  
 Length bp: ..... 241.00m  
 Breadth moulded: ..... 44.00m  
 Depth moulded  
 To upper deck: ..... 21.20m  
 Width of double skin  
 Side: ..... 2.20m  
 Bottom: ..... 2.51m  
 Draught  
 Scantling: ..... 14.80m  
 Design: ..... 12.91m  
 Gross: ..... 63,058gt  
 Deadweight  
 Design: ..... 89,652dwt  
 Scantling: ..... 115,656dwt  
 Speed, service: ..... 15.2knots  
 Cargo capacity  
 Liquid volume: ..... 133,033.1m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 3,277.3m<sup>3</sup>  
 Diesel oil: ..... 370.4m<sup>3</sup>  
 Water ballast: ..... 41,981m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 51.7tonnes/day  
 Auxiliaries: ..... 2.32tonnes/day  
 Classification society and notations: ..... ABS +A1 Oil Carrier, (E), CSR, AB-CM, ESP +AMS, +ACCU, VEC, UWIND, TCM, RW, CPP  
 Main engine  
 Model: ..... 1 x MAN B&W 6S60MC-C  
 Manufacturer: Mitsui Engineering & Shipbuilding Co., Ltd  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 13,560kW x 105rpm  
 Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ... Nakashima Propeller Co., Ltd  
 Number: ..... 1  
 Diameter: ..... 7m  
 Speed: ..... 105rpm  
 Diesel-driven alternators  
 Engine make/type: ..... 3 x Yanmar Co., Ltd/ 6EY18AL  
 Type of fuel: ..... HFO, MDO  
 Output/speed of each set: ..... 660kW x 900rpm  
 Alternator make/type: .. Taiyo Electric Co., Ltd/ FE 547A-8  
 Output/speed of each set: ..... 660kW x 900rpm  
 Boilers  
 Type: ..... 1 x MAC-45B  
 Make: ..... Mitsubishi Heavy Industries Ltd  
 Output, each boiler: ..... 45,000kg/h x 1.57MPa x Saturated Temp  
 Cargo cranes/cargo gear  
 Make: ..... 1 x Kyoritsu Kikai Co., Ltd  
 Type: ..... Electro-hydraulic driven jib type

Performance: ..... 15tonnes x 27m  
 Other cranes  
 Make: ..... 1 x Sekigahara Seisakusyo Ltd  
 Type: ..... Electric driven jib type  
 Performance: ..... 3.5tonnes x 11.4m  
 Mooring equipment  
 Number: ..... 7  
 Make: ..... Kawasaki Heavy Industries Ltd  
 Type: ..... Electro-hydraulic driven type  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 x 25 persons  
 Make: ..... Shigi Shipbuilding Co., Ltd  
 Type: ..... Enclosed FRP fire protected lifeboat  
 Cargo tanks  
 Number: ..... 14  
 Grade of cargo carried: ..... 3  
 Product range: ..... Product oil  
 Coated tanks: ..... Pure Epoxy paint  
 Cargo pumps  
 Number: ..... 3  
 Type: ..... KV450-3  
 Make: ..... Shinko Ind., Ltd  
 Stainless steel: ..... Impeller Shaft  
 Capacity: ..... 3,000m<sup>3</sup>/h x 135m  
 Cargo control systems  
 Make: ..... Nakakita Seisakusho Co., Ltd  
 Type: ..... Remote controlled hydraulic oil system  
 Ballast control system  
 Make: ..... Nakakita Seisakusho Co., Ltd  
 Type: ..... Remote controlled hydraulic oil system  
 Complement  
 Officers: ..... 9  
 Crew: ..... 15  
 Stern appendages/special rudders: ..... Namura control fin  
 Bridge control system  
 Make: ..... Mitsui Engineering & Shipbuilding Co., Ltd  
 Type: ..... BMS-2000 III  
 Fire detection system  
 Make: ..... Nippon Hakuyo Electronics., Ltd  
 Type: ..... FF-3062  
 Fire extinguishing systems  
 Cargo holds/Engine room: ..... Foam type  
 Cabins/public spaces: ..... Portable fire extinguisher  
 Radars  
 Make: ..... 3 x Furuno Electric Co., Ltd  
 Model: ..... FAR-2837S, FAR-2827, FAR-2817  
 Waste disposal plant  
 Incinerator: ..... Sunflame Co., Ltd/ OSV 600SAI  
 Waste shredder/crusher: .. Sanwa Churi Industry Co., Ltd/ Disposer SD-15BS  
 Sewage plant: ..... Evac Oy/ Evac MBR 16  
 Delivery date: ..... 18 January 2012

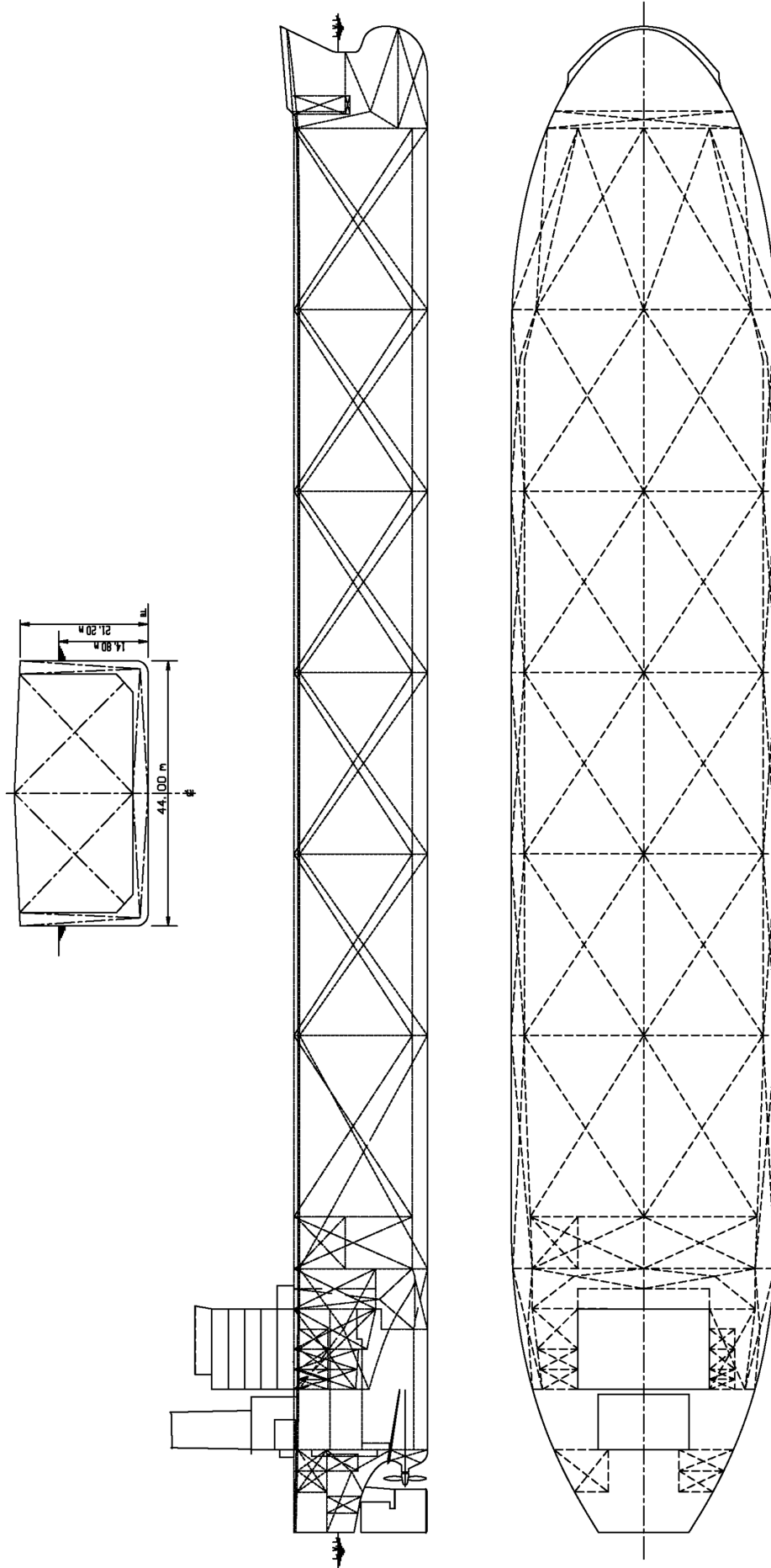
**N**AMURA Shipbuilding Co., Ltd delivered the 115,586dwt product oil carrier *FS Diligence* to Samosa Shipping Company Limited at its Imari Shipyard & Works at the beginning of 2012. The second vessel in the series *FS Endeavor* was delivered in June.

This is the first vessel of a design of an 115,000dwt type product oil carrier which has been developed as a new generation double hull Aframax tanker series. Namura has drastically reviewed and modified the specifications by improving the existing 105,000dwt type product oil carriers. In addition *FS Diligence* has also been fitted with a Namura flow control fin (NCF) that Namura says will enhance its energy saving capacity. The hull construction is designed and constructed in accordance with the common structural rules (CSRs).

The vessel has three sets of cargo pumps with a self-stripping system and can load three different grades of cargoes. The Shinko cargo pumps that are automatically operated, which gives *FS Diligence* better efficiency when unloading cargo. A cargo oil tank level gauge is fitted that increases the measurement accuracy of the tank liquid level.

A pure epoxy coating has been applied to the cargo oil tanks and piping in order to prevent rust contaminating the cargo as the vessel gets older. The vapour emission control system (VECS) has also been applied in compliance with USGC.CFR 46 Part 39 regulation. The vessel is also fitted with radar type tank level gauges in the cargo oil tanks, slop tanks and residual slop tanks.

*FS Diligence* main engine generator engines conform to the Tier 1 NOx emission regulations from the International Convention for the Prevention of Marine Pollution Convention (MARPOL). The vessel is powered by a MAN B&W 6S60MC-C that has a power output of 13,560kW x 105rpm giving the vessel a service speed of 15.2knots.







# HAMBURG EXPRESS: first in new class for Hapag-Lloyd

Shipbuilder: ..... **Hyundai Heavy Industries**  
 Vessel's name: ..... **Hamburg Express**  
 Hull No: ..... **2241**  
 Owner/operator: ..... **Hapag-Lloyd**  
 Country: ..... **Germany**  
 Designer: ..... **Hyundai Heavy Industries**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **HMRI**  
 Flag: ..... **Liberia**  
 IMO number: ..... **9461051**  
 Total number of sister ships already completed (excluding ship presented): ..... **2**  
 Total number of sister ships still on order: ..... **7**

**H**AMBURG Express is the first in a series of 10 of a new class of 13,200TEU container ships for German-based Hapag Lloyd. The vessel which was constructed at Hyundai Heavy Industries was delivered in July.

All 10 newbuilds will sail under the German flag with the next two vessels from the series were delivered to Hapag-Lloyd in late September and mid-November, respectively, and will also be deployed on Loop 4 of the Asia/Europe trade. The remaining seven ships are due for delivery in 2013. Hapag-Lloyd claims that it can return more expensive charter ships and adjust its fleet capacities flexibly in line with market demand.

The 10 vessels in the "Hamburg Express" class will set the highest environmental standards and achieve particularly low figures for fuel consumption and emissions due to the innovative on-board technology, Hapag-Lloyd claims. The main innovation in terms of environmental protection on board is the equipment for ballast water treatment manufactured by the Hamburg-based firm Mahle Industrie-filtr. The system uses filtration and UV light treatment to prevent organisms in the tanks from escaping unintentionally into foreign ecosystems.

Hamburg Express is propelled by one Hyundai-B&W 11K98ME7 electrically controlled engine with MCR of 58,274 kW at 91.8 rpm enabling it to sail at a service speed of 23.6knots at design draft when running at 90% MCR with 15% sea margin burning less fuel of around 214.4 tons per day. The main engine has been optimised with low load tuning by an exhaust by-pass system for the turbocharger for the improvement of fuel consumption at practical operation condition. The pulse width modulator (PWM) type shaft generator is fitted to cover the maximum 4,500kW at sea, contributing reduction of CO<sub>2</sub> emission. A full spade rudder with twisted leading edge is provided for removing rudder erosion and for increase of speed performance.

Hamburg Express is arranged in a two islands concept with the separated location of accommodation from the engine room for crew comfort and optimum ballast tank arrangement to minimise the ballast amount at various loading conditions. The fuel oil tanks are constructed in a double hull structure to protect the fuel oil tanks from external damages.

A ring net distribution system for reefer containers has also been applied for extra safety. The vessel is also fitted with a smoke tube type horizontal composite boiler (Capacity: 7,000kg/h x 7kg/cm<sup>2</sup> for oil fired / 2,900kg/h x 7kg/cm<sup>2</sup> for exh. gas at 50% of MCR). The main engine hydraulic oil system and turbocharger system are separated

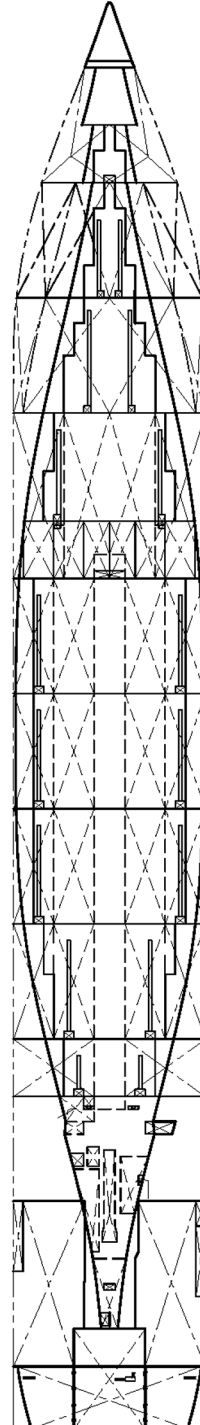
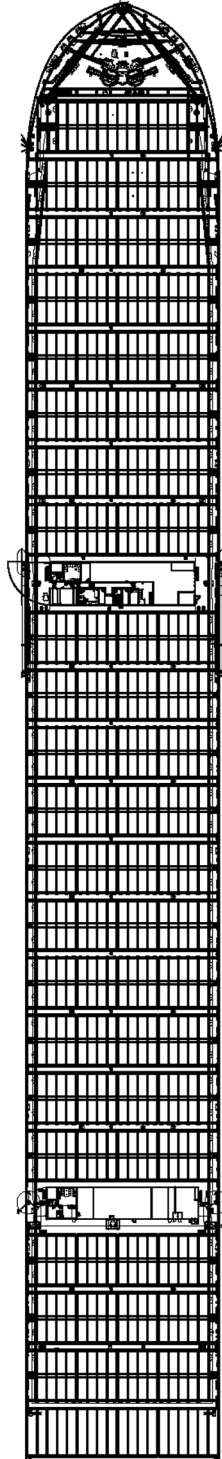
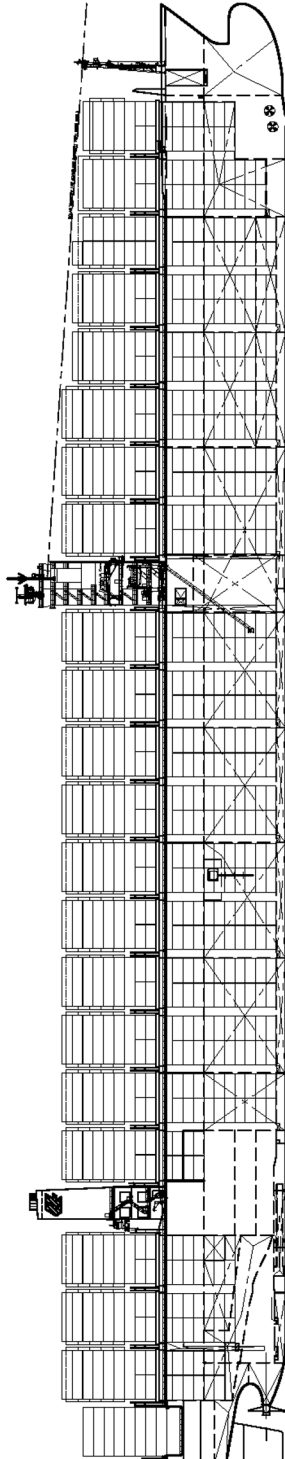
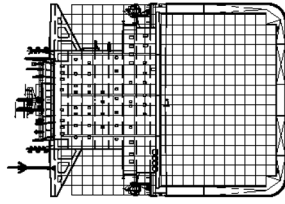
to give better longevity of the components by prevention from oil contamination.

Hamburg Express is classed by Germanischer Lloyd, CONTAINER SHIP, DG, +MC, AUT, RSD, EP, NAV-O, IW, BWM.

## TECHNICAL PARTICULARS

Length oa: ..... 366.45m  
 Length bp: ..... 350.00m  
 Breadth moulded: ..... 48.2m  
 Depth moulded  
 To main deck: ..... 29.85m  
 Width of double skin  
 Side: ..... 2.4m  
 Bottom: ..... 2.3m  
 Draught  
 Scantling: ..... 15.5m  
 Design: ..... 14.5m  
 Gross: ..... 142,295gt  
 Deadweight  
 Design: ..... 142,092dwt  
 Scantling: ..... 127,170dwt  
 Speed, service: ..... 23.6knots  
 Bunkers  
 Heavy oil: ..... 12,785m<sup>3</sup>  
 Diesel oil: ..... 644m<sup>3</sup>  
 Water ballast: ..... 34,519m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 214.4tonnes/day  
 Auxiliaries: ..... 22.1tonnes/day  
 Classification society and notations: ..... GL + 100A5, Container Ship, DG, +MC, AUT, RSD, EP, NAV-O, IW, BWM(D2)  
 Main engine  
 Design: ..... 2-stroke  
 Model: ..... 11K98ME7  
 Manufacturer: ..... Hyundai  
 Type of fuel: ..... HFO, MDO, MGO  
 Output of each engine: ..... 58,274kW  
 Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... Hyundai  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 9m  
 Main-engine driven alternator  
 Make/type: ..... SAM Electronics  
 Output/speed of each set: ..... 4,500kW x 65-95rpm  
 Diesel-driven alternators  
 Engine make/type: ..... Daihatsu/ 8DC-32, 6DC-32  
 Type of fuel: ..... MDO, MGO  
 Output/speed of each set: ..... 3 x 3,844kW, 1 x 2,905kW x 720rpm  
 Alternator make/type: ..... Hyundai/ HSJ7 811-10P, HSJ7 801-10P  
 Output/speed of each set: ..... 3 x 3,650kW, 1 x 2,750kW x 720rpm  
 Boilers  
 Type: ..... Horizontal composite boilers  
 Make: ..... Saake  
 Output, each boiler: ..... 7,000kg/h exhaust gas section: 2,900kg/h

Provision cranes  
 Make: ..... DMC  
 Type: ..... Single jib, electro-hydraulic  
 Performance: ..... SWL 4tonnes x 4m  
 Other cranes  
 Make: ..... Fuchs  
 Type: ..... Monorail hoist  
 Tasks: ..... Spare parts in engine room and handling precision  
 Performance: ..... SWL 12.5tonnes x 7.5m  
 Mooring equipment  
 Number: ..... 2 x combined windlass/mooring winch, 8 x mooring winch  
 Make: ..... Pusnes  
 Type: ..... Conventional lifeboat  
 Hatch covers  
 Design: ..... Cargotec  
 Manufacturer: ..... Hyundai  
 Type: ..... Steel pontoon type on upper deck  
 Containers  
 Lengths: ..... 6,058mm  
 Heights: ..... 2,591mm  
 Cell guides: ..... High/low entry system with protection bar  
 Total TEU capacity: ..... 13,169TEU  
 On deck: ..... 7,105TEU  
 In holds: ..... 6,064TEU  
 Homogeneously loaded to 14tonnes: ..... 9,074TEU  
 Reefer plugs: ..... 800FEU  
 Tiers/rows  
 On deck: ..... 9/19  
 In holds: ..... 11/17  
 Ballast control system  
 Make: ..... Pleiger Far East  
 Type: ..... Electro-hydraulic  
 Water ballast treatment system  
 Make: ..... Mahle  
 Capacity: ..... 2 x 1,500m<sup>3</sup>/h  
 Bow thrusters  
 Make: ..... Kawasaki  
 Output: ..... 1,800kW  
 Bridge control system  
 Make/Type: ..... SAM Electronics/PCS 2200  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salwico  
 Fire extinguishing systems  
 Cargo holds/engine room: ..... NK/CO<sub>2</sub>  
 Cabins/public spaces: ..... NK/ seawater hydrant  
 Radars  
 Make: ..... Furuno  
 Models: ..... FAR-2827, FAR 2837S  
 Integrated bridge system  
 Make: ..... Furuno  
 Model: ..... FEA-2807  
 Waste disposal plant  
 Sewage plant: ..... Hamworthy  
 Contract date: ..... 13 December 2010  
 Launch/float-out date: ..... 6 April 2012  
 Delivery date: ..... 5 July 2012







# HYUNDAI TOGETHER: 13,000TEU containership

Shipbuilder: ..... **Hyundai Samho Heavy Industries Co., Ltd**  
**Hyundai Together**  
 Vessel's name: ..... **S456**  
 Hull No: .....  
 Owner/operator: ..... **Danaos Shipping Co., Ltd**  
**Hyundai Merchant Marine Co., Ltd**  
 Country: ..... **Greece**  
 Designer: ..... **Hyundai Samho Heavy Industries Co., Ltd**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **Hyundai Maritime Research Institute**  
 Flag: ..... **Liberia**  
 IMO number: ..... **9473731**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ship still on order: ..... **4**

Breadth moulded: ..... 48.20m  
 Depth moulded  
 To main deck: ..... 29.85m  
 To upper deck: ..... 29.85m  
 Width of double skin  
 Side: ..... 48.20m  
 Bottom: ..... 2.30m  
 Draught  
 Scantling: ..... 15.50m  
 Design: ..... 14.50m  
 Gross: 59,000gt  
 Displacement: ..... 184,000tonnes  
 Deadweight  
 Design: ..... 126,000dwt  
 Scantling: ..... 141,000dwt  
 Block co-efficient: ..... 0.68  
 Speed, service: ..... 24.70knots  
 Bunkers  
 Heavy oil: ..... 12,500m<sup>3</sup>  
 Diesel oil: ..... 700m<sup>3</sup>  
 Water ballast: ..... 36,000m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 270tonnes/day  
 Auxiliaries: ..... 5.5tonnes/day  
 Classification society and notations: ..... GL + 100A5,  
 Container Ship, SOLAS II-2 Reg.19,  
 +MC, AUT, IW, RSD, STAR, ERS, BWM  
 Main engine  
 Design: ..... B&W  
 Model: ..... 12K98ME-C7  
 Manufacturer: ..... Hyundai  
 Number: ..... 1  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 72,240kW x 104rpm  
 Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... Hyundai Heavy Industries Co., Ltd  
 Number: ..... 1  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 8.8m  
 Speed: ..... 104rpm  
 Diesel-driven alternators  
 Number: ..... 5  
 Engine make/type: ..... Hyundai/Himsen 8H32/40  
 Type of fuel: ..... HFO, MDO, MGO  
 Output/speed of each set: ..... 2,870kW x 720rpm  
 Alternator make/type: ..... Hyundai HSJ7 805-16E,  
 HSJ7 811-16E  
 Output/speed of each set: ..... 2,700kW x 720rpm  
 Exhaust-gas scrubbing equipment  
 Manufacturer: ..... Kangrim  
 Type: ..... Forced  
 On main engine: ..... Yes  
 Boilers  
 Number: ..... 1  
 Type: ..... Fully automatic, forced draft, HFO burning  
 Make: ..... Kangrim  
 Output, each boiler: ..... 5,500kg/h x 6kg/cm<sup>2</sup>  
 Cargo cranes/cargo gear  
 Number: ..... 2  
 Make: ..... Oriental Precision Engineering

Type: ..... Electro-hydraulic driven  
 Performance: ..... 4tonnes  
 Other cranes  
 Number: ..... 1  
 Make: ..... Dongham Marine Crane Co., Ltd  
 Type: ..... Electric motor driven  
 Tasks: ..... Maintenance  
 Performance: ..... 12.5tonnes  
 Mooring equipment  
 Number: ..... 10  
 Make: ..... Towmor  
 Type: ..... Electro-hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 x 28persons  
 Make: ..... Hyundai lifeboats  
 Type: ..... Hinged gravity type  
 Hatch covers  
 Design: ..... Seohae Marine System  
 Manufacturer: ..... Hyundai Samho Heavy Industries Co., Ltd  
 Type: ..... Pontoon  
 Containers  
 Lengths: ..... 6.058mm  
 Height: ..... 2.591mm  
 Total TEU capacity: ..... 13,082TEU  
 On deck: ..... 7,074TEU  
 In holds: ..... 6,008TEU  
 Homogenously loaded to 14tonnes: ..... 8,927TEU  
 Reefer plugs: ..... 800FEU  
 Tiers/rows  
 On deck: ..... 9/19  
 In holds: ..... 11/17  
 Ballast control system  
 Make: ..... Shinshin-Hamworthy  
 Type: ..... Remote control type  
 Complement  
 Officers: ..... 12  
 Crew: ..... 16  
 Stern appendages/special rudders: ..... Semi-spade type  
 Bow thruster  
 Make: ..... Hyundai Heavy Industries Co., Ltd  
 Number: ..... 2  
 Output: ..... 1,800kW  
 Bridge control system  
 Make: ..... Hyundai Heavy Industries Co., Ltd  
 Type: ..... Self Standing  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Consilium Marine AB  
 Type: ..... CS4000  
 Fire extinguishing systems  
 Cargo holds/engine room: ..... NK/ CO<sub>2</sub>  
 Cabins/ public spaces: ..... Seawater  
 Radars  
 Number: ..... 2  
 Make: ..... Furuno  
 Model: ..... FAR-2837S, FAR-2827W  
 Waste disposal plant  
 Incinerator: ..... Kangrim  
 Sewage plant: ..... Jonghaph Machinery  
 Contract date: ..... 29 September 2007  
 Launch/float-out date: ..... 20 November 2011  
 Delivery date: ..... 16 February 2012

**HYUNDAI Together** is the first of a series of five 13,100 container vessels built at Hyundai Samho Heavy Industries, delivered to Danaos Corporation in February, and chartered to Hyundai Merchant Marine for 12 years. The following four vessels on order were also delivered in 2012.

The last of these series, *Hyundai Ambition*, which was delivered at the end of 2012 was awarded the "Ship of the Year" at the annually held Lloyd's List Greek Shipping Awards. The main feature of these five vessels is that they are the largest cellular containerships ever built and controlled by Greek interests.

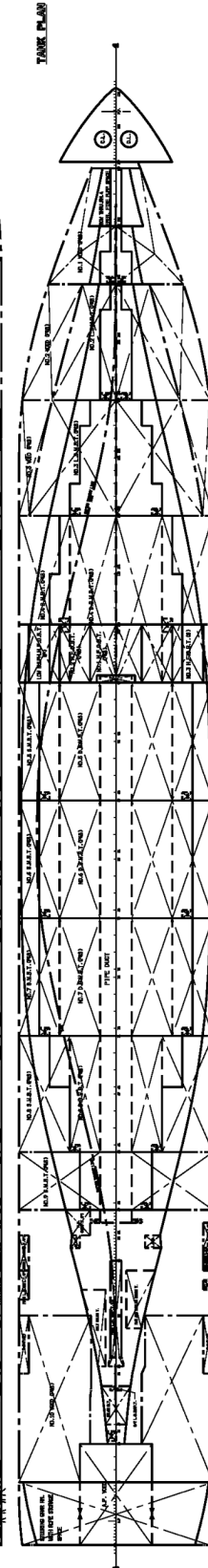
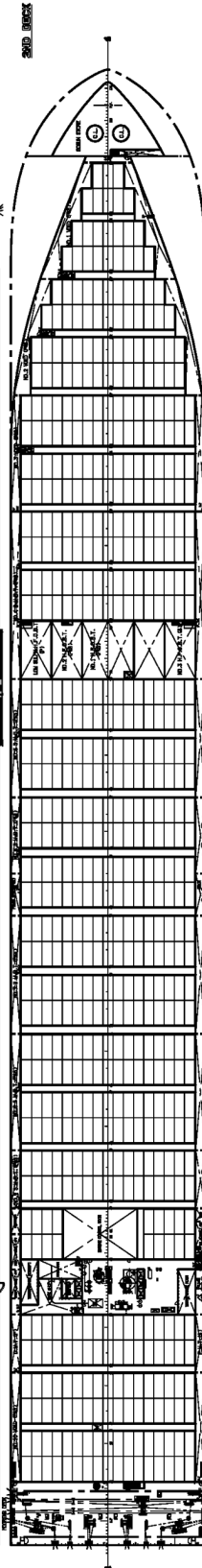
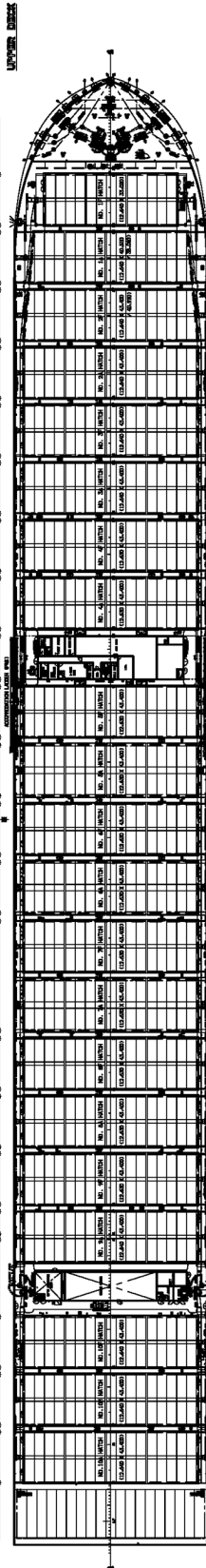
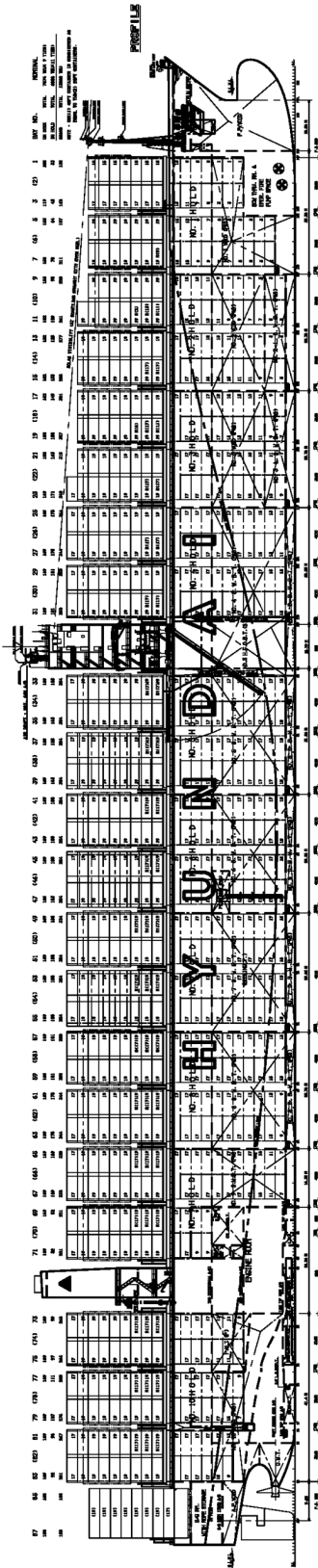
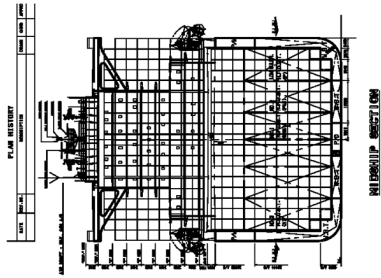
*Hyundai Together* has been designed as an ocean going ship with a single screw directly driven by a marine diesel engine. The vessel has a bulbous bow, open-water type stern and a continuous deck with aft sunken deck. With these five vessels Danaos is increasing its container fleet as it sees the container shipping market move to larger capacity ships.

The vessel is fitted with an electronically controlled main engine, a Hyundai-B&W 12K98ME-C7 that has a total output of 72,240 kW giving the vessel a speed of 24.7knots, it complies with IMO Tier II NOx emissions standards and the phase II IMO EEDI INDEX. It is equipped with turbocharger cut-out measures and is capable of super slow steaming, with the engine able to operate at 10% of maximum load. It is equipped with an advanced performance monitoring system with on line analysis for power measurement and multi-stations alarm monitoring controls.

*Hyundai Together* also has the latest IT, Communication and Entertainment Systems on board, wired and wireless network offering internet and entertainment systems to all crew cabins and mess rooms, centralised video and music centre offering private selection of movies and music onboard, as well as satellite TV at crew public spaces.

## TECHNICAL PARTICULARS

Length oa: ..... 366.53m  
 Length bp: ..... 350.00m







# INNOVATION: modern Kamsarmax

Shipbuilder: ..... **Sungdong Shipbuilding & Marine Engineering Co., Ltd**  
 Vessel's name: ..... **Innovation**  
 Hull No: ..... **S1177**  
 Owner/operator: ..... **Aegean Bulk Co., Inc**  
 Country: ..... **Greece**  
 Designer: ..... **Sungdong Shipbuilding & Marine Engineering Co., Ltd**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **SSPA Sweden**  
 Flag: ..... **Liberia, Monrovia**  
 IMO number: ..... **9622667**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of ships still on order: ..... **nil**

**INNOVATION** has been constructed to the new type Kamsarmax bulk carrier design from Sungdong Shipbuilding and Marine Engineering. *Innovation* is the first vessel in the series of two Kamsarmax bulk carriers for Aegean bulk, which was delivered to the owner in June 2012. *Innovation* has been developed with eco-design specifications that meet the requirements of the vessels' owner.

*Innovation's* design takes in the latest environmental guidelines such as MARPOL Annex I Reg. 12A oil fuel tank protection, inventory of hazardous materials (IHM) for ship's recycling, performance standard for protective coating (PSPC) for water ballast tanks and peak tanks, and ENVIRO notation. The ENVIRO notation is assigned to ships that comply with the Class requirements for environmental protection related to design characteristics, management and support systems, sea discharges, and air discharges.

Notably, the vessel also has separate settling and service tanks for low sulphur HFO and regular HFO, which have been installed to facilitate operations in SOx EMISSION control Areas.

*Innovation* has a flush deck with forecastle, bulbous bow, open water type stern, single rudder and single screw propeller driven by a slow speed diesel engine.

The vessel's cargo holds have been constructed with a single skin and a double bottom and topside tank. The cargo hold area is divided by vertical corrugated transverse watertight bulkheads into seven cargo holds. The topside wing tanks (P&S) of the cargo hold except No.6 and 7 cargo holds are used as water ballast tanks. The heavy fuel oil tanks are arranged in two pairs with No.6 and 7 top side wing tanks that are protected by cargo bilge holding tanks. The No.4 cargo hold can be used as a floodable hold for heavy ballasting condition and No.2 and 6 holds can also be used as a partially flooded hold for adjustment of air draft at the special ports.

The main engine is a MAN 6S60ME-C8.2 that has 11,200kW MCR at 96rpm, giving a speed of 14.5knots, at 85% MCR(9,520kW) with a 15% sea margin at the design draft of 12.2m and range of more than 20,000 nautical miles. The engine is electronically controlled and meets with the IMO Tier II regulations.

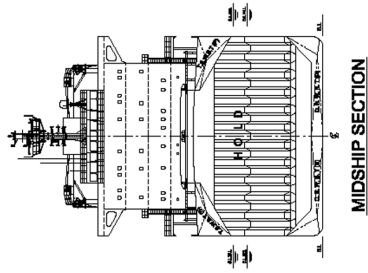
The vessel can carry a number of dangerous cargoes such as aluminium nitrate UN 1438, barium nitrate UN 1446 and others. The owner has requested that the ship be designed for the carriage of dangerous cargoes as well as conventional cargoes.

The vessel has been built under the survey of ABS and designed in accordance with IACS' common structural rules (CSR). The vessel is mainly designed for carrying coal, iron ore and grain in bulk. The BC-A notation is applied for alternate loading in 1, 3, 5 and 7 cargo hold with the maximum cargo density of 3.0tonnes/m<sup>3</sup>.

## TECHNICAL PARTICULARS

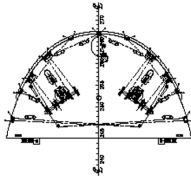
Length oa: ..... 229m  
 Length bp: ..... 222m  
 Breadth moulded: ..... 32.26m  
 Depth moulded  
 To main deck: ..... 20.2m  
 To upper deck: ..... 20.2m  
 Width of double skin  
 Bottom: ..... 1.85m  
 Draught  
 Scantling: ..... 14.55m  
 Design: ..... 12.2m  
 Gross: 44,300tonnes  
 Displacement: ..... 94,900tonnes  
 Deadweight  
 Design: ..... 65,200dwt  
 Scantling: ..... 81,600dwt  
 Speed, service: ..... 14.5knot  
 Cargo capacity  
 Bale: ..... 91,500m<sup>3</sup>  
 Grain: ..... 96,300m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 2,500m<sup>3</sup>  
 Diesel oil: ..... 250m<sup>3</sup>  
 Water ballast: ..... 22,800m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 37tonnes/day  
 Classification society and notations: ..... ABS +A, (E), Bulk Carrier, CSR, ESP, BC-A (Hold no's: 2, 4, & 6 may be empty), AB-CM, GRAB[20], CPS, RW, +AMS, +ACCU, UWILD, TCM, PMA, BWE, ENVIRO, GP  
 Main engine  
 Model: ..... MAN Diesel 6S60ME-C8.2  
 Manufacturer: ..... HHI  
 Type of fuel: ..... HFO, MDO, MGO  
 Output of each engine: ..... 11,200kW x 96rpm  
 Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... Sungdong/HHI  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 7,1m  
 Speed: ..... 96rpm  
 Diesel-driven alternators  
 Engine make/type: ..... STX 5L23 30H IMO Tier 2  
 Type of fuel used: ..... HFO, MDO, MGO

Output/speed of each set: ..... 650kW x 720rpm  
 Alternator make/type: ..... HHI HFCS 520-14K  
 Output/speed of each set: ..... 600kW x 720rpm  
 Boiler  
 Type: ..... Composite boiler  
 Make: ..... Kangrim  
 Output, each boiler: ..... oil-fired 1,300kg/h, exhaust gas 1,300kg/h  
 Other cranes  
 Make: ..... Oriental  
 Type: ..... Overhead crane  
 Tasks: ..... For moving the heavy spare or overhauling in the engine room  
 Performance: ..... 4tonnes x 7m  
 Other cranes  
 Make: ..... Oriental  
 Type: ..... Electro hydraulic cylinder luffing jib type  
 Tasks: ..... Provisions  
 Performance: ..... 4tonnes x 15m  
 Mooring equipment  
 Make: ..... Fluteck-Kawasaki  
 Type: ..... Electro hydraulic high pressure  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 25 persons  
 Make: ..... Hyundai Lifeboats  
 Type: ..... Totally enclosed  
 Hatch covers  
 Design: ..... MacGregor  
 Manufacturer: ..... MacGregor  
 Type: ..... Weather deck hatch covers, side rolling  
 Cargo tanks, number: ..... 7  
 Grades of cargo carried: ..... Grain, coal, ore  
 Ballast control system  
 Make: ..... Kongsberg  
 Type: ..... K-Cheif500  
 Complement  
 Officers: ..... 15  
 Crew: ..... 10  
 Bridge control system  
 Make: ..... HHI  
 One-man operation: ..... Yes  
 Fire detection system:  
 Make: ..... Consilium  
 Type: ..... Addressable  
 Fire extinguishing systems  
 Engine room/Cargo holds: ..... NK/CO<sub>2</sub>  
 Radars  
 Make: ..... Furuno/Models FAR-2827, FAR-2837S  
 Waste disposal plant  
 Incinerator: ..... Hyundai-Atlas/ MAXI NG100SL WS  
 Sewage plant: ..... Il Seung/ISS-25N  
 Contract date: ..... 3 March 2011  
 Launch/float-out date: ..... 7 May 2012  
 Delivery date: ..... 18 June 2012

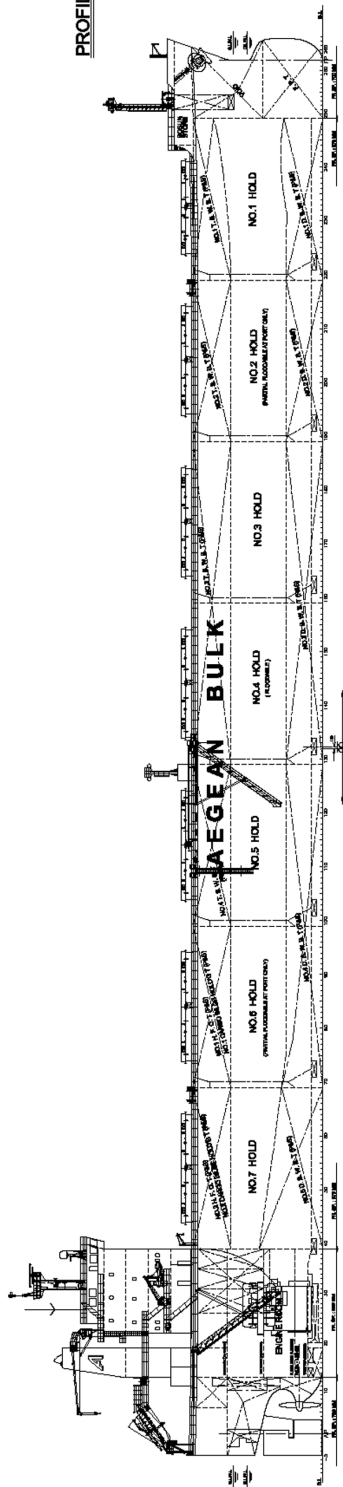


MIDSHIP SECTION

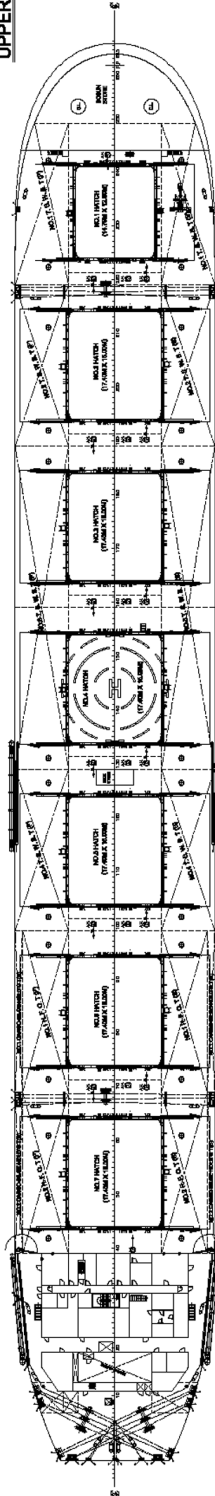
FCLE DECK



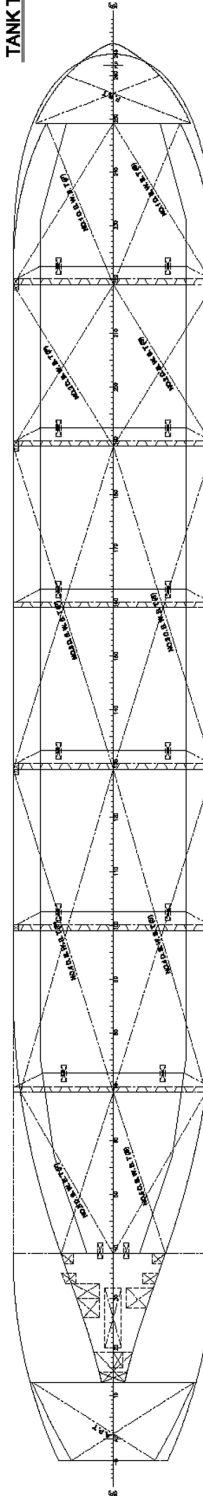
PROFILE



UPPER DECK



TANK TOP







# INNOVATION: flexible jack-up vessel from Hochtief

Shipbuilder: ..... **Crist S.A, Gdansk**  
 Vessels name: ..... **Innovation**  
 Hull No: ..... **142**  
 Owner/operator: ..... **HGO InfraSeas Solutions GmbH & Co. Kg**  
 Country: ..... **Germany**  
 Designer: ..... **Design Consortium Overdick/Wärtsilä**  
 Country: ..... **Germany/Finland**  
 Model test establishment used: ..... **MARIN**  
 Flag: ..... **Germany**  
 IMO number: ..... **9603453**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **nil**

**I**NNOVATION was developed for the construction and servicing of offshore wind farms and oil and gas plants at sea. The vessel was constructed at Crist Shipyard, Gdansk, Poland for HGO InfraSeas Solutions and was delivered in August.

*Innovation* is currently the most powerful jack-up vessel on the market, with project characteristics getting more demanding in the offshore heavy-lift installation market the vessel has been built to meet this latest demand for more powerful vessels.

The vessel features the first installation of the Liebherr CAL 64000-1500 Litronic, a heavy lift offshore crane. The CAL 64000-1500 Litronic achieves a maximum lifting capacity of 1,500tonnes at a maximum working radius of 31.5m. It is designed as "Crane Around the Leg", which means that the heavy-lift crane is able to rotate 360deg around one of the four jack-up legs of the vessel. The CAL 64000 is the first heavy lift offshore crane to be built according to this design. The main advantage of this design is that despite the crane's enormous size it can be positioned in a space-saving way and requires a relatively small obstruction area of 12m.

*Innovation* also features a fully automatic jacking system for faster operation, which will also give the vessel better resistance to daily wear and tear that comes from a manually operated system. The system consists of 96 elevating units, divided into four layers, which are all individually controllable. Due

to its redundancy concept the system is still able to operate even if one layer is lost.

Hamburg-based SAM Electronics has supplied and installed an assembly of electrical and other equipment as part of a consortium headed by Caterpillar Marine Power Systems and including thrust manufacturers SCHÖTTEL and Zeppelin Power Systems.

SAM Electronics' contribution to the vessel was the supply of eco-friendly diesel-electric propulsion equipment consisting of four 3.500kW asynchronous thruster motors feeding a similar number of azimuth propellers and three 2,800kW motors for the bow thrusters. All drives are speed-controlled by low-voltage PWM-converter drives powered by propulsion transformers via a 6,600V bus bar.

Other facilities integrated included six diesel generators providing total onboard electrical power of 34.4MW. They in turn feed two 6,600V high-voltage propulsion switchboards equipped with vacuum circuit breakers and GMP 500 protection modules for shielding of alternators and their supply of power for seven thruster drives, main supply and the vessel's electrical jack-up system. Each PWM-converter drive is equipped with a SAM propulsion drive control panel which is also interfaced to Innovation's automation, control and monitoring system.

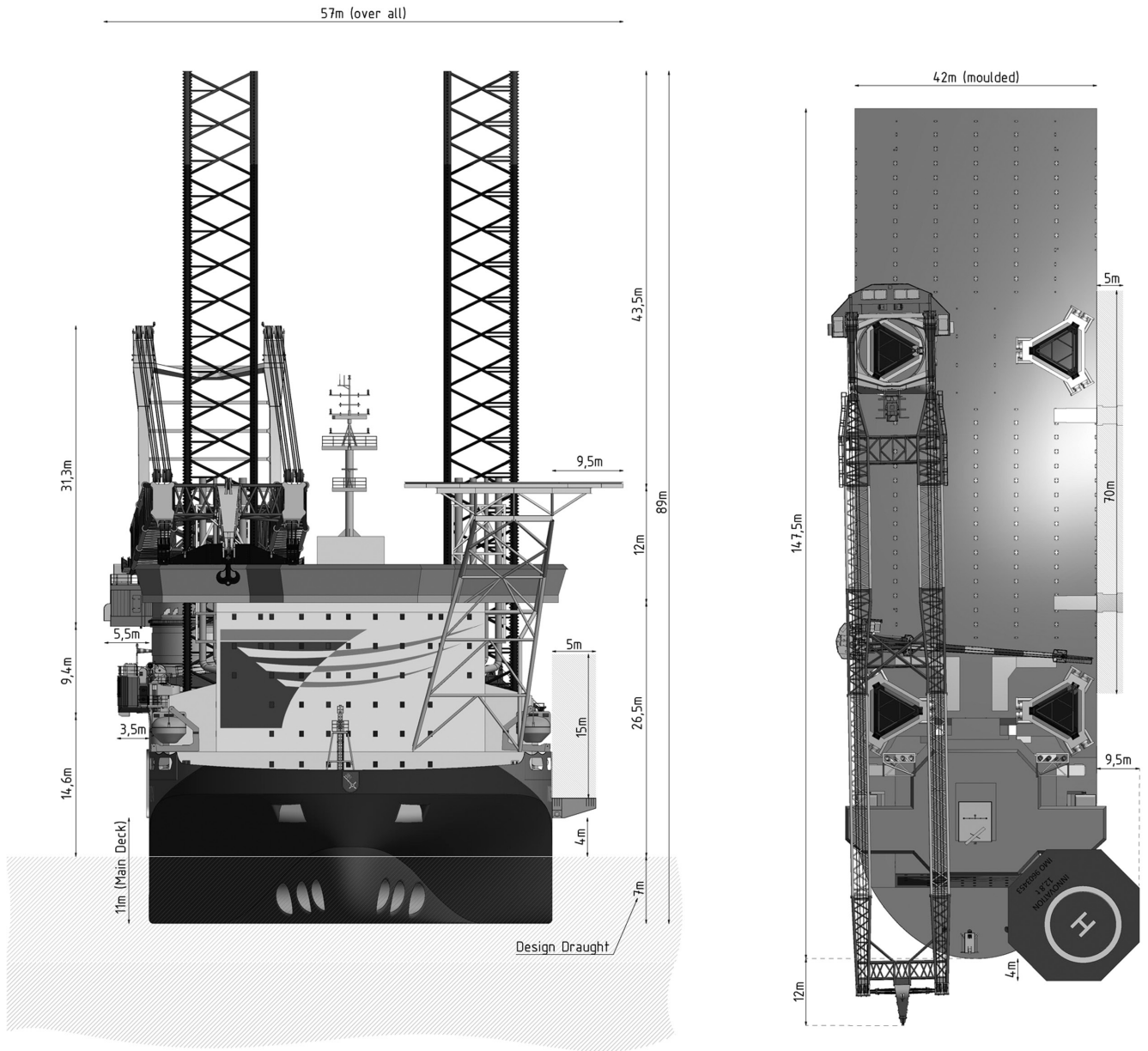
A NACOS Platinum bridge-based automation, control and monitoring system has been installed, which comprises of a series of standardised workstations with multi-function displays supported by a common operating network. Components include one wave radar, an S and three X-band radars linked to five Multipilot workstations which can be variously used for control of radar, Ecdis and conning functions. The system's automation sector can process approximately 4,500 input and output signals controlled by 10 process stations, with operator control possible in differing locations such as the engine control room and officer cabins in addition to the bridge.

A key part of the NACOS Platinum assembly also is an advanced DP2 dynamic positioning unit for maintaining precise vessel location in ever-changing environments. The 147 metre-long vessel has a cargo capacity of 8,000tonnes and is able to operate

over depths down to 50m with up to 150 personnel, it began service in August at the €1.3 billion (\$1.7 billion) 400MW North Sea wind farm, Global Tech 1.

## TECHNICAL PARTICULARS

Length oa: ..... 166.00m  
 Length bp: ..... 146.8m  
 Breadth moulded: ..... 42.00m  
 Depth moulded  
 To main deck: ..... 11,00m  
 To foreccastle deck: ..... 15.00m  
 Draught  
 Scantling: ..... 7.348m  
 Design: ..... 7.00m  
 Gross: ..... 21,900gt  
 Displacement: ..... 35,537tonnes  
 Lightweight: ..... 24,371tonnes  
 Deadweight  
 Design: ..... 9,323dwt  
 Scantling: ..... 11,166dwt  
 Block co-efficient: ..... 0.7594  
 Speed, service: ..... max: 12.3knots service: 10knots  
 Cargo capacity: ..... up to 6 turbines of the 6MW class Up to 3 foundations for the 6MW turbines in 50m water depth  
 Bunkers  
 Marine Gas oil: ..... 1,465.5m<sup>3</sup>  
 Water ballast: ..... 11,037.2m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 15-45tonnes/day  
 Classification society and notations: ..... GL 100A5, SPS, Self Elevating Unit, Operation acc. To operation manual, S9P65, DP2, OSV, WTIS, EP, NAV-OC, MC AUT  
 Main engine  
 Design: ..... Diesel-electric  
 Model: ..... 9M32C/9M20C  
 Manufacturer: ..... MaK Germany  
 Number: ..... 6/1  
 Type of fuel: ..... MGO  
 Output of each engine: ..... 4,500kW/ 1,620kW  
 Propellers  
 Designer/manufacturer: ..... Schottel  
 Number: ..... 4  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 3.4m  
 Cargo cranes/cargo gear  
 Number: ..... 1  
 Make: ..... Liebherr  
 Type: ..... Crane around the leg CAL 64,000/RL 2650-40 LIT  
 Performance: ..... 1,500tonnes x 31,5m/ 40tonnes x 30m  
 Other cranes  
 Number: ..... 1  
 Make: ..... Liebherr  
 Type: ..... RL 2650-40 LIT  
 Task: ..... Auxiliary crane  
 Performance: ..... 40tonnes x 30m  
 Mooring equipment  
 Number: ..... 8  
 Make: ..... Towimoor  
 Type: ..... Electric  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 x 102persons  
 Make: ..... Noreq  
 Type: ..... LBT 935T  
 Complement  
 Crew: ..... 35  
 Bow thruster  
 Make: ..... Schottel Tunnel Thruster STT 3030  
 Number: ..... 3  
 Output: ..... 2,800kW  
 Bridge control system  
 Make: ..... SAM Electronics  
 Fire detection system  
 Make: ..... Sam Electronics/ Consilium  
 Fire extinguishing systems  
 Engine room: ..... CO<sub>2</sub>  
 Cabins/public spaces: ..... Sprinkler  
 Radars  
 Number: ..... 7  
 Make: ..... SAM Electronics  
 Integrated bridge system  
 Make: ..... SAM Electronics  
 Model: ..... Platinum  
 Contract date: ..... October 2010  
 Delivery date: ..... August 2012







# JAGUAR: multi-purpose vessel

Shipbuilder: ..... **Shipkits B.V**  
 Vessels name: ..... **Jaguar**  
 Hull No: ..... **105**  
 Owner/operator: ..... **Jaguar Shipping**  
 Country: ..... **The Netherlands**  
 Designer: ..... **Vuyk Engineering Groningen B.V**  
 Country: ..... **The Netherlands**  
 Model test establishment used: ..... **Marin**  
 Flag: ..... **The Netherlands**  
 IMO number: ..... **9613628**  
 Total number of sister ships already completed  
 (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **3**

**JAGUAR** (VG6000-E) is the latest in multi-purpose ships for Jaguar Shipping. The vessel was conceived in 2009 by Vuyk Engineering Groningen following discussions they had been conducting with a group of shipping companies. The contract between Shipkits and Jaguar Shipping for this vessel, to be named *Jaguar*, was signed in 2010 and it is the first of six vessels of this type awarded to date that was delivered in June.

*Jaguar* is the latest and largest of a family of heavy cargo dynamic positioning (DP) equipped vessels designed to support the offshore market and other special project cargoes. The aim of these vessels is to provide a highly versatile means of transport for a diverse range of special cargoes because of this a great deal of thought has gone into the cargo hold areas.

The vessel, which has its superstructure toward the bow allows the largest possible deck space, has amongst its cargo-carrying features reinforced tank tops, reinforced and removable tween decks and hatch covers. All the hatch covers can be removed and stowed at one end of the cargo hold or deck to allow the vessel to be completely open.

The upper hold is 80m in length making the vessel suitable for carrying parts for wind farm installations. Moreover, the tween deck hatches can be positioned and stored at every position giving better versatility. Manoeuvring of the hatch covers is achieved by means of a single gantry crane that runs the length of the cargo deck. The forward located superstructure provides an element of protection to the cargo carried there. The vessel also has the ability to carry large drums of cable or coils of steel vertically in the hold with the hatch covers stowed.

A closed circuit television system by Orlaco is installed for monitoring the decks and hold, so cargo handling operations can be seen when necessary. The data network can also be monitored both onboard as well as onshore. Because good crews are increasingly difficult to source, efforts have been made to achieve the highest levels of comfort inside the vessel. The finish of the interior, choice of furniture, selection of fabrics and carpentry are all to a very high standard. This is supported by the installation of the internet and TV system fitted in all cabins.

A determination to think 'outside of the box' by the company lead them to enlists several small engines be used in

place of one or two large diesel main engines. In the case of *Jaguar* the generators are located at the aft end of the hull optimising the hull cargo spaces and the shafts are replaced with steerable Z drive thrusters. This allows for one or more generators to be running within a relatively narrow speed band for maximum fuel efficiency. If there is a need to go faster another small diesel generator is started up and shut down when no longer needed.

Alewijnse Marine Systems installed the propulsion system onboard. Working with Vacon they have produced what they call the third generation of diesel electric propulsion.

Direct Current (DC) machines can run at varying speeds without any risk of damage. It makes it ideal for powering this sort of vessel when in transit it will be travelling quite fast whilst in DP mode the power requirement to 'stay on station' will be quite small. To achieve the speed control necessary for propulsion it is necessary to vary the supply frequency. Traditionally this is done by using a variable speed drive. The problem with these is that they cause harmonics, which can cause problems in an electric distribution system. Vacon's solution to this is to employ an Active Front End (AFE) AC/DC rectifier that in turn powers a 750Volt DC bus.

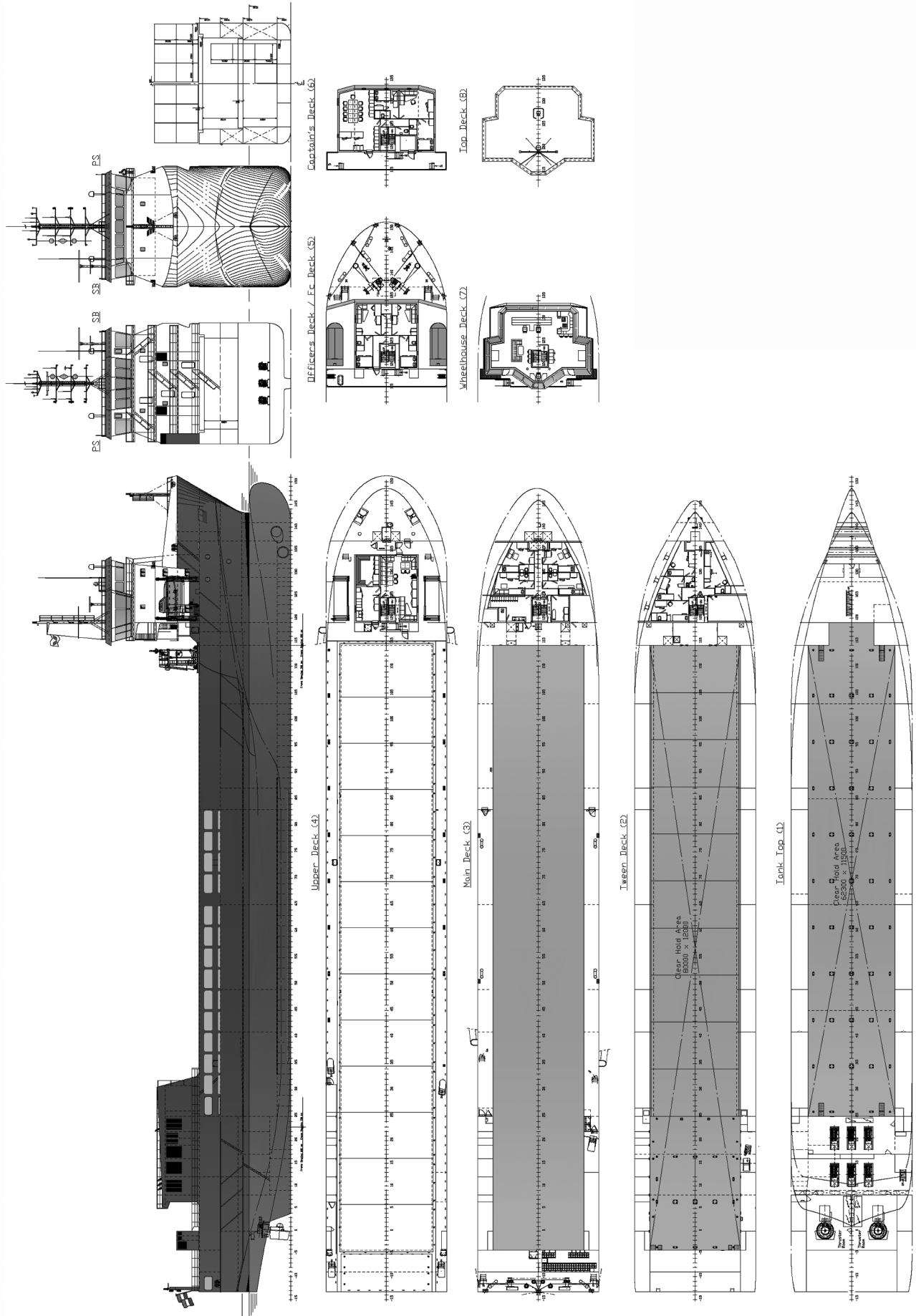
*Jaguar* has six Scania diesel generators to power the DC bus via the AFE Rectifier. The DC bus feeds variable frequency DC/AC inverters to drive the propulsion system consisting of two Azimuthing Z Drive thrusters in the stern and two bow thrusters all of which are AC motors. The remaining motors for pumps and winches are fed by either variable speed or fixed speed inverters as their operational requirements dictate. Fixed frequency inverters feed all other consumers because they do not have the requirement to change speed.

The propulsion consists of a twin-screw diesel-electric concept based on Active Front End and DC-bus technology.

## TECHNICAL PARTICULARS

Length oa: ..... 107,95m  
 Length bp: ..... 99,67m  
 Breath moulded: ..... 16,00m  
 Depth moulded  
 To main deck: ..... 9,30m  
 To upper deck: ..... 12,10m  
 To other decks: ..... 15,00m/ 17,90m/ 20,80m/ 24,00m  
 Width of double skin  
 Side: ..... 2,25m/ 2,00m  
 Bottom: ..... 1,80m  
 Gross: ..... 5,198gt  
 Displacement: ..... 8,776tonnes  
 Lightweight: ..... 2,221tonnes  
 Deadweight  
 Design: ..... 6,555gt  
 Block co-efficient: ..... 0,8696  
 Speed, service: ..... 12knots  
 Cargo capacity: ..... 8,389,55m<sup>3</sup>  
 Bunkers  
 Diesel oil: ..... 566m<sup>3</sup>

Water ballast: ..... 3,395m<sup>3</sup>  
 Classification society and notations: ..... BV I, +HULL, +MACH, AUT-UMS, AUM-DPS, DYNAPOS AM/AT  
 Main engine  
 Design: ..... Scania  
 Model: ..... DI-16 55M  
 Type of fuel: ..... MDO  
 Output of each engine: ..... 532kW  
 Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... ZF  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 2,3m  
 Special adaptations: ..... mounted in nozzles  
 Main-engine driven generators  
 Make/type: ..... Scania  
 Mooring equipment  
 Number: ..... 4 x winches, 2 x windlasses  
 Make: ..... SEC- Groningen  
 Special lifesaving equipment  
 Number and capacity or each: ..... 2 x lifeboats  
 Hatch covers  
 Design/manufacturer: ..... Coops and Nielborg  
 Type: ..... Pontoon  
 Containers  
 Lengths: ..... 20ft  
 Heights: ..... 9,6ft  
 Total TEU capacity  
 On deck: ..... 138  
 In holds: ..... 128  
 Homogenously loaded to 14tonnes: ..... 216  
 Ballast control system  
 Make: ..... Besi/Ariston  
 Complement  
 Officers: ..... 4  
 Crew: ..... 7  
 Bow thrusters  
 Make: ..... ZF  
 Output: ..... 400kW  
 Stern thrusters  
 Make: ..... ZF  
 Output: ..... 1,500kW  
 Bridge control system  
 Make: ..... Alewijnse/ ZF/ SAM Electronics  
 Fire detection system  
 Make: ..... Minimax  
 Fire extinguishing systems  
 Engine room/Cargo rooms: ..... Minimax CO<sub>2</sub>  
 Radars  
 Make: ..... SAM Electronics  
 Contract date: ..... 10 October 2010  
 Delivery date: ..... 01 June 2012







# JS AMAZON: Crown 63 design with EEDI

Shipbuilder: ..... **Sinopacific Yangzhou Dayang Shipbuilding Co., Ltd**  
 Vessel's name: ..... **JS Amazon**  
 Hull No: ..... **DY4001**  
 Owner/operator: ..... **Greenship Bulk Pte Ltd**  
 Country: ..... **Singapore**  
 Designer: ..... **Greenseas Marine Technology**  
 Country: ..... **China PRC**  
 Model test establishment used: ..... **HSVA Hamburg**  
 Flag: ..... **Singapore**  
 IMO number: ..... **9573713**  
 Total number of sister ships already completed (excluding ship presented): ..... **11**  
 Total number of sister ships still on order: ..... **22**

*JS Amazon*, the lead ship of the latest Crown 63 design was constructed by Sinopacific and delivered early in 2012.

The ship design came from Sinopacific's in-house design company Greenseas, which worked closely with French bulk shipping expert Setaf-Saget and Bureau Veritas Class to offer the first of its kind, a fuel efficient and environmentally friendly geared bulk carrier.

The design process involved over 18 months of hull lines optimisation, including five tank testing campaigns at HSVA in Hamburg, resulting in enhancements to wake distribution and flow lines without any need for an added energy saving device, but a rudder bulb and a propeller boss cap. As a result, these developments have led to improved-carrying efficiency, environmental protection, operation and maintenance additional convenience, extremely low vibration and other improvements.

With a summer deadweight of 63,300dwt, these vessels are the biggest "Supramax" class ever built. With an overall length of less than 200m, these vessels can trade the vast majority of Supramax ports with an improved deadweight capacity. It also has five cargo holds with large openings, four x 36tonnes high speed cranes with a 12.5m outreach from ship side, and large 20M3 electro-hydraulic grabs, make them the most efficient self-discharging vessels presently afloat. The cargo holds are fitted with padeyes inside, and there is structural allowance in the design for carrying deck cargo. Long and heavy cargoes such as steel pipes, steel products and hot coils can also be transported.

*JS Amazon* has by all means set a new benchmark in terms of fuel efficiency: Streamlined body lines, lower propeller revolution, with a larger propeller designed by Nakashima, and a series of various technical improvements giving the design a 13% fuel consumption saving at a 14knot service speed with an

improved 5% deadweight capacity. The electronically controlled main engine was selected because of its lower specific fuel consumption over a wider range of operating parameters.

All fuel oil storage tanks are double-skinned for safety, with enclosed overflow and venting to prevent oil spills. There are double settling and service tanks, with separate piping arrangement, designed to ensure fast and safe fuel change over. Capacity for storing up to 450m<sup>3</sup> of LSMGO allows long-range operation in ECAs.

The vessel complies with all the requirements set out in MARPOL ANNEX VI, regarding atmospheric pollution. The vessel can burn all fuels, from the lowest sulphur content (0.1%) to the highest heavy fuel depending the areas in which the vessel is trading.

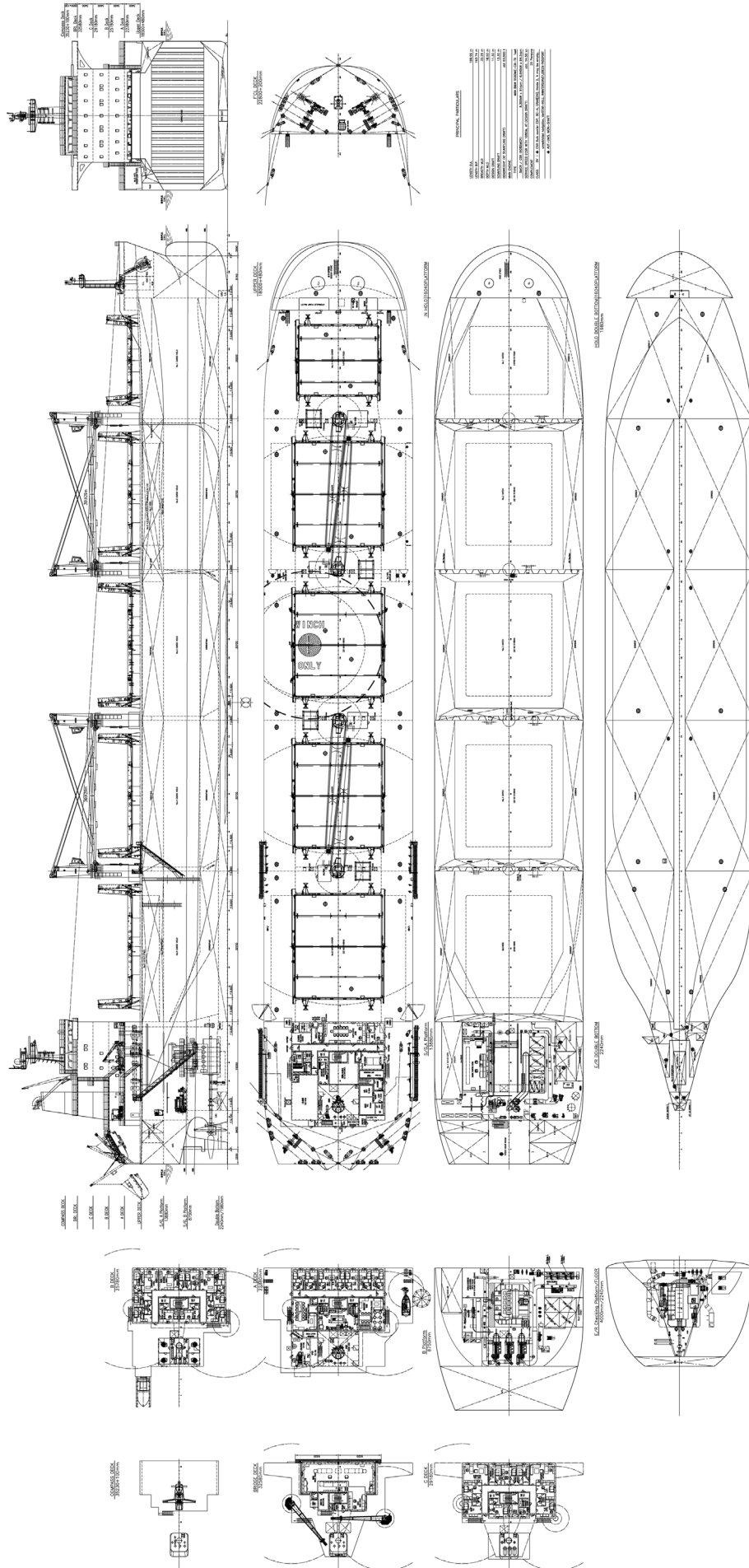
*JS Amazon* and its sister ships have an EEDI attestation, the first of its kind for newbuilding vessels in Asia, 20% lower than today's EEDI reference line and already meets the requirements of the second EEDI phase applicable in 2020, without any compromise on speed or on main engine installed power. Running at 80% MCR, there is good reserve of power to cope with difficult sea conditions.

In addition, the Crown63 class is prepared for the plug-in installation of a ballast water treatment system when it will become mandatory following the soon-anticipated ratification of the IMO Ballast Water Convention.

## TECHNICAL PARTICULARS

Length oa: ..... 199.99m  
 Length bp: ..... 32.26m  
 Depth moulded  
 To main deck: ..... 18.50m  
 To upper deck: ..... 18.50m  
 Draught  
 Scantling: ..... 13.325m  
 Design: ..... 11.30m  
 Gross: ..... 35,812gt  
 Displacement: ..... 74,922tonnes  
 Lightweight: ..... 11,621tonnes  
 Deadweight  
 Design: ..... 50,850dwt  
 Scantling: ..... 63,301dwt  
 Block co-efficient: ..... 0.860  
 Speed, service: ..... 14.5knots  
 Cargo capacity  
 Bale: ..... 75,555m<sup>3</sup>  
 Grain: ..... 77,492m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 1,746m<sup>3</sup>  
 Diesel oil: ..... 186m<sup>3</sup>

Water ballast: ..... 18,385m<sup>3</sup>/ 34,391m<sup>3</sup>  
 with cargo hold number 3  
 Daily fuel consumption  
 Main engine only: ..... 25.8tonnes/day  
 Auxiliaries: ..... 2.0tonnes/day  
 Classification society and notations: ..... BV I +HULL, +MACH, Bulk Carrier, CSR, BC-A (Holds 2 & 4 may be empty), ESP, GRAB[20], CPS(WBT), Unrestricted Navigation, +Veristar-Hull, +AUT-UMS, MON-SHAFT, Inwatersurvey, Green Passport  
 Main engines  
 Design: ..... MAN BW  
 Model: ..... 5S60MEC8 TII  
 Manufacturer: ..... Doosan Engine Co., Ltd  
 Number: ..... 1  
 Type of fuel: ..... HFO, MDO, MGO  
 Output of each engine: ..... 8,300kW x 91rpm  
 Propeller  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... Nakashima  
 Number: ..... 1  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 6.9m  
 Speed: ..... 91rpm  
 Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... CME MAN 5 23/30H  
 Type of fuel: ..... HFO, MDO, MGO  
 Output/speed of each set: ..... 650kW x 720rpm TII  
 Alternator make/type: ..... Zhenjiang China Marine Xiandai Generating Co., Ltd  
 Output/speed of each set: ..... 615kW x 720rpm  
 Boilers  
 Number: ..... 1  
 Type: ..... Combined exhaust/oil fired  
 Make: ..... Saacke  
 Output, each boiler: ..... 700kg/h-1,600kg/h  
 Cargo cranes/cargo gear  
 Number: ..... 4  
 Make: ..... MacGregor  
 Type: ..... GLB 3629  
 Performance: ..... 36tonnes x 29m  
 Other cranes  
 Number: ..... 3  
 Make: ..... Wuxi Huaxing Marine Equipment  
 Type: ..... Electric single jib  
 Tasks: Engine room overhead/provisions and machinery  
 Performance: ..... 2/4tonnes x 5m  
 Mooring equipment  
 Number: ..... 8  
 Make: ..... Rolls-Royce  
 Type: ..... Electro-hydraulic high pressure  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 28 persons, 1 x 6 persons  
 Make: ..... Jiangsu Jiaoyan Marine Equipment  
 Type: ..... Totally enclosed  
 Hatch covers  
 Design: ..... MacGregor  
 Manufacturer: ..... MacGregor Nantong  
 Type: ..... Electro-hydraulic, folding  
 Ballast control system  
 Make: ..... BESI  
 Type: Integrated hydraulic control and monitoring system  
 Complement  
 Officers: ..... 11  
 Crew: ..... 10  
 Stern appendages/special adaptations: ..... Rudder bulb, HSVA rudder profile  
 Bridge control system  
 Make: ..... Nabtesco  
 Type: ..... Conventional  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Salwico Consilium  
 Type: ..... Addressable  
 Fire extinguishing systems  
 Cargo holds: ..... CO<sub>2</sub>  
 Engine room: ..... CO<sub>2</sub>  
 Radars  
 Number: ..... 2  
 Make: ..... JRC  
 Model: ..... JMA 9122, JMA 9132 – TFT 23' arpa  
 Waste disposal plant  
 Incinerator: ..... Teamtec  
 Sewage plant: ..... Jowa/ STP 2010-25  
 Contract date: ..... 16 October 2009  
 Launch/float-out date: ..... 16 December 2011  
 Delivery date: ..... 02 March 2012







# JULES GARNIER II: unique nickel ore carrier

Shipbuilder: ..... **Naikai Zosen Corporation**  
 Vessel's name: ..... **Jules Garnier II**  
 Hull No: ..... **755**  
 Owner/operator: .. **Sunny Durban Maritime S.A**  
 Country: ..... **Panama**  
 Designer: ..... **Naikai Zosen Corporation**  
 Country: ..... **Japan**  
 Flag: ..... **Panama**  
 IMO number: ..... **9646417**  
 Total number of sister ships already completed  
 (excluding ship presented): ..... **3**  
 Total number of sister ships still on order: ..... **nil**

*JULES Garnier II* is the first specialised ore carrier that has been designed with added safety features. The vessel was constructed at Japan's Naikai Zosen Corporation and delivered the ship, in September, to owner Sunny Durban Maritime, part of JX Shipping Co., Ltd.

*Jules Garnier II* is the first vessel in the world to be recognised as a "Specially Constructed Cargo Ship" for the carriage of Nickel Ore in accordance with the IMO's IMSBC Code. The vessel design includes a hold whose shape is especially designed for the handling of nickel ore in the New Caledonia service where it is chartered.

The ISMBC code currently requires that the moisture content (MC) of cargoes that may liquefy be tested prior to their loading onboard ships, and forbids non-specialised vessels from loading cargoes with an MC greater than the specified Transportable Moisture Limit (TML).

The 27,200dwt *Jules Garnier II* is the first vessel in the world to apply ClassNK's new requirements in its construction and makes use of longitudinal bulkheads in its cargo holds to ensure stability and structural strength even when liquefied nickel ore cargoes are loaded. The ship's design earned the approval of the Panamanian government in September 2012, and with its completion in September 2012, is the first vessel to be certified as safe to carry liquefied nickel ore cargoes in line with the IMSBC code. The vessel is also the first to earn ClassNK's new SCCS notation for safe carriage of nickel ore in recognition of its special construction.

The vessel has a double hull construction which will allow for the easier maintenance of the cargo and reduce the risk of outside shell damage which can lead to oil spills.

*Jules Garnier II* has four cargo holds and is equipped with three sets of deck cranes for efficient cargo handling. The hatch sizes have been optimised, taking unloading facilities at ports into consideration.

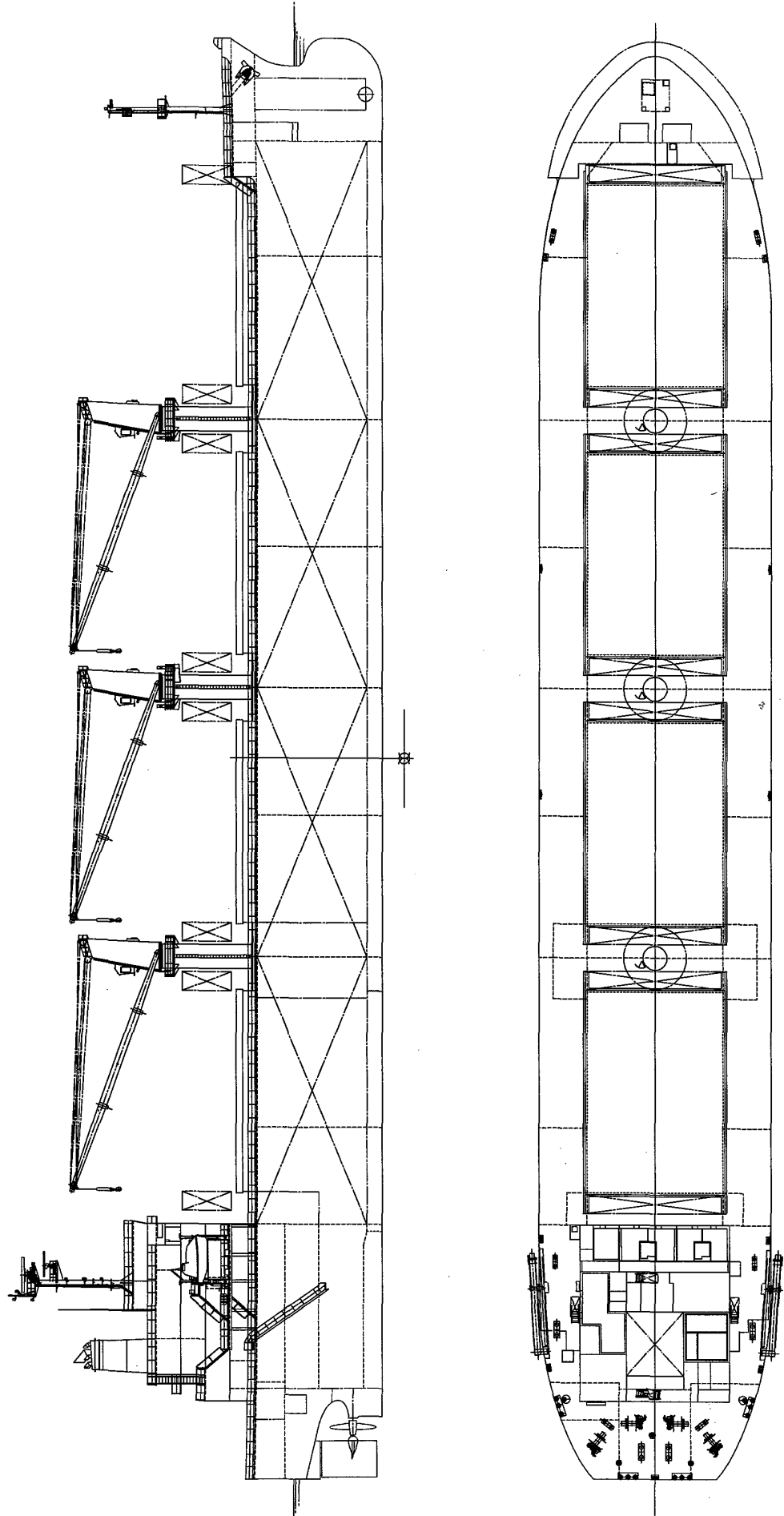
The vessel is equipped with a bow thruster to improve manoeuvrability. A "SURF-BULB" has been fitted to the rudder of the vessel which is an eco-friendly device for

improving the propulsive performance. The main engine also complies with IMO's Tier II emissions regulations to enhance the vessels energy saving abilities.

## TECHNICAL PARTICULARS

Length oa: ..... 160.00m  
 Length bp: ..... 154.50m  
 Breadth moulded: ..... 26.00m  
 Depth moulded  
 To upper deck: ..... 14.00m  
 Draught  
 Scantling: ..... 9.88m  
 Gross: ..... 16,715gt  
 Deadweight  
 Scantling: ..... 27,454dwt  
 Speed, service: ..... 14.5knots  
 Cargo capacity  
 Grain: ..... 20,955.8m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 1,032.2m<sup>3</sup>  
 Diesel oil: ..... 140.3m<sup>3</sup>  
 Water ballast: ..... 13,847m<sup>3</sup>  
 Daily fuel oil consumption  
 Main engine only: ..... 24.7tonnes/day  
 Classification society and notations: ..... ClassNK NS\* (Bulk Carrier Modified, BC-X II, Grab) (IWS), MNS\*  
 Main engine  
 Design: ..... MAN Diesel & Turbo SE  
 Model: ..... Hitachi-MAN B&W 6S42MC7.1  
 Manufacturer: ..... Hitachi Zosen Corporation  
 Innoshima Works  
 Number: ..... 1  
 Type: ..... HFO  
 Output of each engine: ..... M.C.O 6,480kW x 136rpm  
 Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... Nakashima Propeller Co., Ltd  
 Number: ..... 1  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 5.20m  
 Speed: ..... 136rpm  
 Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Yanmar Co., Ltd  
 Type of fuel: ..... HFO  
 Output/speed of each set: ..... 500kW x 900rpm

Alternator make/type: ..... Taiyo Electric Co., Ltd  
 Output/speed of each set: ..... 440kW x 900rpm  
 Boilers  
 Number: ..... 1  
 Type: ..... Vertical, forced draft, composite boiler  
 Make: ..... Miura Co., Ltd  
 Output, each boiler: ..... 1,000/700kg/h  
 Cargo cranes/cargo gear  
 Number: ..... 3  
 Make: ..... IHI Corporation  
 Type: ..... H300185-260  
 Performance: ..... Hook use: 30tonnes x 18.5m  
 Grab use: ..... 24tonnes x 18.5m  
 Mooring equipment  
 Number: 2 x windlass/mooring winch, 6 x mooring winch  
 Make: ..... Nippon Pusnes Co., Ltd  
 Type: ..... Electro-hydraulic driven closed gear  
 Hatch covers  
 Design/manufacturer: ..... Iknow Machinery co., Ltd  
 Type: ..... Folding type steel hatch covers  
 Complement  
 Officers: ..... 8  
 Crew: ..... 12  
 Stern appendages/special rudders: ..... Mariner type with surf-bulb  
 Bow thrusters  
 Make: ..... Nakashima propellers Co., Ltd  
 Number: ..... 1  
 Output: ..... 650kW  
 Fire detection system  
 Make: ..... Nippon Hakujo Electronics Ltd  
 Type: ..... FF-3062-10  
 Fire extinguishing systems  
 Engine room: ..... Air Water Safety Service Inc/ CO<sub>2</sub>  
 Yamato Protec Corporation/ Seawater, portable extinguishers  
 Cabins/public spaces: ..... Portable fire extinguishers  
 Radars  
 Number: ..... 2  
 Make: ..... Japan Radio Co., Ltd  
 Model: ..... JMA-9132-SA, JMA-9122-6XA  
 Waste disposal plant  
 Incinerator: ..... Miura Co., Ltd/ BGW-20N  
 Sewage plant: ..... Taiko Kikai Ind Co., LTD/ SBH-25  
 Contract date: ..... 11 April 2011  
 Launch/float-out date: ..... 4 July 2012  
 Delivery date: ..... 19 September 2012







## K. HOPE: very large ore carrier for SK Shipping

Shipbuilder: ..... **Hyundai Samho Heavy Industries Co., Ltd**  
 Vessel's name: ..... **K. Hope**  
 Hull No: ..... **S588**  
 Owner/operator: ..... **SK Shipping**  
 Country: ..... **Korea**  
 Designer: ..... **Hyundai Samho Heavy Industries Co., Ltd**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **Hyundai Maritime Research Institute**  
 Flag: ..... **Panama**  
 IMO number: ..... **9613783**  
 Total number of sister ships completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **nil**

**K. HOPE** is the first in a series of Very Large Ore Carriers (VLOCs) that has been constructed at Hyundai Samho Heavy Industries (HSHI) for SK Shipping and was delivered in September. Increased environmental regulation has seen Korean shipyards take significant steps to ensure their designs will meet with the demands of new regulations and bring more environmentally friendly vessels to the market.

**K. Hope** has been designed to have better fuel efficiency and is also recognised as the first beneficiary ship under Korea Ship Corp.'s Green Ship Programme, which includes lower interest rates on loans as an incentive to shipowners.

In order to qualify for this financial incentive, the vessel was built using technologies to reduce air pollutants (e.g. NO<sub>x</sub>, SO<sub>x</sub>), CO<sub>2</sub>, or GHG. Korea Finance Corporation is the first financial organisation in South Korea to run a ship finance programme with environmental incentives.

**K. Hope** is a Wozmax-class ore carrier which will load iron ore at Western Australian ports and has the benefits of a shallow draft. A Wozmax ore carrier is an optimal type of vessel with a draft of 18m, but the vessel's beam has been widened to 57m so that it can call at shallow-draft ports. The vessel is powered by a Hyundai-Wärtsilä 6RT-flex82T that has a power output of 23,000kW and gives a service speed of 14.95knots.

The vessel is designed as an ocean going, single screw diesel engine directly driven with a bulbous bow, transom stern and a continuous deck with a forecastle deck. The cargo areas consist of five cargo tanks having double bottom water ballast tanks with six bulkheads, and top side wing ballast tanks. Heavy fuel oil tanks

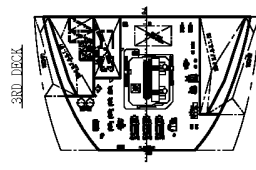
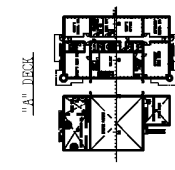
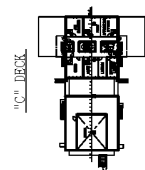
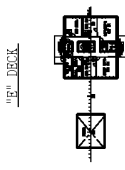
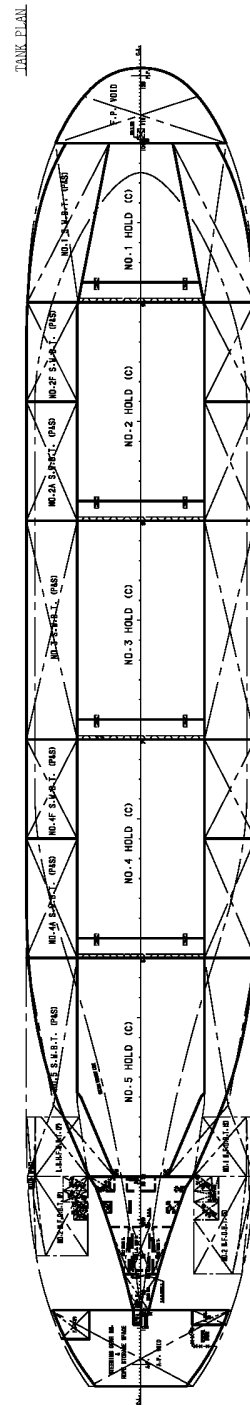
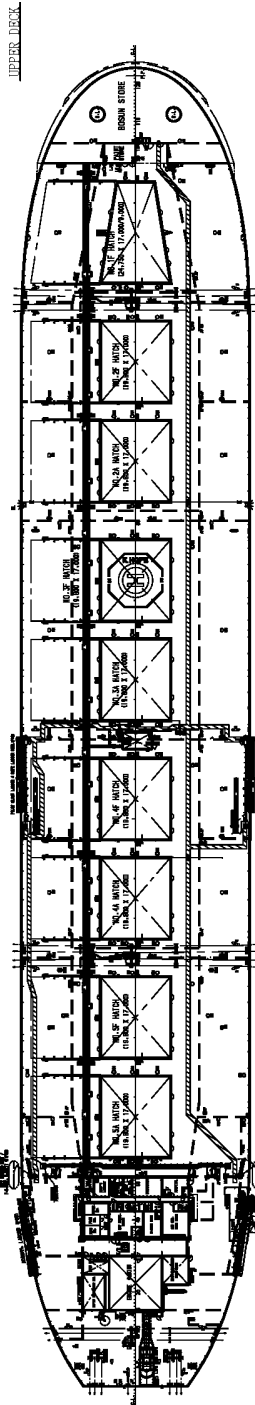
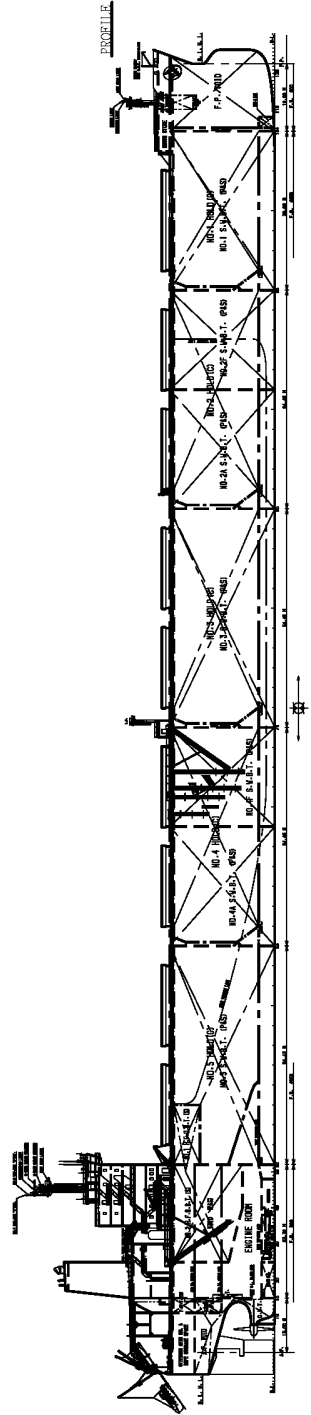
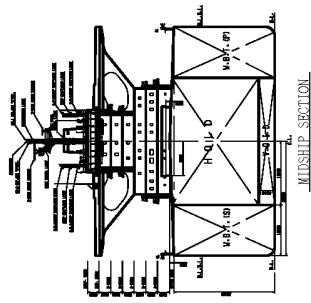
have been arranged in the engine room and tope side wing tanks.

The vessel has been deployed in the transport of iron ore under a long-term charter contract with Hyundai Steel. Hyundai Steel expects that 30 million tonnes of iron ore will be transported around the world over the next 20 years. It is expected that with the optimised features of this vessel that it will be able to save the shipowner costs in operation.

### TECHNICAL PARTICULARS

Length oa: ..... 330.07m  
 Length bp: ..... 321.00m  
 Breadth moulded: ..... 57.00m  
 Depth moulded  
 To main deck: ..... 25.10m  
 To upper deck: ..... 25.10m  
 Width of double skin  
 Side: ..... 31.68m  
 Bottom: ..... 4.00m  
 Draught  
 Scantling: ..... 18.00m  
 Design: ..... 18.00m  
 Gross: ..... 133,647gt  
 Displacement: ..... 285,100tonnes  
 Deadweight  
 Scantling: ..... 250,000dwt  
 Block co-efficient: ..... 0.8424  
 Speed, service: ..... 14.95knots  
 Cargo capacity: ..... 169,455m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 7,142m<sup>3</sup>  
 Diesel oil: ..... 443m<sup>3</sup>  
 Water ballast: ..... 155,083m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 72.7tonnes/day  
 Auxiliaries: ..... 7tonnes/day  
 Classification society and notations: ..... KR, +KRS1-Ore Carrier 'ESP', IWS, Grab, ENV (IBWM, IAFS, IOPP, ISPP, IGPP, IAPP), PSPC, CHA, L1, +KRM1-UMA, STCM. DNV (leading class), +1A1, Ore Carrier, ESP, ES (O), 1B-3, E0, BIS, TMON, BWM-E(s), COAT-PSPC (B) NAUTICUS (Newbuilding), NAUT-OC  
 Main engine  
 Design: ..... Hyundai-Wärtsilä  
 Model: ..... 6RT-flex82T  
 Manufacturer: ..... Hyundai  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 23,000kW x 78rpm  
 Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: Hyundai Heavy Industries Co., Ltd  
 Fixed/controllable pitch: ..... Fixed

Diameter: ..... 9.8m  
 Speed: ..... 78rpm  
 Diesel-driven alternators  
 Engine make/type: ..... Hyundai HIMSEN 6H21/32  
 Type of fuel: ..... HFO, MDO, MGO  
 Output/speed of each set: ..... 1,100kW x 900rpm  
 Alternator make/type: ..... Hyundai/HJ 564-84K  
 Output/speed of each set: ..... 1,000kW x 900rpm  
 Exhaust gas scrubbing equipment  
 Manufacturer: ..... Kangrim  
 Type: .. Forced circulating, surface extended, water tube  
 On main engine: ..... Yes  
 Boilers  
 Type: ..... Kangrim Automatic, forced draft, HFO, burning, marine boiler  
 Output, each boiler: ..... 2,500kg/h  
 Cargo cranes/cargo gear  
 Make: ..... Oriental Precision & Engineering Co., Ltd  
 Type: ..... Electro hydraulically driven  
 Performance: ..... hoisting capacity: 10/4tonnes  
 Mooring equipment  
 Make: ..... Rolls-Royce/Electro-hydraulic  
 Special lifesaving equipment  
 Number or each and capacity: ..... 1 x 25 persons  
 Make: ..... Hyundai lifeboats Co., Ltd  
 Type: ..... Totally enclosed & free-fall launching type  
 Hatch covers  
 Design: ..... SMS/Hyundai Samho Heavy Industries Co., Ltd  
 Type: ..... Side rolling  
 Cargo tanks  
 Number: ..... 5  
 Grades of cargo carried: ..... Ore  
 Ballast control system  
 Make: ..... Ace Valve Co., Ltd  
 Complement  
 Officers: ..... 10  
 Crew: ..... 15  
 Stern appendages/special rudders: ..... Semi-spade type  
 Bridge control system  
 Make: ..... HHI-EES  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... B-I Industrial Co., Ltd/BDS-4000  
 Fire extinguishing systems  
 Cargo holds: ..... Fain/ seawater  
 Engine room: ..... NK/ High expansion foam/seawater  
 Radars  
 Make: ..... JRC/JMA-9132-SA, JMA-9122-6XA  
 Contract date: ..... 22 December 2010  
 Launch/float-out date: ..... 1 June 2012  
 Delivery date: ..... 12 September 2012







# LOG-IN TAMBAQUI: tailor-made ore carrier for Brazil

Shipbuilder: ..... **Estalério Ilha S.A (EISA)**  
 Vessel's name: ..... **LOG-IN Tambaqui**  
 Hull No: ..... **EI-509**  
 Owner/operator: **LOG-IN Logística Intermodal**  
 Country: ..... **Brazil**  
 Designer: ..... **Projemar S.A**  
 Country: ..... **Brazil**  
 Model test establishment used: ..... **Marintek**  
 Flag: ..... **Brazil**  
 IMO number: ..... **9555785**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **1**

*LOG-IN Tambaqui* is a tailor made ore carrier design that was developed for the Brazilian owner LOGIN to operate on a fixed trade for bauxite in the northern region of Brazil between the port of Trombetas located on the Trombetas River, a tributary of the Amazon River, and the port of Vila do Conde known as the Monkey Route. The vessel was constructed at Estalério Ilha S.A (EISA) and delivered at the end of 2012.

The ship's basic design concept was specifically developed taking into account the characteristics of the intended operational region, in particular sailing on the narrow Trombetas River and the loading and unloading ports. For this the cargo hold's structure design and the ballast system design allows for optimised loading and unloading sequences in Single-Pour / Single-Pass operations.

*Log-In Tambaqui* is fitted with two inclined longitudinal bulkheads and five transverse corrugated bulkheads with upper and lower stools, dividing the cargo region in six cargo holds and six pairs of wing ballast tanks. Cargo holds are fitted with hydraulically operated side-rolling hatch covers of two panels each and strengthened for regular discharge by heavy grabs.

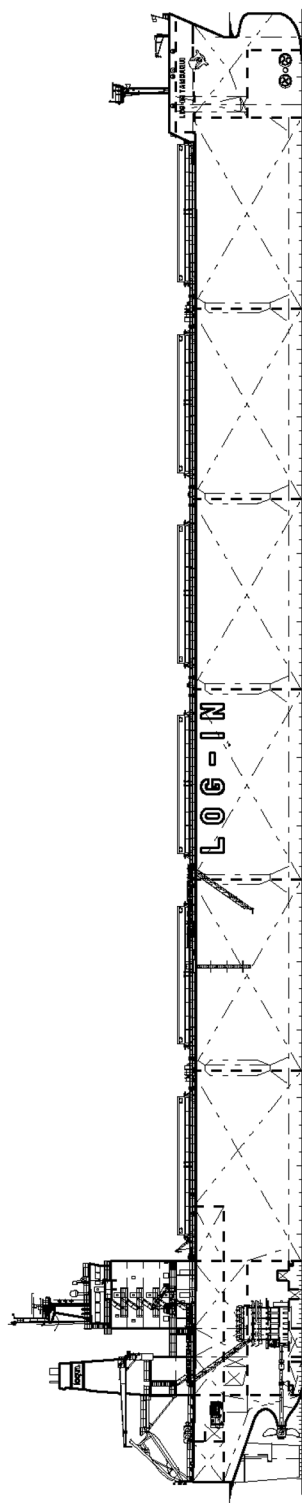
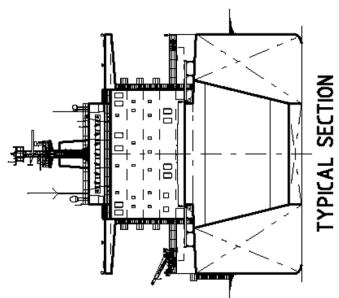
The propulsion installation is arranged with a two stroke main engine direct coupled to a controllable pitch propeller, given a service speed of 14.0 knots at 90% MCR. In order to allow good manoeuvrability on the rivers and restricted manoeuvring basins, the vessel is equipped with a fishing tail rudder and two bow thrusters. Electrical supply is provided by four 520 kW diesel generators each.

## TECHNICAL PARTICULARS

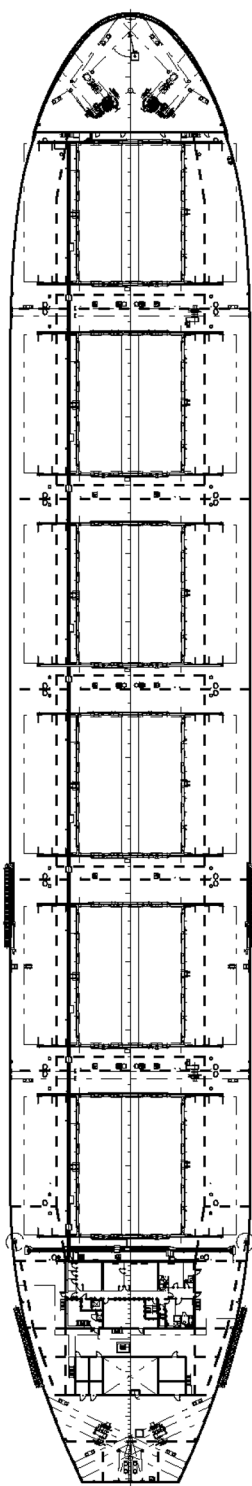
Length oa: ..... 245.00m  
 Length bp: ..... 237.00m  
 Breath moulded: ..... 40.00m  
 Depth moulded  
 To main deck: ..... 17.60m

Draught  
 Scantling: ..... 12.08m  
 Design: ..... 11.58m  
 Gross: ..... 48,258gt  
 Deadweight  
 Design: ..... 78,214dwt  
 Scantling: ..... 82,689dwt  
 Block co-efficient: ..... 0.83  
 Speed, service: ..... 14knots  
 Cargo capacity  
 Ore: ..... 63,235m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 1,844m<sup>3</sup>  
 Diesel oil: ..... 250m<sup>3</sup>  
 Water ballast: ..... 63,556m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 35tonnes/day  
 Classification society and notations: ..... LR 100A1  
 Ore Carrier, ESP, ShipRight (SDA, FDA, CM, ACS(B)) \*IWS, LI, " LMC, UMS" with descriptive notes, "Holds 1 to 6 strengthened for Regular Discharge by Heavy Grabs, Single-Pass Loading Capability as per Approved Loading Sequence, ShipRight (BWMP (S), SCM, ShipRight ES+1 (Bottom and Bilge)), pt higher tensile steel"  
 Main engine  
 Design: ..... Wärtsilä Switzerland Ltd  
 Model: ..... 6RT-flex 50-B  
 Manufacturer: ..... Hyundai Heavy Industries  
 Number: ..... 1  
 Type of fuel: ..... HFO  
 Output of each engine: ..... 9,960kW  
 Propellers  
 Material: ..... Cu-Ni-Al  
 Designer/manufacturer: ..... Wärtsilä Netherlands B.V  
 Number: ..... 1  
 Fixed/controllable pitch: ..... Controllable  
 Diameter: ..... 6.1m  
 Speed: ..... 124rpm  
 Diesel-driven alternators  
 Number: ..... 4  
 Engine make/type: ..... Wärtsilä  
 Type of fuel: ..... HFO/MDO  
 Output/speed of each set: ..... 520kW x 900rpm  
 Alternator make/type: ..... Wärtsilä/ Auxpac 520W4L20  
 Output/speed of each set: ..... 650kVA x 900rpm  
 Boilers  
 Number: ..... 1  
 Type: ..... Composite  
 Make: ..... Aalborg

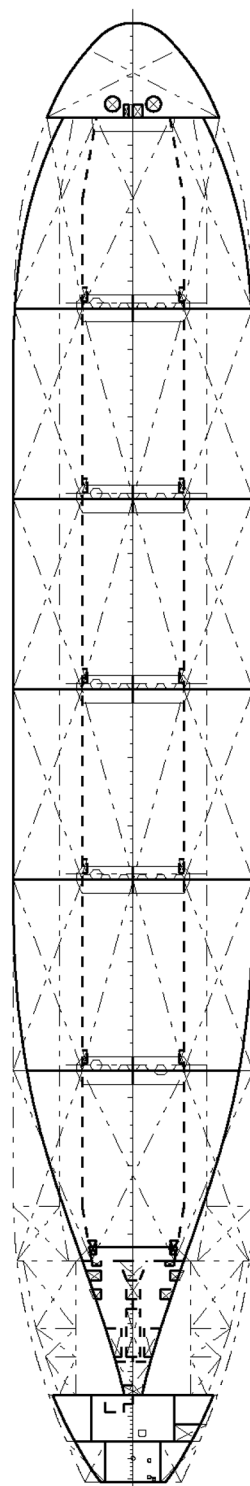
Output, each boiler: ..... 2,900kg/h x7bar  
 Other cranes  
 Number: ..... 2  
 Make: ..... Acta  
 Type: ..... HSC 60-40-15  
 Tasks: ..... Provisions  
 Performance: ..... 4tonnes x 15m  
 Mooring equipment  
 Number: ..... 2  
 Make: ..... TTS Kocks  
 Type: ..... E-Anchor windlass RW W1  
 Special lifesaving equipment  
 Number or each and capacity: ..... 1 x 40persons  
 Make: ..... Norsafe  
 Type: ..... Freefall lifeboat  
 Hatch covers  
 Design: ..... TTC Dry Cargo Handling  
 Manufacturer: ..... EISA  
 Type: ..... Upper deck  
 Cargo control system  
 Make: ..... Interschalt Maritime Systems AG  
 Type: ..... Seacos MACS3  
 Ballast control system  
 Make: ..... Hoppe Bordmesstechnik GmbH  
 Type: ..... Pneumatic  
 Complement  
 Officers: ..... 8  
 Crew: ..... 12  
 Stern appendages/special rudders: ..... Fishing tail rudder  
 Bow thruster  
 Make: ..... Wärtsilä  
 Number: ..... 2  
 Output: ..... 740kN x 1,785rpm  
 Bridge control system  
 Make: ..... SAM Electronics  
 Type: ..... Nacos Platinum  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salwico Fire Alarm  
 Fire extinguishing systems  
 Engine room: ..... Minimax/ Novoc MX 1230  
 Radars  
 Number: ..... 3  
 Make: ..... SAM Electronics  
 Model: ..... S-Band/ X-Band/ Riveradar JMA-610  
 Integrated bridge system  
 Make: ..... SAM Electronics  
 Model: ..... Nacos Platinum  
 Waste disposal plant  
 Incinerator: ..... Atlas/ Atlas 600 SL  
 Sewage plant: ..... Hamworthy/ T0406027 A  
 Contract date: ..... 13 July 2009  
 Launch/float-out date: ..... 11 October 2011  
 Delivery date: ..... December 2012



PROFILE



MAIN DECK



DOUBLE BOTTOM TOP





# MERI: multipurpose deck cargo vessel

Shipbuilder: ..... **STX Finland Turku Shipyard**  
 Vessel's name: ..... **Meri**  
 Hull No: ..... **1379**  
 Owner/operator: ..... **Oy Gaiamare Ab**  
 Country: ..... **Finland**  
 Designer: ..... **STX Finland Turku Shipyard**  
 Country: ..... **Finland**  
 Model test establishment used: ..... **Aker Arctic**  
 Flag: ..... **Finland**  
 IMO number: ..... **9622502**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **nil**

**M**ERI has been constructed as a multifunctional, ice classed open deck carrier intended for transporting demanding project cargo, such as offshore wind farm structures as well as containers and bulk cargo such as wood for energy in the Baltic Sea region and during harsh winters it will run on biofuel. The vessel is owned by Finnish operator Oy Gaiamare Ab and has been constructed as a one-off design that was delivered in June by STX Finland.

The Aker Arctic (Double Acting Ship) DASTM vessel, the first dry cargo of its type with this system, is able to operate bow and stern ahead in ice conditions that reflect to Finnish-Swedish Ice Class 1A notation. The dynamic positioning system (DP) and the azimuthing thruster propulsion allow the vessel to provide safe transportation of all types of cargoes.

For the carriage of wood cargoes a full set of removable rails are installed around the cargo deck to give a provisional "bulwark" around the same. The Aker Arctic DASTM ship has high ice class notation and Finnish-Swedish Ice Class 1A. For operation in DASTM mode the ship is equipped with a full set of navigation systems looking aft over the cargo deck.

The vessel is equipped with diesel electric machinery and with an electric propulsion system consisting of two converter controlled electric motors, each driving an azimuthing propulsion unit. The main diesel generators can be driven by marine diesel oils and liquid biofuels (LBF). Two electrically driven thruster units are mounted in the fore ship to provide safe manoeuvring in all conditions. Meri is powered by two four-stroke 6R32 diesel engines. Each engine can produce maximum continuous power of 2,220kW.

The machinery and fuel systems are designed for minimised environmental impact and low emissions. The main engines can be operated with diesel oil or heavy fuel oil or with bio fuels. However, the fuel system has been simplified so that it is uses the minimum amount of components and tanks. This simplification has been achieved because only one type of fuel is normally stored onboard for the main engines, depending on the ship service area and bio fuel availability. The second reason for use of only one type of fuel at same time is that bio fuel can not be mixed with HFO.

The design of the ballast tank arrangement takes into account possible year round work in oil recovery missions. Six ballast tanks with heating with a total capacity of 2,700m<sup>3</sup> can be used for the storage of recovered oil. The open deck is equipped with container fixing points of flush type for securing 80 units of 20ft standard containers. For these adequate local reinforcements are built in the main deck structure for container fixing points, D-rings and other cargo lashing fittings.

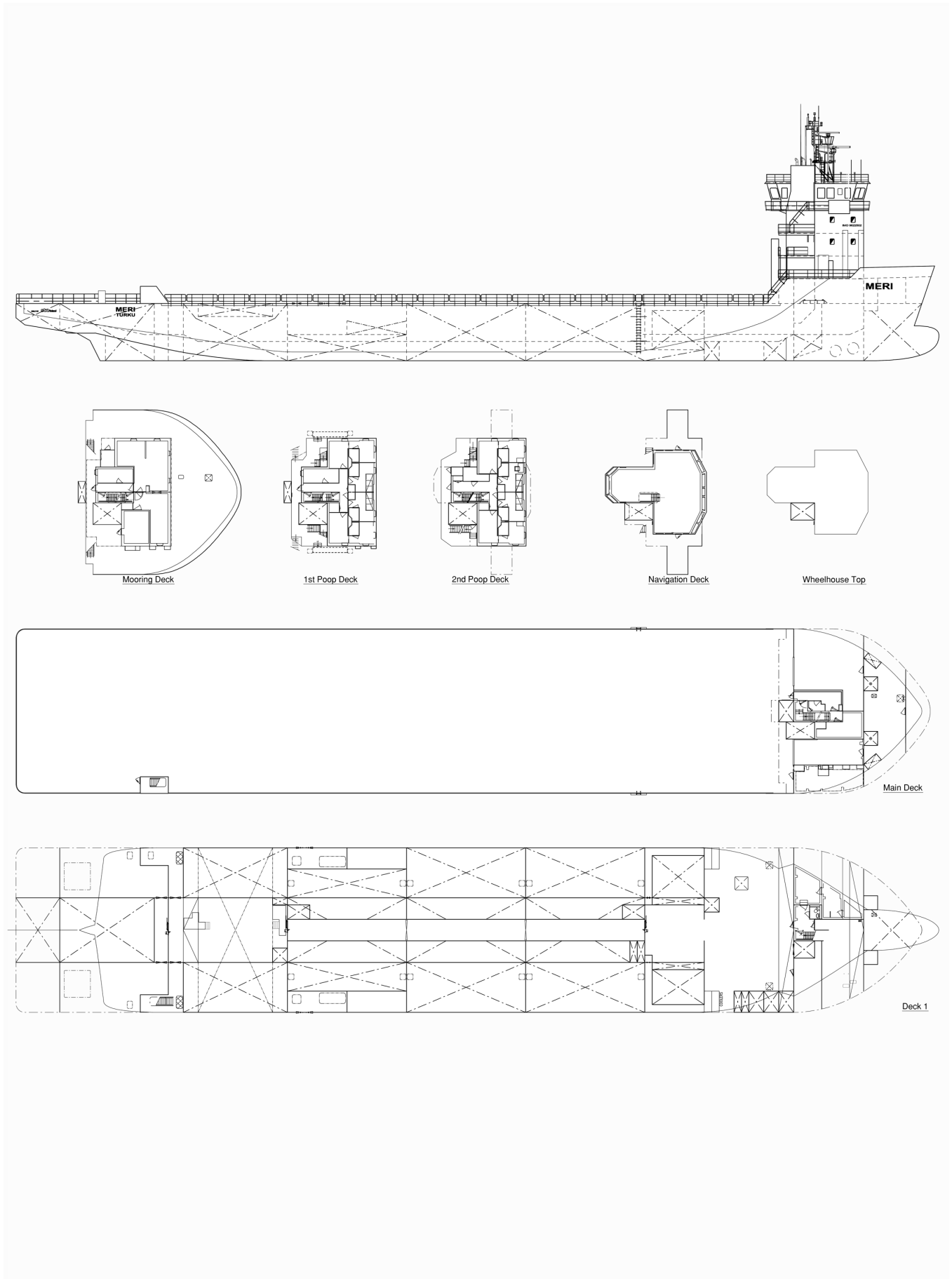
Meri is equipped with the Navis DP1 class system, meeting Bureau Veritas DYNAPOS AM/AT class notation requirements. The NavDP4000 is a Navis' DP systems, which combines elements of the previous version, Navis IVCS, with latest technology developments. The system is based on touch-screen operation, allowing fast access to all system functions and fewer buttons on the main control panel.

It features a new intelligent and flexible power management system, providing high speed dynamic positioning reaction to switching-on external power consumers. This protects the user from power blackout failure and reduces power consumption. One of the other key features of Navis' DP systems is the Thrust Ability Diagram, which in real-time mode shows all possible combinations of control forces in the surge and sway axes for a given value of the rotational control moment and thruster availability and/or allowed power load.

## TECHNICAL PARTICULARS

Length oa: ..... 105.4m  
 Length bp: ..... 95.6m  
 Breadth moulded: ..... 18.8m  
 Depth moulded  
 To main deck: ..... 6.55m  
 Draught  
 Design: ..... 4.0m  
 Draught, at design waterline: ..... 4.0 m  
 Draught, bow & stern first ice operation: ..... 4.7 m  
 Draught, ballast: ..... 3.25 m  
 Gross: 3,360gt  
 Deadweight  
 Design: ..... 3,200dwt  
 Speed, service: ..... 12.5knots  
 Bunkers  
 Heavy oil: ..... 262m<sup>3</sup>  
 Diesel oil: ..... 48m<sup>3</sup>  
 Water ballast: ..... 5,791.6m<sup>3</sup>  
 Classification society and notations: ..... Bureau Veritas  
 Hull \* Mach, Deck Ship, General cargo ship,  
 Unrestricted Navigation, heavycargo  
 [MAIN DECK Frames #9+200 mm  
 to #95, 78.48 kN/m<sup>2</sup>], ICE CLASS 1 A,  
 AUT-UMS, DYNAPOS AM/AT; Equipped  
 for Carriage of Containers, preparations for  
 additional class notation: "Oil Recovery Ship"  
 Main engines  
 Design: ..... Wärtsilä Finland Oy  
 Model: ..... Wärtsilä 6L20  
 Manufacturer: ..... Wärtsilä Finland Oy

Number: ..... 3  
 Type of fuel: ..... HFO/LBF  
 Output of each engine: ..... 1,200kW x 1,000rpm  
 Azimuthing thrusters  
 Designer/manufacturer: ..... Schottel  
 Number: ..... 2  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 2.6m  
 Speed: ..... 230rpm  
 Main-engine driven alternators  
 Number: ..... 3  
 Make/type: ..... AEM Dessau GmbH SE 500L6  
 Output/speed of each set: ..... 1,200kW x 1,000rpm  
 Boilers  
 Number: ..... 1  
 Type: ..... E1134  
 Make: ..... Pyro AS  
 Output, each boiler: ..... 1,162kW  
 Mooring equipment  
 Number: ..... 2 x anchor windlasses/mooring winches,  
 1 x mooring winch aft, 1 x mooring capstan  
 Make: Ships Equipment Centre Groningen BV  
 Type: ..... electric  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 x 26 persons  
 Make: ..... Jiangyn Wolong FRP Boat Co., Ltd  
 Type: ..... JY50CA  
 Containers  
 Total TEU capacity: ..... 80 x 20ft  
 On deck: ..... 80  
 Bow thrusters  
 Make: ..... Schottel  
 Number: ..... 2  
 Output: ..... 450kW  
 Bridge control system  
 Make: ..... Consilium  
 Type: ..... Consilium Selesmar ECCDIS  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Cargo fire alarm system  
 Fire extinguishing systems  
 Engine room: ..... Novenco/ water mist sprinkler  
 Radars  
 Number: ..... 2  
 Make: ..... Consilium  
 Model: ..... Selesmar Selux-ST Arpa  
 Integrated bridge system  
 Make: ..... Consilium  
 Model: ..... Selesmar ECCDIS  
 Waste disposal plant  
 Sewage plant: ..... Evac/MBR  
 Contract date: ..... 23 March 2011  
 Launch/float-out date: ..... 1 March 2012  
 Delivery date: ..... 13 June 2012







# MSC ALTAMIRA: modern 8,900TEU box ship from Hyundai Samho

Shipbuilder: ..... **Hyundai Samho Heavy Industries Co., Ltd**  
 Vessel's name: ..... **MSC Altamira**  
 Hull No: ..... **S592**  
 Owner/operator: ..... **Ofer Ships Holding Ltd/ Bernhard Schulte**  
 Country: ..... **Israel**  
 Designer: ..... **Hyundai Samho Heavy Industries Co., Ltd**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **Hyundai Maritime Research Institute (HMRI)**  
 Flag: ..... **Hong Kong**  
 IMO number: ..... **9619426**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **4**

Breadth moulded: ..... 48.20m  
 Depth moulded  
 To main deck: ..... 24.80m  
 To upper deck: ..... 24.80m  
 To other decks: ..... 20.14m  
 Width of double skin  
 Side: ..... 48.20m  
 Bottom: ..... 2.00m  
 Draught  
 Scantling: ..... 14.50m  
 Design: ..... 12.50m  
 Gross: ..... 94,017gt  
 Displacement: ..... 143,761tonnes  
 Lightweight: ..... 31,245tonnes  
 Deadweight  
 Design: ..... 88,997dwt  
 Scantling: ..... 112,516dwt  
 Block co-efficient: ..... 0.6996  
 Speed, service: ..... 22knots  
 Bunkers  
 Heavy oil: ..... 9003.1m<sup>3</sup>  
 Diesel oil: ..... 485.4m<sup>3</sup>  
 Water ballast: ..... 28,465m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 159.7tonnes/day  
 Auxiliaries: ..... 3.9tonnes/day  
 Classification society and notations: ...KR, +KRS1-Container Ship, IWS, Sea Trust (DSA2, FSA3 and HCM), CDG, ENV (IBWM, IAFS, IOPP, ISPP, IGPP and IAPP), PSPC, LI, CHA + KRM1-UMA, STCM  
 Heel control equipment: ..... Anti-heeling pump  
 Main engine  
 Model: ..... 9S90ME-C8.2  
 Manufacturer: ..... HHI-EMD  
 Number: ..... 1  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 47,430kW x 78rpm  
 Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... HHI-EMD  
 Number: ..... 1  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 9.5m  
 Speed: ..... 76.1rpm  
 Diesel-driven alternators  
 Number: ..... 4  
 Engine make/type: ..... HHI-EMD/7H23/40  
 Type of fuel: ..... HFO, MDO  
 Output/speed of each set: ..... 3,500kW x 720rpm  
 Alternator make/type: ..... HHI-EES/ HJ 807-10P  
 Output/speed of each set: ..... 3,360kW  
 Boilers  
 Number: ..... 1  
 Type: ..... Pin tube type, oil fired buring  
 Make: ..... Kangrim  
 Output, each boiler: ..... 5,500kg/h  
 Other cranes  
 Number: ..... Monorail crane  
 Make: ..... Dongham Marine Crane  
 Type: ..... Electric motor driven sliding type  
 Tasks: ..... Engine room service  
 Performance: ..... SWL 10tonnes

Mooring equipment  
 Number: ..... 2 x Windlasses, 7 x winches  
 Make: ..... Towimor  
 Type: ..... Electric hydraulic and electric driven  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 x 30 persons, 2 x 6 persons, 4 x 16 persons  
 Make: ..... Schat-Harding , Viking Life Saving  
 Type: ..... Lifeboat: totally enclosed, Liferaft: throw over type  
 Hatch covers  
 Design: ..... Cargotec  
 Manufacturer: ..... Marine Tech Inc  
 Type: ..... Pontoon, non-sequential operation  
 Containers  
 Lengths: ..... 20ft/40ft/45ft  
 Heights: ..... 8ft 6inches/ 9ft 6inches  
 Total TEU capacity: ..... 8,886TEU  
 On deck: ..... 5,056TEU  
 In holds: ..... 3,830TEU  
 Homogenously loaded to 14tonnes: ..... 7,260TEU  
 Reefer plugs: ..... 1,000FEU  
 Tiers/rows  
 On deck: ..... 10 tiers/19 rows  
 In holds: ..... 9 tiers/ 17 rows  
 Ballast control system  
 Make: ..... Pleiger Far East  
 Type: ..... Electro hydraulic type  
 Water ballast treatment system  
 Make: ..... Alfa Laval  
 Capacity: ..... 1,000m<sup>3</sup>/h  
 Complement  
 Officers: ..... 11  
 Crew: ..... 16  
 Stern appendages/special rudders: ..... Semi-balance stream line  
 Bow thruster  
 Make: ..... Hyundai Heavy Industries Co., Ltd  
 Number: ..... 1  
 Output: ..... 3,000kW  
 Bridge control system  
 Make: ..... Hyundai Heavy Industries Co., Ltd  
 Type: ..... Self standing  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... NK  
 Type: ..... Smoke detecting type  
 Fire extinguishing systems  
 Cargo holds: ..... NK/ CO<sub>2</sub>  
 Engine room: ..... NK/ CO<sub>2</sub>  
 Cabins: ..... Sea water  
 Public spaces: ..... Sea water  
 Radars  
 Number: ..... 2  
 Make: ..... JRC  
 Model: ..... JMA-9132-SA, JMA-9122-6XA  
 Waste disposal plant  
 Sewage plant: ..... Jonghap Machinery Co., Ltd/ Biological  
 Contract date: ..... 1 February 2011  
 Launch/float-out date: ..... 27 July 2012  
 Delivery date: ..... 28 September 2012

## TECHNICAL PARTICULARS

Length oa: ..... 299.18m  
 Length bp: ..... 286.00m







# MSC ATHENS: green containership with EEDI

Shipbuilder: ..... **Sungdong Shipbuilding & Marine Engineering Co., Ltd**  
 Vessel's name: ..... **MSC Athens**  
 Hull No: ..... **S4010**  
 Owner/operator: ..... **Costamare Inc**  
 Country: ..... **Greece**  
 Designer: ..... **Sungdong Shipbuilding & Marine Engineering Co., Ltd**  
 Country: ..... **Korea**  
 Model test establishment: ..... **Korea Institute of Ocean Science & Technology (KIOST)**  
 Flag: ..... **Greece**  
 IMO number: ..... **9618305**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **5**

*MSC Athens* is the first vessel of six 'eco-friendly' sister ships constructed by Sungdong Shipbuilding & Marine Engineering for its owner Costamare in Greece. The main features of the vessel are that it has been designed with fuel efficiency and vessel safety in mind.

Costamare originally wanted to build a pair of 8,800TEU Containerships in late 2010, where in January 2011 they placed an order with Sungdong Shipbuilding & Marine Engineering for the construction of six vessels, which will be chartered to MSC.

*MSC Athens* has been designed with a wide beam to optimise the hull performance and stability during sailing for worldwide service. Also, the vessel meets Energy Efficiency Design Index (EEDI) regulation 5, 6, 7, 8 and 9 of MARPOL Annex VI resolution MEPC.214(63).

The vessel has been constructed with a double skinned construction in way of the cargo hold. Also the bow thruster room is fitted with a double bottom structure. The fore peak tank is also divided into three parts along with the engine room which is divided into two parts.

*MSC Athens* has been designed to give a highly economic performance. The vessel is fitted with a MAN B&W 9S90ME-C8.2 main engine that meets with the Tier II IMO regulations. The engine develops 47,430kW MCR at 78.0rpm, to give a service speed at NCR(40,316kW at 73.9rpm) and allowing a 15% sea margin of 22knots at scantling draught, which is designed to optimise daily fuel oil consumption.

The bridge has also been designed in compliance with the GL rules for Bridge Design on Seagoing ships, One-Man Console at Ocean area.

This vessel has been arranged with eight cargo holds and has 17 hatches with lift-away type steel hatch covers manufactured by MacGregor. The vessel has been equipped to load nine tiers of containers by 17 rows in the hold and eight/nine tiers by 19 rows on the deck. The hatch covers have three panels except for hatch cover No.1 which has two panels.

The total TEU capacity is 8,770TEU, of which 4,890TEU on deck and 3,880TEU in the hold with 1,462FEU reefer containers (1,272FEU on deck/hatch covers and 190FEU in the hold). Homogeneously

loaded to 14tonnes, total intake is about 7,080TEU at scantling draught.

High cube containers of three tiers can be stowed in the cargo hold at random positions.

Dangerous goods of classes 1, 2, 3, 4, 5.1, 6.1, 8 and 9 can be transported in closed containers in No.1 hold (excluding goods containing hydrogen, a hydrogen mixture) and classes 2, 3, 4, 5.1, 6.1, 8 and 9 in closed containers in No.2, 3, 4 and 6 holds (excluding goods containing hydrogen, hydrogen mixture) and classes 1, 2, 3, 4, 5.1, 6.1, 8 and 9 in closed containers on all hatch cover except engine room above.

The heavy fuel oil tank is divided into seven parts at near mid-ship with one of the parts designed to carry low-sulphur fuel. No.5 of side water ballast tank (P&S) has been designed to be used as anti-heeling tank. The passageway from engine room to forward cargo hold space has been arranged below the upper deck at both sides of the vessel.

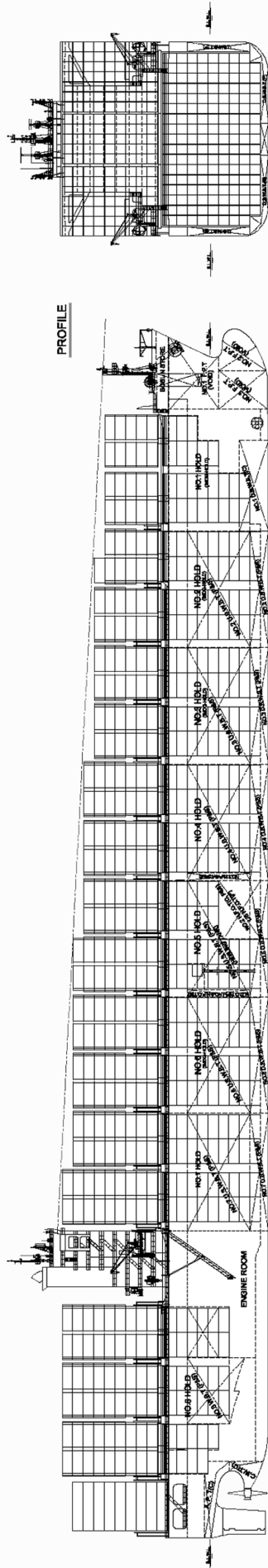
The vessel has a fixed pitch six bladed propeller that was designed by Sungdong Shipbuilding & Marine Engineering and manufactured by the Mecklenburger Metallguß GmbH (MMG) with particular attention paid to the reduction of cavitation. A full spade flap rudder system has been installed and a 3,000kW thruster that has been supplied by Kawasaki, has been installed at the bow.

The electrical systems onboard are served by four generators manufactured by STX installed as two sets which are the 8L 32/40H have a power output of 4,000kW each and the other pair is the 9L32/40H with a power output of 4,500kW each.

## TECHNICAL PARTICULARS

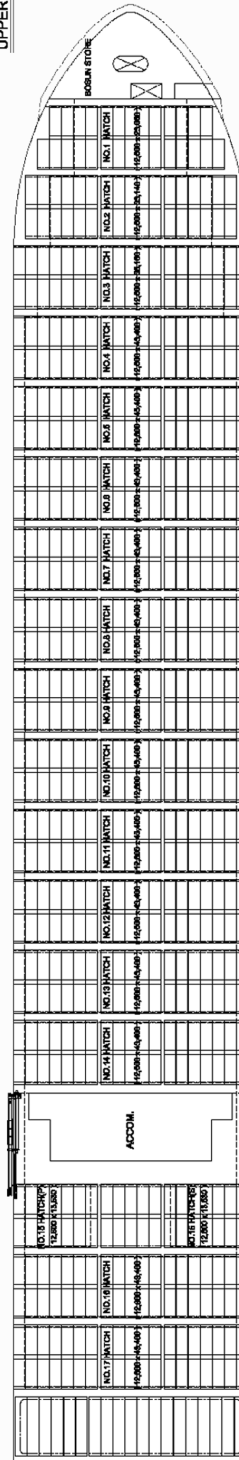
Length oa: ..... 299.95m  
 Length bp: ..... 288.5m  
 Breadth moulded: ..... 48.2m  
 Depth moulded  
 To main deck: ..... 20.14m  
 To upper deck: ..... 24.6m  
 Width of double skin  
 Side: ..... 2.4m  
 Bottom: ..... 2.0m  
 Draught  
 Scantling: ..... 14.5m  
 Design: ..... 12.5m  
 Deadweight  
 Design: ..... 86,375dwt  
 Scantling: ..... 110,875dwt  
 Speed, service: ..... 22knots  
 Bunkers  
 Heavy oil: ..... 8,300m<sup>3</sup>  
 Diesel oil: ..... 800m<sup>3</sup>  
 Water ballast: ..... 30,000m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 160tonnes/day  
 Classification society and notations: ..... GL + 100 A5, Container Ship, DG, IW, BWM, RSD(F25), \_MC, AUT, NAV-O, EP  
 Main engine  
 Design: ..... MAN B&W

Model: ..... 9S90ME-C 8.2(TierII)  
 Manufacturer: ..... HHI  
 Type of fuel used: ..... HFO, MDO, MGO  
 Output of each engine: ..... 47,430kW  
 Propellers  
 Material: ..... Cu-Al-Ni  
 Designer/manufacturer: ..... Sungdong/MMG  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 9.7m  
 Speed: ..... 78rpm  
 Diesel-driven alternators  
 Engine make/type: ..... STX 8L 32 40H  
 STX 9L 32 40H  
 Type of fuel: ..... HFO, MDO, MGO  
 Output/speed of each set: ..... 4,000kW x 720rpm  
 4,500kW x 720rpm  
 Alternator make/type: ..... HHI  
 Output/speed of each set: ..... 5,146.7kVA x 720rpm  
 5,800kVA x 720rpm  
 Auxiliary boiler  
 Type: ..... Missiontm OL/ Missiontm XS-2V  
 Make: ..... Alfa Laval Aalborg  
 Output, each boiler: ..... 5,000kg/h/ 3,000kg/h  
 Other cranes  
 Make: ..... Oriental  
 Type: ..... Over-head crane  
 Tasks: ..... For moving the heavy spare or overhauling in the engine room  
 Performance: ..... 10tonnes x 6.455m  
 Other cranes  
 Make: ..... Oriental  
 Type: ..... Monorail crane  
 Tasks: ..... Provisions  
 Performance: ..... 12.5tonnes x 5m  
 Mooring equipment  
 Make: ..... Rolls-Royce  
 Type: ..... Electric pole change type  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 x 31persons  
 Make: ..... Norsafe  
 Type: ..... Totally enclosed lifeboat  
 Hatch covers  
 Design/Manufacturer: ..... MacGregor  
 Type: ..... Life away type  
 Containers  
 Lengths: ..... 20ft/40ft/45ft  
 Heights: ..... 8.6ft  
 Cell guides: ..... 150mm x 150mm x 15.0E.A  
 Total TEU capacity: ..... 8,770TEU  
 On deck: ..... 4,890TEU  
 In holds: ..... 3,880TEU  
 Homogeneously loaded to 14tonnes: ..... 7,080TEU  
 Reefer plugs: ..... 1,462FEU  
 Tiers/rows  
 On deck: ..... 10/19  
 In holds: ..... 9/17  
 Hold refrigeration system: ..... Air cooled  
 Cargo control system  
 Make: ..... Kongsberg K-Chief 600  
 Type: ..... Integrated control and monitoring system  
 Ballast control system  
 Make: ..... Kongsberg K-Chief 600  
 Type: ..... Integrated control and monitoring system  
 Water ballast treatment system  
 Make: ..... Techcross  
 Capacity: ..... 1,000m<sup>3</sup>/h  
 Complement  
 Officers: ..... 16  
 Crew: ..... 15  
 Stern appendages/special rudders: .. Full spade flap rudder  
 Bow thruster  
 Make: ..... Kawasaki  
 Output: ..... 3,000kW x 900rpm  
 Bridge control system  
 Make: ..... HHI  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Addressable  
 Fire extinguishing system  
 Cargo holds: ..... Sea-plus/High pressure CO<sub>2</sub>  
 Engine room: ..... Tanktech/L.F.F.S  
 Radars  
 Make: ..... Furuno  
 Model: ..... FAR-2827, FAR-2837S, FAR-2817  
 Waste disposal plant  
 Incinerator: ..... Kangrim/KFB-110S  
 Sewage plant: ..... Hamworthy/ST2AC  
 Contract date: ..... 28 January 2011  
 Launch/float-out date: ..... November 2012  
 Delivery date: ..... December 2012

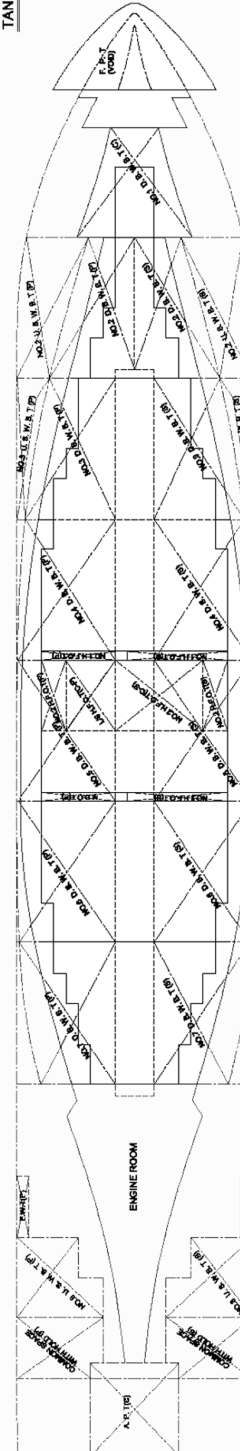


**MIDSHIP SECTION**

**UPPER DECK**



**TANK TOP**







# NEVA LEADER 1: self-propelled dry cargo vessel

Shipbuilder: ..... **Nevsky Shipbuilding-Shiprepair Plant**  
 Vessel's name: ..... **Neva Leader 1**  
 Hull No: ..... **401**  
 Owner/operator: ..... **North-Western Shipping Company, JSC**  
 Country: ..... **Russian Federation**  
 Designer: ..... **Marine Engineering Bureau**  
 Country: ..... **Ukraine**  
 Model test establishment used: ..... **Krylov Shipbuilding Research Institute**  
 Flag: ..... **Russia**  
 IMO number: ..... **9598816**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **10**

**N**eva Leader 1 is the first in a series of 12 vessels of the latest Volga-Don Max type dry cargo vessel that was delivered at the end of 2012 from Nevsky Shipbuilding & Shiprepair plant. The vessel was designed at the Marine Engineering Bureau under the RSD49 project.

The "Volga-Don Max" type vessels have the maximum possible dimensions to navigate the Volga-Don Canal. Vessels in this series will transport general cargo, bulk, timber, grain and large-sized cargoes, dangerous goods of 1.4S, 2, 3, 4, 5, 6.1, 8, 9 classes of IMDG Code and cargoes of category B of BC Code. Sailing regions are the Mediterranean, Caspian, Black, Baltic, White and North Seas, including voyages around Europe and to the Irish Sea in winter.

Neva Leader 1's main feature is that it has a large middle hold of 52m in length setting it apart from all other "Volga-Don Max" type projects designed by MEB. This hold allows the vessel to transport large-sized cargoes in direct voyages from Europe to the Caspian Sea. The vessel was designed for Russian Maritime Register of Shipping class notation of KM Ice2 R2 AUT1-C.

RSD49 project vessels' are the biggest ones among the dry cargo vessels that satisfy Volga-Don Canal dimensions. With a draught of 3.6m in the Volga-Don Canal the deadweight is limited to around 4520tonnes, maximum deadweight in the sea with draught of 4.60m is of 7,150tonnes. There overall length is 139.95m, overall breadth is 16.70m, breadth without side fenders is 16.50m and depth is 6.00m.

In total the vessel's cargo capacity is 10,920m<sup>3</sup>. All holds are box-shaped, smooth-wall, convenient for carrying out the freight works and placing a cargo without shifting. The cargo hold sizes are of 26.0x12.7x8.4 (hold No. 1), 52.00x12.7x8.4m (hold Nos. 2), 27.3x12.7x8.4 (hold No. 3). Cargo holds are equipped with sectional hatch covers of folding type of Cargotec with possibility of 100% opening.


Two medium-speed diesels (main engine) of 1200 kW each use heavy fuel oil with viscosity of IFO380. Heavy fuel stores are placed in deep-tanks in area of the ER fore bulkhead, separated from outside water by a double bottom and double sides. The vessel has an operational speed of 11.5knots. Movement and manoeuvrability of the vessel is provided by two fixed-pitch propellers in nozzles with diameter of 2.5m, two hanging balanced rudders and single bow thruster with capacity of 200kWt.

Modern computing design methods were used for the vessel's hydrodynamics that allowed naval architects to find an optimum combination of propulsion and rudder system elements and hull forms. The refined combination provides high running qualities of the vessel. It also provides a propulsion coefficient above 0.6 during sailing at full draught and maximum speed.

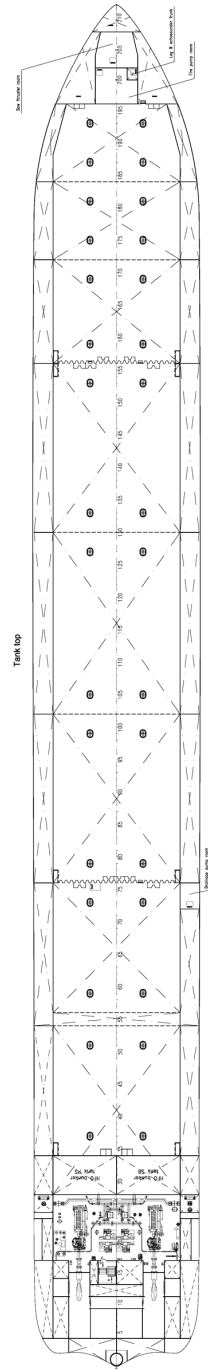
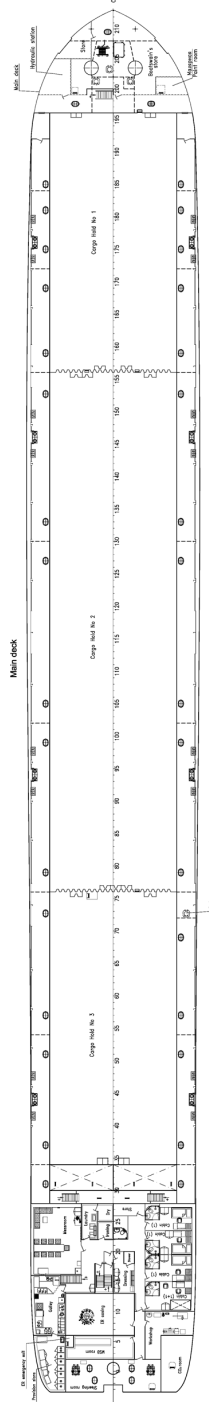
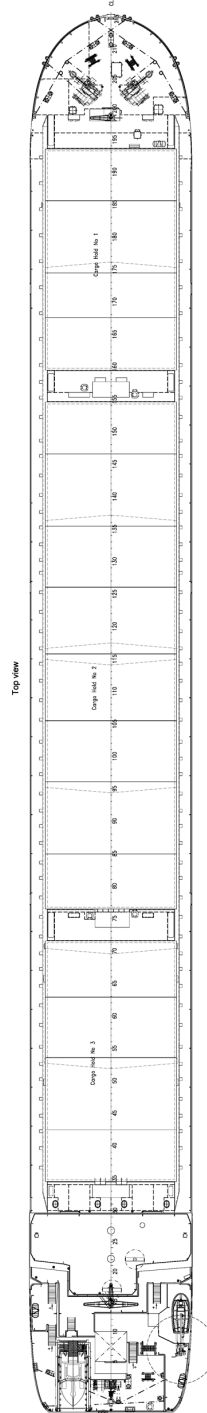
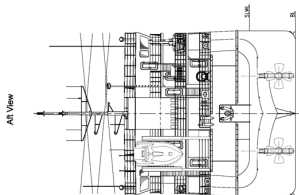
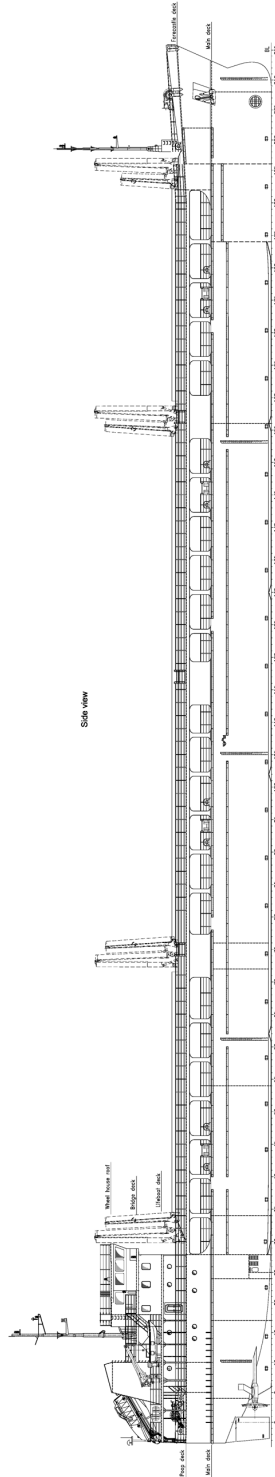
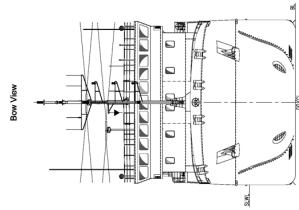
Towing and self-running test of vessel model were carried out to check project decisions and definitions of running qualities in big test pool at CRI named for academic A.N. Krylov. Tests carried out fully confirmed earlier received CFD simulation results.

Crew consists of 10 persons (12 places). Sanitary cabin and pilot cabin are foreseen on vessel. Designed vessel hull's life term is of 24 years. The double bottom is designed for distributed load intensity of 12tonnes per square meter, and also allows to use 16tonnes bucket grab.

## TECHNICAL PARTICULARS

Length oa: ..... 139.95m  
 Length bp: ..... 135.74m  
 Breadth moulded: ..... 16.5m  
 Depth moulded  
 To main deck: ..... 6.00m  
 Width of double skin  
 Side: ..... 1.9m  
 Bottom: ..... 9.8m  
 Draught  
 Design: ..... 4.7m (at sea), 3.6m (in river)  
 Block co-efficient: ..... 0.902  
 Speed, service: ..... 11.5knots  
 Cargo capacity  
 Bale: ..... 10,921m<sup>3</sup>  
 Diesel oil: ..... 75m<sup>3</sup>  
 Water ballast: ..... 3,959m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 8.0tonnes/day  
 Auxiliaries: ..... 0.5tonnes/day  
 Classification society and notations: ..... KM  Ice2 R2 AUT1-C  
 Main engine  
 Design: ..... Wärtsilä  
 Model: ..... 6L20  
 Manufacturer: ..... Wärtsilä

Number: ..... 2  
 Type of fuel: ..... HFO  
 Output of each engine: ..... 1,200kW x 1,000rpm  
 Gearboxes  
 Make: ..... Wärtsilä  
 Model: ..... WAF 863  
 Number: ..... 2  
 Output speed: ..... 247.6rpm  
 Propellers  
 Number: ..... 2  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 2.6m  
 Speed: ..... 247.6rpm  
 Special adaptations: ..... Ice class  
 Diesel-driven alternators  
 Number: ..... 2  
 Engine make/type: ..... MAN D 2876 LE 301  
 Type of fuel: ..... MDO  
 Output/speed of each set: ..... 345kW x 1,500rpm  
 Alternator make/type: ..... Mecc Alte ECO 40-2s/4  
 Output/speed of each set: ..... 292kW x 1,500rpm  
 Boilers  
 Number: ..... 1  
 Type: ..... UNEX CHB-750  
 Make: ..... Aalborg  
 Output, each boiler: ..... 750kg/h  
 Mooring equipment  
 Number: ..... 3 x anchor-mooring winch  
 Type: ..... Electro-hydraulic  
 Hatch covers  
 Design/manufacturer: ..... Cargotec  
 Type: ..... Multi-folding  
 Ballast control system  
 Make: ..... BESI Marine systems  
 Type: ..... Hydraulic system  
 Water ballast treatment system  
 Make: ..... Alfa Laval  
 Complement  
 Officers: ..... 3  
 Crew: ..... 7  
 Bow thruster  
 Make: ..... Schottel  
 Number: ..... 1  
 Output: ..... 200kW  
 Fire detection system  
 Make: ..... MRS Electronics  
 Type: ..... IICM-A addressable type  
 Fire extinguishing systems  
 Cargo holds: ..... Danfoss/CO<sub>2</sub>  
 Engine room: ..... Danfoss/CO<sub>2</sub>  
 Radars  
 Number: ..... 2  
 Make: ..... JRC  
 Model: ..... JMA-5312-6A RPA  
 Launch/float-out date: ..... 14 December 2012/ 20 May 2012  
 Delivery date: ..... 26 November 2012







# NIKOLAY ZUYEV: EEDI compliant tanker for Sovcomflot

Shipbuilder: ..... **Daewoo Shipbuilding and Marine Engineering Co., Ltd**  
 Vessel's name: ..... **Nikolay Zuyev**  
 Hull No: ..... **5384**  
 Owner/operator: ..... **Sovcomflot**  
 Country: ..... **Russian Federation**  
 Designer: ..... **Daewoo Shipbuilding and Marine Engineering Co., Ltd**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **SSPA + HSVA**  
 Flag: ..... **Liberia**  
 IMO number: ..... **9610781**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **nil**

**N**IKOLAY Zuyev the first in a series of two oil/chemical tankers built for Sovcomflot by Daewoo Shipbuilding & Marine Engineering and delivered in May to the Russian owner. The second vessel in the series *Georgy Maslov* was delivered later in 2012.

*Nikolay Zuyev* has a number of competitive technical advantages. In particular, the Energy Efficiency Design Index (EEDI) score of the new vessel is much lower than the basic level established for vessels of this class. The propulsion system enables the continued use of low sulphur (with a sulphur content of 0.1%) fuel. In conjunction with other measures, it makes the ship among the most environmentally friendly afloat. *Nikolay Zuyev* has a draught of 14.9m and increased beam of 46m allows the maximum possible cargo capacity when passing through the Baltic Straits and its dimensions meet the requirements for the seaborne transportation of hydrocarbons to the terminals of Primorsk and Ust-Luga.

The ship's cargo system allows the simultaneous carriage and pumping of three different types of fuels in 12 cargo tanks, including crude oil and dark-oil products. A special steering design is used to improve the propulsive efficiency and manoeuvrability of the vessel; the submerged part of the hull is coated with anti-fouling, low-friction paint; the ship has a weather routing optimisation system and a dynamic trim optimisation system has also been installed to give better energy efficiency. The navigation monitoring equipment will provide the optimal speed parameters, draught and trim of the vessel, depending on the cargo loaded and navigational conditions.

The ship has a continuous upper deck without forecastle, a raked stem with a bulbous bow, a transom stern with open water type stern frame, a flap rudder and a fixed pitch propeller directly driven by a MAN B&W 6S60MC-C8 engine with maximum rating of 13,350kW at 98.4rpm. The deadweight at the scantling draft of 14.9m is approx. 120,600tonnes.

The vessel can navigate at a speed of over 14.6knots at the designed draft with well optimised hull form and propeller design, which contributes to improved propulsion performance and lower fuel consumption in spite of its wide beam.

In addition, a Pre-Swirl Stator (PSS) has been fitted as an energy saving device according to the shipbuilder's design development. Sovcomflot's high standards regarding crew living and working conditions have been fully met.

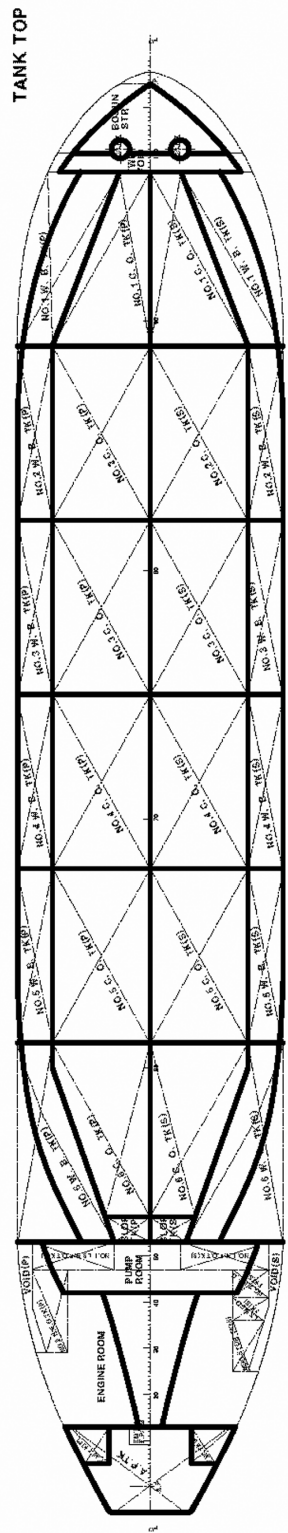
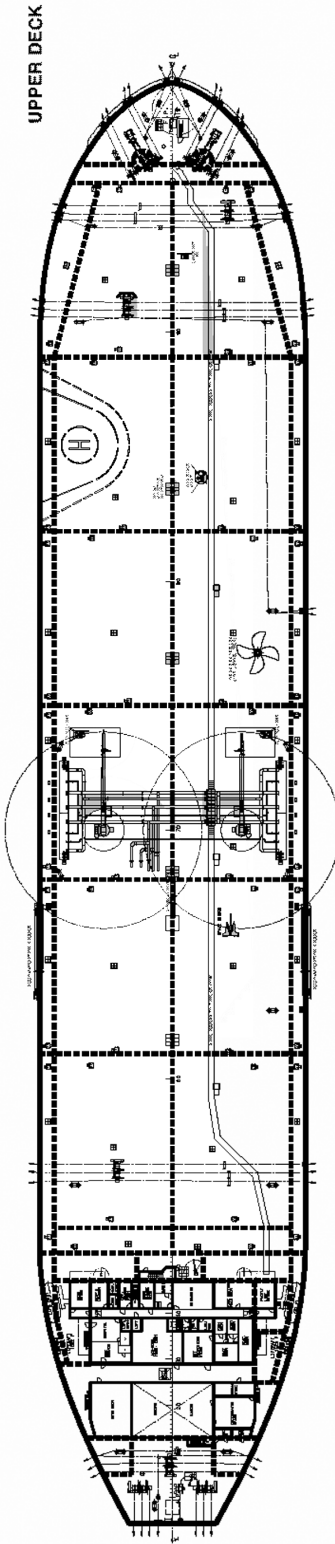
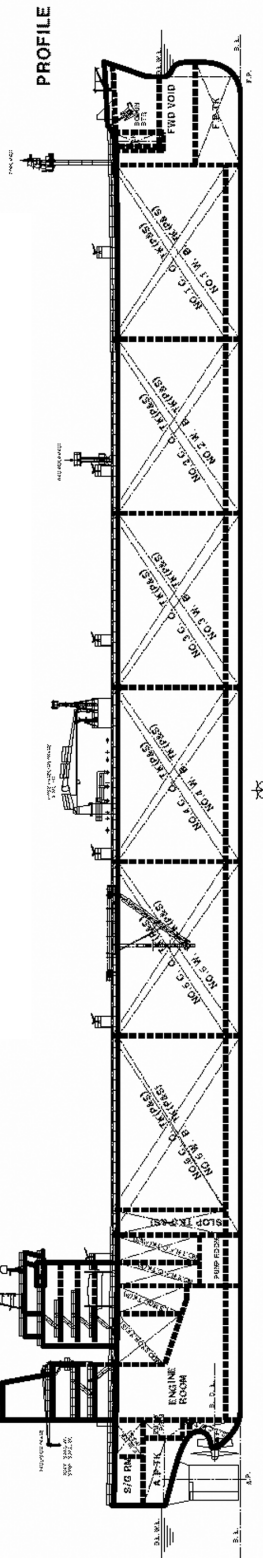
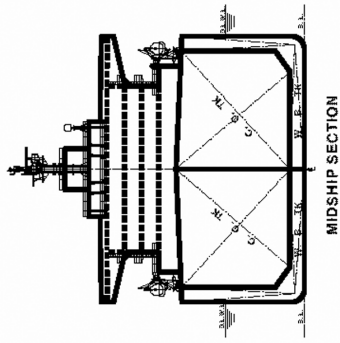
The hull structure has been strengthened to prolong the vessel's fatigue profile for longitudinal stiffener connections to transverse webs/bulkheads.

For the ergonomic and efficient operation of navigation tools, the design and equipment in the wheelhouse is based on the requirement of NAV1 and IBS notations.

## TECHNICAL PARTICULARS

Length oa: ..... 249.9m  
 Length bp: ..... 243.0m  
 Breadth moulded: ..... 46.0m  
 Depth moulded  
 To main deck: ..... 21.2m  
 To upper deck: ..... 21.2m  
 Draught  
 Scantling: ..... 14.9m  
 Design: ..... 13.6m  
 Gross: ..... 66,818gt  
 Deadweight  
 Design: ..... 107,550dwt  
 Scantling: ..... 120,600dwt  
 Speed, service: ..... 14.6knots  
 Cargo capacity  
 Liquid volume: ..... 137,000m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 2,900m<sup>3</sup>  
 Diesel oil: ..... 500m<sup>3</sup>  
 Water ballast: ..... 43,000m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 49.6tonne/day  
 Classification society and notations: ..... LR +100A1, Double Hull Oil Tanker, ESP, CSR, ShipRight (CM, ACS (B)), Part Higher Tensile Steel, +LMC, LI, UMS, IGS, SPM4, COW (LR), \*IWS, with the descriptive notes of ShipRight (SCM, BWM (T), SERS), EP (B, Ede, G,I,O,P,Vc)#, NAV1, IBS, ETA  
 Main engine  
 Design: ..... MAN Diesel & Turbo  
 Model: ..... MAN B&W 6S60MC-C8.2  
 Manufacturer: ..... Doosan  
 Type of fuel used: ..... HFO, MDO, LSMGO  
 Output of each engine: ..... 13,250kW x 98.4rpm  
 Propeller  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... DSME/Samwoo  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 7.4m  
 Speed: ..... 99.8rpm  
 Diesel-driven alternator  
 Engine make/type: ..... HHI Himsen 6H21/32  
 Type of fuel: ..... MDO, LSMGO  
 Output/speed of each set: ..... 1,000kW x 900rpm  
 Alternator make/type: ..... HHI HFC7 508-84K  
 Output/speed of each set: ..... 1,000kW x 900rpm  
 Boilers  
 Type: ..... Vertical, water tube  
 Make: ..... Kangrim

Output, each boiler: ..... 20tonnes/h  
 Cargo cranes/ cargo gear  
 Make: ..... DMC  
 Type: ..... Single jib, cylinder luffing  
 Performance: ..... SWL 15tonnes x 10m  
 Other cranes  
 Make: ..... DMC  
 Type: ..... Single jib  
 Tasks: ..... Provision & engine room spare parts handling  
 Performance: ..... SWL 4tonnes x 10m  
 Mooring equipment  
 Number: ..... 2 x windlass combined with mooring winch, 6 x mooring winch  
 Make: ..... TTS Kocks  
 Type: ..... Electro-hydraulic high pressure  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 x 30 persons  
 Make: ..... Hyundai Lifeboat  
 Type: ..... Totally enclosed gravity launching type  
 Cargo tanks  
 Number: ..... 12 cargo tanks + 2 slop tanks  
 Grades of cargo carried: ..... 3  
 Coated tanks: ..... IPK, tin free epoxy (deckhead and bottom)  
 Cargo pumps  
 Type: ..... Centrifugal, vertical, single stage  
 Make: ..... HHI  
 Stainless steel: ..... Impeller shaft  
 Capacity: ..... 3,000m<sup>3</sup>/h x 130mTH  
 Cargo control system  
 Make: ..... Kongsberg  
 Type: ..... Console  
 Ballast control system  
 Make: ..... Kongsberg  
 Type: ..... Console  
 Water ballast treatment system  
 Make: ..... NK  
 Capacity: ..... 4,000m<sup>3</sup>/h  
 Stern appendages/special rudders: ..... Flap rudder  
 Bridge control system  
 Make: ..... Nabtesco  
 Type: ..... M-800-III  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salwico Cargo  
 Fire extinguishing systems  
 Cargo holds: ..... NK/ deck foam  
 Engine room: ..... NK/ High pressure CO<sub>2</sub>  
 Radars  
 Make: ..... Transas  
 Integrated bridge system  
 Make: ..... Transas  
 Waste disposal plant  
 Waste compactor: ..... Uson Marine/ UBP-30S  
 Sewage plant: ..... Evac/ MBR 32 C  
 Contract date: ..... 20 October 2010  
 Launch/float-out date: ..... 24 March 2012  
 Delivery date: ..... 31 May







# NORD STABILITY: green tanker for Denmark

Shipbuilder: ..... **STX Offshore & Shipbuilding Co., Ltd**  
 Vessel's name: ..... **Nord Stability**  
 Hull No: ..... **S1535**  
 Owner/Operator: ..... **Norden**  
 Country: ..... **Denmark**  
 Designer: ..... **STX Offshore & Shipbuilding Co., Ltd**  
 Country: ..... **Korea**  
 Flag: ..... **Singapore**  
 IMO number: ..... **9629495**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **3**

**G**OING green is the target for most vessel owners at the moment with regulations coming into effect making ships more environmentally friendly. Norden is one of those companies following the eco-vessel route with the delivery of *Nord Stability*, the first in a series of four MR-type product tankers was delivered in the 4th quarter of 2012 with the other three vessels *Nord Strength*, *Nord Steady*, *Nord Strong* expected to be delivered in 2013.

Norden notes that fuel efficiency has become a new competitive parameter in the tanker market. The pressure comes from oil majors and oil traders that wish to be regarded as environmentally conscious, which means that vessels operating for them need to reflect this new reality.

The contracting of these vessels is part of Norden's strategy to expand its fleet of owned product tankers by purchasing or contracting quality vessels.

The market prices for second-hand product tankers have now reached levels to which Norden has said that more favourable deals can be made by making newbuilding contracts in default at the yards and improving the planned newbuildings by making them more fuel efficient and eco-friendly.

In addition, Norden has noted the time of delivery is attractive for the company as it expects an improvement in rates and asset prices in the product tanker market from 2013.

The chemical tanker constructed at Jin-hae Shipyard has three longitudinal bulkheads with double bottom and a double hull, and consists of six pairs of cargo oil tanks, one pair of slop tanks, one residue tank, and six pairs of segregated water ballast tanks.

The most significant improvements on the four vessels are that they are fitted with an electronically injected B&W 6S50ME-C8.2 main engine, Mewis Duct, turbo charger with variable geometry, NPT propeller, frequency controlled pumps in the engine room, advanced Silyl Acrylate based bottom coating, improved insulation, GreenSteam trim optimisation, CASPER. The Mewis Duct which is installed on all the series of vessels will give an expected power saving of about 3%.

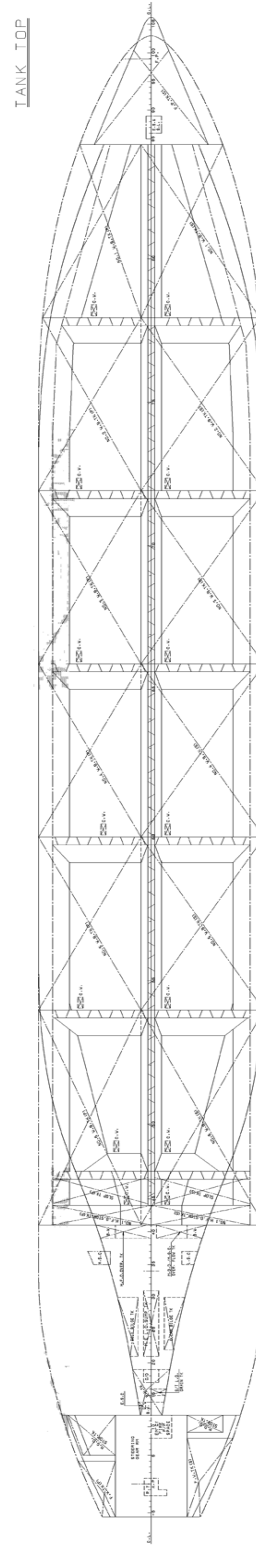
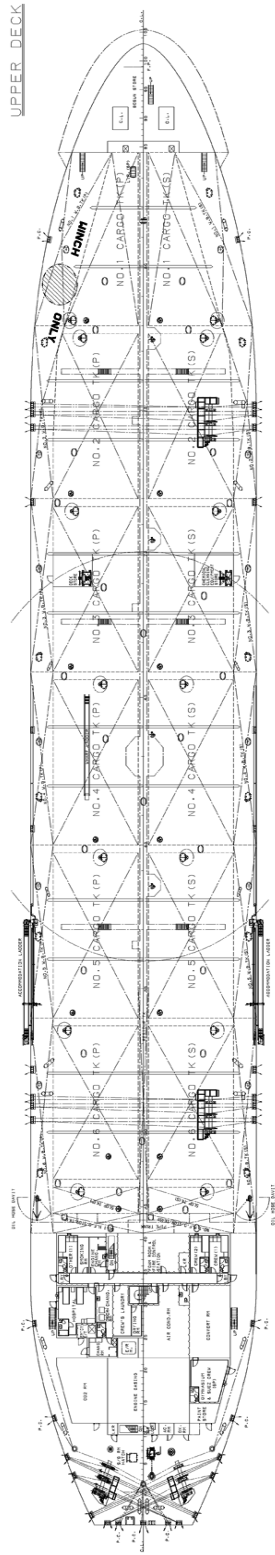
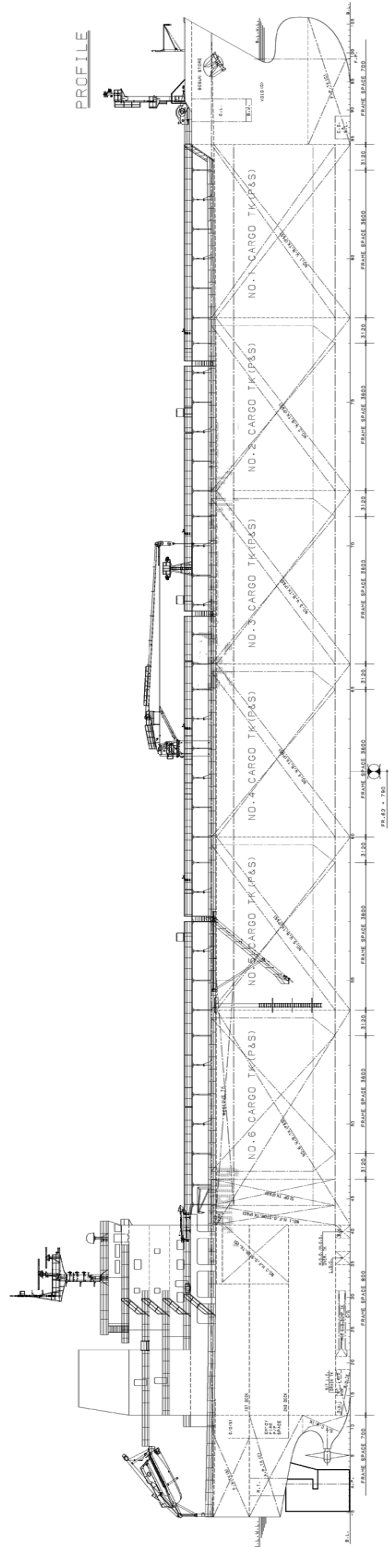
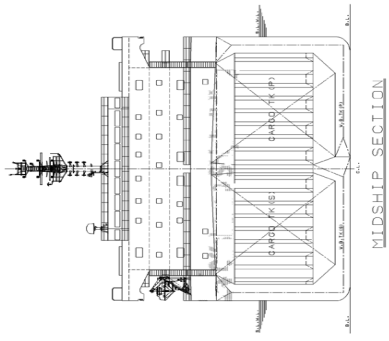
The two stroke engine is compliant with the NOx Tier III regulation. The electricity generating plant consists of three sets of main diesel generator engines and one emergency diesel generator unit.

The electronic main engine and other equipment and systems, are altogether expected to improve the overall fuel efficiency of the vessels and reduce the CO<sub>2</sub> emissions by more than 15%. The improvements imply that the vessels, when sailing at normal speed, will consume four tonnes less fuel per day. Compared to Norden's most recent newbuildings from 2007, there is a 25% reduction in fuel consumption and CO<sub>2</sub> emissions.

## TECHNICAL PARTICULARS

Length oa: ..... 183.00m  
 Length bp: ..... 173.90m  
 Breadth moulded: ..... 32.20m  
 Depth moulded  
 To main deck: ..... 19.8m  
 To upper deck: ..... 19.8m  
 To other decks: ..... 1st deck 14.4m, 2nd deck 8.8m  
 Width of double skin  
 Side: ..... 2.00m  
 Bottom: ..... 2.15m  
 Draught  
 Scantling: ..... 13.15m  
 Design: ..... 11.00m  
 Displacement: ..... 61,345tonnes  
 Lightweight: ..... 10,445tonnes  
 Deadweight  
 Design: ..... 39,814dwt  
 Scantling: ..... 50,900dwt  
 Block co-efficient: ..... 0.8110  
 Speed, service: ..... 14.5knots  
 Cargo capacity  
 Liquid volume: ..... 54,000m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 1,120m<sup>3</sup>  
 Diesel oil: ..... 150m<sup>3</sup>  
 Water ballast: ..... 22,150m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 27tonnes/day  
 Classification society and notations: ..... DNV + 1A1, Tanker for oil and Chemicals ESP, Ship type 2, a2, b3, c3, f2, str 0.075, CSR, E0, COW, COAT-PRPC(B), VCS-2, TMON, BWM-E(s), SPM, BIS, ETC  
 Main engine  
 Model: ..... STX MAN 6S50ME-C8.2  
 Manufacturer: ..... STX Engine  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 7,570kW x 108rpm  
 Propellers  
 Material: ..... Ni-Al Bronze  
 Designer/manufacturer: ..... Haey Ang  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 6.2m  
 Speed: ..... 108rpm

Diesel-driven alternators  
 Engine make/type: ..... STX Engine 6L23/30H  
 Type of fuel: ..... HFO, MDO  
 Output/ speed of each set: ..... 960kW x 900rpm  
 Alternator make/type: ..... STX Engine  
 Output/speed of each set: ..... 960kW x 900rpm  
 Boilers  
 Type: ..... PB0301AS12  
 Make: ..... Kangrim  
 Output, each boiler: ..... 18,000kg/h x 7bar  
 Cargo cranes  
 Make: ..... Oriental precision & Engineering Co.,Ltd  
 Type: ..... Electric-Hydraulic driven  
 Performance: ..... SWL 3tonnes 2.6m-10m  
 Mooring equipment  
 Number: ..... 2 x windlass combined with 4 x mooring winches  
 Make: ..... Flutek  
 Type: ..... Hydraulic motor driven  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 26 persons  
 Make: ..... Hyundai Lifeboats Co., Ltd  
 Type: ..... Freefall  
 Cargo tanks  
 Number: ..... 12 x cargo oil tanks 2 x slop tanks  
 Grades of cargo carried: ..... Crude oil having a flash point below 60degs  
 Coated tanks: ..... Jotun Tankguard special ultra  
 Cargo pumps  
 Number: ..... 12  
 Type: ..... MDPC-200, DEEP, CEN, ELEC, MOTRO DRV  
 Make: ..... Maflex  
 Stainless steel: ..... SUS 316L  
 Capacity: ..... 600m<sup>3</sup>  
 Cargo control system  
 Make: ..... Emerson  
 Type: ..... Remote control  
 Ballast control system  
 Make: ..... Emerson  
 Type: ..... Remote control  
 Complement  
 Officers: ..... 12  
 Crew: ..... 13  
 Bridge control system  
 Make: ..... KTE  
 Fire detection system  
 Make: ..... Autronica/BS-200M  
 Fire extinguishing systems  
 Engine room: ..... NK/ fixed high pressure  
 Radar  
 Make: ..... Furuno  
 Waste disposal plant  
 Incinerator: ..... HMMCO/ MAXI NG150 SL WS  
 Contract date: ..... 30 May 2012  
 Launch/float-out date: ..... 04 October 2012  
 Delivery date: ..... 10 December 2012







# PACIFIC ORCA: wind farm installation vessel

Shipbuilder: ... **Samsung Heavy Industries Co., Ltd. Geoe Shipyard, South Korea**  
 Vessel's name: ..... **Pacific Orca**  
 Hull No: ..... **1940**  
 Owner/operator: ..... **Swire Pacific Offshore Operations (Pte) Ltd., Singapore/Swire Blue Ocean A/S**  
 Country: ..... **Denmark**  
 Designer: ..... **Knud E. Hansen A/S**  
 Country: ..... **Denmark**  
 Model test establishment: ..... **Samsung Ship Model Basin, South Korea**  
 Flag: ..... **Limassol, Cyprus**  
 IMO numbers: ..... **9601326**

ON 27 July, 2012 Samsung Heavy Industries Co., Ltd Geoe Shipyard in South Korea delivered the first of two wind turbine installation vessels to Swire Pacific offshore Operations (Pte) Ltd, *Pacific Orca*. The second vessel, *Pacific Osprey*, was delivered 28 December 2012. This was the culmination of a contract that entered into force on 11 August, 2010. The two new vessels will be operated by the Danish daughter company Swire Blue Ocean A/S.

*Pacific Orca* and *Pacific Osprey* have been designed especially for the installation of offshore wind turbines and for support in the offshore oil and gas sector. The 161m long and 49m wide vessels, which are the largest of their kind, are equipped with six 105m long truss type legs and an electric rack-and-pinion jacking system. The six-legged design was chosen for the greatest safety and reliability under the most extreme weather and sea conditions while being jacked 17m above the sea surface on up to 60m water depth. Should 60m water depth not be enough the legs are designed so that they can be lengthened by further 15m.

The forward legs are closer together than the midship and aft legs to refine the hull lines in way of the shoulders and with a relatively long bow the vessels are designed to make good speed even in higher sea states, where similar vessels with blunter bows would be stopped.

The vessels are equipped with a diesel electric propulsion plant that features a DP-2 dynamic positioning system with four Azipod thrusters aft and two tunnel thrusters and two retractable azimuth thrusters in the bow.

With a cargo deck area of 4,300m<sup>2</sup> and a jackable deadweight of not less than 8,400tonnes, the vessels offer great flexibility in the carriage and installation of offshore wind turbine foundations of all types and sizes, and they are also ideal for decommissioning oil rigs.

The deck is served by two cranes a 1,200tonne main crane, which works around the aft leg in a starboard direction for a 360degs unobstructed rotation, and a 50tonne auxiliary crane, which is fitted on a cantilever on the jacking frame of the midship leg which also works in the starboard direction and has a rotation of 300degs. A knuckle-boom crane for loads up to 4tonnes and man-riding can be easily moved between two foundations; one forward and one aft of the main crane.

The accommodation block forward holds 111 single cabins all with en-suite bathrooms as well as the necessary crew facilities as messes and day rooms, offices and conference rooms etc. A helicopter landing deck for medium size helicopters is fitted above and forward of the accommodation block.

With their superior capacity and flexibility these new vessels are an important and timely innovation for the industry as it moves into deeper waters and more challenging operations.

## TECHNICAL PARTICULARS

Length oa  
 Hull excl. helicopter deck: ..... 161.3m  
 Incl. helicopter deck: ..... 164.9m  
 Length bp: ..... 155.6m  
 Breadth, moulded: ..... 49.0m  
 Depth to main deck, moulded: ..... 10.4m  
 Draught, moulded  
 Design: ..... 5.5m  
 Max. summer: ..... 6.0m  
 Air draught at design draught: ..... 99.5m  
 Gross tonnage: ..... 14,000gt  
 Lightweight: ..... 24,390tonnes  
 Deadweight  
 At design draught: ..... 9,890dwt  
 At max. summer draught: ..... 13,155dwt  
 For jacking: ..... 8,400dwt  
 Block co-efficient: ..... 0.78  
 Service speed: ..... 13.0knots  
 Classification society and notations: ..... GL 100 A5 Offshore Support Vessel Self-elevating Unit WTIS EP Heilil SPS (except SRTP)

Tank capacities  
 Marine gas oil: ..... 4,285m<sup>3</sup>  
 Lube oil: ..... 44m<sup>3</sup>  
 Fresh water – potable: ..... 1,533m<sup>3</sup>  
 Water ballast: ..... 11,905m<sup>3</sup>  
 Cargo deck  
 Deck area: ..... 4,300m<sup>2</sup>

Uniformly distributed load  
 Aft & amidships: ..... 21tonnes/m<sup>2</sup>  
 Forward: ..... 15tonnes/m<sup>2</sup>  
 Grid system of strong points: ..... Mesh 1.4 x 1.4m  
 Max strong point loads aft: ..... 250tonnes downwards / 200tonnes upwards

Automatic anti-heeling system:  
 Pump capacity: ..... 2,000m<sup>3</sup> per hour  
 Change of trim moment: ..... 82,600tm per hour

Diesel generator sets  
 Number of generator sets: ..... 8  
 Engine make/type: ..... MAN L27/38  
 Type of fuel: ..... Marine gas oil  
 Output: ..... 720rpm  
 Alternator make/type: ..... ABB AMG 0710LS10 LSE  
 Rated electrical power: ..... 3024kW

Bow tunnel thrusters  
 Number of thrusters: ..... 2  
 Make/type/capacity: ..... Brunvoll FU100LTC2750, 2.2 MW

Bow retractable azimuth thrusters  
 Number of thrusters: ..... 2  
 Make/type/capacity: ..... Brunvoll AR100LNA2600, 2.2 MW

Stern thrusters  
 Number of thrusters: ..... 4  
 Make/type/capacity: ..... ABB Compact Azipod, 3.4 MW

Dynamic positioning system  
 Type: ..... DP-2

Legs and spud cans  
 Number of legs: ..... 6  
 Type: ..... 3-chorded truss type w. split-pipe-chords  
 Length: ..... 105m (may be lengthened by 15m)  
 Max. leg protrusion below BL: ..... 80m  
 Chord distance: ..... 9.7m  
 Rack thickness: ..... 6inch  
 Spud can area: ..... 95.4m<sup>2</sup>

Jacking system  
 Design and make: ..... BLM  
 Type: ..... High-speed electrical rack-and-pinion  
 Jacking units: ..... 6 double-pinion D110 units per chord  
 Jacking speed:  
 Raising / lowering legs: ..... 2.4 m/min  
 Raising / lowering hull: ..... 1.2 m/min

Operational conditions for jacking  
 Wind speed: ..... 20m/s  
 Significant wave height: ..... 2.5m (subject to actual conditions onsite)

Main crane  
 Make: ..... NOV Amclyde  
 Type: ..... Rope luffing "work-around-leg"  
 Main hoists: ..... 2 x 600t side by side for 1200t 31m in tandem  
 Max. load-radius: ..... 91m  
 Aux hoist: ..... 500tonnes 50m  
 Max. load-radius: ..... 107m  
 Whip hoist: ..... 50tonnes 112m, approved for man-riding  
 Tuggers: ..... 7 x 5tonnes SWL  
 Max operational wind speed: ..... 20m/s

Auxiliary crane  
 Make: ..... NOV Amclyde  
 Type: ..... Hydraulic  
 Main hoist: ..... 35tonnes 6.5 to 30m  
 Aux hoist: ..... 25tonnes 6.5 to 40m, approved for man-riding

Knuckle-boom crane  
 Make: ..... NOV Amclyde  
 Type: ..... Hydraulic with telescopic jib  
 Hoist: ..... 2tonnes 25m, 4tonnes 14m  
 Man-riding radius: ..... 30m by operating telescopic jib

Mooring equipment  
 Make/type: RRM Electric MW 250F / CU 87 U3 / MW250F

Helicopter landing deck  
 D-diameter: ..... 22m  
 Load-bearing capacity: ..... 12.8tonnes

Life boats  
 Number and capacity: ..... 2 x 60persons  
 Make/type: ..... Norsafe JYN 80 with LH-140 davits

Integrated bridge control system  
 Make: ..... Samsung Automation SSAS-Master

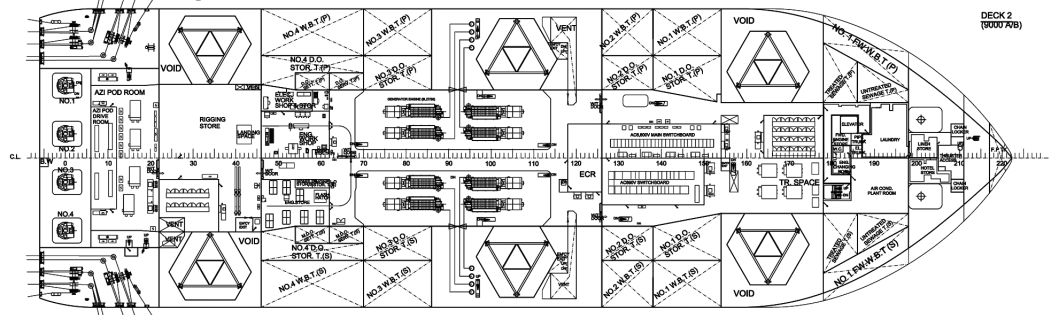
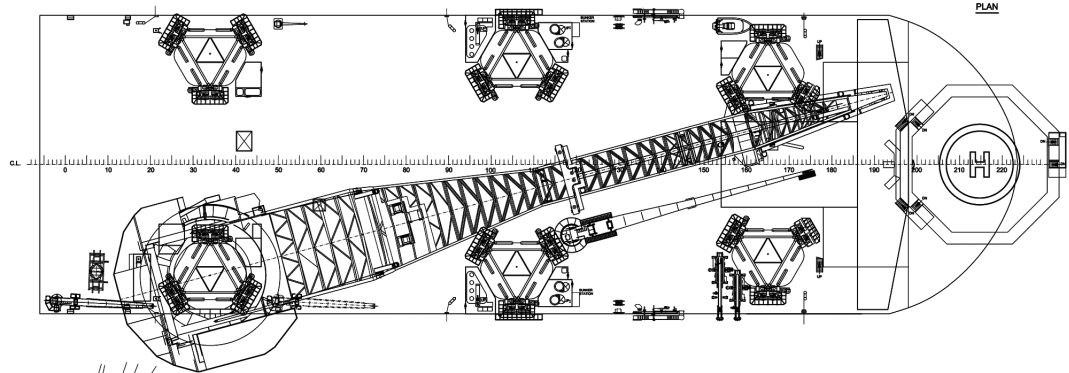
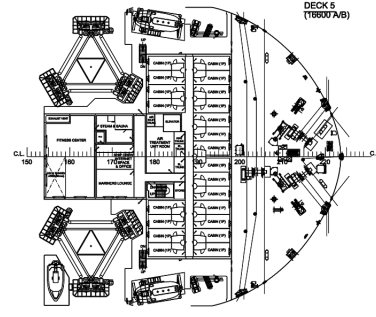
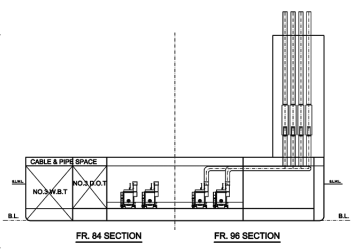
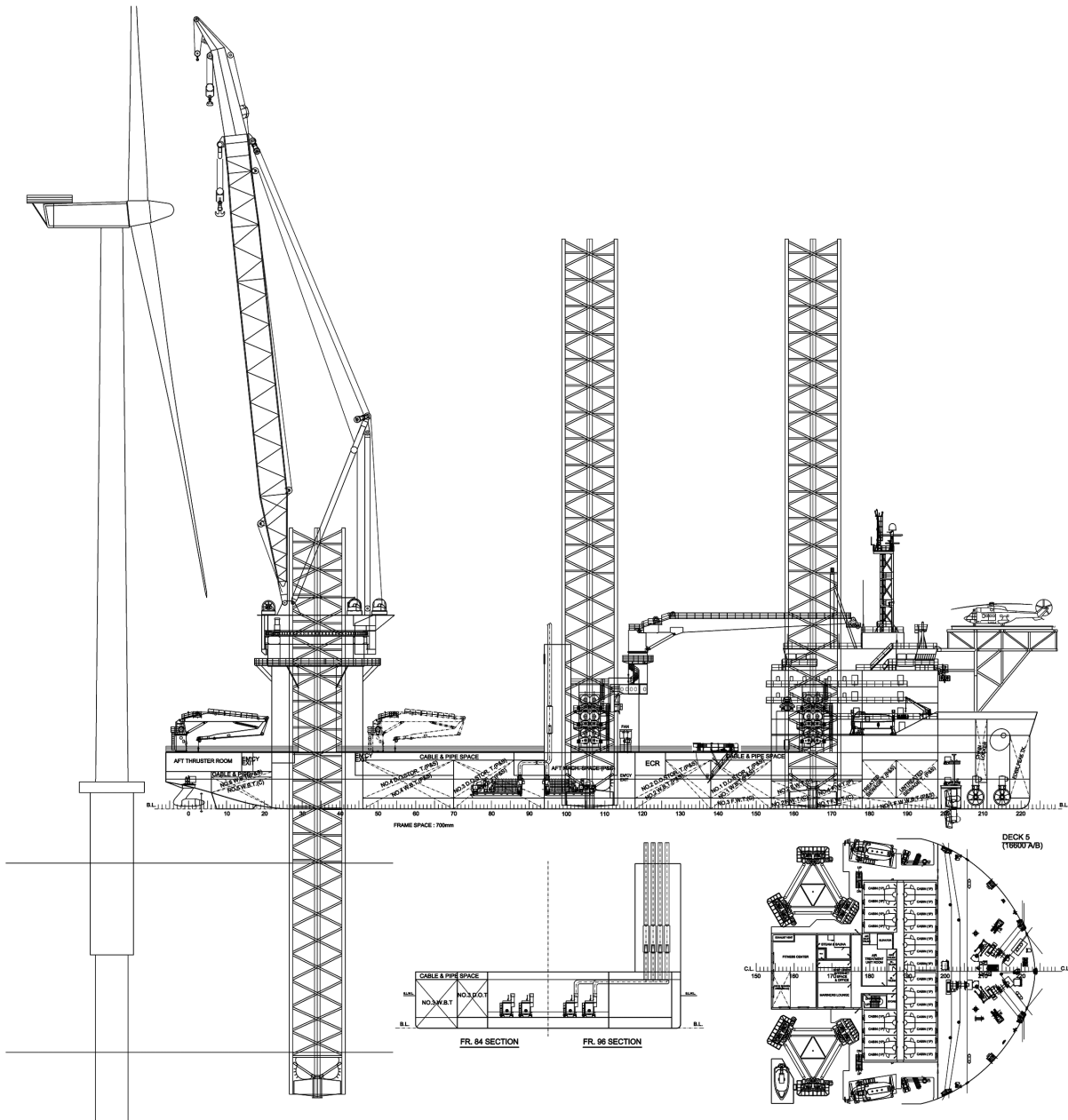
Complement  
 Number of cabins: ..... 111 with en-suite bathrooms

Fire detection system  
 Make/type: ..... Tyco T2000

Fire extinguishing system  
 Engine room: ..... Unitor 50-CO<sub>2</sub> HP system

Waste disposal plants  
 Galley waste handling system: ..... USON Marine  
 Incinerator: ..... Hyundai – Atlas / Maxi NG150SL WS  
 Sewage plant: ..... Omnipure / 5528

Contract date: ..... 11 August 2010  
 Delivery date: ..... 27 July 2012







## PRIME ROSE: 82,000dwt bulk carrier

Shipbuilder: ..... **SPP Shipbuilding Co., Ltd**  
 Vessel's name: ..... **Prime Rose**  
 Hull No: ..... **S5093**  
 Owner/operator: ..... **Active Shipping**  
 Country: ..... **Turkey**  
 Designer: ..... **SPP Shipbuilding Co., Ltd**  
 Country: ..... **Korea**  
 Flag: ..... **Marshall Islands**  
 IMO number: ..... **9590747**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **4**

*PRIME Rose* is the first in a series of four 82,000dwt bulk carriers that were ordered by Active Shipping, in 2010. The vessel was constructed at Korean-based SPP Shipbuilding Co., Ltd and delivered at the beginning of 2012 to its owner. The other four sister vessels of the series were delivered throughout 2012.

*Prime Rose* has been designed by SPP with the focus on efficiency for a modern Kamsarmax design. SPP Shipbuilding Co., Ltd has achieved this through hull form optimisation and the installation of energy saving devices.

The vessel is an ocean going Kamsarmax size bulk carrier with bulbous bow, transom stern and a continuous deck with forecastle. The cargo areas consist of seven cargo holds having double bottom water ballast tanks with hopper and top side wing ballast tanks. Heavy fuel oil tanks are arranged in engine room and top side wing tanks. The No.4 hold can be used as water ballast tank during heavy sea conditions. Also, holds 2, 4 and 6 can be used as water ballast tanks for air draft adjustment conditions at the special ports.

The six-tier deckhouse complies with the SOLAS visibility regulation and provides accommodation for a complement of 24 persons excluding the Suez crew cabin. The vessel is fitted with a MAN B&W Licensed 6S60MC-C8.2 with optimised rating of 10,770kW (SMCR) at 95rpm with de-rating by about 25% from the 14,280kW (NMCR) at 105rpm in order to reduce the fuel oil consumption. Also three sets of generators with each 650kW capacity are installed.

The capacity of the cargo holds and water ballast tanks is 97,000m<sup>3</sup> and 23,000m<sup>3</sup> respectively. With the capacity of 2,500m<sup>3</sup> for the fuel oil, the cruising range is about 24,000 nautical miles on the basis of speed of 14.5knots considering three reserve days.

The vessel is designed and constructed to be loaded not only Group A and B type of IMSBC code but also steel coils (15tonnes, 2tiers) and dangerous cargoes including sulphur.

The vessel has made a remarkable achievement for her speed performance of about 15.1knots at design

draft and NCR with 15% of sea margin by the sea trial. This is due to the optimisation of the hull form by SPP, this performance of speed is said to reduce oil-consumption of DFOC, which is about 28.1tonnes/day at 14.4knots with design draft. Also, the installation of the Mewis Duct also adds to the reduction in fuel and can save up to a further 1.5tonnes/day.

### TECHNICAL PARTICULARS

Length oa: ..... 229.00m  
 Length bp: ..... 223.00m  
 Breadth moulded: ..... 32.26m  
 Depth moulded  
 To main deck: ..... 20.20m  
 To upper deck: ..... 20.20m  
 Width of double skin  
 Bottom: ..... 1.75m  
 Draught  
 Scantling: ..... 14.5m  
 Design: ..... 12.2m  
 Gross: ..... 44,485gt  
 Displacement: ..... 94,867tonnes  
 Lightweight: ..... 13,282tonnes  
 Deadweight  
 Design: ..... 65,304dwt  
 Scantling: ..... 81,595dwt  
 Block co-efficient: ..... 0.8851  
 Speed, service: ..... 15.06knots  
 Cargo capacity  
 Bale: ..... 92,534m<sup>3</sup>  
 Grain: ..... 97,090m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 2,517m<sup>3</sup>  
 Diesel oil: ..... 154.7m<sup>3</sup>  
 Water ballast: ..... 22,612m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 43.68tonnes/day  
 Auxiliaries: ..... 3.13tonnes/day  
 Classification society and notations: ..... LR + 100A1 Bulk Carrier, CSR, BC-A [Holds 2, 4 and 6 may be empty], GRAB[20], ESP, LI, \*IWS, ShipRight (CM, ACS(B)), +LMC, UMS, SERS EP (B,I,R) with descriptive notes "ShipRight (SCM, BWMP(F)), P. Ht., Green passport"

Main engine  
 Design: ..... Hyundai-MAN B&W  
 Model: ..... 6S60MC-C8.1  
 Manufacturer: ..... Hyundai  
 Number: ..... 1  
 Type of fuel: ..... HFO  
 Output of each engine: ..... 10,770kW x 95rpm

Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... Silla Metal  
 Number: ..... 1  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 7.15m

Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Yanmar 6N21L-SW  
 Type of fuel: ..... HFO  
 Output/speed of each set: ..... 745kW x 720rpm  
 Alternator make/type: ..... Nishishiba 3GT4167  
 Output/speed of each set: ..... 680kW x 720rpm

Boilers  
 Number: ..... 2  
 Type: ..... MC-RMS7-ZMD  
 Make: ..... SPP Machine Tech  
 Output, each boiler: ..... 1,500/1,200kg/h x 7kg/cm<sub>2</sub>

Provision cranes  
 Number: ..... 1  
 Make: ..... SPP Machine Tech  
 Type: ..... Electric motor driven  
 Tasks: ..... Provisions, engine room spare parts handling  
 Performance: ..... SWL 4tonnes x 10m

Mooring equipment  
 Number: ..... 6  
 Make: ..... Flutek-Kawasaki  
 Type: ..... Electric-hydraulic

Special lifesaving equipment  
 Number or each and capacity: ..... 1 x 24persons  
 Make: ..... Norsafe  
 Type: ..... Totally enclosed free-fall type

Hatch covers  
 Design: ..... MacGregor  
 Manufacturer: ..... MacGregor  
 Type: ..... Side rolling type

Complement  
 Officers: ..... 13  
 Crew: ..... 14

Stern appendages/special rudders: ..... Mewis Duct

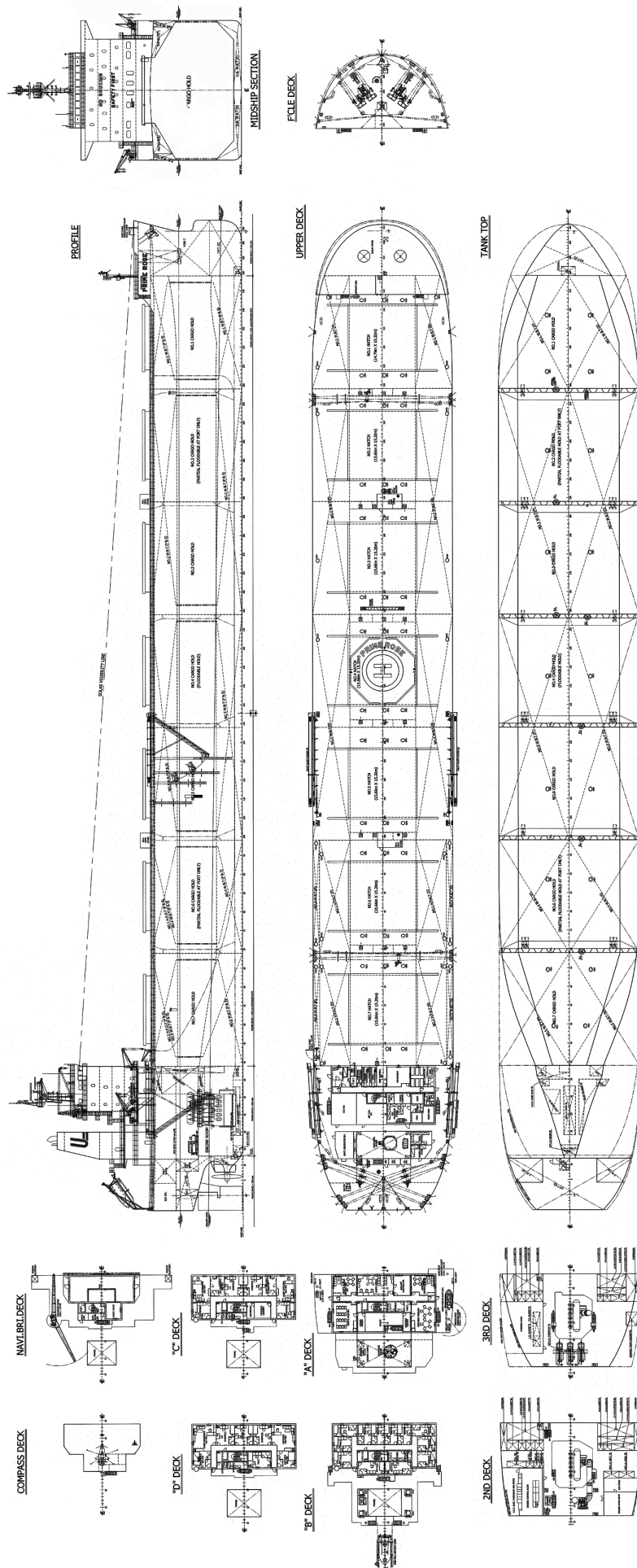
Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salwico Cargo

Fire extinguishing systems  
 Engine room: ..... Tank Tech/X-mist

Radars  
 Number: ..... 2  
 Make: ..... Furuno  
 Model: ..... FAR-2837S, FAR-2827

Waste disposal plant  
 Incinerator: ..... Hyundai-Atlas/ MAXI NG100SL WS  
 Sewage plant: ..... Il Seung/ ISS-25N

Contract date: ..... 23 march 2010  
 Launch/float-out date: ..... 19 November 2011  
 Delivery date: ..... 20 February 2012







# PTSC BIEN DONG 01: first FSO for PTSC

Shipbuilder: ..... **Sungdong Shipbuilding & Marine Engineering Co., Ltd**  
 Vessel's name: ..... **PTSC Bien Dong 01**  
 Hull No: ..... **S5005**  
 Owner/operator: ..... **Petro Vietnam Services Corporation**  
 Country: ..... **Vietnam**  
 Designer: ..... **Sungdong Shipbuilding & Marine Engineering Co., Ltd**  
 Country: ..... **Korea**  
 Flag: ..... **Singapore**  
 IMO number: ..... **9633496**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **nil**

*PTSC Bien Dong 01* is a floating oil storage and offloading unit (FSO) that was ordered by PetroVietnam Technical Services Corporation (PTSC) and PVN's subsidiary Bien Dong Petroleum Operating Company (BDPOC) will be the first newbuild FSO for the Vietnamese company. The vessel was delivered to PTSC from Sungdong Shipbuilding & Marine Engineering Co. Ltd at the end of 2012.

In order to maximise capacity, the vessel has been designed with optimised an arrangement of the cargo tanks. The vessel has a double sided and single bottomed barge type hull. The cargo area consists of six pairs of cargo oil tanks and two slop tanks, and six pairs of water ballast tanks constructed with a single bottom and a double sided arrangement. The vessel has a continuous upper deck with forecastle, a raked stem. The transverse and longitudinal bulkheads below the upper deck are plane type. Accommodation and machinery space are located at the stern of the vessel.

A complete FE structure and fatigue analysis has been carried out for mooring system interface structure to ensure its adequacy for the FSO. This hull shape has been designed with consideration of transportation from the yard in Korea to Bien Dong Oilfield Offshore, Vietnam. A skeg has also been integrated to the after structure to allow course keeping during transit or whilst being towed. *PTSC Bien Dong 01* is a condensate storage vessel for work at sea and is not self-propelled; it has a length of 171.5m; width of 32.4m, 18.2m, draft 12.6m, a gross tonnage of 55,000gt.

*PTSC Bien Dong 01* is moored by a submerged turret loading and mooring (STL) system from which the mooring lines also originate. The STL control room is arranged under the forecastle deck. *PTSC Bien Dong 01* has the capacity for 350,000 barrels. Unlike other floating storage projects currently operating off the coast of Vietnam, *PTSC Bien Dong 01* is more technologically advanced. The STL system used to anchor the vessel has a life expectancy of 20 years without the need for repair or

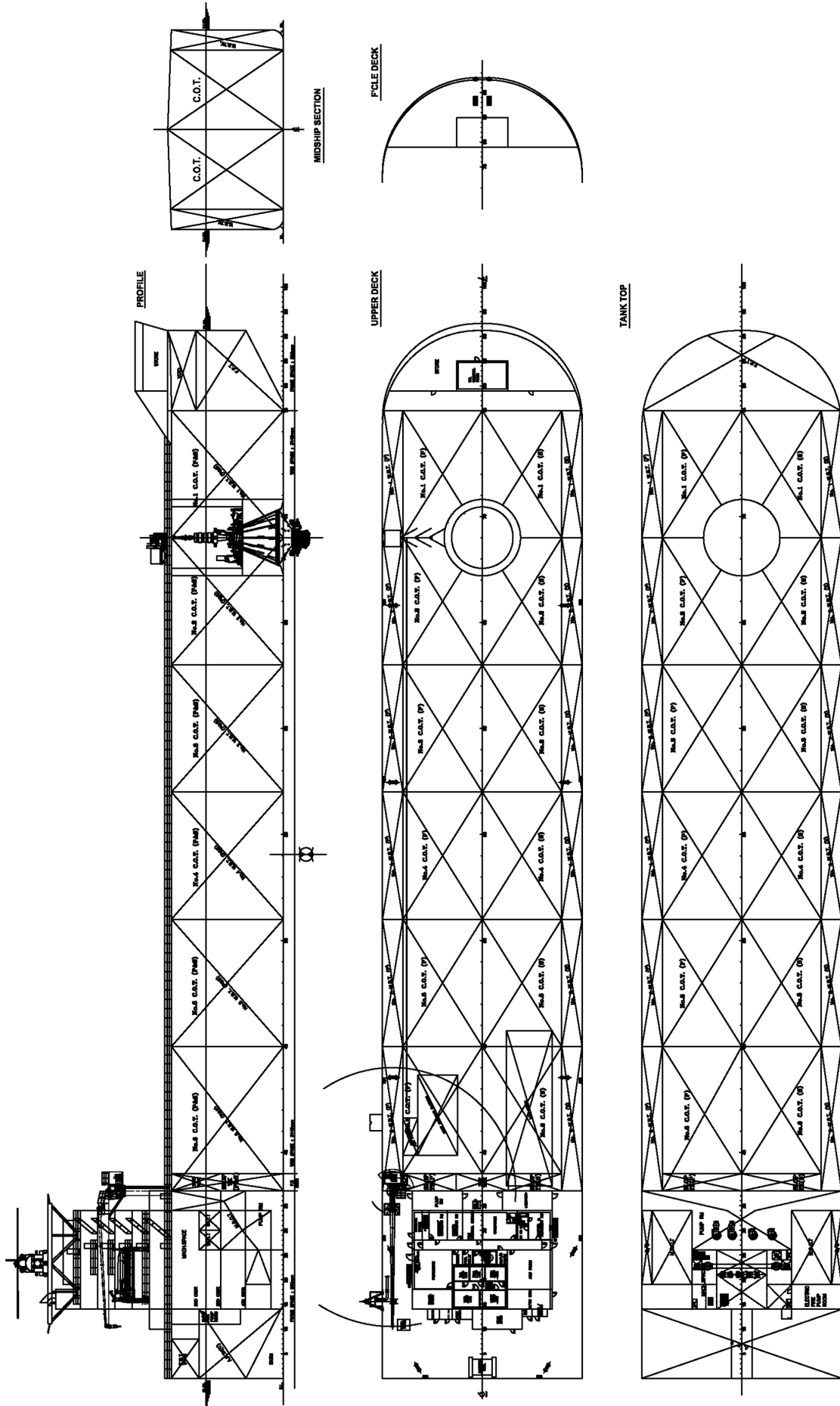
major maintenance. It will be the first of its type to use a modern and complex mooring system, which also marks a milestone for the development of the Vietnamese oil and gas industry, says the company.

A helideck is arranged above the accommodation quarters, with a tandem mooring arrangement and cargo offloading station and equipment are located at the stern of the vessel. The vessel has been awarded an UWILD notation from ABS. This notation signifies that the vessel is in compliance with ABS' class notation Underwater Inspection in Lieu of Drydocking (UWILD) and the owner may request Underwater Inspection as an alternative to Drydocking Inspection within the vessels first 15 years of operation.

## TECHNICAL PARTICULARS

Length oa: ..... 171.5m  
 Length bp: ..... 170.00m  
 Breadth moulded: ..... 32.4m  
 Depth moulded  
 To main deck: ..... 18.2m  
 Width of double skin  
 Side: ..... 3.24m  
 Draught  
 Scantling: ..... 12.6m  
 Design: ..... 12.0m  
 Gross: ..... 31,349gt  
 Displacement: ..... 66,000tonnes  
 Deadweight  
 Design: ..... 51,700dwt  
 Scantling: ..... 55,500dwt  
 Cargo capacity  
 Liquid volume: ..... 58,500m<sup>3</sup>  
 Bunkers  
 Diesel oil: ..... 1,290m<sup>3</sup>  
 Water ballast: ..... 21,230m<sup>3</sup>  
 Classification society and notations: ..... ABS UWILD  
 (Underwater inspection in lieu of drydocking)  
 % high tensile steel used in construction: ..... 80%  
 Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Wärtsilä  
 Type of fuel: ..... LNG, MDO  
 Output/speed of each set: ..... 1,480kW x 900rpm,  
 1,584kW x 1,200rpm  
 Alternator make/type: ..... AVK/DSG99 M 1/8,  
 AVK/DSG99 K 1/6  
 Boilers  
 Number: ..... 2  
 Type: ..... FMB-VL  
 Make: ..... Saake  
 Output, each boiler: ..... 15,000kg/h  
 Cargo cranes/cargo gear  
 Number: ..... 1

Make: ..... Haeam Machinery Ind., Co., Ltd  
 Type: ..... Diesel Engine Driven, Cylinder luffing type  
 Performance: ..... SWL 7.5tonnes  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2  
 Make: ..... Hyundai Lifeboats Co., Ltd  
 Type: ..... Totally Enclosed Lifeboat  
 Vertical or sloping chutes: ..... Vertical  
 Cargo tanks  
 Number: ..... 12  
 Coated tanks: ..... Jotun/ Jotacote Universal N10  
 Cargo pumps  
 Pumps: ..... 2  
 Type: ..... Vertical, centrifugal single stage,  
 electric, motor driven  
 Make: ..... Shinko  
 Capacity: ..... 2,000m<sup>3</sup>/h x 150mTH  
 Cargo control system  
 Make: ..... Shinko  
 Type: ..... Remote control  
 Ballast control system  
 Make: ..... Shinko  
 Type: ..... Remote control  
 Complement  
 Crew: ..... 50  
 Passengers  
 Total: ..... 48  
 Fire detection system  
 Make: ..... HHI (Autronica)  
 Type: ..... BS-420  
 Fire extinguishing system  
 Cargo holds: ..... Wilhelmsen/ low expansion form  
 Engine room: ..... Wilhelmsen/  
 High expansion foam, water mist  
 Radars  
 Number: ..... 1  
 Make: ..... OSB (JRC)  
 Models: ..... JMA5322-9/NKE-2254  
 Integrated bridge system  
 Make: ..... HHI  
 Model: ..... Delta V  
 Waste disposal plant  
 Incinerator: ..... Hyundai-Marine Machinery Co/ MAXI  
 NG25SL WS  
 Waste compactor: ..... Samjoo/TT160  
 Sewage plant: ..... Jong-hap/AEROB-25N  
 ESD System  
 Make: ..... HHI (Emerson)  
 Type: ..... Delta V SIS  
 Contract date: ..... 12 May 2011  
 Launch/float-out date: ..... September 2012  
 Delivery date: ..... December 2012







# RIVER DISCOVERY II: first generation river cruise vessel for US owner

Shipbuilder: ..... **De Hoop Lobith**  
 Vessel's name: ..... **River Discovery II**  
 Hull No: ..... **444**  
 Owner/operator: ..... **Vantage Delux Travel**  
 Country: ..... **USA**  
 Designer: ..... **De Hoop Lobith**  
 Country: ..... **The Netherlands**  
 Model test establishment used: ..... **Development Centre for Ship Technology and Transport Systems (DTS)**  
 Flag: ..... **Germany**  
 MMSI: ..... **211563860**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **1**

*River Discovery II* is the first of a series of three vessels De Hoop is building for Vantage Travel. The first two ships measure 135m, while the third will be 110m, allowing access to smaller rivers such as the Moselle. The company caters primarily for a North-American clientele. Initially, the plan was to build a third 135m vessel for delivery in 2013, but this has been postponed for the time being.

These ships have a classic retro look, but feature the very latest technologies. Never before has De Hoop designed a 135m ship for this customer, the maximum length allowed by EU regulations. The second ship, *River Splendor* is currently under construction and will be delivered in early 2013. For the third ship, *River Venture* (110m), the preparatory work is in progress and it is expected to be delivered in the course of 2013.

*River Discovery II* features a hydrodynamically efficient hull, based on the hull lines and construction of a previous vessel *S.S. Antoinette*, for which a model testing programme was carried out in the towing tank. As a result, the ship can attain a service speed of 11.87knots with its two Caterpillar C32 ACERT main engines, rated at 746kW, coupled to Veth rudder propellers with contra-rotating propellers. The thrusters are located in recesses of the hull, which allows operation with a shallow draught of 1.45m. Moreover, the low resistance and smart construction make for fewer vibrations and less noise, resulting in more comfort for passengers.

The bowthruster is driven directly by another C18 diesel engine from Caterpillar. A shaft generator is mounted between the diesel engine and the thruster, allowing the diesel to be used either for power generation (for a quieter aft ship) or for manoeuvring. This solution allows for a complete shutdown of the aft engine room, provided one generator is enough, during night stays on the quayside. To save on electrical power, the entire ship

has LED lighting. The emergency diesel generator, a 156kVA C6.6 from Caterpillar is also housed in the bowthruster room. The bowthruster is a jet-type thruster from Veth with a rotating grid, allowing for thrust in every direction. During river trials, *River Discovery II* achieved a speed of 5.39knots on the bowthruster alone, making it a very effective emergency propulsion system.

The compact engine room is located in the aft, with exhausts exiting through the stern. Venturi nozzles give the exhaust gases an acceleration to avoid smells on the aft deck. Two main engines and two generators are all cooled with a LI circuit circulating through boxcoolers which are placed in the skeg. Using the ballast tanks, the vessel can be trimmed in such a way that the boxcoolers can be pulled out for cleaning without drydocking. Between the main engines is a diesel-fired boiler for the hot water onboard, which is stored in four 500-litre insulated tanks in the aft.

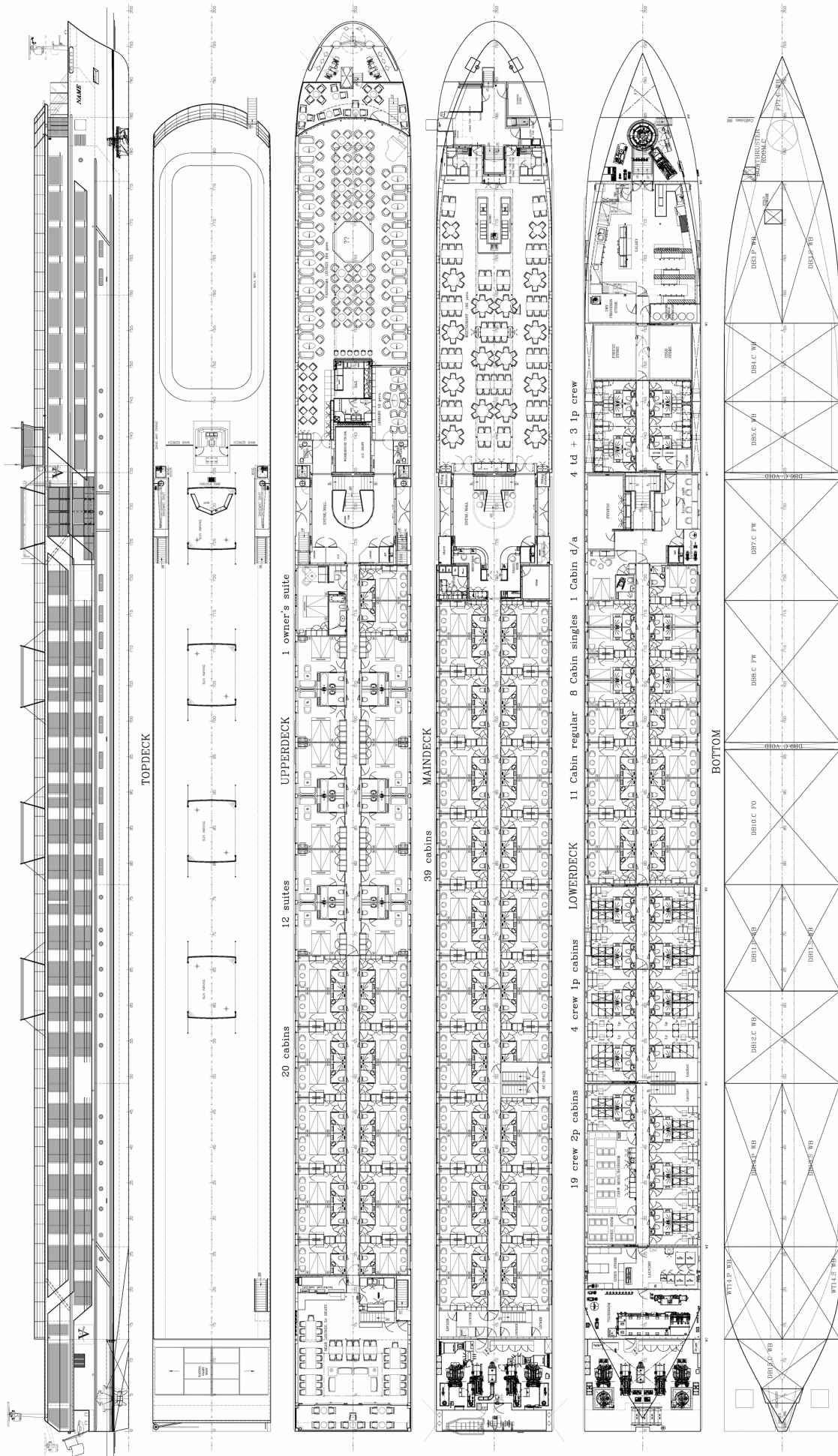
*River Discovery II* will be used on the entire length of the Rhine and Danube, from Amsterdam to the Black Sea. For a significant portion of the Main-Danube Canal, the air draught must be reduced to six metres to allow passage under bridges. It takes eight hours to fill the ballast tanks to achieve the required air draught. Even at the draught of 2.1m, *River Discovery II* complies with all the damaged stability requirements. During the passage through the Main-Danube Canal, the upper deck will not be accessible for a long period. To create an open space during those times, the lounge on the aft upper deck has a roof section which can be opened by hydraulics. Furthermore, about half of the aft glass wall can be opened, to ensure an open-air experience.

## TECHNICAL PARTICULARS

Length oa: ..... 135m  
 Breadth moulded: ..... 11.1m  
 Depth moulded  
 To main deck: ..... 3.25m  
 Draught  
 Operational: ..... 1.4m  
 Ballast draught: ..... 2.1m  
 Block co-efficient: ..... 0.85  
 Bunkers  
 Diesel oil: ..... 120m<sup>3</sup>  
 Water ballast: ..... 850m<sup>3</sup>  
 Classification society and notations: ..... BV I 5 IN (0,6) Z  
 Passenger Vessel/Fire \*MC  
 Main engines  
 Design: ..... Caterpillar  
 Model: ..... Caterpillar C32 Ditta Acert  
 Manufacturer: ..... Caterpillar  
 Number: ..... 2

Type of fuel: ..... MGO  
 Output of each engine: ..... 746kW  
 Propellers  
 Designer/manufacturer: ..... Veth VZ-900 CR  
 Number: ..... 2  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 1.5m front, 1.35m aft  
 Speed: ..... 340rpm  
 Special adaptations: ..... Flexible suspended  
 Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Caterpillar C18 Acert Ditta  
 Type of fuel: ..... MGO  
 Output/speed of each set: ..... 500kVA  
 Alternator make/type: ..... Leroy Somer  
 Output/speed of each set: ..... 439kW x 1500rpm  
 Boilers  
 Number: ..... 1  
 Type: ..... Elprex 420  
 Make: ..... Unical with Riello oil burner  
 Output, each boiler: ..... 360kW  
 Other cranes  
 Number: ..... 2  
 Make: ..... Van Wilk  
 Type: ..... Hydraulic telescopic  
 Tasks: ..... Operation of gangways  
 Performance: ..... SWL 750kg  
 Mooring equipment  
 Number: ..... 2 x anchor/mooring winches,  
 1 x stern anchor/mooring winch  
 Make: ..... Dijkstra  
 Type: ..... Electric  
 Complement  
 Crew: ..... 49  
 Passengers  
 Total: ..... 176  
 Number of cabins: ..... 92  
 Bow thrusters  
 Make: ..... Veth Compact Jet CJ-1200  
 Number: ..... 1  
 Output: ..... 350kW  
 Fire detection system  
 Make: ..... Eltek  
 Fire extinguishing systems  
 Cargo holds: ..... Seafix  
 Engine room: ..... FM200  
 Cabins/public spaces: ..... Imtech  
 Radars  
 Number: ..... 2  
 Make: ..... Alphasat  
 Model: ..... JMA-610  
 Waste disposal system  
 Sewage plant: ..... Gertsen & Olufsen/ BR-37000  
 BG-G Bio compact  
 Contract date: ..... 01 October 2010  
 Launch/float-out date: ..... 14 December 2011  
 Delivery date: ..... 01 February 2012









# S.A. AGULHAS II: single deck research vessel

Shipbuilder: ..... **STX Finland Rauma Shipyard**  
 Vessel's name: ..... **S.A. Agulhas II**  
 Hull No: ..... **NB 1369**  
 Owner/operator: ..... **Department of Environmental affairs**  
 Country: ..... **South Africa**  
 Designer: ..... **STX Finland Oy**  
 Country: ..... **Finland**  
 Model test establishment used: ..... **Aker Arctic and SSPA**  
 Flag: ..... **South Africa**  
 IMO number: ..... **9577135**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **nil**

**S.A. Agulhas II** is the latest in Polar supply and research vessels that has been developed by STX Finland for the South African Department of Environmental Affairs which took delivery of the vessel in April. The ship will function as a multi-purpose vessel, serving as a supply vessel, research vessel, icebreaker, expedition vessel as well as a passenger ship.

The core function of the vessel will be to give logistical support for South African research bases on the Antarctic mainland, Marion Island and Gough Island. The vessel will also be equipped to conduct oceanographic studies as well as marine geological research. In addition, the vessel will conduct continuous measurements of a range of meteorological parameters for transmission to the South African Weather Services, and deploy weather balloons and weather buoys during certain transits.

The ship can spend several months out at sea and it also acts as a mobile laboratory. The vessel has a shelter and landing area for two Puma class helicopters and it will feature laboratories, a library, a gym and a small hospital.

The ice-strengthened vessel is 134m long and it will have accommodation for a crew of 45 and some 100 passengers. The vessel has 10 decks including the wheelhouse top deck. The Tank Top on deck 1 extends to the collision bulkhead at the forward part of the vessel, which mainly comprises of machinery spaces amidships and tanks in the forward part of the deck.

Deck 2 is a tween deck with the aft part of it comprising of two separated steering gear rooms, helicopter fuel pump room and scientific store. Amidships the deck comprises of machinery and electrical stores and workshops, the engine control room, switchboard rooms and machinery spaces. The lower part of cargo holds No. 2 and 3 are located in the forward part of the deck.

The main deck (deck 3) is a bulkhead deck from aft to the cargo hold area and tween deck of the cargo holds No. 2 & 3. The aft part of the deck comprises of a combined scientific and mooring

deck, laboratory spaces, moon pool, research workshops and operation room. Amidships there is crew accommodation, crew service spaces and provision stores.

The ship is a modern two propeller supply/research vessel that is powered by redundant diesel electric propulsion machinery. Each controllable pitch (CP) propeller is driven by an electric propulsion motor placed together with its frequency converter in a watertight and fire insulated compartment. Electric power for the propulsion motors and ship's network is generated by four medium speed diesel generator sets placed in two separate engine rooms.

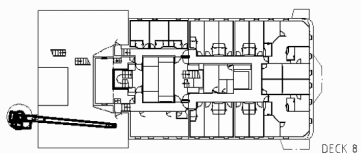
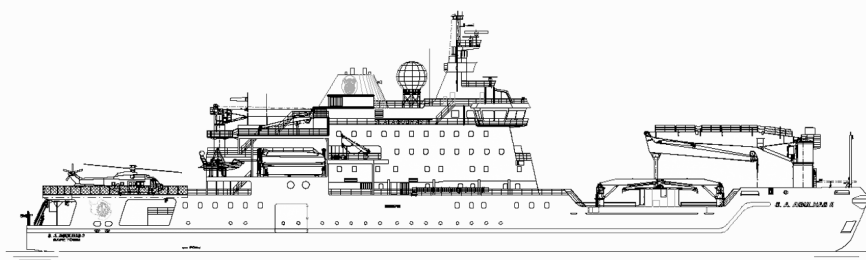
**S.A. Agulhas II** has a 2.4m x 2.4m moon pool that is installed in the CTD Hangar, on the ship's centre line. A drop keel for transducers is positioned at the midship, which is hydraulically operated and capable of being lowered 3m under the bottom of the ship. A hydraulic operated A-frame is housed inside the CTD Hangar ally for deploying Plankton nets over the starboard side.

The vessel is fitted with two plankton winches, one that is vertical to be used to deploy vertical bongo net's that has a drum capacity of 1,500m of 6.35mm diameter four core conductor cable. The plankton towing winch is used for the plankton nets and sampling device's that has a drum capacity of 2,500m of 11.7mm diameter four core conductor cable. A deep coring winch has also been fitted and is used to conduct vertical coring to depths of 5,000m; Box coring, with piston coring to depths of 5000m and to tow small dredges to depths of 1,000m.

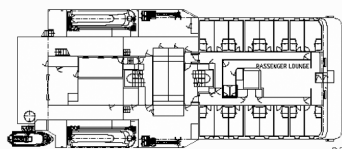
## TECHNICAL PARTICULARS

Length oa: ..... 134.0m  
 Length bp: ..... 121.4m  
 Breadth moulded: ..... 22.0m  
 Depth moulded  
 To main deck: ..... 10.55m  
 To upper deck: ..... 13.55m  
 Width of double skin  
 Side: ..... 1.0m  
 Bottom: ..... 1.2m  
 Draught  
 Scantling: ..... 7.7m  
 Design: ..... 7.65m  
 Gross: 12,897gt  
 Deadweight  
 Design: ..... 5,020dwt  
 Scantling: ..... 5,250dwt  
 Speed, service: ..... 14knots  
 Cargo capacity  
 Bale: ..... 4,000m<sup>3</sup>  
 Grain: ..... 4,600m<sup>3</sup>  
 Refrigerated cargo: ..... 80m<sup>3</sup>  
 Bunkers  
 Diesel oil: ..... 3,650m<sup>3</sup>

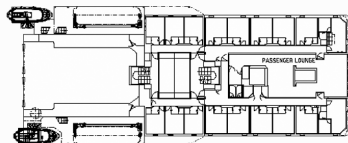
Classification society and notations: ..... DNV + 1A1 PASSENGER SHIP, PC5, WINTERISED  
 BASIC, DAT(-35), EO, RP, HELDEK-SHF,CLEAN DESIGN,COMF V(2)/C(2),NAUT-AW, TMON, BIS, DYNPOS-AUT, DE-ICE, LFL App:(ICE 10 for HULL)  
 Heel control equipment: ..... Hoppe, automatic operating heeling system  
 Roll-stabilisation equipment: ..... Hoppe, controlled passive stabilising tank system  
 Main engine  
 Model: ..... 6L32  
 Manufacturer: ..... Wärtsilä  
 Number: ..... 4  
 Type of fuel: ..... MGO  
 Output of each engine: ..... 3,000kW  
 Main-engine driven generators  
 Make/type: ..... Converteam B128P8  
 Output/speed of each set: ..... 3,230kVA  
 Propulsion motor  
 Motor make: ..... Converteam  
 Motor type: ..... N3HXC1120LL8CH  
 Speed of each set: ..... 140rpm  
 Output of each set: ..... 4,500kW  
 Propeller  
 Material: ..... Stainless steel EN-GX4Cr-Ni-Mo16-5-1  
 Designer/manufacturer: ..... KaMeWa CPP, Rolls-Royce  
 Fixed/controllable pitch: ..... Controllable  
 Diameter: ..... 4.3m  
 Speed: ..... 140rpm  
 Thermal oil heaters  
 Type: ..... TOH 1200V40  
 Make: ..... Gesab  
 Output, each boiler: ..... 1,200kW  
 Cargo cranes/cargo gear  
 Make: ..... TTS  
 Type: ..... Knuckle boom deck crane  
 Performance: ..... 1 x 35tonnes x 27.5m, 2 x 10tonnes x 10m  
 Mooring equipment  
 Make: ..... Hatlapa/ Petrel Engineering  
 Type: ..... Electric  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 x 75 persons, 6 x 25 persons  
 Make: ..... Schat-Harding/ Viking Life-Saving  
 Type: ..... Lifeboats: Kiss1000/ Liferrafts: 15DKF Arctic  
 Hatch covers  
 Manufacturer: ..... Cargotec  
 Type: ..... 3 x upper deck, 3 x tween deck  
 Containers  
 Total TEU capacity: ..... 47 x 20ft ISO containers  
 On deck: ..... 20 cargo + 6 laboratory  
 In holds: ..... 21 cargo  
 Cargo tanks  
 Number: ..... 2  
 Grades of cargo carried: ..... Polar diesel oil  
 Cargo pumps  
 Type: ..... SD100  
 Make: ..... Framo  
 Capacity: ..... 60m<sup>3</sup>/h, 120mic  
 Water ballast treatment system  
 Make: ..... Hyde Marine HG25OS  
 Capacity: ..... 250m<sup>3</sup>/h  
 Complement: ..... 44  
 Passengers  
 Total: ..... 100  
 Number of cabins: ..... 46  
 Bow thruster  
 Make: ..... Rolls-Royce  
 Input power: ..... 750kW  
 Stern thruster  
 Make: ..... Rolls-Royce  
 Input power: ..... 1,200kW  
 Bridge control system  
 Make: ..... Raytheon Anschütz  
 Type: ..... Synapsis  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Consilium Marine/Salvico  
 Fire extinguishing systems  
 Cargo holds: ..... Autronica/CO<sub>2</sub>  
 Engine room: ..... Autronica/Novac 1230  
 Radars  
 Make: ..... Raytheon Anschütz  
 Model: ..... Synapsis  
 Waste disposal plant  
 Incinerator: ..... Teamtec/OG 400 C, CSW  
 Waste compactor: ..... Mil-Tek/ XP300  
 Sewage plant: ..... EVAC/AWT MBR 120C  
 Contract date: ..... 17 November 2009  
 Launch/float-out date: ..... 21 July 2011  
 Delivery date: ..... 04 April 2012



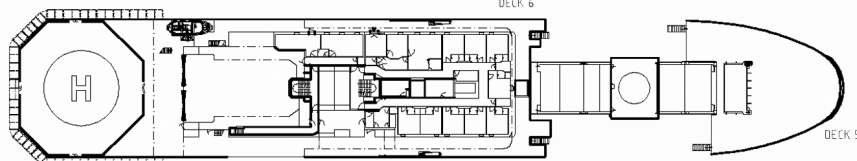
DECK 8



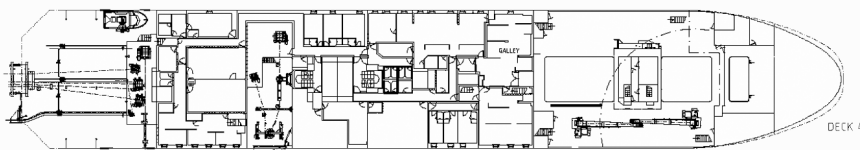
DECK 7



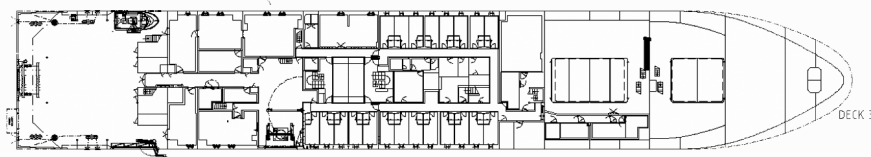
DECK 6



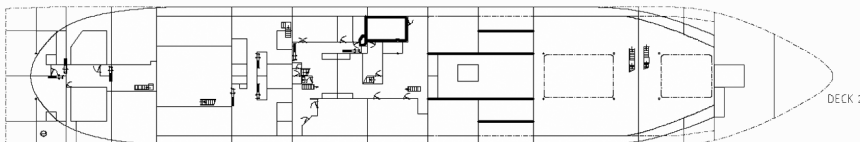
DECK 5



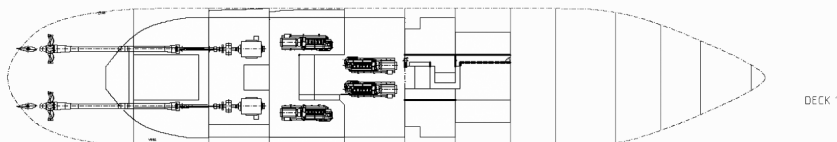
DECK 4



DECK 3



DECK 2



DECK 1





# SEVERINE: Ipswichmax ro-ro from Japan

Shipbuilder: ... **Kyokuyo Shipyard Corporation, Japan**  
 Vessel's name: ..... **Severine**  
 Hull No: ..... **501**  
 Owner/operator: ..... **Shiplux VIII S.A**  
 Country: ..... **Luxembourg**  
 Designer: ..... **Kyokuyo Shipyard Corporation**  
 Country: ..... **Japan**  
 Flag: ..... **Malta**  
 IMO number: ..... **9539078**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **nil**

## TECHNICAL PARTICULARS

Length oa: ..... 152.02m  
 Length bp: ..... 142.00m  
 Breadth moulded: ..... 22.00m  
 Depth moulded  
 To main deck: ..... 8.20m  
 To upper deck: ..... 16.20m  
 Width of double skin  
 Side: ..... 5.40m  
 Bottom: ..... 2.40m  
 Draught  
 Scantling: ..... 5.40m  
 Design: ..... 5.40m  
 Gross: ..... 16,342gt  
 Deadweight  
 Design: ..... 6,576dwt  
 Scantling: ..... 6,576dwt  
 Speed, service: ..... 17knots  
 Bunkers  
 Heavy oil: ..... 764m<sup>3</sup>  
 Diesel oil: ..... 127m<sup>3</sup>  
 Water ballast: ..... 4,135m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 28.6tonnes/day  
 Classification society and notations: ..... BV I +HULL, +MACH ro-ro cargo ship unrestricted navigation, +AUT-UMS, MON-SHAFT, Inwatersurvey  
 Heel control equipment: ..... Frank Mohn, 500m<sup>3</sup>/h  
 Main engine  
 Design: ..... Wärtsilä  
 Model: ..... 16V32  
 Manufacturer: ..... Wärtsilä  
 Number: ..... 1  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 7,000kW x 750rpm  
 Gearboxes  
 Make: ..... Wärtsilä  
 Model: ..... SCV 95-PDMT116  
 Output speed: ..... 168.2rpm  
 Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... Wärtsilä  
 Fixed/controllable pitch: ..... Controllable  
 Diameter: ..... 4.3m  
 Speed: ..... 168.2rpm  
 Main-engine driven alternators  
 Make/type: ..... AVK/DSG99L1/6  
 Output/speed of each set: ..... 2,000kW x 1,200rpm  
 Diesel-driven alternators  
 Engine make/type: ..... Daihatsu Diesel Mfg Co., Ltd  
 Type of fuel: ..... MDO  
 Output/speed of each set: ..... 550kW x 900rpm  
 Alternator make/type: ..... Taiyo Electric Co., Ltd  
 Output/speed of each set: ..... 500kW x 900rpm  
 Boilers  
 Type: ..... Thermal oil heater, Economiser  
 Make: ..... Alfa Laval  
 Output, each boiler: ..... Thermal oil heater 700kW, Economiser 500kW

Other cranes  
 Make: ..... Kyoritsu Kikai Co., Ltd  
 Type: ..... Electric motor driven  
 Tasks: ..... Provision handling  
 Performance: ..... 1tonne x 4m  
 Mooring equipment  
 Number: ..... 2 x windlasses, 2 x mooring winches  
 Make: ..... Nippon Pusnes Co., Ltd  
 Type: ..... Hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 36 persons  
 Make: ..... Hatecke  
 Type: ..... Totally enclosed freefall  
 Vehicles  
 Number of vehicle decks: ..... 3 decks  
 Total lane length: ..... 1,755m  
 Total cars: ..... 116  
 Doors/ramps/lifts/movable car ramps  
 Number of each: ..... 1 x ramp, 1 x ramp cover  
 Type: ..... Stern ramp-way door/ side hinged ramp door  
 Designer: ..... TTS  
 Ballast control system  
 Make: ..... Nakakita Seisakusho Co., Ltd  
 Water ballast treatment system  
 Make: ..... Panasia  
 Capacity: ..... 500m<sup>3</sup>/h  
 Complement  
 Officers: ..... 10  
 Crew: ..... 14  
 Stern appendages/special rudders: ..... Double plated, ocean shilling mariner  
 Bow thruster  
 Make: ..... Kawasaki Heavy Industries, Ltd  
 Output: ..... 144kN  
 Stern thruster  
 Make: ..... Kawasaki Heavy Industries, Ltd  
 Output: ..... 99kN  
 Bridge control system  
 Make: ..... Furuno  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Autronica Fire and Security/ AMCO Engineering Corporation  
 Type: ..... Addressable  
 Fire extinguishing systems  
 Vehicle spaces /Engine room: ..... Danfoss Semco/ CO<sub>2</sub>  
 Cabins/ public spaces: ..... Seawater & portable fire extinguishers  
 Radars  
 Make: ..... Furuno Electric Co., Ltd  
 Models: ..... FAR-2827/ FAR-2837S  
 Integrated bridge system  
 Make: ..... Furuno  
 Model: ..... Voyager  
 Waste disposal plant  
 Sewage plant: ..... Taiko Kikai Industries Co., Ltd/ SBH-40  
 Launch/float-out date: ..... 29 September 2011  
 Delivery date: ..... 25 January 2012

**SEVERINE** is a purpose built Ipswichmax ro-ro that was constructed at Kyokuyo Shipyard in Japan along with its sister ship *Capucine*, which were ordered by European Owner Cobelfret for the Ipswich to Rotterdam route and was delivered early in 2012.

However, since the vessels have come into operation Cobelfret has had to end its Ipswich-Rotterdam freight only ro-ro service due to the state of the market. The two Ipswichmax ro-ro ships that were deployed in the service and especially constructed to navigate on the River Orwell and pass under the Orwell Bridge have since been taken on by Stena Line on a five-year bareboat charter and the Swedish company has deployed them on its Harwich-Rotterdam freight only service, where they have replaced the 2004-built *Stena Carrier* and *Stena Freighter*.

It is expected that with market conditions as they are Stena will still be able to reduce operating costs despite the lower capacity of the Ipswichmaxes because of the fuel efficiency of the vessels.

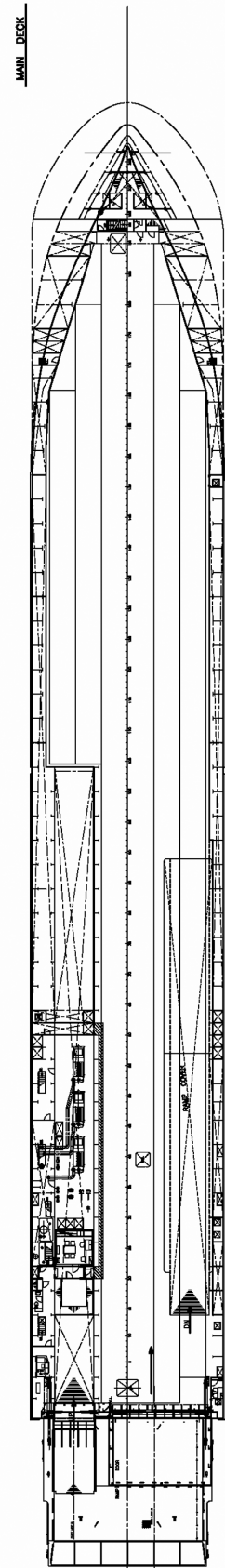
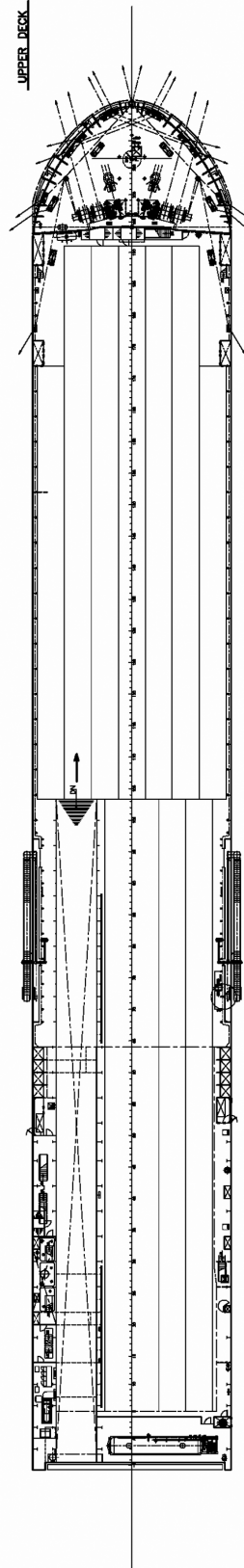
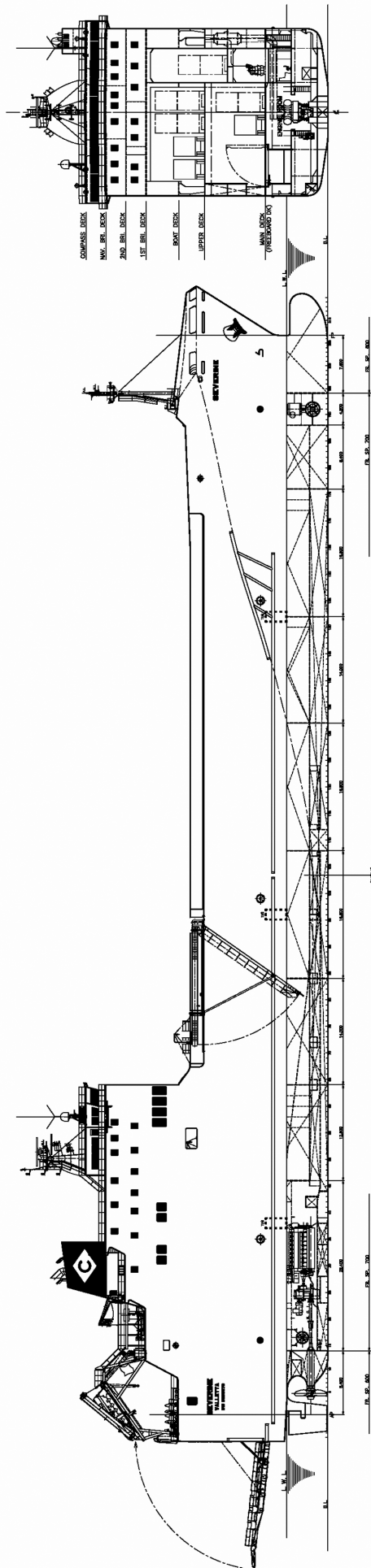
*Severine* is a modern transporter optimised for today's logistics services in Europe. Underneath its clean exterior lines the vessel features a very shallow draft with a design full load draft of 5.4m, making it ideal for river navigation.

The vessel also has three car decks, two of which have a clear height of 7m that can accept trailers loaded with two-tiers of containers. It has 1,760 lane meters, the ramps to the car decks are angled at 6deg to give quicker and smoother cargo loading/discharging. To aid the loading and unloading *Severine* is equipped with a hydraulic-driven 150tonne SWL stern cargo ramp and an inner slope cover.

A Panasia ballast water treatment system (BWTS) that has a capacity of 500m<sup>3</sup>/h has been installed onboard to prevent marine organisms from entering foreign waters.

The main and auxiliary diesel engines meet with Tier II NOx regulations and have a fuel service system included on the main and auxiliary engines and boilers that complies with the EU's low sulphur regulations. The reduction in emissions is geared with a step-up function to help save energy by controlling the shaft generator. The emergency propulsion system that uses the shaft generator also permits slow self-navigation even if the main engine fails.

The bridge is a totally enclosed type with three Furuno SYS-IBS units, which also has the facility for one man operation. The data logger system has an integrated monitoring device with power management and remote controller functionalities.







# SILVER PRINCESS: advanced ro-pax from Japan

Shipbuilder: ..... **Mitsubishi Heavy Industries Ltd**  
 Vessel's name: ..... **Silver Princess**  
 Hull No: ..... **1158**  
 Owner/operator: **Kawasaki Kinkai Kisen Kaisya Ltd**  
 Country: ..... **Japan**  
 Designer: ..... **Mitsubishi Heavy Industries Ltd**  
 Country: ..... **Japan**  
 Model test establishment used: ..... **MHI Nagasaki R&D Centre, Japan**  
 Flag: ..... **Japan (Hachinohe)**  
 IMO number: ..... **9597616**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **nil**

**SILVER Princess** is a ro-pax ferry, for Kawasaki Kinkai Kisen Kaisya Ltd that services the Tomakomai to Hachinohe route. The vessel was designed and built at the Shimonoseki Shipyard & Machinery Works of Mitsubishi Heavy Industries, Ltd. (MHI), and delivered to the owner on 5 April.

The vessel which is a one off design for the owners, has been further optimised with the hull form of *Silver Princess* enhanced through model tank testing which, was used to significantly improve the fuel oil consumption.

The propulsion system installed on the vessel is a combination of two main engines and two controllable pitch propellers driven through two reduction gears. The latest medium speed diesel engines give a service speed of 20.5knots at 85% power. The highly skewed controllable pitch propellers contribute to the reduction in the propeller surface force.

In addition to the above, the ship is equipped with two bow thrusters manufactured by Kawasaki Heavy Industries to enable smooth manoeuvring in harbour. A pair of fin stabilisers have been installed in order to reduce the rolling of the vessel and to increase the comfort level during the voyage.

The maximum loading capacity of vehicles onboard is 92 trailers/trucks and 30 passenger cars. Two outboard ramps on Deck-3 and three inboard ramp ways are arranged to give better loading/unloading at the quays on the vessel's regular route.

There are various cabin types onboard for passengers, such as deluxe class, first class and economy class cabins. The passengers can enjoy the time onboard at various public spaces such as the restaurant, grand bath with ocean view, entrance, lobby, kid's room and other areas. Furthermore, the Japanese barrier free rule has been applied to the vessel, so that all passengers including the handicapped can move about the vessel safely and enjoy the

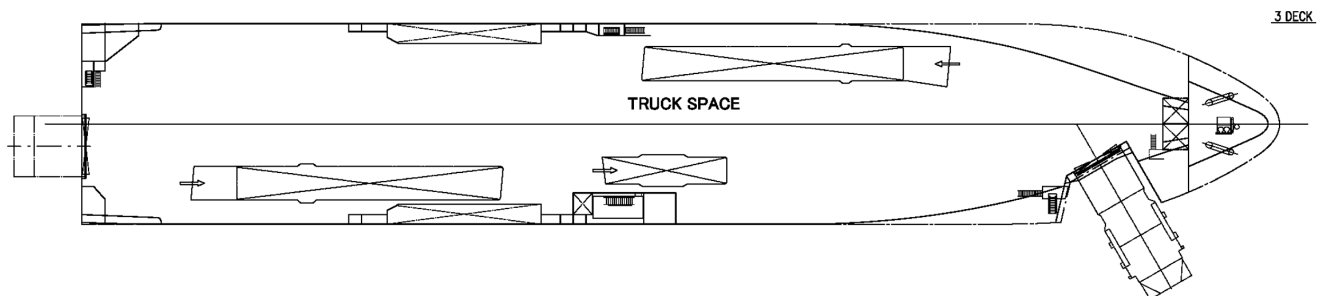
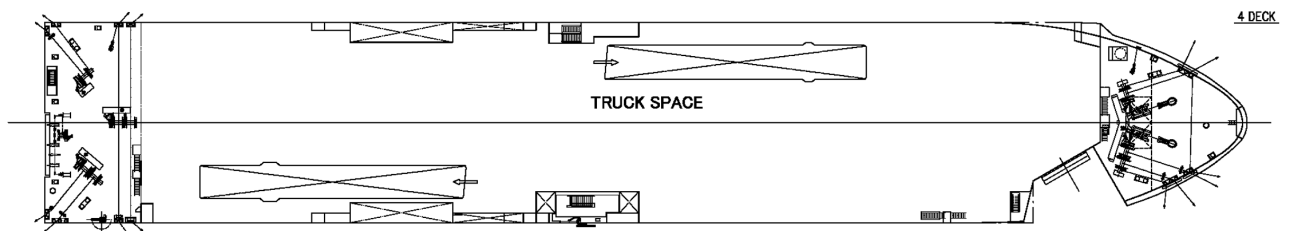
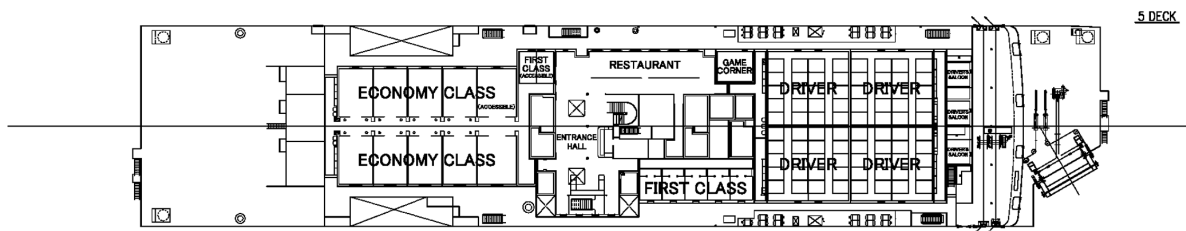
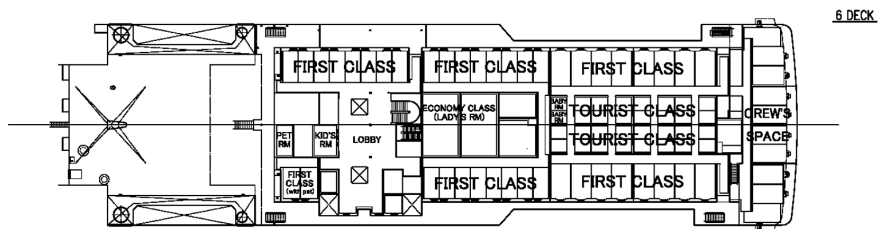
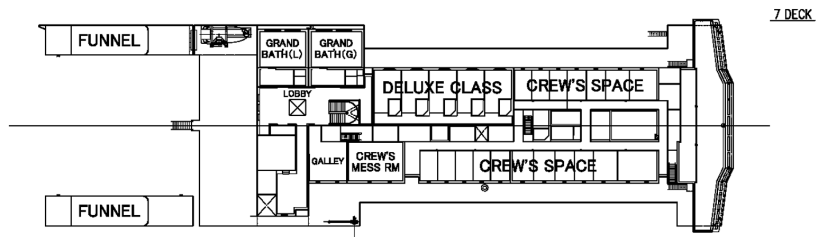
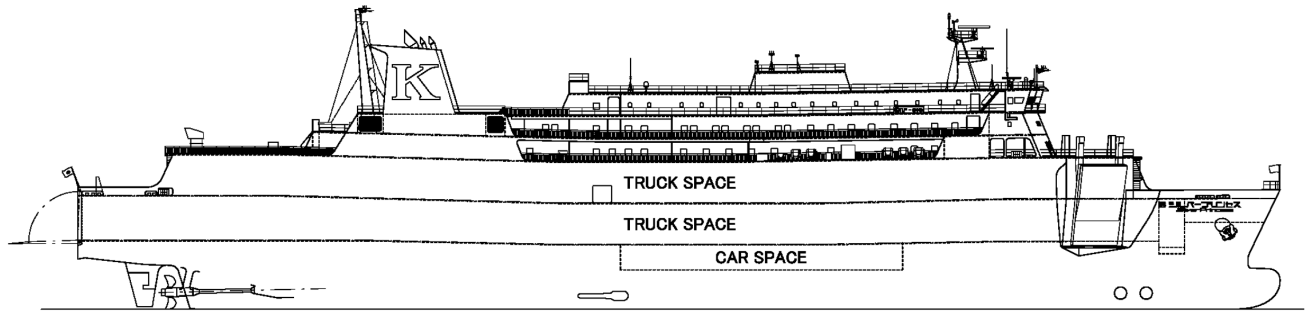
facilities onboard. Two elevators are fitted allowing passenger's to board and disembark and to move around the vessel's accommodation area.

## TECHNICAL PARTICULARS

Length oa: ..... 150.00m  
 Length bp: ..... 137.50m  
 Breadth moulded: ..... 25.00m  
 Depth moulded  
 To main deck: ..... 8.00m  
 To upper deck: ..... 13.15m  
 Draught  
 Scantling: ..... 5.85m  
 Design: ..... 5.70m  
 Gross: ..... 10,536gt  
 Deadweight  
 Design: ..... 4,315dwt  
 Scantling: ..... 4,724dwt  
 Speed, service: ..... 20.5knots  
 Bunkers  
 Heavy oil: ..... 612.3m<sup>3</sup>  
 Diesel oil: ..... 124.8m<sup>3</sup>  
 Water ballast: ..... 3,056.2m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 55.1tonnes/day  
 Main engine  
 Design: ..... S.E.M.T – Pielstick  
 Model: ..... 12PC2-6B  
 Manufacturer: ..... JFE Engineering Corporation  
 Number: ..... 2  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 7,200kW  
 Gearboxes  
 Make: ..... Kitachi Nico Transmission Co., Ltd  
 Model: ..... MGP1843H50  
 Number: ..... 2  
 Propellers  
 Material: ..... ALB3  
 Designer/manufacturer: ..... Kawasaki Heavy Industries  
 Number: ..... 2  
 Fixed/controllable pitch: ..... Controllable  
 Diameter: ..... 4.2m  
 Main-engine driven alternators  
 Number: ..... 2  
 Make/type: ..... Nishiba Electric Co., Ltd  
 Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Daihatsu Diesel MFG. Co. Ltd/ 5DK-20e  
 Type of fuel: ..... HFO, MDO

Output/speed of each set: ..... 900rpm  
 Boilers  
 Number: ..... 1  
 Make: ..... Muira Co., Ltd  
 Output, each boiler: ..... 3,000kg/h  
 Mooring equipment  
 Number: ..... 4  
 Make: ..... Manabe Zoki Co., Ltd  
 Type: ..... Electric-hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... MES-2  
 Make: ..... Fujikura Rubber Ltd  
 Type: ..... FSMES-160 N  
 Vertical or sloping chutes: ..... Vertical  
 Vehicles  
 Number of vehicle decks: ..... 3  
 Total cars: ..... 30  
 Total freight: ..... 92  
 Doors/ramps/lifts/movable car decks  
 Number of each: ..... 2 x ramps, 2 x movable car decks  
 Ballast control system  
 Make: ..... NYK Trading Corporation  
 Complement  
 Officers: ..... 9  
 Crew: ..... 11  
 Passengers  
 Total: ..... 900  
 Number of cabins: ..... 176  
 Stern appendages/ special rudders: ..... Mariner  
 Bow thruster  
 Make: ..... Kawasaki Heavy Industries  
 Number: ..... 2  
 Bridge control system  
 Make: ..... Nabtesco  
 Type: ..... electric  
 Fire detection system  
 Make: ..... Nippon Hakuyo Electronics  
 Type: ..... Smoke detector type & Temperature type  
 Fire extinguishing systems  
 Engine room: ..... Air Water Safety Service/ CO<sub>2</sub>  
 Vehicle spaces: ..... Nohmi Bosai Ltd/ sprinkler  
 Cabins/public spaces: ..... Yamato Protec/ Portable  
 Radars  
 Number: ..... 3  
 Make: ..... JRC  
 Contract date: ..... 26 March 2010  
 Launch/float-out date: ..... 11 November 2011  
 Delivery date: ..... 5 April 2012

# SILVER PRINCESS







# STENA SUPREME: eco tanker from Samsung

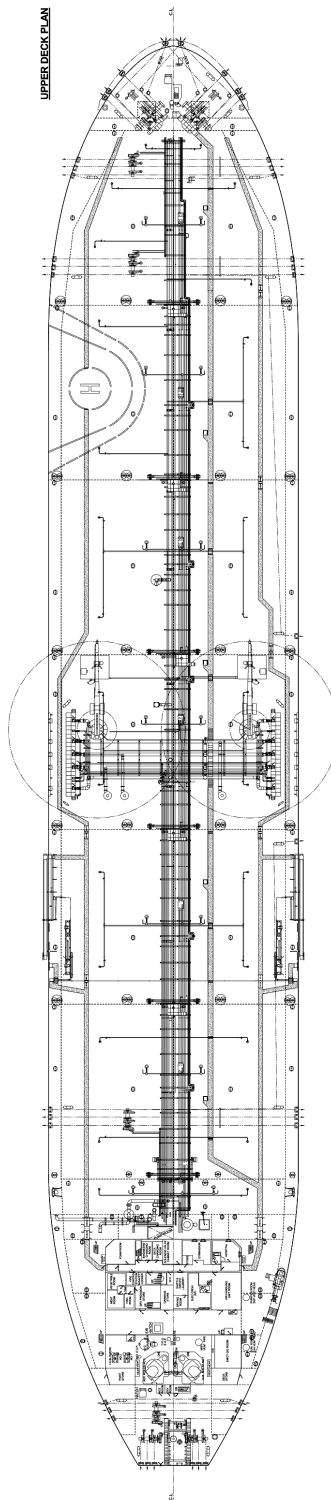
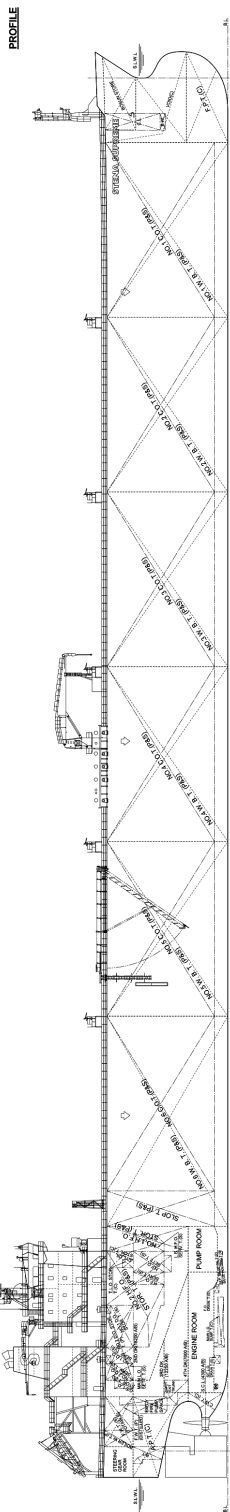
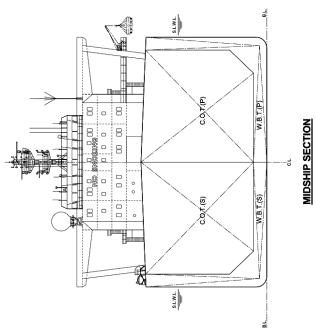
Shipbuilder: ..... **Samsung Heavy Industries Co., Ltd**  
 Vessel's name: ..... **Stena Supreme**  
 Hull No: ..... **HN1925**  
 Owner/operator: ..... **Stena Bulk**  
 Country: ..... **Sweden**  
 Designer: ..... **Samsung Heavy Industries Co., Ltd**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **Samsung Ship Model basin**  
 Flag: ..... **Bermuda**  
 IMO number: ..... **9585895**  
 Total number of sister ships already completed (excluding ship presented): ..... **4**  
 Total number of sister ships still on order: ..... **7**

Breadth moulded: ..... 48.0m  
 Depth moulded  
 To main deck: ..... 23.3m  
 To upper deck: ..... 23.3m  
 Width of double skin  
 Side: ..... 2.45m  
 Bottom: ..... 2.55m  
 Draught  
 Scantling: ..... 17.0m  
 Design: ..... 16.0m  
 Gross: 81,187gt  
 Displacement: ..... 182,914tonnes  
 Lightweight: ..... 23,883tonnes  
 Deadweight  
 Design: ..... 147,090dwt  
 Scantling: ..... 159,031dwt  
 Block co-efficient: ..... 0.8267  
 Speed, service: ..... 14.58knots  
 Cargo capacity  
 Liquid volume: ..... 175,742m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 3,532m<sup>3</sup>  
 Diesel oil: ..... 608.2m<sup>3</sup>  
 Water ballast: ..... 52,032m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 49tonnes/day  
 Classification society and notations: ... BV I, +Hull, +MACH, Oil Tanker, ESP, CSR, Unrestricted Navigation, +AUT-UMS, +VeriSTAR-HULL, MON SHAFT, In Water Survey, VCS, \_AUT-PORT, SYS-NEQ-1, Cleanship(C), ALP  
 Main engine  
 Design: ..... MAN Diesel & Turbo  
 Model: ..... 6S70ME-C  
 Manufacturer: ..... Doosan Engine (MAN Licensee)  
 Type of fuel: ..... 15,720kW x 81.4rpm  
 Propeller  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... SHI/HHI  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 8.4m  
 Diesel-driven alternators  
 Engine make/type: ..... Yanmar/6N21AL-GV  
 Type of fuel: ..... HFO, MDO  
 Output/speed of each set: ..... 950kW x 900rpm  
 Alternator make/type: ..... Hyundai/ HFC7 508-84K  
 Output/speed of each set: ..... 1,187.5kVA  
 Boilers  
 Type: ..... Mission OL 30000  
 Make: ..... Aalborg

Output, each boiler: ..... 30tonnes/h x 16kg/cm<sub>2</sub>  
 Cargo cranes/cargo gear  
 Make: ..... DMC  
 Type: ... Electric-hydraulic, self-contained type, single jib  
 Tasks: ..... Provisions and machinery part handling  
 Performance: ..... 2tonnes/6.3tonnes  
 Mooring equipment  
 Make: ..... Flutek Kawasaki  
 Type: ..... Electro-hydraulic driven  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 32 persons  
 Make: ..... Fassmer  
 Type: ..... Freefall  
 Cargo tanks  
 Number: ..... 12 + 2 slop tanks  
 Grades of cargo carried: ..... Grade B  
 Product range: ..... Crude oil (S.G 0.85)  
 Cargo pumps  
 Type: .. Vertical, single stage, centrifugal, double suction  
 Make: ..... Hyundai Heavy industries Co., Ltd  
 Stainless steel: ..... Impeller shaft  
 Capacity: ..... 3,800m<sup>3</sup>/h x 135m at S.G 1.025  
 Cargo control system  
 Make: ..... Samsung  
 Ballast control system  
 Make: ..... Samsung  
 Bridge control system  
 Make: ..... Nabtesco  
 Type: ..... M-800 III  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Addressable type  
 Fire extinguishing systems  
 Engine room: ..... Wilhelmsen/ High expansion foam & seawater  
 Cabins/ public spaces: ..... Seawater & portable fire extinguishers  
 Radars  
 Make: ..... Furuno  
 Model: ..... FAR-2827, FAR-2837S  
 Integrated bridge system  
 Make: ..... Furuno  
 Type: ..... FEA-2807  
 Waste disposal plant  
 Incinerator: ..... Hyundai-Atlas/ MAXI T150SL WS  
 Sewage plant: ..... II Seung/ ISS-35N  
 Contract date: ..... 19 March 2010  
 Launch/float-out date: ..... 19 May 2012  
 Delivery date: ..... 30 June 2012

## TECHNICAL PARTICULARS

Length oa: ..... 274.23m  
 Length bp: ..... 264.0m







# STI AMBER: first in series for Scorpio Tankers

Shipbuilder: .... **Hyundai Mipo Dockyard Co., Ltd**  
 Vessel's name: ..... **STI Amber**  
 Hull No: ..... **2332**  
 Owner/operator: ..... **Scorpio Tankers**  
 Country: ..... **Monaco**  
 Designer: ..... **Hyundai Mipo Dockyard Co., Ltd**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **Force Technology**  
 Flag: ..... **Marshall Islands**  
 IMO number: ..... **9629926**  
 Total number of sister ships already completed (excluding ship presented): ..... **4**  
 Total number of sister ships still on order: ..... **3**

SCORPIO Tankers has received the first vessel *STI Amber* as part of its fleet renewal programme from Hyundai Mipo Dockyard Co., Ltd (HMD) in mid-2012.

To be able to achieve this expansion programme Scorpio Tankers signed an agreement with its lenders Nordea Bank Finland plc, DNB Bank ASA, and ABN AMRO Bank N.V. to extend the availability period of its 2011 Credit Facility until 31 January 2014. The availability period was previously scheduled to expire in May 2013. There is currently US\$115 million available for borrowing under this facility, which can be used to finance up to 50% of future vessel acquisitions.

The contract for the building of the new fleet was awarded to HMD to construct a 52,000dwt MR-type product tanker and at this time Scorpio Tankers also entered into agreements to sell three of its Handymax vessels, and agreed to terms for the time charter of two MR product tankers. The contract with HMD to construct the newbuilding was said to be US\$36.0 million.

The vessel is an ocean going product & chemical tanker with bulbous bow, transom stern, flush deck with forecastle and open water type stern frame, single rudder and single screw propeller driven by a slow speed diesel engine. To improve energy efficiency an ME-B engine and Mewis Duct have been installed on the vessel. The propulsion machinery and living quarters including the navigation bridge are located in the aft of the vessel.

The vessel has a continuous deck from stern, transverse bulkheads and three longitudinal bulkheads in way of the cargo space divided for the fore peak tank, void space, chain lockers and the bosun store. The cargo space is divided into six pairs of cargo oil tanks and one pair of slop tanks and six pairs of water ballast tanks. One residual oil tank is also located inside of the slop tank on the starboard side.

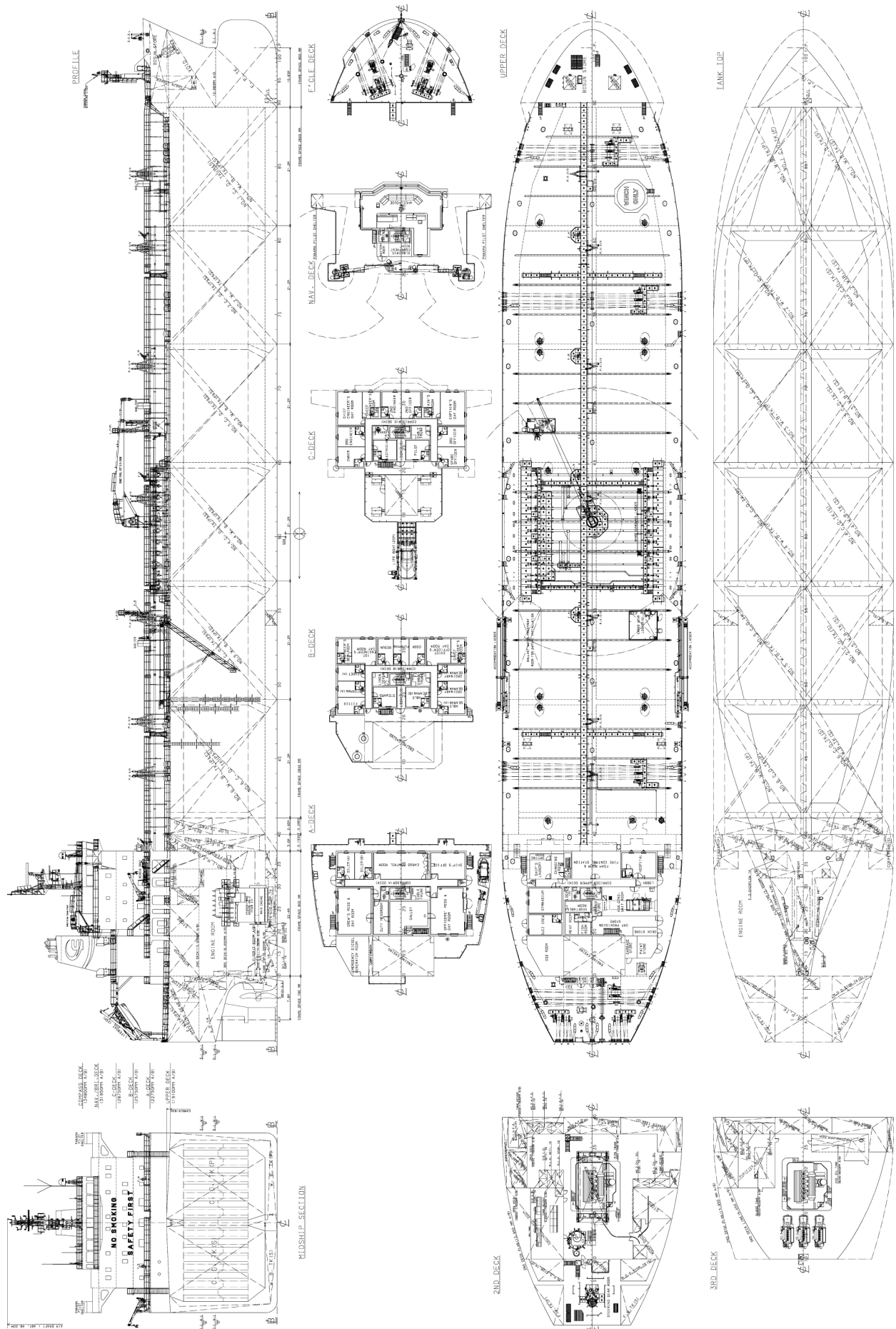
The engine room has four heavy fuel oil storage tanks that are arranged between the cargo space and in the engine room, one of those tanks may be used for low sulphur heavy fuel oil tank. The marine diesel oil storage tanks have a double hull structure and are arranged in the steering gear room. In the aft of the vessel is the peak tank, steering gear

compartment, fresh water tanks and stern tube cooling water tank.

## TECHNICAL PARTICULARS

Length oa: ..... 183.31m  
 Length bp: ..... 174.00m  
 Breadth moulded  
 To main deck: ..... 19.1m  
 To upper deck: ..... 19.1m  
 Width of double skin  
 Side: ..... 2m  
 Bottom: ..... 2.15m  
 Draught  
 Scantling: ..... 13.30m  
 Design: ..... 11.00m  
 Gross: 29,708gt  
 Displacement: ..... 50,048tonnes  
 Lightweight: ..... 10,389tonnes  
 Deadweight  
 Design: ..... 39,659dwt  
 Scantling: ..... 51,616dwt  
 Speed, service: ..... 15.4knots  
 Cargo capacity  
 Liquid volume: ..... 55,320m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 1,454m<sup>3</sup>  
 Diesel oil: ..... 267m<sup>3</sup>  
 Water ballast: ..... 22,428m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 31.8tonnes/day  
 Classification society and notations: ..... ABS, +A1, Hull Oil and Chemical Carrier, +AMS, +ACCU, CSR, AB-CM, VEC, UWILD, COW, TCM, CRC, ENVIRO, GP, POT, RRDA, SPMA, RW, ESP, IMO Ship Type 2, BWE  
 Main engine  
 Design: ..... Hyundai Heavy Industry Co., Ltd  
 Model: ..... 6S50ME-B9.2  
 Manufacturer: ..... Hyundai Heavy Industry Co., Ltd  
 Number: ..... 1  
 Type of fuel: ..... HFO  
 Output of each engine: ..... 8,890kW x 99rpm  
 Propeller  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... HHI-EMD  
 Number: ..... 1  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 6.6m  
 Speed: ..... 99rpm  
 Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... HHI 6H21/32  
 Type of fuel: ..... HFO, MDO  
 Output/speed of each set: ..... 1,000kVA x 720rpm  
 Alternator make/type: ..... HHI HFC7 508-14K  
 Boilers  
 Number: ..... 2  
 Type: ..... Aux. boiler, composite boiler  
 Make: ..... Alfa Laval

Output, each boiler: ..... 18,000kg/h, 2,000kg/h (oil fired), 850kg/h (exhaust)  
 Cargo cranes/cargo gear  
 Number: ..... 1  
 Make: ..... Dongham Marine Crane  
 Type: ..... Electric-hydraulic  
 Other cranes  
 Number: ..... 1/2  
 Make: ..... Dongham Marine Crane  
 Type: ..... Motor drive/ electric-hydraulic  
 Tasks: ..... E/R crane/ provision handling  
 Mooring equipment  
 Number: ..... 8  
 Make: ..... Aker Pusnes  
 Type: ..... Hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1  
 Make: ..... Fassmer Marland  
 Type: ..... CFL-T66  
 Cargo tanks  
 Number: ..... 12 x cargo oil tanks, 2 x slop tanks, 1 x residual tank  
 Grades of cargo carried: ..... Chemical cargoes compatible with IMO ship type II  
 Product range: According to cargo list approved by ABS  
 Cargo pumps  
 Number: ..... 15 sets  
 Type: ..... Submerged type  
 Make: ..... Framo  
 Stainless steel: ..... 316  
 Capacity: ..... 600m<sup>3</sup>/h, 300m<sup>3</sup>/h, 75m<sup>3</sup>/h  
 Cargo control system  
 Make: ..... Kongsberg Maritime Korea  
 Type: ..... CMS  
 Ballast control system  
 Make: ..... Emerson Process Management  
 Type: ..... CMS  
 Complement  
 Officers: ..... 11  
 Crew: ..... 13  
 Bridge control system  
 Make: ..... Hyundai Heavy industry Co., Ltd  
 Type: ..... Floor mounted and self standing  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salwico Cargo  
 Fire extinguishing systems  
 Cargo holds: ..... Maritime protection/ Inert gas  
 Engine room: ..... SeaPlus/ Water mist  
 Cabins/public spaces: ..... NK/ portable fire extinguishers  
 Radars  
 Number: ..... 2  
 Make: ..... Furuno  
 Model: ..... FAR-2837S, FAR-2827  
 Waste disposal system  
 Incinerator: ..... TeamTec/ OG400CS  
 Sewage plant: ..... Il Seung/ ISS-25N  
 Contract date: ..... 02 June 2011  
 Launch/float-out date: ..... 10 May 2012  
 Delivery date: ..... 20 July 2012







# STOLT RHINE: new and improved inland tankers

Shipbuilder: ..... **Mercurius Shipbuilding (Mercurius Shipping group)**  
 Shipyard: ..... **Shipyard (Serbia)**  
 Vessel's name: ..... **Stolt Rhine**  
 Hull No: ..... **294**  
 Owner/operator: ..... **Stolt Nielsen Inland Tanker Service B.V**  
 Country: ..... **The Netherlands**  
 Flag: ..... **The Netherlands**  
 MMSI number: ..... **244740787**  
 Total number of sister ships already completed (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **nil**

*STOLT Rhine* is the first in the series of three inland tankers for Stolt Nielsen Inland Tanker Service (SNITS) constructed at Mercurius Shipbuilding and delivered at the beginning of 2012. The three vessels were planned as part of a fleet expansion programme by Stolt Nielsen after evaluating a number of shipyards. Sister vessels *Stolt Merwede* and *Stolt Justina* were also delivered in 2012.

A special feature of these vessels is that they are constructed with 10 stainless steel cargo holds with individual heating systems, which will enable the vessels to be more flexible in the cargoes that they transport. Building stainless steel inland tankers requires very specific knowledge based on this the order for the vessels was originally placed in 2010 by Stolt Nielsen after evaluating a number of shipyards. The first steel plates were laid in November of 2010, with sea trials taking place at Novi Sad on the Danube River.

The vessels are designed with a double hull, single screw, chemical Tanker, type C (hull), 50kPa, outfitting as Type C, and are suitable for transportation of mineral oils and liquid chemicals, on West European inland waterways. They have a double bottom and double skin around the cargo area and the space between the cargo tanks and the shell is used for ballasting.

The steel used in the tankers has been approved by Lloyd's Register shipbuilding and are of Grade A category, except sheer strake which is Grade D and the double bottom bulkheads which are of a high tensile steel AH36. The cargo area is constructed from and approved by Lloyd's Register stainless steel Duplex 2205 (UNS S31803) PRE min 34. The surface preparation is classified according to ASTM A240 with No. 1 surface finish according to ASTM 4480.

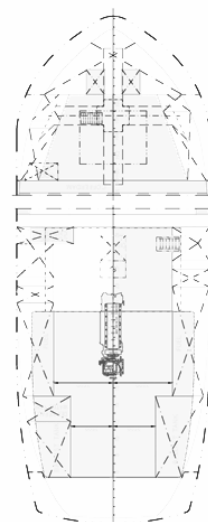
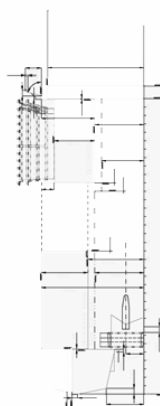
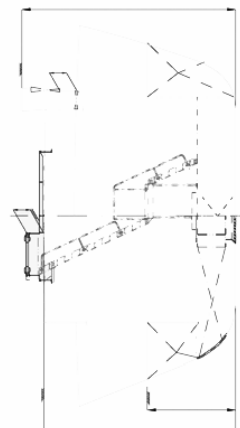
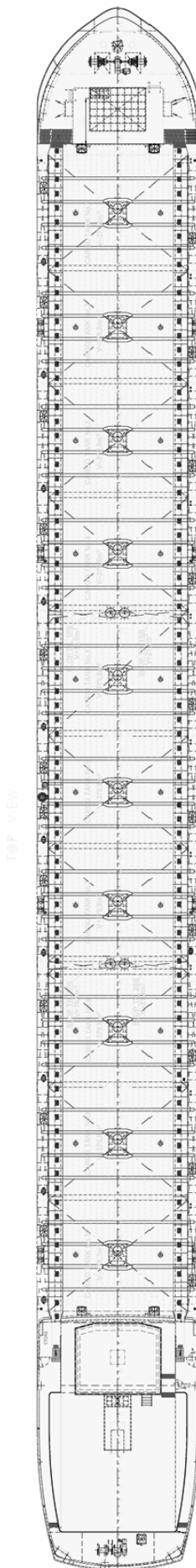
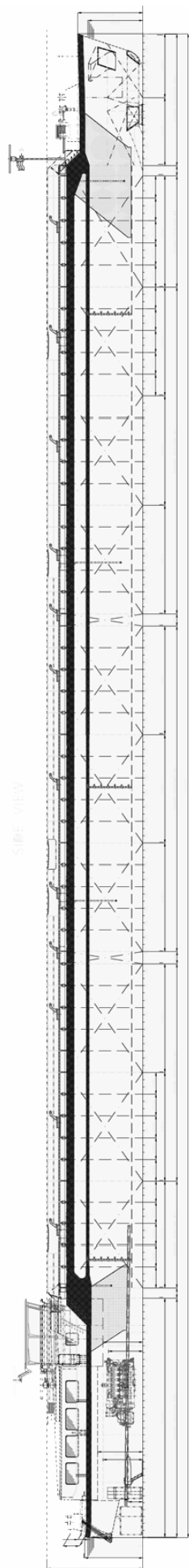
The 10 centre tanks are surrounded by the side and double bottom U- shaped ballast tanks. The cargo tank bottoms have a minimum inclination of 1.5deg towards the centre line. All cargo tanks were initially approved for a maximum cargo temperature of 80°C without a reduction in filling limits. On specific request of the owner, the goal was to achieve LR approval for a maximum cargo temperature of 90°C. The cargo tanks are designed and approved

for 50KPa over pressure. The tanks are designed for an S.G. of 1.6 MT/m<sup>3</sup>.

## TECHNICAL PARTICULARS

Length oa: ..... 109.99m  
 Breadth moulded: ..... 11.35m  
 Depth moulded  
 To main deck: ..... 5.35m  
 Width of double skin  
 Side: ..... 80cm  
 Bottom: ..... 65cm/80cm  
 Draught  
 Design: ..... 4.00m  
 Gross: ..... 3,409.795gt  
 Displacement: ..... 3,409.795tonnes  
 Deadweight  
 Design: ..... 1,007.823dwt  
 Speed, service: ..... 10.63knots  
 Cargo capacity  
 Liquid volume: ..... 3,791m<sup>3</sup>  
 Bunkers  
 Diesel oil: ..... 48m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 6,0912tonnes/day  
 Auxiliaries: ..... 3,414tonnes/day  
 Classification society and notations: ..... LR + A1 IWW  
 Chemical Tanker Type C, in association with a list of a defined cargoes, loading sequence "0"  
 Main engine  
 Design: ..... ABC  
 Model: ..... 6 DZC-1000-166-A  
 Manufacturer: ..... Anglo Belgian Corporation N.V  
 Number: ..... 1  
 Type of fuel: ..... MDO  
 Output of each engine: ..... 1,325kW  
 Gearboxes  
 Make: ..... ZF-Masson  
 Model: ..... ZF W12000 C  
 Number: ..... 1  
 Output speed: ..... 335,35rpm  
 Propellers  
 Material: ..... CU3  
 Designer/manufacturer: ..... Wärtsilä Iberica S.A  
 Number: ..... 1  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 1.75m  
 Speed: ..... 30,71rpm  
 Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Cummins  
 Type of fuel: ..... MDO  
 Output/speed of each set: ..... 560kW, 153kW, 81kW  
 Alternator make/type: ..... Marathon  
 Output/speed of each set: ..... 660KV, 160KV, 107KV  
 Cargo boilers  
 Number: ..... 1  
 Type: ..... 5-TFO-020  
 Make: ..... Heatmaster

Output, each boiler: ..... 2,100kW  
 Mooring equipment  
 Number: ..... 2  
 Make: ..... Dijvler Materialen B.V  
 Type: ..... Electric  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 3 persons  
 Make: ..... Riwa Boating International  
 Type: ..... Riwa 400 River Warrior  
 Hatch covers  
 Design: ..... Mercurius Shipbuilding  
 Manufacturer: ..... Shipyard Begej  
 Cargo tanks  
 Number: ..... 10  
 Grades of cargo carried: ..... Closed  
 Product range: ..... Type C  
 Coated tanks: ..... Stainless steel  
 Stainless steel: ..... St.st/ Duplex 2205, piping system AISI 316L  
 Cargo pumps  
 Number: ..... 10  
 Type: ..... MDPD-80  
 Make: ..... Marflex  
 Stainless steel: ..... St.st AISI 316L  
 Capacity: ..... 140m<sup>3</sup>/h  
 Cargo control system  
 Make: ..... Magnetrol Eclipse  
 Type: ..... 7XA  
 Complement  
 Officers: ..... 2  
 Crew: ..... 4  
 Stern appendages/special rudders: . Promac with 2 rudders  
 Bow thruster  
 Make: ..... Verhaar Omega  
 Number: ..... 1  
 Output: ..... 393kW  
 Bridge control system  
 Make: ..... Radio Holland  
 Type: ..... Sigma Line  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Crowcon Detection Instrument Ltd  
 Type: ..... Gasmaster II 4/4  
 Fire extinguishing systems  
 Engine room: ..... Niecom Constructie B.V/ FM2300  
 Cabins/public spaces: ..... Crowcon Detection Instrument  
 Radars  
 Number: ..... 2  
 Make: ..... Furuno  
 Model: ..... RHRS 2005RC TFT  
 Contract date: ..... 15 October 2010  
 Launch/float-out date: ..... 19 November 2011  
 Delivery date: ..... 6 February 2012







# STX ARBORELLA: open-hatch bulker

Shipbuilder: ..... **STX Offshore & Shipbuilding Co., Ltd**  
 Vessel's name: ..... **STX Arborella**  
 Hull No: ..... **S1539**  
 Owner/operator: ..... **POS Maritime CA S.A/ STX PanOcean Co., Ltd**  
 Country: ..... **Korea**  
 Designer: ..... **STX Offshore & Shipbuilding Co., Ltd**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **MOERI**  
 Flag: ..... **Marshall Islands**  
 IMO number: ..... **9613288**  
 Total number of sister ships completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **9**

For the second five Vessels (Hull No: S-1544/45/46/47/48) will be classed to KRS, +KRS1-Cargo Ship General Dry Cargo HC (Hold No 2, 4, 6 and 8 may be empty with maximum cargo density 3.0t/m<sup>3</sup>), GRAB[20], IWS, PSPC, ENV (IBWM, IAFS, IOPP, ISPP, IAPP), CHA, LI, +KRM1-UMA, STCM.  
 STX Arborella will transfer wood pulp cargoes for Votorantim Celulose e Papel (VCP) and Arazruz two of the largest wood pulp manufacturers in Brazil. Also, the vessel is able to transfer to other cargoes such as steel coil, grain, coal, sulphur.

## TECHNICAL PARTICULARS

Length oa: ..... 199.9m  
 Length bp: ..... 191.8m  
 Breadth moulded: ..... 32.26m  
 Depth moulded  
 To main deck: ..... 19.3m  
 To upper deck: ..... 19.3m  
 To other decks: ..... 16.4m  
 Width of double skin  
 Side: ..... 2.03m  
 Bottom: ..... 1.9m  
 Draught  
 Scantling: ..... 12.7m  
 Design: ..... 11.0m  
 Gross: ..... 39,009gt  
 Displacement: ..... 70,605tonnes  
 Lightweight: ..... 13,065tonnes  
 Deadweight  
 Design: ..... 47,171dwt  
 Scantling: ..... 57,539dwt  
 Block co-efficient: ..... 0.8746  
 Speed, service: ..... 13.9knots  
 Cargo capacity  
 Grain: ..... 68,539m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 3,149m<sup>3</sup>  
 Diesel oil: ..... 250.7m<sup>3</sup>  
 Gas oil: ..... 162.5m<sup>3</sup>  
 Water ballast: ..... 23,019m<sup>3</sup>  
 Daily fuel consumption  
 Main engine: ..... 37.2tonnes/day  
 Auxiliaries: ..... 449tonnes/day  
 Classification society and notations: ..... DNV, +1A1  
 General Cargo Carrier, HC-A  
 (Holds 2, 4, 6 & 8 may be empty maximum cargo density 3.0tonnes/m<sup>3</sup>), BIS, COAT-PSPC(B), BWM-T, E0, TMON, Naticus (newbuilding), GRAB[20]  
 Main engines  
 Model: ..... MAN 6S50MC-C8.1  
 Manufacturer: ..... STX Heavy Industries  
 Number: ..... 1  
 Type of fuel: ..... HFO  
 Output of each engine: ..... 9,960kW x 127rpm  
 Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... STX/SILLA Metal  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 6m  
 Special adaptations: ..... PBCF  
 Diesel-driven alternators  
 Number: ..... L23/30H-S-1539  
 Engine make/type: ..... STX engine/ 6L23/30H

Type of fuel: ..... HFO, MDO, MGO  
 Output/speed of each set: ..... 960kW x 900rpm  
 Alternator make/type: ..... Hyundai/ HFC7 508-84K  
 Output/speed of each set: ..... 910kW x 900rpm  
 Boilers  
 Number: ..... MPS012011STV  
 Type: ..... Composite boiler  
 Make: ..... SeAH E&T Co., Ltd  
 Output, each boiler: ..... 1,200kg/h (oil fired), 1,100kg/h (exhaust gas)  
 Cargo cranes  
 Make: ..... MacGregor  
 Type: ..... Electro hydraulic  
 Other cranes  
 Make: ..... Oriental  
 Type: ..... Electro hydraulic, single jib type  
 Tasks: ..... Provision and engine part handling  
 Performance: ..... SWL 2tonnes  
 Mooring equipment  
 Number: ..... 2 x Windlass, 4 x winches  
 Make: ..... Flutek-Kawasaki  
 Type: ..... Electro hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 24 persons, 1 x 6 persons, 2 x 25 persons, 1 x 6 persons  
 Make: ..... Oriental/ Viking  
 Type: ..... Frefall, rescue boat, liferafts  
 Hatch covers  
 Manufacturer: ..... MacGregor  
 Type: ..... Piggy bag type & folding  
 Cargo tanks  
 Number: ..... 8  
 Coated tanks make: ..... Jotun/ Jotacote Universal  
 Ballast control system  
 Make: ..... Lyngso Marine  
 Type: ..... MOS2200  
 Water Ballast Treatment System  
 Make: ..... Techcross electro chamber unit  
 Capacity: ..... 2 x 1,000m<sup>3</sup>/h  
 Complement  
 Officers: ..... 11  
 Crew: ..... 13  
 Bridge control system  
 Make: ..... Tokyo-Keiki  
 Type: ..... PR-6000  
 Fire detection system  
 Make: ..... B-I Industrial Co., Ltd  
 Type: ..... BDS-4000  
 Fire extinguishing systems  
 Cargo holds: ..... NK/ CO<sub>2</sub>, seawater  
 Engine room: ..... NK/ CO<sub>2</sub>, seawater  
 Cabins: ..... NK/ Portable fire extinguisher  
 Public spaces: ..... NK/ portable fire extinguisher  
 Radars  
 Make: ..... SAM Electronics  
 Model: ..... NACOS Platinum  
 Waste disposal plant  
 Incinerator: ..... Hyundai Machinery Co., Ltd/ MAXI NG100SL WS  
 Waste compactor: ..... SAMJOO/ BS520  
 Sewage plant: ..... Il-Seung/ ISS-25N  
 Contract date: ..... 13 December 2010  
 Launch/float-out date: ..... 6 December 2012  
 Delivery date: ..... 9 November 2012

STX Arborella is the first order for STX Offshore and Shipbuilding for an open-hatch type bulk carrier with a removable deck for open-hatch and hold to accommodate heavy-lift cargo in the holds, valued at 20 to 30% higher than other bulk carriers of a similar size. STX Arborella is the first in a series of 10 vessels for STX Pan Ocean.

STX Pan Ocean signed a contract for the specialised vessels with Fibria of Brazil in October 2010. Subsequently, in October 2011, it signed an additional transportation contract worth US\$246 million.

The ship is the first of a total of 230 open hatch general cargo carriers ordered by STX Pan Ocean and will be deployed on the trade lanes between Brazil and the Americas, Europe and Asia, beginning in September 2012. STX Arborella will be on a 25-year long-term charter contract with Fibria to export wood pulp. The nine ships in the series are scheduled to be delivered in due order by 2014.

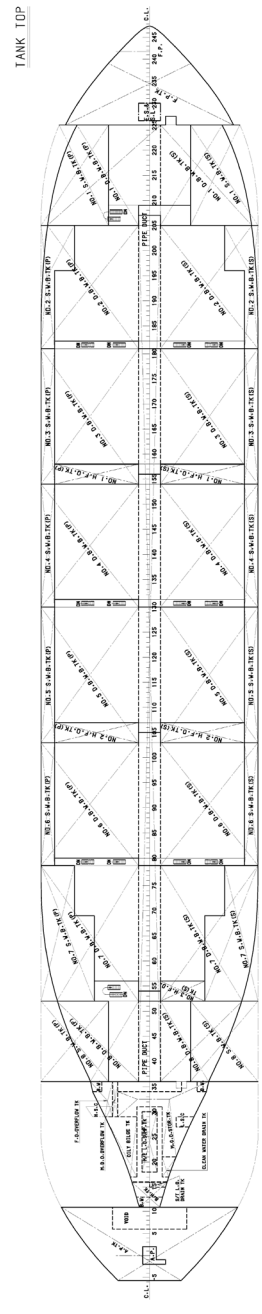
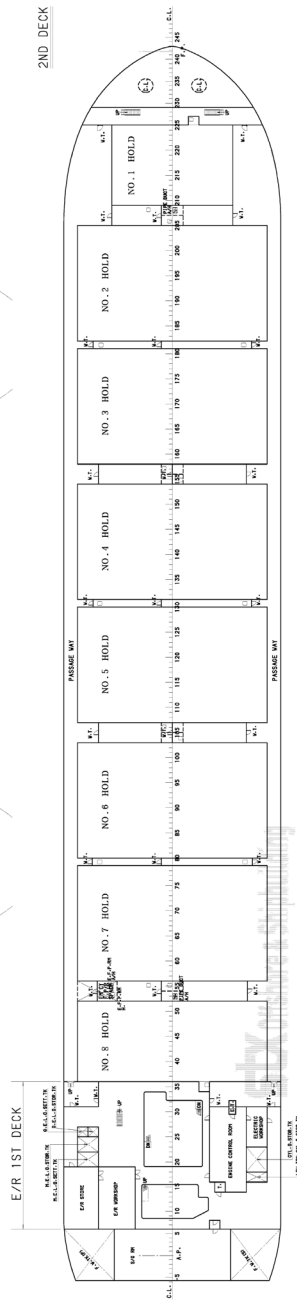
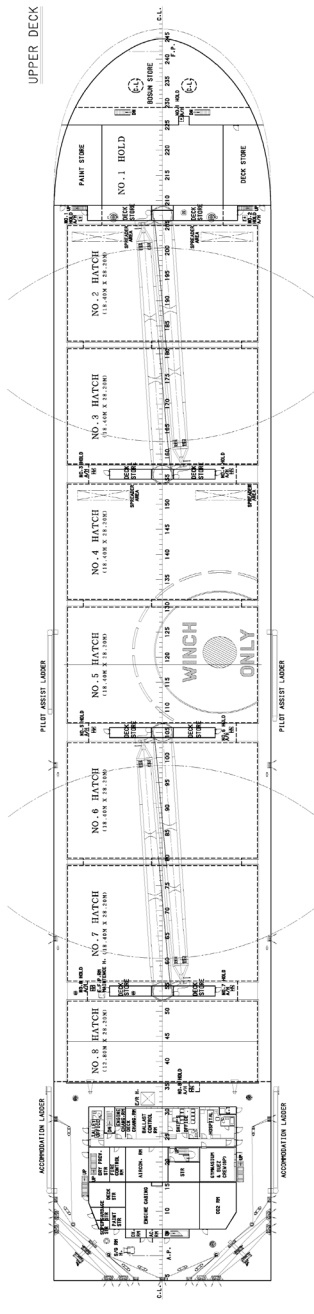
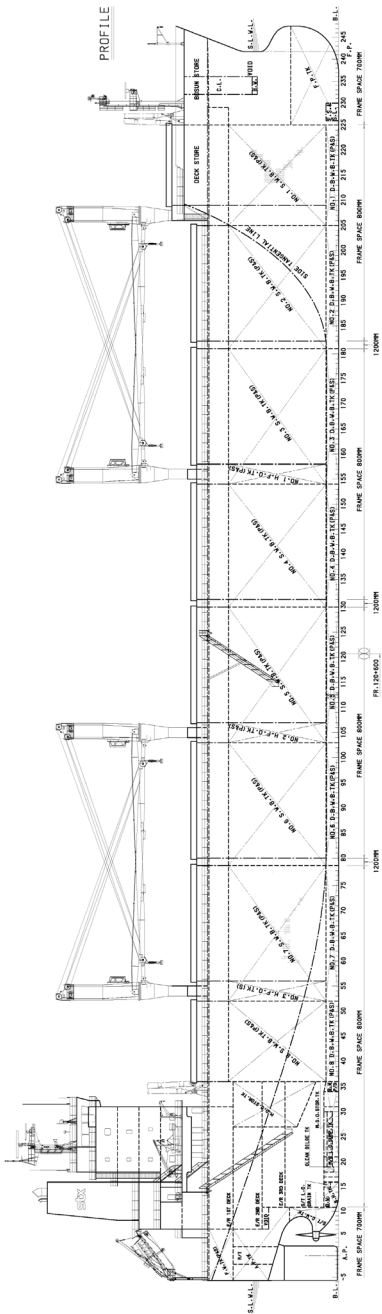
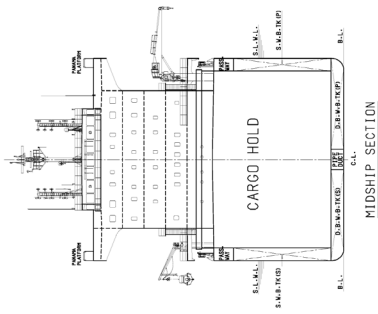
STX Arborella was optimally designed to suit the characteristics of wood pulp freight. This ship is expected to contribute to Fibria being able to maintain its competitiveness in its distribution costs, leading the market in the future and present an opportunity for STX Pan Ocean to strengthen its status as the leading maker of specialised shipping vessels in the world's wood pulp market.

Shipping companies from northern Europe have mainly operated the South American wood pulp transportation market. The order for the vessel and the 25-year charter sees the first Asian-based shipping firm to operate in the wood pulp market.

STX Arborella is 199.9m long, 32.26m wide and 19.3m high, can ship more than 55,000tonnes of wood pulp as the largest-scale ship of the Supramax-grade open hatch ship type. The vessel has eight cargo holds that have a double bottom with water ballast tanks and side ballast water tanks. The longitudinal passageway (P&S) is arranged at the port and starboard sides under the upper deck.

Another notable point about this series of vessels is that they will have dual classification with both DNV and the Korean Register (KRS) classifying the vessel. DNV will be the classification society for the first five Vessels ( Hull No: S-1539/40/41/42/43), which will be classed to DNV +1A1 General Cargo Carrier, HC-A (Holds 2, 4, 6 & 8 may be empty Maximum Cargo Density 3.0t/m<sup>3</sup>), BIS, COAT-PSPC(B), BWM-T, E0, TMON, NAUTICUS (Newbuilding), GRAB[20].

Whereas, the second five vessels will be dual classed by KRS. In this case, DNV shall be the main class and KRS shall be entitled as sub-class. In addition, if there is any discrepancy in the rules, following an inspection, between DNV and KRS, DNV shall have the overall say.







# TANIT: ro-pax built to latest regulations

Shipbuilder: ..... **Daewoo Shipbuilding & Marine Engineering, Ltd**  
 Vessel's name: ..... **Tanit**  
 Hull No: ..... **H.7511**  
 Owner/operator: ..... **Compagnie Tunisienne De Navigation**  
 Country: ..... **Tunisia**  
 Designer: ..... **Daewoo Shipbuilding & Marine Engineering, Ltd**  
 Country: ..... **Korea**  
 Model test establishment used: ..... **MARIN**  
 Flag: ..... **Tunisia**  
 IMO number: ..... **9598579**  
 Total number of ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **nil**

**TANIT**, was the ship that was going to help Daewoo Shipbuilding & Marine Engineering (DSME) break into the cruise market. That is what was expected of this vessel in the beginning, but what was actually discovered from the building of the ro-pax ship is that the cruise industry may not be that easy to get into if you come from outside Europe.

DSME has said that the cruise market has been difficult to enter due to the outfitting of the interiors of the ferries with most interior designers for cruise ships being based in Europe and being expensive to use. Added to this are the difficult technical specifications for the interiors of cruise ships, highlighted the company.

This cruise ferry as DSME refers to the vessel has been constructed for Tunisian state company, COTUNAV, and was delivered in May 2012. The vessel's main feature is that it complies with the Safe Return to Port (SRTIP) requirements and will be the largest ferry operating in the Mediterranean.

The vessel was specifically designed for cross Mediterranean journeys between Tunisia and France, Italy and Spain and will offer first class accommodation, various amenities and spacious areas for its 3,200 passengers. The vessel has over 10,000m<sup>2</sup> public spaces, including a swimming pool and a mosque. Tillberg Design US was employed for the outfitting of the interior design of this vessel, which has been themed on the essence of the Tunisian culture.

The 210m vessel has a capacity of more than 1,000 cars or a mixture of trucks and cars. The vessel has been designed for better cargo flow with a bow and a stern ramp for the 1,060 cars (or 91 trailers and 339 cars) that will come aboard in a journey. Also, cargo capacity has been maximised through the installation of an upper car deck, a main cargo deck with hoistable car decks and a lower hold.

Van der Velden Marine Systems has supplied the two TIMON rudders for *Tanit*. The TIMON flap type rudders installed on the vessel will optimise speed and course corrections and reduce cavitation and vibration. The rudder profile is based on the HSVA and NACA profiles and is suitable for fast vessels requiring high manoeuvrability performance. Because of the flap, turning circles are smaller and course corrections can be made more efficiently.

The two TIMON rudders are provided with Asymmetric Rudder Technology (ART). ART is a special rudder design that has been developed to improve propeller flow. The special layout modifies the profile above and below the centreline of the propeller in such a way that effects of the rotation of the propeller slipstream are countered. This expands the cavitation-free rudder angle and reduces drag,

which contributes to the ship's speed abilities. Reduced rudder cavitation also gives an extended life span to rudders and shaft bearing systems. Low vibration and noise levels are an additional bonus.

*Tanit* has been designed with two separate engine rooms that are fitted with four MAN B&W 12V48/60CR that also have propeller shaftlines which have different lengths of over 40m. Having this arrangement the vessel meets with the requirements for safe return to port. The final propeller blade design has been hydro dynamically optimised and carefully balanced with a special focus on propulsion efficiency, low noise, and cavitation levels. The vessel is capable of a maximum speed of 30knots, which will also make it one of the fastest sailing ferries in the world.

## TECHNICAL PARTICULARS

Length oa: ..... 210.0m  
 Length bp: ..... 189.6m  
 Breadth moulded: ..... 30.0m  
 Depth moulded  
 To main deck: ..... 10.5m  
 To upper deck: ..... 16.62m  
 Width of double skin  
 Bottom: ..... 1.6m  
 Draught  
 Scantling: ..... 7.92m  
 Design: ..... 7.29m  
 Gross: 52,645gt  
 Deadweight  
 Design: ..... 6,126dwt  
 Speed, service: ..... 27.5knots  
 Bunkers  
 Heavy oil: ..... 1,780m<sup>3</sup>  
 Diesel oil: ..... 290m<sup>3</sup>  
 Water ballast: ..... 2,450m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 196.3tonnes/day  
 Auxiliaries: ..... 24.5tonnes/day  
 Classification society and notations: ..... BV I, HULL, MACH, Roro Passenger Ship, COMF-NOISE2, COMF-VIB 2, AUT-UMS, AUT-PORT, SYS-NEQ-1, MON-SHAFT, Ice Class ID, REF-STORE, ALP, SDS, Inwater Survey, Unrestricted  
 Heel control equipment: ..... Two pairs of heeling tanks  
 Roll-stabilisation: ..... One pair of fin stabilisers  
 Main engine  
 Design: ..... MAN B&W  
 Model: ..... 12V48/60CR  
 Manufacturer: ..... MAN B&W  
 Number: ..... 4  
 Type of fuel: ..... HFO, MDO  
 Output of each engine: ..... 14,400kW x 514rpm  
 Propeller  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... MAN  
 Number: ..... 2  
 Fixed/controllable pitch: ..... Controllable  
 Diameter: ..... 5.6m  
 Diesel-driven alternators  
 Number: ..... 4  
 Engine make/type: ..... MAN 6L32/40  
 Type of fuel: ..... HFO, MDO  
 Alternator make/type: ..... HHI/HFJ 808-8P

Output/speed of each set: ..... 2,850kW  
 Boilers  
 Number: ..... 2  
 Type: ..... Steam boiler  
 Make: ..... Staacke  
 Output, each boiler: ..... 5,000kg/h  
 Mooring equipment  
 Number: ..... 6  
 Make: ..... Rolls-Royce  
 Type: ..... Low pressure hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... 4 x 632 persons  
 Make: ..... RFD  
 Type: ..... MES  
 Vertical or sloping chutes: ..... Vertical  
 Vehicles  
 Number of vehicle decks: ..... 3 x fixed, 1 x movable  
 Total lane length: ..... 1,400  
 Total cars: ..... 1,060  
 Total freight units: ..... 91 trailers (14.6m x 3m), 339 cars or 1,060 cars  
 Doors/ramps/movable car decks  
 Number of each: ..... 8/4/12  
 Type: ..... Hydraulic  
 Designer: ..... TTS  
 Water ballast treatment system  
 Make: ..... Panasia  
 Capacity: ..... 300m<sup>3</sup>/h  
 Complement  
 Officers/crew: ..... 285  
 Passengers  
 Total: ..... 3,200  
 Number of cabins: ..... 653  
 Percentage/number outboard: ..... 21%/136 cabins  
 Stern appendages/special rudders: ..... Flap rudder  
 Bow thruster  
 Make: ..... Brunvoll  
 Number: ..... 2  
 Output: ..... 1,750kW  
 Bridge control system  
 Make: ..... JRC  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Addressable  
 Fire extinguishing systems  
 Engine room: ..... CO<sub>2</sub>  
 Vehicle spaces: ..... Drencher  
 Cabins: ..... Marioff/ water mist  
 Public spaces: ..... Marioff/water mist  
 Radars  
 Number: ..... 3  
 Make: ..... JRC  
 Models: ..... JMA-9122-6XA, JMA-9132-SA, JMA-9122-6XA  
 Integrated bridge system  
 Make: ..... JRC  
 Model: ..... JAN-901B-CON  
 Waste disposal unit  
 Waste compactor: ..... Uson/USC-2030  
 Waste shredder/crusher: ..... Uson/USC-2030  
 Sewage plant: ..... Hamworthy/ST-50C  
 Contact date: ..... 26 July 2010  
 Delivery date: ..... 31 May 2012







# TZINI: boxship with piracy protection

Shipbuilder: ..... **SPP Shipbuilding Co., Ltd**  
 Vessel's name: ..... **Tzini**  
 Hull No: ..... **H-4076**  
 Owner/operator: ..... **Eastern Mediterranean Maritime**  
 Country: ..... **Greece**  
 Designer: ..... **SPP Shipbuilding Co., Ltd**  
 Country: ..... **Korea**  
 Flag: ..... **Malta**  
 IMO number: ..... **9625906**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **2**

**TZINI** is a landmark building project for SPP shipbuilding as it is the first 1,700TEU container carrier to be constructed by the yard, which has previously specialised in bulk carriers and product tankers. *Tzini* is the first of three sister vessels ordered by Eastern Mediterranean Maritime and was delivered at the end of 2012. The other two vessels, *San Giorgio* and *Sea Eagle*, will be delivered in March and September 2013.

Eastern Mediterranean Maritime is a new customer for SPP and has also ordered two 52,000dwt MR-type tankers that are under construction at SPP Shipbuilding. Furthermore, three 3,600TEU container carriers from a different ship owner are scheduled to be built at the SPP shipyard by 2015.

A special feature of *Tzini* is that it is also installed with the latest in anti-piracy security. As an anti-piracy measure, a citadel has been incorporated into the design; the facilities for the Citadel have been fitted in the steering gear room. A Citadel is a designated pre-planned area specifically built into the ship where – in the event of imminent boarding by pirates – all crew can seek refuge with the objective of preventing pirates from gaining control of the vessel. The Citadel will have control capability of the vessel, emergency rations, safe air supply, CCTV control and good external communications.

The vessel is an ocean going, so-called Bangkokmax size container carrier, with bulbous bow, transom stern and a continuous deck with forecastle deck. The cargo areas consist of seven cargo holds having a double bottomed water ballast tank and weather deck. Heavy fuel oil tanks are arranged in the middle of No.5 hold in order to meet MARPOL fuel oil protection requirements.

A seven-tier deckhouse that complies with the SOLAS visibility regulations provides accommodation for a complement of 23 persons excluding the Suez crew cabin. The vessel consists of eight hatches with pontoon type steel hatch covers handled by the three sets of the ship's own cranes with a capacity of about 40tonnes each, with containers that can be stowed on deck/hatch covers.

In-line with the latest environmental regulations the vessel is also fitted with a ballast water treatment system (BWTS), which has a capacity of 500m<sup>3</sup>/h for both sides of the ballast tanks that has been supplied by Pansia. The capacity of the ballast tanks is 9,700m<sup>3</sup>. With the capacity of 2,000m<sup>3</sup> of fuel oil, the cruising range of the vessel is about 13,000 nautical miles on the basis of speed 19.0knots taking in to consideration three days reserve.

## TECHNICAL PARTICULARS

Length oa: ..... 170.00m  
 Length bp: ..... 160.00m  
 Breadth moulded: ..... 29.8m  
 Depth moulded  
 To main deck: ..... 14.5m  
 To upper deck: ..... 14.5m  
 To other decks: ..... A Deck 18.50m, B Deck 21.50m  
 Width of double skin  
 Side: ..... 29.8m  
 Bottom: ..... 25.7m  
 Draught  
 Scantling: ..... 9.5m  
 Design: ..... 8.5m  
 Gross: ..... Abt. 20,600gt  
 Displacement: ..... 32,665tonnes  
 Lightweight: ..... Abt. 8480tonnes  
 Deadweight  
 Design: ..... 20,001dwt  
 Scantling: ..... 24,185dwt  
 Block co-efficient: ..... 0.7015  
 Speed, service: ..... 19knots, 90%MCR with 15% sea margin  
 Bunkers  
 Heavy oil: ..... 2,007m<sup>3</sup>  
 Diesel oil: ..... 157m<sup>3</sup>  
 Water ballast: ..... 9,703m<sup>3</sup>  
 Container ships – water ballast in loaded conditions: ..... 4771tonnes  
 Daily fuel consumption  
 Main engine only: ..... 51.5tonnes/day  
 Auxiliaries: ..... 14tonnes/day  
 Classification society and notations: ..... +100A5, Container Ship, DG, BMW, IW, RSD, +MC AUT, CM-PS

Main engine  
 Design: ..... MAN Diesel & Turbo  
 Model: ..... 6S60ME-C8.2  
 Manufacturer: ..... Hyundai Heavy Industries  
 Type of fuel: ..... HFO  
 Output of each engine: ..... 14,280kW x 105rpm at MCR  
 Propellers  
 Material: ..... Ni-Al Bronze  
 Designer/manufacturer: ..... SHJ/ Silla Metal Co., Ltd  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 6.6m  
 Speed: ..... 105rpm  
 Diesel-driven alternators  
 Engine make/type: ..... HHI/ 8H21/32  
 Type of fuel: ..... HFO  
 Output/speed of each set: ..... 1,760kW x 900rpm  
 Boilers  
 Type: ..... MC  
 Make: ..... SPP Machine Tech  
 Output, each boiler: ..... 1,500 (oil fired)/1,300 (exh. Gas) kg/h x 7kg/cm<sup>2</sup>  
 Cargo cranes/cargo gear  
 Make: ..... Liebherr  
 Type: ..... Self contained electro-hydraulics single jib type  
 Mooring equipment  
 Number: ..... 2 x Windlass  
 3 x winches  
 Make: ..... Oriental  
 Type: ..... Hydraulic motor driven  
 Special lifesaving equipment  
 Number of each and capacity: ..... 2 x 23 persons  
 Make: ..... Fassmer  
 Hatch covers  
 Manufacturer: ..... SMS  
 Type: ..... Steel pontoon hatch cover  
 Containers  
 Lengths: ..... 20ft, 40ft  
 Heights: ..... 20/40ft  
 Cell guides: ..... 130mm x 130mm x 15mm  
 Total TEU capacity: ..... 1756TEU  
 On deck: ..... 1136TEU  
 In holds: ..... 620TEU  
 Homogenously loaded to 14 tonnes: ..... 1380  
 Tiers/rows  
 On deck: ..... 7 tiers/12 row  
 In holds: ..... 6 tiers/ 19 rows  
 Doors/ramps/lifts/movable car decks  
 Number of each: ..... 124  
 Type: ..... Joiner door, steel door  
 Designer: ..... Sta-Intec, Kwang-Lim  
 Cargo tanks  
 Number: ..... 7  
 Grades and cargoes carried: ..... Dangerous goods of classes 1.4s, 2.3,4,5.1, 6.1,8 and 9 in closed containers in No 1 & 2 holds (excluding goods containing hydrogen, hydrogen mixture) and classes 1,2,3,4,5.1,5.2,6.1,8 and 9 in closed container on all hatch covers except above engine room.  
 Ballast control system  
 Make: ..... Scana Korea  
 Type: ..... Piano type ballast control console  
 Water ballast treatment system  
 Make: ..... Pansia  
 Capacity: ..... 500m<sup>3</sup>/h  
 Complement  
 Officers: ..... 13  
 Crew: ..... 10  
 Bow thrusters  
 Make: ..... Kawasaki  
 Output: ..... 800kW  
 Bridge control system  
 Make: ..... Nabtesco  
 Type: ..... M-800III  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salwico Cargo  
 Fire extinguishing systems  
 Engine room/Cargo holds: ..... NK/ CO<sub>2</sub>, seawater  
 Public spaces: ..... Il-Jin AND/ KS2000  
 Radars  
 Make: ..... Furuno  
 Models: ..... FAR-2837, FAR-2837S  
 Waste disposal plant  
 Incinerator: ..... Hyundai Marine Machinery/ MAXI NG100SL WS  
 Sewage plant: ..... Il Seung/ ISS-25N  
 Contract date: ..... 11 April 2011  
 Launch/float-out date: ..... 22 September 2012  
 Delivery date: ..... 14 January 2013







## ULUSOY-14: longest ro-ro from FSG

Shipbuilder: ..... **Flensburger Schiffbau-Gesellschaft GmbH & Co. KG**  
 Vessel's name: ..... **Ulusoy-14**  
 Hull No: ..... **753**  
 Owner/operator: ..... **Ulusoy Sealines**  
 Country: ..... **Turkey**  
 Designer: ..... **Flensburger Schiffbau-Gesellschaft GmbH & Co. KG**  
 Country: ..... **Germany**  
 Model test establishment used: ..... **HSVA**  
 Flag: ..... **Turkey**  
 IMO number: ..... **9506253**  
 Total number of sister ships already completed (excluding ship presented): ..... **nil**  
 Total number of sister ships still on order: ..... **1**

AT 208m *Ulusoy-14* is the longest and largest ferry constructed at Flensburger Schiffbau-Gesellschaft GmbH & Co. KG (FSG) that was delivered at the end of 2012 to Turkish-owner Ulusoy Sealines as part of its fleet expansion plan.

Ulusoy Sealines ordered the two modern freight ferries from FSG for service on the route between Cesme and Trieste where the latest vessels will replace four older ferries on the route. The vessels have almost the same freight capacity as the ferries they are replacing, but will consume significantly less fuel and will therefore have fewer emissions. FSG has said that in order to meet these demands they have optimised the vessels' design to make them more fuel efficient and eco-friendly.

Ships of this type have few or no transverse bulkheads, which reduces the racking stiffness. It was a challenge for the yard to design a proper connection between slender mainframe structure and the rigid ramp structure, the shipyard says. FSG has performed finite element (FE) analysis for these areas, which was verified by DNV.

The four-deck design of the vessel has been specified with one design draught, enabling the designers to optimise the hull form at that particular draft. A stern trim wedge has been fitted, boosting the speed by about a half knot compared to earlier three-deck vessel designs.

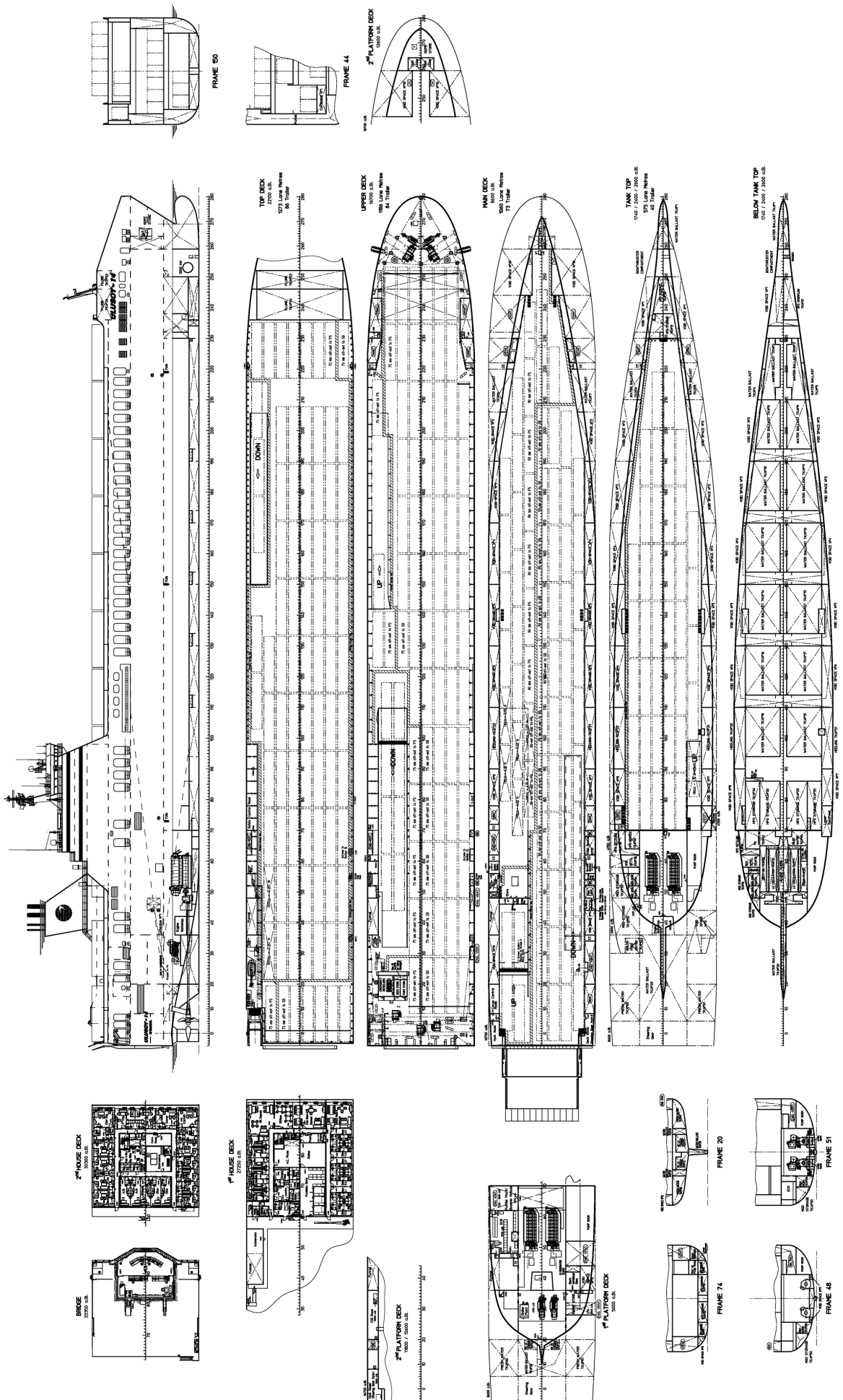
The 31,700gt ferry has the capacity for 283 freight units over 4,094 lane meters within the ferry that are loaded via the stern ramp. The vessel can take up to 12 passengers onboard. *Ulusoy-14* is powered by a MAN 8L 48/60-CR with a power output of 9,600kW that gives the vessel a service speed of 20.6knots. The vessel is also fitted with a full spade rudder with Costa bulb that also adds to the vessel's efficiency.

### TECHNICAL PARTICULARS

Length oa: ..... 208.30m  
 Length bp: ..... 197.39m

Breadth moulded: ..... 26.00m  
 Draught  
 Scantling: ..... 7.00m  
 Design: ..... 6.45m  
 Gross: ..... 31,700gt  
 Displacement: ..... 1,025tonnes/m<sup>3</sup>  
 Lightweight: ..... 1,023NT  
 Deadweight  
 Design: ..... 10,749dwt  
 Scantling: ..... 13,124dwt  
 Speed, service: ..... 20.6knots  
 Bunkers  
 Heavy oil: ..... 4,250/h  
 Diesel oil: ..... 760/h  
 Water ballast: ..... 2,280m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 63,98tonnes/day  
 Classification society and notations: ..... DNV +1A1, General Cargo Carrier Ro-Ro, E0, NAUT-AW, DG-P, TMON\*, BIS\*\*  
 Roll stabilisation equipment: ..... Flume stabilisation system  
 Main engine  
 Model: ..... MAN 8L 48/60-CR  
 Manufacturer: ..... MAN  
 Number: ..... 2  
 Type of fuel: ..... HFO  
 Output of each engine: ..... 9,600kW x 500rpm  
 Gearboxes  
 Make: ..... Renk  
 Model: ..... RSH-1050  
 Number: ..... 2  
 Output speed: ..... 137.2rpm  
 Propellers  
 Material: ..... Ni-Al-Bronze  
 Designer/manufacturer: ..... Schottel  
 Number: ..... 2  
 Fixed/controllable pitch: ..... Controllable  
 Diameter: ..... 5m  
 Speed: ..... 137.50rpm  
 Main-engine driven alternators  
 Number: ..... 2  
 Engine make/type: ..... AEM SE 500L4  
 Output/speed of each set: ..... 1,800rpm  
 Diesel-driven alternators  
 Number: ..... 2  
 Engine make/type: ..... HFO/MDO  
 Output/speed of each set: ..... 1,185kVA  
 Alternator make/type: ..... Hyundai heavy industries 35/B20  
 Output/speed of each set: ..... 1,187kVA  
 Boilers  
 Type: ..... UNEXTMBH-3000

Make: ..... Aalborg  
 Output, each boiler: ..... 2,000kg/h  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 40persons  
 Make: ..... Hatecke  
 Type: ..... GFF 8.1  
 Vehicles  
 Number of vehicles: ..... 4 fixed  
 Total lane length: ..... 4,094m  
 Total freight units: ..... 283 trailers  
 Doors/ramps  
 Numbers of each: ..... 1 stern ramp, 1 vertical sliding door, 1 ramp cover  
 Type: ..... All directly hydraulically driven  
 Designer: ..... Cargotec MacGregor  
 Complement  
 Officers: ..... 9  
 Crew: ..... 14  
 Passengers  
 Total: ..... 12  
 Stern appendages/special rudders: ..... Full spade rudder with Costa bulb  
 Bow thrusters  
 Make: ..... Brunvoll  
 Number: ..... 1  
 Output: ..... 2,000kW  
 Bridge control system  
 Make: ..... SAM Electronics  
 Type: ..... Type 1100  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salmico CS 4000  
 Fire extinguishing system  
 Cargo holds: ..... Wilhelmsen Technical Solutions/ Water spray system  
 Engine room: ..... Wilhelmsen Technical Solutions/ CO<sub>2</sub> HP systems FW BLAFFS  
 Vehicle spaces: ..... Wilhelmsen Technical Solutions/ Water spray system  
 Integrated bridge system  
 Make: ..... SAM Electronics  
 Model: ..... Type 1100  
 Waste disposal plant  
 Incinerator: ..... Deerberg systems/ IRLA-30  
 Sewage plant: ..... RWO/ WWTLCO5  
 Contract date: ..... February 2008  
 Launch/float-out date: ..... 03 August 2012  
 Delivery date: ..... 06 December 2012







# VF TANKER 1: latest tanker design for Russian inland waterways

Shipbuilder: ..... **Kranoye Sormovo (OJSC), Nizhny Novgorod**  
 Vessels name: ..... **VF Tanker 1**  
 Hull No: ..... **02001**  
 Owner/operator: ..... **VF Tanker Ltd**  
 Country: ..... **Russian Federation**  
 Designer: ..... **Marine Engineering Bureau**  
 Country: ..... **Ukraine**  
 Model test establishment used: ..... **Odessa National Maritime University basin/ Krylov Shipbuilding Research Institute**  
 Flag: ..... **Russian Federation**  
 IMO number: ..... **9640499**  
 Total number of sister ships already completed (excluding ship presented): ..... **14**  
 Total number of sister ships still on order: ..... **3**

Maritime Register of Shipping (RS) limitations of 'ECO-S' ('Clean Design') class were taken into consideration during the design. *VF Tanker 1* has a bulbous bow and transom stern and if fitted with semi-tunnels and a skeg.

The RST27 project vessels are assigned for the transportation of crude oil and oil products, without flash point restrictions. The cargo system also provides for the simultaneous transportation of two cargoes. The vessel has a total capacity of six cargo tanks and two slop tanks, which gives the vessel a total capacity of 8,274m<sup>3</sup>.

Certain characteristics of the vessel's design have generated a high interest from leading Russian shipowners, says MEB. Twenty-eight tankers were ordered from three shipyards ("Krasnoye Sormovo", "Okskaya shipyard" in Navashino, Russia and Kherson shipyard in Ukraine) during the period from March of 2011.

Model: ..... SRP1012FP  
 Output speed: ..... 307rpm  
 Propellers  
 Fixed/controllable pitch: ..... Fixed  
 Diameter: ..... 1.9m  
 Speed: ..... 307rpm  
 Diesel-driven alternators  
 Engine make/type: ..... Rigas Diselis  
 Type of fuel: ..... MDO  
 Output/speed of each set: ..... 296kW  
 Boilers  
 Type: ..... CHB-3000  
 Make: ..... Aalborg  
 Output, each boiler: ..... 2.5tonnes/h  
 Other cranes  
 Make: ..... Davit International  
 Type: ..... C-SH.30/2.5-12  
 Tasks: ..... Manifold crane  
 Performance: ..... Flame-proof construction  
 Mooring equipment  
 Number: ..... 2 x winches, 1 x capstan  
 Make: ..... Adria Winch  
 Type: ..... Electro-hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 16 persons  
 Make: ..... Davit International  
 Type: ..... JY-FF-4.90  
 Cargo tanks  
 Number: ..... 6 + 2 slop tanks  
 Cargo pumps  
 Type: ..... MDPD-150  
 Make: ..... Marflex  
 Capacity: ..... 200m<sup>3</sup>/h  
 Cargo control system  
 Make: ..... Valcom  
 Type: ..... TSS/Control  
 Complement  
 Officers: ..... 3  
 Crew: ..... 9  
 Stern appendages/special rudders: ..... 2 full-revolving rudder propellers with fixed-pitch propellers in nozzels SRP-1012FP Schottel  
 Bow thruster  
 Make: ..... Schottel  
 Output: ..... 230kW  
 Bridge control system  
 Make: ..... Northrup Gruman Sperry Marine  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salvico CS4000  
 Radars  
 Make: ..... Northrup Gruman Sperry Marine  
 Model: ..... Visionmaster FT, ECAT2 25  
 Launch/float-out date: ..... 17 February 2012  
 Delivery date: ..... 05 May 2012

## TECHNICAL PARTICULARS

Length oa: ..... 140.85m  
 Length bp: ..... 137.10m  
 Breadth moulded: ..... 16.70m  
 Depth moulded  
 To main deck: ..... 6.00m  
 Width of double skin  
 Side: ..... 1.85m  
 Bottom: ..... 1.2m  
 Draught  
 Design: ..... 4.2m (at sea)  
 3.6m (in river)  
 Gross: ..... 5,075gt  
 Displacement: ..... 9,483tonnes  
 Lightweight: ..... 2,461tonnes  
 Deadweight  
 Design: ..... 7,022dwt (at sea)  
 5,420dwt (in river)  
 Block co-efficient: ..... 0.936  
 Speed, service: ..... 11knots  
 Cargo capacity  
 Liquid volume: ..... 8,274m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 350m<sup>3</sup>  
 Diesel oil: ..... 59m<sup>3</sup>  
 Water ballast: ..... 4,650m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 8tonnes/day  
 Auxiliaries: ..... 0.5tonnes/day  
 Classification society and notations: ..... Russian Maritime Register of Shipping (RS), KM Ice 1 R2  
 AUT 1- ICS OMBO VCS ECO-S Oil Tanker (ESP)  
 Main engine  
 Model: ..... 6L20  
 Manufacturer: ..... Wärtsilä  
 Type of fuel: ..... HFO  
 Output of each engine: ..... 1,200kW  
 Rudder/propeller  
 Make: ..... Schottel

*VF Tanker 1* (RST27 Project) is the first vessel in a new series of vessels for the Russian company VF Tanker that meets with the dimensions of the Volga-Don Canal and Volga-Baltic Way. The vessel designed by the Marine Engineering Bureau (MEB) was constructed by Kranoye Sormovo shipyard, and was delivered in May.

MEB highlights that Russian river-sea vessels that were built before the 21st century had hulls with a block coefficient of around 0.84. However, the latest design of tanker has an increased river function compared with other MEB projects. The river deadweight of the RST27 project vessels is increased by 732tonnes compared to Armadas type of vessels (RST22 projects with a block coefficient of 0.90). The vessel recorded a block coefficient of 0.93 with a speed of 11.7knots during trials at running line with the main engines at a capacity of 2,100kW (87.5% MCR) with fore/aft draughts of 3.2/3.3m.

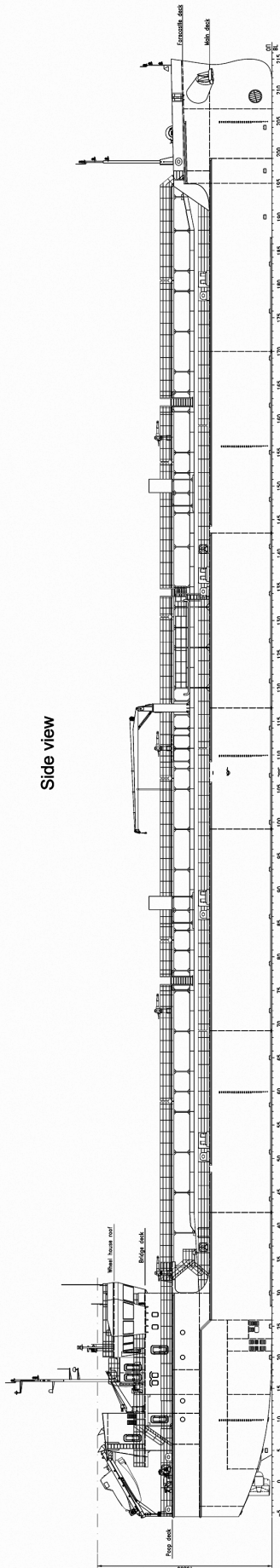
Fully loaded the vessel has a limited block coefficient of 0.93 and has a towage power which is 4% larger than another vessel of this type with a 0.90 with a speed of 10.5knots. At the same time the vessel also has a deadweight that is 15% higher than a vessel with a block coefficient of 0.90.

*VF Tanker 1* has an increased hull strength (vessel is of R2 sea navigation area) whilst keeping the same fuel consumption with an increased cargo capacity. The hull's theoretical forms are a result of scientific research carried out by MEB in 2010 and were defined with the help of CFD modelling. Results were obtained in the tow tanks that were close enough to the CFD prognosis to ensure that there are no significant detached flows.

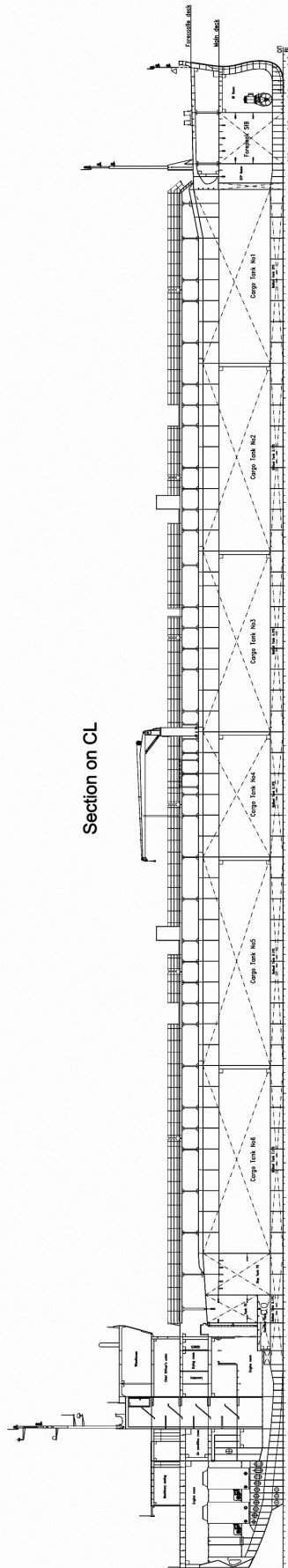
As with other river-sea going MEB tanker's RST27 project vessels use fully-rotating rudder propellers for both propulsion and manoeuvring. The vessel design also features an increased trunk and use submersible cargo pumps. They have no longitudinal bulkhead in CL and no framing in cargo tanks.

Special requirements of the Russian and world petroleum companies, along with the additional Russian

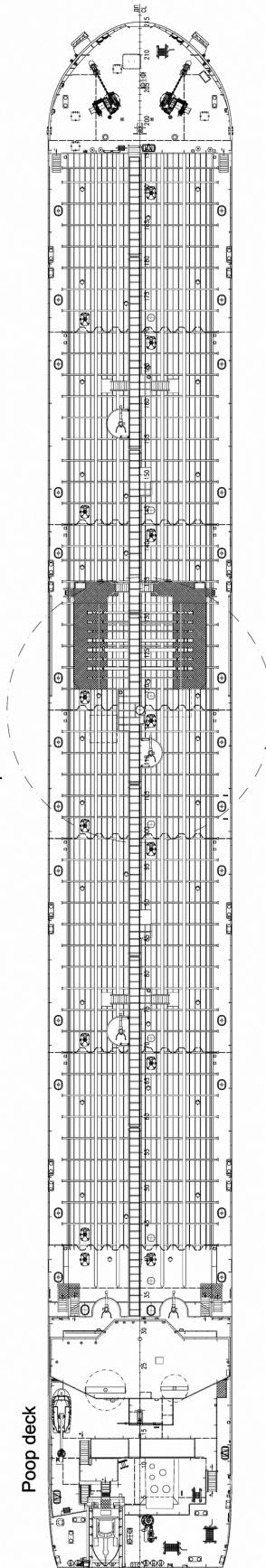
Side view



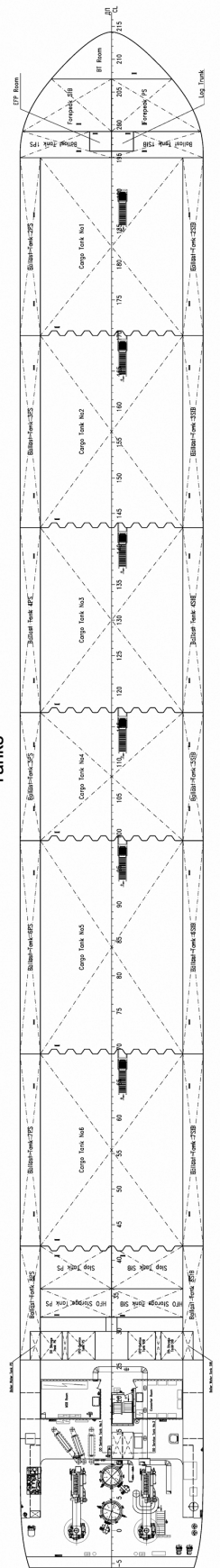
Section on CL



Top view



Tanks







# WAN HAI 511: Taiwan-built 4,500TEU class, wide beam container vessel

Shipbuilder: ..... **CSBC Corporation, Taiwan, Kaohsiung shipyard**  
 Vessel's name: ..... **Wan Hai 511**  
 Hull number ..... **950**  
 IMO number ..... **9455296**  
 Owner/operator: ..... **Wan Hai Lines Ltd**  
 Designer: ..... **CSBC Corporation, Taiwan**  
 Model test establishment used: ..... **HSVA, Germany**  
 Flag: ..... **Singapore**  
 Total number of sister ships already completed (excluding ship presented): ..... **2**  
 Total number of sister ships still on order: ..... **3**

**W**AN Hai 511 is the first 4,500TEU class container vessel with a 37.3m wide beam, which was delivered in May from Taiwan-based CSBC Corporation. Compared with traditional Panamax container vessels, WAN Hai 511 has a superior stability that will improve cargo loading performance and reduce ballast water intake dramatically.

The lashing bridges on this ship are not standard for Panamax container vessels. An additional tier height lashing bridge has been fitted to enhance the stacking weight. Usually, 45' container storage is arranged from the third tier on deck. In order to increase loading flexibility, the ship's length has been increased to allow five bays to load 45' container directly on deck. The cargo hold can accommodate five tiers of standard containers plus two tiers of high cube containers. Dangerous goods can be loaded in holds 3 to 5.

Powered by an MAN B&W engine with a turbocharger cut out device which allows one turbocharger set to be closed down thereby enhancing the other turbocharger's efficiency and improving fuel consumption. The electric power is supplied from three diesel generator sets each developing 2,280kW of power. A controllably pitch propeller type bow thruster with 1, 600kW capacity is also installed.

Marine gas oil (MGO) is cooled by an MGO cooler to increase the viscosity to the main engine's allowable operation range. When the ship sails in an emission control area (ECA), the main engine's exhaust gases will comply with SOx emission requirements by adopting this solution.

Necessary space for an alternative maritime power (AMP) system is reserved for transformer and corresponding facility installation. Through mobile container type cable reel, 6,600V shore power can be transformed to 450V shipboard power, and the diesel generators can be shut down during cargo handling to reduce carbon emissions.

WAN Hai 511 is also fitted with a PBCF (Propeller Boss Cap Fin) to recover rotational energy loss and

improve propeller efficiency. For WAN Hai 511 and its following two sister ships, space for the ballast water treatment system is reserved and the pump head has been increased to compensate for the pressure drop. For the last three sister ships, a UV filter type ballast water treatment system supplied by Alfa Laval has been installed. An anti-pirate safety cabin equipped with a communication device has also been fitted for emergencies. The coatings in ballast water tank comply with PSPC (Performance Standard for Protective Coatings) requirements.

## TECHNICAL PARTICULARS

Length, oa: ..... 259.00m  
 Length, bp: ..... 246.40m  
 Breadth, moulded: ..... 37.30m  
 Depth, moulded: ..... 19.40m  
 Gross: ..... 46,904gt  
 Deadweight  
 Design: ..... 44,053dwt  
 Scantling: ..... 57,830dwt  
 Draught  
 Design: ..... 11.00m  
 Scantling: ..... 12.80m  
 Speed: ..... 23.62 knots  
 Bunkers  
 heavy oil: ..... 5,341m<sup>3</sup>  
 diesel oil: ..... 284m<sup>3</sup>  
 Water ballast: ..... 15,777m<sup>3</sup>  
 Fuel consumption  
 Main engine only: ..... 138tonnes/day  
 Classification society and notations: ...DNV with the symbols of +1A1 "Container Carrier", E0, TMON, Nauticus (Newbuilding), BIS, DG-P  
 Heeling control system: ..... Auto control, 550m<sup>3</sup>/h  
 Main engine  
 Design: ..... MAN B&W  
 Model: ..... 8K90MC-C6  
 Manufacturer: ..... Hitachi Zosen Diesel & Engineering  
 Number: ..... 1  
 Type of fuel: ..... HFO  
 Output: ..... 36,540kW x 104rpm  
 Propeller  
 Material: ..... Ni-Al-bronze  
 Design/Manufacturer: ..... CSBC/Nakashima  
 Number: ..... 1  
 Fixed/controllable pitch: ..... Fixed  
 Speed: ..... 104rpm  
 Diesel-driven alternators  
 Number: ..... 3  
 Engine make/type: ..... Yanmar /8EY26LW  
 Type of fuel: ..... HFO  
 Output/speed of each set: ..... 2450kW x 720rpm  
 Alternator make/type: ..... Hyundai/HFC7714-10P  
 Output/speed of each set: ..... 2280kW x 720rpm

Boilers  
 Number: ..... 1  
 Type: ..... AQ10/16, Vertical oil fired boiler  
 Make: ..... Alfa Laval Aalborg  
 Output, each boiler: ..... 3,000kg/h  
 Mooring equipment  
 Number: ..... 2 x mooring winch/windlass, 4 x mooring winch  
 Make: ..... Nippon Pusnes  
 Type: ..... Electric  
 Lifesaving equipment  
 Number of set and capacity: ..... 2 x 25 persons  
 Make: ..... Fassmer-Marland  
 Type: ..... Gravity type  
 Hatch covers  
 Design: ..... Cargotec  
 Make: ..... CSBC  
 Type: ..... Pontoon type  
 Containers  
 Lengths: ..... 20ft/40ft  
 Total TEU capacity: ..... 4,532  
 on deck: ..... 2,790  
 in hold: ..... 1,742  
 homogeneously loaded to 14tonnes: ..... 3,524  
 Reefer plugs: ..... 400FEU  
 Tiers/rows (maximum)  
 on deck: ..... 7/15  
 in hold: ..... 7/13  
 Ballast control system  
 Make: ..... Emerson  
 Type: ..... Remote control  
 Complement  
 Officers: ..... 12  
 Crews: ..... 11  
 Suez Canal crew: ..... 6  
 Bow thruster  
 Make: ..... Nakashima  
 Number: ..... 1  
 Output: ..... 1,600kW  
 Fire detection system  
 Make: ..... Consilium  
 Type: ..... Salwico Cargo  
 Fire extinguishing system  
 Cargo hold/Engine room: ..... Fixed CO<sub>2</sub>  
 Make: ..... NK Co., LTD  
 Radars  
 Number: ..... 2  
 Make: ..... JRC  
 Model: ..... JMA-9133-SA/JMA-9126-6XA  
 Waste disposal plant  
 Incinerator: ..... Kangrim/ KIN-80SDA  
 Sewage plant: ..... Hamworthy/ ST2A-C  
 Contract date: ..... June 2007  
 Launch date: ..... June 2012  
 Delivery date: ..... May 2012







# ZEALAND JULIANA: general cargo vessel

Shipbuilder: ..... **Sefine Shipyard**  
 Vessels Name: ..... **Zealand Juliana**  
 Hull No: ..... **16**  
 Owner/operator: ..... **Sefine Denizcilik  
 Tersanecilik TUR. SAN. VE TIC. A.S**  
 Country: ..... **Turkey**  
 Designer: ..... **Delta Marine**  
 Country: ..... **Turkey**  
 Model test establishment used: ..... **Bulgarian Ship  
 Hydrodynamics Centre (BSHC)**  
 Flag: ..... **Dutch**  
 IMO number: ..... **9655951**  
 Total number of sister ships already completed  
 (excluding ship presented): ..... **1**  
 Total number of sister ships still on order: ..... **1**

**ZEALAND Juliana** is the latest in next generation cargo ship design from Turkish naval architects Delta Marine. The vessel was delivered to its owner Sefine Denizcilik Tersanecilik TUR. SAN. VE TIC. AS in September.

The design has taken into account features for low fuel consumption, reduced costs and the ability to transport a range of cargoes. To achieve this, the hull form and propulsion systems have been optimised along with optimisation of the steel used in construction in an effort to save as much weight as possible.

The general cargo ship design has a double hull structure, single screw propulsion, unrestricted navigation (incl. St. Lawrence area) and ability to carry general cargoes, steel coil, coal, grain, grab and dangerous goods etc. at shallow drafts.

The cargo area is divided into four box shaped cargo holds by means of transverse corrugated bulkheads. There is no structural element facing the holds and this design brings the advantage of a reduction in time for cleaning. Clear hatch coamings of 24.0m x 18.2m in size ease the loading and unloading operations. The cargo hold covers are reinforced against loads of up to 20tonnes/m<sup>2</sup>, while the bottom hold is strengthened for heavy cargoes and protected against grab operations.

Four pairs of "L" type ballast tanks surround the cargo holds. The tunnel between the double bottom ballast tanks at the centreline keeps the ballast/bilge lines/valves indoor and accessible.

To ensure the safe carriage of dangerous cargoes and increase the number of dangerous cargoes to be carried on-board the ship, the cargo holds are fitted with CO<sub>2</sub> fire-fighting and mechanical ventilation systems. Additionally separate bilge discharging for the cargo area and A60-rated fire insulation in the engine room fore bulkhead are provided.

The weather deck hatch covers are of the high stowing folding type, operated by means of external hydraulic cylinders. The hatch covers are constructed with flat top plates and are of double skin construction. The vessel is equipped with three deck cranes, installed on centreline pillars and having 30tonnes SWL with 25m outreach.

From an environmental perspective, the vessel's design provides attractive features such as its EEDI value being below the present IMO baseline curve, compliance with requirements of "Cleanship" class notation and regulations for NOx emissions.

The hull structure has been analysed by FEM tools for safety, weight optimisation and vibration. The hull form, optimised with CFD analysis, is designed for minimum resistance, minimum fuel consumption at economical speed.

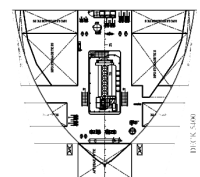
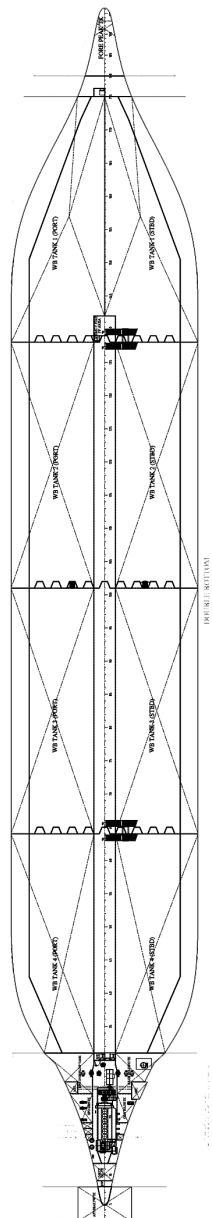
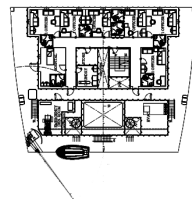
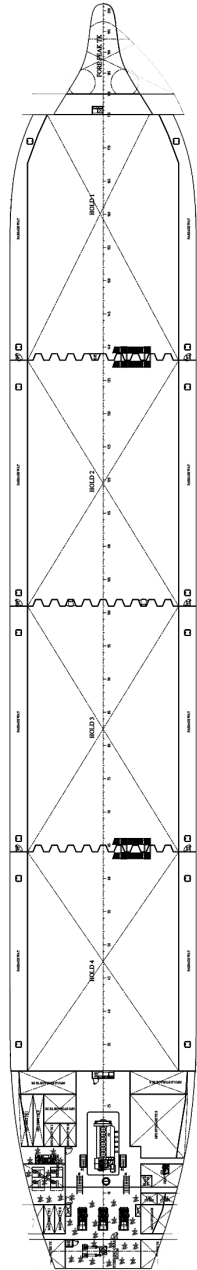
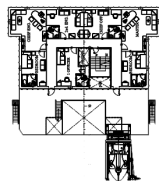
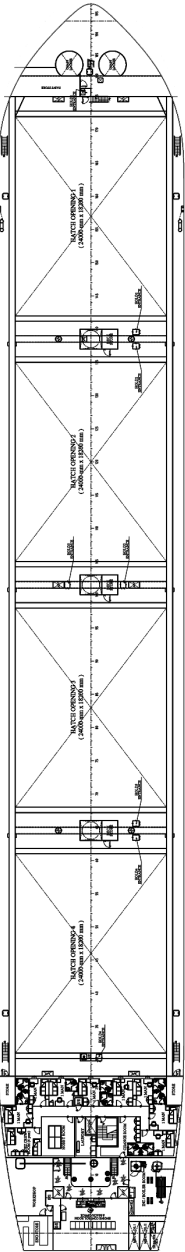
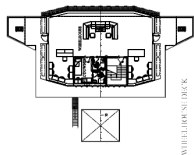
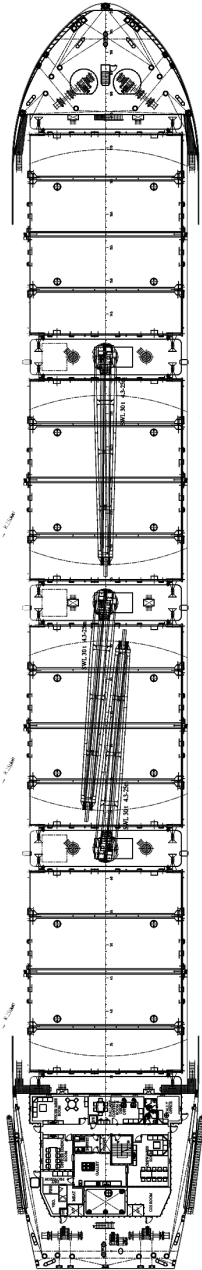
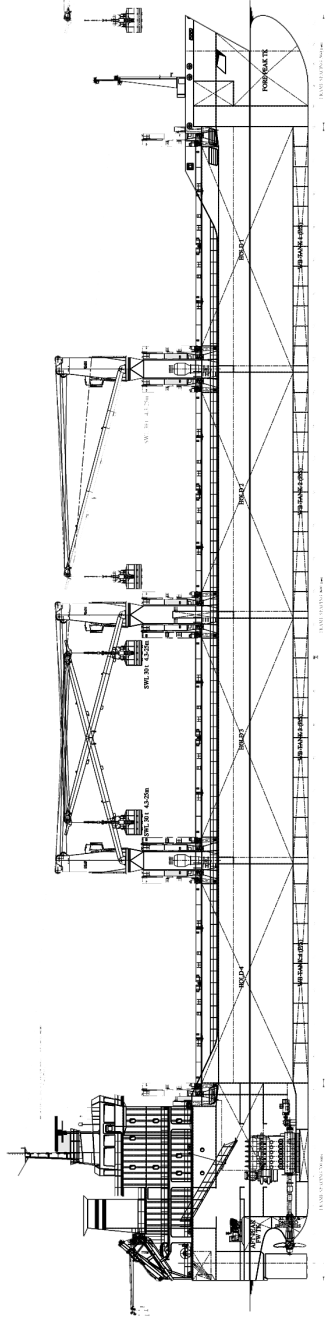
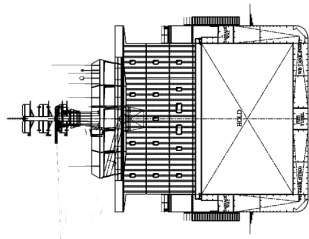
For tank and accommodation heating purposes, the ship is equipped with a 600kW thermal oil heater and economiser.

To minimise noise and vibration levels in the accommodation area, special attention has been paid to the structure of the vessel in these areas. The vessel has 20 cabins and a pilot cabin, all with private facilities, galley, provisions room, two mess/dining rooms, ballast control room & deck office, hobby room, Suez crew room, change room and wheelhouse.

## TECHNICAL PARTICULARS

Length oa: ..... 152.50m  
 Length bp: ..... 146.00m  
 Breadth moulded: ..... 20.00m  
 Depth moulded  
 To main deck: ..... 10.80m  
 To upper deck: ..... 10.80m  
 Width of double skin  
 Side: ..... 2.15m  
 Bottom: ..... 1.80m  
 Draught  
 Scantling: ..... 7.00m  
 Design: ..... 7.00m  
 Gross: ..... 11,627gt  
 Displacement: ..... 21,655tonnes  
 Lightweight: ..... 4,918tonnes  
 Deadweight  
 Design: ..... 14,412dwt  
 Scantling: ..... 16,736dwt  
 Block co-efficient: ..... 0.838  
 Speed, service: ..... 13knots  
 Cargo capacity  
 Grain: ..... 21,759m<sup>3</sup>  
 Bunkers  
 Heavy oil: ..... 640m<sup>3</sup>  
 Diesel oil: ..... 83.4m<sup>3</sup>  
 Water ballast: ..... 7,668m<sup>3</sup>  
 Daily fuel consumption  
 Main engine only: ..... 16.2tonnes  
 Classification society and notations: ..... BVI, HULL, MACHINERY, General Cargo Ship, Occasional Dry Bulk Cargo, Unrestricted Navigation, Heavy Cargo (20tonnes/m<sup>2</sup>), Grabloading (10tonnes), AUT-UMS, Ice Class 1C, SYS-NEQ-1, Cleanship, IWS, MON-SHAFT  
 Main engine  
 Design: ..... MAN  
 Model: ..... 6S35MC  
 Manufacturer: ..... STX-MAN  
 Type of fuel: ..... MDO, HFO  
 Output of each engine: ..... 4,440KW x 173rpm  
 Gearboxes  
 Make: ..... Kumera  
 Model: ..... 2FG-1100-450

Output speed: ..... 173 x 1,800rpm  
 Propeller  
 Material: ..... Ni-Al-Bronze  
 Designer: ..... Berg  
 Fixed/controllable pitch: ..... Controllable  
 Diameter: ..... 3.9m  
 Speed: ..... 173rpm  
 Main-engine driven alternators  
 Make/type: ..... AVK/ DSU-62 L1-4  
 Output/speed of each set: ..... 640kW x 1,800rpm  
 Diesel-driven alternators  
 Engine make/type: ..... MAN/ Lindenberg  
 Type of fuel: ..... MDO  
 Output/speed of each set: ..... 472kW  
 Alternator make/type: ..... AVK/ DSU 62 L1-4  
 Output/speed of each set: ..... 1,800rpm  
 Boilers  
 Type: ..... Thermal oil heater  
 Make: ..... Garioni Naval/SMAN  
 Output, each boiler: ..... 600KW  
 Cargo cranes  
 Make: ..... NMF  
 Type: ..... DKV 30025  
 Performance: ..... SWL 30tonnes x 25m  
 Other cranes  
 Make: ..... Gürdesan  
 Type: ..... GD.KHK-20/9.0  
 Tasks: ..... Provisions  
 Performance: ..... SWL 2tonnes x 9m  
 Mooring equipment  
 Make: ..... Denizsan  
 Type: ..... Electro hydraulic  
 Special lifesaving equipment  
 Number of each and capacity: ..... 1 x 25persons  
 Make: ..... GEPA  
 Type: ..... free-fall  
 Hatch covers  
 Design: ..... Gürdesan  
 Manufacturer: ..... Gürdesan  
 Type: ..... High stowing folding  
 Cargo tanks  
 Product range: ..... General cargo, steel coil, coal, grain, grab, dangerous goods  
 Coated tanks make: ..... Jotun  
 Complement  
 Officers: ..... 11  
 Crew: ..... 8  
 Bridge control system  
 One-man operation: ..... Yes  
 Fire detection system  
 Make: ..... Polimar/ Almar  
 Waste disposal plant  
 Sewage plant: ..... Detagasa  
 Contract date: ..... 28 March 2011  
 Launch/float-out date: ..... 13 June 2012  
 Delivery date: ..... September 2012





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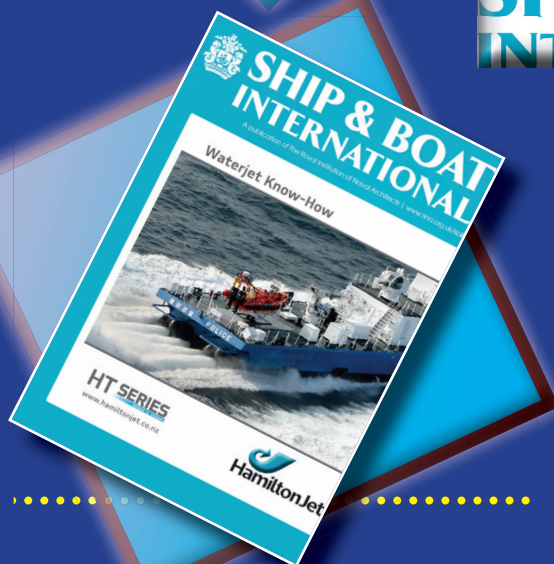


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# SIGNIFICANT SHIPS OF 2013

A publication of The Royal Institution of Naval Architects

The twenty fourth edition of our annual Significant Ships series, *Significant Ships of 2013*, will be published in February 2014. As in previous editions we shall be including up to 50 of the most innovative and significant commercial ship designs (of mostly 100m length and above) that will be covered during the forthcoming year.

The Editor invites shipbuilders, designers and naval architects to submit proposals for possible inclusion in *Significant Ships of 2013*. Entries should be in the established two-page format, with a brief description and tabular details (including major specifications) followed by a full page of technical general arrangement drawings. Each entry should comprise a short text description, a list of key features and a drawing highlighting the special features and design details.

## All entries to:

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