

SUNFLOWER KURENAI 6,918 DWT Passenger/Car Ferry **1**

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SUNFLOWER KURENAI 6,918 DWT Passenger/Car Ferry 1

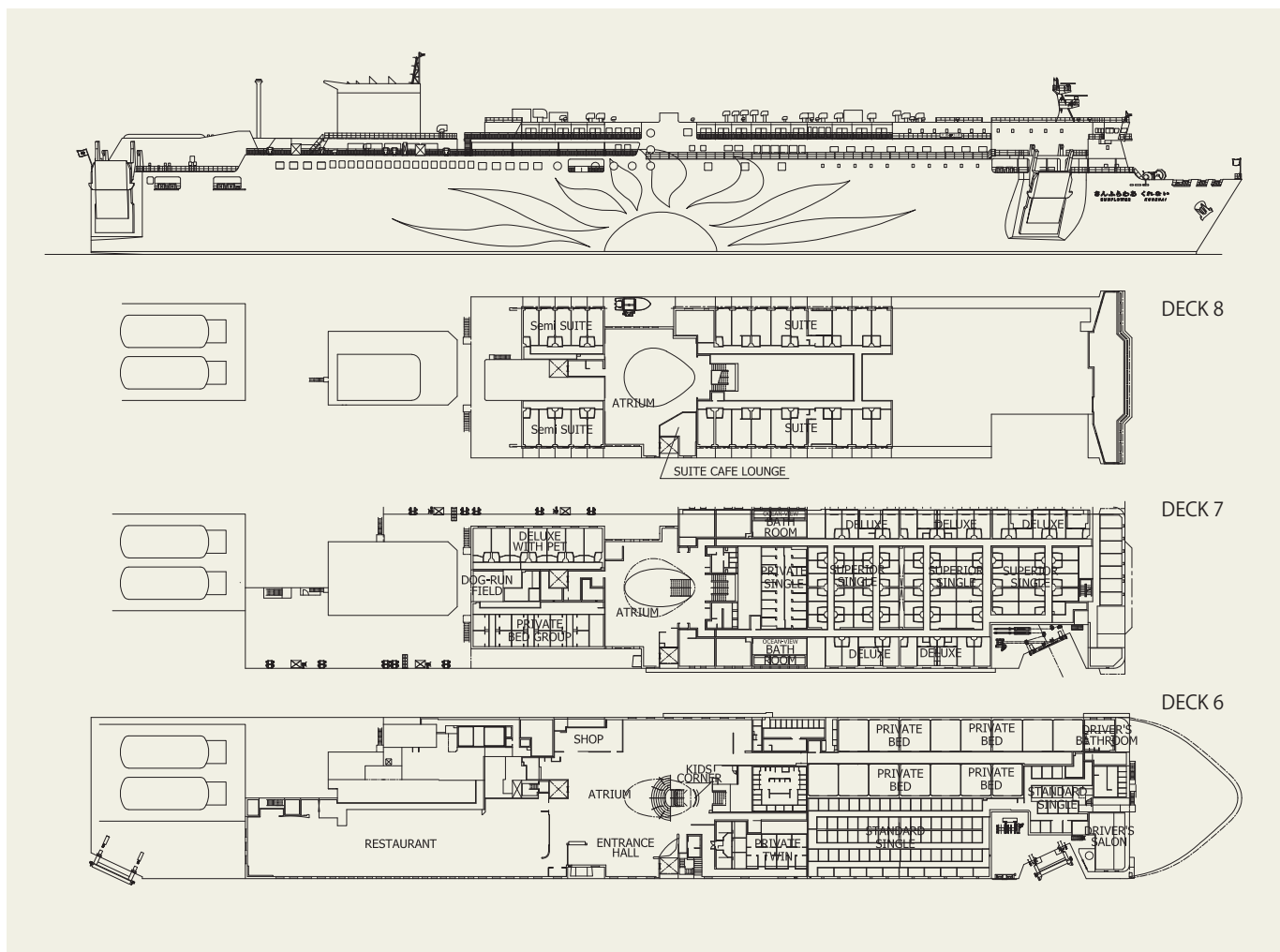
Contents By Builder By Ship Type

The SUNFLOWER KURENAI is Japan’s first LNG-fueled ferry designed and built by Mitsubishi Shipbuilding Co., Ltd. and was delivered to the owner Mitsui O.S.K. Lines, Ltd. and the operator Ferry Sunflower Co., Ltd. (currently MOL Sunflower Ltd.) on December 16, 2022 to start its service in a domestic ferry route between Osaka (Osaka) and Beppu (Oita). The environmental performance and seaworthiness of the vessel are enhanced by advanced propulsion systems and equipment.

State of the art high-performance dual-fuel engines can run with both liquefied natural gas (LNG) and marine diesel oil. The use of LNG fuel is expected to achieve a 20% reduction in CO₂ emissions and close to zero emissions of sulfur oxides (SOx). The newly designed high performance hull form reduces the hull resistance, and the proximity twin-screw system incorporates shaft brackets to improve the propulsion efficiency. The shaft generators/motors controlled

by thyristors are driven by both main engines and electric diesel generators, to supply electricity for hotel services and propulsive power assistance. Public areas include enlarged bathing facilities, a more spacious restaurant, and a three-

deck-high atrium. Some cabins and public spaces are equipped with various barrier-free facilities so that every passenger can enjoy their onboard trip throughout its voyage.



PRINCIPAL PARTICULARS

Length (o.a.)	199.9 m
Breadth (mld.)	28.00 m
Depth (mld.)	20.90 m
Draft (mld.)	6.80 m
Gross tonnage	17,114
Deadweight	6,918 t
Main engine	Wartsila 16V31DF
Speed (service)	22.5 knots
Complement	759
Classification	JG
Loading capacity (passenger)	716
(car/vehicle)	Car:100, 13mTruck:137
Builder	Mitsubishi Shipbuilding Co, Ltd.

OSHIMA MARU Training Ship 76

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OSHIMA MARU Training Ship 76

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Oshima Maru is the successor to the same name ship which was built by Mitsubishi Heavy Industries, Ltd. in 1993. Compared with its predecessor, new Oshima Maru is enlarged in gross tonnage, which has enhanced the safety and learning environment as follows.

- The student rooms have been moved from below to above waterline.
- Dedicated area for female students for convenience and security.
- Air-conditioning system designed to prevent infectious diseases.
- A wide variety of research equipment to enable research and survey of seabed topography, oceanography and meteorology.

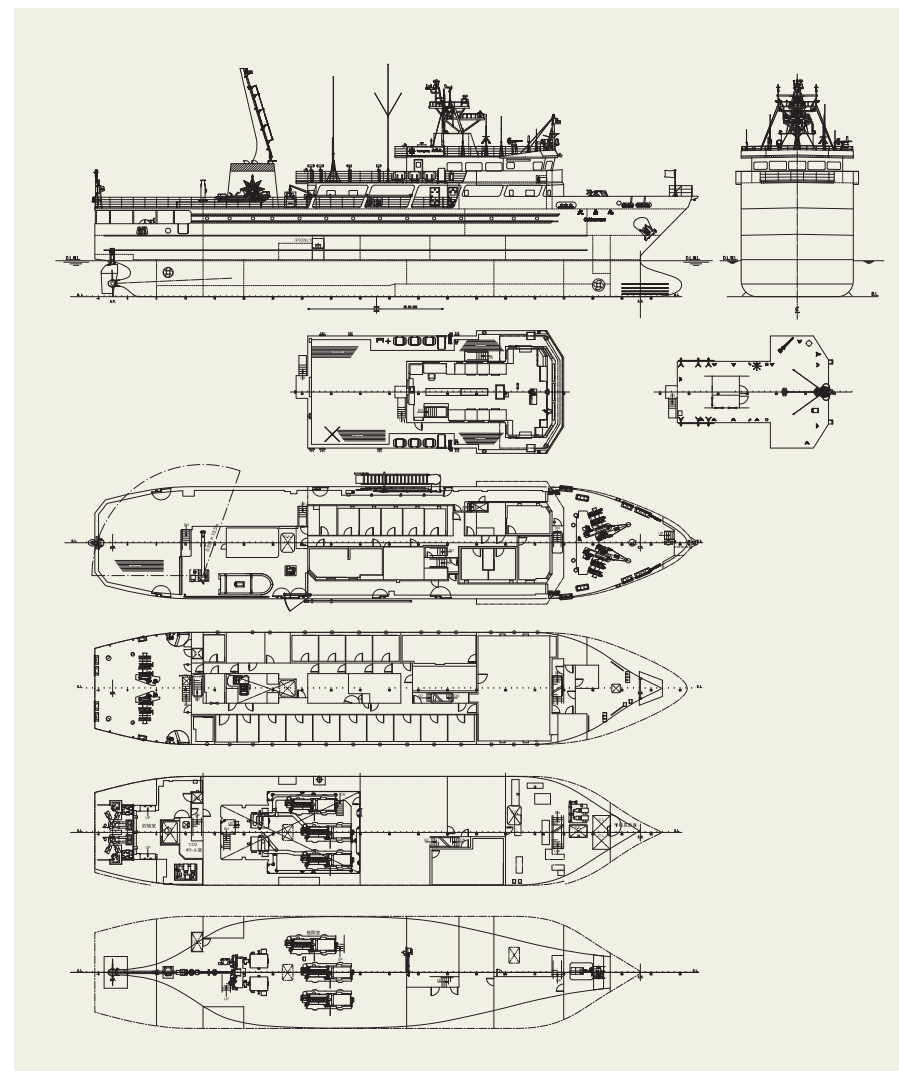
It also functions as a support vessel in the event of a disaster by providing electricity, water and sanitary facilities. The propulsion system of Oshima Maru employs two two-

speed propulsion motors and one Controllable Pitch Propeller (CPP) via a clutched reduction gear. The system is equipped with a function to limit the propulsion motor output by automatic load control (ALC) of CPP to protect the propulsion motor overload and the power plant. Other protective functions, such as emergency stop and automatic slow down, ensure the safety of the propulsion system. Furthermore, an electric propulsion system has resulted in low vibration and noise, which contributes to improved concentration during training and reduced fatigue.

It is equipped with three main generators as main power supply and a lithium-ion battery as auxiliary power supply. This hybrid power supply system has energy-saving functions such as main generator output levelling/peak shaving and suppression of bus line frequency fluctuations, in addition to number control of generator in accordance with the ship's load such as propulsion motors.

In home port, it has a dedicated land-based power supply system, which receives power from shore when the ship is moored, and the main generator can be switched off, thereby reducing fuel consumption and CO₂ emissions. During onboard tours and training at

berths in other ports, the main generator can be shut down and the battery system alone can provide onboard power, achieving zero emissions for limited time.



PRINCIPAL PARTICULARS

Length (o.a.)	56.49 m
Length (b.p.)	49.90 m
Breadth (mld.)	10.60 m
Depth (mld.)	5.80 m
Draft (mld.)	3.40 m
Gross tonnage	373
Main generator	750 kW x 3 units
lithium-ion battery	417kWh x 1 unit
Propulsion motor	745/220kW x 2units
Speed (max. trial)	13.44 knots
(service)	12.5 knots
Complement	60
Classification	JG
Builder	Mitsubishi Shipbuilding Co., Ltd.

KAIKI Environment Survey/Cleaning Ship **77**

Contents

By Builder

By Ship Type



Kaiki is the successor to the same name ship which was constructed by Mitsubishi Heavy Industries, Ltd. in 2003. The mission of Kaiki is to carry out marine environment improvement projects such as survey and observation in closed shallow water area, collection of floating debris and drifting wood. In addition, a dedicated fresh water supply line is provided as a disaster support device, and a small container for transporting relief supplies can be mounted. With reference to the design concept of Kaiki, it is able to work in shallow water with a water depth of about 2 meters. There is enough space on board to accommodate various types of observation equipment in a restricted deck area. Moreover, it is able to travel at high-speed movement in order to cover widespread observation points.

In view of efficient navigation, it has the following features;

- A catamaran hull configuration and a water jet propulsion system are adopted.
- A skipper type debris recovery system is installed in the bow of the ship between the two hulls.

- Grab is attached to an articulated crane, and drifting wood can be picked up and recovered by the grab.
- Equipped with a number of survey equipment to carry out water quality surveys, sediment surveys, tidal current observations, deep shallow surveys, etc.

PRINCIPAL PARTICULARS

Length (o.a.)	29.50 m
Length (b.p.).....	27.80 m
Breadth (mld.).....	9.00 m
Depth (mld.).....	3.3 m
Draft (mld.).....	1.3 m
Gross tonnage.....	128
Deadweight.....	14.63 t
Main engine.....	MTU16V2000M72 x 2 sets
MCR (kw × rpm).....	1,440 x 2,250 x 2 sets
Speed (max. trial)	above 24 knots
Complement	[24h or more] 6p(Officer & Crew) [Less than 24h] 6p(Officer & Crew), 10p(passengers), 2p(others)
Classification	JG
(tank)	FO 21.42m ³ / FW 11.86m ³ / BW 20.35m ³
Builder.....	Mitsubishi Shipbuilding Co., Ltd.

