



Photo by Flying Focus-Bussum, The Netherlands

# SHOREWAY & CRESTWAY

IHC MERWEDE DELIVERS PAIR OF 5.600 M3 TRAILING SUCTION HOPPER DREDGERS TO BOSKALIS

**Builders:**  
IHC Holland Merwede BV,  
The Netherlands  
**Owners:**  
Royal Boskalis Westminster,  
Papendrecht, The Netherlands

**I**HC Merwede has completed the Crestway; her sister vessel Shoreway is still under construction. Both ships are trailing suction hopper dredgers specifically designed for land reclamation and the transport of sand and sludge. This means that the ships are designed for a low draught - only 7.10 m at the maximum loading capacity - and discharge through the bottom doors in shallow waters. This makes them particularly suitable for the maintenance of harbours, beach replenishment and land reclamation projects. Concerns over global warming and the consequent rise in sea water level will certainly assure a good market for this kind of vessel for years to come.

## Newbuilding program

The owner of the vessels is dredging company Royal Boskalis Westminster, based in Papendrecht, the Netherlands. Some of its most notable projects are the seaward expansion of the port of Rotterdam, the creation of Al Sowa

island in the United Arab Emirates and the protection and reconstruction of the Vilufushi Island in the Maldives, which was completely destroyed by the tsunami in December 2004. Around the island, Boskalis created a ring, much like an artificial atoll. For the construction of the island's port, the rubble of the destroyed houses was used. The fleet of Royal Boskalis Westminster contains around 300 ships, ranging from

stone dumpers to cutter suction dredgers and trailing suction hopper dredgers. An active newbuild program will add a new deepwater fallpipe vessel (which is used to dump stones on the bottom in a precise location), a new side stone-dumper and various tugs and workboats. The TSHD Queen of the Netherlands will be extended to become a 35.500 m<sup>3</sup> mega hopper.

## One-man operation

The Crestway and Shoreway both feature the one-man-on-bridge operation which has proven successful on earlier IHC Merwede deliveries such as *Marieke* and *Reynaert*. Both the dredging and navigation systems are automated and simplified by IHC Systems b.v. to such an extent that a single person can control both activities.

The monitoring of various parameters is done with Trafag Pressostats, Pressure Sensors, Temperature Sensors, Valve Blocks and Thermostats, all delivered by Marktechnical BV from Dongen. They also delivered the PT100 sensors from

### Main particulars

Length o.a.	97.50 m
Length b.p.	84.95 m
Beam	21.60 m
Moulded depth	7.60 m
Draught (dredging mark)	7.10 m
Speed (laden, at trials)	12.8 kn.
Deadweight	over 8,000 tons

### Dredging

Hopper volume	5,600 cu.m
Dredging depth	33 m
Pipe diameter	1000 mm
Pipe diameter (discharge)	900 mm

### Tank capacities

Marine diesel oil	134 cu.m
Drinking water	92 cu.m
Lubricating oil	25 cu.m
Ballast capacity	420 cu.m

Mueller (Germany). Deck gear includes 2 foredeck winches and a stern anchor winch from Kraaijeveld Machine- & Lierenfabriek. As a consequence of the large bulbous bow, the anchors are held in frames external to the ship's hull. The davits for the lifesaving appliances were supplied by Promac.

### Alarm & Monitoring system

The dredgers are both equipped with the Maxi-Guard alarm and monitoring system from Praxis Automation Technology. The output of this system is on Windows XP-based workstations which run on robust marine personal computers and are controlled through a 17 inch TFT screen, an operator control panel and a tracker ball.

The Maxi-Guard distributed processing units fully execute control, alarm and monitoring functions even when no operator work station is connected. Each module has between 16 and 96 I/O channels. The modules are located in a dedicated cabinet. The system contains an extensive alarm system for compliance with unmanned machinery space requirements, including an engineer call system, on-duty selection either manually or automatically based on shifts and a dead man timer for engineer safety. Local operator panels, giving access to the alarm and monitoring system, are located in the bridge, technical space and in the engine room. The cabins and mess rooms are equipped with LED panels.

### Twin sisters

The Shoreway was built and launched at IHC Merwede's facility in Sliedrecht[IB3]; commissioning of the Shoreway is carried out in Kinderdijk and the planned delivery will be 2nd quarter



A hopper capacity of 5.600m<sup>3</sup>

2009. The Crestway was built and commissioned in Kinderdijk. Building kits for the steel were supplied by IHC Metalix. Both of the vessels measure 97.5 m long by 21.6 m wide. The design focused on minimal weight to maximize the hopper capacity, which is 5.600 m<sup>3</sup>. A substantial bulbous bow increases the buoyancy, and thus payload, within the ship's length, beam and draught.

A 1.000 mm suction tube on port side allows for dredging up to 33 m depth. The spoil can be discharged through two rows of rectangular bottom doors or by pumping it either into a floating pipeline or through a rainbowing nozzle over the bow. The vessels can achieve a maximum speed of 13 knots and provide accommodation for 14 persons.

### Dredging

At the heart of the dredging activity is a massive IHC high efficiency dredge

pump with an impeller of 2.3 m. A hydraulically adjustable overflow in the hopper skims off the water from the top. The spoil is discharged into the hopper through two crossbeams. The jet pump, driven by the SB engine, provides pressurised water with two functions. A water jet at the draghead loosens up the bottom, to facilitate the suction. Water jets in the bottom of the hopper on the other hand render the spoil liquid enough again so it can be pumped out to shore.

### Accommodation

The accommodation is located in a deckhouse on the bow of the ship.

The galley and laundry have been outfitted by Bouter. To minimize noise transmission, Nautec SX and FS subfloors have been installed throughout the accommodation by Helder & May. The watertight sliding doors are of the Eagle-type from Winel. Weathertight doors are Musketeer-type doors from the same supplier, which also delivered RM tank vent check valves.

### 3 main engines

The Shoreway and Crestway each feature a twin-screw arrangement. Three Wärstilä 6L26A diesels take care of the propulsion, electric power supply and dredging power. The SB main engine drives the SB propeller, a shaft generator and the jet pumps. The central engine is used exclusively for the dredge pump. The PS main engine is used for the PS propeller and can also be used in parallel with the center engine to drive the dredge pump when the cargo is pumped through a long floating pipeline.

The propellers rotate in Optima nozzles supplied by Damen Marine Systems. The stern tubes are sealed with



The auxiliary machinery room

Supreme seals and use the white metal bearings supplied by IHC Lagersmit. The cooling system for main engines and generators is with Bloksma boxcoolers in the seachests. The engine room ventilation was in the hands of NR Koeling, which also took care of the heating, ventilation and air-conditioning throughout the accommodation.

Piping was installed by De Jong and IHC Piping b.v.. The Fuel Supply Units were delivered by Mar-In Controls B.V., with fuel oil and luboil separators from Alfa Laval. The installation is suitable to run both on MGO and HFO 380. The control air system was delivered by Bosch Rexroth. Fuel tank heating is with a thermal oil system from INTEC Energy.

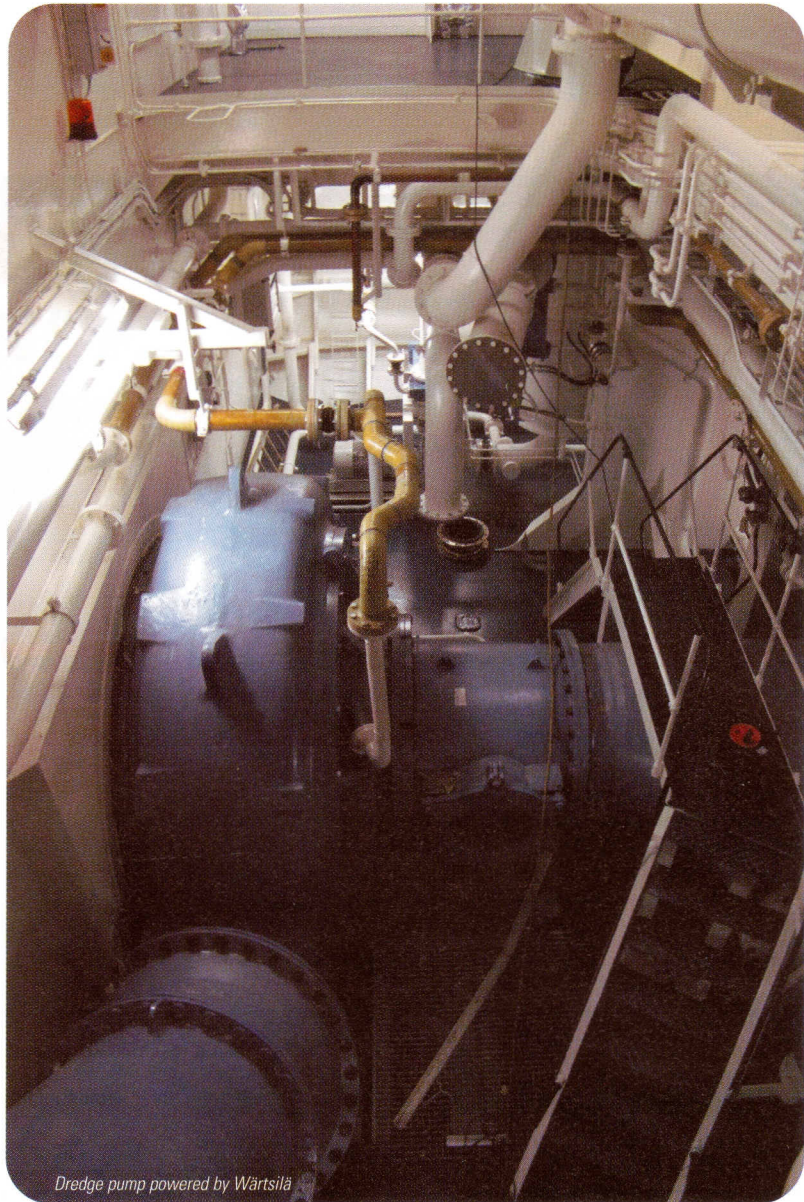
### E-power

In addition to the shaft generator, the electric power is also generated in an auxiliary generating set rated at 660 kVA, composed of a Cummins VTA28 D(M) engine and a A.v.Kaick DSG 62 L2.4 alternator. The emergency/harbour generator is rated at 131 kVA and consists of a Cummins 6CT 8.3 D(M) engine and a Stamford UCM 274 F alternator. Both generating sets were delivered by De Ruyter Dieseltechniek.

The bowthruster is an electrical thruster with fixed pitch propeller.

### Navcom

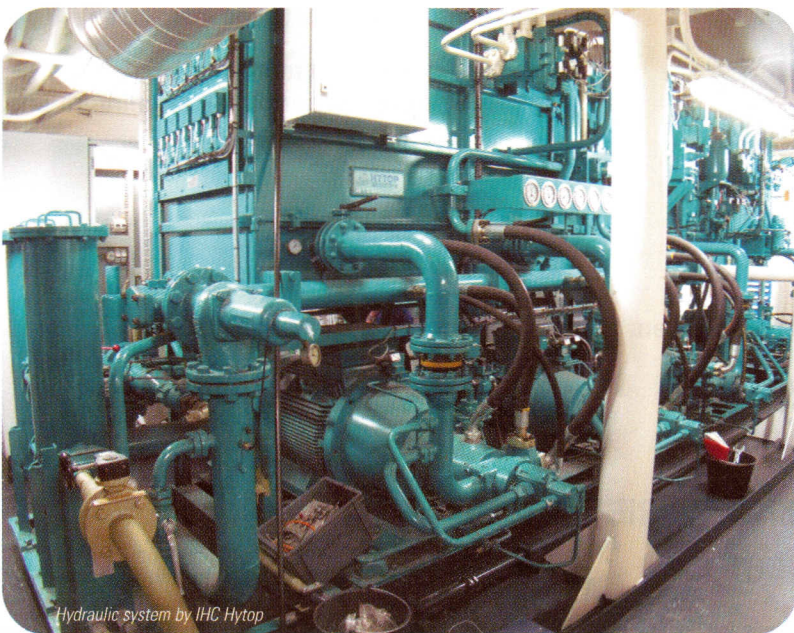
The navigation and communication equipment was delivered by Alphantron. It's main navigational aids include a Alphaconning display, an Alphanicourse gyro system and an Anschutz pilotstar D autopilot. Communication equipment includes a.o. an Alpha GSM unit, a Sailor/Thrane Fleet 77 satcom and SSAS. To increase the audibility of outside sounds in the



Dredge pump powered by Wärtsilä

wheelhouse, a Phontech Sound Reception System is installed. ScheGro BV supplied the practical Hansen Pilot Seats and the tracks which allow their

variable positioning. The wheelhouse features full height windows in the central sections, both facing forward and abaft.



Hydraulic system by IHC Hytop

### Subcontractors and suppliers of equipment fitted on board the 'CRESTWAY' (partial list)

<b>Ajax Fire Protection Systems,</b> Amsterdam	: fixed CO <sub>2</sub> system for engine room
<b>Alfa Laval Benelux,</b> Breda	: fuel oil- and lub oil separators
<b>Alphantron Marine,</b> Rotterdam	: navigation systems; communications equipment; conning information system
<b>Bakker Sliedrecht Electro Industrie,</b> Sliedrecht	: bowthruster engine; generators
<b>Bloksma,</b> Almere	: box coolers
<b>Boone,</b> Oud-Beijerland	: Keller propulsion gearboxes; reduction gearbox; dredge pump and jet pump drive with ancillary equipment; <i>KWD</i> elastic (clutch) couplings
<b>Bosch Rexroth,</b> Boxtel	: main control air system
<b>Bouter Grootkeukentechniek,</b> Zoetermeer	: galley & laundry equipment
<b>Brusselle Marine Industries,</b> Nieuwpoort (B)	: steering gear
<b>Bureau Veritas,</b> Rotterdam	: classification
<b>Caldic Techniek,</b> Rotterdam	: <i>Stamford</i> generator
<b>Damcos,</b> Alblasserdam	: actuators; tank level gauging

**Damen Marine Components,**  
 Hardinxveld-Giessendam ..... *Optima* propeller nozzles  
**Datema Delfzijl,** Delfzijl ..... meteorological instruments  
 and safety equipment  
**Econosto,** Capelle a/d IJssel ..... remote tank diagramme  
**Endenburg,** Gouda ..... rigging  
**Exxon Mobil Marine Lubricants,**  
 Breda ..... *Mobil* lubricants  
**Facet Industrial,** Almere ..... bilge water separator  
**Fridina,** Groningen ..... cold & freeze stores  
**Grijp Buizen, Van de,** Papendrecht ..... dredging pipes  
**Hatenboer-Water,** Schiedam ..... freshwater hydrophore and  
 treatment unit; hot water  
 calorifiers  
**Helder & May,** Europoort RT ..... *Nautec* SX and FS subfloors  
**IHC Hytop,** Sliedrecht ..... hydraulic systems  
**IHC Lagersmit,** Kinderdijk ..... Supreme stern tube seals  
 and bearings  
**IHC Metalix,** Kinderdijk ..... complete building kit  
**IHC Parts & Services,** Kinderdijk ..... dredging installation  
**IHC Piping,** Sliedrecht ..... lubrication system and  
 piping systems  
**IHC Systems,** Sliedrecht ..... semi integrated dredging  
 control system  
**INTEC Netherlands,** Heerde ..... thermal oil installation  
**Jong's Pijpleidingfabriek, De,**  
 Sliedrecht ..... mid-, fore-, and  
 accomodation piping  
**Koning Straal- en Schilder-  
 werken, De,** Oosterhout ..... paint works  
**Korteland,** Nieuw Lekkerland ..... safety signalling marks  
 IMO / SOLAS

**Kraaijeveld, Machine en  
 Lierenfabriek C,** Sliedrecht ..... winches  
**Kroon,** Hoogezand ..... ship's hardware  
**Leeuwen Jr's Buizenhandel, Van,  
 Zwijndrecht** ..... steel pipes, flanges & fittings  
**Leun Installatiebouw, Van der,  
 Sliedrecht** ..... complete electrical  
 installation  
**Mar-In Controls,** Krimpen a/d IJssel ..... fuel supply module  
**Marktechnical,** Dongen ..... *Trafag* pressure  
 transmitters, pressostats &  
 thermostats; sensors,  
*Muellersensors*  
**Merwede Interior,**  
 Hardinxveld-Giessendam ..... carpentry  
**Nieuwburg & Zn, L.,  
 Krimpen a/d IJssel** ..... insulation  
**Nijhuis Pompen,** Winterswijk ..... pumps  
**N.R. Koeling,** Krimpen a/d IJssel ..... HVAC plant accomodation;  
 ER ventilation  
**Praxis Automation,** Leiden ..... alarm-, monitoring- &  
 control system  
**Promac,** Zaltbommel ..... *Promac-Global Davit* davit  
**Reikon,** Spijkenisse ..... *Azcue* pumps  
**Rotor,** Eibergen ..... electric motors  
**Ruyter Dieseltechniek, De,  
 Sliedrecht** ..... auxillary & emergency  
 generator set with  
*Cummins* diesel engines  
**R&M Spreeuwenberg,** Zwartewaal ..... scaffolding  
**ScheGro,** Zwijndrecht ..... *Hansen* wheelhouse chairs,  
 deck tracks

**SKF Machine Support,** Ridderkerk ..... alignment and chocking  
 with *Epocast 36R* and  
 mounting of the flexible  
 couplings of the complete  
 propulsion and dredge  
 pump installations  
**Sperre Rotterdam, Ridderkerk** ..... starting air compressors  
**Theunissen Technical Trading,  
 Malden** ..... *Aqua Signal* lighting; *Pesch*  
*Seematz* searchlights &  
 window wipers; *Zenitel*  
 communication equipment;  
*Zenitel Servoteknikk* fire  
 detection system  
**Uittenbogaart, T.B.U.,** Rotterdam ..... *Dreggen* ship crane;  
*BioCompact* sewage  
 treatment plant; *Winel*  
 doors & ventilation cowls;  
*SMA* mooring equipment;  
*Jets* vacuum toilet system  
**Velden® Barkemeijer, Van der,  
 Reinbek (G)** ..... *Barke* flap rudder  
**Wärtsilä Nederland, Zwolle** ..... *Wärtsilä* main engines  
**Wärtsilä Propulsion Netherlands,  
 Drunen** ..... *Lips* CPP propeller and bow  
 thruster  
**Wiko Isolatie techniek,** Rotterdam ..... insulation  
**Winel, Assen** ..... *Eagle* watertight sliding  
 doors; *WET* musketeer  
 doors; tank vent check  
 valves  
**Zee, Van der,** Amersfoort ..... *Maderas Jumilla* sanitary units

## GENERAL ARRANGEMENT

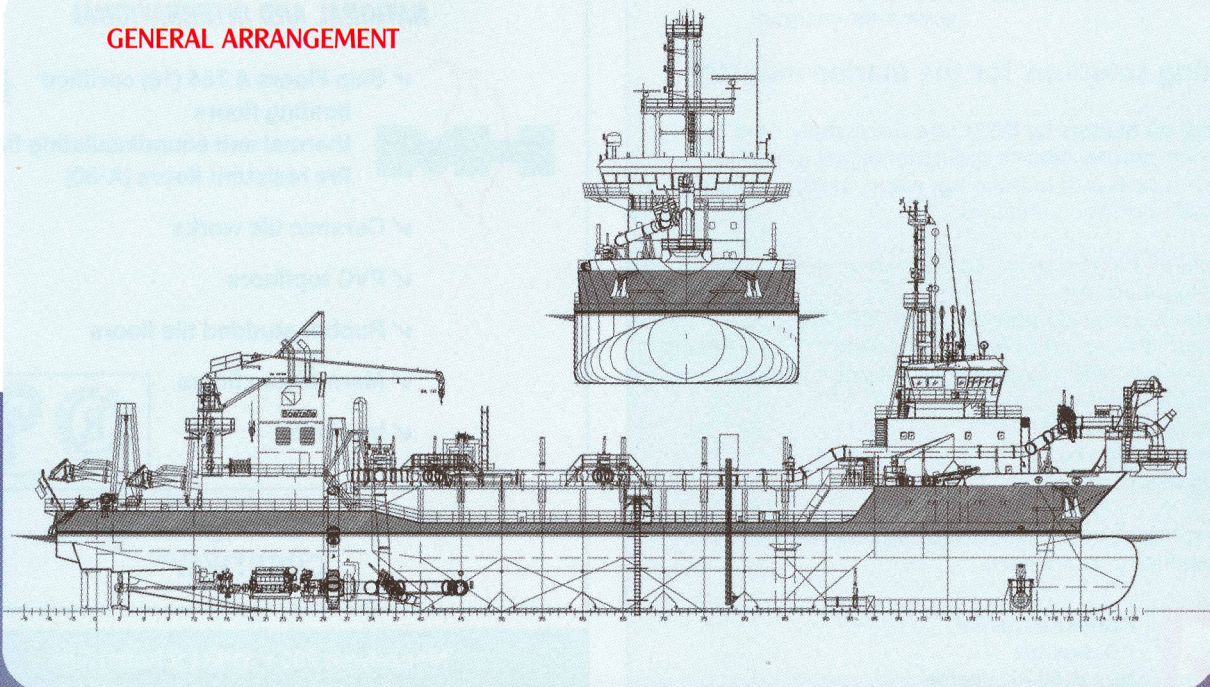


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