# *The salient features of the 27m Ocean Shuttle Catamaran Hull Designs*

The hull form is a semi-planing type catamaran. It employs a combination of symmetrical and asymmetrical sponson shapes, thereby combining the attributes of both shapes in one hull. The symmetrical bow-section ensure directional stability in short swell conditions and following seas, whilst the asymmetrical midships and aft sections ensure softness of ride and reduced whetted area which enhances comfort and economy.

The catamaran hull has a high tunnel ceiling with a large opening between the sponsons, which allows free movement of wind-waves without slamming on the wet-deck. Horizontal steps on the inside of the tunnel walls act both as chines to deflect green water from the hull surface, and to break up the solid water into spray.

## Comfort

The hull is particularly soft riding and is ideal for passenger ferries where comfort is of great essence. This is mainly due to the vertical inside shape of the sponsons, which reduces the planing area, thereby reducing the vertical acceleration forces.

However, a further important feature in enhancing passenger and crew comfort is the action of the longitudinal chines on the inside of the tunnel walls. As solid green water is broken up into spray whilst being deflected from the hull, it mixes with air streaming down the opening between the sponsons. This mixture of spray and air creates a high-density medium inside the tunnel, which causes a dampening effect each time the hull moves through a trough of a wave.

Since the vertical accelerations caused by wave action on this type of hull is lower than most other types of craft, the vessel can maintain service speeds in relatively rough conditions without compromising the comfort of its passengers.

## Performance and speed

The action of the longitudinal chines inside the tunnel, as well as wide chines on the outside, both deflecting water away from the hull, reduces the whetted area and therefore the resistance of the hull. The vertical inside shape of the sponsons minimizes wave interference between the sponsons, which further reduces drag. The combined effect is a hull with low resistance, low vertical accelerations and therefore excellent performance. A further benefit of the vertical inside shapes is that the direction of forces imposed on the hull during turning, causes the vessel to bank inwards on turning, similar to a mono hull, thereby increasing high speed turning performance and safety.

In applications where speed is of essence, a hydrofoil is fitted to the hull. It consists of an underwater wing profile spanning the tunnel at approximately midships position. The lift produced by the hydrofoil

reduces the hull resistance, which increases speed, whilst at the same time increasing the load-bearing capability. The foil action reduces the power needed to maintain service speed, and therefore fuel consumption and running costs are reduced. Unlike conventional hydrofoils, which lift the hull completely out of the water, the hydrofoil is designed to only partly reduce the draft, thereby reducing resistance, but still maintaining good sea keeping by having the hull still partly submerged. The hydrofoil further enhances the softness of the ride, especially in choppy seas.

Probably the most outstanding feature of this hull-form is its soft riding characteristic. The ability to maintain high speed in rough water conditions makes the hull particularly well suited for para-military and passenger ferry applications, when voyages or scheduled crossings need to take place in all weather conditions.

## Wake

The height of the wake produced by catamarans type hulls is much reduced as compared to conventional mono hulls, due to the reduced wave making resistance of the long, slender sponsons. The lift action of the hydrofoil reduces the draft and therefore the amount of water which need to be displaced by the underwater part of the hulls. This results in a further reduction of the size of the wake. Typically, a Teknicraft catamaran of 63' waterline length, displacing 27t and running at 27 kn will create a maximum wake height (peak to trough) of 19", with a rms wake height of less than 6".

## Safety

Catamarans are generally the safest type vessels due to the high transverse stability of the hull shape as well as having two separate hulls contributing to positive buoyancy in case of damage.

Watertight bulkheads divide the hull into several compartments, all capable of supporting a substantial displacement, in case of flooding of other compartments.

Design work is done in accordance with rules of various classification societies, with statutory safety requirements adhered to as well. When necessary, plan approvals are obtained from the relevant authorities prior to construction of a vessel, and the construction is surveyed to ensure proper building standard.

## Economy

The lower resistance of the hull necessitates less power and therefore less fuel to attain a given service speed. Ensuring that all systems are simple to run and easy to maintain further reduces running cost.

The hydrofoil, being permanently fixed in one position and constructed of high strength corrosion resistant steel or aluminium alloy, need no maintenance. It is fixed above the keels of the sponsons and is therefore no more vulnerable to damage than the hull itself.

## Space

The high beam to length ratio of the catamaran hull provides a large deck area for placing of passenger seating, deck cargo, fish stowage, industrial equipment or for entertainment. Due to the high stability of the hull, second and third tier decks can be fitted to increase space without compromising on comfort or safety.


27m OCEAN SHUTTLE - 35 kn. - 150 passengers

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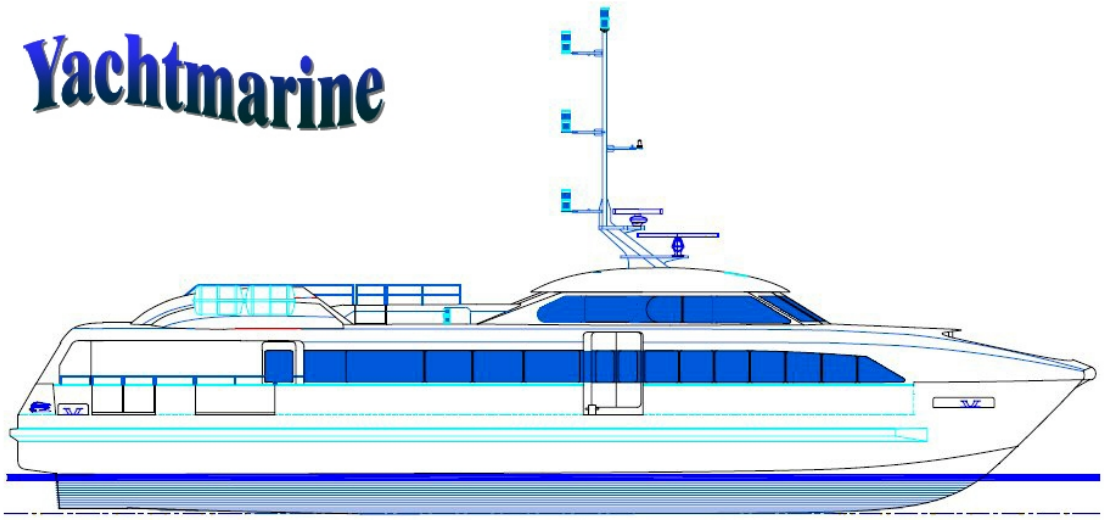

**27 M OCEAN SHUTTLE - HYDROFOIL ASSISTED CATAMARAN - 36 KNOTS**

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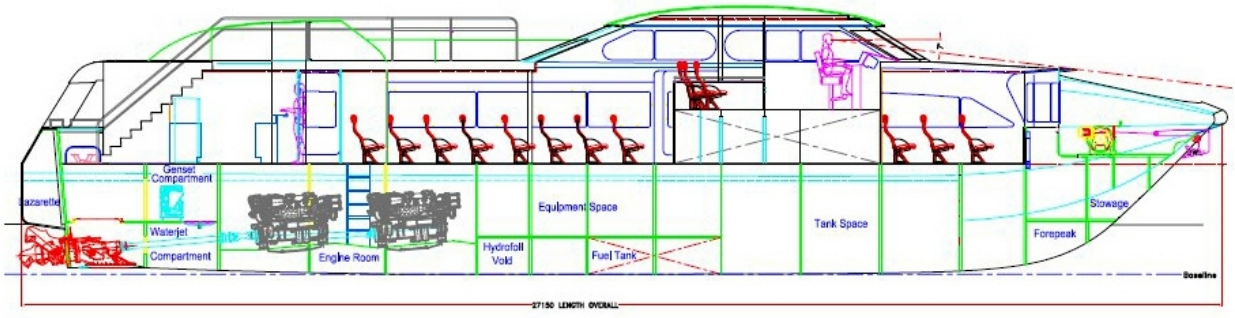

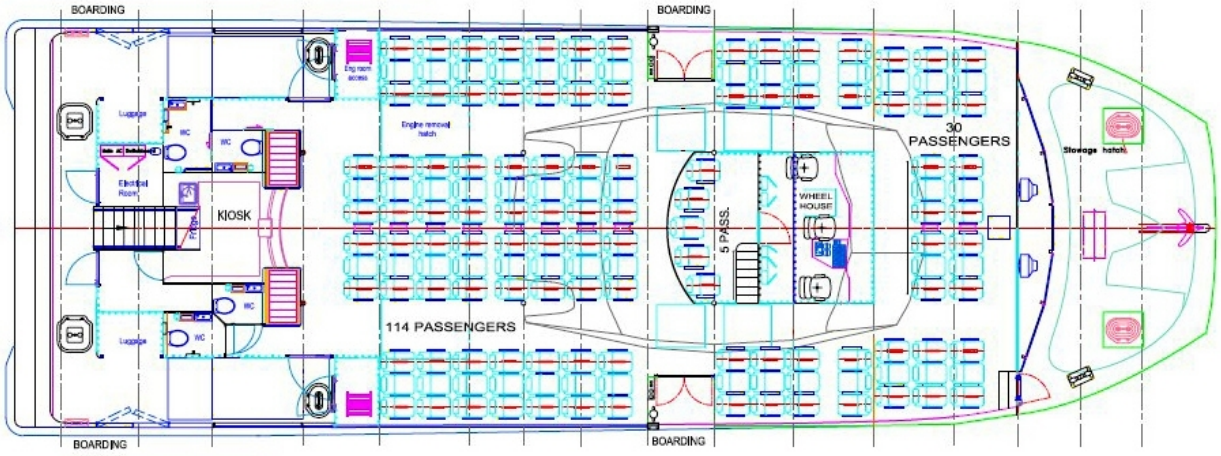


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## LEADING PARTICULARS

| | |
|---|---|
| LENGTH (OA) | 27.2 m |
| LENGTH (WL) | 24.1 m |
| BEAM (Moulded) | 9,0 m |
| DRAUGHT | 1,12 m |
| ENGINES | 4x CATERPILLAR 3412E |
| PROPULSION | Hamilton 391 Waterjet |
| SPEED | 35 kn |
| FUEL | 7000 lt |
| PASSENGERS | 149 |
| HULL TYPE | Catamaran,hydrofoil assisted |
| HULL CONSTRUCTION | Composite |
| SUPERSTRUCTURE CONSTR | Aluminium |
| CLASSIFICATION | DNV +1A1 HSLC Passenger R2 EO |

teknicraft DESIGN

Teknicraft Design Ltd
PO Box 34-712
Birkenhead
Auckland
New Zealand
Tel: +64 9 482 3331
Fax: +64 9 482 3334
Email: design@teknicraft.com

VESSEL: 27m Hydrocruiser

DRAWING: General Arrangement