Bakri Cono Shipyard
Asian Specialist in Custom Yachts

MTV 35 / 55 Catamaran Watercraft

Introduction

Increasing competition in the tourist industry and worsening traffic conditions in cities requires one to look for a new approaches in the development of water transportation that meets and exceeds requirements of the average water taxi. For remote island resorts such as in the Maldives and Andaman Sea, small water craft are often the only means of transport and here a large number of small passenger crafts have been developed by AMD (Albatross Marine Design) during the recent years. Great emphasis has been placed on interior layouts which enhance and assess efficiency of the hull and maximize some of the most critical criteria such as: comfort, safety, seating arrangements, boarding options and luggage storage. It is well understood that larger water craft provide better efficiency compared to small craft, however this is subject to a number of limitations and realities. In many locations, operation of small passenger craft is encouraged by:

- Minimizing the initial investment and future operational cost
- Certification requirements
- Shallow draft and berthing limitations
- The demand for specific tasks and destinations.

This vast knowledge base of AMD with physical data at hand has led to the development of Bakricono's MTV 35 & 55 (Multiple Transport Vessel) which not only meets the requirements of **ISO Small Craft**, but well exceeds all expectations.

Bakricono's MTV has a unique commercial approach for your boat requirements, using a modular system in reply to today's fast changing business requirements, **the MTV can conveniently be converted from a Passenger ferry to a dive boat, ambulance boat, house boat or even a conference boat.**

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Passenger compartment

Pilot station

MAIN PARTICULARS MTV 35 /55

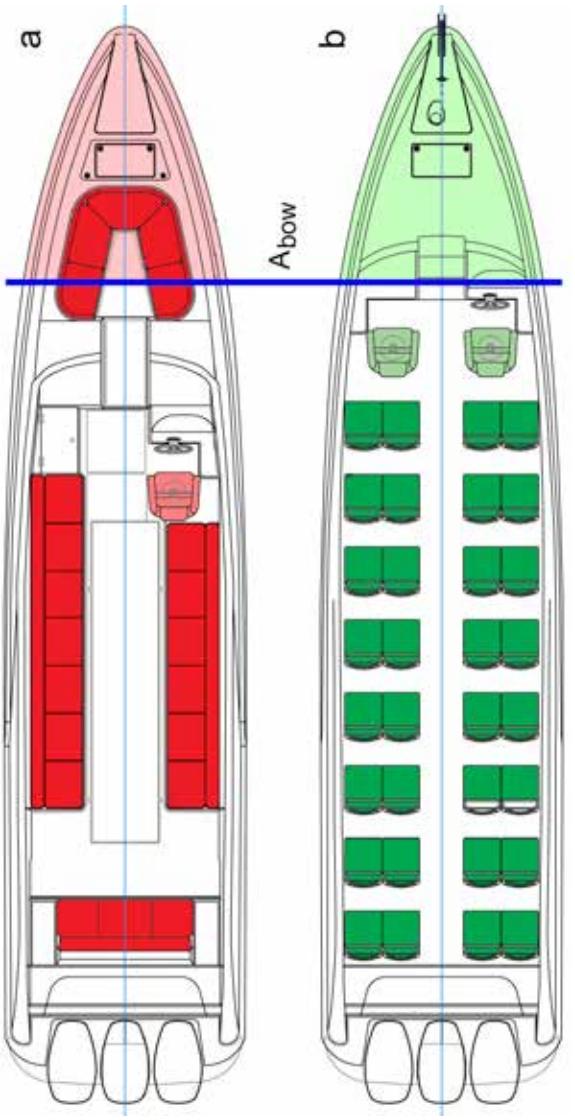
PARAMETER	SYMBOL	UNITS	VALUE MTV35	VALUE MTV55
LENGTH				
maximum length (with platform)	LMAX	m	11.96	16.00
length of hull	LH	m	11.16	15.16
length of waterline (at DWL)	LWL	m	10.16	14.16
BEAM				
maximum beam	BMAX	m	4.05	
beam of hull	BH	m	3.92	
beam at waterline (at DWL)	BWL	m	1.21	
beam between centres of buoyancy	BCB	m	2.41	
beam of chine	BC	m	1.15	
DEPTH				
maximum depth	DMAX	m	2.06	
midship depth	DLWL/2	m	1.99	
DRAUGHT				
canoe body draught (LDC displacement)	TC	m	0.72	
maximum draught (LDC displacement)	TMAX	m	1.11	
HEIGHT				
air draught (excluding antenna)	HA	m	3.58	
DISPLACEMENT				
volume displacement (at DWL)	VD	m3	10.15	15.17
light craft condition mass	mLCC	kg	7570	11500
mass of craft at minimum operation condition	mM0C	kg	7800	11700
loaded craft mass	mLDC	kg	12470	17900
maximum load	mMTL	kg	4670	6400
immersion (at DWL)		kg/cm	220.4	314.9
ENGINES				
number of engines			2	2
recommended power (total)		HP	2 x 300	2 x 300...450
PERFORMANCE				
maximum design speed (minimum operation condition)		kts	22..24*	25..32*
maximum design speed (loaded craft)		kts	18..19*	18..27*
recommended cruising speed		kts	16	16…22
TANKAGE				
fuel		L	2 x 900	
water		L	300	
waste		L	300	
PASSENGERS/CREW				
passengers/crew		-	36/2	60/4
CERTIFICATION				
Standards compliance			ISO Small Craft	

* *- estimated speed*

All measurements according to ISO8666

Composite advantages

- Composite has the greatest advantage of flexibility to create any attractive shapes allowing for ultimate freedom in styling.
- The material is designed specifically for the boats; this means the designer is using custom lay-up schedules and can optimize weight and strength of the craft in the direction of loading. This is especially important for high-tech craft such as performance sailing cats and high-speed boats.
- Composite sandwich gives strength, stiffness and insulation at the same time and the structures are lighter compare to those in aluminium, wood and steel.
- Due to lightness of structures, composite craft can either carry more payloads, or use smaller engines giving better fuel efficiency.
- By utilizing a core sandwich, composite structures requires a minimal amount of stiffeners and insulation compared to Aluminium and Steel. This in turn maximizes interior spaces which are especially important on smaller boats and on catamarans, where hulls are narrow.
- Minimal maintenance costs compared to all other materials.
- Lover construction costs, especially in Asia.
- Low radar signature, this is especially important for naval applications and piracy prone regions.



Composite disadvantages (real and imaginary)

- It is often claimed that composite craft are less suitable for low temperatures. This is not exactly true because composites are used in Scandinavia for both ferries and naval ships such as Visby corvettes. On composite craft, it is possible to obtain ‘ice class’ assigned by Lloyd.
- Material is produced during construction of the craft; this means that defects might stay unseen until it breaks. Nevertheless, today’s technologies such as infusion and quality control allow methods to minimize the risks to a minimum.
- Lower life span of composite vessels, they are less durable compared to metal, say 10-20 years with metal taken up to 20-40 years. This is not an issue for most of the pleasure craft, as yacht will get out of fashion long time before it happens.
- Material is not recyclable.
- Material is combustible.

Seating arrangements and safety

Another important theme is a proper sizing of the selected type of craft to avoid an undersized boat for the desired operation. In practice often a customer is in the market for a 12m vessel with a capacity of 40 passengers for use at sea state 3 at 40 knots, which is extremely uncomfortable and unsafe. Great emphasis has to be placed on the seating arrangements and locations as to maximize on comfort, safety and to ensure clear view for the captain. As illustrated in the “Arrangement of Seating”

a: Sideways seating is undesirable and does not allow for impact bracing and body support. Seating at the bow is in the “bow damage” area and greatly disrupts the “line of sight” of the captain

b: Forward facing seating are most desirable with structure forward, un-impaired vision of the captain.

Statistics of small high speed craft accidents indicates that craft’s arrangement is critical for safety. On boats with sideways seating up to 70% of passengers experience injuries following collision accidents, due to ejections, falling and contact with structures. Though formally small passenger craft are not subject to HSC Code, some good design practices reflected in the Code are useful when planning craft’s layout:

- Bow deck area vulnerable to collision damage, where no passenger and crew seating should be allowed. This area is 4% of total deck area or larger, depending on craft’s speed and parameters (fig.4).
- Direction of seating – facing forward or aft is preferable as it provides safety from shift in case of collision impacts;
- Safe protection of luggage and heavy objects on board from shifting;
- Escape routes – 900mm wide as per HSC Code requirement; for smaller craft a minimum 500mm can be used as guideline;
- At least two exits from every passenger space.

Shapes and location of sofas, tables, doors, and handholds are critical; any sharp corners should be avoided. Also, high speed turn can cause heel or side shift so protection should be provided; though this not important for catamarans having small heel angles.

Beach access ramp

Engineering and Construction

The hull structure of the MTV 35 is designed in composite with application of PVC sandwich panels by method of Vacuum Infusion in order to reduce on weight, increase stiffness and extend lifetime of the vessel. The bottom is comprised of Soric XF core material which allows for a Solid Bottom with superior impact resistance and allows for the capability to be beached. The rest of the structure uses a H80 foam core, with multi-axial fabrics and polyester/vynilester resins. In general, the boat's structure is designed following German Lloyds' High Speed Craft Rules with use of stack laminate analysis and FEA methods as illustrated bellow. Areas vulnerable to tear damage can be protected by stainless steel cover plates. The bow section below the waterline is filled with foam forming a 'collision block' as a solution that proved to work well during unlikely accidents.

Optional structural fire protection in engine room can be achieved by means of fireproof mats approved for use with FRP sandwich structures, or by fire retardant resin and extra lamination. With the collaboration of Albatross Marine Design's engineering and interior design teams, moldings have been planned from starting point of the design process. All major interior moldings are structural, a solution used to reduce the mass of the craft. For example, ceiling liner molding does not only provide interior finish, but also forms top hat stiffeners, air ducts and wiring space. The base design of MTV vessels are studied for stern-drive units with diesel inboard engines. Several engine options and drives including shaft drives, V-drives, Jet-drives and **Hybrid propulsion** are available by simple modifications and inserts in the molds.

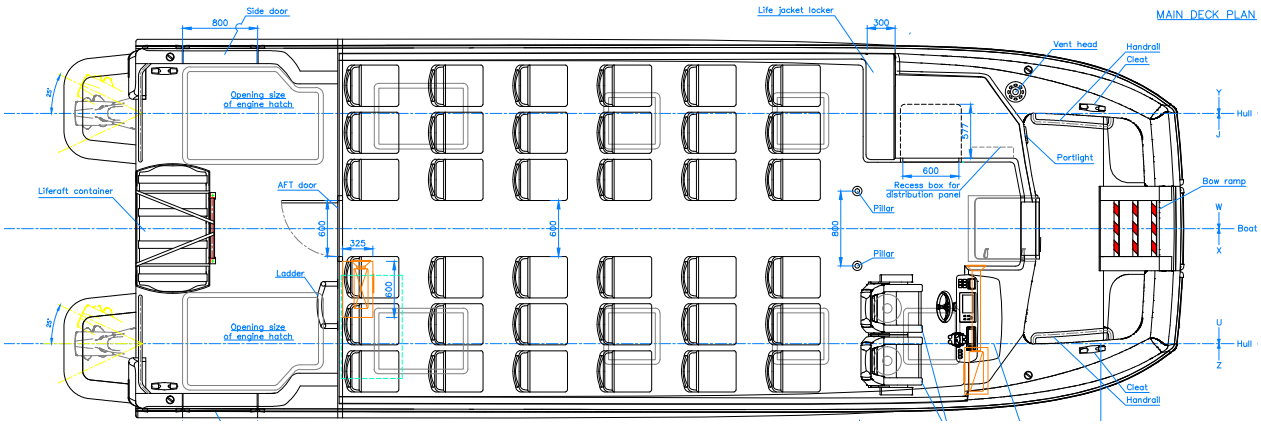
Layout functionality

Functionality is related to boarding options (side, bow, aft and beaching), analysis of passenger flows and avoiding congestions, placement and pickup of luggage and personal effects. Though it is difficult on very small boats, accessibility by elderly people or passengers with disabilities should be considered.

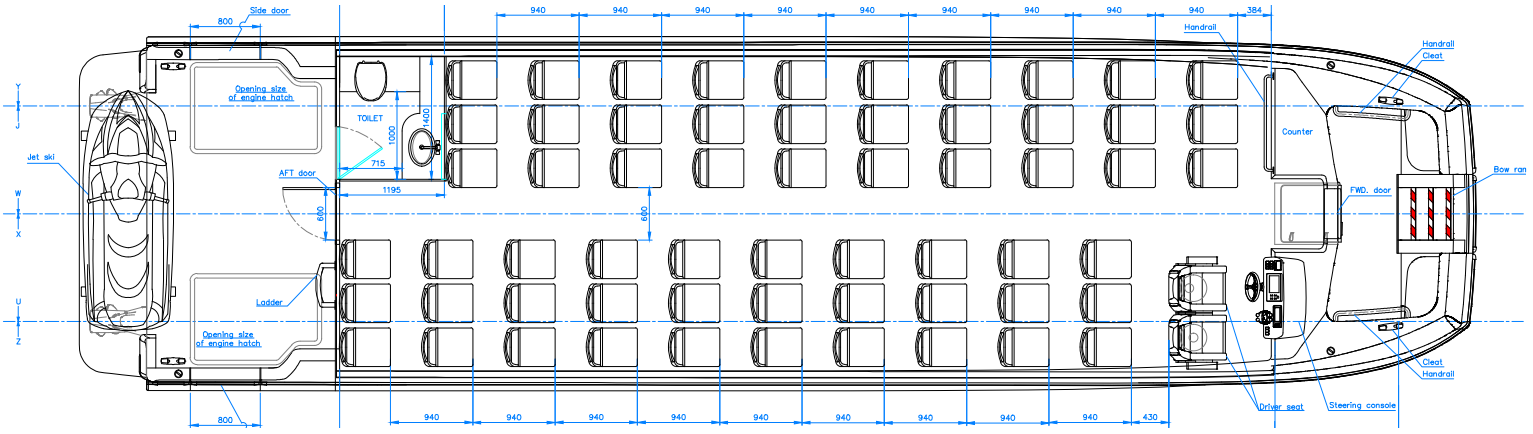
Luggages storage

Toilet and sink

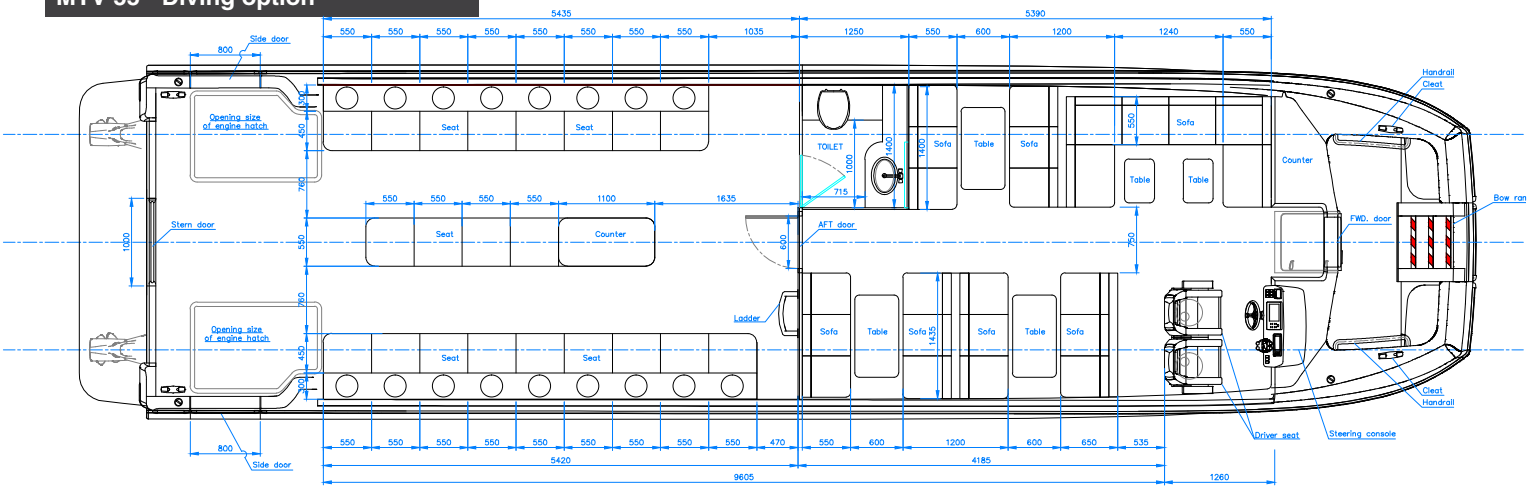
MTV 35 - Passenger transport



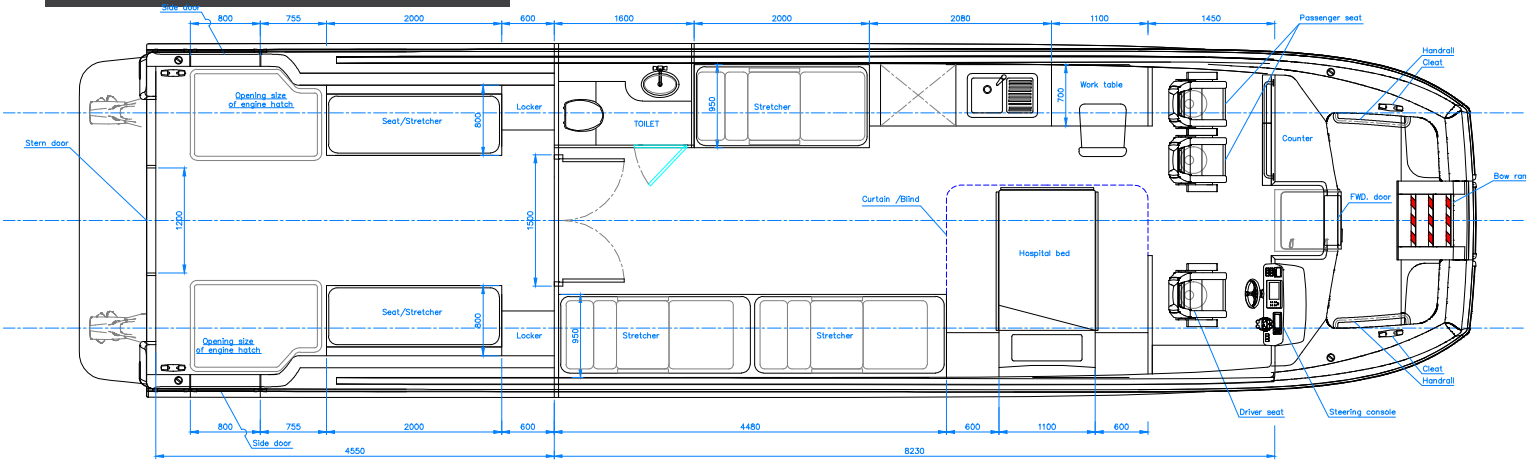
MTV 55 - Passenger transport



MTV 55 - Diving option



MTV 55 - Emergency response vessel



R38 RESCUE CATAMARAN

The Rescue 38 is as versatile as a catamaran vessel can be. The asymmetric hull has been designed for high speed interventions, reaching 42 knots, that allows for fast planning, excellent sea keeping, stability, safety and comfort in rough seas. Originally designed as an emergency boat for rescue operation in Thailand, this vessel is intended for heavy duty professional use by the Special Forces, navy, police, customs, sea rescue, ambulance and patrol boat operators. Propulsion methods can be adjusted to accommodate Inboard engines, stern drives, water-jets and outboard engines. The light-weight rigid sandwich core composite construction allows for ease of customizable layouts and equipment arrangements.

The Asian specialist in custom yachts

PMG MARINE COMPLEX

In February 2015 Bakricono shipyard secured South East Asia's premier shipyard complex, owned by Ports Marina Groups Co., LTd (PMG Complex) with 20,000 sqm, PMG marine complex is the largest yacht construction yard located in Thailand with individual production units each totaling 7,000 sqm under roof having direct access to the sea.

PMG marine complex is strategically located by the sea on the eastern sea board of the Gulf of Thailand, at 1 kilometer of the Commercial deep sea Port of Maptaphut facilitating overseas export. Bangkok Airport is only two and half hours away by car and thirty minutes from U-Tapao Airport.