



TECHNICAL SPECIFICATION

36 M MOTORYACHT
HULL No.2

PROJECT MF 36 H2

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Issue for Bidding



A.Vallicelli & C.
yacht design



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1000 GENERAL REQUIREMENTS

1000 PRINCIPAL CHARACTERISTICS

The principal characteristics of the motor yacht will be as stated in the paragraphs below. Reference is to be made to the General Arrangement Plan, which is an integral part of Specification, and the Agreement.

1005 Intent of the specification

This Specification describes and specify design, machinery, material, construction, and equipment of a 36.0 meters long range, twin screw luxury Motor Yacht, named “MF 36 H2”.

The Yacht, including hull, machinery and equipment, shall be designed, built, equipped, surveyed, tested, and handed over to the Owner by the Builder according to the Technical Specification, General Arrangement Plan, Builder’s standards, Class and Flag regulation, Owner’s Representative approval and the Agreement.

The Motor Yacht will be designed and built according to the rules of Registro Italiano Navale, and will comply with the Red Ensign Group Yacht Code (from here REG Code) for short range Navigation.

It is agreed that anything not specified in this Technical Specification, but anyway required by the Classification Society or any other Class and Flag requirements as listed herein, shall be supplied and/or arranged by the Builder.

It is to be noted that the subject Yacht is custom built, and therefore main characteristics and dimensions of the hull, tanks and other calculations are for guidance only, and are subject to variations during the design process. However, any deviation from the above will be notified to the Owner’s Representative.

It must be underlined that some of the equipment characteristics given through all the specification are subject to the selection of the final manufacturer, subcontractors and suppliers.

The Builder is free to select any manufacturer / supplier from the makers list enclosed in this specification.

Subcontractors and suppliers not mentioned in the makers list can be proposed by the Builder. The selection of alternative subcontractors and suppliers shall be made in agreement with the Owner’s Representative.



1010 General description

The subject motor yacht will be designed with a semi displacement round bilge hull, plumped bow, with twin screw propeller and transom stern.

The propulsion system shall be composed of two diesel engines, each driven by a fixed pitch propeller through a reduction gear and flexible coupling.

The Yacht shall be equipped with a twin spade rudder plant, one electric bow thruster and a not-retractable stabilizer fin system designed to provide active roll reduction both in underway and ‘at anchor’ condition.

The electric power required for ship service shall be generated by two diesel generators. Particular care will be taken to noise insulation all over the boat, and in particular to critical noise and vibration sources as main engines, rotating equipment and air/gases ducts.

At design stage, particular care will be put on maintenance friendly systems and equipment, so to reduce maintenance time after launch.

Hereto a list of all parties involved in the project:

The Builder	C.P.N.
Exterior Designer	A. Vallicelli & C. Yacht Design
Interior Designer	TBD
Naval Architecture	Yachting Expertise
Classification Society	RINA
Flag	RED ENSIGN

The yacht shall have four decks, from here called:

- “A” Deck: Lower deck
- “B” Deck: Main deck
- “C” Deck: Upper deck
- “D” Deck: Sun deck

1020 Principal dimensions

The vessel shall have the following main dimensions:

- Length overall (at bow bulbous)	m	36.60
- Length at water line	m	34.45
- Breadth moulded	m	7.60
- Breadth max (at wing station)	m	8.25



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- Depth moulded	m	3.80
- Gross tonnage	GT	299

1030 Design displacement and tank capacity

Ful load displacement:

- Light displacement	t	238
- Fuel oil	t	39
- Lube oil	t	1
- Fresh water tanks	t	8
- Crew/Passengers/Effects	t	3
- Provisions	t	3
- Ship store (Owner's Supply)	t	5
- Other liquid (Sw,Bilge/Sludge)	t	2
- Full load displacement	t	299
- Draft at full load (from B.L.)	m	1.95
- Draft at full load (below skeg)	m	2.25

Trial displacement:

- Light displacement	t	238
- Fuel oil	t	19.5
- Lube oil	t	1
- Fresh water tanks	t	4.0
- Crew/Passengers/Effects	t	3
- Provisions	t	1.5
- Ship store (Owner's Supply)	t	5
- Trial displacement	t	272

Tank capacity:

- Fuel oil tanks	litres	47,500
- Dirty oil tank	litres	0,650
- New oil tank	litres	800
- Fresh water tank	litres	8,000
- Grey/Black water tanks	litres	7,500
- Sludge tank	litres	900



The materials arrangement and scantling of the structural members shall be in compliance with the requirements of the Classification Society and the work will be executed under the survey of the Classification Society.

Attention shall be paid by the Builder to the design of the hull structure to ensure continuity strength of the main structural members and to achieve the minimum vibration and noise within the contractual limits. Particular care shall be given to the construction of the following areas:

- a) Aft end structure to withstand stresses caused by propellers and rudders.
- b) Bow structure to withstand to the higher stress caused by the impact of the sea
- c) Machinery seating
- d) Superstructure and internal casings in accommodation areas.

Arrangement for inspection, access, cleaning and painting shall be provided for all the spaces through the yacht by means of permanent ladders, doors, hatches and manholes.

Battens and ceiling hold, storerooms and other spaces, and protective casings around pipes shall be made readily removable for this purpose.

1075 Interior accommodation

The complement of the vessel shall be in accordance with the GA Plan, as follows:

Owner's party:

- N. 1 Owner's suite
- N. 4 Guest cabins

Ship's complement

- N. 1 Captain cabin with a double size bed
- N. 2 Crew's cabins with two beds each

1080 Discrepancies

Any discrepancy between the technical specification and other contractual documents shall be ruled in accordance with the terms of the contract.



1085 Supervision and Inspection

Before the construction, the Builder shall prepare and submit work progress schedules covering the design and construction under these specifications; the Builder shall cooperate with the Owner in this respect in order that both parties may be thoroughly familiar with the progress made and in order that the yacht may be completed within the contract period.

The yacht shall be constructed and equipped under the supervision of the Classification Society's and the Owner's Representative and Flag Authority.

The scope and authority and responsibility of the Owner's Representative shall be in accordance with the terms of the Contract and shall include the right to reject all workmanship and/or equipment which does not meet the requirements set forth in the Specification and contractual drawings. The decisions so made shall be binding.

The Owner's Representative will have access to the Builder's and Sub-contractor's premises during the normal working hours. Access outside normal working hours shall be by arrangement. A suitably furnished office shall be provided in the Builder's premises during the construction of the yacht, at Builder expenses with telephone/e mail and fax facilities (communication charges to be invoiced at costs).

1090 Modifications

The Owner may request alterations of or additions to the Yacht during the construction. These alterations or additions will be requested in writing.

Costs, changes in performance and/or delivery time will be subject to Variation Certificates.

The Builder will not make any changes to the Specification without prior written approval of the Owner or his Representatives.

1100 GENERAL DESIGN CHARACTERISTICS

1110 General arrangement

The Yacht will be built in accordance with the General Arrangement Plan drawing "MF 36 H2" and this Specification.

The Builder will be responsible for the yacht's structure, safety requirements, seaworthiness and quality of both internal and external finish. All accommodation spaces and adjacent corridors will have a secondary means of escape as required by Authorities.



In general the clear headroom in the Owners and Guest and crew accommodation areas will be as follow:

- Lower deck: Guest area 2.00 mt outside dome / 2.10 mt in way of dome;
Crew area 2.03 mt
- Main deck: 2.00 mt outside dome / 2.10 mt in way of dome
- Upper deck: 2.00 mt outside dome / 2.10 mt in way of dome

Stowage will be arranged for tools, oilcans and spare parts that are to be delivered according to the Specification. Stowage for tools and machinery parts will be provided in the aft storeroom. Stowage for deck supplies will be provided in the forepeak.

1120 Classification and Registration

The yacht, including its machinery, equipment and outfitting, will be constructed in accordance with the rules and regulations of Registro Italiano Navale for classification of special service craft and will obtain the following class notation:

C,✱ HULL, ● MACH, Y_{ch}, SHORT RANGE, DMS, AUT-UMS (Y)

The following rules and regulations, including all amendments valid at the date of the Vessel Construction Agreement shall be complied with:

- Class Rules and Regulations for the Classification of Charter Yachts
- Red Ensign Group Code (Part A and Annexes)
- International Tele Communication Convention, 1967.
- International Load Line rules ILLC66
- International Convention of Tonnage Measurements of Ships (ITC 1969)
- GMDSS (Global Maritime Distress and Safety System).
- COLREG - Convention on the International Regulations for Preventing Collisions at Sea, 1972, as amended
- Convention on the Control of Harmful Anti-Fouling Systems on Ships, 2001, as amended (AFS 2001)

All Rules, Regulations and Codes applied shall be those current at the time of signing the Contract.



The following certificates and documents shall be obtained by the Builder and supplied to the Owner at the time of delivery of the yacht free of any conditions:

- Classification Certificate
- International Load Line Certificate
- Load Line Condition of Assignment
- Radio Survey
- Declaration of Antifouling System
- Statement of compliance to REG Code issued by the Class
- REG Yacht Code Statement of Compliance
- Builder's Certificate issued by the Builder
- Certificates of International Tonnage
- Navigation lights Certificate.
- Magnetic compass Certificate.
- Compass adjustment Report.
- Stability Booklet
- All the certificates issued by the Classification Society for machinery, equipment and material fitted on board (where requested by the Classification Society).
- Exemption Certificates (as far as applicable).
- The certificates which confirm that the propulsion engines meet the new IMO emission standards, as per Marpol 73/78, Annex VI

1130 Naval Architecture

1131 Weight control

The weight and the location of the centre of gravity of the vessel shall be strictly monitored throughout the entire building process, in order to ensure acceptable levels of trim, compliance with stability criteria and to achieve the specified contractual performance.

The Builder shall present to the Owner's Representative a proposal for monitoring and control any weights loaded on board. With monthly frequency the Builder shall provide the list of all weights loaded on board indicating the service and location.



1132 Trim and stability

Prior starting the construction, a preliminary trim and stability calculations shall be determined by the Builder and submitted to the Owner's Representative and relevant Authority to demonstrate that the vessel shall have suitable trim and stability in the following conditions:

- Departure (with 100% of liquid and provision)
- Half displacement (with 50 % of liquid and provision)
- Arrival (with 10% of liquid and provision)

The Builder shall submit the stability analysis to the Flag Authority for a preliminary approval.

The Builder can fit on board permanent ballast up to a maximum of 3% of the declared light ship weight in order to meet the applicable stability criteria and or for trim and list correction.

The above permanent ballast shall not have any effects on the contractual performance of the vessel. All fixed ballast will be secured against movements and properly insulated from the steel structure. The provision for the permanent ballast, including the final location and amount, shall be discussed and agreed with the Owner Representative.

During the design and construction of the yacht adequate attention shall be paid to weight, stability and trim monitoring to ensure that the yacht is designed for the use of no fixed ballast. The use of fixed ballast shall be a corrective measure and not inherent to the basic design.

The trim of the yacht shall be carefully set such that in all reasonable cases of operational loading there is adequate freeboard maintained to lower deck aft storage area.

In case of any proposed deviation from the specifications and associated plans during the construction which changes the lightship weight or centre of gravity, whether proposed by the Builder or the Owner, the Builder shall determine for the approval of the Owner the effect on the deadweight, stability, and trim before the relevant work is commenced.

On completion of construction the Yacht shall undergo an inclining test and lightship survey as acceptable to Class to determine the actual displacement and the position of the centre of gravity. This information shall be used to analyse the vessels stability against the relevant criteria before the vessel embarks on any sea trials. The inclining



experiment survey shall not be conducted until the remaining weights to load on board are within 2% of the predicted lightship.

The inclining test shall be conducted under the supervision of the Owner's, Flag and Classification Society representatives. All labour and material in connection with the inclining experiment shall be furnished by the Builder.

The Builder shall prepare and submit to the Owner the report of the inclining test establishing the vessel's lightship weight and centre of gravity together with the final calculations of trim and stability.

On completion of the Vessel a full operational stability information booklet in the format and content as established by the Flag or Class shall be submitted to the Owner, and relevant regulatory bodies for approval before the vessel proceeds to sea.

1133 Hull Design

The hull design shall be evaluated through a CFD numerical analysis by a recognized tank testing institute, such as Marin®.

The CFD numerical analysis program shall be based in principle on the following:

- Evaluation of the Naval Architect's preliminary lines plan;
- Short optimisation process, by using the Marin® in house potential flow solver RAPID, to check the initial hull lines and evaluate possible further improvements. The calculation will be done for two speeds (top and range) and one draught (design).
- Alignment of the appendages (one draught, one speed)
- Calculation of the resistance curve (seven speed, one draft)
- Calculation of the nominal wake field for propeller design (seven speed, including shafts and struts)
- Speed power prediction with the calculated resistance (seven speed, one draft)

The following information shall be also included in the report:

- Wavy free surfaces along the hull in 3D format (this can be used to better locate the exhaust scoops or check position of openings and anchor pockets)
- Streamlines in 3D format (this can be used to align the appendages including bow thruster tunnel and grids, exhaust scoops, bow bulbous, etc.)



- Nominal wake field in ASCII format (this can be used for the designing the propellers)
- RAPIS viewer to view the RAPID results

The hull design CFD analysis shall be provided to the Builder by the Owner's Naval Architect.

1134 Ambient conditions

The yacht shall be designed with the following temperature:

Maximum external temperature	35°C
Minimum external temperature	0 °C
Maximum sea water temperature	32°C
Minimum sea water temperature	2 °C
Maximum ambient temperature in technical areas	45°C

1135 Speed

The following speeds at the trial displacement as defined at section 1030 have been considered:

- maximum speed of 14.0 knots with Main Engine at 100% of MCR
- cruising speed of 12.0 knots with Main Engine at 50% of MCR
- economical speed of 10 knots

The above speed shall be confirmed and/ or modified following CFD program execution.

1136 Range

The range of the ship at the trial displacement shall be as follows:

- approx 3400 miles at cruising speed
- approx 5400 miles at economical speed

The range shall be calculated on the basis of 39 tons of fuel (excluding unpumpable fuel) and one diesel generator running at 70% of the load.

The above range shall be confirmed and/ or modified following CFD program execution.



1140 Noise Levels and Vibration

A detailed analysis of air and structure borne noise transmission from the respective noise sources such as, but not limited to, propellers, main engines, auxiliaries, extraction and ventilation systems, human activity in common areas and so forth will be carried out in order to determine the insulation to be applied to achieve the required noise reduction and general acoustic conditions.

Particular attention shall be given to the design and construction of the yacht to minimise the impacts of vibrations and noise transmitted by the main sources.

The hull general design and the construction details shall be such as to limit vibrations tending to cause damage to the hull structure and equipment as well as to limit the interference with the proper functioning of equipment and to assure the best comfort on board.

Care shall be taken to provide adequate scantlings and seating continuity of the main engines and reduction gears. The structure in way of shafts and shafts seats shall be adequately strengthened to avoid undue vibrations.

The calculation of the torsional vibrations of the propulsion system shall be carried out in order to analyse the critical of the shafts and propulsion system.

The Builder shall make every effort to locate and correct undue vibration arising during tests and trials of the hull as a whole and to items of structure, panelling, outfit and equipment.

Appropriate sound isolation treatment shall be provided as necessary to keep noise within an acceptable level.

The following noise levels shall be not exceed in the harbour condition with yacht completed and outfitted in any parts, with main engines stopped, one generator running, stabiliser running, engine room ventilation adequate for one generator running, and all harbour systems fully operating and with air conditioning set to a low speed (30% of maximum fan speed):

- External aft main and upper decks	60	db(A)
- Guest cabins	40	db(A)
- Crew cabins	50	db(A)
- Owner suite	40	db(A)
- Living rooms, saloon	45	db(A)
- Wheelhouse	50	db(A)



The noise levels at external main and upper decks are measured at centreline. The following values shall apply underway with the yacht in the above conditions, maximum sea state as detailed at section 1420, and at a cruising speed. All systems will be run as normal, excluding the galley range-hood, gantry cranes, audiovisual equipment, bow thruster, and hydraulic system or any variation items that are added to the original contract yacht. All interior and exterior doors will be closed as normal:

- External aft main and upper decks	70	db(A)
- Guest cabins	52	db(A)
- Crew cabins	58	db(A)
- Owner suite	45	db(A)
- Living rooms, saloon	55	db(A)
- Wheelhouse	55	db(A)

In the above conditions, the vertical and horizontal vibration levels in Owner's, guest and crew accommodation shall not exceed the following values:

- 0-Peak acceleration for frequency range 1 to 5 Hz 68 mm/s²
- 0-Peak velocity for frequency range 5 to 100 Hz 1.5 mm/s

In the other areas the following values shall be not exceed:

- 0-Peak acceleration for frequency range 1 to 5 Hz 126 mm/s²
- 0-Peak velocity for frequency range 5 to 100 Hz 2.0 mm/s

In general the noise and vibration work program shall be the following:

- Main engines shall be elastically mounted;
- Generator sets shall be elastically mounted and provided with soundproof boxes;
- The exhausts of the main engines at medium and high ship speed shall be lead out under water;
- The exhaust of the main engines at low ship speed shall be lead out above waterline;
- Air ducts shall be adequately dimensioned so to keep air speed low;
- Propellers are designed especially under the aspect of silent run;



- Good propeller tip clearances (> 25 %);
- Rotating or reciprocating machinery shall be flexibly mounted if appropriate in light of noise and vibration
- Engine room fans shall be controlled with frequency controller (variable speed) and attenuating silencer;
- The bulkheads adjoining the accommodation areas shall receive a combined thermal / acoustic insulation and a flexible suspended cladding as far as necessary to fulfil the noise criteria;
- The interior joinery bulkheads between cabin and cabin and between cabin and public areas shall be erected in order to guarantee a minimum acoustic privacy level; for the same purpose overheads decks will have a special acoustic treatment to avoid footfall noise above all guest and Owner's cabin;
- Non-structural bulkheads shall be flexibly mounted as far as necessary;
- Special attention shall be given to the routing of toilet, shower, and wash basin discharges;
- Silencers shall be fitted where necessary
- Flexible hoses and electrical cables to be installed so as to compensate for the motions of any flexibly mounted equipment. These fittings shall meet the requirements of the Classification Society and Regulatory Bodies and will handle the maximum design movements of the mounted equipment without over-stressing or deforming the attached piping or cables.
- The watertight bulkheads, side walls and ceiling of the engine room shall be treated with a special damping compound, mineral-wool and an exterior aluminium covering plate.
- The engines seating shall be of heavy type with strong foundations to avoid transmission of vibrations through the hull.
- The air conditioning ducts and the piping containing liquids at high and low temperature shall be covered with glass-wool and material of Armaflex® type respectively.

The Builder shall employ a recognized and experienced noise and vibration expert who shall produce an estimate of probable noise levels, based on his own empirical data, the General Arrangement drawings and the information contained in this specification, where possible supplemented by specific information from equipment suppliers.

Then, at the earliest possible stage of the Naval Architect's design work, the noise and vibration expert shall be consulted about those noise sources and those hull and machinery parts of which a modification at a later stage would be prohibitive. At least the following items shall be thoroughly investigated:

- Dimensions and material thickness of engine and generator foundations.
- Thickness of hull bottom in way of the engines and the propellers.
- Diameter and design of the propellers.
- Flexible installation of engines, gears and generator sets.
- Structure under the main deck in the engine room.
- Construction of watertight bulkheads.
- Construction of casings.
- Desirability for installing randomly spaced transverse frames.
- Details of insulation materials to be applied on either side of the casings.
- Generator sub-frame and sound shield.

In order to meet and improve upon the set targets the advice of the noise and vibration expert shall be strictly adhered to.

Checks are to be carried out after float-out to ensure that there are no structural or panel resonance co-incident with machinery or propeller exciting frequencies. The method for carrying out these checks shall be agreed with the Owner prior to undertaking tests.

During trials noise and vibration parameters are to be measured and formally reported by a specialist consultant to confirm that the noise limits defined in this specification have been achieved. Noise measurements and recording shall be generally carried out in accordance with the IMO Resolution A.468 (XII) Code of Noise Levels Onboard Ships. Vibration measurements are to be conducted in accordance with ISO 6954.

1170 Detailed Engineering and Drawings

The Builder will prepare a schedule in conjunction with the Naval Architect covering the timetable for the preparation and delivery of all drawings by the Builder, the Naval Architect and any subcontractor who may be involved in the building of the Yacht.

The Builder will prepare all drawings and will carry out all calculations necessary for the construction and performance of the Yacht and its systems in accordance with this Specification and for compliance with the requirements of the Classification Society and any other Regulatory Bodies.



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Two print copies and one copy in electronic format of the drawings below listed will be sent to the Owner for approval. One approved print copy shall be returned to the Builder with the Owner's comments.

The construction will be executed according to the drawings as approved or as altered and afterwards approved.

In general the construction drawings will be submitted to the Classification Society at the same time as they are submitted to the Owner.

All the above requirements refer to drawings specifically made by the Builder, Naval Architect and his Sub-contractors for the construction of the Yacht and the installation of machinery and equipment for the Yacht. The drawings will include at least the following:

1. General Arrangement Plan
2. Capacity plan
3. Hull main structural sections
4. Hull longitudinal structural sections
5. Hull structural decks
6. Hull shell plating
7. Superstructure longitudinal, decks and transversal section
8. Masts and funnels/wings
9. Arrangement of tanks, bilge wells, manholes
10. Main engines and generator seating
11. Interior joinery shop drawings
12. Yacht's ship systems
13. Coordination plans (all decks and technical areas)
14. Arrangement of technical spaces
15. Stern door arrangement and construction details
16. Arrangement of boat crane
17. Anchor and mooring arrangement
18. Engine room arrangement
19. Engine and generator exhaust systems
20. Shafting arrangement
21. Bow thruster arrangement
22. Stabilizer arrangement
23. Steering gear arrangement and rudder blade details
24. Sacrificial anodes arrangement



25. Interior and exterior coating systems
26. Water line design
27. Electric load balance
28. Electrical wiring diagrams
29. Fire detection system
30. Exterior lighting
31. Navigation lights arrangement
32. Windows and porthole arrangement
33. Windows cleaning arrangement
34. Exterior deck layout plan and details
35. Teak deck plan
36. Awning plan
37. Antennas plan
38. Safety plan
39. Docking plan
40. Insulation arrangement
41. Ventilation arrangement
42. Aft storage arrangement
43. Storage plan

Other drawings will be made as judged necessary by the Builder or Classification Society.

1300 MATERIAL AND WORKMANSHIP

1305 General

Both workmanship and materials may be inspected by the Owner or his nominated representative at any time and, if faulty or otherwise not according to this Specification, may be rejected by them and must be replaced at the Builder's expense.

1310 Material

All materials and items of equipment installed in or delivered with the yacht shall be new and suitable for the purpose intended.



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All equipment shall be manufactured by well known international makers as equipment purchases become due during the course of the construction. The Builder shall, at no additional cost to the Owner and up to order date, replace the specified models with the latest equivalent generation/models of equipment as they become available from the respective manufacturers. Equipment shall be capable of withstanding local ambient temperatures as defined in section 3120 for long periods without affecting its efficiency.

The Builder shall provide all items of material and equipment which are appropriate or necessary for the proper operation of the yacht, with the exception of those items specifically included in the list of items supplied by and at the expense of the Owner.

Where the proprietary and company names are mentioned in the Specification they are not in all cases intended to be restrictive in furnishing the articles, but it shall mean that any items similarly equal in design, performance, material and suitability are not excluded, if the equivalence can be demonstrated.

Items which are not specified "of acceptable manufacture" or by trade mark or name shall be at the Builder's option unless otherwise agreed. However the readiness with which service and spare parts can be obtained shall be taken into account in the choice of material and equipment.

Material shall be used and/or fitted in accordance with the manufacturer's recommendations and care exercised to ensure material are not subjected to deterioration or damage while in storage or during construction.

Steel used in the construction of the hull shall be high tensile steel type RINA AH36. Before prefabrication all steel will be sand blasted and primed by the steel producer.

The aluminium alloy used in the construction of superstructure shall be of a suitable marine grade approved by the Classification Society. The grade shall be as follow:

- Plate: 5083 or 5383-H321
- Extrusions: 6082 T6

The hull and superstructure material shall be in accordance with the requirements of the Classification Society. Test certificates shall be supplied to the Owner at the yacht delivery time.

For all stainless steel parts, AISI 316L will be used. Any other grade of stainless steel cannot be used, unless otherwise indicated in this specification.



All wood used in the construction shall be well seasoned, free of sap, shakes, warp and other defects. All timber shall be treated with anti-pest and anti-rot preservatives as necessary.

Galvanising will be carried out in a hot bath of at least 98% pure zinc to ISO standards. All items of any size or thickness or heavy weight are to be pre-heated before galvanising. In principle, galvanising shall be carried out after cutting, bending and welding. Damages to the zinc layer shall not to be repaired with zinc compound, with exception of minor ones. Complete re-galvanising shall be carried out to the satisfaction of the Owner's Representatives.

Any timber shall be coated with fire retardant paint on completion, as far as it is requested by the Class/ Flag. All plywood shall be of first quality marine grade material of hardwoods and bonded by phenolic glue except where otherwise specified by the manufacturer.

Particular care shall be taken to avoid conditions leading to galvanic corrosion of dissimilar metals which are not shown to be compatible and are not to be jointed directly but shall be electrically insulated by the fitting of joints, gaskets, washers, sleeves, etc. of suitable material.

1320 Workmanship

All workmanship shall be in accordance with marine practice for a motor yacht of this size and type. The work shall be carried out by qualified and skilled workmen under regular and competent supervision.

The workmanship shall be to the satisfaction of the Classification Society. Any defective workmanship found shall be put right at the Builder's expense.

A high standard of cleanliness shall be maintained throughout the yacht during the whole period of construction.

The Builder shall provide suitable facilities and exercise proper diligence in connection with the storage, handling and installation of both Builder-furnished and Owner-furnished materials and equipment going into the yacht. Machinery and other components subject to damage or deterioration from exposure to weather or excessive heat, cold or humidity, shall be placed in suitable storage.

Particular attention shall be given to manufacturers' installation instructions as to both procedure and consideration to weather conditions.



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Appropriate measure shall be taken, where necessary, to keep to a minimum wear and damage incident to construction and to prevent corrosion or other deterioration, especially to unpainted, polished and moving parts.

Electric welding shall be applied extensively for the connection of aluminium structural members using TIG or MIG process, as the case may be.

Welding procedures including edge preparation and welding sequences shall be in accordance with the Builder's practice and subjected to the Classification Society approval. The structures shall be welded in accordance with the best marine practice and particular care shall be taken to reduce distortion as much as possible. Butt joints of the underwater part of the hull shall be radio graphed where necessary and according to the Classification Society. Penetration liquids tests shall be carried out in critical areas.

Plating shall be fair, closely fitted and shall be free from objectionable buckles or uneven sight edges.

All attachment by welding to exposed surfaces of decks, superstructure, deckhouse, mast, etc. shall be completely welded all around to prevent accumulation of moisture.

Continuous welding shall be at all bulkheads, frames, and girders and structures in way of wet spaces such as bilges, chain locker, water tanks, wet rooms, steel plating surrounding sanitary spaces, laundry and refrigerator and freezer compartments.

Slots, air holes, drain holes, scallops and lightening holes shall be provided where necessary and in accordance with a good working practice, subjected to the approval of the Classification Society.

Side frames, bottom floors, deck girders, etc. shall have slots of simple shape to accept the connection of the stiffening member and to have circular cut-outs at inner ends.

The longitudinal members in tanks shall have air and drain holes correctly positioned such that the strength of those members is not adversely affected.

Scallops shall be arranged where necessary for the execution of welding. Longitudinal members shall be terminated in way of tank boundaries. Where structural members pass through or form tank boundaries weld stop-water details shall be utilized.

Temporary access openings may be provided on shell, bulkheads, decks, casings etc. for convenience of work.

Prior to the assembly of any parts, all rough and sharp cutting- and burning edges are to be ground smooth and rounded to a clearly broken edge so that paint can adhere properly and pulling back of the paint from the edges is prevented. Following assembly, all welding residue shall be removed.

1330 Deflections and tolerances

The aluminium and steel framing and plating of the superstructure, top sides, decks, bulkheads will be fabricated with the described deflection tolerances, which will be in accordance with this section of the specification and will be measured in the presence of the Owner's Representative.

At the welding completion of hull and superstructure and after any straightening has taken place, the following deflection from fair lines shall be permitted:

Local plating of superstructure, topside, exterior decks

- 1% of the shortest panel dimension

Local plating of interior bulkheads and decks

- 5 mm over a frame spacing of 400 mm

Fairness over longer length

Fairness is measured with a fairly stiff batten of up to 6 meter long. When the batten is held against the structure at any position to follow the built-in contours without too much pressure with three people, the following tolerances shall be not exceeded:

- 6 mm for steel and aluminium, before fairing

The above level of fairness shall be reached for at least the 90% of the measurements points. The maximum tolerance is based on the length of a fairly stiff batten of 6 meter and an unsupported length of the batten of 3 meters. If the unsupported length of the batten is less than 3 meters, the allowance tolerance is reduced according the unsupported length, with a minimum of 3 mm. If the unsupported length of the batten exceed 3 meters, than the tolerance allowed is for the unsupported length of 3 meter.

1340 Housekeeping

The yacht and its immediate surroundings are at all times to be kept clean and free from any accumulation of debris and of vermin or insect infestation. A regular cleaning schedule shall be strictly adhered to.

Special care is to be taken that drain pipes and other locations, which are similarly difficult to reach at the later stages, are kept open and unclogged at all times. To this end the Builder shall plug the ends with numbered plugs. A record of these and where they are used shall be kept and the removal will similarly be recorded.



Extensive precautionary measures must be taken to protect the completed or partially completed portions of the yacht and the installed components against any form of damage.

1400 TESTS AND TRIALS

1410 General requirements

All tests and trials shall be conducted in accordance with the requirements of the Classification Society and Builder's practices.

The Builder shall conduct tests and trials necessary to ensure that all structure, systems, equipment and fittings are in accordance with the specification and working satisfactorily. The yacht's machinery, equipment and fittings to undergo shop testing according to the Builder and/or manufacturer's usual practices followed by such onboard test as considered necessary.

Further, in testing equipment, particular attention shall be paid to vibration, seating, leaks and practical operating convenience.

The Builder shall submit to the Owner's Representative a detailed schedule or memorandum for the test items in due time prior to those tests.

The Owner's Representative and the Builder shall, on the basis of the above mentioned detailed schedule, determine the scope of tests or inspections to be attended by the Owner's Representative.

Dock trials and preliminary underway trials shall be carried out in accordance with the Builder's practice and at his discretion.

All mechanical, propulsion, piping, refrigeration and electrical systems shall undergo satisfactory dock trials and shall operate at various loads for a sufficient length of time to demonstrate to be in proper working order before sea trials.

When the yacht is substantially completed, except for such items of work as the Builder and Owner agreed to be accomplished at a later date, the yacht shall be subject to the acceptance sea trials described below.

The official sea trials shall be carried out before the ship delivery and in accordance with the sea trial schedule submitted by the Builder to the Owner's Representative. The schedule shall be presented to the Owner's Representative at least two weeks before the sea trial beginning.



The Builder is responsible for collecting and analysing all data and records obtained during the various trials, properly tabulated and presented into a trials record booklet, one copy to be supplied to the Owner.

The sea trials shall be carried out by and at the expense of the Builder who shall provide all necessary material and services for the operation of the yacht during the sea trials programme. After delivery of the vessel any remaining fuel oil in the tanks shall be invoiced to the Owner at prices current at time of trials.

A detailed report of the trials shall be prepared by the Builder and submitted to the Owner's Representative.

1420 Speed trials

The official sea trials shall be conducted under good weather conditions and with sea conditions of not more than Sea State 2 of Douglas scale. In case of unfavourable conditions, the date of sea trials could be postponed. Sea trials shall take place in at least 36 metres of sea water.

Speeds shall be measured by GPS on a distance of sufficient length of course, with the Vessel operating at stable conditions in opposing directions. Two runs shall be conducted at each speed point and at 180° one to the other.

The speeds from opposing directions will be averaged (by mean of means) and recorded. The course shall have sufficient space to allow safe manoeuvring and test conditions to stabilize before recording the data.

Stabilizers shall be fixed in the centered position and the displacement shall be the "trial displacement" as defined in section 1030 of the present Specifications.

The wind direction and speed shall be recorded together with a good indication of sea state.

Sea trials shall be carried out at least at 15%, 25%, 50%, 75%, 100% of the engine power. Additional sea trials shall be conducted to cover the expected speed for range calculation. A representative of the engines manufacturer shall report engine exhaust gas temperatures together with the exhaust back pressure. At each run, the shaft power and engine rpm shall be recorded and reported.

Measurements shall be also taken of inlet air temperature, fuel pressure and temperature, engine oil pressure and temperature, engine coolant temperature and engine loading factor.

For the purpose of range calculation, engine fuel consumption shall be determinate by a calibrated tank or by a flow meter or by the engine monitoring system.



1430 Manoeuvring trials

The yacht shall be subjected to manoeuvring trials which shall include ahead and astern steering at maximum and minimum speeds, turning circles to port and starboard, maximum speed "Z" manoeuvre.

Ahead and astern steering and turning circle manoeuvres shall be carried out with the automatic pilot.

1440 Stabilizer trials

The Stabilizers shall be tested and proved efficient under normal working conditions. The stabilisers are to provide adequate roll reduction at the nominal cruising speed of 12 knots.

At anchor stabilization test shall be also conducted to demonstrate the efficiency of the system.

1450 Equipment trials

All mechanical, electric and electronic equipment and systems shall be tested and shown to be in a satisfactory working order while operated under yacht generated current. All pumps to be operated sufficiently to demonstrate a satisfactory installation together with their associated systems components.

The dockside trials shall also include hose tests on hatches, doorway, windows, etc. The required water tightness shall be demonstrated.

Effective performance of anchoring equipment shall be demonstrated by setting and recovery of the gear in the open deep sea.

1460 Noise and vibration tests

Noise and vibration measurement shall be taken during sea trials in all compartments as specified at Section 1140 in accordance with ISO 2923. All data shall be reported according to ISO standard.

1470 Various tests and trials

The following trials shall be conducted as part of the dockside / sea trials program, in addition to those referenced in this section:

- Engine endurance test, according to the Class
- Emergency stopping (class requirement).

- Bow thruster trials.
- Machinery ventilation checks (confirmation of temperature differential and also checks for hot-spots).
- Blackout test (Class requirement).
- Operational test of watertight doors and fire doors.
- Navigation and communications system testing (speed log, depth transducer, radar etc.).
- UMS testing schedule – to requirements of class for UMS notation.
- Bridge Controls Tests.
- Test of propulsion system from ahead to astern and back to ahead.
- Slow ahead trials with both engines.
- Slow ahead trials with one engine only.
- Full ahead trials to determine vessel max speed on one engine only (to determine max speed) before overloading the engine and to check rudder angles.
- Fuel consumption tests (incorporated into other endurance and duration trials).
- Sea water and exhaust system checks (incorporated into other endurance and duration trials), sea water depressions, temperatures and exhaust system back pressures to be recorded along with standard engine suppliers trials requirements.
- Tests of emergency steering and manoeuvring gear.

In addition to the above sea trials the following tests are anticipated to be conducted at dock prior to departure:

- Emergency alarm system
- Monitoring and control system (UMS).
- Fire system.
- Automatic fire doors, if any
- Watertight doors.
- Engine room ventilation system
- Blackout testing
- Tests of emergency steering and manoeuvring gear.
- Test of main engine start battery capacity (Class requirement)



- Test starting of emergency source of electrical power (Class requirement).
- Reduction gear tooth contact (Class requirement) before and after sea trials.

1500 DELIVERY

1510 Delivery documents

The Builder shall provide an inventory of all machinery, equipment and outfitting placed on board, including the maker's standard instruction books. During the course of construction the Builder and Project Manager shall cooperate to compile a list of all major items of machinery, equipment and fit-out specifying mode, serial number and guarantee and contact details.

All plans, instructions books and manuals shall be in the English language and shall be complete of operating and maintenance instructions.

At the time of completion of the yacht, the following documentation shall be delivered on board:

- a) 1 sets of operating and maintenance manuals, covering all main machinery. The instruction books shall contain the information, the operating data, design data, reference and serial numbers, maker's reference numbers, maintenance data as specified by the manufacturer, or, where applicable, according to Builder's standard.
- b) 1 complete set of drawings "as built", covering hull, machinery, auxiliary systems and outfitting, as listed in section 1170.
- c) 1 complete set of certificates as listed in section 1120
- c) 1 printed Fire Control Plan framed behind glass and placed on board of the vessel.

All above documents shall be also delivered in electronic format (.pdf).

1520 Spare parts

The Builder provided spare parts as recommended by the Class and Flag, except where otherwise requested in this specification. Regardless of the spare parts requested by the rules, the following spares shall be provided by the Builder:

- Fire detection kit
- Main engine sea water pump
- Gearbox lube oil pump



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- Transom door and deck hatches gasket
- Portable fire extinguishers

The Builder shall provide to the Owner's Representative a complete list of spare parts of any machinery and equipment as recommended by the supplier.

1530 Tools

The Builder shall provide special tools as required by the Class and/or Flag.

1600 OWNER'S SUPPLY

The following is a list of equipment which are not included in the Builder scope of supply:

- Gymnasium equipment
- Diving equipment, except equipment detailed in this specification
- Consumable stores at delivery of the yacht
- Fuel oil and lube oil, except quantity used for trials before delivery from Shipyard
- Nautical publications
- Special gold fittings
- Special pictures and knick-knacks
- Paintings, sculptures and works of art generally
- Bed and table linen
- Pots and pans, tableware, silverware, glassware and bar-ware
- Uniforms and guest clothing
- Sundries (lamps, ashtrays, vases, etc.)
- Tools and spares , as defined in section 1520 and 1530
- Tenders and any water sport equipment
- Interior loose furniture
- Exterior loose furniture
- Interior and Exterior household appliances
- Any other equipment not mentioned in the specification and not required by the Class and/or Flag. Items with a significant impact on the weight shall be subjected to the Builder approval.

**1700 ALLOWANCES**

The Builder shall incorporate in the contractual price the following allowances:

- | | | |
|--------|--------------|---|
| - Euro | 100.000,00 | for Networking and Entertainment system |
| - Euro | 150.000,00 | for Navigation and Communication system |
| - Euro | 35.000,00 | for Exterior outfitting (see note 1 below) |
| - Euro | 1.450.000,00 | for Guest and Crew area
(see note 1 below) |
| - Euro | 30.000,00 | for Exterior lighting |
| - Euro | 40.000,00 | for Awnings |

The above allowances include the engineering, material, transport, custom duty and installation costs.

(Note 1)

Interior outfitting

The fitting out of the interior includes, where applicable, the engineering, fabrication and installation of all interior joinery and woodwork and the purchase and installation of integrated fixed sofas, ceilings, interior lighting, hardware for doors, inside finish of exterior doors, household appliances, free standings, stairs as far as not part of the ship's structure, floor coverings, carpets, carpet runners, teak gratings, curtains, electrical roman or Venetian or black-out blinds, upholstery, fabrics, mattresses, foldable fixed, pullman bunks, sanitary and bathroom fixtures and accessories, sinks, gold plating, nature stone, marble, interior rough partitions including fire doors, interior sliding doors, floor heating, inter cabin insulation and sound-proofing, interior painting and varnishing, lacquering, veneers, wheelhouse pilot chairs, food lift, sauna and steamer incl. equipment, interior mock ups and sea fastening and any other part essential for the completion of the interior outfitting.

Exterior outfitting

The allowance for exterior outfitting, shall include:

- Decoration items at exterior decks
- Exterior fixed tops on fixed cabinets and decoration on fixed sofas.
- Exterior drapery and cushions
- Exterior canvas
- Household appliances



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The allowance shall not include any structural item welded to the superstructure as part of the main construction.



1800 OPTIONS

The following is a list of options which are not included in the scope of supply but can be required by the Owner in accordance with the production plan at below indicated price:

a) Joystick System

The Builder shall provide a Joystick System made by Rexroth® capable to control the yacht during the manoeuvring by a single lever. The system provide a control of the following:

- Engine speed
- Gearbox
- Bow thruster

Joystick levers shall be provided in wheelhouse and wing stations.

Price for above

25.000,00 Euro



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1900 MAKER LIST

Watertight interior doors and Hatches	Calistri Newthex
Weathertight exterior doors/ Hatches/ Transom door	Nauticoliver SCM Newthex Tencoinox
Main engines	MAN
Generators	Kohler
Reduction gear	Rejenties
Propulsion system	Rubber Design Italian Propeller Eliche Radice
Screw propeller	Detra Veem Ltd Eliche Radice
Sanitary system	EVAC Jets
Water treatment system	Tecnicomar Selmar
Pumps	FEIT Pompe Garbarino Gianneschi P. & B.



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Fresh water maker	HEM Idromar
Air compressor	Hatlapa Atlas Copco
Cathodic protection	Polipodio
Generator exhaust gas	MiveEco Marquip
Main engine exhaust gas	Marquip MiveEco
Fuel filter	Alfa Laval
Air conditioning and ER Ventilation	Heinen & Hopman VECO
E/Fans	Sear Dynair AirFoil Heinen & Hopman
Crane	HS Marine
Rudders and Steering gear	Opem Sistemi Marsili
Thruster	CMC Marine ABT-TRAC
Stabiliser	CMC Marine ABT-TRAC



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Passerelle	Motomar Opacmare Sanguinetti Pin Craft
Anchor and Chain	Posidonia
Windows and portholes	Isoclima Viraver Sovit Misa
Porthole	SCM Fabbri Fiore Wigo
Fire and gas detection	Consilium Marine
Ship Monitoring System	Onyx Marine A.
Sea chest antifouling system	Cathelco Ltd
Anchor windlass & Capstans	Opem Sistemi Muir Maxwell
Battery charge	Mastervolt
Searchlight	The Carlisle Finch Sunshine
Horn	Kahlenberg
Windscreen wiper	Speich Gallinea



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Exterior Painting coating system	Boero Awlgrip Jotun International
Interior Painting coating system	International Jotun
Awnings	AMS Yard Multiplex
I-Bridge /Navigation/ Communication	Team Italia Telemar Furuno
Entertainment / Domotic	Videoworks Icon Connect Domosystem Eggzero Design Tech. Uniproject
Exterior Lights	UWL Europe Palagi Cantalupi Quick Applelec Yacht Prebit Yacht Metallart BCM Illuminazione Fort Fibre Ottiche Fibre Tec Metalstyle



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Noise and Vibration Consultant

Cergol Engineering

Note: The above final maker list is indicative and it shall be reviewed with the Builder at the time of contract negotiation.



2000 STRUCTURE

2010 General Requirements

The Yacht will be generally of welded steel construction throughout. All materials and scantlings, including plating, beams, girders and pillars will meet the Classification Society requirements.

The hull will be constructed of Class approved high tensile steel. The superstructure shall be built in sea water resistant aluminium alloy. The hull structure will have primarily longitudinal framing, for which the Builder has developed techniques to help control distortion of the shell plating and other visible surfaces. The superstructure and deckhouse will also generally have longitudinal framing, except that anywhere in the vessel transverse framing may be used wherever deemed desirable by the Builder to improve headroom, facilitate interference control, or for other situations encountered during the construction. In all cases, whether longitudinal or transverse, frame spacing will be in accordance with the Rules.

Attention will be paid to the design of the hull structure to ensure continuity of strength of main structural members, and to achieve the minimum vibration and noise levels within the specified limits. Special care will be given to the following areas:

- Aft end structures in way of propellers and rudders
- Machinery seating
- Fin stabilizers
- Superstructures and internal casings in accommodation areas

All external decks will have camber. All internal decks will be flat, except that steps may be incorporated in order to adjust to the sheer of the vessel in certain areas as shown on the General Arrangement Plan.

2020 Scantlings

The thickness of shell, deck, bulkhead and other plating and the dimensions of all stiffeners, stanchions, and other scantlings will be in accordance with the requirements of the Classification Society.

Where headroom and other potential interference problems allow, the depth of beams, girders and/or stiffeners may be increased to provide a stiffer structure that may reduce potential resonance and vibration problems.

The minimum thickness of the hull top side and bulwark shall be 5 mm.



2030 Electric Welding

The vessel will be built of fully welded construction, corresponding to the requirements of the Classification Society.

Generally, all welds should be continuous. Scalloped and intermittent welds may be used where applicable and specifically allowed by the Classification Society. In any case, welding inside tanks will be continuous.

Welding type, procedures and sequences, including plate bevels, will be executed in accordance with Builder's standard and Classification Society requirements.

U shape frame for shell plating welding shall be fitted on internal side.

Welding tests will be performed in accordance with Classification Society requirements.

Type of welding will be in accordance with Builder's welding booklet, approved by the Class.

The lengths of stiffeners and pipes will be lofted as great as possible to avoid unnecessary joints. Distortion from welding stress will be minimized as far as possible during construction.

2100 HULL

2110 Hull form

The hull form shall be of bilge round type with level keel, good dead rise, bow bulbous, transom stern and plumped bow, capable of worldwide ocean-voyages. The hull shall be also fitted with a skeg having adequate strength for docking purposes.

Due care shall be given in setting off the yacht's form during construction so that the yacht's keel line shall be held as straight as possible during fabrication and that the design lines are accurately reproduced.

Clearances between the propellers, hull structure and rudders shall be determined in order to optimise the general yacht performance in terms of manoeuvrability and propeller efficiency as well as to minimise noise and vibration transmission.

The bow bulbous shall be built as an integral part of the hull.

2120 Hull plating

The hull plates shall be full welded and where the hull strakes vary in thickness, they shall be arranged to give a flush outside surface to the hull.

Continuous welding shall be provided in the bilges for corrosion prevention and in highly loaded areas.

Fairing and straightening of the plating shall be done after welding to minimise the amount of fairing compound needed.

The keel shall be a fully welded flat plate. The skeg shall have a heavy soleplate for docking.

The stem shall be of fair formed welded plate construction, with suitable breast hooks, and plump shape.

Hull plating shall be reinforced with insert plates fitted flush with the outside of the hull to take local loads in way of shaft brackets, propellers, rudder stock tubes, stabilizers, bow thruster, sea chests, anchor pocket and scupper pipe penetrations.

On main deck a bolted hatch shall be provided flush with deck in order to permit loading and unloading of major machineries. For the same purpose a bolted hatch shall be also provided on the engine room aft bulkhead.

2130 Bottom Structure

The bottom structure shall be arranged with a double bottom in way of the liquid tanks.

In the engine room a transverse framed system shall be used in conjunction with the main longitudinal system; they shall be arranged at every frame space and may be provided with large size lightening holes.

Bracket floors shall be fitted where approved within double bottom tanks. Floors forming tank ends and other positions of increased loading shall be in accordance with the requirements of the Classification Society. Bilge wells shall be provided for proper drainage in way of double bottom spaces.

Particular attention shall be given to the aft bottom construction in way of shaft brackets and rudder stock tubes by the provision of deep longitudinal and transverse girders and floor brackets.

The inner bottom shall be tight according to the service. Where the size of the compartment prevents welding from inside, clips or flanges shall be arranged to allow plug or slot welding from top to floors and longitudinal.

2140 Machinery foundation

Foundation for propulsion machinery shall be of welded construction and shall have adequate strength and rigidity. Seating shall be integral with the hull consisting of deep longitudinal girders in conjunction with transverse floors of increased thickness of girder

and floor face plates, in accordance with the requirements of the Classification Society and to minimize vibration or its effects.

Foundations for auxiliary machinery shall be checked against the machinery or certified installation drawings before completion. Provision for vibration mountings shall be made where required by the Noise and Vibration Consultant.

Foundations and fastening of machinery shall be adequate for its weight and for the forces imposed by the action of the vessel in extreme sea conditions. Foundations shall provide restraint in all directions and shall minimise vibration in the mounted component. The foundation shall provide for the ready removal of the mounted components and accessibility for maintenance.

2145 Propeller shaft brackets

A “V” type brackets will support the shaft on the stern side. The spread angle and bracket thickness will depend on the number of propeller blades and the propeller revolutions in order to reduce structural resonance. The final design shall be confirmed by the CFD analysis.

Shaft brackets will be constructed of steel and welded to a proper foundation incorporated in the hull construction.

2150 Main bulkheads

Main transverse bulkheads shall be provided in accordance with the sub-division of the yacht and to meet the criteria on damage stability. They shall be of steel with vertical stiffeners. In order to reduce distortion, continuous welding shall be minimized by using intermittent welding where it meets strength and classification society requirements.

The main watertight bulkheads penetrations shall be kept at minimum. Where necessary those shall be protected by stuffing glands, standpipes or by watertight doors and hatches.

Other bulkheads shall be of steel plates and shall be watertight or non-watertight according to their respective function.

Electric cable penetration on fire and watertight bulkheads and decks shall be by Roxtec or RISE system; pipe penetration shall be by Roxtec, hermetic or of structural.

2160 Deck plating

Deck plating inside the line of deckhouses shall be flat and without camber. Outside the line of deckhouses, the deck shall be cambered.



Deck plating shall be increased in thickness or suitably reinforced in way of openings and breaks, as required; any increase in thickness under wood decking shall be made inwardly. At the corners of openings, decks plating shall have suitable round elliptical form as required by the Classification Society.

2165 Double plates and inserts

Local reinforcing plates may be inserted in to the hull, deck and/or bulwarks where higher local stress is expected due to the geometry of the structure or to the presence of equipment and machinery.

2170 Tanks

Fuel, fresh water and sewage storage tanks shall be fitted in the double bottoms outside engine room. Fuel service tank, lube oil, used lube oil, fuel overflow, bilge and sludge tanks shall be fitted in engine room. Fuel tanks are foreseen in both the stern and in the bow section for trim adjustment.

All tanks shall be pressure tested for eventual leaking with the attendance of a Classification Surveyor.

Flush bottom plugs will be installed in all double bottom, deep tanks and the forepeak tank.

All tanks are to be fitted with filling, emptying and vent connections, manholes, liquid level indication devices and insulation where required by the or Flag.

All double bottom tanks will be equipped with steel sounding tubes which will be equipped with a threaded plug on top and a striker plate on the bottom. The plug shall be labelled with the tank identification.

2180 Manholes

Manholes shall be bolted on suitable gaskets to permanently withstand the same head as the tank or compartment served. Covers, bolts and threads shall be of such material and dimension as to permit periodic removal and subsequent closing to the original tight condition. Covers shall be flush in tank tops serving as decks, by the application of a welded ring with non-penetrating tap threads and bronze flat head machine screws. Elsewhere, they may be surface or flange mounted.

Wherever necessary on and around the manholes handgrips and steps shall be welded in place to facilitate access in and out of the tank. Additionally, there shall be hand grips on the manhole covers.

Each manhole shall be fitted with identification nominating the tank and its contents. In general manholes shall be located clear of working and access areas. Access to manholes shall be not impaired by pipe work, machinery, equipment, machinery seats, interior joinery, structure, etc. Manhole arrangement shall be designed to assure access to all parts of the tanks for cleaning purposes.

2185 Freeing ports

Freeing ports shall be fitted at a low level to all main deck and foredeck bulwarks, which size and number shall be in accordance with the Classifications Society's requirements.

2190 Rub rails

An upper rub-rail shall be fitted as shown on the external profile. Rub rail shall be made in steel and welded to the hull side structure. Internal stiffeners, coincident the selected frames, shall be adequately spaced.

2195 Hull pillars

Steel pillars will be fitted in the hull, welded to the structure, to properly support the decks avoiding deflections and vibrations.

Pillars will be filled with sand in order to reduce vibration from the engine basements.

2200 SUPERSTRUCTURE

The structure above the main hull deck shall be of welded aluminium alloy construction and shall include external and internal deck casings and decks.

The decks shall be of welded aluminium plate supported by beams in conjunction with girders, transverses and pillars. The deck plating shall be suitably reinforced under local loads such as boat crane, swimming pool, pillars, masts, etc.

The superstructure shall be erected and fabricated with special care that will assure minimum distortion. Openings shall be properly reinforced. Areas around large windows shall be aligned so as not impose any twist or strain on the glass.

Deck stowage lockers shall be arranged and built into the superstructure where possible, and shall be provided with suitable weather tight covers, with stainless steel locks, hinges and gas piston as well as with appropriate drainage arrangements.



As far as it is practicable, lifebuoy shall be recessed into the aluminium superstructure in order to have a clear passage.

Triclad type transition joint shall be used to connect aluminium structures to steel.

2210 Main mast

The aluminium alloy main mast will be positioned above the sun deck amidship, as shown in the exterior profile.

The mast shall be fitted with cross trees, halyards and signals attachments as well as all necessary platforms, fittings and supports for antennae, decorative and working lights, horns, radars, satellite domes and other requisite equipment plus adequate access ladders and safety harness attachments as mentioned above. Great care will be given to permit easy access for the servicing of all equipment on the mast through access hatches and compartments. All cover plates on the mast and under platforms shall have concealed non-corroding fasteners for ease of maintenance.

The top section of this mast will be bolted for access into shipyard facilities.

2230 Ensign staff

One ensign staff in polished stainless steel shall be fitted at stern with socket arranged in stern bulwark and at aft end of upper deck.

Staff shall be provided with necessary sheaves, cleats and halyards for ensign.

2240 Wing stations

Wing controls shall be built into the bulwark adjacent of the wheelhouse doors, on each side. The base plates of the controls shall be made in aluminium recessed into the bulwark so as to have the controls enclosed. The controls and gauges shall be mounted on this plate. A weather tight seal shall be recessed and the latch down lid shall continue the natural line of the bulwark. Access plate shall be fitted to the inside of the bulwark for maintenance access.



3000 MACHINERY AND PIPING

3100 MACHINERY

3110 General

The main propulsion system shall consist of two marine diesel engines driving two fixed pitch propellers through two independent reverse/reduction gearboxes.

The engines shall operate by diesel oil and will be designed to ensure the normal operating conditions of the yacht.

The gearbox shall be equipped with a trailing pump to permit the lubrication of the reduction gear while the propeller shaft that is being trailed is rotating.

3120 Operating conditions

All machinery and associated air and oil cooling water shall be capable of efficient operation when yacht is permanently listed 15 degrees either side or pitching 10 degrees longitudinally and when rolling up to 22,5 degrees from the vertical.

The machinery ratings are based on the following standard conditions:

Maximum sea water temperature	32 deg °C
Ambient air temperature (within the machinery space)	45 deg °C

3130 Main engines

Two MAN D2868 LE425 high displacement, four stroke, turbo charged, after cooled, rated at 588 KW @ 2100 rpm shall be fitted on board. The main engines shall be in compliance with IMO/EPA applicable rules.

The unidirectional main diesel engines are to operate on gas oil ISO 8217: 1987 DMA spec. Emissions will be compliant with IMO Tier II and US EPA Tier 3 standard.

In order to achieve reduced smoke on engine start and during engine operation, each engine will be fitted with an optimised fuel injection control system.

Provision will be made for engine driven pumps for sea water cooling, fresh water cooling, lubricating oil and fuel oil injection.

The engines will be fresh water cooled via a salt water/fresh water heat exchanger.

The engines will be electric start. Combustion air for the engines will be drawn from the engine room.

Engine and gearbox will be painted in white colour.



3140 Main generator

Each diesel engine is to operate on fuel meeting the ISO 8217, 1987 DMA standards. Emissions will be in compliance with IMO/ EPA applicable rules.

The main generating plant shall consist of two diesel generators type Kohler 80EFOZDJ by ekW 80:

Electric power	Main generators:100 KVA- 80 eKW
Rated voltage	AC 400 V
Frequency	50 Hz
Number of phases	3
Power factor	0.8
RPM	1500
Rating	Full load continuous
Insulation	Class H
Protection	IP23
Screening	Grade N
Voltage regulation	+/- 0.5%
Frequency regulation	0.5%
Max intake air	45 deg. C
Intake sea water	32 deg C
Starting system	24 V D.C.

A Power Management System (PMS) shall be provided and used to control the load sharing, auto-start and shut down of generators.

Synchronizing facilities shall be provided and the two generators shall be capable of automatic parallel operation. Each main generator shall be capable of selection as stand-by unit and to be started automatically on blackout. The diesel generator engines shall have their own independent protection systems so that in the event of high cooling water temperature, low lubricating oil pressure or over-speed they will fail to safe (shut down).

Cooling water piping shall be connected to the water pump of the engines. From the pump the water travels through the heat exchangers and is then injected into the exhaust line.

Each generator shall be supplied with a Decision Maker 550 (DEC) controlling system for the monitoring of all the alarms and the interface with the Ship Alarm and Monitoring system.

Engine and alternator will be painted in Kohler standard white colour with mega yacht finish. The generators shall be enclosed in a sound proof housing.

3150 Propellers

The design of the propeller shall be a careful balance between the requirements for efficient propulsion, on the one hand, and for the quietest possible operation on the other. The naval architect shall at the earliest stage of his work, consult with the noise and vibration specialist and the propeller designer in order to determine the optimum solution for this yacht using the above guidelines.

The propeller shall be custom designed with fixed pitch, skewed and ISO 484 Class S1 finishing tolerance. The propeller shall be made in NIBRAL, five blades, with a diameter of about 1250 mm and outward rotation.

3160 Shafting and stern gear

The propeller shafts shall run in stern tubes with sea water lubrication. The propeller shaft shall be of Duplex steel type 1.4462.

The stern tubes with flanged-on stern tube glands are located at the propeller shaft penetrations at the hull. Wear parts of the stern tube gland can be replaced by inflating the pneumatic-stop with stationary shaft, even without docking the yacht.

Diameter and bearing spacing shall be in accordance with the Classification Society requirements.

The shafts shall be able to be withdrawn aft, after removal of propellers. Hoisting points shall be provided as per manufactures recommendation.

Between the gearbox and the shaft line an elastic coupling type ERD by Rubber Design® (or VULKAN® type) shall be fitted.

Elastic couplings, gearbox and main engine mounting system shall be subjected to N&V Consultant approval.

3170 Rudders

Two double plate semi balanced spade type rudders with streamline section shall be fitted having appropriate rudder area for maximum directional stability and good manoeuvrability at low speed.



Rudder stock shall be housed in a heavy duty steel casing adequately built into the hull framing structure, and fitted with self-lubricated composite material lower bearing and spherical roller top bearing. Rudder stocks shall be of grade 1.4462 Duplex stainless steel or AISI 316L.

The top end shall be necked down and have a keyway to allow coupling to the tiller.

The lower end of the stock/casing shall be fitted with two lip seal. Lubrication shall be connected to introduce new grease above the seal and at the top bearing level. A return pipe will allow used grease to return to the steering flat and at the same time evidence correct lubrication. An automatic greasing shall be provided.

An eyebolt shall be fitted at top for lifting purpose.

Suitable arrangements (push-up blocks) shall be provided to prevent rudders from undue lifting in a seaway. The rudders shall be oil filled and fitted with filling and draining points. Rudders shall be pressure tested. Construction and arrangement shall be in accordance with Classification Society Requirements.

3180 Steering gear

One electro-hydraulic and assisted steering gear made by Opem Sistemi® or equivalent shall be provided. The steering gear shall be designed in compliance with the requirements of the Classification Society. The gear shall be provided with two independent pumping units, (one as stand-by) each consisting of a constant displacement gear pump and an electric motor, necessary hydraulic piping with stop valves, by-pass valves, relief valves etc.

The steering gear shall be capable of putting both rudders from maximum 35 degrees on either side to 30 degrees on the other side in less than 28 seconds at the vessel's maximum ahead speed, when actuated by one pumping unit.

A mechanical stop shall be incorporated into the steering gear arrangement.

The steering system shall be designed with one double acting hydraulic cylinder coupled to each tiller. The cylinder shall be made with stainless steel rod, spherical bushing at the ends and capable to operate both tillers. In order to achieve this, the tillers shall be cross connected.

The steering gear shall be normally controlled by a wheel from the wheelhouse and electronic tillers for the wing controls. It shall also be controlled by the auto pilot system.

The electric hydraulic pumps shall be supplied from the emergency switchboard.

Control and monitoring operations are provided by a touch screen terminal in the navigation bridge connected to a PLC device.



In case of failure of the power unit the rudder control shall be from the aft peak by using an hand wheel. The piping system to the emergency station shall be independent from the main piping.

Start/stop button for the steering gear motors shall be located in the wheelhouse and locally on the switchboard.

Rudder indicators shall be fitted in the wheelhouse, wing controls and at the emergency steering station. Hydraulic pipes shall be of high quality seamless stainless steel pipes.

Pipelines shall be supported in brackets lined with rubber bushes to limit noise transmission.

3190 Ventilation and air conditioning

3191 General requirements

The yacht shall be fully ventilated by natural, mechanical and air conditioning system as appropriate to the respective compartments. The standard of ventilation and air conditioning shall reflect the high standard of construction and comfort required for this yacht.

All stores, except small stores, and machinery compartments shall be provided with forced ventilation. Small stores and all other areas shall be provided with vent pipes or openings for natural ventilation.

The following type of ventilation shall be applicable to the listed compartments and the air changes per hour shall be considered the minimum required by the Administration and more detailed in A/C final project:

COMPARTMENT	SUPPLY	EXHAUST
PUBLIC SPACES	A.C.	M
GUEST CABINS	A.C.	M
CREW CABINS	A.C.	M
ENGINE ROOM	M /A.C.	(by main engine combustion)
AFT STORAGE	M/A.C.	N
FORE PEAK SPACE	N	N

Legend:

- A.C. Air Conditioned
- M Mechanical ventilated



N Natural ventilated

3192 Heating and Air Conditioning

The plant for providing conditioned air shall be realized with centralized units, suitable to provide the best efficiency for a vessel of this type.

In general all living quarters and interior spaces shall be provided with fan-coil units that receive their fresh air through a fresh air unit. All sanitary spaces shall be provided with forced exhaust ventilation.

The type of ventilation, diffusers, etc. shall be such as to produce as low noise as possible and insulation shall be fitted accordingly.

The air conditioning system shall be designed and installed with the purpose of providing the maximum comfort of the guests and crew through the control of: temperature, humidity, air purity and velocity.

To achieve this purpose, the system shall be sized to guarantee the following ambient conditions taking into account the number of passengers, thermal dispersion and the air changes required.

<u>Summer</u>	Outside	Inside
Temperature dry bulb	34°C max	21° ± 1°C
Relative humidity	80% max	55% ± 5%
Sea water temperature	32°C max	

<u>Winter</u>		
Temperature dry bulb	0°C min	21° ± 1°C
Relative Humidity	90% max	
Sea water temperature	2°C min	

System description

The central air-handling and fan coil units shall be cooled by means of chilled water from the chilled water unit in the engine room.

The design and installation of the air conditioning and ventilation system shall meet the following criteria:

- minimum fresh air rate shall amount to 25 m³/hr per person or
- public spaces 3 air changes/hr



The conduct air, the flow velocity, air diffusion and efficiency at diffuser or grilles shall be such as to ensure a draught-free environment.

The fresh and exhaust air ducts shall be provided with flow damper in order to balance the air flow in each area.

The lay out of the air conditioning ducting, diffusers and grilles shall be in accordance with the requirements of the interior designer. Ventilation and air conditioning shall be carefully balanced ensuring a slight overpressure in the accommodation. This shall prevent contaminated air or smells entering the spaces. All fans to be placed on vibration dampers and flexible mounted. This concerns air-conditioning and exhaust units as well. The capacities for the different ventilation and air-conditioning installations shall be derived from the heat load calculations of the spaces. The calculations shall take into account transmission, sun, machinery and equipment radiation, number of occupants and other heat sources as well as minimum required air changes per hour and fresh air requirements. The transmission and radiation shall be carefully calculated, taking into account insulation, colour of the hull, deck covering specifications, type and area's of windows, etc.

The pantries, provisions, stores and sanitary spaces shall receive their balance air from the adjoining spaces; the galley shall receive its balance air from outside; the laundry shall accommodate dryers of condensation type.

In summer conditions, the chilled water cooling plant shall be in operation. The chilled water pumps shall deliver chilled water of 6°C (supply temp.) and 12°C (return temp.) to the fresh air units and the fan coil units. In winter conditions the chilled water cooling plant shall be switched off (pending on heat load in special areas with high heat radiation such as laundry, galley, electric rooms etc).

In spring time and autumn (and even in the wintertime) it is possible that some areas needs air-conditioning, this regarding the internal heat loads. Therefore the fan coil units will be executed with chilled chasers.

In wintertime, the chilled chasers shall be in operation (if needed) which are built in the fan coil units. The electric pre-heater in the air handling unit will heat the passing air to 12°C. (fully automatic system). The temperature control inside the accommodation shall be similar in the previous described control under summer conditions. Due cold water is still available during winter period, spaces with heat radiation such as AV-rooms, laundries can be cooled down.

Each space will be equipped with a display, including thermostat (temperature sensor and temperature controller). The display will enable the Owner, Guests, staff or crew to



adjust the desired room temperature ($\pm 3^{\circ}\text{C}$ from the set point) in respect to design conditions.

In general air-conditioning and ventilation systems will be designed and executed in such a way that the noise levels will be not more than as specified.

The conditioned air will be distributed to the spaces by ducts carrying 100% of the required air.

Materials

The piping material of the AC system shall be CUNI 90/10 for sea water and in stainless steel AISI316L for coolant; all the valves shall be in bronze.

Ducts shall be made in galvanised steel and insulated for fire and/or noise aspects, where necessary and where required by the Noise and Vibration Consultant.

Fresh Air Units

One air-handling unit shall be provided on forward technical space. The unit will be of a sturdy marine execution with a galvanised steel casing and suitable for mixing, filtering, heating, humidifying and cooling of the air. The air-handling unit will be so arranged that access is only required from one side, facilitating the construction of compact fan rooms. The casing will be insulated with minimum 25 mm thick fireproof insulation at the inside. Equipment inside the casing will be accessible over one side by removable panels. The air-handling units will be arranged as follow:

Filter Section

The filter will be G4 type and shall contain a disposal pre-filter on flame resistant material

Pre-Heating section

This section will contain of an electric heater of SS304 casing and SS304 electric elements. The heater is including a maximum temperature protection and flow switch.

Cooling section

This section will contain a coil of copper tube and aluminium fin construction, suitable for chilled water as cooling medium. The coil is treated with a protective coating.

Re-Heating section



This section will contain of an electric heater of SS304 casing and SS304 electric elements. The heater is including a maximum temperature protection and flow switch.

Fan section

The fan section will contain of a V-belt driven centrifugal fan with an electric motor suitable for frequency drive, isolated from the casing by means of anti/vibration mounting and flexible fan connections. The fan motor is a horizontal shaft and frame model and fitted on the sub base of the fan, thus facilitating easy removal for inspection and maintenance.

Distribution section

This section will be executed as plenum and insulated at the inside against sound and heat dissipation. The conditioned air will be distributed over the connected supply ducts / spiro pipes to the fan coil units.

Sound attenuating dampers

The necessary sound attenuating dampers will be placed in the supply and exhaust ducting according manufacturer recommendations. In each main supply duct from fan coil unit to plenum a flexible sound reducing flexible duct shall be installed.

Ducting

For fresh air, rectangular galvanized ducting will be applied in the steel hull compartments as well as in the superstructure. Both the fresh and exhaust air ducting will be provided with control dampers to adjust the correct amount of air.

Ducting in the engine room or other visible spaces shall be routed and laid in an orderly, carefully considered fashions, to enhance the appearances of those areas.

Fan coil units

Designated spaces will be provided with fan-coil units as described in the specification. The fan-coil units will be connected to the chilled water-system. The units will be complete with cooling coils, fan, drip tray with double drain connection, electrically actuated three-way valve and electric chill chaser. Each unit will be provided with a control unit for room temperature and fan speed settings and a display panel. Each unit can further be provided with an air sensor and water sensor and the necessary cables

for connection of the unit to the display, sensors, etc. Fan-coil controller is suitable for monitoring (optional). Fan coils shall be selected to deliver the needed amount of treated air at variable fan speed: this allows to rapidly cool the spaces when needed utilizing maximum speed. Normal operation shall be at slow speed (30% of the maximum air flow) , this shall minimize the noise during the night condition, when the air velocity at the outlet shall not exceed 2.5 metres per second. There will be 6 main speeds. Each main speeds will be set as per customer request in a range going from 10 to 60 Hz.

Chilled water system

One chilled water unit of about 150 KW cooling capacity will be installed in engine room, and will have a capacity equal to 70% of the required cooling capacity of the fan-coil units and 80 % of the required cooling capacity of the engine room cooling units.

The chilled water unit will consists of:

- N.2 semi-hermetic piston compressors
- N.2 Sea water cooled condensers, shell and tube type
- N.2 Stainless steel plate type heat exchangers
- N.2 Frequency inverters for compressors soft start and capacity control (built on the compressors)
- N. 2 chilled water circulating pumps, one acting as stand-by
- N.2 Sea water circulating pumps, one for each condenser
- N.2 Frequency inverters for sea water pumps capacity control
- A closed expansion vessel with pressure gauge and high pressure safety valve
- One central switchboard panel

The chilled cooled water central switchboard panel will be serving the compressors, heaters and chilled water circulation pumps and fitted with all necessary relays, thermal overload protection, fuses, automatic sequence switch, delay starting in compressors, temperature control, hour counter, temperature indicators, pressure indicators and external alarm contacts. The display will show temperatures, pressures, alarms, etc.

The chilled water unit will further be equipped with all necessary electric and electronic controls, such as solenoid valves, control thermostat, safety thermostats, frost protection, flow switch, high pressure transmitter, low pressure transmitter, oil pressure switch and internal motor protection and all necessary refrigerant copper piping,

complete with non-return valves, check valves, sight glasses, filter dryers, flexible connections, thermostatic expansion valves, Aeroflex insulation and suction line filter. Anti-interference filters will be installed to avoid disturbance of the board voltage. The compressor/condenser systems will be fully independent, so that one system can run while the other is being serviced/repared. Chilled water to be filled with glycol to provide protection to -5°C .

Mechanical supply / exhaust ventilation (accommodation and galley)

Each mechanical exhaust system will be provided with an exhaust unit, consisting of a fan section with a belt driven or direct driven centrifugal fan, elastically mounted on a frame and soundproof insulated, necessary un-insulated galvanized spiral ducting/rectangular un-insulated galvanised steel ducting, necessary sound attenuating dampers in extraction as well as discharge air ducting or elsewhere required, fire dampers (as far as required by Rules and Regulations), necessary exhaust nozzles and local control at the air handling unit.

Mechanical exhaust in the galley will be established via proper hood over cooking plates, ovens and fryers. A supply duct for outside air will be integrated in the hood. This supply will have forced ventilation. The hoods will be provided with a grease filter and drip tray with drain. The exhaust of the galley shall be led to the main mast as far as it is practicable.

The galley shall be equipped with an electric variable speed extraction fan which, while at high speed shall extract cooking produced smells during food preparation, at low speed shall maintain the area in slight depression. Extractor speed control shall be achieved through a speed regulator controlled by an inverter. When the galley extraction fan runs at high speed, a balancing amount of fresh outside air shall be drawn in, so the effects on the air balance in the rest of the yacht shall be kept to a minimum

Mechanical supply / exhaust ventilation (laundry and technical spaces)

The described spaces, as indicated in this specification, will be provided with natural or mechanical supply ventilation, as the case. The supply fans can be of the centrifugal type or axial type, in special marine type execution. The impeller will be directly driven by an electric motor. The clothes dryer discharges will discharge into the atmosphere via accessible lint-traps.

Small technical stores will generally be ventilated through proper grills onto the hatches.

3194 Air casing

Casings above the main deck shall contain the air intake trunk for the main engines, generators and other systems such as air-conditioning as well as for the ventilation of machinery space. The inlets shall be arranged with adequately sized grilles and traps. Emergency closing device of the fire dampers and air ventilation shall be provided in a dedicated station near the engine room. The casings shall have soundproofing and thermal insulation.

Particular attention shall be paid to reducing noise levels on living decks by reduction of air velocity, air grill design, etc.

The machinery spaces ventilation system intakes will comprise inlet louvers and hose proof water spray mist eliminators fitted with an adequate drainage system.

3195 Engine room ventilation

The engine room shall be fitted with two supply fans with control switch locally and in the engine room. The air flow required for ventilation (engine air consumption and heat removal) shall be in accordance to ISO 8861, taking into consideration the maximum outside temperature as defined at section 3192. In any event, the ventilation shall be laid out in such a way that outside air is circulated through the engine room leaving no hot spots. The system shall ensure that cool air is provided to the air inlets of all combustion machinery, to ensure that engines do not de-rate because of high inlet air temperature.

The fans will be run automatically in supply mode and in reversible mode only manual is possible. The capacity of the fan shall be sufficient for air consumption of the main engines and diesel generators, 20% of engine room heat dissipation and a small over-pressure through the casing. The fan shall be of the axial flow type with an impeller directly driven by an electric motor. The fan shall be fitted in galvanized steel casings on anti-vibration mounts. The fan shall be driven by frequency inverter for speed control and a pressure sensor shall be fitted in such a way that a slight over pressure is maintained in the engine room. The pressure will be controlled by an automatic controller.

The heat load from the engine room will be eliminated by an internal cooling system. This system consist of four chilled water cooled cooling units, which are connected to the chilled water system. The maximum air temperature rise of 12.5 °C in the engine room as a result of radiation from all machinery and systems under the most unfavourable conditions. The temperature will be controlled by an automatic controller (same control system for fans).



3200 PIPING SYSTEM

3210 General requirements

All piping systems will be dimensioned with sufficient cross-section and will be installed in accordance with the requirements of the Classification Society. An adequate coaming will be arranged around oil and water pumps, engines, compressors, filters, tanks, heat exchangers, purifiers, air conditioning units, etc. All scuppers and coaming will be designed to contain fluids and to drain under all normal conditions of pitch and heel.

All piping will be securely supported and braced to prevent damage from vibration and isolated when necessary to prevent transmission of vibration.

Each system shall be provided with sufficient valves and cocks to allow adequate control of flow and to provide satisfactory isolating for maintenance of equipment, piping components and instrumentation.

Attention should be given at the design stage to ensure streamline flow in all systems.

Main and auxiliary engine exhaust pipes shall be designed so as to prevent load imparted to the engines.

Exhaust gas pipes and silencers shall be resiliently mounted to minimise structure borne noise.

The main sea water intakes shall be protected by an electric antifouling system.

International standard shore connections shall be provided for the filling of fuel and water, and for the discharge of sewage, used oil and sludge. Relief or safety valves shall be provided as necessary to protect system from damage due to excessive pressure. Systems shall be designed such that pipe lengths and fittings can be removed with minimum disturbance to other equipment, system or fittings.

The piping shall be run with minimum number of bends as practicable. Piping shall be so designed to allow for stress due to thermal movement and deflection due to yacht's working and to be adequately protected against mechanical damage.

Pipes, valves, cocks, joints, etc. which shall be fitted throughout the vessel shall be in accordance with ISO Standards, or equivalent, and good commercial practice subject to compliance with Classification Society.

Piping and fittings used in the hydraulic steering gear and fixed fire extinguisher system shall be in accordance with maker's standards, subject to Classification Society approval.



The joints between pipes and fittings generally shall be of the flanged type, unless where specified otherwise. Slip on type coupling shall be acceptable in areas where they must remain removable for inspection and maintenance. Slip on joint coupling shall be only used where approved for the specific system.

Type approved pipe penetrations such as Roxtec, Rise or Slipsil, shall be fitted where pipes pierce watertight and oil tight bulkheads, tank tops or decks. Flanged penetration shall be used in way of the collision bulkhead.

The penetration in way of insulated work shall have sufficient pipe length to permit access to the joint without disturbing insulation.

Bending work on pipes shall be by cold bending or where hot bending is desirable by controlled heating.

Pipes will be not bent to a centre-line radius of less than 1.5 times the nominal diameter of the pipe.

Small radius bending may be fabricated with welded elbows, having a radius of approximately equal to the nominal diameter of the pipe.

The bending radius of copper pipe and aluminium alloy pipe shall be about 3 times the nominal diameter.

Where galvanized steel pipes are used, all work on the pipe shall be completed before the pipe is galvanized.

Galvanizing destroyed by welding onboard shall be touched up with zinc rich paint.

Care shall be taken that the alignment of pipes shall be such that the flanges to be joined are parallel before the joint is made and that no unnecessary force is required to bring the two faces together.

Mating pipe and fitting shall be installed with the bores concentric.

Care shall be taken to ensure any gasket fitted between the flanges does not protrude into the bore.

Acceptable supports and hangers shall be used to prevent undue stress on pipes and fittings by the contraction or expansion of the piping and machinery, or by vibration and working of the yacht and are not to restrict movement of the piping necessary for flexibility.

Particular care shall be taken to ensure cleanliness of the system and that no foreign matter is allowed to contaminate the system. Plugs and seals shall be used over opened pipes when not being worked upon and not removed until just prior to installation.

The general requirements for all pipe works shall be:

- stress free installation on properly spaced support brackets and/or hangers.



- metal pipes to be fitted into the brackets using rubber linings.
- non-metal pipe systems which continue into the engine room shall change to a metal pipe in accordance to Class / Flag requirements.
- installation with constant drops and straight runs avoiding sharp bends.
- all pipe bends shall have smooth radiuses. No mitred joints shall be acceptable
- pipe connections to be flanged and fitted with expansion joints as necessary
- watertight bulkhead- or deck penetrations to be flanged or through the use of an approved fitting.
- slip on joint couplings shall be acceptable in tight places.
- fuel vent pipes shall be integrated to the structure except where access to other parts is required
- where pipes are to pass through tanks or tank-type watertight compartments, a heavy walled tube shall be welded into the tank or compartment.
- pipes which are to be galvanized, shall first be completely fitted in place, where appropriate, using untreated steel pipes of the appropriate quality, after which the fabricated pipe sections are to be removed, grit-blasted, galvanized and reinstalled.
- sight glasses to be fitted in appropriate locations.
- shock accumulators in all high pressure lines.
- overboard valves shall be generally of the screw-down-non-return type (SDNR).
- partially completed portions of the pipe systems shall be pressure tested prior to their being covered or hidden by subsequent construction.
- the method for pipe hanging for all systems, including hydraulic system, shall be in accordance with the supplier recommendation and shall be agreed with Noise & Vibration consultant.

3220 Piping insulation and identification

All pipe work shall be insulated in accordance with the following schedule:

System	Material	Location
Cold fresh water service	Armaflex®	All pipe work



Hot fresh water	Armaflex®	All pipe work
Air conditioning	Armaflex®	All pipe work

Insulation shall be continuous. Where any of the above pipe work is visible, the surface shall be covered and painted.

3230 Piping material

For all fittings and valves a single source of supply shall be preferred. The same holds true for the supply of elastic mounts, flexible pipe hangers, rubber bellows and expansion joints.

Piping and fittings material shall be in accordance to the following table:

<u>Service</u>	<u>Material</u>
Fuel oil	Steel
Lubricating oil	Steel
Hydraulic fluid	Stainless steel
Compressed Air	Stainless steel AISI 316
Fresh water	Stainless steel AISI 316 inside engine room (press fitting or welded type) Polypropylene outside.
Exhaust gas	Stainless Steel AISI 316 (wet part) Mild steel (dry part)
Sea water	CUNI 90/10
Bilge	CUNI 90/10
Fire and wash deck	CUNI 90/10 AISI 316 L in exposed areas
Grey/Black water	Stainless steel AISI 316 inside engine room, PVC outside
Scupper	Stainless steel AISI 316 below main deck, PVC above main deck
Vents	Fuel: Steel

The valves connected with stainless steel and steel pipes shall be of stainless steel material, the valves connected with copper alloy shall be in bronze or stainless steel AISI 316 L.

The fluid velocity shall be in accordance with the Class requirement and building practice with respect to the longevity of the piping system.

3240 Pumping arrangement

All ships service pumps (as bilge, fire-fighting, fuel, lube. oil, waste water etc.) shall be fitted in the engine room.

The fire-fighting / bilge system shall be fed in emergency by a pump located outside the engine room.

Vacuum system pumps shall be fitted in engine room bilge space.

Pumps for A/C and fresh water pressure tanks shall be fitted in the engine room.

In addition to the main bilge pump in E/R, a hand pump shall be fitted in the fore peak.

Generally, for all water lines, centrifugal self-priming pumps shall be fitted, while services as fuel, lube. oil, and hydraulic oil shall be of volumetric type.

The general requirements for all pumps shall be:

- pumps to be delivered with a flexible coupling between the pump and the electric motor and be painted in RAL 9003
- all pumps shall be installed on selected highly flexible V-type mounts in painted stainless steel drip trays, wherever necessary, with fixed drain pipes to the sludge tank.
- flanged expansion bellows at all connections between pumps and pipe
- work or valves, with double clamped hoses acceptable for the small pipe sizes.
- vacuum and pressure gauges, fitted with closing valves, for all pumps
- pumps to be fitted with valves on sides, allowing removal or repair.
- assembled pump units shall be painted in RAL 9003, prior to installation.

3250 Tank levels

All ship tanks shall be provided with an electronic measured level which is to be displayed on a mimic screen of the Ships Monitoring and Alarm System.

Appropriate vent pipes arrangement shall be in accordance to the Classification Society requirement.

3300 SHIP SYSTEM

3310 Bilge System

The bilge arrangement shall be in accordance with the requirements of the Classification Society and Flag.

The design of the suction piping network (including bilge main and branch diameters) shall ensure adequate performance of the bilge / fire pumps when under bilge duty.

The main line shall be led through the watertight compartments from main and emergency bilge / fire pump. The main pump shall be located in engine room and the emergency out-side. Each suction shall be provided with a valve with a pneumatic actuator controlled manually locally and by remote control from Ship Monitoring System. Each suction shall be fitted with a strum box and a non-return valve. Main bilge suction within the engine room shall be fitted with mud boxes and non-return valves.

The engine room will be fitted with an emergency suction from one main engine raw water pump and a direct suction according to Rules.

Each branch suction in engine room and technical spaces shall be provided with easily accessible strum box of CUNI 90/10.

The forepeak and chain locker compartment shall be drained by main bilge pump and locally by hand pump. A separate bilge pump system shall be also installed in the forepeak/chain locker. This system shall comprise a separate suction pipe with strainer and non-return valve, both an electric and a manual self-priming pump discharging via a SDNR valve into the forward scupper network.

Each watertight compartment shall be provided with level gauges and an audio/visual alarm incorporated in the ship monitoring system. Piping shall be made in CUNI 90/10.

One bilge water separator located in the engine room with adequate capacity will be provided. The bilge water separator shall fulfil the requirements of IMO rules, in that the discharge oil content is less than 15 ppm. The discharge from the separator shall be pumped either overboard or back to the bilge tank when the oil content is more than 15 ppm. Oil sludge from bilge water separator to be collected to the sludge tank.

3320 Fire and deck washing system

A fire main shall be provided in accordance with Classification requirements and REG Code. The minimum working pressure of the system shall be checked during the design phase. The main line shall be connected with one pump in engine room while a fire pump outside the engine room shall be fitted for emergency use.

An automatic isolating valve shall be provided to isolate engine room fire line in case of emergency.



Sufficient hydrants shall be provided to enable a fire to be extinguished in any part of the yacht including accommodation, on decks and in the machinery space.

Piping shall be in CUNI 90/10 with the exception of exposed areas where the piping shall be AISI 316L stainless steel.

Storz® type fire hydrants shall be installed in covered recesses in the superstructure into which there shall also be a rack with the fire hose, the special coupling wrenches, the spray nozzles and the fresh water deck wash valves.

The anchor chain wash system shall be integrated to the fire main and equipped with suitable pressure regulator.

All fire connections and hoses shall be of International type flange.

The fresh water deck wash system shall be separate from the domestic fresh water system and be either fed by a special purpose high pressure / high volume pump or through the use of a bypass, by the domestic water pressure system.

The fresh water deck wash valves shall be ball valves and shall be installed next to the fire hydrants in the same recesses. The Builder shall supply two wash down hoses with Storz® couplings and adjustable/variable spray nozzles, with sufficient fresh water hose connections, allowing the efficient washing down of the yacht. A fresh water connection shall be also fitted in the aft storage area for cleaning/ maintenance of the fitted equipment.

3330 Scuppers

All exposed decks shall be drained by sufficient numbers of scuppers, appropriately spaced along the lowest point of the sheer, and discharging overboard through the hull at the boot-top level.

Scupper pipes to be AISI 316L stainless steel for hull and PVC Schedule 80 for superstructure and run internally with discharge below the water line.

Removable stainless steel gratings shall be fitted at each deck.

Scupper pipe penetrating hull shell plate shall be full penetration welded, in agreement with Class recommendation.

Use of butt welding in way of sleeves shall be considered, as far as it is practicable and acceptable to Class

Adequate draining slope both transversely and longitudinally shall be provided.

Quantity and location of scuppers shall be such to guarantee efficient drainage in peak rain fall. Elbow to have large radius as far as it is practicable.

3340 Sanitary and Sewage system

The sanitary system shall be of vacuum type for the black water and gravity type for the grey waters.

Two systems shall be provided as follow:

- Sanitary system: Evac® vacuum toilet system (or Jets®) , with fresh water flushing, pumps located in engine room .
- Sewage system: Fully integrated Tecnicomar@ (or similar) treatment plant, located in engine room

In order to obtain an optimised design, the Builder shall at the earliest moment submit his proposed toilet system layout drawings for approval to the manufacturer representatives. The systems shall be commissioned by the equipment supplier's technicians.

The sewage system shall be designed for compliance with U.S. Coast Guard and IMO resolution MEPC 227 (64). Additionally, there shall be one day toilet suitable for manual operation and direct discharge overboard to be used in case of a system break down. In the normal situation, this toilet shall discharge in the back water tank.

After treatment, the effluent shall be discharged directly overboard. The discharge condition shall be selected via a remote controlled electric valve.

Galley discharges shall be fitted with a grease trap from which the liquids shall drain directly to the grey water tank. The galley sinks discharge line(s) shall be equipped with Y-valve arrangements to allow direct overboard discharge.

All sewage tanks shall be provided with alarm for 90% full. The black water tank shall have a high-high level alarm using the 4-20 mA sensor and the Alarm and Monitoring System. Sanitary and sewage discharge piping shall be in either CUNI 90/10 or stainless steel in engine room and in PVC Schedule 80 material outside the engine room. Black and grey water pumps shall be provided with a means of back-up in case of failure of the main pump.

3350 Domestic water service

The fresh water double bottom tanks shall be built integral with the hull structure and shall be fitted with electronic sounding device. Provision shall be made for access to all parts of the interior of the tanks for cleaning, maintenance and repairs. The tanks shall be thoroughly cleaned prior to filling or connecting to the system. Fresh water shall be



used for hot and cold water system and sanitary purposes throughout the accommodation.

Fill stations shall be fitted on port and starboard sides in the main deck bulwark. The fill system shall be suited for low pressure filling. The two filling lines, the supply line from the water maker and the pressure regulated shore connection line, shall each be fitted, with a closing valve at their connection to the fresh water transfer/distribution manifold. There shall be a water softener in the supply line from the pressure regulated shore connections.

A small accumulator tank and two variable speed pumps driven by the inverter shall be arranged.

The hydrophore / fresh water pressure set shall be sized to suit anticipated peak demands on the vessel and the builder shall demonstrate the evidence supporting selection of the pump capacity.

A UVA sterilizing unit shall be fitted in the fresh water supply. A silver and copper ionisation unit shall be provided as required by REG Code.

The hot fresh water system shall be supplied by two 150 litres boilers fitted with 3+3 KW/each electric immersions heaters.

Boilers shall be insulated with glass wool and lined with polished stainless steel sheet.

The circuit shall be arranged with two return loops to provide instant hot water at the fixtures, by circulating pumps. Cold fresh water washing shall be fitted to forward windows of wheelhouse.

The Builder shall supply and fit on board one IDROMAR® or similar duplex fresh water maker of 180 litres/h capacity each, complete with sand filter and accessories.

Fresh water piping shall be in stainless steel inside engine room and Polypropylene Schedule 80 outside.

3360 Compressed air system

A compressed air system for ship's systems shall be supplied and fitted in machinery space. This system shall be fitted with all essential water traps, filters and controls.

One air compressor and an air drying unit, shall be built together on a single frame with all necessary valves, pipes, fittings, pressure switches, safety valves etc. The total compressor capacity shall be sufficient to supply all the regular users and the air ship horn.

A 100 litres galvanized steel pressure tank shall be Class certified and installed separate from the air compressors.



Compressors and air receivers shall be suitably sized to ensure that the consumption requirements of services are met and where relevant will comply with class requirements. It shall also ensure that the air horn is capable of complying with COLREGS (72) requirements with the installed equipment.

Provision for the operation in emergency of bilge control valves and horn shall be discussed and agreed with Class, Flag and Owner's Representative.

3370 Fuel system

One centrifugal fuel purifier by Alfa Laval® or similar of adequate capacity shall be installed in the machinery space with discharge into the sludge tank. The separator shall be plumbed to facilitate that all fuel drawn from a bunker tank and passing through the separator, can be transferred either to the central fuel tank or to another bunker tank. The separator shall be fitted with a by-pass. It will be possible to transfer fuel between the various tanks while the purifier is working. Installation shall be on a deep drip tray with a permanent drainpipe to the sludge tank. The purifier alarms shall be integrated into the vessel's machinery monitoring and alarm system.

The fuel system shall be arranged so that bunkering can be done via a Camlock fitting and pressurized filling. The bunker station should be fitted with a drain allowing any spilled fuel to drain to the sludge tank.

A fuel flow meter shall be installed on the fuel transfer system, which will also feed the fuel tenders. A dedicated pump connected to the day tanks shall be fitted on the fuel transfer pump line to the tender fuelling.

The system shall be provided with two electric pumps, one acting as back-up; the use of the fuel purifier pump as back-up shall be considered.

Two filling stations shall be fitted, one on port side one on starboard side in the main deck bulwark.

A tender filling station shall be fitted in the aft main deck.

3380 Cathodic protection

All the piping shall have electric continuity where compensator in rubber or special material is fitted between two pipe lines. A copper strap shall be fitted with 'star' type spring washers between the strap and the pipe flange.

A Cathelco® anti fouling system shall be fitted to all the sea chests, including the desalination system.



3385 Sea water cooling system

All water cooled equipment shall be sea water cooled. The main sea water crossover will be sized that 100% consumption can be achieved through one sea inlet only.

The main sea inlet strainers shall be sized in accordance with the maximum allowable particle sizes of the equipment / heat exchangers being supplied.

The sea inlet strainers shall be sized with a minimum free area of 4 times the pipe diameter.

The system shall be capable of supplying water to engines at 100% MCR, two generator sets in parallel and the chiller plant on full load, with no inlet depression issues (i.e. within manufacturers specification).

All equipment within the sea water cooling network shall be arranged for galvanic compatibility. Sea chests shall be constructed of Bronze / Cunifer or Monel. All valves shall be either NBR lined cast iron (ductile at the shell), bronze or AISI 316L.

All butterfly valves shall be of either double flanged or lugged type so that the strainer / pipe section may be taken out without disturbing adjacent piping systems.

The sea chests shall be provided with low pressure compressed air blow down connections from the compressed air system.

3390 Main engine exhaust gas system

At medium and high engine speed, the main engines exhaust gas will be led under the sea water level, as appropriate to avoid to exceed the engine manufacturer allowed back pressure value. An exhaust gas scoop made in steel shall be provided at gas outlet in order to reduce the back pressure.

Exhaust gas system will be provided with dry type silencers installed immediately above the main engine and supported by a dedicated stainless steel frame with elastic resilient mounts. The mount rubber element will be properly protected by the silencer high temperatures by the interposition of a temperature isolating material.

The exhaust gas, prior to be discharged at sea, will be cooled by a water injection system using the main engine cooling sea water. At low engine speed the exhaust of the main engines shall be lead out above waterline. An electric motor actuated butterfly valve will be fitted in order to control the exhaust gas by-pass.

The main engines exhaust line will be lined with an upholstery insulation material.

The main engine exhaust gas system shall be designed by a specialized company such MIVECO® or similar and this shall include the design of the exhaust scoop, the



calculation of the back pressure and the design of the exhaust line mounts. The drawing shall be submitted to the Noise and Vibration Consultant for approval.

3391 Diesel generator exhaust gas system

A combined silencer/ water separator shall be provided on the exhaust gas line and installation shall be as per manufacturer recommendation. The water drain outlet shall be below the water line while the exhaust gas outlet shall be above.

The auxiliary engine exhaust gas system shall be designed by a specialized company such as MIVEECO® or similar and this shall include the calculation of the back pressure and the design of the exhaust line mounts. The drawing shall be submitted to the Noise and Vibration Consultant for approval.

The auxiliary engines exhaust line will be lined with an upholstery insulation material.

3394 Lube Oil system

The waste lube oil and clean lube oil system shall be totally independent to avoid contamination of the lube oil. Two electric volumetric pumps shall be fitted.

Each system shall be fitted with its own transfer pump, connected to flexible hose fitted on a manual stainless steel hose reel and fitted with a filling nozzle on the clean oil hose and valve on the waste oil suction hose.

The main propulsion engine, gear sumps and generator engine sumps shall be fitted with a valved drain that can be connected to the waste oil suction hose to carry out oil change operations via valve quick disconnect fittings on the inboard side of the engine beds.

A United States Coast Guard (USCG) compliant containment drain shall be provided in the lube oil and fuel oil filling station.

Machinery shall be arranged with drip trays leading to the sludge tank, as far as it is practicable.

Standard CAMLOCK connections shall be provided for all fill station pipes and ISC connections shall additionally be provided where mandated by MARPOL / SOLAS.

3396 Air vents

All tanks are to be fitted with fillers and vents pipes according to Rules.

The black water /grey water tanks as well as fuel tanks vent lines shall lead to the mast and shall be provided with anti-odour filter.

All the remaining tank vent lines shall be lead above the main deck.



3398 Equipment labels

Suitable brass or heavy plastic identification plates is to mark all valves, cocks, filters, pumps, electrical components, electrical wires, etc. All plates shall be in English. Plates shall be screwed or glued in place.

All pipes throughout the vessel shall be colour coded according to their functions by self-adhesive coloured tapes with arrows indicating direction of flow.

In any case, no paper labels shall be used throughout the vessel.



4000 ELECTRICAL AND ELECTRONICS

4100 ELECTRICAL

4105 General electrical

The whole of the electrical installation shall be designed, installed and tested in accordance with the Classification Society requirements and shall be of a type proven satisfactory for marine use. All the electrical equipment and wiring not specified in this section and required by the Classification Society shall be installed by the Builder with no extra charge for the Owner.

The installation shall be splash proof in the interior and totally waterproof in the exterior areas. All cables shall be numbered and marked on a proper drawing.

The performance/rating of electrical equipment shall be determined on the basis of:

- Sea water temperature 32 °C
- Engine room ambient air temperature 45 °C

Consideration shall be given, in the selection of electrical/electronic equipment, to the ambient temperatures to be encountered when the yacht is not in use and without power. Care shall be taken with the selection and location of electrical equipment to ensure adequate protection against damage in service from water, steam, oil, humidity, vibration. Equipment should be arranged so as to facilitate easy access for maintenance. The ship's Electric Generating Plant (EGP) shall consist of:

- Two (2) diesel driven main generators Kohler 80EFOZDJ by 80 eKW
- 24 VDC Emergency batteries

Before defining the exact generator and batteries capacity, a preliminary electrical balance shall be prepared by the Builder for the following operational conditions:

- Day Navigation, one diesel generator running
- Day Navigation, full hotel, two diesel generators running
- Manoeuvring, two diesel generators running
- Day Anchor, one diesel generator running
- Night Anchor, one diesel generator running



- Navigation, only crew on board, one diesel generator running
- Harbour (shore connection)
- Emergency

Harbour condition, when connected to shore supply, is specified with partly used air-conditioning system, galleys and pantries.

4110 Supply System

Main power:

3 phase, 3 wire
400 volts, 50 Hz

Lighting and small power:

3 phase, 3 wire
230 volts, 50 Hz (2 wire
final sub circuits)

Emergency lighting:

24 volt D.C. Battery system

Alarms/Communications/Electronics:

24 volt D.C. Battery system

4115 Batteries

All batteries shall be Gel or AGM of maintenance free type.

The following groups of 24 VDC batteries shall be provided separately for:

- each generators starting;
- bilge/fire diesel pump starting;
- fire detection system;
- each main engines starting;
- electronic main engine and generators;
- auxiliary service and navigation (service bank);
- emergency lights, alarms and essential users (emergency bank);
- radio and communication;

Starting and electronic batteries shall be located close to the engine; service, emergency and radio batteries shall be installed in a well ventilated compartment above the freeboard deck.

Battery capacity for communications, navigation lights and radio shall be adequate to meet Class and Flag requirement. Each battery bank shall be equipped with its own

Mastervolt® battery charger and shall be installed in accordance with the Classification Society directly fed from main and emergency generators.

The emergency battery bank shall be the emergency source of electrical power having a capacity for 6 hours running in the event of failure of the main sources of electrical power.

4120 Main switchboard

The main switchboard shall be constructed in steel painted to white colour RAL 9003 and shall be installed in the engine room. The electric protection level shall be IP 23. A frontal access shall be provided for maintenance purposes.

All switchboard wiring shall be provided with crimped (compression) type terminals and shall have numbered marker ferrules for identification purposes.

Non-conducting hand rails shall be provided on front and non-conducting mats shall be provided at the front of the switchboard. The switchboard shall be illuminated externally and internally by the main and emergency lighting system.

The switchboard shall contain the following separately grouped sections:

- Generating section;
- Synchronizing section;
- General load distribution section 400V, 230V and 24V;
- Shore connection section;
- Monitoring and Automation section.

Bus bars shall be of hard drawn, high conductivity copper and insulated.

Each generator and shore power panel shall have an ammeter and wattmeter.

Wattmeter shall be capable of indicating reverse power up to 15% of the rated full load of the generators.

Two voltmeters, two frequency meters and a synchronizing device comprising either a synchroscope and lamp, or an equivalent arrangement, shall be provided for paralleling purposes.

Switchboard instruments shall be 90 square mm minimum size. Full load values shall be indicated in red.

A double pre-set of load shedding operation with harbour mode and navigation mode condition shall be provided. In addition a safety condition shall be arranged in the monitoring system that shall be able to “force” the PMS (Power Management System) in a semiautomatic mode having both generators in parallel sharing the whole load needed during the manoeuvring operation regardless the work-load.



In case of one generator failure, bow thruster and all manoeuvring devices shall be available under emergency condition with only one generator running.

The switchboard shall also include preference trips (MAYER system) and earth fault resistance meters so that any leg of any voltage can be checked.

Spare capacity for the connection of additional circuits shall be provided for both 400 volt and 230 volt system.

Two spare circuit breakers shall be installed in 400 volt distribution section and two spare circuit breakers shall be installed in the 230 volt distribution section.

4123 Shore connection

The Builder shall supply one 125A shore line cable of 30 m length, of flexible type stored in the port aft peak on an electric cable roller made by DR Italia® (or similar) and it shall be led inboard through a small watertight hatch in the transom. The cable shall be connected to a power box inside the main switchboard and shall incorporate a circuit breaker, ammeter, volt meter, phase and frequency indicator.

The main parameters of the shore power (current, voltage and power) shall be displayed in the Ship Monitoring System.

The PMS shall be linked to the shore power in order to start up a main generator in case of shore power lost.

4125 Distribution panels

The power and light distribution panel boards shall consist of steel cabinets with a waterproof enclosure suitable for their location and with hinged doors and will be covered by a decorative door matching with the surrounding joinery (where necessary). The alive parts shall be adequately protected. There shall be no dismantling of interior structure including shelves, to access the distribution panel boards.

Each individual circuit shall be protected by miniature easy access case circuit breaker.

All distribution panels will have the same type of locking device. Each panel shall have an allowance for approximately 10% spare breakers and shall be installed with a surge arrester to kill voltage spikes.

4130 Electrical cables

As required by the Class, the electrical cables shall be designed, manufactured and tested in accordance with the relevant IEC Publication or an acceptable and relevant National Standard.



Other requirements shall be in accordance with this technical specification and RINA Rules. In case of discrepancy between the technical specification and Class requirement, the Class requirements shall prevail.

All cables shall be Class approved marine type cable and where possible shall be XLPE core insulation, halogen- free compound and inner insulation and a halogen- free compound, flame retardant outer sheet.

For installations sensitive to electrical interference and on locations where required by the class, the cables also shall be provided with galvanized steel wire braiding, over the braided thinned copper earth lead.

Cable glands for equipment terminal boxes shall be suitable for the reception and termination of wire braid protected cables. When required by the manufacturer of special equipment, cable for this equipment shall be connected by means of special earth-glands or EMC- glands.

Cables shall be installed on steel trays and secured with PVC tie-wraps and stainless steel wraps where required by the Classifications. Cable trays are to have an extra 5% capacity for future installations. Cables to have crimped (compression) type terminators.

Power cables and control or signal cables shall be run in separate cable trays to prevent electromagnetic interference. Where it is necessary to run power and control and signal cable in the same tray, bundled power cabling shall be separated from bundled signal cable by at least six inches within the tray.

The Builder shall provide cable protective spiral tubes through the yacht for future installation of fibre optic cables.

All junction boxes, connection boxes shall be readily accessible and in a watertight execution for outside locations and in the engine room.

Penetration of bulkhead girders, decks shall be done as per Contractor's standard with multi-cable transits or cable glands for single cables, if water or gas tightness is required.

Multi cable transits shall be of ROX type or similar, silicon free.

In general cable chafing shall be avoided. Metal parts in bathrooms shall be grounded.

4135 Radio interference suppression

It shall be the responsibility of the Builder to ensure that all cabling and equipment in the yacht is screened or suppressed, as necessary, to minimize the interference with operation of navigation and communication equipment to an level in accordance to the EC Directive. To this end all shielded cables shall be earth bonded at the supply end only, unless the equipment manufacturer advises to the contrary.

4140 Motors and control gear

Electric motors shall be of squirrel case type with class "F" insulation but temperature rise in accordance with class "B". With the exception of motors installed on open decks, all motor shall be of totally enclosed type (IP44) with watertight terminal boxes(IP 56).

Motors on open decks shall be suitably protected, (IP56). Motor starters shall have minimum enclosure protection IP 23.

Where motor starters are not located on the motor, start/stop pushbuttons (enclosure IP56) shall be installed near the motor.

The air conditioning compressor motors shall be provided with inverter drives.

In general all electric motors shall be equipped with soft starters unless the maximum transient voltage dip when starting is less than 15%. In those cases direct on line starters shall be acceptable. As a general rule, starter switches shall be located in the direct vicinity of the motors.

Except for small motors with a capacity of less than 1 KW, only three phase induction motors shall be acceptable.

Motors of equipment that operate (nearly) continuously shall be class-H. Motors in moist/damp locations shall be IP65. Any motor in areas where gasoline is stored shall be of explosion proof type.

All flexibly installed motors shall be grounded to the hull by means of braided copper straps.

4145 Transformers

Transformers for lighting and small power supplies shall be 3 phase air cooled type class "B" insulation with enclosure protection IP23. For main lighting and small power supplies two, 3 phase 400/230 VAC, transformers of identical rating shall be installed and connected working one at a time.

For main galley and laundry appliances one, 3 phase 400/400-230V 3 phase + neutral transformers of suitable rating shall be installed and connected.

The Builder can replace the three requested transformer with two identical transformers capable to work alternatively for 230 VAC users and galley/laundry appliances.

Meggers will be installed after each isolation transformer to monitor and survey any leakage of phase to ground. In principle the following shall be provided:

- one megger for 400V on main switchboard;
- one megger for 230V on main switchboard;



- one megger for galley and laundry equipment on main galley sub panel.

4150 Lighting and power sockets outlets

Main lighting system shall be supplied at 230 VAC. In addition, an emergency 24 VDC system of lighting, supplied from the emergency batteries, shall be installed throughout the yacht, of capacity to meet the Class / Flag requirements and shall be energized in case of black out. Each deck shall have a separate lighting distribution board.

Power socket outlets in the accommodation spaces, intended for use with electric shavers (one in each cabin), shall be supplied from isolating transformers.

At least two industrial socket shall be installed in the engine room. Socket shall be also installed in the garage area and technical spaces.

Interior Lighting and power outlet sockets

The following general requirements shall be applied to the interior areas:

- In potentially wet areas the lighting system shall be 24 Volt DC
- Switches and outlets to be BTicino® in crew areas with standard finish.
- Strip lighting into underside of all stair treads.
- Strip lighting in coves in all areas except for crew.
- Strip lighting shall be diffused to ensure an uniform lighting.
- Each guest and Owners cabin shall have separate sub-circuits.
- Wardrobes lighting in the cabins shall be provided, activated by door switches.
- Circuits for power socket outlet shall be separate from lighting circuits.
- Watertight lighting fittings shall be used in the machinery and technical spaces.
- Four dedicated electric sockets for recharge wireless electric vacuum cleaners (one in crew area, one in guest area, one at main deck and one at upper deck level)

External Lighting and power outlet sockets

The following general requirements shall be applied to the exterior areas:

- Generally, the lighting shall be IP55 or better.
- Lighting bezels shall be stainless steel, chrome plated or expert painted as per the designer's colour scheme.
- Overhead lights shall be installed flush with the deck heads over the side and aft decks.

- The lights shall be switched in groups: two groups for each side deck and one group for each aft deck on a dimmer.
- Separately switched low level courtesy lights in the superstructure sides and recessed/hidden strip lighting at seat fronts, base boards of integrated furniture and stairs.
- There shall be separately switched low level working lights at the foredeck, at the aft capstans and at the spring line cleats.
- Recessed in the bottom of the upper deck bulwarks there shall be high intensity floodlights that shall be directed down- and outboard for lighting the perimeter of the yacht.
- All external lighting shall be controlled from the wheelhouse
- A system of navigation LED lights shall be installed and controlled by an indicator/alarm panel in the wheelhouse. The navigation lights shall be capable of operating from two supplies (main and emergency system).

Searchlight

One searchlight made by Sanshin® HRX 150 or similar shall be installed on the main mast to be capable of being remotely operated from within the wheelhouse and complete with joystick for rotation, elevation and focus adjusting.

4155 Machinery controls alarms and instrumentation

An alarms, monitoring and control system shall be installed on board in accordance with Classification Society requirements and class notation. The system shall consist of:

- one main station in the crew mess, with 17" LCD monitor;
- one main station on the bridge, with 17" LCD monitor;

General overview

In addition of being in accordance with the requirements of the Classification Society the main purpose of the alarm and monitoring system is to manage and control states, alarms and parameters of ship's plants.

The ship's plants monitored and/or controlled by that system shall be the following:

- Fuel Oil System (monitoring + control of fuel pump and valves)
- Lube Oil System (monitoring)
- Fresh Water system (monitoring + control)



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- Bilge System (monitoring + control of pump and valves)
- Sewage System (monitoring)
- Tanks level indicators and alarms (monitoring)
- Batteries System and Batteries Charging system (monitoring)
 - MMEE + MMEE Electronics
 - DDGG
 - Services
 - Radio
- Propulsion System (Mechanical, electrical, electronics and alarm monitoring + START/STOP via Modbus link)
- Diesel Generators (Mechanical, electrical and Alarms monitoring + START/STOP via Modbus link)
- Power Management System (monitoring + control, including automatic black-out recovery)
- ER Ventilation Management System (monitoring + control)
- Air Conditioning System and AHU main values (monitoring of cumulative failure for each unit + management of Chillers Capacity Limit so to manual derate Ship's Load when connected to the Shore line)
- Watertight interior doors and hatches (monitoring)
- Exterior doors (monitoring)
- Fire dampers (monitoring)
- External Lights (monitoring + control)
- Check List (monitoring)
 - Steering system
 - Stabilizer system
 - Fire detection system (cumulative alarm)
 - Main machinery cumulative alarms (AHU, Main Swb, Black out, Mayers load shedding status, etc.,)
 - Emergency stop system status
 - Shore line power
- Set-up
- Threshold Tank Alarms
- UMS Set-up
- Check sum for system status (Ethernet – CanBus – Power Supply – CPU's)



- Alarms

System Layout

The Monitoring and Control systems shall be designed to interface with most of the electrical devices onboard. The electrical signals are gathered and delivered to the main processor through a CAN bus network, then routed to the LCD displays connected by an Ethernet link, and then presented on the screen, in order to allow the user getting all the available information at a glance.

The user can also remotely operate the devices by means of the touch-screen integrated in the display units as far as allowed by the UMS notation.

4160 Light and sound signals

The following lights and equipment of approved type and complying with COLREG '72 rules shall be supplied and fitted by the Builder:

- Navigation lights of LED type made by Lopolight®, including:
 - n. 1 Masthead light, 225°, 5 nm,
 - n. 1 Masthead light, 225°, 5 nm (towing condition)
 - n. 1 Towing light, 135°, 2 nm,
 - n. 1 Side light, green, 112.5°, 3 nm
 - n. 1 Side light, red, 112.5°, 3 nm
 - n. 1 Stern light, white, 135°, 2 nm
 - n.1 Anchor light, white, 360°, 2 nm
 - n.2 Not Under Control lights, red, 360°, 2 nm
- Daylight signalling lamp type Francis / Aldis
- One marine sound signal chrome finish air horn
- Bronze bell, 300 mm. diameter with halyard and mounted on a polished stainless steel support on foredeck. The bell shall be engraved with name of yacht and year of delivery.
- Three black balls (600 mm diameter)
- One diamond (600x1200 mm)

4200 NETWORKING AND ENTERTAINMENT SYSTEM

The systems and/or the individual components of the Entertainment and Networking system shall be subject to finalizing and upgrading up to the point in time that purchase



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orders must be placed to ensure timely delivery and installation, and in accordance with the available allowance as specified in Section 1700.

4300 NAVIGATION AND COMMUNICATION SYSTEM

The systems and/or the individual components of the Navigation and Communication system shall be subject to finalizing and upgrading up to the point in time that purchase orders must be placed to ensure timely delivery and installation, and in accordance with the available allowance as specified in Section 1700.



5000 INTERIOR ACCOMMODATIONS

5100 JOINERWORK

5110 General requirements

The accommodation layout will be according with the general arrangement drawing, technical specification and external profile that will be part of the building specification.

The above mentioned documents may be modified, during the development of the Yacht's design, where necessary in order to:

- accommodate the necessary piping, cable trays, trunks and air conditioning systems;
- take into account technical rooms such as electric stations, fire lockers, engine room, as well for HVAC system need;
- take into account the requirements of the REG Code and the Classification Society.

Any modification shall be agreed with the Interior Designer and the Owner's Representative.

The Interior construction standard are referenced to Motor Yacht "K 584" built by C.P.N.

Final bulkhead positions and dimensions shall be fixed when hull and superstructure drawings (lines and construction) shall be finished.

The interior of the vessel is based on the premise that the design shall be of a common and uniform style in detail and construction throughout all areas. The exception being the crew area, which shall be somewhat simpler, none the less, no lowering standards of construction, plumbing, lighting or finish shall be accepted.

All items specified herein shall be provided, together with any other items necessary for the proper furnishing, outfitting and equipping of all spaces in a manner suitable for the intended use. Any spaces not specifically mentioned, nor completely covered herein, shall be suitable and completely furnished and fitted as specified for other similar spaces.

In the layout of the spaces and the various services, every possible advantage shall be taken of the available space and the various fittings are disposed and fitted in the most efficient manner. Fittings and items of equipment, which require ready access for operation or maintenance, shall be placed in positions so that access is secured without undue disturbance of other fittings in the immediate vicinity. Where it is necessary for

maintenance of plant and concealed systems, secret detachable panels shall be installed.

During construction of the Yacht, the weight of the interior shall be strictly monitored and duly constantly reported. The weight budget for the interior shall be confirmed at earliest stage of engineering by the Builder, Interior Designer and Naval Architect and should be strictly adhered to. As indicative value the average weight budget for the interior should be approximately of 140 Kg/m².

Generally the construction, fittings and equipment shall be as light as possible without compromising the quality standards. Any weight saving construction detail shall always respect the needs for noise and vibrations requirements.

The installation and the fasteners should avoid any cause of noise and should be of anti-corrosive material. In all instances fastenings are to be suitable for the marine environment.

The materials selected by the Interior Decorator shall be available on the market and in compliance with all applicable rules, regulation and environmental requirements.

5120 Accommodation linings and furnishings

The spaces shall be lined and finished as per the approved Interior Decorator drawings and contractual General Arrangement Plan.

In case of covering with synthetic rubber flooring, the thickness shall be 5 mm and the deck under shall be flush and levelled with synthetic composition underlay.

Carpets shall be laid on under felt of about 6 mm thickness, the edges of the fitted carpets shall be bonded or over-locked, depending on the selected carpet. Door frames and bulkhead corner pillars shall be hardwood.

The internal view of all the doors shall be covered with the same material as the adjoining walls, unless otherwise indicated.

Exterior doors shall be of hollow core type, well insulated with glass wool or similar material.

Where laminated finishes are used, such as melanin plastics, stainless steel, leather, vinyl etc., exposed thickness of the materials shall not be visible. The use of compound curves in any joinery finishes shall be kept to a minimum.

5130 Mock-ups and samples

In order to ensure agreement with the Owner on the quality and exact finishes for the interior, the Builder shall:



- Produce samples of all timbers (minimal dimensions A4 each) complete with all different finishes and colours under consideration for selection and approval by the Designer.
- Upon approval of these initial samples, produce a complete full size mock-up of a guest cabin that shall include: door, bulkhead, skirting, cornice moulding, with cove lighting, window wall with sill, column and below sill panelling, typical cabinet, part of typical bed, blinds and dress curtains, leather padded ceiling and floor finishes (carpet and timber). This shall be a fully representative corner unit incorporating the above features.
- Produce 3D drawings of the console and the navigators workstation for approval by the Designer and the Owner's Representative

5140 Furniture and furnishings

All furniture shall be of first class material and workmanship, properly fitted and finished. They shall be free of blemishes and defects harmful to their appearance which might adversely affect their serviceability. Built-in furniture shall be of wood construction.

Screws and bolts in wood structure shall be of suitable stainless steel except in interior unstressed joinery where brass may be accepted.

Where wood is bolted or fastened to aluminium, the fastenings shall be of stainless steel. Wood adhesives and bedding compounds shall be suitable for the specific application.

Particular attention shall be given to the interior design in order to prevent vibration transmission and to eliminate any source of noise. The arrangement and details shall be agreed with the Noise and Vibration Consultant.

All cupboards and fitments shall be of a finish appropriate to the space.

The interiors shall be of selected veneered plywood unless otherwise specified. All drawers shall be lift-up type or shall be fitted with positive locks.

The hinges of cabinets and doors shall be flush mounted and not visible unless they are an integral part of the interior design.

All hinges, fittings, handles and other similar hardware shall be of anodised or sprayed aluminium and no brass fittings shall be used except where particularly specified.

The wardrobes will be provided with shoe racks and hanging racks. All sofa cushions shall be fitted with high quality synthetic rubber foam of appropriate thickness mounted on a plywood base panel, and covered with fabric of an appropriate material and quality.



The dining room, pantry and mess room furniture shall be provided with all necessary internal stowage for crockery, glasses, kitchenware, etc. This shall be in clear plexi-glass.

Lighting throughout shall be either built into the overheads or incorporated in bulkheads or fitments and shall include: spotlights, courtesy lights, floor and ceiling decoration lights and emergency lights. All desks and working tops shall have independent lights. Fixed spotlights shall be fitted to toilet mirrors.

The interior shall make the best possible use of the available volume, specifically:

- All drawers shall be as deep as possible, maximising the use of the available space in/under the furniture, while still permitting removal of the drawer.
- All lockers, cabinets, open recesses, etc. shall be as close as practically possible to the linings.
- Void spaces shall be made available for storage where practical.

The interior of all furniture shall be fully finished in a manner matching the exterior. The insides of cupboards and wardrobes are to be finished in a manner to match to the exterior and are to include drawers, hanging rails, shoe racks, shelves, racks, bookshelves and built-in provisions for TV, video and hi-fi.

All drawers shall operate on telescoping sliders with nylon runners and be fitted with “lift-up and pull-out” arrangement.

All wardrobes are to have automatic interior lighting.

Loose furniture will be in accordance with the General Arrangement plan and will include, sofas, dining tables, chairs, game tables, coffee tables, easy chairs, bar stools, etc, together with the relevant fabric and pillows.

Loose furniture shall be generally secured for use at sea, where appropriate.

As shall be requested/indicated by the Owner or the Designer, invisible secure hanging/fixing of pictures, sculptures and similar items shall be provided.

The following “credit card type” safes shall be provided by the Builder:

- One large size safe for use by the captain
- One large size safe in the Owner’s suite
- One small safe in each guest cabin.

5150 Windows treatment

The following window treatment systems shall be provided:



- Crew area: no curtains shall be provided; blackout shall be by the porthole deadlight
- Lower deck guest area: two manual operated roller curtain (one blackout and one shade)
- Main deck and upper deck (excluding wheelhouse): two manual operated roller curtains (one blackout and one shade) in way of windows. Two manual operated theatre curtains (one blackout and one shade) in way of access doors
- Wheelhouse: shade curtain on frontal windows

5160 Household appliances and other equipment

The appliances shall generally be of the best professional quality and shall be installed in such a manner as to readily permit service and maintenance. Care shall be taken that sufficient ventilation and air exhaust facilities are provided for those equipment in accordance with the maker recommendation.

The water supply to espresso machines, icemakers and hot taps shall be fitted with in-line filter elements to insure the best possible water quality.

The specified models and types establish the standard and complexity that is intended but may be subject to change as equipment manufacturers bring out new models and new technology. It is intended that the latest most up to date equipment, at the time of order, shall be installed. Prior to placing the orders with the suppliers, the Builder shall be required to present the equipment lists to the Owner for approval.

Galley

- One dish washer
- One induction hob
- One electric hob
- One cooking oven
- One ice maker
- One microwave oven
- One coffee machine
- One fridge
- One wine cellar
- One blast chiller



- Two stainless steel fridge/freezer, stand alone type
- One stainless steel exhaust canopy, connected to the exhaust ventilator, with removable stainless steel grease filters, lighting and a CO2 fire extinguishing system (if required by the Class).
- Two sinks
- One waste grinder/disposal units for under sink installation.

Crew mess

- One coffee machine
- One cold storage (see 5800)
- One microwave oven
- One mini fridge
- One sink

Laundry

- Two professional washing machines
- Two professional dryers of condensation type
- One professional iron
- One washtub in stainless steel
- One clothes ceiling rail

Upper Lobby

- One dish washer
- One coffee machine
- One sink

Wheelhouse

- One mini fridge

5170 Hardware

The following specification should be followed by the Builder:

- All door handles and fittings should be selected from the standard range of a top quality manufacturer
- A master-key plan shall be set up for the locks of all entrance doors.



- All doors and drawers shall be provided with seagoing catches and/or positive locking devices to prevent rattling or opening in a seaway.
- Toilet door locks shall be keyless with emergency opening facility.
- All doors should be provided with three ball-bearing hinges, with middle hinge reversed.
- All entrance door frames shall be fitted with rubber seals and doors fitted with brush at bottom.
- All electric sliding or pocket doors shall be fitted with foot switch operation and optical sensor to avoid injury
- Grab rails shall be fitted in accordance with REG Code to permit a safe movement of persons during severe weather conditions.

Unobtrusive/concealed access panels shall be fitted where necessary or advantageous. Where fire class doors are required by the fire protection plan, door specification shall be in accordance with manufacturer type approval document.

5200 Crew Areas

The interior design of all crew areas shall be based on a single theme, with repeating details.

Following, a listing of materials as an indication of what shall be generally expected:

- Floors to be covered with vinyl.
- Wall coverings to be timber, plastic laminate, or vinyl.
- Ceilings with removable lacquered panels.
- Manually operated curtains.
- Hardware by OLIVARI® or similar
- Dressing mirror in each cabin.
- In each cabin, a wall- or door mounted robe hook for each occupant.
- Bathroom fixtures from the INDA® program or similar
- Vanity tops of a basic colour Corian® with integrated sink.
- Mirrored cabinets over vanities.
- Bossini® shower column.
- Hardened glass shower doors, without frames, sandblasted or etched.
- B-Ticino® Living™ series switches and outlets.
- Overhead and indirect lighting.



- Overhead light fixtures, reading light at each berth and desk light.
- Plywood mattress support frames, with ventilation holes.
- Fabric curtains.
- One personal drawer with lock for each crewmember.
- Individual hanging locker with lock for each crewmember
- The available space should be optimally used with storage cabinets, drawers and shelves.

5300 Public Areas

The public areas shall be based on a single theme, with recurring details and specific features in each individual space. Following, a listing of materials as an indication of what shall be generally expected:

- Cabinet work from the best quality exotic timbers and veneers.
- Entrance doors with stainless steel inlay styling detail.
- Floors to be covered with wood, incorporating a specific design.
- Wall coverings shall be timber, lacquered, leather, fabric or mirrored.
- Ceilings with lacquered removable panels.
- Custom stainless steel hardware.
- B-Ticino® Living™ series switches and outlets.
- Overhead and indirect lighting.
- Zucchetti® or Grohe® bathroom fixtures or similar
- Hand shower next to the toilet
- Granite, marble and or Corian™ bathroom interiors with ceramic sinks.
- Hidden recesses for fire hose reels, fire extinguishers etc.
- Discreet escape route marking lights.

5400 Owner's and Guest Area

The interior design for the owner's and guest area shall be based on a single theme, with recurring details and specific features in each individual space. The theme shall be the same as in the yacht's other luxury areas. The Owner's private area shall take up the forward portion of the main deck.

Following, a listing of materials as an indication of what shall be generally expected:

- Cabinetwork from the best quality exotic timbers and veneers.
- Floors shall be covered with wood.



- Wall coverings shall be timber, lacquered fabric, mirrored or special decoration.
- Ceilings with removable panels lacquered or covered with padded leather.
- Manually operated curtains and blinds at all windows, with discretely located switches as per interior designer's instructions.
- Wardrobes with hanging rods, shoe storage, drawers and shelves with fiddles.
- B-Ticino® Living™ series switches and outlets.
- Overhead and indirect lighting, with chrome plated.
- Zucchetti® or Grohe® bathroom fixtures or similar
- Hammam in Owner's Bath.
- Marble shower compartment.
- Sandblasted safety glass shower door.
- Fabric curtains.

5500 Ship's Complement

The Builder shall supply and properly fit onboard the following accessories for a proper use of the Yacht. This shall include the following:

Owner and guest cabins:

- N. 4 Double mattresses
- N. 2 Single mattresses
- N. 10 Pillows

Crew and captain's cabins:

- N. 4 single mattresses
- N. 1 Double mattress
- N.6 pillows
- N. 4 sets of sheets and pillow cases for crew
- N. 4 woollen blankets for crew
- N. 1 set of sheets and pillow cases for captain
- N. 1 woollen blanket for captain
- N. 2 set of towels for captain (three pieces each set)
- N. 1 bath robe for captain
- N. 4 set of towels for crew (Three pieces each set)



Crew mess and galley:

- One complete set of pots and accessories suitable for 24 people
- One set of dishes for 12 people (including coffee and tea)
- One set of cutlery for 12 people
- One set of glasses for 12 people

5700 Lower Deck Storage Area

The lower deck storage area shall be finished with a self-levelling compound and antiskid paint. The interior ceiling and walls shall be lined with aluminium sandwich panels type DI-Bond. One manually operated pantograph transom door shall be provided for access into the area. The status of the door shall be displayed in the ship alarm and monitoring system.

The storage area shall be also outfitted with air / fresh water connections, shelves for books and manuals, a work table, stainless steel sink, wardrobe, a desk with chair and storage for water toys.

Electric sockets and air connections shall be located at ceiling.

5800 COLD STORAGE

A cold storage shall be provided in the lower deck crew area as shown on the GA Plan. The area shall be divided in two sections, one refrigerator and one freezer. Two refrigerating units (one running, one standby) shall be fitted in the engine room. The refrigeration machinery shall be of R-404A direct expansion system and each unit shall consist of an electric motor driven reciprocating compressor and a multi pass shell and tube type condenser.

The compressor shall be provided with suction and discharge stop valves, dual pressure switch, magnetic valve, relief valve and necessary fittings for manual and automatic operation controlled by refrigerant pressure, oil pressure and cooling sea water pressure as well as the temperatures.

Each refrigerating machine shall be able to maintain the specified temperature under the following conditions:

- | | |
|---|--------|
| - Cooling water temperature | 35 °C |
| - Minimum refrigerator/freezer temperature | -20 °C |
| - Maximum refrigerator /freezer temperature | +8 °C |



A hot gas defrosting system by manual control shall be provided with necessary valves and piping for defrosting.

The cold storage shall be fitted with the following alarms: high temperature, low temperature and door open. These alarms shall be integrated in the ship alarm and monitoring system with a dedicated page with all other refrigeration and air-conditioning alarms.

6000 HULL PROTECTION

6100 Internal Protective Coating

A detailed technical specification of the internal structural surfaces protective coating is reported in Annex 1.

6200 External Painting

A detailed technical specification of the external painting is reported in Annex 2.

6300 Cathodic Protection

A cathodic protection system of bolt on type zinc anodes, of acceptable manufacture, shall be fitted to the underwater body, the rudders, the stabilizers, the propeller brackets, the thruster tunnels, all the seawater inlets and where else required, in order to protect the hull and other metallic equipment from galvanic erosion. The number and disposition of the anodes shall be in accordance with the manufacturer's recommendations.

Number and position of anodes shall be determined for eighteen months dry docking cycle.

Earthing arrangements shall be provided for the propeller shafts. During the construction or during on afloat period the hull shall be connected to earth.



7000 HULL AND MACHINERY OUTFITTING

7100 DOORS, WINDOWS AND HATCHES

7110 Watertight internal doors and hatches

Sliding watertight doors below the main deck will be fitted between watertight compartments of the vessel, if required by the Flag or Class. Nevertheless the Flag and Class requirements, sliding doors shall be fitted if shown on the GA plan.

Clear openings will be as per Interior Decorator layout, flush to floor in accommodation spaces. The sill of all watertight doors will be positioned below the level of the bare floor in order to achieve a flush decorative flap in line with the floor finish.

Operation will be electric with remote closing control from the wheelhouse. There will also be facilities for local operation on each side of the door, under which circumstances a signal will be sent to the wheelhouse. Watertight doors shall be kept as discrete as possible. Local door operating audible and visual alarms shall be fitted.

Where necessary and where approved by the Class and Flag, watertight sliding doors can be replaced by watertight hinged doors providing that are intended to be kept permanently closed during navigation. Hinged type doors shall have rounded corners, adequate number of dogs and shall be arranged for local manual operation from both sides.

The status of the doors shall be displayed on ship alarm and monitoring system, all in accordance with the requirements of the Class and Flag.

7120 Weather doors

Weather deck doors giving direct access to accommodation as shown in the GA Plan shall be of weather tight type. Each door shall be built, finished and installed to suit its particular enclosures and purposes. Weather doors shall be of aluminium alloy construction, complete with hand wheels, locks and sealing gaskets.

Weather tight manual sliding doors shall be provided at Owner's cabin entrance.

Means shall be provided to prevent noise from doors in both the open and closed positions and neoprene or similar stops shall be provided on door jambs. The inside of the doors will be lined according to the Interior Design.

7122 External Locker Hatches

The available external space should be optimally used with storage lockers.



An adequate number of weather tight hatches will be provided to access to lockers, filling stations and storage areas from outside. Hatches will be built in aluminium with stainless steel concealed hinges and stainless steel knobs.

Small hull hatches will be provided in the stern near the gangway hatch to run through the hull shore power cables, fresh water connection and door bell cables.

Deck hatches shall be generally made of aluminium construction with four dogs and central wheel or handle. All accessories shall be in polished stainless steel AISI 316L.

7126 Fire doors

Fire doors shall be arranged where required by Classification Society and Flag State Authority regulation, hinged where possible, but otherwise sliding (according to the GAP). Their construction and installation shall be in accordance with the Rules. The fire doors shall be rated the proper fire rating for the fire boundary they are in.

Fire doors will be also capable of being released locally and from the wheelhouse, if required by the Rules.

For hinged doors, retention will be using electromagnets, with power fed from the emergency supply.

Sliding doors shall be fitted with electric device and shall be hidden in wall pockets for permanent open position with flap on both sides of the panelling and a channel in the ceiling with brush seals and stainless steel AISI 316L threshold with a small groove in the floor. Where visible, fire doors will be finished in the same style, and to match, all other internal doors.

7128 Bulwark doors

Two hinged manually operated bulwark doors shall be arranged on the lateral main deck (P/S) and aft main deck as shown in the GAP.

Doors shall built of aluminium alloy construction with not visible polished stainless steel AISI 316L hinges and flush mounted closing cleat.

Door frame shall be welded to the bulwark and shall be made in stainless steel AISI 316L.

7130 Portlights

Not opening type portlights below the main deck shall be provided as shown on the external profile drawing.



Portlights shall be provided with polished AISI 316L stainless steel frame and aluminium or stainless steel deadlight. A flush mounted stainless steel collar welded to the hull side will be fitted. Deadlights shall be of portable type. In the guest area deadlights are made in anodised aluminium alloy and stowed under the bed, properly labelled. Deadlights in the crew area shall be made in polished stainless steel and assembled to the respective portlights.

Portlights shall be designed according to Class requirement and REG Code.

7140 Windows

The number and distribution of all windows are shown on the general arrangement plan and profile view.

All windows will be of non-opening type, glued to frames as per Builder's standard, approved by the Classification Societies.

Windows shall be as required by the styling and shall run as continuous as possible consistent with the structural requirements. The units shall be of modern design, with glass colour as indicated by designer except bridge windows which shall be of transparent type.

The strength requirement shall be covered by meeting classification and statutory requirements.

Wheelhouse area shall be provided by windows having excellent vision forward and to the sides. If practical, flat glass panels shall be used in this area. The windows shall be of multilayer with SGP layer on main and upper deck. Windows glass thickness and composition shall be such to avoid storm shutters, as per REG Code.

The glass used for the windows shall be or chemically or thermal toughened safety glass type.

Fresh water washing and demisting facilities shall be provided for the wheelhouse windows, according to ISO standard.

7200 LADDERS, HANDRAILS AND PASSERELLE

7210 Ladder and stairs

Inclined or vertical ladders shall be provided, as may be necessary, for the entry into spaces for normal access and operation of the vessel and as shown on the general arrangement plan.



External ladder ways shall be constructed of aluminium with anti skid paint on treads. Handrails shall be of stainless steel where necessary. Lighting shall be provided to illuminate the ladder way.

Aluminium alloy vertical ladder with flat bar stringers shall be provided for access to the mast.

7220 Handrails

Handrails will be fitted on all exterior decks where shown on the exterior profile drawing. The top rail or capping rail will have a minimum height of 1.00 m above the finished deck level in accordance with the rules. Handrails will be of round section, mirror polished stainless steel construction and shall be attached to the superstructure or bulwark as required by the Exterior Designer.

Mirror polished stainless steel handrails and safety rails will be also fitted around exterior stairways.

Safety grab rails shall be fitted in the wheelhouse, and in way of consoles, and elsewhere in the accommodation and technical spaces, and as required by the rules.

Railings in machinery places will be removable as required for maintenance.

Handholds are to be provided in way of all access manholes, hatches and escape routes, and as required by the Rules.

7250 Stern gangway

One electro-hydraulic telescopic retractable stern gangway will be fitted, at transom starboard side under the main deck, as shown on GA plan.

The gangway should have at least a clear width of at least 600 mm between the handrails and a suitable length to be deployed of at least 2.4 meter over the stern platform. The gangway shall be of aluminium alloy construction with teak treads, lighting and grating complete with out-board rubber wheels and portable polished stainless steel handrails. The gangway shall be arranged to swing out from stowed position by hydraulic operation and to be stowed in a recessed position. The gangway shall be housed inside a watertight box with a proper closing hatch with seals. Loading capacity at the end shall be 150 kg in extended condition.

The gangway shall have tilting capabilities (approximately 15° both up and down) and a facility to support door bell cable. The hydraulic system shall include relief facilities to permit free up and down and sideways movement. Control of the gangway shall be by a fixed exterior control panel inside the storage area as well as by a radio frequency panel.



7260 Boarding ladder

One boarding ladder, manually operated, shall be provided with hull connections at both side of the yacht. The ladder shall be of aluminium construction with self-levelling teak treads and stainless steel or anodised aluminium handrails.

7300 INSULATION

7310 General Insulation requirements

The hull and superstructures shall be insulated against sound, heat and fire as necessary to maintain the acoustic and thermal performance specified in section 1140 and 3192 respectively. The insulation of decks and bulkheads shall be also designed to include material and specification to meet the fire rating as requested by the Class and Flag. All materials used shall be of non-combustible type.

Particular attention shall be given to the sound proofing plan, using material and treatment appropriate to the location and nature of the spaces.

The insulation material shall be applied after preservative coatings are applied to the aluminium or other material as the case may be. Adequate studs or securing devices shall be installed to secure the insulation in place and the linings shall be installed in a workmanlike manner by qualified and experienced installers.

All insulation material will be tight fitted against structures, hull, decks and superstructure, and will be foil sealed and taped on its inner surface, thereby precluding the risk of loose fibres escaping to the atmosphere. Generally, insulation shall cover all frames and girders.

Vapour barrier shall be installed in lieu of fabric lining as appropriate to the space and where requested by the rules.

In formulating the insulation proposals for the aft storage area, due consideration must be given to both aesthetics and salt contamination, considering that the stern door will often remain open at sea.

Vibration damping treatment will be carried out to minimise the transmission of vibration along the yacht structures.

The vibration damping treatment will include the use of constrained metal plates laid on a visco-elastic compound. Position, thickness and spacing of the damping treatment will be as recommended by the Noise and Vibration Consultant.



The insulation key plan and details shall be produced by the Noise and Vibration Consultant in agreement with the Builder and to fulfil the noise level targets. The Builder has the right to install alternative materials based on the market availability, weight balance as well as certification validity at the time of installation, subjected to the Noise Consultant agreement. The Builder shall inform the Owner's Representative of any deviation.

Pipes capable of transmitting flow noise to the accommodations shall be acoustically insulated in order to meet noise requirements. Special consideration shall be given to the insulation of piping passing through or in way of Owner's and Guest cabins.

7320 Main engine and generator exhaust insulation

Particular attention shall be given to the exhaust line which shall be flexibly connected. Exhaust gas lines and silencers shall be covered with adequate thickness of heat resistant insulation covered with appropriate material.

In principle the following insulation specification shall be applied on the exhaust line:

- Two layers of PROMAGUARD 10 mm
- Two layers 25 mm FIREMASTER 128 Kg/m³
- Finish cladding in upholstered material

The Builder shall have the right to change the above specification, meeting an equivalent efficiency in terms of heat dispersion.

All flanges shall be covered with a special upholstered material having the same finish of the cladding.

The above specification shall assure a superficial temperature on the exhaust piping and silencer not exceeding 65°C.

7330 Propeller area treatment

The thickness of the bottom structural shell plate over the main propellers shall be increased of 50%. A damping material shall be provided in the bilge area over the propeller, about 1 meter aft and forward. It generally shall consists of 2 mm visco elastic material with 3 mm stainless steel plates covering the 80% of the area.



7400 EXTERIOR OUTFITTING

7410 Exterior decks and stairs

All the exterior decks and stairs, excluding foredeck and sun deck, will be planked in natural teak having a finished thickness of 12 mm.

Teak shall be of first quality and it shall be well laid out with margin planks and the planking following the curve of the gunwale and checked into a king plank.

The teak planks used shall be not less than 3.0 meters long and 60 mm wide.

The teak installation shall follow a procedure as recommended by Sika®.

The installation detail and workmanship will be done according to the Builder teak booklet, that shall be approved by the Owner's Representative.

The teak quality shall be selected to cover the high quality standard of yachts, having as main characteristic a straight grain (max 1 cm on 10 cm length), uniform colour, no knots, no cracks and a quarter sawn.

The margin planks shall be 90/100 mm wide and the design shall be with nibbled ends .

The caulking shall be by Sikaflex compound with an isolating tape at the bottom of the seam. Finally, prior gluing the planks to the deck the Owner's representative will examine the selected planks and will check the compliance with the above characteristics.

7420 Overhead of external decks

The overheads of the external decks shall be integrated into the aluminium structure. Lighting, loudspeakers, air grills, etc., shall be recessed into the deckhead.

7440 Protective covers

External covers shall be provided to protect external equipment. They shall be of light weight nylon of colour at Owner's choice.

Covers shall be provided with nylon sail bags, duly marked, and stowed in deck lockers.

Suitable covers shall be fitted on:

- Anchor windlasses
- Capstans
- Horn
- Bell
- Tenders
- Exterior fixed and loose furniture

7450 Awnings

Manually deployed sun awnings, fabricated from lightweight, ultra violet proof self extinguishing fabric shall be provided in the following external areas:

- Aft Upper deck Area
- Forward Area in front of wheelhouse

The awnings shall be supported by removable carbon fibre poles with connections on the respective decks.

7470 Trackway arrangement

Where necessary, a trackway arrangement for overside working shall be provided by the Builder. The arrangement shall be agreed with the Owners Representative and shall be in accordance with the rules as outlined in Marine Guidance Note 422.

Sail tracks by Ronstan® or Harken® will be securely attached to the superstructure for the securing of crew safety harnesses for cleaning and maintenance of all exterior parts of the Yacht that can be reached otherwise, such as the wide body areas. In other areas, such as on the mast structure, pad-eyes will be fitted for the attachment of safety harnesses.

7480 Deck lockers

The Vessel will feature several small lockers suitable for stowage of the following items:

- Wash-down and cleaning equipment.
- Miscellaneous deck equipment.
- Safety & navigation equipment.

Whilst not explicitly indicated on the General Arrangement Plan the Builder shall work with the Owner to develop a suitable minimum level of lockers and miscellaneous stowage spaces during the design and construction of the Yacht.

7490 Aft bathing platform

The aft bathing platform shall be outfitted with recessed bollards and two flush stainless steel sockets for the installation of one manually deployed swimming ladder complete with stainless steel hand railing. The ladder shall be made in stainless steel with teak treads and shall be stowed inside the aft storage area. An external shower shall be also



provided with a box locker on the port side of the transom. A deck wash connection shall be also provided inside the box.

Steps made with a curved steel pipe shall be welded on the transom for emergency access on board.

Removable handrails shall be provided on the stern platform if required by the Rules.

The final layout shall be agreed with the Owners' Representative.

7500 CRANES

7510 Crane devices for tenders

One electro-hydraulically telescopic boom deck crane made by HS Marine® type AK16 shall be provided in the external aft upper deck, with the possibility to launch/haul the tenders.

The crane will be designed and tested for a minimum safety working load of 1.62 tons with a maximum extended arm of about 6.9 mt.

All terminal gear subject to chafing and corrosion shall be in stainless steel AISI 316 L. The tender crane shall be provided with spectra cable type.

The control of the crane shall be by a portable panel complete with a wandering cable with sufficient length to reach the aft deck bulwark at the extremities.

An overhead light will be provided at the end of the crane.

7520 Boat chocks straps and covers

Aluminium chocks padded with leather shall be supplied for the tender boats.

Chocks shall be of the drop down type, wherever necessary, and shall be secured to the deck by stainless steel eyebolts, and shall be removable leaving flush surface on deck. Additional eyebolts shall be provided on the aft main deck in agreement with Owner's Representative.

Boat straps shall be with stainless steel bottle screws with hand-wheel or ratchet type device for tightening.

Straps shall be made of terylene or equivalent material.

Covers of synthetic fabric, white colour shall be provided for the tender boats. The cover shall be properly shaped for drainage, and shall be complete with cord lashings and eyes.



Sets of synthetic lifting sling belts, complete with cross arms and necessary fittings shall be provided as required for the tender boats.

7600 MOORING

7610 Anchor windlass

Two electrically driven vertical anchor windlasses model Opem Sistemi® or equivalent, complete with galvanised steel chain lifter and polished stainless steel warping head shall be provided. The windlass shall have an electrical motor sufficient to exert a continuous duty pull, as requested by the Classification Society, over a period of 30 minutes. Furthermore the windlass shall be capable to exert, over a period of 3 minutes, a pull equal to 1.5 times the continuous duty pull.

Each windlass shall be fitted with a two-speed reversible electric motor (4 poles of approximately 4 KW electric power with electromagnetic disc-brake) driving through totally enclosed planetary reduction gear vertical or right angle type.

The speed and direction shall be controlled by a portable panel complete with a wandering cable with sufficient length to reach the foredeck bulwark at the extremities.

A chain stopper with polished stainless steel hand-wheel shall be fitted. A set of stainless steel devil's claws with stainless steel adjusting bottle screws shall be provided for each chain.

Each windlass shall be mounted on heavy duty steel raised reinforced foundation with a stainless steel top plate. Around the foundation will be stainless steel AISI 316L scuppers draining to below the waterline. The chain stopper with rollers and devil's claws shall be installed on one foundation plate, which will be mounted on the windlasses foundation.

The windlasses shall be approved and tested by the Classification Society.

7620 Warping capstan

Two electrically driven capstans model Opem Sistemi® or equivalent with under deck motors and gear case and with a polished stainless steel warping head shall be fitted on the aft deck on properly re-enforced seats.

Each capstan shall have a two-speed reversible electric motor (4 poles of approximately 3 KW electric power with electromagnetic disc-brake) driving through totally enclosed planetary reduction gear right angle type.



The speed shall be controlled by a fixed watertight panel. For each capstan, the direction shall be controlled by two foot switches; those shall be protected by a cover to prevent accidental use.

7630 Anchor and chain

Anchor and cables shall be in accordance with the requirements of the Classification Society. Two galvanized type high holding power and full balanced anchors each of the same weight of 200 Kg, shall be supplied and stowed in bow anchor boxes.

Anchor chain shall consist of 4 lengths (for each anchor) of galvanized stud link steel chain of 16.0 mm, U2 grade, and each length shall be joined by a Kenter shackle. An adapter piece with U2 galvanised steel swivel shall connect the cable to each anchor shackle. Anchor weight and chain size shall be confirmed by the Equipment Number Plan as approved by the Class, but in no case the final anchor equipment shall be of size smaller than above specified.

A full 3D anchorage arrangement shall be submitted to the Owner's Representative for approval.

The inboard end of the chain cable shall be fastened by a manual quick release system located on the longitudinal bulkhead of each cable locker.

Two bow hawse pipes with anchor boxes shall be fitted of stainless steel AISI 316L construction with necessary chafing bars, and adequate bolsters at hull and deck to ensure the flukes shall arrange for the proper stowage.

Diameter of the hawse pipes shall be such to suit the anchor cable and the lead and design of anchor boxes; hawse pipes shall be such as to ensure satisfactory self-stowing of the anchors.

Stainless steel AISI 316 cover plates shall be provided for the upper end of the hawse pipes at deck over hawse pipe openings.

Wash-down facilities shall be provided in the hawse pipes from fire and deck wash line.

A chain locker of ample capacity to give clear headroom above the chain when stowed shall be arranged in the fore peak having divisional bulkheads of sufficient width and height to contain the port and starboard chain apart. Steel bulkhead shall be lined with wood planks having hand and foot cut-outs to serve as access ladder to the space.

The bottom of the lockers shall be provided with portable false bottom of perforated stainless steel plates providing access for cleaning and drainage. The plates shall be located approximately 100 mm above the bottom.

The chain locker shall be fitted with soft mattress for chain noise damping.



Spurling pipes shall be of stainless steel construction, suitably supported, and with one curve at the upper end and well belled mouthed at the lower end. Spurling pipes shall be positioned to provide even stowage of the chain within the locker.

7640 Deck bollards

All deck bollards will be designed with vertical pillars and made in polished AISI 316L stainless steel which base is connected to the deck and side gutter ways as appropriate. There shall be welded stopper line ring at the end of the bollard. An insert plate of adequate thickness shall be provided on the deck in way of the bollards.

The fairleads shall be of polished stainless steel AISI 316 L and fitted with double rollers (where practicable) of removable type to facilitate maintenance and cleaning.

Mooring bollards shall be provided as follows (size shall be confirmed by the selected manufacturer):

- Fore deck: 4 bollards approx. size 500 x 130 mm.
- Aft deck: 4 bollards approx. size 500 x 130 mm.
- Stern platform: 2 bollards approx. size 400 x 120 mm.
- Centre side deck: 2 bollards integrated in the fairlead

The bollards shall be also designed to meet the requirements of the equipment number to ensure they are of suitable strength.

The final position of the bollards and fairleads shall be agreed with the Owner's Representative.

Roller fairleads shall be positioned to give straight leads to either the windlass warping drums forward or the capstan aft.

7650 Mooring and towing lines

The following mooring/towing lines shall be provided:

- Four by 32 m each of 28 mm diameter
- Four by 42 m each of 28 mm diameter
- One by 100 m each of 32 mm diameter (towing)

Ropes shall be stowed in suitable positions forward and aft.

Rope lines will have eye splice of about 120 cm at one end with a leather protection in the eye.



7660 Fendering

An adequate fendering arrangement made by inflatable PVC fenders shall be provided by the Builder.

Twelve special fender hooks to suit the bulwark shall be provided by the Builder.

7670 Mooring whips

One complete set of 16 feet mooring whips , Richman Marine® model, shall be provided on board.

Mooring whips bases shall be provided by the Builder on the stern platform. Stern whips bases shall be made in polished stainless steel AISI 316 L and shall be flush with the deck.

7700 SAFETY AND NAVIGATION

All equipment and outfit shall be installed or stowed as appropriate by the Builder in accordance with the recommendations of the manufacturer, Class, Flag and also in accordance with the best yacht building practice.

The Builder shall provide the necessary foundation attachments and storages for all equipment and outfit. All stowage arrangements shall be tested by placing the various items in their designated stowage.

7710 Life saving equipment

The Builder shall at an early stage, but in any case before production of any interior joinery drawings, produce a preliminary Safety Plan on the basis of which the required spaces can be reserved in the interior.

The life saving and safety equipment shall be in accordance with but not be limited to the Flag authority and the REG Code requirements for Life saving appliances on board of short range yachts.

The following equipment shall be provided on board:

- 3x Inflatable life-rafts of 16 people each (one spare), made by Zodiac in rigid G.R.P. containers, and fitted with hydrostatic releases H20 (quantity and capacity may vary depending on the final arrangement of the life-rafts).
- 1x Man overboard rescue net safety system
- 4x lifebuoys, (2 complete with self-igniting light and smoke signal, 2 with 30 m buoyant lines) in stainless steel brackets. Lifebuoys shall be marked with name of yacht and port of registry.

- Lifejackets shall be provided, and marked with the name of the vessel, as follow:
 - 18x Adult lifejackets complete with light and whistle
 - 3x Child lifejackets complete with light and whistle
- 1x Set of line throwing appliance (4 lines + 4 charges)
- 6x red rocket parachute flares
- 15x immersion suite for adult, 5 mm neoprene
- 3x immersion suite for children, 5 mm neoprene
- SOLAS Card No.1
- 1x Medical store as required by the Flag
- 2x Two-way radiotelephone set
- 1x Sart
- 1x Epirb
- One pilot and embarkation ladder (2 meter)

7720 Fire Fighting equipment

The following equipment shall be supplied and fitted on board. They shall also be in accordance with Flag Authority and the REG Code requirements for vessel of less than 500 GT:

- An addressable fire detection and alarm system by Consilium® or equivalent shall be fitted in the machinery space and throughout the accommodation and service spaces with an electric alarm panel fitted in the wheelhouse. The system shall be complete of smoke and heat detectors, manual call points and alarm sirens.
- A fire water main system complete with spray/jet/shut-off nozzles and 15 meter fire hose. The fire hoses shall be fitted with UNI 45 connection.
- An emergency diesel fire pump shall be connected to the fire main.
- A Novec 1230 (or FM200 as alternative) fixed fire fighting system shall be installed in the machinery space. The system shall be located in a dedicated area and it will have a manual remote control outside the compartment. Adequate number of nozzles shall be provided in the engine room area and engine room bilge.

The Builder shall also investigate the possibility to install, as alternative to the above, a fire suppression system type Aerosol.

- If required by the Class or Flag according to the final duct arrangement, a CO2 system in the galley exhaust duct shall be provided with local manual control. The duct shall be fitted with automatic fire shutters that can be opened and closed electrically.
- Portable fire extinguishers in accommodation and service spaces, available for use within 10 meter from any location.
- Portable fire extinguishers in machinery space
- Firemen Outfit shall be supplied two in number consisting of the following:
 - Protective fire suit
 - Boots and gloves of rubber or other electrically non-conducting material
 - Rigid helmet
 - Approved type electric safety lamp
 - Axe
 - Smoke helmet or mask with self contained breathing apparatus.
 - Lifeline with snap-hook.
- One fire blanket, coated glass fibre, 180x120 cm in the galley.

7730 Navigation Instruments

The following navigation instruments shall be fitted on board:

- n. 1 clock in wheelhouse
- n. 1 Chronometer
- n. 1 Hygrometer
- n. 1 Thermometer
- n. 1 Barometer
- One set of instruments to be fitted on the wheelhouse indicating wind speed and direction
- n. 1 clinometer to be fitted in engine room

7740 Flags

A fully divided Flag cabinet, with clear acrylic front shall be recessed into the chartroom console, and contain the following Flags, in wool bunting:

- n. 1 set international code Flags (medium size)
- n. 1 set vessel's call letter Flag group (medium size)
- n. 1 national Flag (country of register)
- n. 1 courtesy Italian Flag



7750 Windscreen wiper

Electric windscreen wipers shall be fitted in forward facing wheelhouse windows. Wiper arms shall be in stainless steel with intermittent, slow and high speed. Wiper blades shall self-park to one side on switching off; the motor shall have anti radio interference construction and components.

The system shall be provided with a proper control panel also including separate switches for controlling the water supply to the nozzles to permit wetting of the windows independent from wiper operation

7800 TECHNICAL AREAS

7810 Machinery space

The machinery space shall be easily accessible from the lower deck crew area through an insulated water tight steel door.

An emergency escape to the exterior main deck shall be provided through an insulated water tight aluminium or steel hatch. From the machinery space an access to the aft storage area shall be also provided.

The machinery space shall be lined with acoustic/thermal insulation which shall be protected against physical damage by painted aluminium sandwich panels type DI-Bond or similar.

Adequate space shall be allowed for easy access to and for maintenance of machinery and electrical equipment in place and for removing items which require replacement.

Brackets, eye-plates and lifting beams shall be fitted in appropriate positions to facilitate transfer of machinery components.

All machinery shall be resiliently mounted to reduce noise.

Engine room access and layout shall be in accordance with Classification requirements and marine practice.

7820 Generator space

The machinery space shall also accommodate the two generators. Each generator shall be located in a sound proof housing.

7850 Floor plates, ladders and guardrails

Ladders, platforms and floor-plates shall be provided as necessary for convenient access and operation of the various machinery and electrical items.

The main ladders shall have non-skid treads and polished stainless steel hand-rails. Floor shall be anodised aluminium chequer plate and shall be made readily removable for access to bilges, pipe-work and machinery.

Stainless steel AISI 316L tubular handrails for the protection of personnel shall be provided where necessary. Safety grills or guards will be positioned in way of rotating machinery.

7860 Workbench

A workbench shall be provided in the machinery space between the two engines, including the following:

- One working bench of suitable size
- One bench vice of suitable size
- Aluminium shelves and lockers for tools
- Sockets for heavy duty electrical tools
- One stainless steel hand-wash basin.
- One set of compressed air spraying equipment complete of all necessary fittings and nozzles and suitable length of hoses.

7870 Shelving in storage spaces

Suitable spaces in the technical will be provided to store oil cans, yacht equipment and spare parts. The spaces will be fitted out with appropriate flooring. Steel or plywood shelves will be installed in the storage spaces.

7900 Name plates, notices and marking

The builder will furnish and install nameplates, notices, markings and labels in accordance with the nameplate schedule in English. Suitable aluminium or plastic identification plates will be installed to mark all valves, cocks, filters, pumps, electrical components etc. The nameplates will be screwed or glued in place. All pipes shall be colour-coded according to their functions by marking tape.

The Yacht's name and Port of Register shall be marked on the stern by polished stainless steel lettering, as per Exterior Designer proposal.



Polished stainless steel draft marks and load lines (Plimsoll marks) will be fitted according to the Flag Authority's requirements, glued on the hull. The load line marks will be fitted amidship.

All instructions for operation of shipyard supplied lifesaving or safety equipment such as fire extinguishers, fire stations, fire suppression release, etc., will be provided in English. The ships official number, IMO number and tonnage will be centre punched into a transverse structural member.

8000 YACHT EQUIPMENT

8100 Hydraulic System

(3) Three separate central hydraulic power pack units will be installed with associated piping, valves, fittings and controls to serve the following:

- (1) Power Pack Unit located in the aft peak for the gangway
- (1) Power Pack Unit located in the aft peak for the steering
- (1) Power Pack Unit located in the aft storage area for the tender crane

In general each unit will be powered by an electric motor and will be complete, pre-piped with hydraulic pump, reservoir, return filter, relief valves, gauges, isolation valves and foundation.

All supply piping and fittings will be in stainless steel AISI 316L. Piping diameter and schedule shall be in accordance with manufacturer instructions.

8200 Bow Thruster

A bow thruster unit shall be installed in a transverse tunnel in a suitable location in the stem forefoot.

The unit shall be driven by an electric motor of 52 kW, turning a fixed pitch screw propeller.

The thruster tunnel and the bow thruster compartment shall be properly insulated, in accordance to the noise and vibration consultant recommendation.

All components of the system shall be located and installed in accordance with the instructions and recommendations of the Manufacturer.

The speed and direction shall be controlled by a full proportional tiller.

The start/stop button as well as the speed and directional controls and indications shall be fitted in the wheelhouse and wing stations.



The electric motor and gearbox shall be fitted in a separate watertight compartment which shall be adequately ventilated.

The transverse tunnel shall be in steel and welded to the hull structure; shell plate thickness shall be increased in way of the tunnel.

Flat grids made with stainless steel AISI 316L, 10 mm diameter round bars shall be provided acting as protection of the bow thruster screw propeller at either end of the tunnel. These shall be fixed in place using Stainless Steel AISI 316 bolts.

The bow thruster shall have an independent oil tank for the gearbox lubrication.

8300 Stabilizer

One set of fully electro driven non retractable type anti-rolling fins shall be provided. The fins construction shall be in fibreglass and/or steel.

The size and the location of the fins shall be determined in consultation with the manufacturer, and considering the requirement that the fins remain within the envelope of the keel line and the maximum beam shall be a limiting factor. The system and fin dimensions shall be designed for peak performance at 12.0 knots while underway and optimum roll damping while at anchor.

The system includes a brushless motor with electromagnetic brake, epicyclic gear unit and a mechanical transmission from the electric actuator and fins.

The system shall be provided with a fin centre position function in order to bring the fins at the hydrodynamic central position.

All steel forming seating and shell openings shall be constructed by the Builder in accordance with the instruction of the manufacturer and the requirements of the Classification Society.

8410 Aft Main Deck handling arrangement

The Owner shall provide one diesel tender of about 6.0 meter with an inboard engine and one diesel tender of about 4 meter with an outboard engine to be installed by the Builder on aft main deck. The launching and recovery of the tenders shall be by a telescopic boom deck crane.

All the equipment necessary for launching and recovering of the tenders shall be provided by the Builder.

Crane device and boat chocks shall be provided as reported in section 7510 and 7520 respectively.



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The final deployment arrangement for tenders shall be worked out in detail through discussions between Builder and Owner Representative. This activity is part of the Owner's Decision List.



PROJECT MF 36_H2



9000 ANNEXES

9200 ANNEX 1: INTERNAL PROTECTIVE COATING



PROJECT MF 36_H2



9300 ANNEX 2: EXTERNAL PAINTING