

SPECIFICATIONS OF CONSTRUCTION  
FOR  
FRP FISHERIES RESEARCH VESSEL  
IN  
AQUACULTURE DEPARTMENT SOUTHEAST  
ASIAN FISHERIES DEVELOPMENT CENTER  
(SEAFDEC)

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# C O N T E N T S

	Page
Chapter 1    GENERAL .....	1
1.1    General Description .....	1
1.2    Class, Inspection and Supervision .....	1
1.3    Nationality .....	1
1.4    Vessel's Form and Etc. ....	2
1.5    Principal Particulars .....	2
1.6    Others .....	2
 Chapter 2    HULL PART .....	 4
2.1    Hull Construction .....	4
2.2    Stores .....	4
2.3    Anchoring Gear and Mooring Equipment .....	4
2.4    Steering Gear .....	5
2.5    Ladder and Hand Rail .....	5
2.6    Mast and etc. ....	5
2.7    Awning and Cover .....	6
2.8    Life Saving Appliances and Dinghy .....	6
2.9    Fire Extinguishing Appliance .....	6
2.10    Oil and Water Tanks .....	7
2.11    Various Piping .....	7
2.12    Communications and Signalling .....	8
2.13    Lighting and Ventilation .....	8
2.14    Nautical Instruments .....	9
2.15    Radio Equipment .....	10
2.16    Fishing Gears .....	10
2.17    Life Bait Tank .....	11



2.18	Top of Wheel House .....	1 1
2.19	Top of Deck House .....	1 1
2.20	Wheel House .....	1 1
2.21	Crew's Space .....	1 2
2.22	Galley .....	1 3
2.23	Water Closet .....	1 4
2.24	Battery Box .....	1 4
2.25	Painting .....	1 4
2.26	Marks .....	1 5
2.27	Anchors, Chain Cables and Ropes .....	1 5
2.28	Accessories of Hull Part .....	1 6
2.29	Inventory and Spare Parts of Hull Part .....	1 7
Chapter 3	MACHINERY PART .....	1 8
3.1	General Description .....	1 8
3.2	Main Engine .....	1 8
3.3	Shafting and Propeller .....	1 9
3.4	Main Engine Remote Control System .....	1 9
3.5	Auxiliary Engine .....	2 0
3.6	Pumps .....	2 1
3.7	Hydraulic System .....	2 1
3.8	Oil Tank .....	2 2
3.9	Engine Room Outfitting .....	2 3
3.10	Exhaust Piping .....	2 3
3.11	Piping .....	2 3
3.12	Painting and Marking .....	2 4
3.13	Spare Parts of Machinery Part .....	2 4
3.14	Inventory of Machinery Part .....	2 4

Chapter 4	ELECTRIC PART .....	27
4.1	General Description .....	27
4.2	Main Electric Source .....	27
4.3	Sub-Electric Source .....	28
4.4	Shore Source Connection Equipment .....	28
4.5	Switchboard .....	28
4.6	Electric Power System .....	29
4.7	Lighting System .....	29
4.8	Marks .....	31
4.9	Spare Parts of Electric Part .....	31
4.10	Supplementary Outfit of Electric Part .....	32
4.11	Use Division of Electric Power .....	32
Chapter 5	MISCELLANEOUS TESTS AND PLANS .....	34
5.1	Miscellaneous Tests .....	34
5.2	Approval Drawings and Final Drawings .....	35
5.3	Appendix .....	36

## CHAPTER 1 GENERAL

### 1.1 General Description

1. This is a Fisheries Research FRP Vessel to be aimed at following affairs belonging to The Aquaculture Department Southeast Asian Fisheries Development Center (SEAFDEC, in the Republic of The Philippines).
  - (1) The purchase of the caught shrimps by the Normal fish vessels.
  - (2) Inspection Work by the Other Shrimp Trawl and Trammel net (Sanmai Ami)
  - (3) Investigation of the Resources, the Life and Ocean
  - (4) The training of the crews concern the above mentioned (1), (2), and (3) items
2. The vessel is to be built in accordance with this Specification and the attached General Arrangement and Midship Section (Reference Plan). Detailed Plans are to be made by mutual consent between the Owner's representatives and Fishing Boat Association of Japan.

### 1.2 Class, Inspection and Supervision

1. The vessel to be passed the inspection of The Japanese Government for Exporting.
2. The vessel to be built in compliance with the Japanese Ship's Safety Rule & Regulations (the 3rd class fishing vessel of the special Rules) and the temporary rule of FRP Vessel in Japan (Notice of NOT, Aug. 7, 1968) and the construction rule of FRP fishing vessel (The temporary rule of Lloyd's Register of Shipping).
3. The vessel to be passed the inspection of (NK) (the Japanese Ship's Safety Rule & Regulations (the 3rd class fishing of the Japanese Special Rules)). However, small electric fittings to be used one phase, AC 220 volt by the requirement of Aquaculture Department Southeast Asian Fisheries Development Center (SEAFDEC).
4. The Tonnage Certificate (NK: Japanese rule) to be furnished.
5. The vessel to be inspected by the Authorities of Japanese Government for the Republic of the Philippines in Radio telegraphy and necessities.
6. This vessel to be supervised by Fishing Boat Association of Japan.

### 1.3 Nationality

Nationality certificate to be issued by the Republic of Philippines.



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SPECIFICATIONS OF CONSTRUCTION

FOR

FRP FISHERIES RESEARCH VESSEL

IN

AQUACULTURE DEPARTMENT SOUTHEAST

ASIAN FISHERIES DEVELOPMENT CENTER

(SEADEC)

ERRATA

PAGE	LINE	RIGHT	WRONG
9	8	driven	driven
9	26	not	pot
11	31	vinyl	vinyle
13	25	asbestos	asbestos
17	11	Vinyl	vinyle
24	21	drill	dril
25	18	funnel	funnerl
26	16	parallel type	paralled type
34	22	Go-astern test	Go-stern test

(end)

#### 1.4 Vessel's Form and etc.

1. The vessel is to be of single flush decker type with deck houses on upper deck.
2. The vessel to keep good stability and seaworthiness, and to have good maneuverability.
3. It is imperative to keep the following requirements at construction of this vessel.

To construct to endure impact of waves, and consider to prevent vibration, ventilation, wetness and heat.

#### 1.5 Principal Particulars

##### 1. Principal Dimensions

Length (by Japanese fishing boat rule)	14.00 m
Breadth (moulded)	3.90 m
Depth (moulded)	1.50 m

2. Gross Tonnage (by Japanese rule) about 20 ton

##### 3. Main Engine

Single action 4 cycle medium speed diesel engine with turbocharger, output of not less than 150 P.S.

##### 4. Capacity

Fuel oil tank	about 2.5 m <sup>3</sup>
Fresh water tank	" 0.8 m <sup>3</sup>
Lubricating oil tank	" 0.1 m <sup>3</sup>

##### 5. Speed

Designed trial max. speed about 9 knots

6. Duration of cruise about 2 days

7. Complement Total 8 persons

#### 1.6 Others

1. Approval drawings, final drawings, instruction books, marks and colour photograph with principal particulars are to be in English.
2. Working to be done so carefully and kindly, as to be easy for repair and maintenance.
3. The vessel to be of FRP material, and to be arranged with special attention so as to avoid galvanic action.



4. The vessel to be carried by shipment to the Republic of the Philippine, and so fore and after mast, antenna for radio telephone to be of removal style, and the shipyard shall supply the cradle of the vessel.

## CHAPTER 2 HULL PART

### 2.1 Hull Construction

#### 1. General

The construction and scantling of hull structure members are to be strengthened in accordance with the Midship Section Plan, referring the construction rule of FRP fishing vessel (the temporary rule of Lloyd's Register of Shipping)

The vessel to be designed to prevent hard spot and considered to prevent deflection and vibration.

#### 2. Rudder

The rudder is to be of double steel plated, balanced type and to be covered with FRP.

#### 3. Others

- (1) The cutting parts of FRP in way of holes or openings and attached parts of deck fittings are to be sealed with plastics for glass fiber not to be exposed, and also to be reinforced suitably.
- (2) Suitable protection is to be provided at the parts where defacement, cracks and etc. will occur at touching to other vessels and quay walls, or at handling deck machineries and equipments.
- (3) Zinc anodes for cathodic protection are to be fitted around the propeller and sea chests.

Earths are to be provided at machinery in engine room and shaftings to prevent galvanic action.

### 2.2 Stores

The store is to be installed at the bow, and both side of steering gear room.

The F.R.P. water tight hatches, are to be fitted on the upper deck, and to be provided with locks. The inner surfaces of the stores to be of wooden sheet.

### 2.3 Anchoring Gear and Mooring Equipment

1. Anchors and mooring to be done by the warping end of trawling winch on the forecastle deck through the side roller. Anchor lashing device are to be fitted on the forecastle deck.

2. The following mooring equipments are to be provided.

Fore: One bitt, 2 fair leaders (on fore bulwark)

Aft: Each one bitt (port & starboard)

Galvanized steel bands and patches to be fitted on bitts.

Other: Ring plates, cleats, and rollers.

#### 2.4 Steering Gear

The steering apparatus to be a hand hydraulic gear and also emergency hand operating apparatus to be provided.

The oil pressure pipe between the steering stand and gear to be installed and arranged for easy repair. Suitable protection to be provided at the parts where will occur at damage. The hatch of steering gear room to be of steel and water tight.

#### 2.5 Ladder and Hand Rail

1. Wooden ladder with hand rail to be furnished at accomodation part, and steel ladder at engine room.

F.R.P. material step to be provided at outside wall on deck house.

2. Steel (galvanized) hand rail to be provided between deck on wheel house, deck on deck house and bulwark at port and starboard.

#### 2.6 Mast and etc.

1. All masts to be of light metal or FRP material.
2. The standing riggings to be covered with vinyl pipe and to be fitted with rigging screw.
3. The followings to be fitted on each mast.

fore mast	mast light	fishing light	anchor light
after mast	stern light	working light	

4. Flag staffs to be installed at the bow and stern, and fitted with blocks and wires.

## 2.7 Awning and Cover

### 1. Awning

The awning to be of synthetic fiber, and to be installed on the after parts of the upper deck.

The awnings to consist of center-ridge, stanchion, reach rope and etc.

### 2. Covers

The covers to be of synthetic fiber and to be fitted at the main engine, radar scanner and working light.

## 2.8 Life Saving Appliances and Dinghy

### 1. Life Saving Appliances

(1) As the life saving appliances, provide the following items.

a. Inflatable life raft, with FRP container, for 13 persons, Out type	1 sets
b. Inflatable life jacket	12
c. Ring life buoy	2
d. "SOS" Auto-alarm (2182 KHz)	1
e. Self igniting light	2
f. Self activating smoke signal	2
g. Rocket	2
h. Parachute signal	4

(2) The inflatable life raft to be installed at appointed position on the top of deck house, platform and release to be fitted.

### 2. Dinghy

A dinghy to be about 3.5 m inflatable rubber boat with 3 PS outboard engine, hand operate air pump.

## 2.9 Fire Extinguishing Appliance

As the fire extinguishing appliances, five (5) portable foam extinguishers to be provided.

## 2.10 Oil and Water Tanks

Oil tanks to be of hull construction type and welded steel or FRP type.  
Fresh water tanks to be of hull construction type.

In each tank, stiffener, swash plates, manholes to be fitted, and also air pipe, sounding pipe, filling pipe, discharging pipe, connecting pipe and etc. to be installed.

## 2.11 Various Piping

Various pipings to be installed in accordance with the followings.

Fresh water pipe, sea water pipe, oil pipe, air pipe, filling pipe (fresh water and oil) and sounding pipe on the decks are to be fitted with name plates in english and to be arranged for convenience of installation, inspection, and repair.

### 1. Bilge pipe

- (1) The following spaces bilge to be discharged by the motor driven pump and/or hand bilge pump.

Place	bilge pump	
	motor	hand
Bottom space under crew's space	o	o
Engine room	o	o
Steering gear room		o

- (2) One (1) hand pump to be provided.

### 2. Wash deck pipe

- (1) Wash deck pipe to be arranged the both side of the engine casing from a motor driven general service pump, and with hose couplings and stop valves.
- (2) Two (2) rubber hoses (each 8 m length) with hose coupling and nozzle for deck washing to be provided.

### 3. Fresh water piping

Fresh water line to be arranged to supply to the sink of galley and wash basin of water closet from fresh water tank by motor driven fresh water service pump.

#### 4. Sanitary pipe

The sewage at water closet to be drain by hand sea water pump, and non-return valve to be fitted at shell outlet.

Sewage pipes to be arranged to discharge soil water outboard from the water closet and sink at galley.

#### 5. Scupper pipe

The scupper pipes to be arranged at wheel house, galley and water closet.

#### 6. Oil pipe

Refer to Machinery Part

### 2.12 Communications and Signalling

#### 1. Voice tube

The voice tube between wheel house and engine room to be fitted with whistles, and the tube in wheel house to be of non-magnetic material.

#### 2. Motor siren

Motor siren to be of water proof type, 0.4 KW.

#### 3. Engine telegraph

Engine telegraphs to be of hand type, and to be used between wheel house and engine room.

### 2.13 Lighting and Ventilation

#### 1. Lighting to be installed as follows.

Designation	Type	Place
Square window	Lifting type, reinforced glass	Front of wheel house (with shifting board) (3) Side of wheel house (2)
Scuttle	Fixed simple type	Door of galley and water closet (3)
Skylight	Opening type (water tight)	Crew's room (or emergency hatch) engine room (or emergency hatch)



- (1) Eaves to be installed on the upper part of square window.
- (2) One of the square windows in front of wheel house is to be of fixed type, and fitted with one motor driven clear view screen.
- (3) The skylights to be operated at inside and outside.

The skylight in crew's room to be fitted with a light intercepting cover.

## 2. Mechanical ventilation

- (1) Motor driven axial blowers to be installed at the following places.

Place	Type of motor	Output of motor	Quantity
Engine room	Reversible type	0.4 KW	1
Main engine	Supply type	0.4 "	1
Crew's room	Reversible type	0.4 "	1

- (2) Ducts are to be made of galvanized steel sheet or FRP, and provided with punkalouvre or equivalent for accommodation space. The inlets and outlet of ducts at engine room are to be fitted steel nets.
- (3) The air inlets of blowers are to be provided with closing appliance for emergency.

## 3. Mush-room ventilators

Mush-room ventilators are to be installed at engine room, W.C. and galley.

## 2.14 Nautical Instruments

The following nautical instruments are to be provided, and also necessary stands, wiring, accessories and spares to be provided.

1. Radar (table stand type) 1  
Braun tube dia 7 inches, peak power not less than 5 KW, range not less than 30 sea miles, and electric source DC 24 V.
2. Magnetic compass (table stand type) 1  
with adjusting tools deflector, compass card dia. 150 mm.
3. Fish finder (with Braun tube) frequency 200 KHz and electric source DC 24 V. 1

## 2.15 Radio Equipment

The following radio equipments are to be provided, and also necessary accessories, spares, tools, and documents to be provided.

### 1. SSB system radio telephone apparatus

Quantity	1
Antenna power, output and type	A <sub>3</sub> J 50W, A <sub>3</sub> H 12.5W
Frequency range	1.6 - 9 MHz
No. of channel	Transmitter and Receiver about 18
Electric source	DC 24V

2. Suitable antenna for equipment are to be installed.

## 2.16 Fishing Gears

The following fishing gears to be installed. The detail of gears, ie, size, installation, arrangement and etc. to be decided according to Owner's instruction.

Some apparatus that to be decided in accordance with the indication of supervisor are to be kept at the condition of removal.

### 1. Shrimp otter trawl fishing gears

- (1) Trawl winch to be of Hydraulic (high pressure) motor driving system, and installed on the aft part of upper deck.

Winch capacity to be 1t x 30m/min, and to be locally controlled.

Winch to be with 2 main drums and 2 warping end drum, wire shifter (connection type for only main drum), clutch (hand driving type) and brake (hand driving type).

Main drum to be with warp (9mmø x 300m).

Suitable reinforcement is to be provided under winch.

Hydraulic unit for trawl winch driven to be as machinery part 3.7.

- (2) About 2.5m length bulwark at center part of aft. bulwark are to be made low about 400mm than others, horizontal roller for pulling of net (100mm dia, 2.5m length, with gun metal bush) to be fitted.

(3) On the aft bulwark, about 1 m height two gallows (reverse L type) are to be installed. Gallows are to be with top roller and marking roller.

(4) Aft bit is to be with ring for hanging stopper of otter board.

(5) Necessary blocks, cleats, rings and shackles etc. are to be fitted.

2. Trammel net fishing gears

Trammel net to be of hand type, not installed gear especially.

3. Derrick post and derrick boom (0.5T) to be fitted at aft of engine casing for driving of trawl net and cargo, also necessary blocks and ropes are to be fitted. Cargo handling to be done by warping and drum of trawl winch.

2.17 Life Bait Tank

1. Life bait tank of 1 m<sup>3</sup> capacity to be of FRP and fastened on aft deck or on deck of crew's space, and also necessary platform, ropes to be fitted.

2. At the Life bait tank, supply system of sea water and drainage system to be fitted.

2.18 Top of Wheel House

Following equipments to be installed on this deck.

Working light (500W) x 1, radar stand x 1

Side light x 1 set, Whip antenna for SSB x 1

2.19 Top of Deck House

Following equipments to be installed on this deck.

engine skylight, funnel, mechanical ventilator, mush room ventilator, life raft, fore mast.

2.20 Wheel House

1. Ceiling insulation to be considered to prevent over heating by the sun.

Inner surface of ceiling to be laid with thick vinyle cloth instead of linnings.

Linning of arround wall to be of marine use water proof plywood, and insulation of 50 mm thick to be fitted.

2. Floor to be laid with linoleum.
3. The door of wheel house to be of light alloy sliding door with thick glass at square and rubber packing.
4. The following equipments to be provided in the room.

Hand steering stand	Engine remote controller	Radar indicator	Fish finder
Magnetic compass (table stand type)	Chart table with chart box and blind	Barometer indicator	SSB system radio-telephone
Clock	Telegraph	Navigation light indicator	Voice tube
Motor siren controller	Binocular box	Book case	Signal flag box
Fire extinguisher (1)	Others		

## 2.21 Crew's Space

The furnishings in crew's rooms, to be as follows.

1. The ceiling and wall of room to be insulated with insulation material of not less than 50 mm in thickness, and to be lined with water-proof treated plywood for marine use.
2. The floor to be laid with linoleum.
3. Furnitures and fittings for room to be provided as the following table.

Item	Quantity	Item	Quantity
Single berth (with mattress and curtains)	4 P.	Blanket (Single)	10
		Hat hook	10
Pillow	4	Book case	4
Locker	4		
Fire extinguisher	1		

4. Effective size of berth to be 1.90 m x 0.60 m
5. Mattress to be foam mattress of not less than 50 mm. in thickness.

## 2.22 Galley

1. Door of galley to be of light alloy (water tight) and with fixed scuttle.
2. Furnitures and fittings in galley to be provided as the following table.

Item	Quantity
Auto-rice cooker (propane gas use)	1.8 lit-terxl
Propane gas range	1
Stainless sink (with fresh water cock)	1
Electric refrigerator, about 120 litter	1
Locker	1
Fire extinguisher	1
Cooking utensils	1 set

3. The ceiling and wall near the cooking range to be lined with fire-proof sheets of asbestos and etc. and to be protected from fire.
4. Sewage pipe of sink to be with non-return valve and etc.

5. Propane gas detector to be fitted.
6. Propane gas bottle to be supplied by the owner and to be installed at outside. Pipe between bottle and Auto-rice cooker, range to be of copper pipe.

#### 2.23 Water Closet

1. Door of water closet to be of light alloy.
2. The following equipments to be installed in WC.

Item	Quantity
Western style stool (Small, with storm rail)	1
Hand sea pump (cleaning use)	1
Paper holder	1
Water basin (with cock for fresh water)	1
Sea water cleaning pipe	1
Soap case	1

3. Sewage pipe of water closet to be with non-return valve.

#### 2.24 Battery box

Battery box to be arranged in the engine room.

The inner surface to be coated with acid resisting paint and gas outlet to be provided.

#### 2.25 Painting

The shell plates above water line to be coated with polyester gelcoat (appointed colour), and the shell plates below water line to be coated with bottom paint.

The exposed deck to be coated with urethane and sand mixed paint. (appointed colour).

The outside and inside of upper constructions to be coated with urethane paint. (appointed colour).



The inner bottom and places under floor to be coated with rust colour marine paint.

Wooden parts except treated plywood to be coated with urethane paint.

Steel parts to be galvanized or coated with colour paint after coating of anti-corrosive paint.

All paint to be coated 3 or more times carefully.

## 2.26 Marks

### 1. Ship's name and port of registry

The ship's name to be indicated in English at each side of the bow, and at stern.

The port of registry to be indicated as above-mentioned at stern.

### 2. Draft marks

Draft marks to be indicated at each side of the bow, and stern.

### 3. Funnel mark

The appointed funnel mark to be attached to the funnel.

### 4. Other marks

Other necessary marks to be fitted at the life rafts and etc.

## 2.27 Anchors, Chain Cables and Ropes

Anchors, chain cables and ropes to be provided as follows.

Bow anchor (Danforth type)	25 Kg x 2 sets
Bow anchor chain cable (welded type)	10 mm dia. x 5 m x 2
Bow anchor rope (viniron rope)	24 mm dia. x 100 m x 2
Mooring rope (viniron rope)	25 mm dia. x 110 m x 1 18 mm dia. x 50 m x 4
Hawser (viniron rope)	18 mm dia. x 100 m x 1
Shackle for bow anchor	4

## 2.28 Accessories of Hull Part

Accessories to be provided according to Japanese rule requirement of the 3rd class fishing vessel (less than 25m in length).

Items	Quantity	Items	Quantity
Gong	1	Fishing light (elect. lamp)	1 set
Clock (transistor type)	1	Fishing ball	1 set
Binocular (7 times x 50 mm)	1	Black ball	1
Barometer	1	Nationality flag	2
Sextant	1	NC flag	1 set
Magnetic compass (table stand type)	1	Sign flag	1 set
Mast light (elect. lamp)	1	Owner flag	2
Side light (elect. lamp)	1 pair	Motor siren	1
Stern light (elect. lamp)	1	Driving anchor (parachute type)	1
Anchor light (elect. lamp)	1	Hand lead (not less than 3.2kg)	1
		Chart (near Philippines)	10 sheets

## 2.29 Inventory and Spare Parts of Hull Part

### 1. Inventory and Spare parts

Inventory and spare parts for various fittings to be supplied in accordance with makers' standard.

### 2. The following inventory and spare parts to be provided.

Item	Quantity	Item	Quantity
Chart weight(circular type, covered)	4	Sea knife	2
Triangle for chart	1 set	Scissors (various kinds)	each 1
Divider	1	Scupper driver.	1 set
Clinometer	1	Spanner(various kinds)	each 1
Vinyle spherical fender (with rope)	2	Plier	1
Rubber stick fender(with rope)	4	Driver(± large, medium, each 1 small)	
Steel block (single, with rope)	2	Monkey wrench(large, small)	each 1
Wooden block (single, with rope)	2	Pipe wrench(large, small)	each 1
Steel and wooden snatch block	each 2	English Spanner	1
Throwing rope(with sand bag)	1	Bucket (poly)	2
FRP repair tool	1 set	Sand box	2
FRP repair material	1 set	Small oil can	1
Hammer (medium & small size)	each 1	Spike (wooden & steel)	each 1
Carpenter tool (with box)	1 set	Whetstone(various kinds)	each 1
Chisel (various kinds)	each 1	Whistle	2
Set file ( " )	each 1	Basin (poly)	3
File handle	2	Step board	1
Painting tool	1 set	Folding chair	3
Paint (various kinds)	a little		
Funnel	1		
Oil feeder (mouse type)	1		
Sounding scale(for water & oil)	each 1		
Nail pole	1		
Flashlight(water proof, with 3 cells)	2		
Room cleaning tool	1 set		
Deck washing brush	2		
Soap brush	2		

## CHAPTER 3 MACHINERY PART

### 3.1 General Description

Machineries in engine room are to be made in good order for performance and strength, and so arranged as to be easy for watching, maneuvering, inspection, overhauling, repair and etc., and to avoid vibration. Dangerous parts are to be guarded with covers.

### 3.2 Main Engine

The main engine is to have following particulars, and is so designed to avoid torsional and other vibration, and to be able to be driven as slowly as possible.

1. Type & No. : 4 cycle medium speed diesel engine with turbocharger x 1
  - Rating output : Not less than 150 PS
  - Rating revolution : Not more than 1,800 RPM
  - Propeller revolution : Not more than 600 RPM
  - No. of cylinder : 6
  - Starting system : Electric motor starting
  - Fuel oil : Diesel oil
  - Cooling system : Sea water cooling
2. A reverse-reduction gear and a clutch to be attached.
3. The governor to be of all-speed type.
4. The engine to be attached with fuel oil supply pump, lubricating oil pump, cooling water pump, bilge pump, which are to be driven by the main engine and lubricating oil hand pump, cooling water hand pump.
5. A air clutch and gear to be installed at fore end of crank shaft in order to drive hydraulic oil pump for trawl winch.

Furthermore, air clutch system to be provided with air compressor (0.4KW electric motor driven), air reservoir, safety valve, pressure reducing valve, pressure gauge, etc.

### 3.3 Shafting and Propeller

#### 1. Shafting

The propeller shaft is to be of stainless steel or to be high tensile manganese bronze. The medium shaft is to be of solid forged steel. The bearing part of shafting to be a little larger than original shaft in diameter.

2. Stern tube to be cooled by sea water supplied by cooling water pump as attached to the main engine. Good gum bearing long enough to be used at bearing part.

Good packing to be used at ground of fore side.

#### 3. Propeller

Propeller to be of fixed pitch type.  
Propeller to be of high tensile manganese bronze, and to be good at dynamical and statical balance.

#### 4. Eating Device for Shafting

For anticorrosive of shafting, carbon-brush type to be equipped.

### 3.4 Main Engine Remote Control System

The main engine to be remotely controlled from wheel house.  
Control of speed, on-off clutch and reversing of main engine to be done at fore mentioned position. Starting and stopping of main engine to be locally done.

1. Remote control system to be of hydraulic type (hand driven) or equivalent.

The control panel (stand type) in wheel house to be equipped with following. Lamp test equipment to be provided on the control pannel.

#### (1) Maneuvering Handle etc.

2 handle-system

One of main engine revolution

One of reversing and clutch

Emergency stop switch

#### (2) Monitoring System

Electric engine tachometer

Indicating pilot lamp

For maneuvering position (wheel house-engine room)

For reversing clutch (ahead - neutral - astern)

Others necessary

(3) Alarming System (Buzzer and Lamp)

Low pressure of main engine lubricating oil  
High temperature of main engine cooling water  
Emergency stop  
Low level of fuel oil gravity tank

Also, illumination equipment with dimmer switch for meters to be installed.

2. Engine Room Monitoring Panel

Engine room monitoring panel to be of wall-mounting type (fitted with lamp test equipment), and to be installed near main engine local maneuvering handle.

(1) Monitoring System

Indicating pilot lamp  
For maneuvering position (wheel house-engine room)  
For reversing clutch (ahead - neutral - astern)

(2) Alarming System

Low-pressure of main engine lubricating oil  
High temperature of main engine cooling water  
Low level of fuel oil gravity tank

3.5 Auxiliary Engine

The engine is to have following particulars and is so designed as to avoid vibration.

Starting and stopping of engine to be locally done.

Type & No.	: 4-cycle diesel engine x 1
Rating output	: Not less than 15 PS
Rating revolution	: Not more than 2,400 RPM
No. of cylinder	: 1
Starting system	: Electric motor starting
Cooling system	: Sea water cooling
Fuel oil	: Diesel oil
Driven generator	: A.C. 10 KVA

The engine and generator to be mounted on common bed plate.



### 3.6 Pumps

Specification of main pumps except ones attached to main engine to be as follows.

Name	Type	No.	Head (m) (abt)	Capacity (abt)(m <sup>3</sup> /hr)	Driving method
General service pump	Centrifugal	1	13	7	0.75 KW electric-motor
Bilge pump	Centrifugal	1	13	7	0.75 KW electric-motor
Fresh water pump		1			0.25 KW electric-motor
Fuel oil transfer & service pump	Geared	1	15	3	0.75 KW electric-motor
Fuel oil pump Lubricating oil pump	Geared	1 each			hand driven

1. General service pump to be used for stand-by of main engine cooling water pump.

Bilge pump to be used for general service pump.

2. For sea water pump and bilge pump, impeller to be of bronze, and shaft to be of 18-8 stainless steel.
3. Fuel oil transfer & service pump to be used for fuel oil transferring and fuel oil service.
4. If necessary, hand driven pump to be installed.

### 3.7 Hydraulic System

Trawl winch (1t x 30 m/min) to be driven by hydraulic system (about 140 kg/cm<sup>2</sup> pressure).

Hydraulic pump to be driven by main engine and to be started and stopped at position of pump unit. Speed control, brake and clutch

operation etc. of trawl winch to be done at position of trawl winch.

Following apparatus to be provided on operation platform of trawl winch.

- Speed control handle
- Clutch operating handle
- Blake handle
- Hydraulic pressure gauge
- Indicating lamps (Running lamp and alarm)
- Other necessary equipments

Furthermore, hydraulic system to be provided with automatic change-over valves, control valves, safety valves, pressure gauges, oil tank, oil cooler etc. completely and hydraulic oil to be supplied.

### 3.8 Oil Tank

Following tanks to be installed in engine room. Capacity to be decided by mutual agreement with supervisors.

Name	No.	Remark
Lubricating oil tank	1	Ample capacity
Fuel oil gravity tank	1	
Hydraulic oil tank	1	
Daily service tank	1	
Waste oil tank	2	Fuel oil & lubricating oil tank
Others		

1. Fuel oil gravity tank to be fitted with a plate which instruct to take out sludge.
2. Each tank to have level indicator, connecting pipe, air vent pipe, drain pipe, valve and cocks, if necessary.
3. Fuel oil tank and lubricating oil tank to have oil pan, in which waste oil is to be led to waste oil tank by piping.

4. Low level alarm devices of fuel oil gravity tank to be provided on control panel in wheel house and on monitoring panel in engine room.

### 3.9 Engine Room Outfittings

1. Main engine, auxiliary engine, generator, switchboard and pumps to be installed according to the general arrangements to facilitate maintenance and to have means enough to avoid vibration of machinery. Dangerous parts of machinery to have some guard, if necessary.
2. In engine room there are necessary air duct and ventilating fans of electric motor driven axial flow type for engine room ventilation. Natural ventilator to be provided, by which air supply of engine and air exhaust of room to be done enough.
3. For overhaul of main engine, I-type lifting beam and lifting gear to be provided. Overhauling equipment to be arranged above auxiliary engine and generator.

Engine room passage and necessary place to be covered with grating, and to be provided with steel grating, steel ladder, steel handrail (of stainless steel), duct and etc. In the vicinity of main engine handle, engine telegraph, voice tube and buzzer to be arranged, and at suitable place, clinometer extinguisher and thermometer to be provided. At suitable place in engine room, diary and working table (with vice), blackboard and tool hanging to be provided and necessary tools, equipments, tool boxes and shelves to be provided.

### 3.10 Exhaust Piping

1. Exhaust silencer to be attached to each engine.
2. Consideration to be made for inside ventilation of funnel.

Exhaust pipe and silencer of each engine to be given the greatest attention so that no vibration to be developed, and expansion joint (of stainless steel) to be arranged at necessary position. Outside of those machines to be covered with firm material, asbestos of enough thick.

### 3.11 Piping

Piping in engine room to be so arranged as not to disturb inspection of other machinery, and so that no drain and no air to stay in pipes.

1. Sea water pipe, bilge pipe and fresh water pipe to be galvanized steel pipe or copper pipe.

## 2. Oil pipe

Piping to be so arranged with special attention as to be easy for inside cleaning of pipe. Fuel oil pipe to be arranged to transfer oil to every tank by switch, and valves to be set at position easy for maintenance.

### 3.12 Painting and Marking

1. Machineries and equipments in engine room to be painted with approved color after being coated with anticorrosive paint.
2. Every pipe to be painted with various color according to its use.
3. Valves and meters to be fitted with name plates, and tanks to be named.

### 3.13 Spare Parts of Machinery Part

Spare parts to be provided according to Japanese rule requirement of Class 3 fishing vessel (less than 30 m in length) and maker's standard.

### 3.14 Inventory of Machinery Part

Besides tools necessary to overhaul, repair and assemble the machinery, followings to be provided. Ones provided by machinery makers to be not necessary to be provided.

Name	Quantity	Name	Quantity
Portable electric drill	1	Wooden hammer	1
Straight shank twist drill (2,4,5,6,7,8 mm)	each 2	Chipping hammer	2
Steel tape measure (10 m length)	1	Scraper(each kind)	each 2
Feeler gauge	1	Bar scraper	2
Outside calipers, and inside calipers	each 1	Vernier calipers	1
Compass	1	Center punch	2
Straight edge (60 cm length)	1	Punch	2
Hand drill	1	Chisel (for oil way, flat-type)	each 2

Name	Quantity	Name	Quantity
Straight shank twist drill (3, 4, 5, 6, 7, 8 mm)	each 5	Oil stone (each kind)	each 1
Dies & Tap (All in box)	1 set		
Files (each kind)	each 2	Bolt and nut (each size)	a few
Set files	1 set	Stud and nut (each size)	"
File handle	5	Steal washer (each size)	"
Brush for file	3	Split pin (each size)	"
Hand steel hammer (1, 2 lbs. weight)	each 1	Scissors for packing	1
Sledge hammer	2	Scissors for tin (flat, round edge type)	each 1
Beam grab	2	Hacksaw frame with 1 dozen blades	1 set
Wedge (steel, wood made)	each 2	Grand packing knife	1
Turning tool for valve handle (large, small)	each 2	Smith tool tong (large, small)	each 1
		Oil filter	1
Oil measure (large, small)	each 1	Screw driver (plus, minus) (large, middle, small)	each 1
Oil funnerl (large, small)	each 1	Micrometer	1
Small oil can (each kind)	each 1	Shackle (each size)	each 1
Pipe wrench (large, small)	each 1	Oil feeder (mouse type, trumpet type)	each 2
Adjustable wrench (large, small)	each 1	Oil tray receiver	1
Thermometer (100°C, 500°C)	each 2	Chain block (0.5 ton)	1
Flashlight with 3 dry cells	2 sets	Spike (steel, wood made)	each 1

Name	Quantity	Name	Quantity
Areometer	2	Torch lamp (middle)	1
Portable electric grinder	1	Marking mudle	1
Nipper (middle)	1	Tachometer (Hasler type)	1
Cutting plier elect insulated (middle)	1	Anvil	1
Folding scale	1	Test hammer	1
Plier	1	Hole punch (each size)	each 1
Rushing device (0.5t)	1	Bucket(alumite made 1) plastic made 2)	3
Ring spanner (each size)	each 1	Sand paper (of cloth)	20 sheets
Socket wrench	2	Nylon rope (13mm $\phi$ X 100m) 16mm $\phi$ X 100m)	each 2
English spanner	1	Number mark	1 set
Bench vice with copper clips (15 cm breadth) paralalled type	1	Deflection gauge (for main engine)	1
Vinyl hammer (2 lbs. weight)	1	Bore Gauge (for main engine)	1
Surface plate (40 cm square.)	1	Test Pump for fuel oil injector(for main engine)	1 set
		Lapping tool for suction and exhaust valve(for main engine)	1 set



## CHAPTER 4    ELECTRIC PART

### 4.1 General Description

Electric power system is to be as follows.

Main circuit	Generator installed in this vessel	3 phase 225V 60 Hz	Electric power equipment
		1 phase 225V 60 Hz	General light Small appliance, etc.
Sub-circuit	Battery installed in this vessel	DC24V	Emergency light, Interior communication and measuring system, Radio equipment, Engine starter, etc.

### 4.2 Main Electric Source

1. Main Generator 1 set  
3 phase, AC 60 Hz, 225V, 10 KVA, 1,800 RPM, self excited, drip proof type, with voltage regulator, driven by auxiliary engine.
2. Auxiliary Generator (for general light, small appliance) 1 set  
3 phase, AC 60 Hz, 225V, 3 KVA, 1,800 RPM, self excited, drip proof type, with voltage regulator & A.V.R., driven by main engine.

Generators to be installed on firm bed, and to have preventing device for slipping due to extension of its belt.

#### 4.3 Sub-Electric Source

As sub-electric source, following storage batteries are to be used.

24V, 200 A.H., 1 sets (for emergency light, measuring system, radio equipment, etc.)

24V, 200 A.H., 2 sets (for engine starters, etc.)

These batteries are to be float-charging, and charging is to be silicone rectifier as follows (with full-wave rectifier, output voltage regulator and overvoltage and overcurrent protection device)

Rectifier to be following and to have enough current capacity.

Input : 3 phase, 60 Hz, 225 V

Output : D.C. 22 - 35 V

#### 4.4 Shore Source Connection Equipment

Shore source connection box (single phase, 60 Hz, 220 V) to be containing a switch (with fuses) having necessary connection capacity and pilot lamp of electric source providing with anticorrosive treatment. 50 m single phase cord (with reel) for shore source supply to be supplied.

#### 4.5 Switchboard

##### 1. Construction

The switchboard to be of drip proof type and semi-dead front type, and to consist of baking painted substantial angle steel frame work and steel plate, and its inner inspection and maintenance to be facilitated.

A metal handrail, fluorescent lamps and emergency lamps to be provided on its surface. Floor in front of the board to be covered with non-slip insulating mat.

##### 2. Device and Instrument

The switchboard to have connection circuits of electric source, subelectric source and shore electric source, and equipment for charging and discharging of batteries, and to be provided with necessary switch, push button and followings.

(1) Meters

Voltmeter (A.C. and D.C.), Ammeter (A.C. and D.C.),  
Frequency meter, etc.

(2) Protection Device

3 poles air circuit breaker with inverse action and  
instantaneous trip (not less than 2 poles), Cellolite  
fuse or acme fuse.

(3) Monitoring Equipment

Each electric source pilot lamp.

Pilot lamp for "ACB ON-OFF", Earth lamp, etc.

(4) Change over switch for source of emergency light

(5) Other necessary fittings.

3. Besides

Meters admitted to be used by exchange to be used with a  
change over switch, getting owner's approval.

4.6 Electric Power System

1. Electric motors and accessories to be provided with wiring  
and connection.
2. Principal starters to be provided with an ammeter and  
indicating device for monitoring.
3. Section boxes and distribution boxes for power supply to be  
of construction that crew can't attach live part when  
operating, and to be facilitated inspection and repair, and  
to be fitted with source lamp.
4. Cellolite fuse or acme fuse to be used.

4.7 Lighting System

1. General Lights

- (1) At suitable position of lighting circuit section boxes,  
distribution boxes, connection boxes and branch boxes  
to be provided, and to be wired by way of these boxes,  
to each light and lighting fixture.
- (2) Section boxes, distribution boxes and etc. for power  
supply to be of construction that crew can't attach  
live part when operating.
- (2) Bed lamp to be with milky white globe.

- (3) Ceiling light of cabins and rooms in accommodation to be directly attached to ceiling.
- (4) Lighting fixture provided at places, engine room and exposed deck where instruments are liable to be injured, to be provided with protection devices.
- (5) Fluorescent lamps are not to exert inductive influence on communication circuit and electric instruments.
- (6) Emergency lights, in principle, to be combined general lighting fixtures and depending on their fitting location, getting owner's approval, to be installed independently as general lights.
- (7) Light and plug socket to be able to be increased in number not more than 5.
- (8) For navigation light, switch and flicker lamp to be installed in wheel house.

2. Standard installation of lighting to be as follows.

- (1) Electric service for ceiling lights and desk lights to be A.C. 220V and for bed lights, emergency lights to be D.C. 24V.
- (2) Spare plug sockets to be installed separately as following table, and its capacity to be 220V - 10A.

A. Room Light

Kind Place	Ceiling light		Bed light		Emergency light		Spare plug socket	Remark
	W	No.	W	No.	W	No.		
Wheel house	(20)	2			10	1	2	Chart table light (40Wx1)
Cres's room	(20)	3	(10)	4	10	1	2	
Galley	(20)	1			5	1	2	
Toilet	10	1			5	1		
Engine room	(20) 60	5 4			10	2	2	
Steering engine room	40	1					1	

## B. Outside Light

Kind Place	General light		Emergency light		Remark
	W	No.	W	No.	
Fore wall of wheel house	60	1	10	1	
Side wall of deck house	60	each 1	10	each 1	
Aft wall of deck house	60	1	10	1	
Working light	500	2			Incondecent light Eye lamp type
Portable light	60	3			With capture cord (5m)
Navigation light		1 set			Due to Japanese regulations
Anchoring light				1	Due to Japanese regulations
Fishing light		1 set			Due to Japanese regulations
Magnetic compass		1			

Note: ( ) mark to indicate fluorescent light.

Others to indicate incandescent light.

### 4.8 Marks

Inboard electric wire and plug sockets to be fitted with marks at suitable position, to discriminate easily A.C. or D.C. and kind of voltage.

### 4.9 Spare Parts of Electric Part

1. Spare parts of generator (with exciter), electric motor, starter and switch board to be supplied in accordance with manufacture's supplying standard.
2. Electric lights to be supplied in number of 50% for each candle power. Number to be in the range of 10.

and two working lights to be supplied for spare.

3. Each kind of fuse to be supplied in suitable number.

#### 4.10 Supplementary Outfit of Electric Part

- |                                  |       |
|----------------------------------|-------|
| 1. Universal tester              | 1     |
| 2. Grease pump                   | 1     |
| 3. Tools for repair and overhaul | 1 set |

#### 4.11 Use Division of Electric Power

Use	Inboard Source			Shore Source
	3 Phase A.C. 220V	1 Phase A.C. 220V	1 Phase D.C. 24V (Battery)	1 Phase A.C. 220V
Electric clear view screen	○ 18W			
Motor fan (for main engine, engine room, accommodation)	○ 0.4KW x 3			
Radar			○	
Fish finder			○	
SSB system radio telephone			○	
Electric motor siren		○ 0.4 KW		
Refrigerator		○		○
Navigation light (mast light, side light, stern light)		○	○	
Anchor light			○	
Fishing light			○	
Motor for main engine starting			○	
Motor for auxiliary engine starting			○	

Air compressor for air clutch	0.4 KW			
Control panel at wheel house			○	
Monitoring and alarm system for main engine			○	
Bilge pump	○ 0.75 KW			
General service pump	○ 0.75 KW			
F.O. shift and service pump	○ 0.75 KW			
Fresh water pump	○ 0.25 KW			
Ceiling light, chart light		○		○
Bed light			○	
Side wall light		○		○
Working light		○ 500W x 2		○
Portable light		○		○
Detector for propane gas			○	



## CHAPTER 5 MISCELLANEOUS TESTS AND PLANS

### 5.1 Miscellaneous Tests

#### 1. Shop Tests

About principal machines and equipments described in this specification, shop tests to be carried out, and if necessary, supervisors to be present at shop tests.

#### 2. At suitable time before lunching, hull deflection test to be carried out in the presence of supervisor.

#### 3. Final Tests

After completion, in the presence of inspector and supervisors, following official trials and performance tests to be carried out. Builders to supply all articles consumed at tests; fuel oil, lubricating oil and so on.

##### (1) Sea Trials

- a. Between mile posts, progressive speed trials of main engine output and dead slow speed trial to be carried out, and during these periods, followings to be carried out besides speed measuring.  
Temperature and pressure of each kind of oil, sea water, air, gas. Revolution of engine, Fuel oil consumption
- b. During trials, following tests to be carried out timely.

Turning test	Go-ahead and Go-stern test	Inertia test
Steering test	Main engine starting test	Clutch test
Main engine remote control test	Others appointed	

##### (2) Performance Tests

After completion, following tests to be carried out.

Inclining test	Rolling test	Machines test
Nautical Instruments test	Others appointed	

## 5.2 Approval Drawings and Final Drawings

### 1. Approval Drawings

In line with specifications and attached plans, following approval drawings to be submitted to supervisors for approval before laying down.

#### (1) General

General arrangement	Lines	Hydrostatic curve
Weight & KGG & trim calculation	Capacity plan	Gross tonnage calculation
Methods of tests	Contents of approval drawings	Schedule of Built

#### (2) Hull Part

Midship section	Hull strength calculation	Construction profile & plans
Deck outfittings & Machines plans	Wheel house arrangement	Deck piping plan
Fishing apparatus arrangement & Fishing gear plan		

#### (3) Machinery Part

Engine room arrangement	Main engine & aux. engine plan	Shafting & propeller plan
Engine room piping plan	Hydraulic system plan	Other machines plans

#### (4) Electric Part

Switchboard	Generator	Radio equipment
One line diagram of electric power system		Navigation meter plan

#### (5) Others

Others appointed by supervisors

## 2. Final drawings

Final drawings to be the said approval drawings and followings.

Finished principal particulars
Results of miscellaneous tests
Instruction book of principal apparatus (in English)
Framed color photo (ones of this vessel sailing, size, quarts, 5 sheets)
Color photograph noted principal particulars (300 sheets, postal size)

3. The number of approval drawings and final drawings to be decided according to understanding.

## 5.3 Appendix

1. Doubt occurring about this specification and drawings are to be decided upon deliberation with supervisors.
2. About double described item and mote in this specification, one described in article to be more impossible than one in clause.
3. The small items about size and arrangement described in this specification to be changed with owner's approval, if they were admitted not to spoil necessary performance of this vessel.
4. Principal machines, apparatus, and outfittings to be purchased after the deliberation with supervisor.
5. At changing of general arrangement by reason of purchased machines and apparatuses, it is necessary to be get supervisor's approval.

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