

REPORT  
ON  
BASIC DESIGN SURVEY  
FOR  
THE FISHERIES DEVELOPMENT PROJECT  
IN  
THE REPUBLIC OF SIERRA LEONE

March 1981

JAPAN INTERNATIONAL COOPERATION AGENCY

(JICA)

FDT  
81-23



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BASIC DESIGN SURVEY  
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## PREFACE

It is with great pleasure that I present this report on BASIC DESIGN SURVEY FOR THE FISHERIES DEVELOPMENT PROJECT IN THE REPUBLIC OF SIERRA LEONE to the Government of the Republic of Sierra Leone.

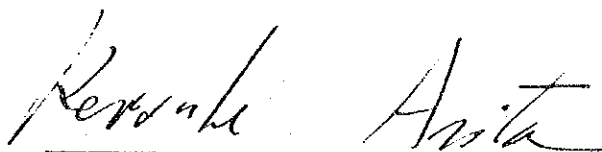
This report embodies the result of a basic design survey which was carried out in the Republic of Sierra Leone from January 19 to 24, 1981 by a Japanese survey team commissioned by the Japan International Cooperation Agency following a request of the Government of the Republic of Sierra Leone to the Government of Japan.

The survey team, headed by Mr. Kaoru Yamada, had a series of discussions with the officials concerned of the Government of the Republic of Sierra Leone and conducted a wide scope of field survey and data analysis.

I hope that this report will be useful as a basic reference for development of the project.

I wish to express my deep appreciation to the officials concerned of the Government of the Republic of Sierra Leone for their close cooperation extended to the Japanese team.

March, 1981



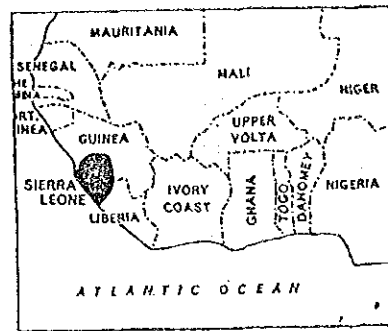
Keisuke Arita

President

Japan International  
Cooperation Agency



# MAP OF THE REPUBLIC OF SIERRA LEONE









Typical Canoe Fishing Village  
GODERICH (near Free Town)



Signing of the Minutes  
Team Leader, Mr. K. Yamada  
Chief Fisheries Officer,  
Mr. T.J. Shorunkeh Swayer



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## SUMMARY





## SUMMARY

1. The Government of Republic of Sierra Leone is promoting the offshore and coastal fisheries development project in the National Development by considering the development of fisheries as one of the principal measures to secure low priced animal protein food for her people.

The Government of Republic of Sierra Leone has requested the Government of Japan to extend the grant assistance for the equipments and materials required for the advancement of the Project in order to seek the fisheries promotion and development of coastal small-scale canoe fishermen in the Project.

Based upon this request, the Japan International Cooperation Agency has dispatched the basic design survey team.

2. The survey team has conducted the on-the-spot survey of the areas concerned in the Project. As a result, the Government of Japan with the Director General of the Fisheries Division, Ministry of Natural Resources of Republic of Sierra Leone has signed the Minutes incorporating the items recommending the measures required for the grant of fishing materials, outboard engines, fishing boats and etc. to be taken.



3. This Project will provide equipments and materials to the enlargement of production and improvement of living standards of the coastal small scale canoe fishermen who comprise the majority of the fisheries production; and thus by confirming the reasonability of this Project, we consider the effect of assistance to this Project to be great.
  
4. The specific items which are judged essential to the Project are as follows:
  - (1) Fishing materials : several kinds
  - (2) Outboard engines : 200 units
  - (3) 6m class FRP boats : 6
  - (4) Purse Seiner : 2  
(outfitted with purse seine gears)
  - (5) Trawler : 2  
(outfitted with trawl gears)
  
5. As the reception set-up of the Sierra Leonean side for the assistance has been prepared and planned with the Fisheries Division of the Ministry of Natural Resources as the authority in charge, the Project is judged to be rational and thus the management and operation of the assisted materials and equipments are appraised to be carried out effectively and appropriately.  
  
FRP fishing boat will be used to train and guide the coastal fishermen with the method of modern fisheries,



and this will establish the foundation of development from coastal fisheries to offshore fisheries.

Because the facilities to repair the hull, engine and other parts of the fishing boat are directly owned by the Government and the engineers of the facilities are comprised of governmental technical officers with experience and techniques, the maintenance and management of the boats are considered to be carried out smoothly.



## CHAPTER 1

### OUTLINE OF THE SURVEY





CHAPTER 1  
OUTLINE OF THE SURVEY

1-1 Purpose of the Survey

The Government of Republic of Sierra Leone has drawn out the Fisheries Development Project as one of the projects of National Development Plan, and has been promoting its implementation; however, its promotion has been lagging behind due to shortage of equipments and materials. Thus the Government of Republic of Sierra Leone, as a part of the implementation plan, has requested the Government of Japan to extend fisheries grant assistance for the fisheries equipments and materials.

In response to this request, the Government of Japan has determined to examine this case as one of possible grant assistance cases, and sent a basic design survey team through Japan International Cooperation Agency with the purpose to conduct field survey required for the evaluation of items of request as well as to hold discussion meetings with the authorities concerned.



1-2 Members of the Survey Team

Team Leader	Kaoru Yamada	Fishing Vessel Div., Oceanic Fisheries Dept., Fisheries Agency
Fishing Gear and Method	Shigeo Kobayashi	Universal Marine Consultant Co., Ltd.
Small-Sized Fishing Boat	Kanji Yoshimi	Same as above
Coordinator	Motobumi Kohara	Fisheries Technical Cooperation Office, Japan International Cooperation Agency



1-3 Persons Concerned of the Republic of Sierra Leone

Ministry of Natural Resources

Minister	Hon. K.C. Gbamanja
Permanent Secretary	Mr. C.D. Williams
Deputy Secretary	Mr. C.E. Logan

Fisheries Division (Divisional Headquarters)

Chief Fisheries Officer	Mr. T.J. Shorunkeh Sawyerr
Acting Deputy Chief Fisheries Officer	Mr. K.A. Fergusson

Government Fisheries Divisional Office (KISSY)

Acting Assistant Chief Fisheries Officer	Mr. A.B. Kamara
Master Fisherman	Mr. W. Addo Davies
Master Boatbuilder	Mr. R.E. Williams
Senior Marine Mechanic (Work shop)	Mr. P.A. Johnson
Area Fisheries Officer (LUNGI)	Mr. S.E. During

Chief Veterinary Officer	Dr. R.S. Kamara
--------------------------	-----------------

Ministry of Foreign Affairs

Economic Affairs and Technical Cooperation Division

Director	Mr. S.D. Taylor
Senior Assistant Secretary	Mrs. B.A. Hamilton



1-4 Survey Itinerary

No. of days	Date	Outline of Activities	
1	Jan. 17 (Sat)	22:30	Lv. Tokyo (JL 421)
2	Jan. 18 (Sun)	06:20 22:55	Ar. London Lv. London (BR 351)
3	Jan. 19 (Mon)	06:55	Ar. Free Town  Meeting with officer in charge of Ministry of Foreign Affairs, Director General of Fisheries Div. of Sierra Leonean Government, and Honorary Consul of Japan
4	Jan. 20 (Tue)	morning:  afternoon:	Courtesy call and meeting with the Ministry of Foreign Affairs, Ministry of Natural Resources, Fisheries Div.  Visit KISSY Outstation of Fisheries Div. Survey on fisheries related facilities of KISSY region (Governmental and fisheries company's facilities)
5	Jan. 21 (Wed)	morning:  afternoon:	Discussion with Director General of Fisheries Div. and other persons concerned on the requested case, and explanation on the system of Japanese Fisheries Grant Aid  Survey a fishing village (GODERICH) in the suburbs of Free Town





No. of days	Date	Outline of Activities	
6	Jan. 22 (Thu)	<p>morning: Visit LUNGI Outstation of Fisheries Div. Survey the project site (KONAKRIDEE) as well as the fishing boat, fishing gear, and smoking factory</p> <p>afternoon: Survey the cold storage and smoking factory of MURAG TOWN in Free Town as well as the fish meal factory of JUI in the suburbs</p>	
7	Jan. 23 (Fri)	<p>morning: Report the survey result to the Minister of Natural Resources. Discussion with Director General of Fisheries Div. and other persons concerned on the Minutes draft</p>	
8	Jan. 24 (Sat)	<p>morning: Signing of the Minutes at the Fisheries Div., Ministry of Natural Resources</p> <p>afternoon: Compilation of survey results</p>	
9	Jan. 25 (Sun)	<p>(Team Leader, Coordinator)</p> <p>16:40 Lv. Free Town (WT 923)</p> <p>17:30 Ar. Monrovia</p>	<p>(Consultant)</p> <p>Compilation of survey result and materials</p>
10	Jan. 26 (Mon)	<p>morning: Report the survey result to the Japanese Embassy in Liberia</p> <p>22:25 Lv. Monrovia (SN 422)</p>	<p>09:30 Lv. Free Town (BR 352)</p> <p>17:25 Ar. London</p>



No. of days	Date	Outline of Activities			
11	Jan. 27 (Tue)	06:05	Ar. Brussels	14:30	Lv. London (JL 424)
		08:05	Lv. Brussels (SN 639)		
		08:55	Ar. Paris		
12	Jan. 28 (Wed)	11:30	Lv. Paris (JL 424)	17:20	Ar. Tokyo
13	Jan. 29 (Thu)	15:25	Ar. Tokyo		



MINUTES OF DISCUSSIONS

In response to the request made by the Government of the Republic of Sierra Leone for the Small Scale Fisheries Development (hereinafter referred to as "the project"), the Government of Japan has sent, through the Japan International Cooperation Agency (JICA), a team headed by Mr. Kaoru Yamada, Fishing Boat Inspector, Fishing Boat Division, Fisheries Agency, to conduct a basic design survey for 6 days from January 19, 1981.

The team had a series of discussions and exchanged views with the authorities concerned.

As the result of the study and discussions, both parties have reconfirmed the items of request for Japanese assistance with their order of priority made by the Government of the Republic of Sierra Leone as listed in the Annex attached hereto.

Upon request of the Sierra Leone side, the Japanese side agreed to convey the desire of the Government of the Republic of Sierra Leone that latter will consider the possibility of extending its grant assistance for the implementation of the project.

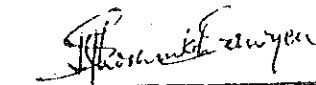
January 24, 1981



KAORU YAMADA

LEADER

JAPANESE BASIC DESIGN SURVEY  
TEAM



T.J. SHORUNFEMI-SMYERN

CHIEF FISHERIES OFFICER.



ANNEX:

Items of the request in the order of priority

1. Fishing Materials
2. Outboard Engines
3. 6M Class FRP Boats
4. Purse Seiners
5. Trawlers

山田 達

*Handwritten signature*  
24/1/81.





## CHAPTER 2

### OUTLINE AND APPRAISAL OF THE REQUESTED PROJECT



## CHAPTER 2

### OUTLINE AND APPRAISAL OF THE REQUESTED PROJECT

#### 2-1 Outline of the Requested Project

As mentioned earlier, the Government of Republic of Sierra Leone has been implementing the Fisheries Development Project as the National Project; and has requested the Government of Japan to extend the grant assistance for the materials and equipments required for the promotion of the Fisheries Development Project subjecting the coastal canoe fishermen who are carrying out small scale fisheries. The outline of this Project is as follows:

##### (1) Objectives of the Project

The major objectives of the Project, as specified in Chapter 1 of the Fisheries Development Project, is "to secure cheap fish protein source and to seek increased production for the people of Sierra Leone." About 80% of the total fish catch of Sierra Leone is brought about by canoe fishermen who are petty fishermen. Therefore in order to achieve the objectives of the Project, the guidance and cooperation towards the canoe fishermen who are the petty fishermen are considered with priority.

On the other hand, since presently the canoe fishermen are mostly undertaking fisheries with unmotored canoe which is the traditional way of fishing and by simple fishing gears and methods, and the distribution of fish catches is carried out by the middlemen who



provides loans to fishermen who in turn pay back in a natural economic system that is from their sales of fish; there are many negative effects on the fishermen.

Therefore, for the canoe fishermen the Government of Republic of Sierra Leone seeks to increase the fish catch by introducing fishing materials for the improvement of their fishing gears and methods, outboard engine for motorization of canoe, boat as the modern model boat, and fishing boat for the training of modern fishing method; seeks to promote the formation of organizations by fishermen through the program to distribute fishing materials to fishermen; and aims to improve the living standard of the fishermen by eliminating the intermediary exploitation.

(2) Requested Materials and Equipments for Promotion of the Project

- 1) Required materials for improvement of fishing gears and methods

Netting cloth for bottom gill net, completed trammel net and etc. (mending yarn, rope, float, sinker, netting needle, anchor, raincoat, boots, and life jacket)

- 2) Outboard engine to motorize canoe to enlarge fishing grounds

Outboard engine of 2 types, 15 PS and 20-25 PS

- 3) 6m class FRP boat as modern model boat



4) Fishing boat for training of modern fishing method

i) 15m class FRP purse seiner and fishing gears

ii) 15m class FRP trawler and fishing gears





## 2-2 Survey Result of the Requested Project

The Survey Team firstly learned the background of the requested Project, ideas of the development project, and outline of the circumstances until it came up as a request from the official concerned of the Government of Republic of Sierra Leone; then conducted the survey on the fishing village in the suburbs of Free Town as well as canoe fishing villages which are the regions concerned of the Project, and the governmental fisheries related facilities, modern private fisheries facilities and the like of Free Town region concerned with the training on management and maintenance of the requested equipments in order to grasp the present state of the background of the Project; and examined the background from which the assistance was requested as well as its necessity and nationality. Based on the result of the examination, discussions concerning the specific items of possible request were held with the governmental officers concerned, and after coming to agreement by confirming the order of priority of the possible request, the Minutes were drawn out and signed.

The contents of the survey during this period are the followings:

### (1) Reception Set-up for the Requested Materials and Equipments

- 1) Reception set-up for fishing material, outboard engine, and 6m class FRP boat

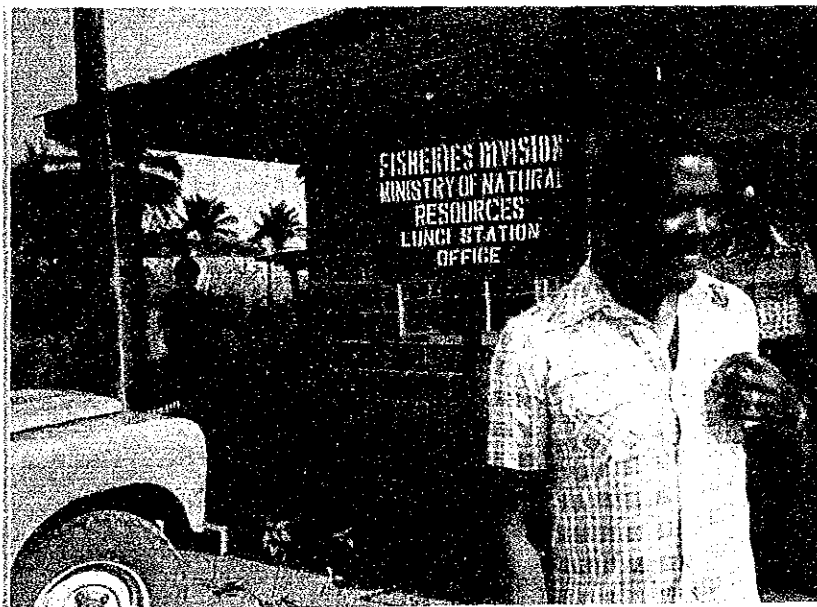
The Fisheries Development Section will be in charge of this. One of their outstations is located in each coastal administrative district,



totalling five outstations, to which governmental officers, who are in charge of pitty canoe fishermen in the fishing village under their control, are stationed. The contents of their work range widely from the survey on the actual state of the fishing village under their jurisdiction, collection of statistics data, guidance on fishing techniques to administrative guidance of promoting the formation of organization of fishermen.

Out of this, the fishing villages of the 4 outstations will be subject to the Project.

- i) Kychom Outstation → Kychom
- ii) Lungi Outstation → Konakiridee
- iii) Shenge Outstation → Shenge
- iv) Bonthe Outstation → Bonthe



Lungi Outstation  
Outstation Director, Mr. During



2) Distribution Plan

The materials and equipments will be distributed to the fishermen through the outstation by the application made by the fishermen's group (the name of the group varies from district to district, the number of members are few such as 20 - 30, and the organization is not systematic like the Fisheries Cooperative Union) which have already been formed in the fishing villages under the control of each Outstation. Non-membered fishermen shall be excluded from this benefit, and thus it is also aiming to promote formation of organizations of fishermen.

3) Management Plan

The management of the distributed fishing gears and materials, and outboard engines is planned to be conducted by firstly renting them out to the fishermen and collecting their rent which will be then used to supplement the procurement fund for the next required equipments.

4) Technical Predisposition of Fishermen

Since the fishing gears to be introduced this time have been requested based upon the already existing gears, and the fishing methods do not differ from the already existing ones, they can all be used immediately, and since the outboard engines are already being used despite by few fishermen, special technical training or guidance is not necessary.



(2) Reception Set-up for Purse Seiner and Trawler

- 1) The Fisheries Division will directly receive the boats, be in charge of management and operation, cruise the boats periodically to the 4 fishing villages in the region concerned of the Project with Free Town as the base, and carry out guidance and training on navigation method and use of the modern fishing boats as well as on fishing gears and methods for the fishermen.

The instructor and crew will be comprised of governmental engineers and about 70 persons who had already received training at the Fisheries Training Center as well as about 30 persons who had received training overseas (mainly Soviet Union), and thus the set-up to provide navigation training only by the people of Sierra Leone is completed.

2) Operation Plan

Necessary fuel for fishing gears, water, food and ice are planned to be loaded at Kissy Base in Free Town, and the boat will be allocated to 4 fishing villages concerned of the Project. By making the local fishermen to get on board, the practical training on purse seine, trawl, drift gill net and long line operation will be conducted according to the fishing device equipped in each boat. The catch is planned to be either unloaded on the spot or brought back to the base and then unloaded. The proceeds will be used to supplement part of the operation cost.





3) Maintenance and Management Set-up

The Fisheries Division owns the following facilities in the location next to the fisheries base of Kissy District and conducts their maintenance and management.

- Fisheries Research Center

Laboratory for Ecology of Fish, Aquaculture Research Facility, Processing Experiment Facility, Library, Statistics Room

- Shipyard

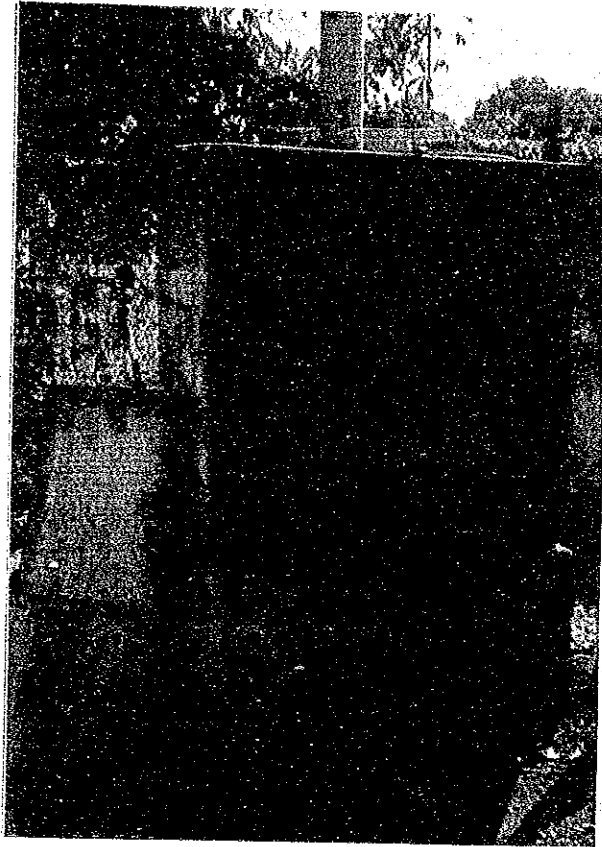
Facility to build and repair fishing boat of about 10m length

- Engine Repair Plant

Repair facilities for internal combustion engine (about less than 200 PS) and other machinery

- Fishing Gear Repair Plant and Store House





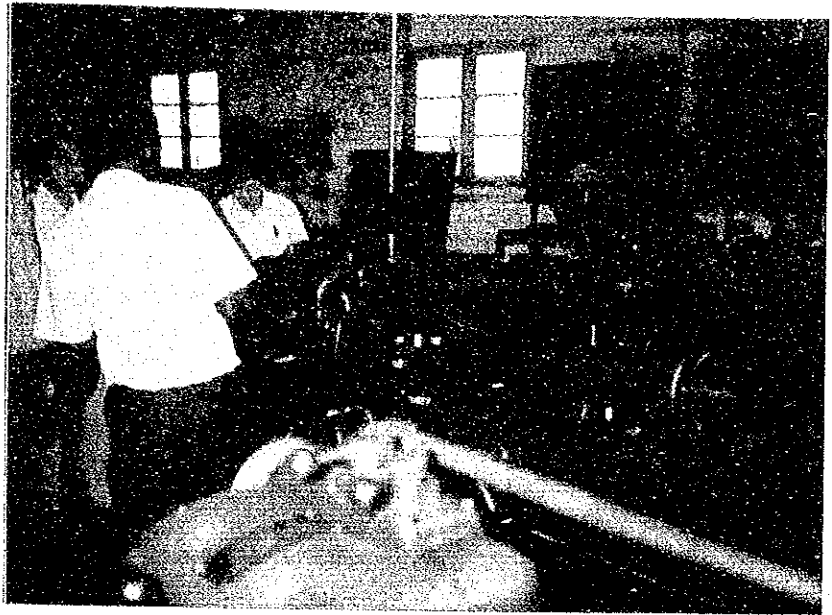
Simplified Smoking Tester  
KISSY Research Centre, Fishing Division



Completed 10m Class Wooden FAO Standard Type Trawler  
KISSY Shipyard, Fisheries Division



Engine Repair Plant  
KISSY, Fisheries  
Division



Engine Repairing



Repairing Out-  
Board Engine





(3) Development of Fisheries Engineers

As for the institution to foster fisheries engineers, there is a high-level Research Department belonging to Free Town University; and as for the institution to train persons engaged in fisheries, there is a training center (SIAKA STEVENS Marine Training School) belonging to Sierra Fisheries Company (20% governmental capital), the largest fisheries Enterprise.

Principally, the trainees are high-school graduates; the training of special subjects are provided to the children of coastal fishermen for the period of 18 months. The training subjects range from engine, cold storage and refrigeration, travel, navigation technique, and processing, totalling five; of which each class has 10 trainees, and thus the total of 50 trainees are trained at the training center. The practical trainings are conducted at fishing boat, cold store house, processing facilities, and etc. belonging to the company. The instructors are comprised of governmental technical officers, engineers of private fisheries company, and engineers dispatched by Soviet Union (4, out of which 1 is interpreter), and the lecture offered can be divided into the lecture on special techniques and that of general required subjects. The number of persons who completed training up to now is 72.

(4) Priority of Requested Materials and Equipments

The basic policy of the Government is to place the highest priority on fishing materials and outboard engines required for the development of canoe fishermen's fishery, which is a small-scale fishery; and





the purse seiner as the fishing boat for fisheries training will come next, and since trawlers have already been used and some trainings are conducted in Free Town and other place, it is placed at the lowest place.



### 2-3 Appraisal of the Project

The fishery industry holds an important position in the industries of the Republic of Sierra Leone, and thus the fisheries direct effect on the people's lives is extremely large.

This Project shall provide materials and equipments which are essential to increase production and to improve the living standard of coastal small-scale canoe fishermen who are undertaking the majority of fisheries production, and by confirming its reasonability, we consider that the implementation of cooperation to this Project is necessary and that its effect would be great.

When the development of the traditional fisheries, namely the canoe fisheries which is essential to the fisheries development has become to be full-scale, the fisheries of the Republic of Sierra Leone will get into a state of stable development and the foundation of the industry which can supply sufficient fish to the people of Sierra Leone will be established; therefore, we consider the significance of the cooperation of Japan for this purpose to be great.



CHAPTER 3

BASIC DESIGN



CHAPTER 3  
BASIC DESIGN

Taking the background objectives and local condition of the requested Project into full consideration, the basic design of the materials and equipments required for the implementation of the Project was drawn out with emphasis to gain the maximum effect by the simplest ones avoiding the complicated ones by examining the durability, economical aspect, and safety.

The basic specifications and quantity of the requested materials and equipments were determined as follows.

3-1 Fishing Materials

(1) Netting Cloth for Bottom Gill Net

Nylon netting cloth shall be used for bottom gill net; and in order to reinforce at the time of use, and to facilitate the tailoring (preparation), half of each upper and lower part (float side and sinker side) of the netting cloth shall be double knitted net.

Two net colours shall be used: light green and light gray. The tying knot shall be English knot. Because the condition of use is harsh, especially the tying knot part should be made up of material by which some shift of mesh is hard to occur. (We do not consider the fishing boat which uses main net and the land facility for storing net to be sufficient.)





Specification and Quantity

Kind of Twine	Thickness of Yarn	Mesh Size	No. of Mesh	Length of Net	Quantity
	denyl	inch	mesh	yard	piece
Nylon Light green Light gray	210/6 " "	2 " "	30 " "	100 " "	500 500
Nylon Light green Light gray	210/6 " "	3 " "	30 " "	100 " "	500 "
Nylon Light green Light gray	210/9 " "	3 " "	30 " "	100 " "	500 500
Nylon Light green Light gray	210/9 " "	4 " "	25 " "	100 " "	500 500
Nylon Light green Light gray	210/12 " "	4 " "	25 " "	100 " "	500 500
Nylon Light green Light gray	210/9 " "	5 " "	25 " "	100 " "	500 500
Nylon Light green Light gray	210/12 " "	5 " "	25 " "	100 " "	500 500
Nylon Light green Light gray	210/12 " "	6 " "	25 " "	100 " "	500 500
Nylon Light green Light gray	210/15 " "	6 " "	25 " "	100 " "	500 500



(2) Completed Trammel Bottom Gill Net

Local fishermen have still not used this net and by actually operating with the trammel net, the steady use of this fishing method is sought by making fishermen realize the superiority of its catch efficiency.

The specifications for the inner net and outer net will be same with that of the bottom gill net cloth (however, the upper and lower part of the outer net shall not be made of double knitted net).

The float and sinker shall be of piercing type which is the most popular one in Japan, and its merit should be widely known.

In case of applying piercing method, mesh shift hardly occurs and the net form will not be destroyed.

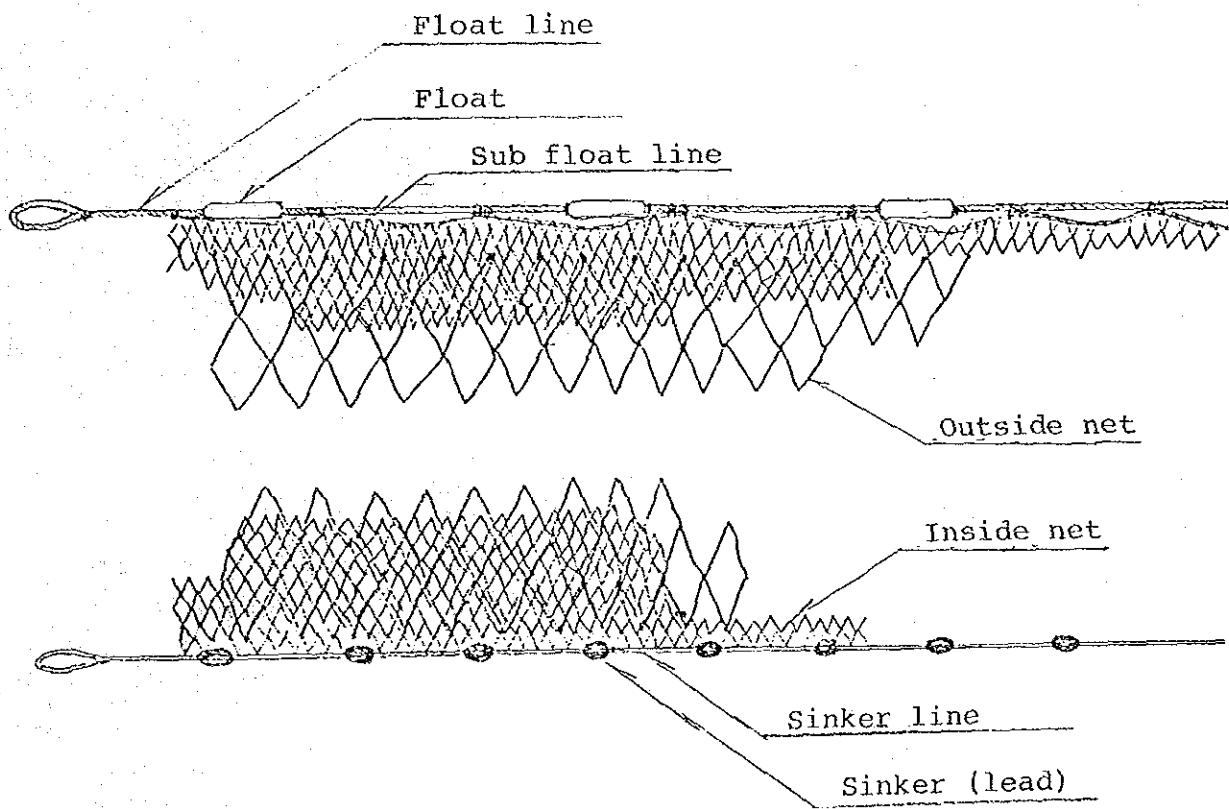
Since the trammel net will be used for bottom gill net and moreover will be used in the reef zone, the float used should be a powerful one (float for deep sea shall be used).

For connecting every piece of net, 30 cm pot shall be attached to both part of float and sinker.



1) Specification and quantity of the trammel net

Compositional Illustration





Specification and Quantity

Kind of Twine	Thickness of Yarn	Mesh Size	No. of Mesh	Length of Net	Quantity
	denyl	inch	mesh	yard	set
Nylon light green	210/6	3	60	50 (1,200)	250
	210/6	21	18	(160)	
Nylon light gray	210/6	3	60	50 (1,200)	250
	210/21	21	18	(160)	
Nylon light green	210/9	4	60	50 (880)	250
	210/21	18	18	(160)	
Nylon light gray	210/9	4	60	50 (880)	250
	210/21	18	18	(160)	
Nylon light green	210/9	5	50	50 (700)	250
	210/21	18	18	(160)	
Nylon light gray	210/9	5	50	50 (700)	250
	210/21	18	18	(160)	
				Total	1,500

Float line diameter 8 m/m  
 Sub Float line diameter 3 m/m  
 Float synthetic float  
 Sinker lead sinker





(3) Netting Needle

The needle will be used for tailoring and mending the gill net, and the plastic needle of medium size with sufficient strength is desirable.

Specification and Quantity

Length	Quantity
inch	dozen
less than 3	20
4	20
5	20
6	20
8	20
10	20
Total	120



(4) Nylon Rope

The rope will be used for many purposes such as for float rope, sinker rope, end rope, etc.; and as for reference the weight of 200 m/coil and the tearing strength shall be listed.

Triple twine, normal twine, z-twine.

In order to adjust loosening of twine and rope ends, high frequency wave heat process is performed on the rope. The colour shall be white.

Specification and Quantity

Diameter	Weight	Training Strength	Quantity
mm $\phi$	kg/coil	kg	coil
6	4.43	840	300
8	7.86	1,400	300
10	12.30	2,200	300
12	17.70	3,200	300
16	31.30	5,400	300
Total			1,500



(5) Nylon Netting Yarn (Twines)

The nylon netting yarn will be used for tailoring and mending, and for that purpose convenient type of yarn shall be used.

One Lb. (pound) yarn shall be coiled over the paper core. Two colours shall be used: light green and light gray.

Specification and Quantity

Thickness of Twines	Colour	Quantity dozen
210/6	Light green	100
	Light gray	100
210/9	Light green	100
	Light gray	100
210/12	Light green	100
	Light gray	100
210/15	Light green	100
	Light gray	100
210/18	Light green	100
	Light gray	100
210/21	Light green	100
	Light gray	100
210/24	Light green	100
	Light gray	100
210/30	Light green	100
	Light gray	100
Total		1,600



(6) Float

This float is for the floating gill net operated locally, and in Japan it is called rubber float (foam type).

Considering the condition of use, the following type is considered to be appropriate.

Length × outer diameter × hole diameter  
= 80 m/m × 105 m/m × 20 m/m

Float power: 500 gr  
(Because it is a completed product, permissible difference is to be 10%.)

Quantity: Total 30,000 pieces

(7) Sinker

Locally the plate-shaped one (1 m/m thick, 1 m × 2 m) is used by cutting into appropriate size. As regards the attaching method, the lead plate is tied around the sinker rope which is already attached to the net.

Specification and Quantity

1 m/m thick × 1 m wide × 2 m long  
(weight about 23 kg/plate)  
Total 250 plates

(8) Anchor for Gill Net

The anchor will be used to fix the gill net and weighs 7 lbs (about 3.2 kg).

Grapnel anchor (four nail anchor)  
Quantity: 1,000





(9) Gill Net Marking Float

The marking floats will be attached to the ends of the gill net when it is casted, and pressure-resistance function is unnecessary. Striking colour is considered to be suitable. They will be made of plastics.

Ball-type : 180 m/m  $\phi$   
2 eye type  
Float power : more than 2,700 gr  
Colour : orange

(10) Life Jacket

Vest type and front open type, fixed type including synthetic foaming material.

Quantity: Total 1,000 jackets

(11) Boots

Rubber boots : size 6, 7, 8, 9 and 10  
Quantity: 60 pairs for each size  
Total 300 pairs

(12) Rain Coat

Material: Vynil coated on both side of  
synthic fabric  
Tailor and quantity: Short coats with hood 300  
Trousers 300



### 3-2 Outboard Engines

The necessity of high quality outboard engines for the development of canoe fishery is a fact as has been already explained.

Therefore, we have judged that the outboard engines requested should be used in the following way.

Namely,

- (1) 15 PS outboard engine for 7 m - 10 m class canoe
- (2) 20-25 PS outboard engine for 15 m class canoe

Nextly, the main items of these outboard engine shall be listed.

#### Particulars of Outboard Engine

##### 15 PS Outboard engine

- |                 |   |                         |
|-----------------|---|-------------------------|
| 1. PS x R/M     | : | 15 PS x about 5,500 r/m |
| 2. Displacement | : | about 240 cc            |
| 3. Fuel oil     | : | Gas-oil mixture (50:1)  |

##### 20-25 PS Outboard engine

- |                 |   |                                       |
|-----------------|---|---------------------------------------|
| 1. PS x R/M     | : | 20-25 PS x about 5,000 -<br>5,500 r/m |
| 2. Displacement | : | about 390 - 430 cc                    |
| 3. Fuel oil     | : | Gas-oil mixture (50:1)                |



Spare parts and special tools

Spare parts and tools are to be supplied according to the maker's standard.

Stock repair parts of outboard engines

At least the following kinds and numbers of repair parts shall be presented for each 100 set of 15 PS and 20-25 PS outboard engines. (Required numbers are for 100 sets of engines.)

<u>Description</u>	<u>No. req'd</u>
Anode	40
Bearing, assorted	50
Bolt, assorted	360
Bond #4, 200 gr	20
Bond #5, 150 gr	20
Bushing	20
Cap, assembly	10
Caburetor assembly	5
Caburetor repair set	20
Case, starter	5
Casing, upper	3
Circlip, assorted	100
Clip	40
Clutch, dog	5
Coil, ignition	5
Condensor	10
Connecting rod assembly	20
Contact breaker assembly	40



<u>Description</u>	<u>No. req'd</u>
Cowling, bottom	2
Crank case assembly	2
Crank assembly	5
Diaphragms	40
Drive shaft complete	3
Element, filter	30
Filter assembly	20
Fuel oil pipe joint complete	20
Fuel oil pump assembly	5
Gaskets, assorted	160
Gasket, body	40
Gasket, casing upper	30
Gasket, cover	40
Gasket, cylinder head	20
Gasket, exhaust inner co	40
Gasket, float chamber	40
Gasket, fuel oil pump	40
Gasket, kit for power UNI	20
Gasket, kit for power HEA	20
Gasket, water pump	40
Gear 1, assembly	5
Gear 2, assembly	5
Grease, A 250 gr	24
Grease, C 150 gr	20
Housing, water pump	10
Ignition coil assembly	20
Impeller	20





<u>Description</u>	<u>No. req'd</u>
Insert cartridge	10
Inner plate, cartridge	10
Keys, woodruff	50
Mount rubber, lower front	5
Mount rubber, lower side	10
Mount rubber, upper front	20
Mount rubber, upper side	20
Nuts, assorted	120
Nut, hexagon	20
Nut, propeller	20
O-ring, assorted	170
Oil seals, assorted	140
Outer plate, cartridge	10
Packing, filter	30
Packing, lower casing	30
Packing, calve seat 1	40
Paul, drive	40
Piston assembly	20
Piston ring set	40
Pin, cotter	100
Pin dowel B	400
Pinion	5
Pin, piston	20
Pin straight	120
Plug cap assembly	20
Plug, spark	200
Plug, straight	30
Primary pump assembly	20



<u>Description</u>	<u>No. req'd</u>
Propeller assembly, 7"	10
Propeller assembly, 9"	5
Rubber, water seal	40
Screw, pan head	30
Shaft, propeller	3
Spring, return	40
Spring, starter	10
Starter assembly	2
Starter rope, 6 x 50 m	3
Stop switch assembly	10
Throttle wire complete	30
Valve, check	30
Valve seat assembly	20
Washer plate	30
Water pump repair kit	20



### 3-3 6m Class FRP Boat

The type of canoe being used in canoe fishery can be roughly classified into 7m class, 10m class and 15m class ones. Because the Republic of Sierra Leone has the intention to reevaluate the already existing boat types from different viewpoint and if necessary wants to improve them, 6 of 6m class FRP boats are included in the requested equipments of the Project.

As a result of surveying the local spot, many problems were found in the design, manufacture, material and others of the wooden canoe, and thus we judged that their improvements were required urgently. Therefore, the request for them is very much to the point and thus the adoption of 6m class FRP boat was determined by placing due consideration on the following conditions.

- (1) As a type which is suitable for moving operation in the sandy beach of a shoal, it should be flat bottomed as well as light in weight.
- (2) From the above reason, outboard engine is suitable than interior engine.

Based on the above mentioned conditions, the major items of the boat compiled are as follows, and as for reference material, general arrangement plan shall be also listed.



Particulars of 6 m Class FRP Boat

1. Type of Boat : Open deck type
2. Principal Dimensions
  - Length (over all) : about 6.00 m
  - Breadth (over all): about 1.70 m
  - Depth (moulded) : about 0.65 m
3. Hull Weight : about 0.20 ton
4. Dead Weight : about 0.80 ton
5. Complement : 3 persons
6. Outboard Engine : about 15 PS x 1  
Recommended
7. Service Speed : about 7 knots (in case of  
15 PS engine installed)
8. Hull Structure

Bottom and side shall be of FRP moulded  
single skin construction.



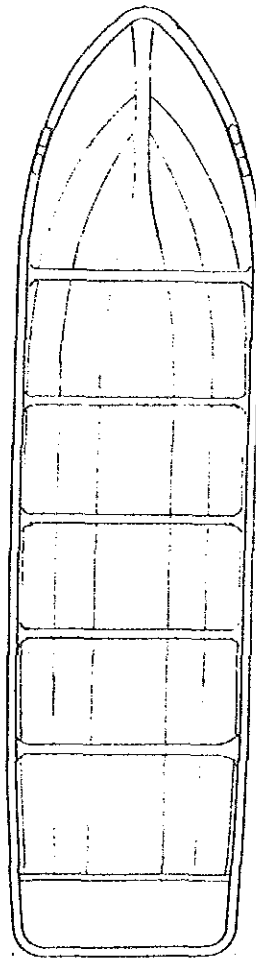
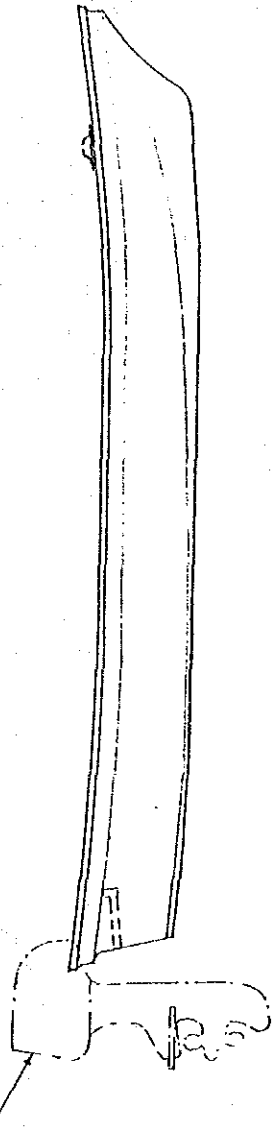


6 m Class FRP Boat

$$L(\text{oa}) \times B(\text{oa}) \times D(\text{mld})$$

$$= \text{abt. } 6.00^{\text{m}} \times 1.70^{\text{m}} \times 0.65^{\text{m}}$$

15 PS OUTBOARD ENGINE





3-4 Purse Seiner and Trawler

Based on the objectives of the request, the basic design of these boats were drawn out taking due consideration on the following matters.

- (1) In principle the cruise will be a 1 day voyage, and since the catches will be stored only by ices, the maximum days of continuous voyage is limited to be 3 days.
- (2) By taking the actual record of catch by these boats belonging to the local company and the opinions of the persons in charge of the Fisheries Division of the Government of Sierra Leone, the maximum catch per 1 voyage shall be as follows:

Trawler	:	3.0 ton
Purse Seiner	:	5.0 ton
- (3) For the purpose of training, each boat shall be equipped both with line hauler and net hauler so that long-line and gill net fishing can be conducted.
- (4) The complement shall be 8 persons and no dwelling facility shall be designed for the cruise will be only 1 day trip.
- (5) The service speed was determined to be about 7 knots from economical reason.



- (6) Wireless telephone (VHF) for taking contact with the base and for emergency shall be equipped, and the same typed wireless telephone shall be equipped in 4 land basis.
- (7) As for the supplementary fishing gears for training of each boat, each boat shall be equipped with the completed purse seine gears, trawl gears, and accessories according to the purpose of use of each boat.

Nextly, particulars of the boats of the Project, general arrangement plan, items of supplementary fishing gears, and Compositional Chart will be listed for reference.

### 3-4-1 Particulars of Purse Seiner

#### (1) Hull Part

##### 1) Kind of vessel, Regulation and Inspection

Kind of vessel	:	Purse seiner
Regulation	:	Japanese Government Small Fishing Vessel Safety Rule
Inspection	:	Japanese Government Export Inspection

##### 2) Principal Dimensions

Length (over all)	:	about 15.0 m
Breadth (over all)	:	about 3.5 m
Depth (registered)	:	about 1.15 m



Depth : about 2.15 m  
(including height of  
bulwark at amidship)

3) Capacities

Fish hold : about 12.0 m<sup>3</sup>  
Fuel oil tank : about 2.0 m<sup>3</sup>  
Fresh water tank : about 0.5 m<sup>3</sup>

4) Complement : 8 persons (no living  
quarter to be provided)

5) Service speed : not less than 7 knots

6) Hull structure

Shell, deck and superstructure are to be of FRP  
moulded single skin construction.

Engine bed : Steel plating  
Bulkhead : Plywood covered with FRP  
Fish hold insulation: Polyurethane foam, min  
thickness of 50 mm  
Rudder : Steel galv.  
Rudder post : Stainless steel

7) Deck machineries

1 - manual hydraulic type steering gear with  
emergency tiller  
1 - hydraulic capstan type purse winch,  
2 ton x 35 m/min  
1 - hydraulic net hauler,  
160 kg x 14 m/min approx.  
1 - hydraulic line hauler,  
200 kg x 100 m/min approx.





- 2 - hydraulic vang winch;  
0.5 ton x 30 m/min approx.
- 1 - galley appliances, consisting of:
  - 1 - LPG range and 1 - small size sink

8) Miscellaneous equipments

Following equipments and appliances are to be provided according to the rule, requirements and builder's standard.

- a. Life saving appliances
- b. Fire fighting appliances
- c. Nautical instruments
- d. Anchoring and mooring equipments
- e. Navigational lightings and signals
- f. Drainage apparatus

9) Outfittings and fishing equipments

Necessary outfittings and fishing equipments are to be installed and fitted to the hull according to the builder's standard.

10) Mechanical ventilation fan

- 1 - 0.2 kW, 24V DC for engine room air supply

11) Inventory

Deck inventories to be supplied according to the builder's standard.

12) Extra spare parts of purse winch

for 2 years maintenance and operation

- Rubber hose : 1 pc
- Needle valve set : 1 set



(2) Machinery Part

1) Main engine

Type : Water cooled 4-cycle  
vertical diesel engine  
Output : not less than 90 PS  
(max. cont. rating)  
Starting system : Electric  
Cooling system : Fresh water cooling  
with heat exchanger  
Reverse and reduction : Hydraulic wet type  
gear multiplate clutch  
Remote control device : 1 set  
No. installed : 1 set

2) Propeller and shafting

1 - manganese bronze, 3 blade fixed pitch type  
1 - High tensile brass shafting

3) Hydraulic pump unit

1 - Hydraulic pump unit for deck machineries  
driven by main engine with hydraulic oil  
tank

4) General service pump (driven by main engine)

Capacity : not less than 100  
ℓ/min: 1 set  
No. installed : 1 set

5) Spare parts and tools to be prepared according  
to the builder's standard.



6) Stock repair parts of main engines

At least following kinds and numbers of repair parts shall be prepared for two(2) vessels.

<u>Section</u>	<u>Description</u>	<u>No. req'd</u>
Cylinder head & related parts	Gasket, cylinder head	2
	Chamber sub ass'y, pre-combustion	1
	Gasket, pre-combustion chamber	12
	Gasket, valve rocker arm	1
	Guide, inlet valve	6
	Guide, exhaust valve	6
	Seat, exhaust valve	6
	Seal, valve stem	12
	Seal, oil	4
	Gasket, oil pan	2
	O-ring	10
	Gasket, coolant drain cock	5
	Gasket, tapet chamber	5
	Gasket, water gallery cover	5
Cylinder block	Liner, cylinder	6
	Bearing, cam shaft No. 1	1
	Bearing, cam shaft No. 2	1
	Bearing, cam shaft No. 3	1
	Bearing, cam shaft No. 4	1
	Bearing, injection pump	1
Idler gear, cam shaft	Bearing, thrust idler gear	1
	Bushing	1
	Plate, cam shaft thrust	1



<u>Section</u>	<u>Description</u>	<u>No. req'd</u>
Timing gear cover, flywheel housing	Gasket, timing gear cover	2
	Seal, oil	1
	Ring set, piston	2 sets
	Ring, retainer	30
	Bushing, piston pin	6
	Bolt, connecting rod cap	12
Main moving parts	Washer, lock	30
	Bearing set	1 set
	Bearing set	1 set
	Bearing set thrust	1 set
	O-ring	5
	Gasket	5
	Seal, oil	1
	Sleeve	1
	O-ring	5
Valve system	Valve, inlet	6
	Valve, exhaust	6
	Spring, valve outer	2
	Key, valve stem	24
	Screw, adjusting	5
	Gasket, intake manifold	12
	Gasket	5
	Pipe, breather	1
	Gasket, exhaust	5
	Spring, decompression	1
Oil pump	O-ring	10
Oil filter	O-ring	10
	O-ring	30
	Element kit	18





<u>Section</u>	<u>Description</u>	<u>No. req'd</u>
Oil filter	O-ring	10
	Spring	2
	Gasket	2
	O-ring	2
	O-ring	10
Oil cooler	Gasket, element	10
	O-ring	4
	O-ring	2
	Hose 2	2
	Clamp, hose	5
Oil drain piping	Gasket	10
	Gasket	10
	Hose	4
	Clamp, hose	10
Fuel system	Seal, oil	1
	Washer	10
	Washer	5
	Washer	10
	Holder ass'y, nozzle	1
	Nozzle, throttle	12
	Gasket, nozzle	30
	Gasket	10
	Washer, soft	10
Fuel injection pump	Spring, delivery valve	1
	Gasket, delivery valve	10
	Element sub ass'y, injection	6
	Washer, fuel pipe union	10
	Packing, air breather	20
	O-ring	2



<u>Section</u>	<u>Description</u>	<u>No. req'd</u>
Fuel injection pump	Washer, copper plate	10
	O-ring	5
Mechanical governor	Gasket	1
Fuel feed pump	Gasket	10
	Filter, pipe joint	1
Water cooler housing	Gasket	5
	Cap	1
	Gasket	5
	Thermostat	1
	Seal, thermostat	5
	O-ring	5
	Cap, water cooler	1
	Cap, water cooler 2	1
	Clamp, hose	5
	Clamp, hose	5
	Clamp, hose	5
	Gasket, water inlet	20
	Gasket, water outlet	20
Gasket, exhaust manifold	20	
Coolant pump 1	Gasket, water pipe	5
	Clamp, hose	5
	Gasket, coolant pump	2
Coolant pump 2	Seal, coolant	1
	Gasket, case plate	2
Sea water pump	Gasket, housing cover	5
	Impeller	2



<u>Section</u>	<u>Description</u>	<u>No. req'd</u>
Sea water pump	Cam	1
	Plate, wear	1
	Belt	5
	O-ring	10
	Hose	1
	Hose	1
	Clamp, hose	5
	Gasket	10
	O-ring	20
	Mechanical seal	1
Piping	Hose	2
Electrical 1	Gasket, heater plug	6
Alternator	Bearing	1
	Bearing	1
	Brush holder ass'y	1
Electrical 2	Thermo switch ass'y	1
	Bulb, pilot light (24V-3W)	10
	Thermo unit	1
Electric panel, tool	Fuse (10A)	20
	Fuse (40A)	10
Meter panel	Heater signal ass'y	1
Tachometer	Tachometer cable ass'y	1
	Seal, oil	1
	Gasket	3
Bilge pump	Impeller	1



<u>Section</u>	<u>Description</u>	<u>No. req'd</u>
Housing	Transmission overhaul kit	1 set
	Strainer, oil	1
	Gasket	10
	Bearing	1
	Bearing	1
	Plate, clutch	8
	Plate, back	7
	Spring, clutch	2
	Tube, pin	1
Remote control	Cable	1
	Cable end ass'y	1
	Cable end, remote control	1
	Plate, stopper	5
	O-ring	1
	O-ring	1
	O-ring	2
Fuel filter	Kit, element	18
	O-ring	20
	O-ring	10
	O-ring	20





7) Shore based tools of main engine for purse seiners and trawlers [one(1) set for four(4) vessels]

Screw driver Medium (+)	1
Screw driver Large (+)	1
Screw driver Medium (-)	1
Screw driver Large (-)	1
Center punch 100 mm	1
Snap ring plier Outer	1
Snap ring plier Inner	1
Snap ring plier Claw set	1
Long nose piler LP-150	1
Adjustable sliding wrench MW-250	1
Box wrench set B3017	1
Scraper	1
Plastic tool box	1
Offset wrench set 45° (6 pcs)	1
Open-end wrench 17 x 19	1
Double ended wrench set S1006	1
Wire brush	1
Hexagon wrench set	1
Shock less hammer 0.5 LB	1
Gear puller 150 mm	1
Nozzle tester NT-500	1
Torque wrench 2800FK	1
Measuring steel tape 2 m	1
Plier JP-200	1
Socket wrench adaptor BA3040	1
Socket wrench socket 46 mm	1
Ring gear stopper (ME590)	1
Ring gear stopper (ME990)	1
Valve spring press	1
I-bolt	1
Filler gauge 60 M	1



(3) Electric Part

1) Generator, driven by the main engine

Capacity : about 850 W, 24 V DC: 1 set

2) Storage battery

Type : Lead Acid

Capacity : 24 V DC x 200 AH: 1 set

3) Switchboard and distribution panel: 1 set each

4) Lighting system

<u>Lights</u>	<u>Volts</u>	<u>Watts</u>
Nav. lights	24 V	20 W
Room lights	24	20
Deck flood lights	24	60
Search light	24	110

5) Nautical instruments

Radio telephone (VHF)

Power supply : 12 V DC

Output power : 25 W

No. of channels : 2

No. installed : 1 - onboard

1 - shore station

Fish finder

Power supply : 12 V DC

Output power : 100 W

Depth range : 0 - 180 meters

No. installed : 1 set

Clear view screen : 1 set



6) Spare parts and tools

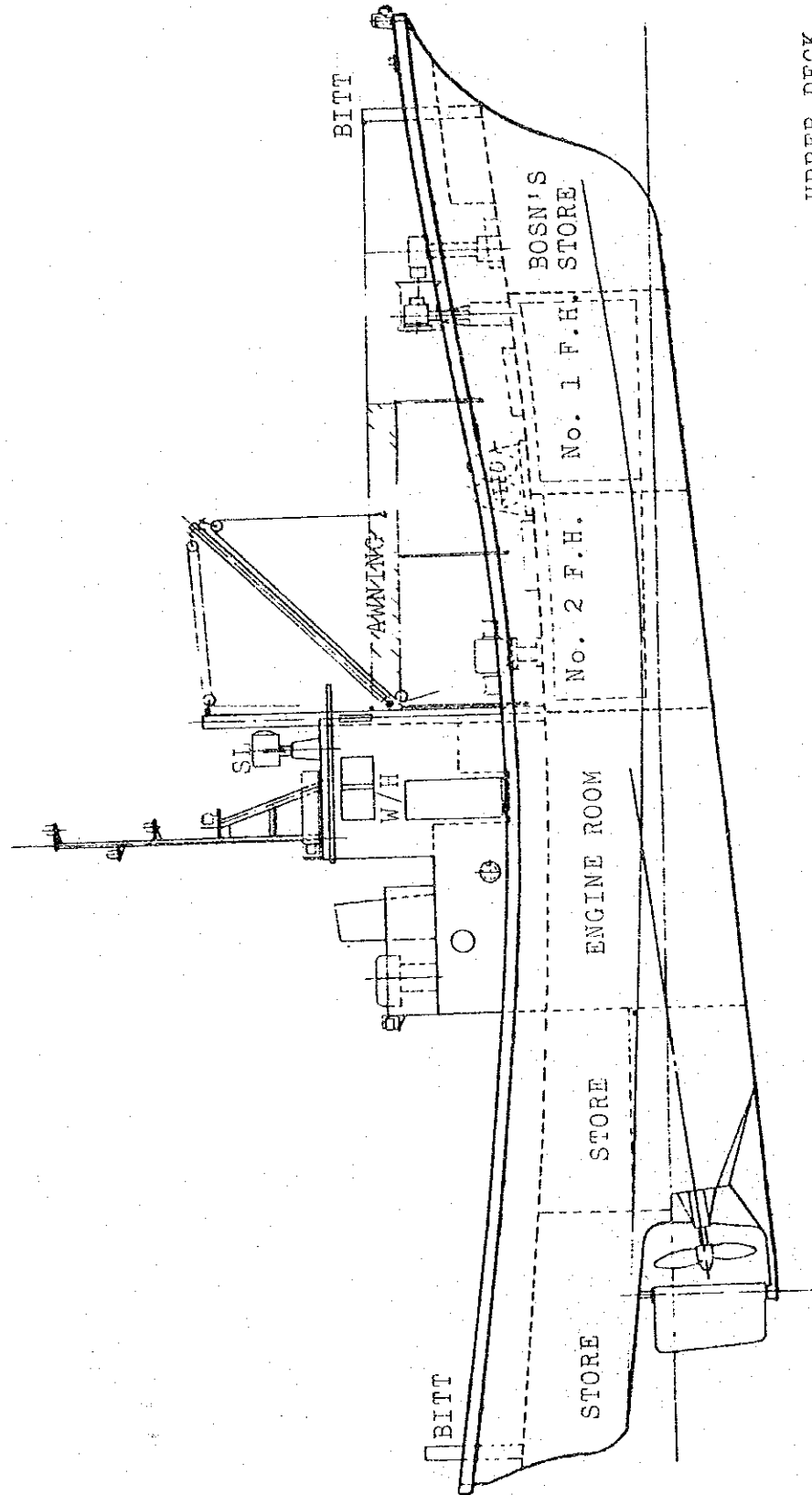
Spare parts and tools to be supplied according to the maker's standard.

7) Stock repair parts of nautical instruments

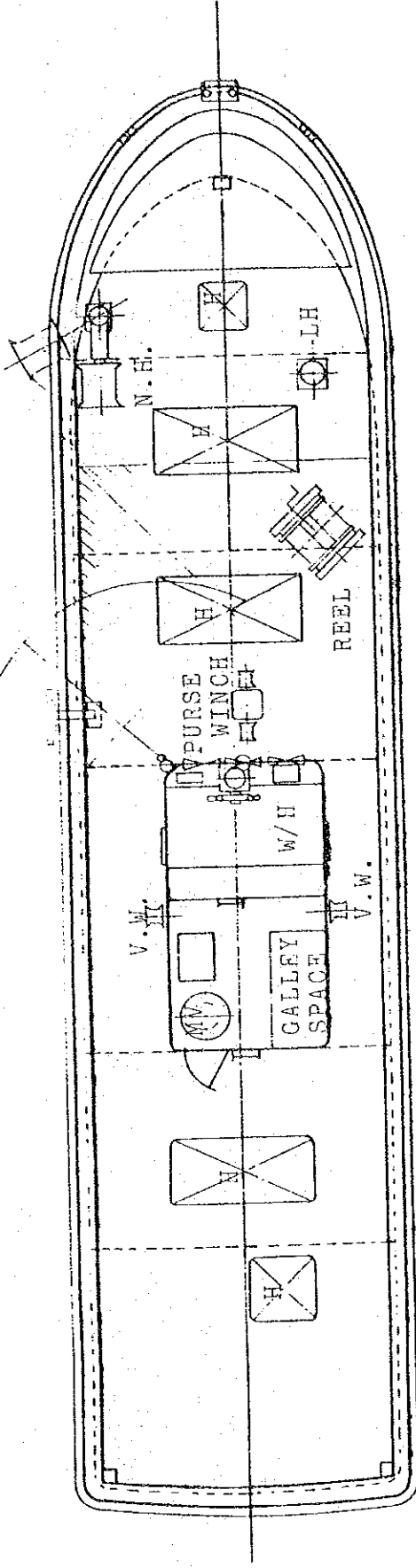
The following kinds and numbers of repair parts, tools and consumables shall be prepared for each vessel.

Recording paper	100 rolls
Recording pen	5 pcs
Recording belt	2 pcs
Take up belt	2 pcs
Pen guide, Up, Down	2 each
Spool	1 pc
Pilot lamp	4 pcs
Fuse 7A for DC 24 V	5 pcs
Fuse for AC 100 V	5 pcs
Grease	1 pc
Oil and oiler	1 pc
Screw driver set	1 pc
Screw driver	1 pc
Screw driver	1 pc
Hex wrench, 3 mm, 4 mm	1 each
Pen cleaner	1 pc
Pilot lamp	2 pcs
Tester	1 pc
Tool box	1 pc
Spring	2 pcs
<u>VHF Radio telephone</u>	
Fuse	4 pcs

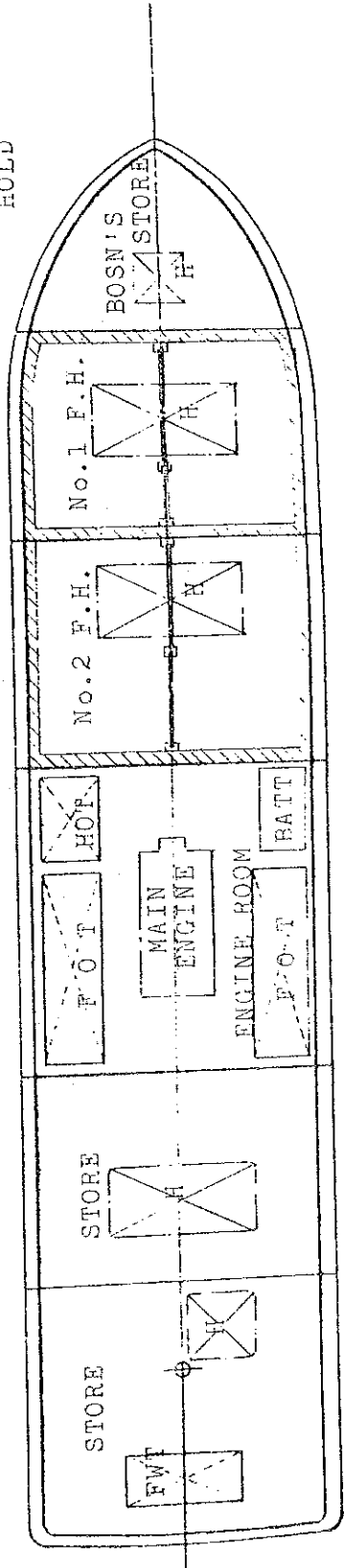
GENERAL ARRANGEMENT OF PURSE SEINER



UPPER DECK



HOLD





3-4-2 Purse Seiner Gears

(1) Particulars of Purse Seiner Gears

- 1) Fishing games : Pelagic fish (Sardinella spp, Banga)
- 2) Length and depth of net : 280 m x 42 - 45 m
- 3) Type of net : One boat purse seiner type
- 4) Net twine : Nylon twine (main net)
- 5) Mesh size and No. of twine

Main net	210 d/6	1/2"	(12.7 m/m)	mesh
Cod-end	210 d/9	1/2"	(12.7 m/m)	mesh
- 6) Hanging-in : Main net 25%  
Cod-end 32%
- 7) Purse line : Nylon braided rope 8 str  
(cross rope)
- 8) Float : Synthetic float
- 9) Sinker : Lead sinker

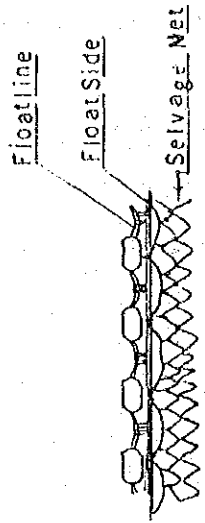
(2) Specifications and accessories

Based on the above mentioned conditions, the major items of the purse seiner gears are as follows; and as for reference material, specifications and accessories shall be listed.

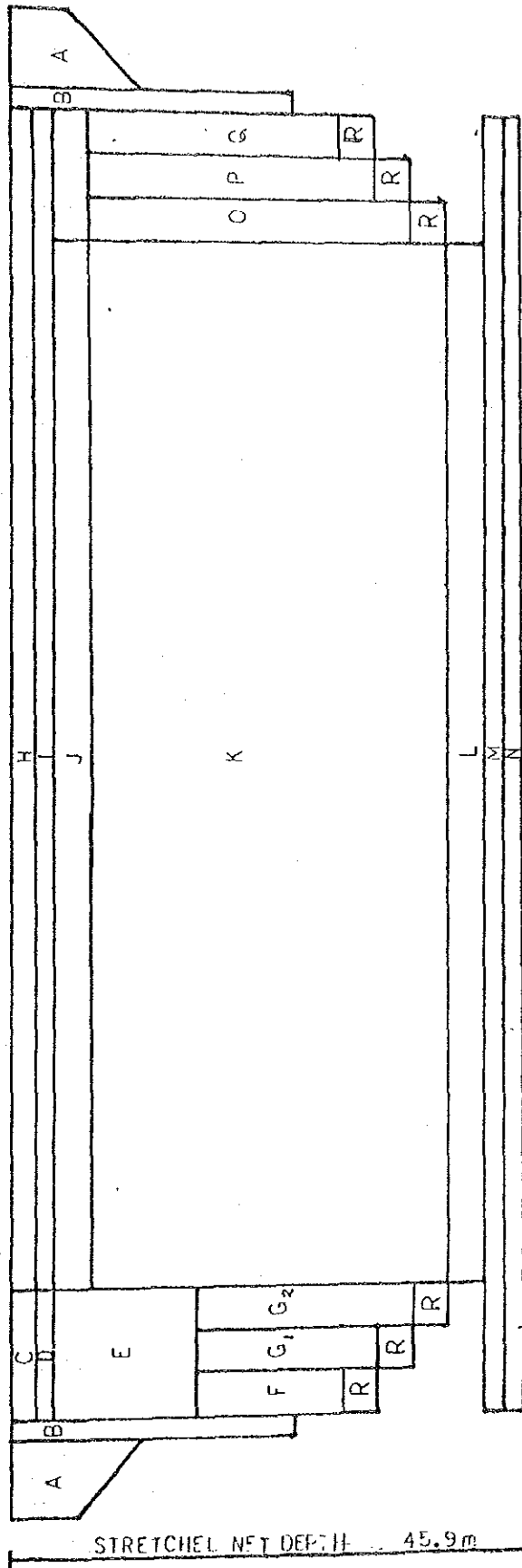
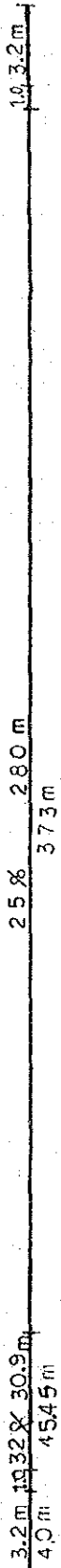




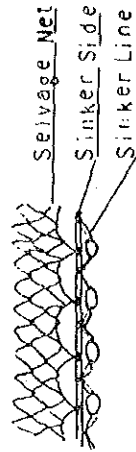
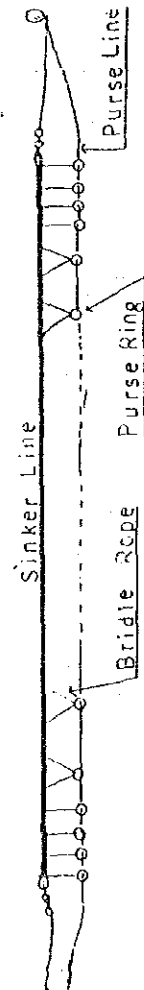
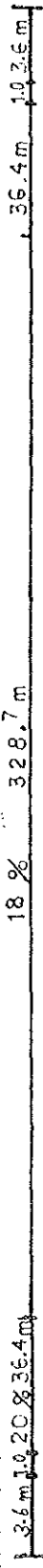
1) Purse seine net (One boat type)



FLOATLINE LENGTH



SINKERLINE LENGTH





2) Net composition

	Material	Size of Mesh (m/m)	No. of Meshes	Length (m)	Quantity pcs
A	Nylon braided rope	150	20 × 60	4.0	2
B	Nylon 210d 3/90	60.6	20	22.7	2
C	Nylon braided rope	90	3	45.5	1
D	Nylon 210d 3/45	20.2	20	45.5	1
E	Nylon 210d 3/9	12.7	400	45.5	3
F	Nylon 210d 3/9	12.7	400	15.2	3
G <sub>1</sub>	Nylon 210d 3/6	12.7	400	15.2	4
G <sub>2</sub>	Nylon 210d 3/6	12.7	400	15.2	5
H	Polyethlen 400d 2/200	90	3	373.5	1
I	Nylon 210d 3/30	20.2	50	373.5	1
J	Nylon 210d 3/15	12.7	100	327.9	1
K	Nylon 210d 3/6	12.7	400	327.9	8
L	Nylon 210d 3/15	12.7	100	327.9	1
M	Nylon 210d 3/90	60.6	20	418.95	1
N	Polyethlen 400d 2/200	90	3	418.95	1
O	Nylon 210d 3/15	20.2	200	15.2	9
P	Nylon 210d 3/15	20.2	200	15.2	8
Q	Nylon 210d 3/18	20.2	200	15.2	7
R	Nylon 210d 3/24	20.2	200	15.2	6



### 3) Specifications of Accessories

Float	Synthetic float	
Float line	Nylon spun 12 m/m	2.5 coil
Float side line	Nylon spun 14 m/m	2.5 coil
Sinker	Lead 187.5 g/pce	900 pcs
Sinker line	P.P. rope 14 m/m	2 coil
Sinker side line	P.P. rope 16 m/m	2 coil
Bridle rope	Nylon braided rope 8 str 20 m/m	50 m
Shackle	26 m/m spunk type	5 pcs
Both eye swivel	19 m/m	2 pcs
Purse ring	20 m/m x 160 m/m pair type	120 pcs
Purse line	Nylon braided rope 8 str 18 m/m	3 coil
Swivel	19 m/m	2 pcs
Triangle		2 pcs



### 3-4-3 Particulars of Stern Trawler

#### (1) Hull Part

##### 1) Kind of vessel, Regulation and Inspection

Kind of vessel : Stern trawler  
Regulation : Japanese Government  
Small Fishing Vessel  
Safety Rule  
Inspection : Japanese Government  
Export Inspection

##### 2) Principal Dimensions

Length (over all) : about 14.0 m  
Breadth (over all) : about 3.0 m  
Depth (registered) : about 0.75 m  
Depth : about 1.70 m  
(including height of  
bulwark at amidship)

##### 3) Capacities

Fish hold : about 5.5 m<sup>3</sup>  
Fuel oil tank : about 1.0 m<sup>3</sup>  
Fresh water tank : about 0.4 m<sup>3</sup>

4) Complement : 8 persons (no living  
quarter to be provided)

5) Service speed : not less than 7 knots

##### 6) Hull structure

Shell, deck and superstructure to be of FRP  
moulded single skin construction.





Engine bed	:	Steel plating
Bulkhead	:	Polywood covered with FRP
Fish hold insulation:		Polyurethane foam, min thickness of 50 mm
Rudder	:	Steel galv.
Rudder post	:	Stainless steel

7) Deck machineries

- 1 - manual hydraulic type steering gear with emergency tiller
- 1 - hydraulic trawl winch with warping ends, 1.5 ton x 50 m/min
- 1 - hydraulic net hauler, 160 kg x 14 m/min approx.
- 1 - hydraulic line hauler, 200 kg x 100 m/min approx.
- 1 - galley appliances, consisting of:
  - 1 - LPG range and 1 - small size sink

8) Miscellaneous equipments

The following equipments and appliances are to be provided according to the rule, requirements and builder's standard.

- a. Life saving appliances
- b. Fire fighting appliances
- c. Nautical instruments
- d. Anchoring and mooring equipments
- e. Navigational lightings and signals
- f. Drainage apparatus

9) Outfittings and fishing equipments

Necessary outfittings and fishing equipments are to be installed and fitted to the hull according to the builder's standard.



- 10) Mechanical ventilation fan  
1 - 0.2 kW, 24 V DC for engine room air supply
- 11) Inventory  
Deck inventories to be supplied according to the builder's standard.
- 12) Extra spare parts of trawl winch  
for 2 years maintenance and operation
- |                     |        |
|---------------------|--------|
| Rubber hose         | 1 pce  |
| Needle valve set    | 1 set  |
| Brake lining        | 2 pcs  |
| Traverser piece     | 4 pcs  |
| Metal, guide roller | 10 pcs |

(2) Machinery Part

1) Main engine

Type	:	Water cooled 4-cycle vertical diesel engine
Output (max. cont. rating)	:	not less than 90 PS
Starting system	:	Electric
Cooling system	:	Fresh water cooling with heat exchanger
Reverse and reduction gear	:	Hydraulic wet type multiplate clutch
Remote control device	:	1 set

2) Propeller and shafting

1 - manganese bronze, 3 blade fixed pitch type  
1 - high tensile brass shafting



- 3) Hydraulic pump unit
  - 1 - hydraulic pump unit for deck machineries driven by main engine with hydraulic oil tank
- 4) General service pump (driven by main engine)
 

Capacity : not less than 100  
l/min: 1 set
- 5) Spare parts and tools are to be prepared according to the builder's standard.
- 6) Stock repair parts of main engines
 

At least following kinds and numbers of repair parts shall be prepared for two(2) vessels.

<u>Section</u>	<u>Description</u>	<u>No. req'd</u>
Cylinder head & related parts	Gasket, cylinder head	2
	Chamber sub ass'y pre-combustion	1
	Gasket, pre-combustion chamber	12
	Gasket, valve rocker arm	1
	Guide, inlet valve	6
	Guide, exhaust valve	6
	Seat, exhaust valve	6
	Seal, valve stem	12
	Seal, oil	4
	Gasket, oil pan	2
	O-ring	10
	Gasket, coolant drain cock	5
	Gasket, tapet chamber	5
Gasket, water galley cover	5	



<u>Section</u>	<u>Description</u>	<u>No. req'd</u>
Cylinder block	Liner, cylinder	6
	Bearing, cam shaft No. 1	1
	Bearing, cam shaft No. 2	1
	Bearing, cam shaft No. 3	1
	Bearing, cam shaft No. 4	1
	Bearing, injection pump	1
Idler gear, cam shaft	Bearing, thrust idler gear	1
	Bushing	1
	Plate, cam shaft thrust	1
Timing gear cover, flywheel housing	Gasket, timing gear cover	2
	Seal, oil	1
	Ring set, piston	2 sets
	Ring, retainer	30
	Bushing, piston pin	6
	Bolt, connecting rod cap	12
Main moving parts	Washer, lock	30
	Bearing set	1 set
	Bearing set	1 set
	Bearing set thrust	1 set
	O-ring	5
	Gasket	5
	Seal, oil	1
	Sleeve	1
	O-ring	5
Valve system	Valve, inlet	6
	Valve, exhaust	6
	Spring, valve outer	2
	Key, valve stem	24
	Screw, adjusting	5





<u>Section</u>	<u>Description</u>	<u>No. req'd</u>
Valve system	Gasket, intake manifold	12
	Gasket	5
	Pipe, breather	1
	Gasket, exhaust	5
	Spring, decompression	1
Oil pump	O-ring	10
Oil filter	O-ring	10
	O-ring	30
	Element kit	18
	O-ring	10
	Spring	2
	Gasket	2
	O-ring	2
	O-ring	10
Oil cooler	Gasket, element	10
	O-ring	4
	O-ring	2
	Hose 2	2
	Clamp, hose	5
Oil drain piping	Gasket	10
	Gasket	10
	Hose	4
	Clamp, hose	10
Fuel system	Seal, oil	1
	Washer	10
	Washer	5
	Washer	10
	Holder ass'y, nozzle	1



<u>Section</u>	<u>Description</u>	<u>No. req'd</u>
Fuel system	Nozzle, throttle	12
	Gasket, nozzle	30
	Gasket	10
	Washer, soft	10
Fuel injection pump	Spring, delivery valve	1
	Gasket, delivery valve	10
	Element sub ass'y, injection	6
	Washer, fuel pipe union	10
	Packing, air breather	20
	O-ring	2
	Washer, copper plate	10
	O-ring	5
Mechanical governor	Gasket	1
Fuel feed pump	Gasket	10
	Filter, pipe joint	1
Water cooler housing	Gasket	5
	Cap	1
	Gasket	5
	Thermostat	1
	Seal, thermostat	5
	O-ring	5
	Cap, water cooler	1
	Cap, water cooler 2	1
	Clamp, hose	5
	Clamp, hose	5
	Clamp, hose	5
	Gasket, water inlet	20
	Gasket, water outlet	20
Gasket, exhaust manifold	20	



<u>Section</u>	<u>Description</u>	<u>No. req'd</u>
Coolant pump 1	Gasket, water pipe	5
	Clamp, hose	5
	Gasket, coolant pump	2
Coolant pump 2	Seal, coolant	1
	Gasket, case plate	2
Sea water pump	Gasket, housing cover	5
	Impeller	2
	Cam	1
	Plate, wear	1
	Belt	5
	O-ring	10
	Hose	1
	Hose	1
	Clamp, hose	5
	Gasket	10
	O-ring	20
	Mechanical seal	1
Piping	Hose	2
Electrical 1	Gasket, heater plug	6
Alternator	Bearing	1
	Bearing	1
	Brush holder ass'y	1
Electrical 2	Thermo switch ass'y	1
	Bulb, pilot light (24V-3W)	10
	Thermo unit	1



<u>Section</u>	<u>Description</u>	<u>No. req'd</u>
Electric panel, tool	Fuse (10A)	20
	Fuse (40A)	10
Meter panel	Heater signal ass'y	1
Tachometer	Tachometer cable ass'y	1
	Seal, oil	1
	Gasket	3
Bilge pump	Impeller	1
Housing	Transmission overhaul kit	1 set
	Strainer, oil	1
	Gasket	10
	Bearing	1
	Bearing	1
	Plate, clutch	8
	Plate, back	7
	Spring, clutch	2
	Tube, pin	1
Remote control	Cable	1
	Cable end ass'y	1
	Cable end, remote control	1
	Plate, stopper	5
	O-ring	1
	O-ring	1
	O-ring	2
Fuel filter	Kit, element	18
	O-ring	20
	O-ring	10
	O-ring	20





(3) Electric Part

1) Generator, driven by the main engine

Capacity : about 600 W, 24 V DC: 1 set

2) Storage battery

Type : lead acid

Capacity : 24 V DC x 150 AH: 1 set

3) Switchboard and distribution panel: 1 set each

4) Lighting system

<u>Lights</u>	<u>Volts</u>	<u>Watts</u>
Nav. lights	24 V	20 W
Room lights	24	20
Deck flood lights	24	60
Search light	24	110

5) Nautical instruments

Radio telephone (VHF)

Power supply : 12 V DC

Output power : 25 W

No. of channels :

No. installed : 1 - onboard

1 - shore station

Fish finder : 1 set

Power supply : 12 V DC

Output power : 100 W

Depth range : 0 - 180 meters

Clear view screen : 1 set



6) Spare parts and tools

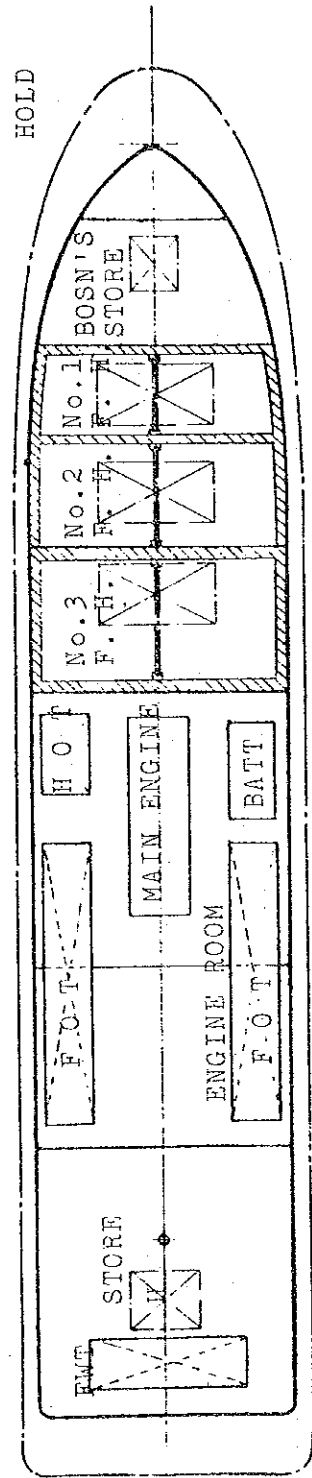
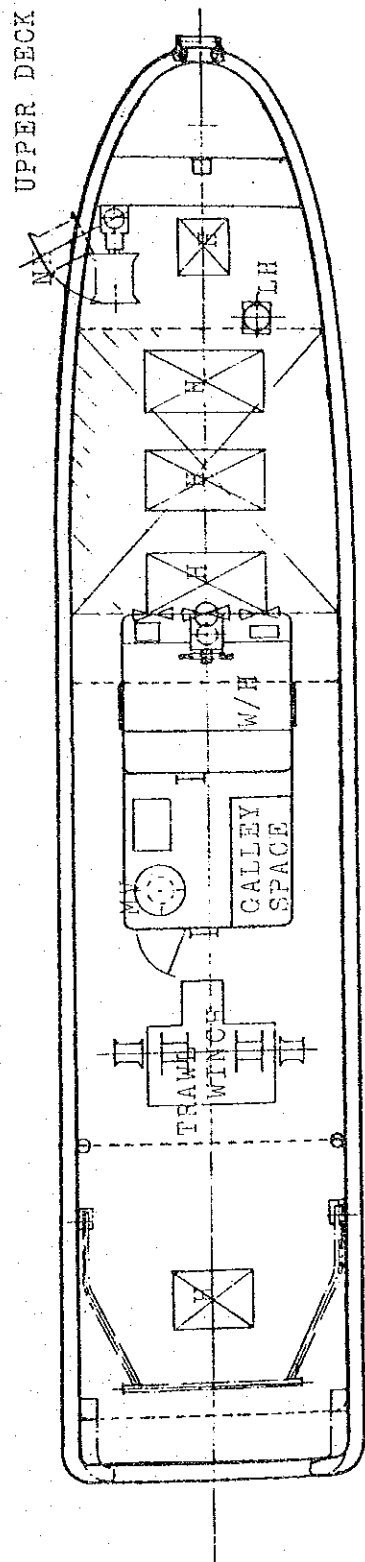
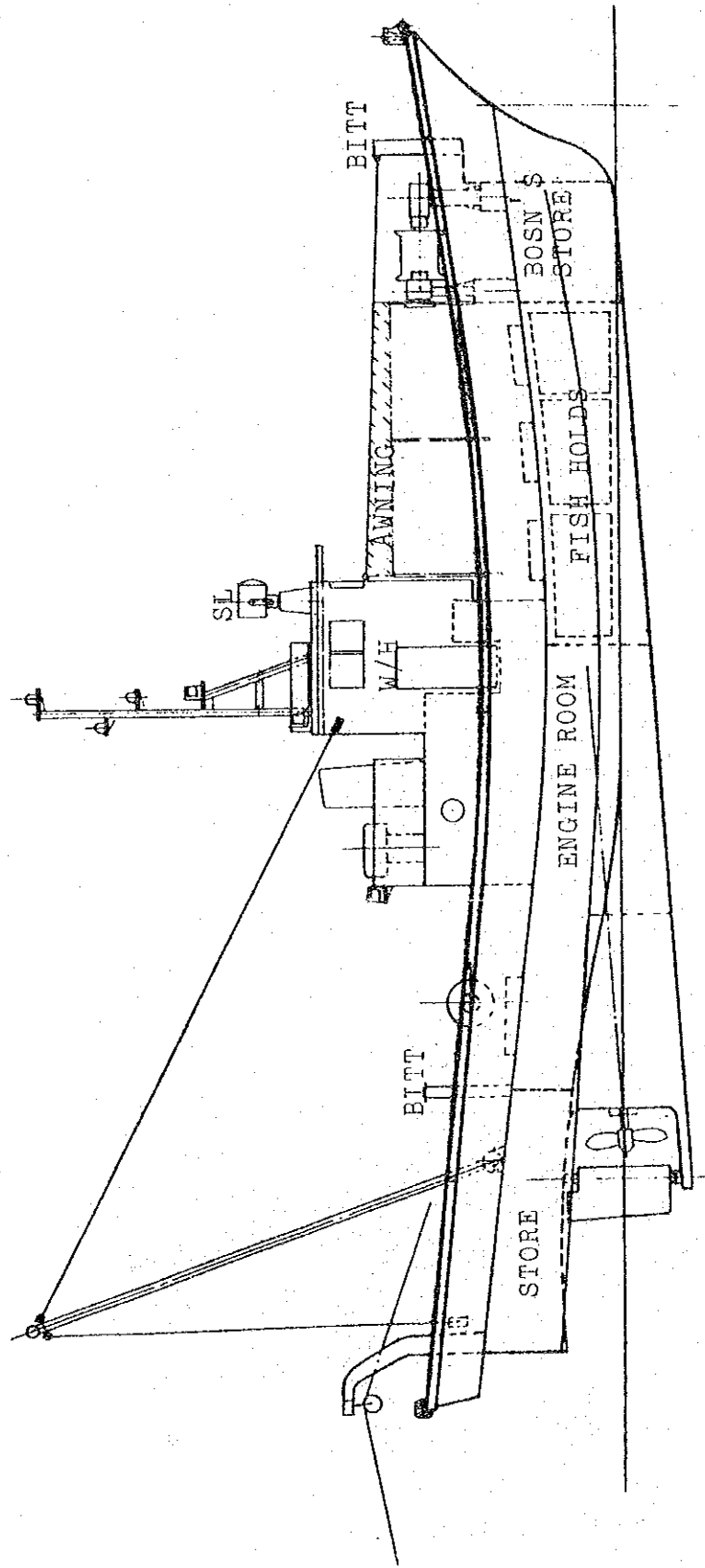
Spare parts and tools are to be supplied according to the maker's standard.

7) Stock repair parts of nautical instruments

The following kinds and numbers of repair parts, tools and consumables shall be prepared for each vessel.

Recording paper	100 rolls
Recording pen	5 pcs
Recording belt	2 pcs
Take up belt	2 pcs
Pen guide, Up, Down	2 each
Spool	1 pc
Pilot lamp	4 pcs
Fuse 7A for DC 24 V	5 pcs
Fuse for AC 100 V	5 pcs
Grease	1 pc
Oil and oiler	1 pc
Screw driver set	1 pc
Screw driver	1 pc
Screw driver	1 pc
Hex wrench, 3 mm, 4 mm	1 each
Pen cleaner	1 pc
Pilot lamp	2 pcs
Tester	1 pc
Tool box	1 pc
Spring	2 pcs
<u>VHF Radio telephone</u>	
Fuse	4 pcs

GENERAL ARRANGEMENT OF TRAWLER





### 3-4-4 Trawl Gears

#### (1) Particulars of Trawl Gears

- 1) Fishing games : Demersal fish
- 2) Fishing method : Stern trawler type
- 3) Main engine power : 90 PS
- 4) Type of net : 4-seam type for fish
- 5) Fishing ground : Quality of bottom mud sand  
Depth 20 m - 60 m
- 6) Otter board : Wooden otter board
- 7) Trawling warp : Diameter 10 m/m wire

#### (2) Specifications and accessories

Based on the above mentioned conditions, the major items of the trawl gears are as follows; and as for reference material, specifications and accessories shall be listed.

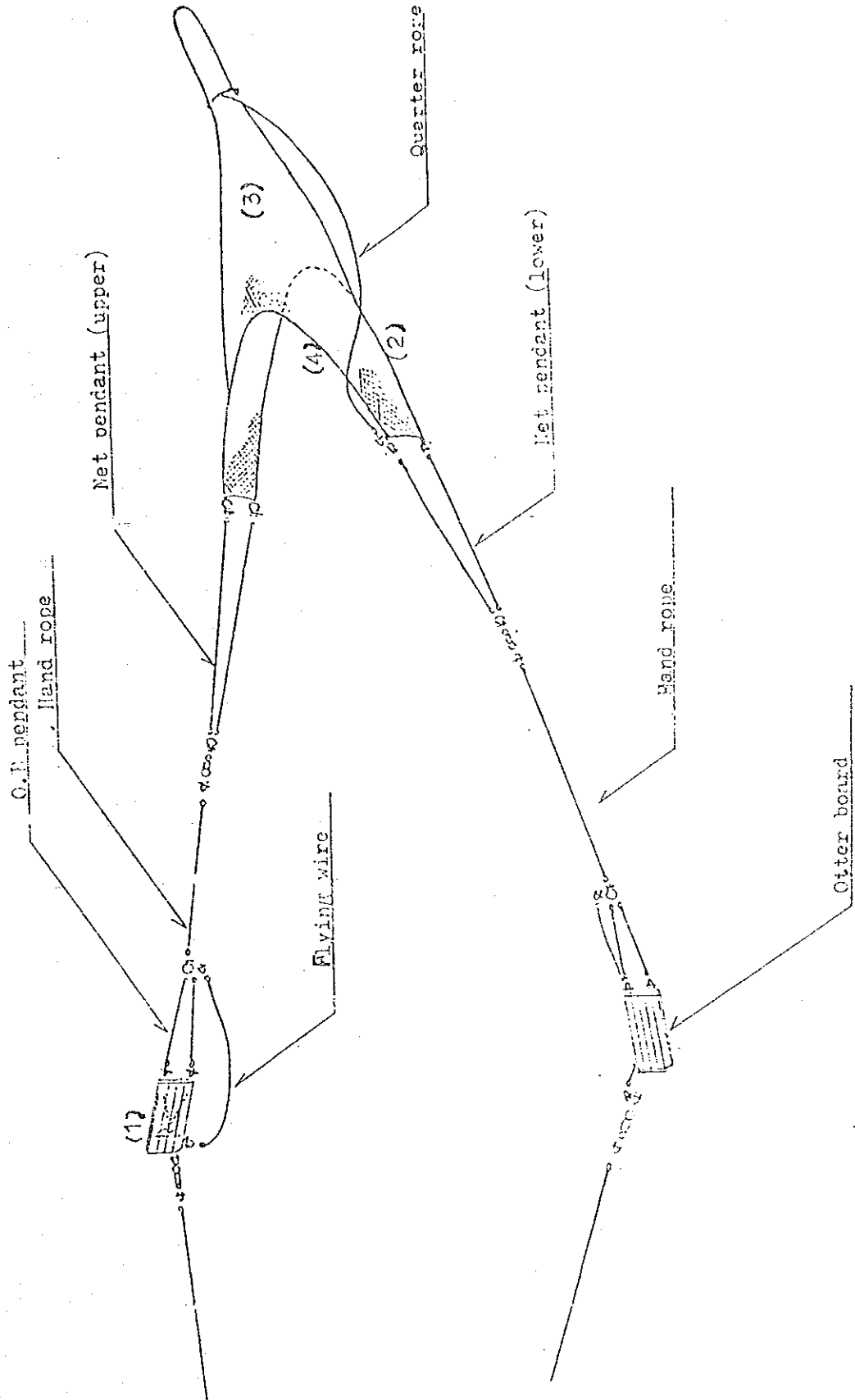
- (3) The trawl fishing gear should have extra materials for repairing because of the very hard wearing of the trawl fishing gear.

The specifications of the trawl fishing gear is as shown in the table below, 5).





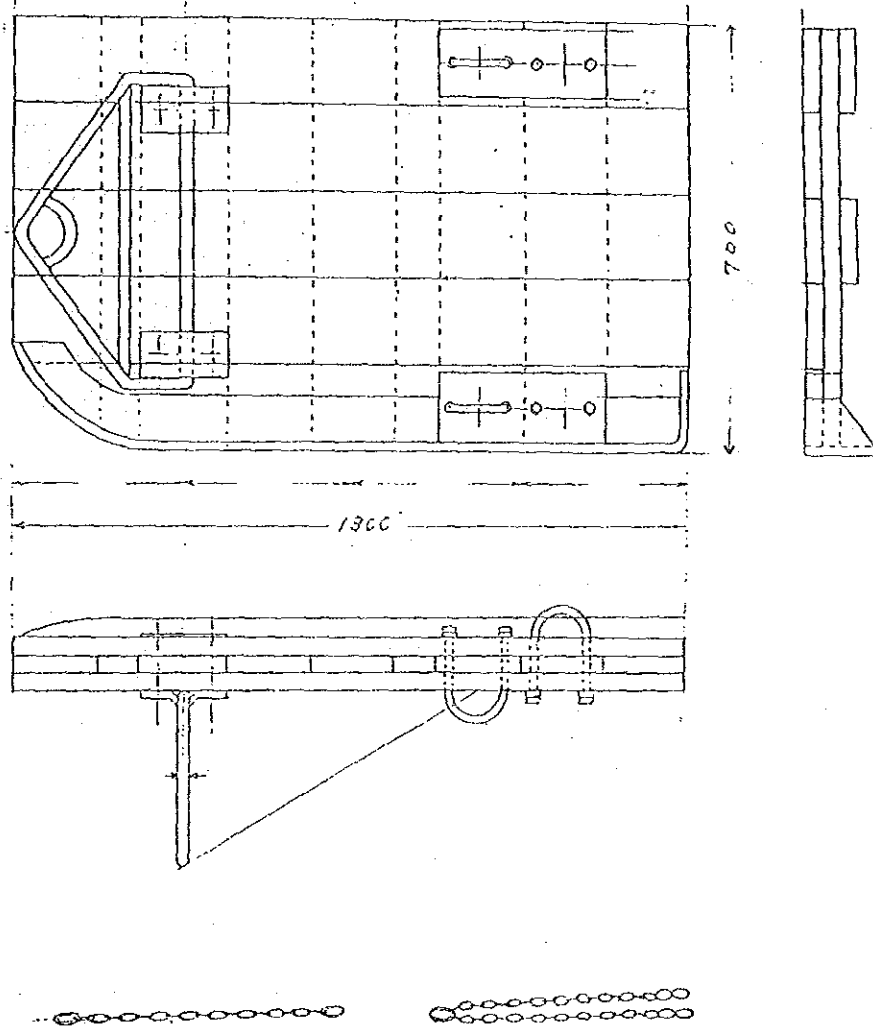
1) Gear arrangement





2) Otter board 700 x 1300

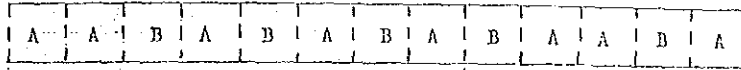
Weight (Under Water) : 42 kg



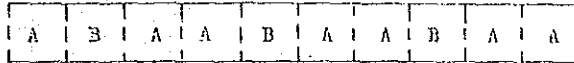


3) Ground rope

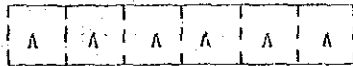
Wing 4.10 M



Quater Part 3.20 M



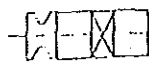
Bosson 2.00 M



Fixing Method



Rubber Bobbin  
80 x 80 mm 3 pcs  
Rubber Bobbin M-type  
63 x 93 mm 1 pc

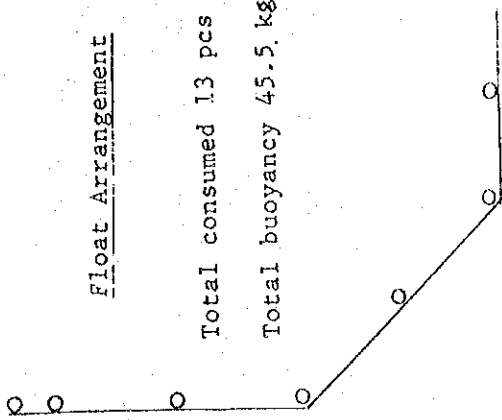


Rubber Bobbin  
80 x 80 mm 2 pcs  
Rubber Bobbin M-type  
63 x 93 mm 1 pc  
Iron Sinkers  
1.5 kg 1 pc



4) 90 PS bottom trawl net

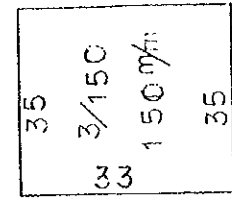
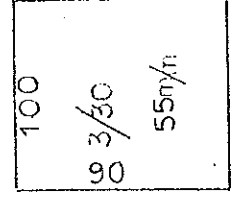
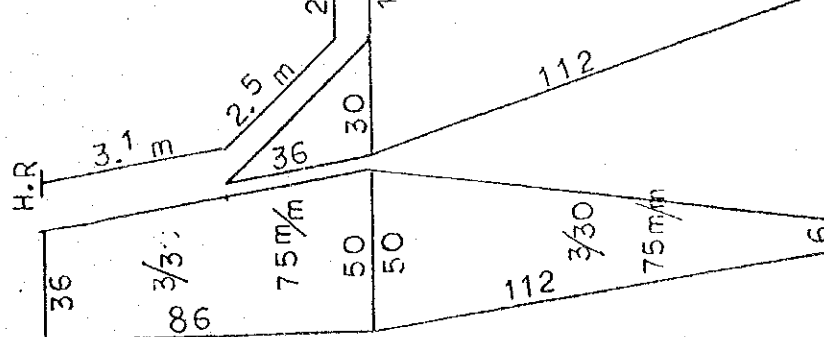
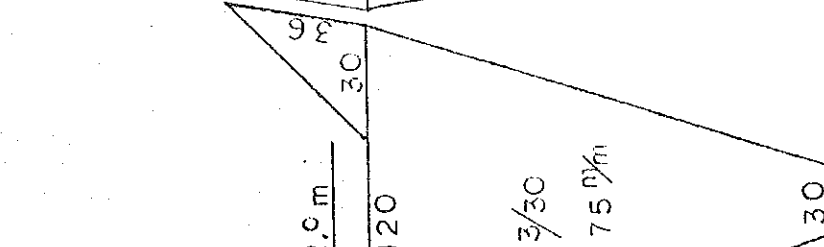
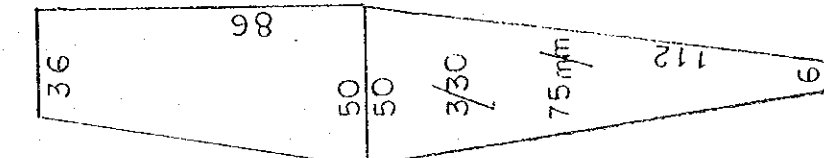
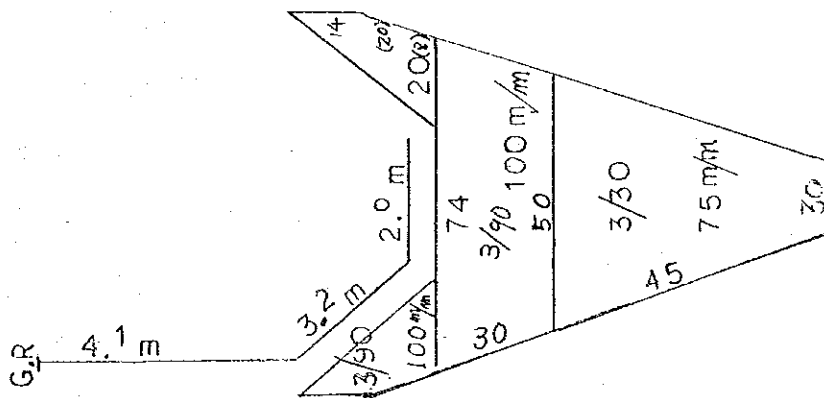
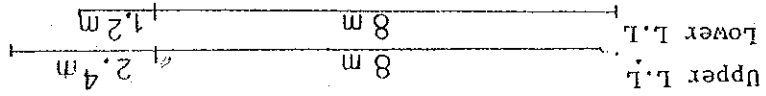
Head Rope



Float Arrangement

Total consumed 13 pcs

Total buoyancy 45.5 kg







5) Specifications and quantity (including spare parts)

<u>Description</u>	<u>Quantity</u>
Bottom Trawl net (complete set)	2 sets
Wire rope for main warp, JIS-4, 10 m/m Dia, 200 m/coil	3 coils
Spare Netting, P,e 360-400d/90 - 100 m/m Str 100 MD	150 m
Spare Netting, P,e 360-400d/30 - 75 m/m Str 100 MD	150 m
Spare Netting, P,e 360-400d/30 - 55 m/m Str 100 MD	50 m
P,e Twine, 360d/3/15, 2.5 kg/coil	20 coils
P,e Twine, 360d/3/24, 2.5 kg/coil	10 coils
Vinylon Twine, 5S/18, 2.5 kg/coil	10 coils
Vinylon and P,e Mixed Twine, 3.5 gr/m, 2.5 kg/coil	5 coils
Vinylon and P,e Mixed Rope, 12 m/m Dia, 200 m/coil	2 coils
P,e Rope, 8 m/m Dia, 200 m/coil	2 coils
P,e Rope, 18 m/m Dia, 200 m/coil	2 coils
Vinylon Rope, 18 m/m Dia, 200 m/coil	2 coils
Vinylon Rope, 14 m/m Dia, 200 m/coil	2 coils
Vinylon C.P.R, 16 m/m Dia, 200 m/coil	2 coils
Thimble, 12 m/m	20 pcs
Dog Hook, for 1 ton	3 pcs
Short link chain, 6 m/m, 25 mtr/pce	3 pcs
Short link chain, 13 m/m, 25 mtr/pce	4 pcs
D-shackle, 6 m/m	30 pcs
D-shackle, 9 m/m	30 pcs
D-shackle, 13 m/m	30 pcs
D-shackle, 16 m/m	30 pcs



<u>Description</u>		<u>Quantity</u>
B-shackle	16 m/m	10 pcs
Swivel	13 m/m	20 pcs
Float, ABS, 120 m/m Dia for 500 mtr Depth		50 pcs
Iron Ring, 6 x 60 m/m		10 pcs
Siezing wire, No. 20		50 kg
Otter Board		2 pairs



CHAPTER 4

IMPLEMENTATION PLAN



CHAPTER 4  
IMPLEMENTATION PLAN

In implementing this Project, the Survey Team has drawn out the Implementation Plan with maximum consideration upon fully grasping the items of request by the Government of Republic of Sierra Leone and examining the result of field survey. The Implementation Plan was drawn out as the urgency in implementing the Fisheries Development Project of Sierra Leone was recognized as a result of examining the necessity, rationality and urgency of the items of the request of grant assistance.

4-1 Measures Taken by the Sierra Leone Side on Material Grant

- (1) The fisheries materials and equipments to be supplied by the grant will be effectively used and managed by the Government.
  
- (2) The customs proceedings, customs clearance, storage and transportation of all the fisheries materials and equipments in Sierra Leone will be undertaken.





4-2 Implementation Schedule

The implementation schedule of the Project is expected to be as the following table shows:

Number of Month	1	2	3	4	5	6	7	8
Signing of Exchange of Notes								
Preparation of Tender	▬							
Conclusion of Construction Contract		▬						
Construction and Manufacturing			▬	▬	▬	▬		
Transportation							▬	▬





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