4-2 Design Concept

1) Ferryboat Design Concept:

Ferryboat design shall be based on the following concept:

(1) Capacity to handle future increase in the number of passengers and vehicles.

(2) Provisions for passenger accommodations, life saving and fire fighting equipment.

(3) Ferryboat maneuverability that is not only safe and reliable, but matching the skills of the present Western Samoan crews.

(4) Passenger accommodations suitable to the tastes of the Western Samoan people and appropriate for the local climatic conditions.

(5) Fuel efficiency, economical maintenance and operating costs, and simple maintenance and repair.

2) Repair Parts and Machinery:

The procurement of repair parts and machinery shall be planned based on the following aspects:

(1) Simple, easy-to-operate units that do not require special knowledge or skill to handle.

(2) Trouble free and easily maintainable units that have a minimum number of complicated and sophisticated parts.

(3) Multipurpose machinery that does not have parts that are difficult to obtain.

(4) Units that resist high temperatures and humidity.

(5) Units that can be used on different qualities of steel.

(6) Units that are adaptable to variable electricity voltage, different qualities of gas, oil, and water.

4-3 Design Specifications

1) Laws and Regulations:

The Western Samoan Shipping Act, the ratified International General Shipping Act, and other international shipping acts to be ratified, shall be applied to the Inter-Island Passenger/Vehicular Ferryboat Project.

The new ferryboat shall be designed in accordance with Japanese Industrial Standards (JIS).

2) Classification and Requirements:

The new ferryboat shall be classified in accordance with Japan Maritime Association (NK) Standards. The navigational area of the new ferry is equivalent to the "coastal use" classification.

3) Ferryboat Size:

Taking into consideration the present port facilities and the current channel regulations, the maximum ferryboat size is established as follows:

Length: LWL 40.0 meters
Draft: 2.25 meters

Note: The maximum draft of 2.15 meters was described in the Minutes of Discussions. However, the maximum draft to 2.25 meters (which is within the limits for safe operations) will be employed in order to meet transportation demand.

The new ferryboat shall be a double decker, having both a vehicle carrying deck and a passenger deck.

4) Transporting Capacity:

300 passengers
7 Trucks
10 Light Vehicles

5) Speed and Cruising Range:

Speed: 13.0 knots with 85% main engine thrust under full load conditions.

The cruising range shall be determined based upon a fuel oil supply once every two weeks.

6) Loading and Unloading:

Two (2) roll-on/roll-off ramps, one for the bow and one for the stern.

7) Engine

Fuel efficient diesel engines: 2 units - 2 shafts
Fuel Oil: A-Type heavy oil

8) Spare Parts:

Spare parts adequate for two (2) years' operating.

9) Other Items:

Sea Water Temperature: 32°C, Specific Gravity: 1.025
Electricity: 240 Volts 50 Hz

4-4 Basic Plan

4-4-1 Requirements for the Ferryboat:

1) Major Items:

(1) Service route and applicable laws and regulations:	
Service Route	Mulifanua (Upolu Island) -- Salelologa (Savaii Island)
Navigation Area Class	Equivalent to "coastal use". Japan Maritime Association (NK), Coastal Service
Laws and Regulations	Western Samoa Shipping Act 1972 International load line regulation, 1966 International convention for the Safety of Life at Sea, 1960, 1974 International Convention for Prevention of Pollution from Ships 1973, 1978 Protocol International Regulation for Preventing Collision at Sea, 1972 International regulations for Tonnage Measurement, 1969 convention USCG Regulation for foreign flag Vessels entering into U.S. ports.

(2) Dimensions		
Length:	LOA LPP	43.30 m 38.60 m
Breadth (Beam):		11.50 m
Deck Height:	Vehicle Deck Passenger Deck Full Load Draft	3.90 m 8.10 m 2.25 m

(3) Tonnage and Loading Capacity	
Gross Tonnage	Approx. 999 tons
Load: Planned Full Load Draft	Approx. 185 tons
Full Load Displacement:	Approx. 700 tons

(4) Speed and Cruising Range:		
Sea Trial Maximum Speed	Under continuous maximum thrust, No sea margin sea trial condition	13.7 knots
Cruising Speed	Normal thrust, planned full load condition	13.0 knots

(5) Main Propulsion Machinery:	
Main Engines	4 cycle diesel engines, 2 units Continuous maximum operation: 1,200 PS x 800 RPM per unit
Propellers	Manganese bronze material 4 blades, 1.6 meter diameter, 2 units
Generators	Drip-proof, air cooling system 130 KVA (104 kw), AC 420 V 50Hz, 2 units

(6) Accommodations for Passengers, Crew, and Vehicle		
Passenger capacity	Passengers: Vehicle Operators TOTAL	280 20 300
Crew	Captain & Chief Engineer Others TOTAL	2 8 10
Maximum number of persons	300 + 10 = 310	
Maximum Vehicle Carrying Capacity	7 - Trucks (8 meters) 10 - Light Vehicles (4.5 meters)	

(7) Tank Capacity:	
Fuel Oil	Approx. 50 m^3
Fresh Water	Approx. 10 m^3
Ballast Tanks	Approx. 100 m^3

2) Detailed Specifications:

(1) General Arrangement:

a. Outline:

The engine room of the new ferryboat shall be located in the midship section. The ferryboat shall be a self-docking/undocking, mariner type stern, flush deck steel boat with twin diesel engine propulsion. Light vehicles (passenger cars), trucks, and cargo shall be loaded on the vehicle carrying deck. Passenger compartment shall be on the main deck. The crew's and officers' quarters shall be on the upper deck. The bow and stern shall be equipped with shore ramps for combined passenger and vehicle use. A thruster shall be installed in the bow to ease steering during docking and undocking operations.

b. Compartments:

(i) Below Vehicle Deck:

Compartments below the vehicle deck shall be as shown in Fig. 4-9, page 4-37. The engine room shall be in the midship section and the thruster shall be in the bow section as shown in Fig. 4-9. A fuel oil tank and a ballast tank shall be placed forward of the engine room. A fresh water tank shall be installed aft of the engine room. A bow tank and two aft ballast tanks, used for trimming and heeling the boat, shall be installed as shown in Fig. 4-9.

(ii) Vehicle Deck:

The vehicle carrying compartment, chain lockers, storerooms, pump rooms, exhaust casings, and stairways shall be arranged as shown in Fig. 4-9.

(iii) Passenger compartment and benches, water closets, stairways, and anchoring and mooring

facilities shall be arranged on the passenger deck as shown in Fig. 4-9.

(iv) Navigation Bridge:

Control room (including chart space), crew's berthing, water closets, galley, and life saving equipment shall be arranged on the navigation bridge (upper deck) as shown in Fig. 4-9.

(2) Specifications for Equipment, Facilities and Outfits:

EQUIPMENT & FACILITIES	ITEM	SPECIFICATIONS	UNITS
1. Deck Facilities	Anchor Winches	Hydraulic, Electric, 3.5/3t x 9/10 m/min	2 units
	Mooring Winches	Hydraulic, Electric, 3t x 10 m/min	2 units
	Ramp Door Cylinders	Hydraulic, Electric, 21 t	2 sets
	Steering	Hydraulic, Electric, 1.6 t-m	2 units
	Lifeboat Winch	Electric Motor	1 unit
	Hydraulic Pumps	22 kw	2 units
2. Loading Facilities	Ramp Doors	4.0 m (width) x 5.0 m (length)	2 sets
	Vehicle Tiedowns	For trucks	7 sets
		For vehicles	10 sets
3. Passenger and Crew Accommoda-tions	Passenger	In compartment benches (wooden)	300 seats
		Weather deck benches (steel)	
	Crew	One-man cabins	2 rooms
		4-men quarters	2 rooms

EQUIPMENT & FACILITIES	ITEM	SPECIFICATIONS	UNITS
4. Ventilation and Air Conditioning	Ventilation	Bow thruster compartment 0.4 Kw	1 unit
		Galley 0.2 Kw	1 unit
		Water Closets 0.2 Kw	3 units
	Air Conditioning	Passenger compartment 7.5 Kw unit cooler	2 units
5. Life Saving Equipment	Lifeboat	FRP (6P) with an engine	1 unit
	Inflating Rubber Raft	25P	15 sets
	Life Jackets	For adults	310 sets
		For children	30 sets
	Lifebuoy		4 sets
	Smoke Signal		2 sets
	Parachute Flare		4 sets
	Light Buoy		2 sets
	Very Pistol	200 P	2 sets
	SOS Buoy		1 set
6. Bow Thruster	Electric Powered Variable Propeller	Thrust: 1.15 t	1 set
7. Fire Fighting Equipment	Fire Plug, Hose and Spray Nozzle		1 set
	Portable Fire Extinguisher	Foam type, 9 L x 15, 45 L x 1	16 sets
		CO_2 Bottle, 5 kg	3 sets
	Halon	Engine Room	1 set
	Fire Alarm	Engine Room	1 set
		Vehicle compartment	1 set

EQUIPMENT & FACILITIES	ITEM	SPECIFICATIONS	UNITS
8. Water Closet		Waste Holding Tank, 1 m^3	1 unit
9. Galley Facility	Electric Range	4 kw	1 unit
	Hot Water Maker	4 kw	1 unit
	Refrigerator	400 L	1 unit
10. Navigation Equipment	Navigation Lights		1 set
	Stay Light		1 set
	Red Lanterns	Kerosene Lamp	2 sets
	Magnetic compass	165 mm	1 set
	Gyrocompass		1 set
	Magnetic Log		1 set
	Sonar Sounding		1 set
	Searchlight	1,000 W	1 each
	Floodlights	200 W	4 each
	Morse Signal Light		1 set
	Air Horn		1 set
	Engine Telegraph		1 set
	Helm Indicator		1 set
	Window Wipers		3 sets
	Anemoscope & Anemometer		1 set
	Radar	12-inch dia.	1 set
11. Painting	Bottom Shell	SPC	2 coats
	Outer Shell & Weather Deck	Rubber Chloride	2 coats
	Fresh Water Tank	Epoxy	2 coats

EQUIPMENT & FACILITIES	ITEM	SPECIFICATIONS	UNITS
	Ballast Tanks	Tar Epoxy	2 coats
	Shell Anti-Corrosion	Zinc anode, for bottom and outer shell	As Required
12. Outfits	Main Anchors	1,020 Kg	2 sets
	Anchor Chain	28 mm ϕ x 357.5 m (long)	1 set
	Mooring Rope	Nylon, 27 mm ϕ x 140 m (long)	6 rolls
	Pulling Wire	Steel, 26 mm ϕ x 180 m (long)	1 roll
	Anchor Swivels		2 units
	Anchor Shackles		2 units
	Bell	300 mm ϕ	1 set
	Clocks		5 each
	Binoculars		1 set
	Lead lines		2 sets
	Black Balls		3 each
	Flag	Western Samoan	1 each
	International Signal Flags		1 set
	Barometer		1 unit
	Sextant		1 unit
	Portable Speaker		1 unit
	Carpentry Tools		1 set
	Painting Tools		1 set
	Blackboard		2 units

(3) Specifications for Machinery:

ITEM	SPECIFICATIONS	UNIT
Main Diesel Engines	Air started, water cooled, 1,200 PS	2 sets
Recuction Gears		2 sets
Shafts		2 sets
Propellers		2 each
Diesel Engine for Generator	Water cooled, 160 PS	2 sets
Diesel Engine for Auxiliary Generator	Salt Water Cooled, 20 PS	2 set
Main Air Compressor	14.5 m^3/hr x 30 kg/cm^2	2 sets
Emergency Air Compressor	Hand Operation	1 set
Main Air Tanks	200 L x 30 kg/cm^2	2 units
Emergency Air Tank	45 L x 30 kg/cm^2	1 unit
Fire/Bilge Pump	80/50 m^3/hr x 18/50 m	2 sets
Fresh Water Pump with Pressure Chamber	50 L/min x 40 m	1 set
Oil/Water Separator	0.5 m^3/hr	1 set
Salt Water Pump with Pressure Chamber	50 L/min x 40 m	1 set
Fuel Oil Transfer Pump	8 m^3/hr x 3 kg/cm^2	1 set
Hydraulic Pump Unit	22 KW	2 sets
Workbench		1 each
Chain Block for Main Engine Repair		1 set
Main Engine Remote Operating System		1 set
Main Air Compressor, Automatic Start/Stop System		1 set
Fuel Oil Service Pump, Automatic Start/Stop System		1 set
Fresh Water Pump, Automatic Start/Stop System		1 set
Engine Room Alarm System		1 set

(4) Specifications for Electrical Work

ITEM	SPECIFICATIONS	UNIT
Main Generators	420 VAC, 50 Hz, 3 ph, 130 KVA	2 sets
Auxiliary Generator for Harbor Use	420 VAC, 50 Hx, 3 ph, 15 KVA	1 set
Batteries	400 AH	2 sets
Battery Charger		1 set
Transformers	10 KVA	3 sets
Power Distribution Panel		1 set
Shore Power Supply Connection Set	415 VAC, 50 Hz, 3 ph	1 set
Lighting System	For entire boat	1 set
Radar	12-inch dia, CRT	1 set
Inter-communications Telephone System	Battery operated	1 set
Onboard Announcing System	30 W	1 set
Fire and Emergency Alarm System		1 set
Engine Telegraph System		1 set
Helm Indicating System		1 set
Inter-communication System		1 set
SSB Communication Unit	400 W	1 set
VHF Telephone	20 W	1 set
Transceivers	400 MHZ	4 sets

(5) Spare Parts:

Spare parts for the Project shall meet the standards of boat classification regulations and shall be standard units produced by each manufacturer. The supply of spare parts shall be adequate to handle two (2) years' servicing needs.

4-4-2 Repair Machinery and Tool Plan:

Repair equipment necessary for the ferryboat's inspection and repair are shown in Table 4-2, below, under two separate columns ("This Project" and "UNDP Project"):

Table 4-2 Repair Machines and Tools

GROUP	ITEM	PROJECTS	
		THIS PROJECT	UNDP PROJECT
Machine Tools	Lathe (Large)	1	
	Lathe (Small)	1	
	Milling Machine	1	
	Drilling Machine (Radial)	1	
	Drilling Machine (Table)	1	
	Portable Electric Drill		2
	Bench Grinder	1	
	Portable Grinder		2
	Valve Refacing Machine (W Kit)		1
	Pipe Bender Machine		1
Welding/Cutting Equipment	A.C. Arc Welder (W/Engine)	1	
	Gas Welding & Cutting Equip	1	
	A.C. Arc Welder	1	
Common Use Equipment	Air Compressor	1	
	Battery Charger	1	
	Steam Cleaner	1	
	Drier		1
	Ventilating Fan and Duct		1
	Electric Fan		1
	Hydraulic Test Pump		1
	Submersible Water Pump		1
	Diving Gears		2
	Steel Wire Rope (12, 20M/M)		200 m
	Welding Cable (20 m)		4
	Temporary Cable (200 m)		2
	Air Hose		100 m
	Water Hose		200 m
	Vinyl Hose		200 m
	Safety Belt		5
	Helmet		20
	Dust Mask		5
Winch/Carrier	Chain Block (5 ton)		1
	Chain Block (2 ton)	1	
	Chain Block (1 ton)	2	
	Chain Block (0.5 ton)	1	

GROUP	ITEM	PROJECTS	
		THIS PROJECT	UNDP PROJECT
Winch/Carrier	5 Ton 4-Wheel Jack		1
	Portable Jack		5
	Puller 3 Jaws		1
	4-Wheel Hand Truck		2
	Hand carrier		1
Instruments	Injection Tester		1
	Indicator		1
	Portable A.V.O. Meter		1
	Crowler Tester (Armature)		1
	Micrometer		2
	Calliper		2
	Vernier Calliper		2
	Dial Gauge		2
	Deflection Gauge		1
	Cylinder Gauge		1
	Depth Gauge		1
	Thickness Gauge		2
	Membrane Thickness Gauge		1
	Tachometer		2
	Measuring Tape		3
Tools	Complete Socket Set (1/2" SAE, 1/2" MET, 3/4 DRIVE)		1
	Straight Edge		2
	C-Clamp		10
	Shackle, Eye-Bolt, Wire Clip		1 Set
	Electric Impact Wrench		1
	Parallel Vice		2
	Crescent (15", 18", 24")		2
	Surface Plate		2
	Hand Tools		1 Set

PRINCIPAL PARTICULARS

Loa	=	43.30 M
Lpp	=	38.60 M
B	=	11.50 M
D	=	3.90 M
d	=	2.25 M
Vs	=	13.0 Knot (Service)

Capacity :

Heavy Truck x 7 (8.0 M x 2.4 M)

Light Vehicle x 10 (4.5 M x 1.7 M)

Passenger x 300 P

Crew x 10 P

SCALE 1/200

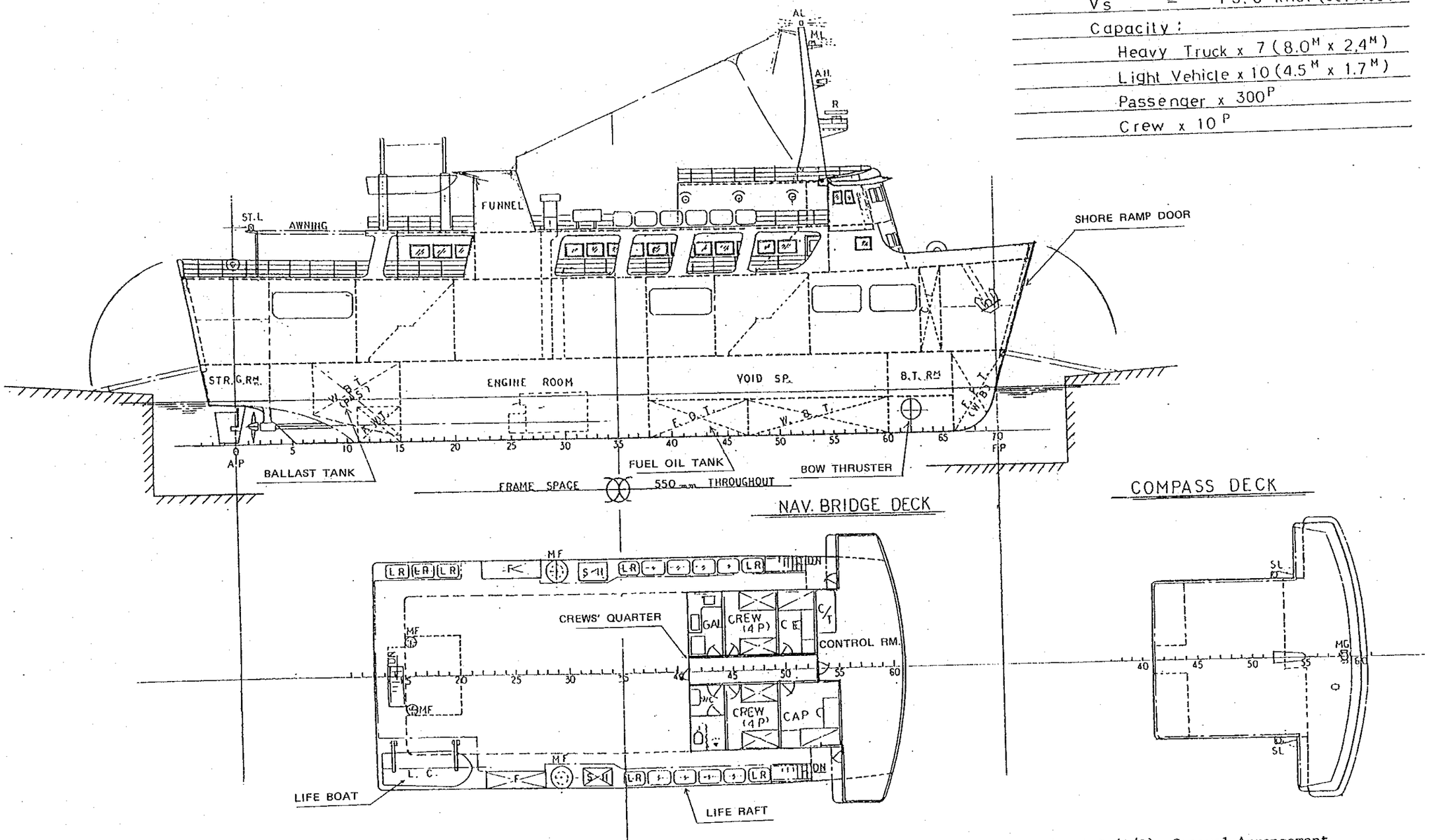


Fig. 4-9 (1/2) General Arrangement

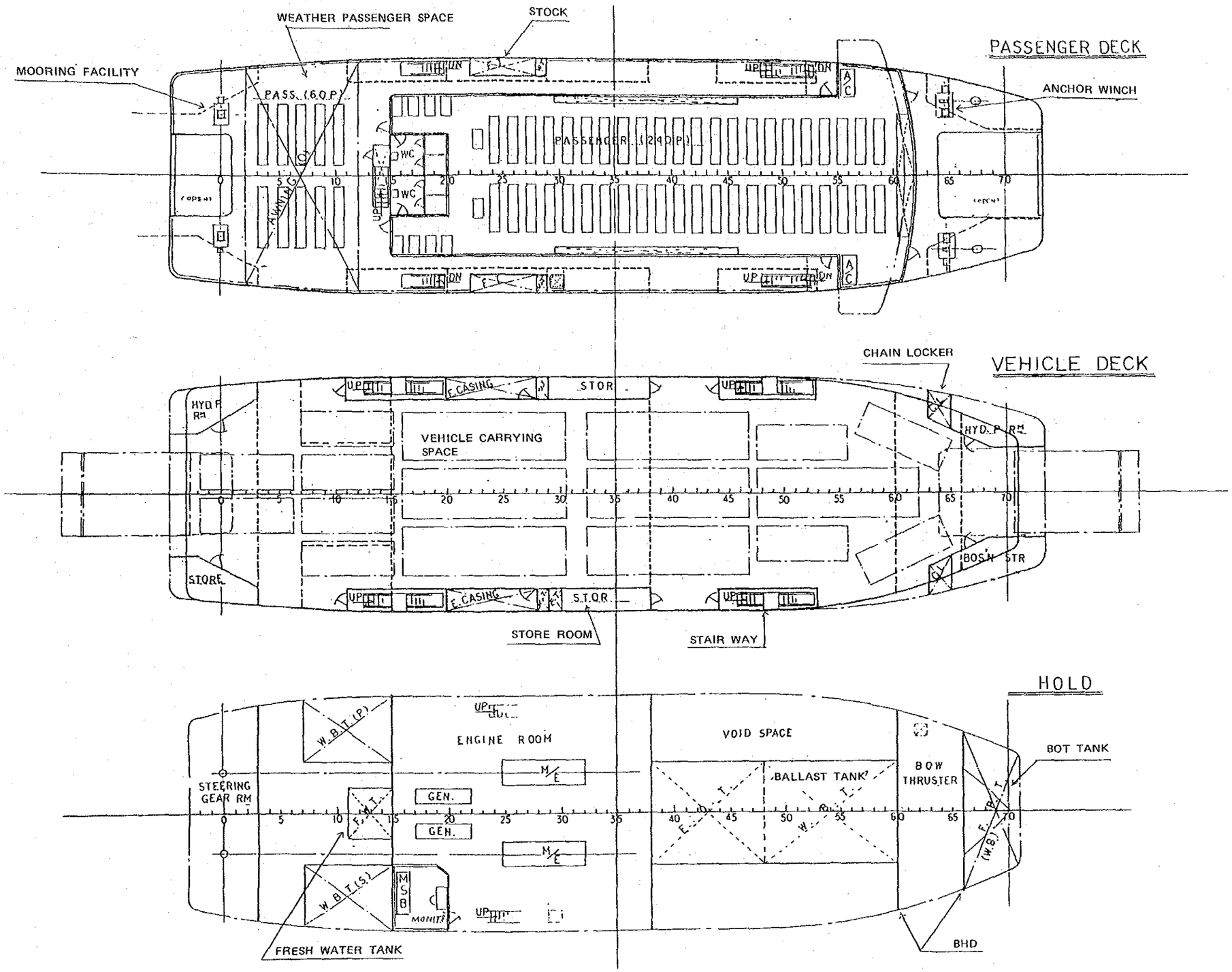


Fig. 4-9 (2/2) General Arrangement

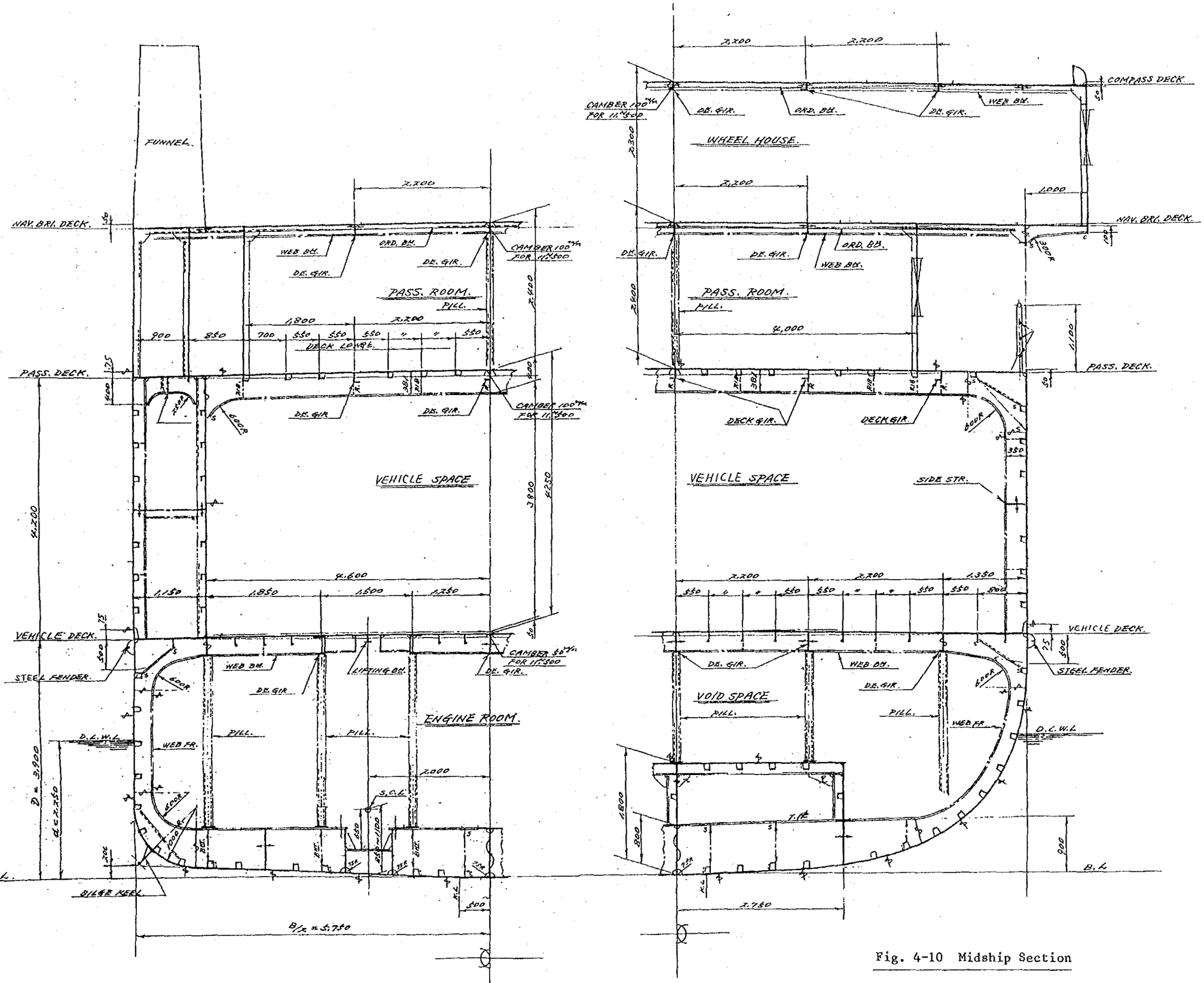


Fig. 4-10 Midship Section

4-5 Shipbuilding Plan

4-5-1 Shipbuilding Conditions and Building Schedule:

1) Ferryboat:

In Western Samoa there is no shipyard capable of building a ferryboat. In American Samoa, there is a ship repair yard, but no shipbuilding facility. In Fiji, there is a shipbuilding yard, but the techniques and skills required to build a reliable steel ferryboat is limited. It is recommended, therefore, that a safe and reliable ferryboat should preferably be built in a Japanese shipyard under strict supervision.

There are three possible methods for delivering the new ferryboat to Western Samoa from Japan, they are as follows:

(a) Shipboard transportation
(b) Towing (by tug)
(c) Independent sailing

As for method (a), there is not enough capacity of scheduled shipping service between Japan and Samoa. Method (b) poses the problem of towing the shallow draft ferry under rough sea conditions. Further, because of the time and distance involved, towing costs would be extremely high. Therefore, for safe and economical delivery, the ferryboat travel to Western Samoa under its own power, method (c) is recommended.

2) Repair Machinery and Tools:

It is desirable that, for the following reasons, repair machinery and tools be procured from Japan:

(a) It is impossible to procure repair machinery and tools in Western Samoa.

(b) It would be difficult to have repair machinery manufactured in the neighboring countries of American Samoa and Fiji. Even if it were possible to purchase these items, they would have probably been imported and the cost would be excessive.

(c) The study team sent by UNDP for the "Establishment of Shipping Maintenance Programme" plans to send Japanese technicians to Western Samoa to instruct local repair personnel in the performance of proper ferryboat repairs with the use of Japanese made tools and repair machinery.

(d) The management, inspection, testing of Japanese equipment is not at all difficult.

4-5-2 Extent of Responsibility of the Project

The extent of responsibility of the Project for the governments of Japan and Western Samoa are as shown in Table 4-3.

Table 4-3 Extent of Responsibility of the Project

ITEM	JAPANESE GOVERNMENT	WESTERN SAMOAN GOVERNMENT
Ferryboat	Building and delivery Costs Delivery location: Apia Port Costs for sea trial before Delivery Costs for crew (Captain & Chief engineer) training in Japan (approx. two weeks) Spare parts for ferryboat main machinery (two years' provisions)	Delivery costs from Apia Port to serving port Registration costs
Repair Machinery, Tools and Spare Parts	Repair machinery and tools as listed in Table 4-2	Transportation costs of repair machinery, tools, and spare parts from the arriving port to the repair facility Installation costs for repair machinery and tools

4-5-3 Management and Supervision Plan

Upon completion of the detailed design and tender documents the Consultants will provide the following services:

1) Assistance for pre-qualification of tenderers

2) Assistance for pre-qualification of tenderers

3) Assistance to the Government of Western Samoa and a contractor in regards to the contract agreement.

4) Inspection and Supervision, as follows:

   (1) Approval of final drawings

   (2) Supervision of various tests and inspection during the actual shipbuilding

   (3) Attending sea trials

   (4) Attending final pre-delivery sea trial

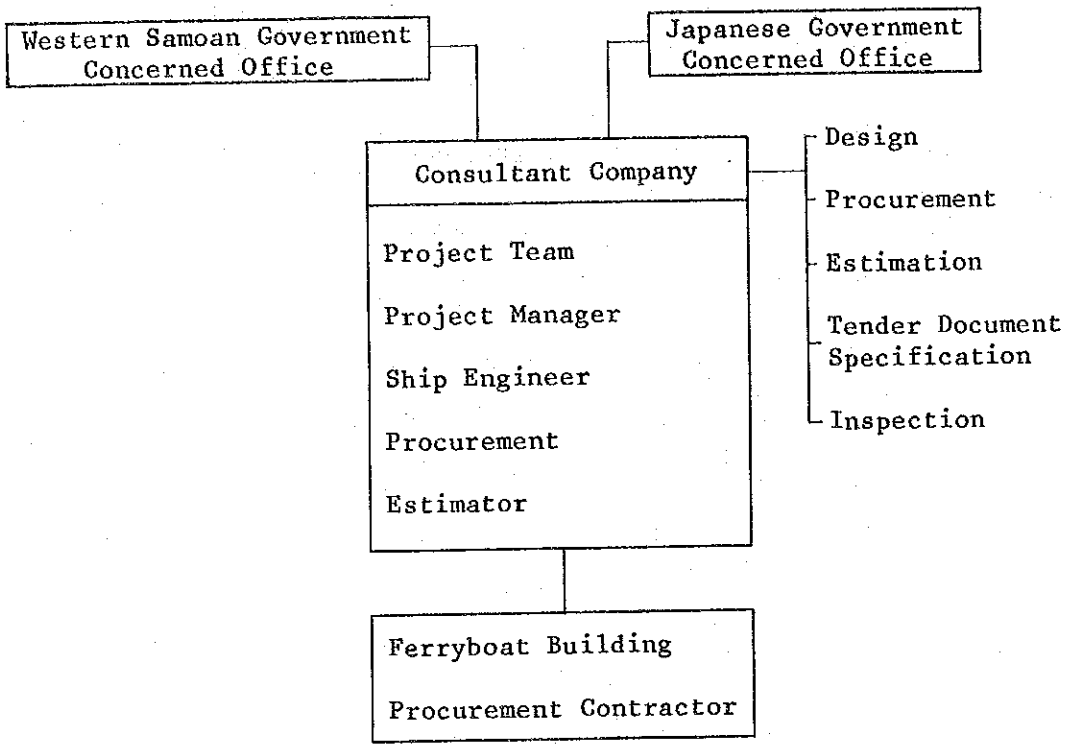
5) Inspection and approval of repair machinery, tools, and spare parts:

   (1) Pre-packing inspection

   (2) Witnessing the delivery of repair machinery, tools, and spare parts.

The management of the Project will be carried out as shown in Fig. 4-11.

Fig. 4-11 Management Chart



4-6 Project Schedule

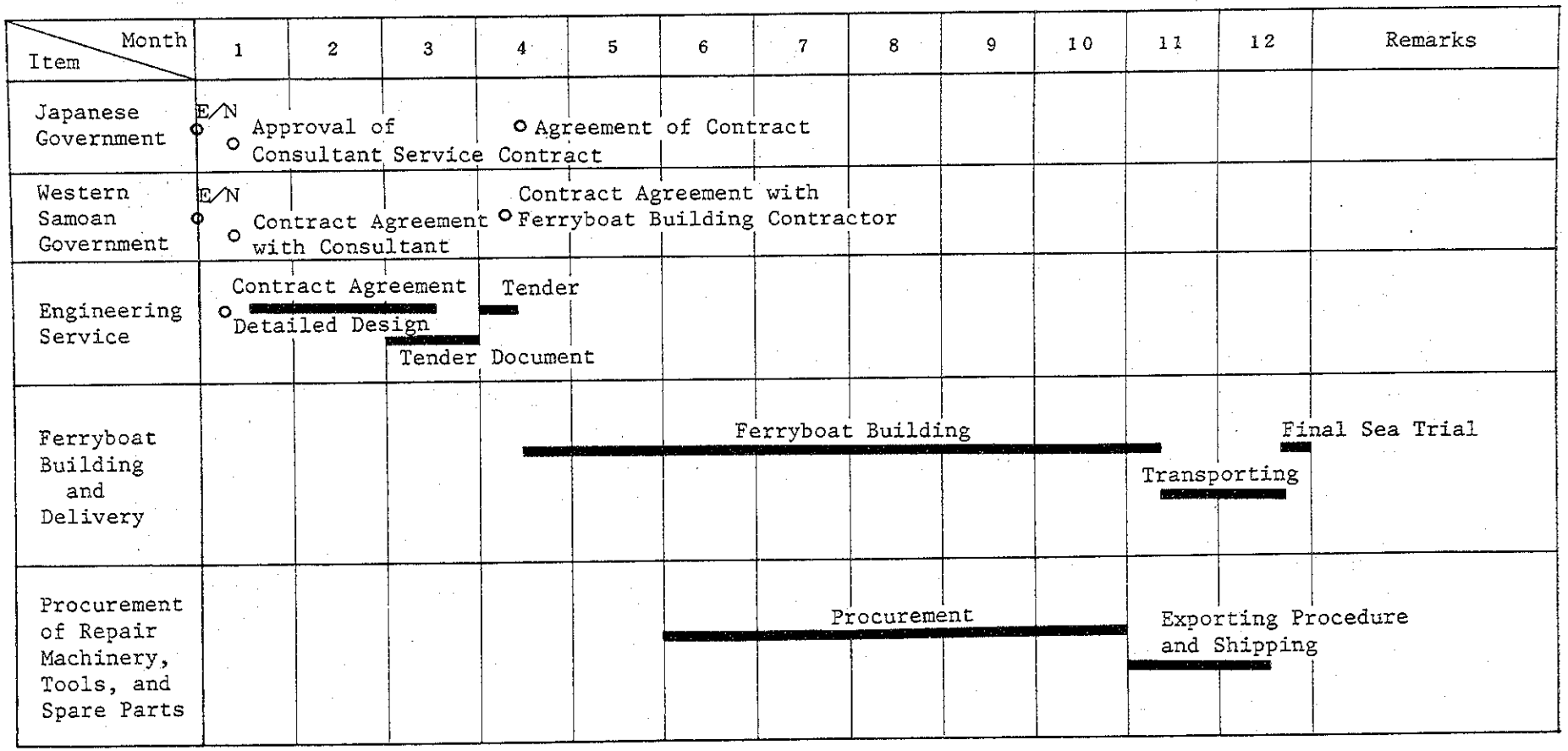
After the governments of Japan and Western Samoa exchange their signed documents, the Government of Western Samoa and a Consultant firm will sign the Consultant Service Contract which is to be approved by the Japanese Government. It will take three and one half (3.5) months for the exchange of notes, the tender document preparation and tendering for the Project.

It will take seven (7) months for tendering, for making the contract agreement between the Government of Western Samoa and a ferryboat building contractor which is to be approved by the Japanese Government, and the actual building of the ferryboat.

One and one half (1.5) months will be required for the sea trials and the delivery of the new ferryboat.

The procurement and exportation of repair machinery, tools, and spare parts will be accomplished during the period of ferryboat building and delivery.

Fig. 4-12 Project Schedule



4-7 Maintenance and Management Cost

Presently, the management, operation, and maintenance of ferryboat are conducted by the Western Samoa Shipping Corporation, Inc. The financial conditions of the inter-island ferryboat operation are as follows:

(a) Revenue and Costs of Three Ferryboats:

	1984	1985	1986
Revenue	622,801	1,152,383	1,352,000
Costs	616,557	1,193,852	1,050,180
Balance	6,244	Δ 41,469	301,820

Unit: Tala

(b) Ferryboat Salafai:

	1984	1985	1986
Revenue	239,488	407,642	286,400
Costs	210,118	239,406	380,160
Balance	29,370	168,236	Δ 93,760

(Repaired at Pago Pago in 1986)

(c) Ferryboat Pleono

	1984	1985	1986
Revenue	383,313	396,021	396,000
Costs	406,439	215,327	229,160
Balance	Δ 23,126	180,694	166,840

(Repaired at Pago Pago in 1984 & 1986)

(d) Lady Samoa (Introduced in 1985)

	1984	1985	1986
Revenue	-	348,720	669,600
Costs	-	739,119	440,860
Balance	-	Δ 390,399	228,740

Judging from the above tables, the ferryboat operation is, from an economic point of view, relatively healthy, except for the years when the ferryboats underwent large scale repairs. As for the Lady Samoa, in 1985 she operated at a loss due to her high amortization and depreciation costs.

4-8 Project Cost

For this project, no burden to the Government of Western Samoa is required.

CHAPTER 5 PROJECT EVALUATION

CHAPTER 5 PROJECT EVALUATION

5-1 Project Evaluation

The accomplishment of the Project, targeted for 1991, will permit the ferryboat service to meet the estimated passenger and vehicle transportation demand, solve transportation problems, and bring the following additional benefits to the country:

1) Periodic safe and reliable ferryboat service between Upolu and Savaii Islands will allow the nation's people to travel more freely to satisfy their own personal needs, especially during the heavy traffic periods of Independence Day, White Sunday, Christmas, etc.

2) The new ferryboat service will accelerate the Savaii Island's development as planned for in the Government's Development Plan:

   (a) The increased transportation of agricultural products from Savaii to Upolu will accelerate the development. Further, this increase will motivate the people to become more productive.

   (b) The increased ferryboat service will allow a greater abundance of items of daily necessity, industrial materials, food, and imported items to flow from Upolu Island. This, too, will raise the standard of living for the people residing on Savii Island.

   (c) With the improved periodic transportation service, a definite contribution will be made to the accomplishment of the Government's Agricultural Development Project and to the Livestock Production Increase Program.

3) The establishment of a ferryboat and repair capability "in country" will reduce the overhauling time it would take if performed in a foreign country. This will not only stem the

outflow of currency to foreign countries, but will provide a more reliable service by reducing the number of ferry breakdowns. As a consequence, there will be greater ferryboat longevity.

From the above, it may be seen that the implementation of the Project is an urgent necessity for the country of Western Samoa.

5-2 Profitability of Ferryboat Operations

Establishing 1988 as the year when the new ferryboat is to be introduced, the profitability of operations during the 1988 -1991 period were calculated.

1) Conditions of the Calculations:

(a) Ferryboat Fares:

Passengers:	Adults, 4 Tala; Children 2 Tala
Light Vehicles:	20 Tala
Trucks:	40 Tala

(b) Estimated Passenger and Vehicle Demand:

(See estimates shown in Fig. 4-4, page 4-10)

(c) Fuel Cost and Harbour Charge (a 3% annual increase is included)

New Ferryboat:	572,000 Tala per year
Salafai:	134,000 Tala per year

(d) Crew Costs (a 3% annual increase is included)

New Ferryboat:	20,000 Tala per year
Salafai:	20,000 Tala per year

(e) Supply and Lubricating Oil (a 3% annual increase is included):

New Ferryboat:	30,000 Tala per year
Salafai:	20,000 Tala per year

(f) Repair Costs (regular repair and the once every two year inspection and repairs in drydock):

	Regular Repairs	Once every Two Years Inspection & Repair
New Ferryboat	45,000 Tala/year	180,000 Tala/year
Salafai	20,000 Tala/year	150,000 Tala/year

(g) Insurance Fees:

New Ferryboat: 51,000 Tala per year
Salafai 30,000 Tala per year

(h) Management Fees:

Calculated from the management cost of 130,000 Tala in 1985, including a 3% annual increase and proportional ratio of 7:3 for the new ferryboat and the Salafai:

New Ferryboat: 91,000 Tala per year
Salafai: 39,000 Tala per year

(i) Depreciation Cost (15 year life, 10% salvage value):

Note: Rental fee is listed for Salafai (The Government leases the Salafai to the Western Samoa Shipping Corp.)

New Ferryboat: 450,000 Tala per year
Salafai: 12,000 Tala per year

2) Summary of Balance for Four Year Operation

Unit: 1,000 Tala

		Salafai	New Ferryboat	TOTAL
Fare Revenue		1,892	6,136	8,028
COSTS	Fuel and Harbour Charge	561	2,393	2,951
	Crew Fee	84	84	168
	Ship Supplies	84	125	209
	Lubricating Oil	41	42	83
	Repair	340	450	790
	Insurance	120	204	324
	Management	163	381	544
	Lease Fee	48	0	48
	Interest	0	0	0
	Depreciation	0	1,800	1,800
COST TOTALS		1,441	5,479	6,920
BALANCE		451	657	1,108

As described above, the four (4) year operation, after introducing the new ferryboat shows a healthy economy. It is believed that the new ferry will contribute greatly to the balanced development of the islands of Upolu and Savaii by improving the sea transportation service between them.

For comparison, the profitability was analyzed for a case wherein passenger rates were reduced from those presently being charge:

Adults: 4.0 Tala down to 3.5 Tala
Children: 2.0 Tala down to 1.5 Tala

Unit: Tala

	1988	1989	1990	1991	TOTAL of 4 YEARS
REVENUE	1,669,500	1,766,000	1,860,500	1,957,000	7,253,000
COSTS	1,684,000	1,717,400	1,741,616	1,776,654	6,919,670
BALANCE	Δ 14,500	48,600	118,884	180,346	333,330

Note: Vehicle fares are the same as presently being charged.

CHAPTER 6 CONCLUSION AND RECOMMENDATIONS

CHAPTER 6 CONCLUSION AND RECOMMENDATIONS

6-1 Conclusion:

As discussed in Chapter 5, the implementation of the Project will contribute significantly to the nation's rural development, economic growth, and to the upgrading of the standard of living of the Western Samoan people. It is, therefore, very worthwhile that this Project be carried out as soon as possible with grant aid from the Government of Japan.

6-2 Recommendations:

The implementation of the Project will bring about safe and reliable ferryboat transportation service between the two main islands. It is, however, necessary that the following management and operations be performed in order to maintain this service:

1) Specified inspections required by ship class regulations must be conducted in order to retain the ferryboat class registration.

2) Technical skills must be upgraded permitting the performance of daily maintenance and repair work "in country" in order to schedule the ferryboat maintenance plan without excessive delay.

3) Ferryboat inspection and repair schedules must be well planned in advance in order to take measures to meet unexpected temporary suspensions of service.

4) The establishment of a ferryboat inspection and repair system must come about promptly. It will be based on the UNDP's Shipping Maintenance Programme.

5) The ferryboat repair yard must be properly maintained and operated.

6) A long term management plan, and a rational maintenance system for all ferryboats within the country must be established.

7) The fares may be lowered if the profitability of the new ferryboat is increased favorably.

APPENDIX

APPENDIX

APPENDIX 1. Minutes of Discussions

MINUTES OF DISCUSSIONS
ON
THE PROJECT FOR BUILDING
THE INTER-ISLAND PASSENGER/VEHICULAR FERRY BOAT
IN
WESTERN SAMOA

In response to the request of the Government of Western Samoa, the Government of Japan decided to conduct a basic design study on the Project for Building the Inter-Island Passenger/Vehicular Ferry Boat (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to Western Samoa the study team headed by Mr. Takao Shinohara, Deputy Director, Safety Standards Division, Maritime Technology and Safety Bureau, Ministry of Transport from December 9th to December 21st, 1986.

The team had a series of discussions on the Project with the officials concerned of the Government of Western Samoa and conducted a field survey.

As a result of the study, both parties agreed to recommend to their respective Governments that the major points of understanding reached between them, attached herewith, should be examined towards the realization of the Project.

Apia, December 19th, 1986

(Mr. Takao Shinohara)
LEADER, BASIC DESIGN STUDY TEAM
JAPAN INTERNATIONAL COOPERATION AGENCY

(Honourable Toeolesulusulu S. Toalepaialii)
MINISTER OF MARINE AND SHIPPING

for and on behalf of the Government of Western Samoa.

ATTACHMENT

1. The objective of the Project is to build a ferry boat which transports passengers and vehicles between Mulifanua port and Salelologa port and to provide necessary spare parts and equipment for maintenance of the boat.

2. The executing agency for the implementation of the Project in Western Samoa is the Ministry of Transport.

3. The both parties agreed that the type and size of the ferry boat would be examined in detail in Japan taking into consideration of the following specifications.

(1)	Seating Capacity:		around 300
(2)	Vehicle Capacity:		8 heavy trucks and 12 light vehicles at most 6 heavy trucks and 10 light vehicles at least
(3)	Crusing speed	:	around 13 knots
(4)	Draft	:	Not to exceed 2.15 metres
(5)	Type	:	twin decker (all steel hull)
(6)	Engine	:	twin diesel engine
(7)	Number of Crew	:	not to be more than 10

4. The Western Samoa side understood the Japan's Grant Aid system which was explained by the study team.

5. The Government of Western Samoa should take the following measures on condition that the Japan's Grant Aid is extended to the Project.

   a. to own the ferry boat and the equipment for maintenance.

   b. to take the periodical survey for the safety of the ferry boat at least once a year.

   c. to inspect the bottom of the ferry boat on a slipway in a neighbour country once every two years.

   d. to keep the classification of the ferry boat, such as LR, NK.

   e. to bear the following commissions to the Japanese foreign exchange bank for the banking services based upon the Banking Arrangement..

      * Advising commission of Authorization to Pay
      * Payment commission.

   f. to ensure unloading, tax exemption, customs clearance at ports of disembarkation in Western Samoa and prompt internal transportation from the port, of what would be provided by Japan.

LIST OF ATTENDANTS

Western Samoa Side:

Toeolesulusulu Siueva Toalepaialii	Honourable Minister of Marine & Shipping
Pollard J. Moore	Ministry of Transport
Iulai Lavea	Department of Economic Development
Ana	
Alan Wendt	Foreign Affairs Officer

Japanese Side:

1.	Mr Takao SHINOHARA	Leader, Basic Design Study Team
2.	Mr Ryota ONO	Member, -ditto-
3.	Mr Isamu HOTTA	Member, -ditto-
4.	Mr. Akira WATANABE	Member, -ditto-
5.	Mr Toshio SHIBAO	Member, -ditto-

APPENDIX 2. Members of the Study Team

Name	Task	Affiliation
Takao Shinohara	Team Leader	Deputy Director, Safety Standards Division, Maritime Technology and Safety Bureau, Ministry of Transport
Ryota Ono	Project Coordinator	2nd Basic Design Study Division, Grant Aid Planning & Survey Department, Japan International Cooperation Agency
Isamu Hotta	Sea Transport Planner	Pacific Consultants International
Akira Watanabe	Naval Architect (Ferryboat Design)	Pacific Consultants International
Toshio Shibao	Naval Architect (Repair and Maintenance)	Pacific Consultants International

APPENDIX 3. Schedule of the Study Team

DATE (1986)	ACTIVITIES
Dec. 9, Tuesday	Team Leader, Mr. Shinohara, Team Member, Mr. Ono, Mr. Hotta, Mr. Watanabe, Mr. Shibao departed Narita for Apia via Honolulu (crossed the International Date Line).
Dec. 9, Tuesday	Arrived at Apia
Dec. 10, Wednesday	Had a meeting with JICA officials in Western Samoa. Paid a courtesy visit upon the Minister of Transport and confirmed the request of the Government, and explained about the area survey, its schedule, and the grant aid system of the Japanese Government.
Dec. 11, Thursday	Made a round trip between Mulifanua Port and Salelologa Port by Ferryboat Salafai. Visited the Western Samoa Shipping Corporation and investigated the present ship repair facility.
Dec. 12, Friday	Visited the Ministry of Foreign Affairs and discussed the Project with the Deputy Minister of Foreign Affairs. Visited the Western Samoa Central bank and collected economic data. Collected data from the Ministry of Transport and the Western Samoa Shipping Corporation.
Dec. 13, Saturday	Visited UNDP office - discussed the shipping maintenance programme with the officials, and collected related information. Conducted origin and destination survey at Mulifanua and Salelologa Ports.

DATE (1986)	ACTIVITIES
Dec. 14, Sunday	Conducted a field survey of Apia Port. Investigated a ferry terminal for American Samoa Line.
Dec. 15, Monday	Investigated present ferryboat operations and repair system and collected information. Investigated the repair facility and repair system of the Fishery Center and the Marine Training Center.
Dec. 16, Tuesday	Mr. Ono, Mr. Watanabe, and Mr. Shibao visited American Samoan shipyards. Collected ferryboat operation data at the Western Samoa Shipping Corporation.
Dec. 17, Wednesday	Held a discussion among the study team about the project. Discussed ferryboat maintenance, repair, and management plan with UNDP officials.
Dec. 18, Thursday	Had a meeting with the Minister of Transport and officials of the Ministry of Foreign Affairs and the Ministry of Economic Development on the draft of Minutes of Discussions. Collected data at the Meteorological Service Apia Observatory.
Dec. 19, Friday	The Minutes of Discussions on the Project was signed. Collected data at the Western Samoa Shipping Corporation, Ministry of Economic Development, Faleolo International Airport and Ministry of Labour.
Dec. 20, Saturday	Conducted market research relative to construction prices and import taxes and ship repair machinery and tools.

DATE (1986)	ACTIVITIES
Dec. 21, Sunday	Team Leader, Mr. Shinohara, and a team member, Mr. Ono departed Aia to Nadi (crossed the International Data Line).
Dec. 22, Monday	Mr. Shinohara and Ono arrived at Nadi.
Dec. 23, Tuesday	Departed Nadi to Auckland to Wellington via Auckland.
Dec. 24, Wednesday	Visited the Japanese Embassy in New Zealand and reported the results of the study. Departed Sydney to Narita.
Dec. 25, Thursday	Arrived at Narita.
Dec. 21, Sunday	Three study team members classified collected data.
Dec. 22, Monday	Collected date at Faleolo International Airport. Obtained ferryboat operations and management data at the Ministry of Transport and the Western Samoan Shipping Corporation.
Dec. 23, Tuesday	Visited the Ministry of Transport and the Western Samoa Shipping Corporation and obtained remained information. Expressed appreciation for their splendid cooperation. Mr. Hotta, Mr. Watanabe, and Mr. Shibao departed Apia to Suva via Tonga (crossed the International Data Line).
Dec. 24, Wednesday	Arrived at Suva via Tonga.
Dec. 25, Thursday	Investigated the Suva Public Slipway.

DATE (1986)	ACTIVITIES
Dec. 26, Friday	Investigated the Suva Public Slipway ship repair facility. Departed Suva to Nadi. Arrived at Nadi.
Dec. 27, Saturday	Arrived at Narita.

APPENDIX 4. List of Interviewed Personnel

Ministry of Transport	Minister	Hon. Toeolesulusulu S. Toalepaialii
Ministry of Transport	Acting Secretary	Mr. Nofo Vaaelua
Ministry of Transport	Marine Pilot	Mr. Malu
Ministry of Transport	Maritime Consultant	Mr. Pollard J. Moore
Foreign Affair	Deputy Secretary	Mr. Elisaia
Foreign Affair	Officer, Japan Desk	Mr. Alian Wendt
Economic Dept.	Deputy Director	Mr. Falani Chan Tung
Economic Dept.	Senior Trade and Marketing Officer	Mr. Iulai Lavea
Economic Dept.	Senior Planning Officer	Miss. Lusia Sefo
Labour Dept.	Commissioner of Labour	Mr. Tate Simi
Statistic Dept.	Executive Officer	Mr. Ralph Yandall
Public Work Dept.	Assist. Superintendent	Mr. Leiataua Lemuelu
Fishing Div.	Chief Fisheries Officer	Mr. Ueta Faasili
Marine Training Center	Principal	Mr. Mila Vili
Central Bank of Samoa	Economist	Mr. Iosefo Bourne
Western Samoa Shipping Corp.	General Manager	Mr. Fuimaono Poufa
Western Samoa Shipping Corp.	Chief Accountant	Mr. Vaamu Tagiilima
Western Samoa Shipping Corp.	Operation Manager	Mr. Gustar Chu-Ling
Meteorological Service Apia Observatory	Chief Observer	Mr. Taala Pauga

American Samoa (Pago Pago). South-west Marine Inc.	General Manager	Mr. Larry Horning
American Samoa. South-west Marine Inc.	Production Super-intendent	Mr. Terry Conden
Fiji Institute of Technology School	Adviser	Mr. T. Hiroshima
Harison Grierson Consultants Ltd (Fiji)	Engineer	Mr. T.J. Chan
United Nations Development Programme	Chief Officer	Mr. Y. Hasegawa
Japanese Embassy in New Zealand	Ambassador	Mr. S. Ohmori
Japanese Embassy in New Zealand	First Class Officer	Mr. O. Okano
JICA (Western Samoa Branch Office)	Branch Manager	Mr. R. Takaoka

APPENDIX 5. Condition of Ferryboat Route

Fig. A-1 shows the ferryboat service routes and channel conditions for Salelologa Port on Savaii Island, and Mulifanua Port UpoluUolu Island.

Fig. A-2 and Fig. A-3 show the port facilities at Salelologa and Mulifanua Ports.

Fig. A-1 Ferryboat Route

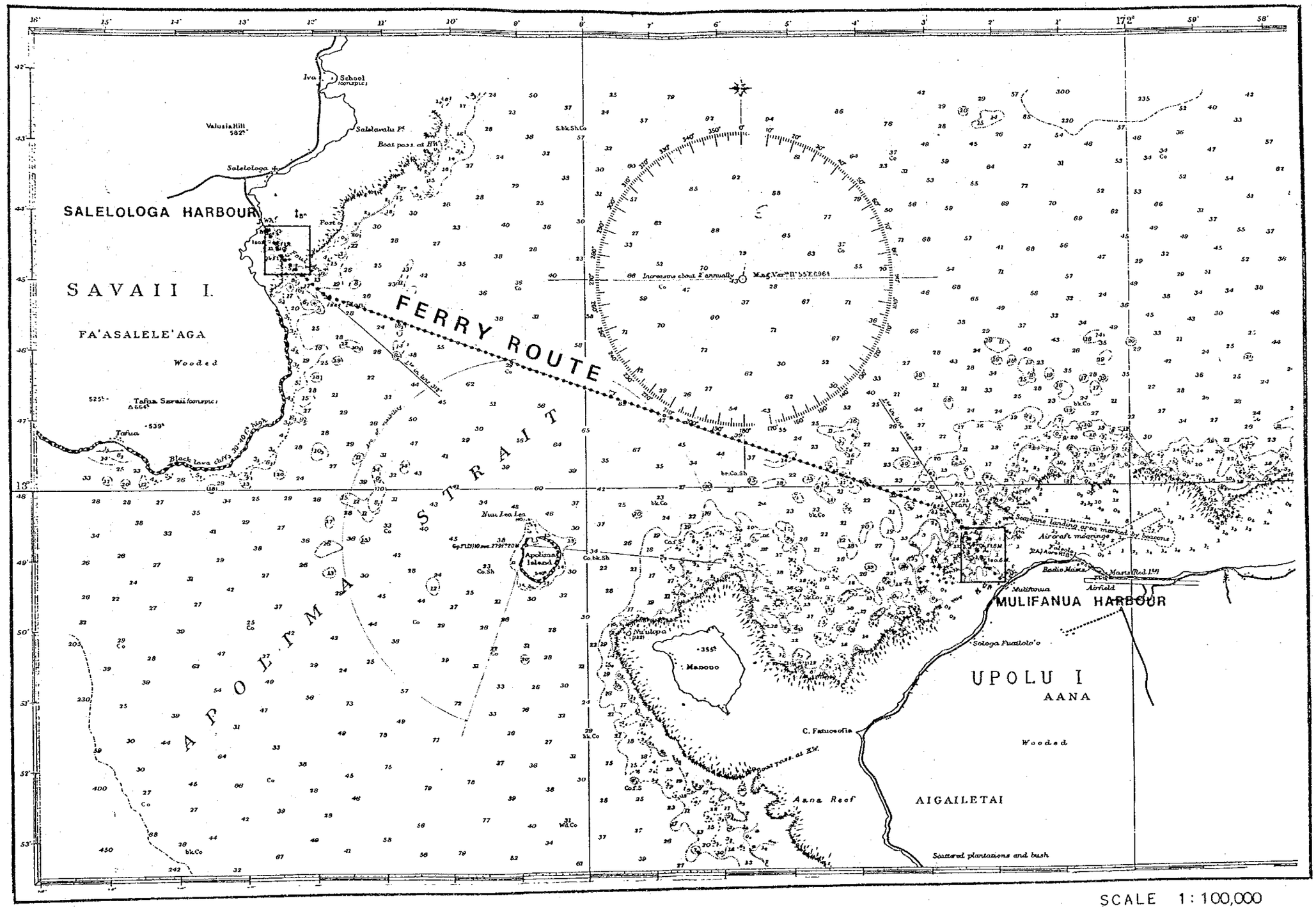
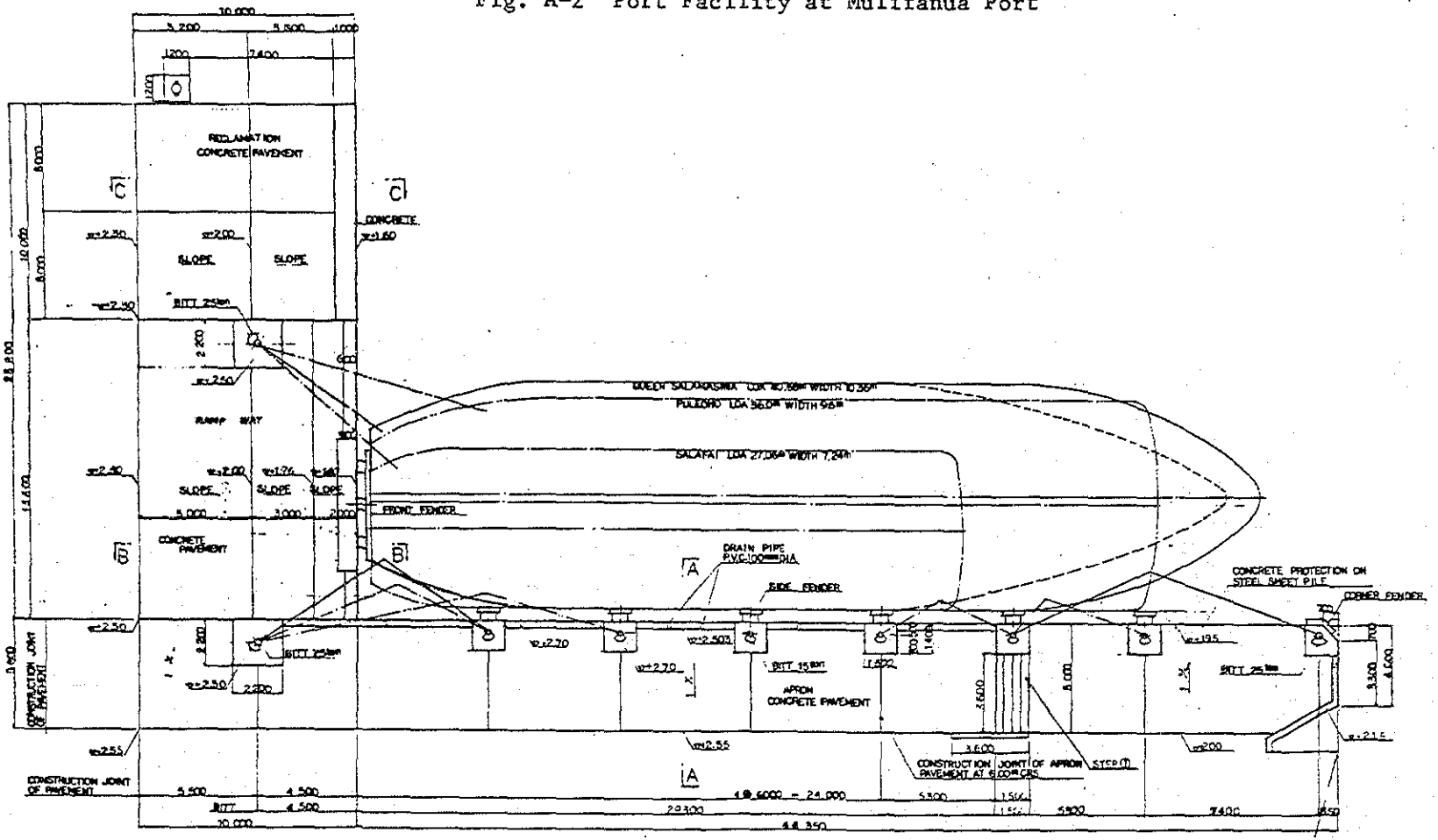
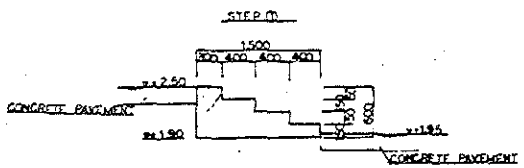


Fig. A-2 Port Facility at Mulifanua Port





GENERAL NOTES

DESCRIPTION	DWG. NO.
REFERENCE DRAWINGS	

NO.	DATE	DESCRIPTION	BY	APP'D
REVISIONS				

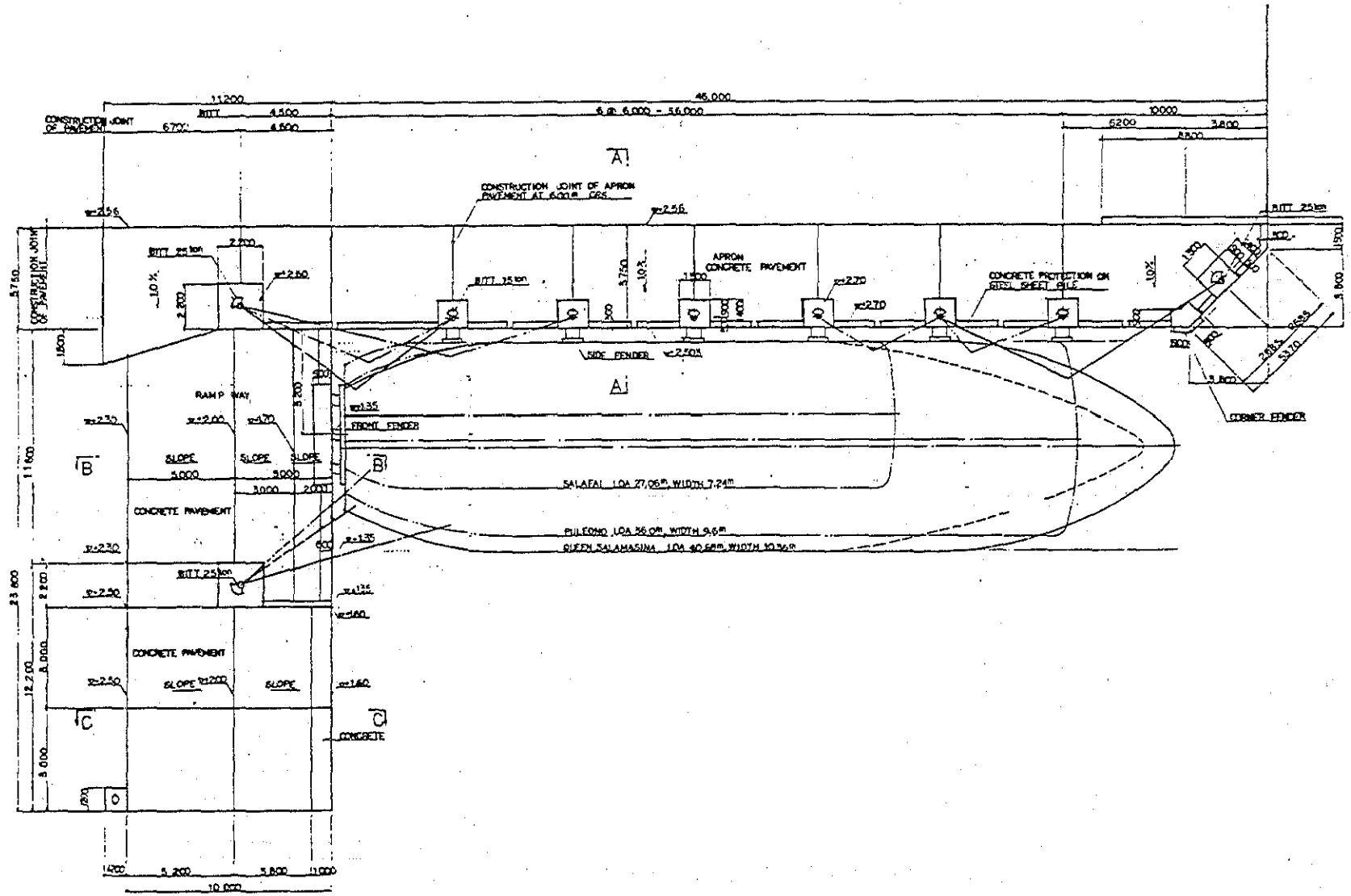
CIVIL
WHARF LAYOUT

PACIFIC CONSULTANTS INTERNATIONAL

1:100

DWG. NO. C-16

Fig. A-3 Port Facility at Salelologa Port



A-14

GENERAL NOTES

DESCRIPTION	SPEC. NO.
REFERENCE DRAWINGS	

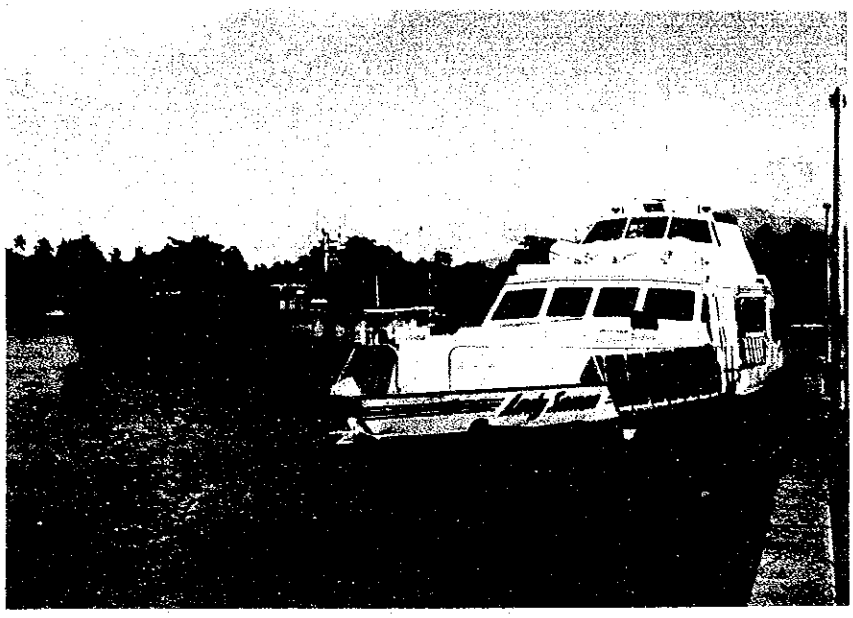
NO.	DATE	DESCRIPTION	BY
REVISIONS			

CIVIL
WHARF LAYOUT

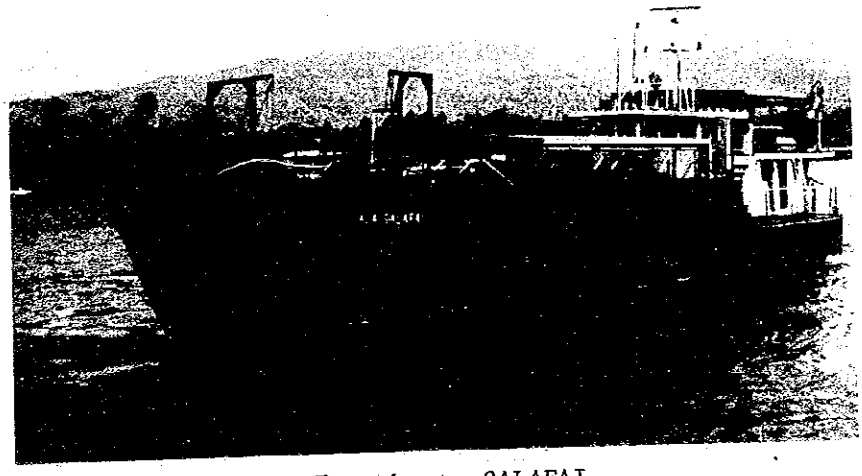
PACIFIC CONSULTANTS INTERNATIONAL

1:100

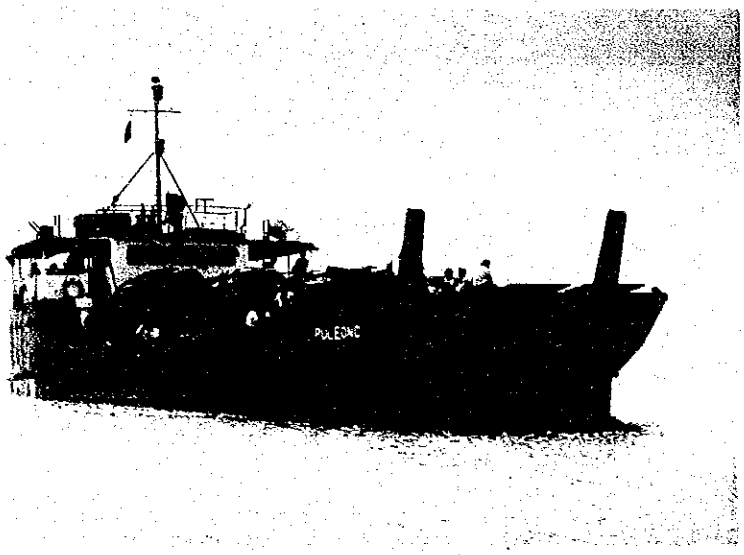
APPENDIX 6. Project Related Photographs



Ferryboat, LADY SAMOA (right)



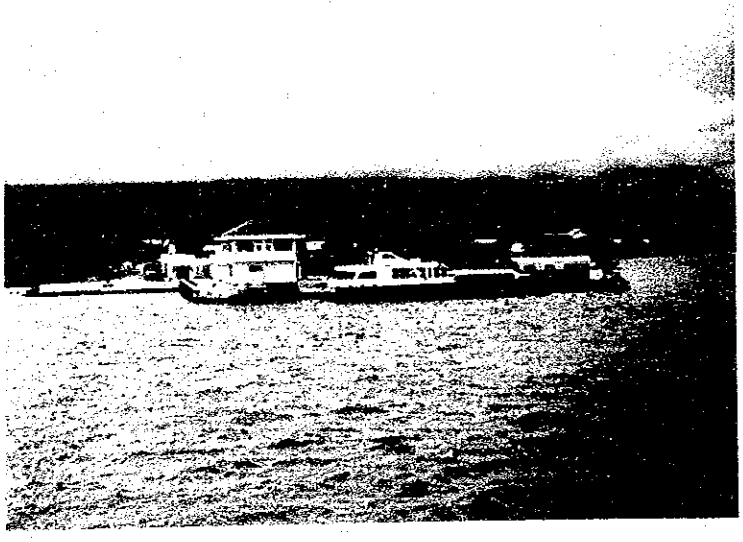
Ferryboat, SALAFAI



Ferryboat, PLEONO

WORKSHOP

MULIFANUA PORT



SALELOLOGA PORT

APPENDIX 7. List of Collected Data

Socio-Economic Data

Western Samoa's Fifth Development Plan. 1985-1987	Government of Western Samoa
Western Samoa, Socio-Economic Situation on Development Strategy and Assistance Needs Volume I, Main Report	Government of Western Samoa
Western Samoa, Socio-Economic Situation on Development Strategy and Assistance Needs Volume II, Project Profiles	Government of Western Samoa
Annual Statistical Abstract 1985	Department of Statistics
Quartary Statistical Bulletin, 1st and 2nd Quarter (1984 Jan. - June)	Department of Statistics
Quartary Statistical Bulletin, 3rd and 4th Quater (1984 July - December)	Department of Statistics
Buiietin, December 1986, Vol. I, No. 4	Central Bank of Samoa

Natural Condition Data

Meteorological Data in 1984 and 1985: Temperature Rain fall Humidity Air Pressure Wind	Meteorological Service Apia Observatory
Tunami Report	Department of Agriculture

Transportation Data

List of Port Projects Recently Executed and Under Construction	Ministry of Transport
Country Report: Institutional Framework for Transport Development in Western Samoa	Acting Assist. Secretary, Roodransport
Port Charge Regulation 1984	Ministry of Transport
Act. 1972, No. 18	Ministry of Transport
Act. 1978, No. 32	Ministry of Transport
Articles of Association of Western Samoa Shipping Corp. Ltd.	Western Samoa Shipping Corp.
- Western Samoa Shipping Corporation, Organization Chart	Western Samoa Shipping Corp.
- Total Number of Employment in Western Samoa Shipping Corp.	Western Samoa Shipping Corp.
- Budget, Profit & Loss Account for the Year Ended 31 December 1983, Western Samoa Shipping Corp.	Western Samoa Shipping Corp.
- Estimated Profit & Loss Account for the Year Ended 31 December 1984, Western Samoa Shipping Corp.	Western Samoa Shipping Corp.
- Estimated Profit & Loss Account for the Year Ended 31 December 1984	Western Samoa Shipping Corp.
- 1985 Capital Expenditures	Western Samoa Shipping Corp.
- Mulifanua and Salelologa Ferry Service Report and Actuals Collected	Western Samoa Shipping Corp.

Inter-Island Ferry Transportation Record, Ferry Boats Engaged for the Period of 1979 - 1986	Western Samoa Shipping Corp.
Inter-Island Ferry Transportation (Passenger and Vehicles).	Western Samoa Shipping Corp.
Certificates of Queen Salamasina	Ministry of Transport
Certificates of Survey: Salafai Certificates of Survey: Lady Samoa Certificates of Survey: Q. Salamasina	
Survey REport on Salafai	Ministry of Transport
Syllabus for Engine Ratings (Basic Course)	Marine Training Center
Dry Dock Invoice for Ferry Boats	South-West Marine Inc. (pago Pago)
Repair Specification for Salafai, Lady Samoa and Puleono	South-West Marine Inc.
Project Document, Establishment of a Shipping Maintenance Programme	United Nations Development Programme
Data Required on Slipway in Fiji	Harrison Grierson Consultants Ltd.
Suva Public Slipway	Mr. Hiroshima, Adviser. Fiji Institute of Technology, School of Maritime Studies
Drawings of Channels and wharts of Salelologa and Mulifanua Port	Ministry of Transport

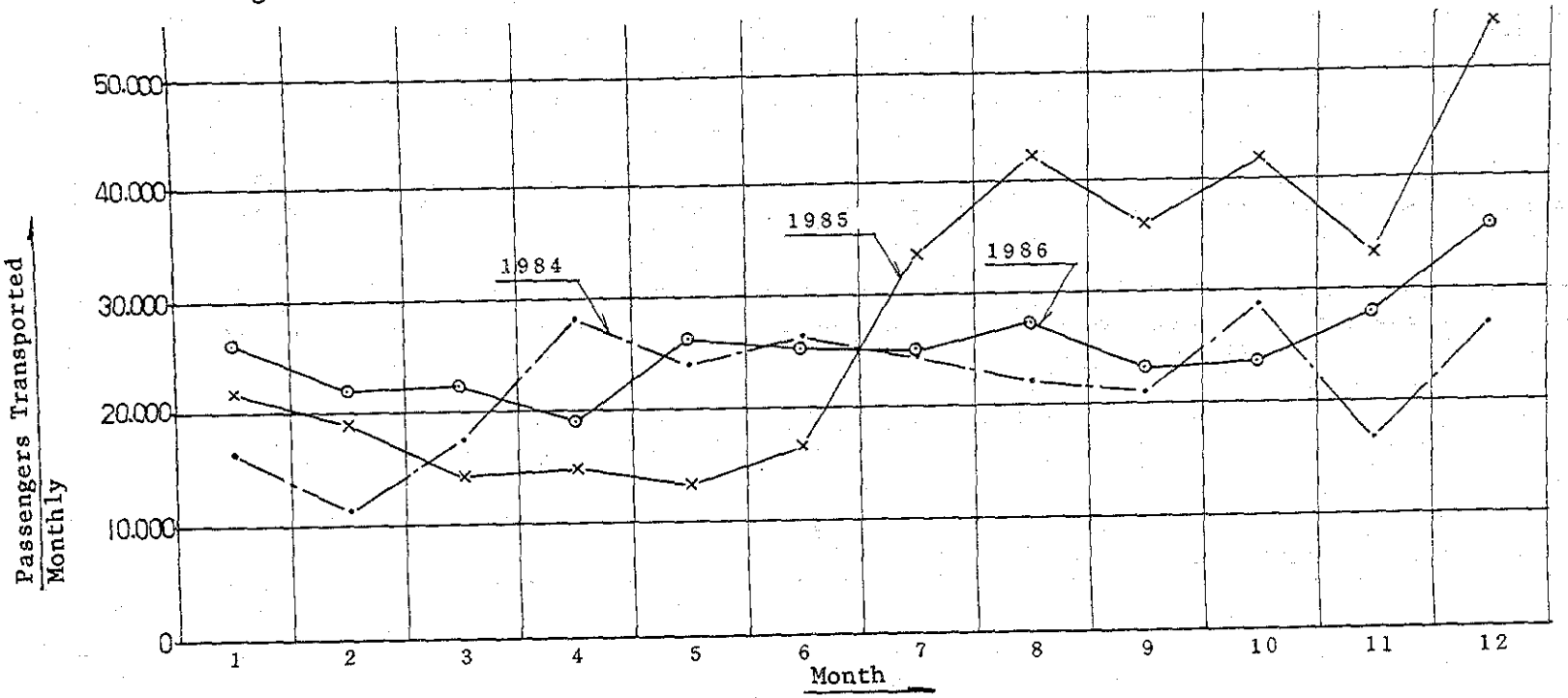
APPENDIX 8. Other Data

8-1 Present Ferryboats

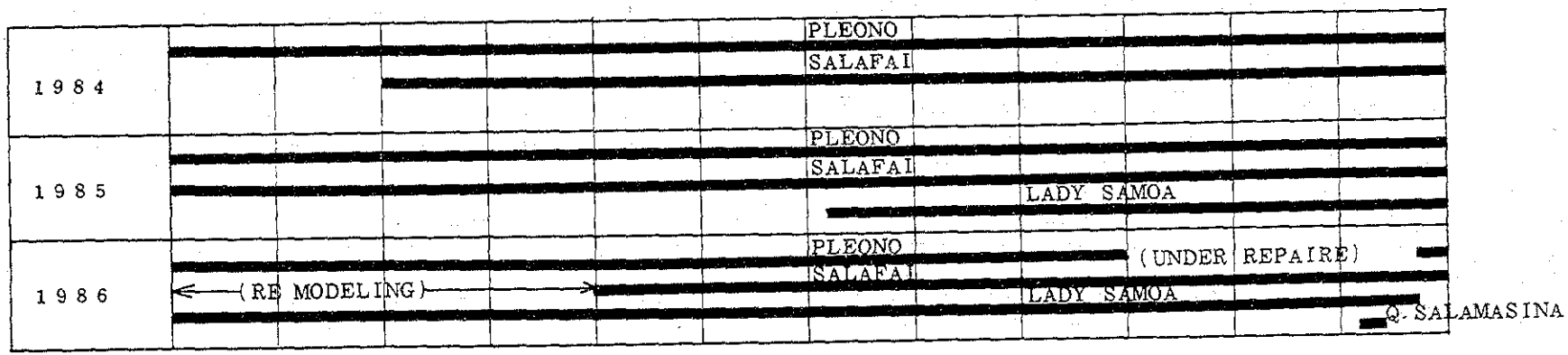
Table A-1 Ferryboat Data

Item \ Name	SALAFAI	PLEONO	LADY SAMOA	QUEEN SALAMASINA
Built Shipyard	Index Eng. Australia	Robin Shipyard Singapore	P. Coleman & Sons Australia	Dillingham Australia
Built Data	1970	1975	1983	1977
Length (LOA) m	27.06	36	32.3	42.55
Beam	7.24	9.6	6.3	10.36
Gross Tonnage	121	229	136	714
Capacity Tonnage	85	90		91
Draft	1.59	1.5	1.4	2.14
Speed (knots)	10	9.5	16	11
Passenger Capacity	120	119	252	216
Vehicle Capacity	4	16	0	15
Fuel Consumption	18 gals/mile	24 gals/mile		50 gals/mile
Introduction Year	March 1984	Jan. 1979	June 1985	Dec. 1978
Classification	Lloyds	Bureau Veritas		Lloyds

Fig. A-4 Record of Passengers Transported Monthly in 1984, 1985 and 1986



Ferryboat Passenger Transporting Operational Periods



8-3 Ferryboat Vehicle Transportation Record

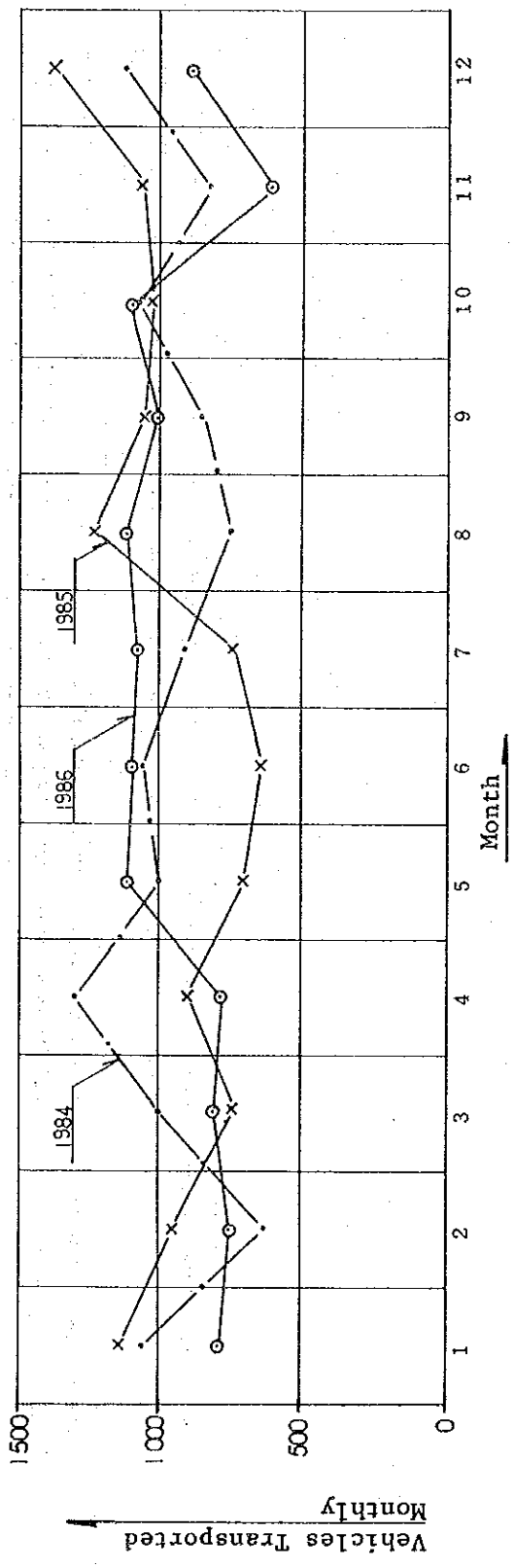
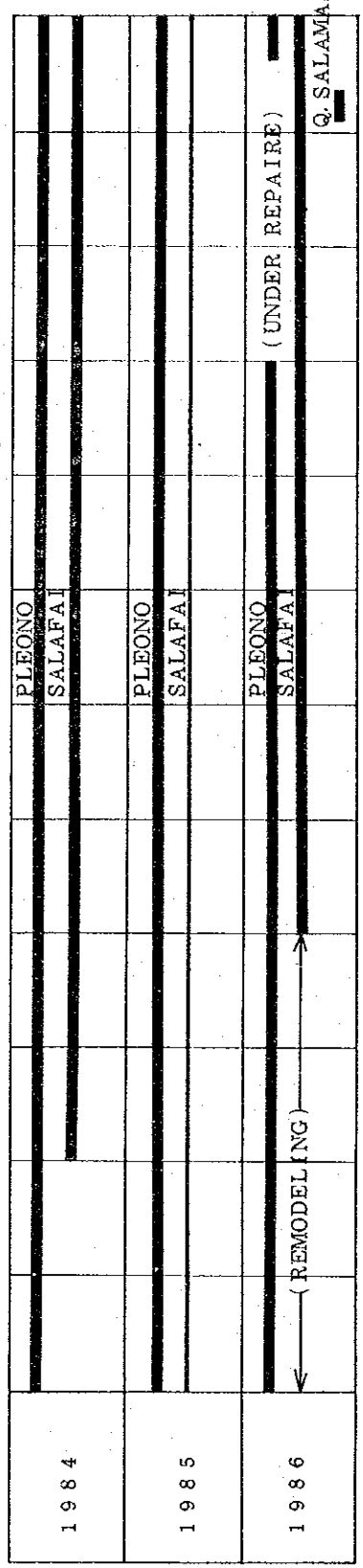
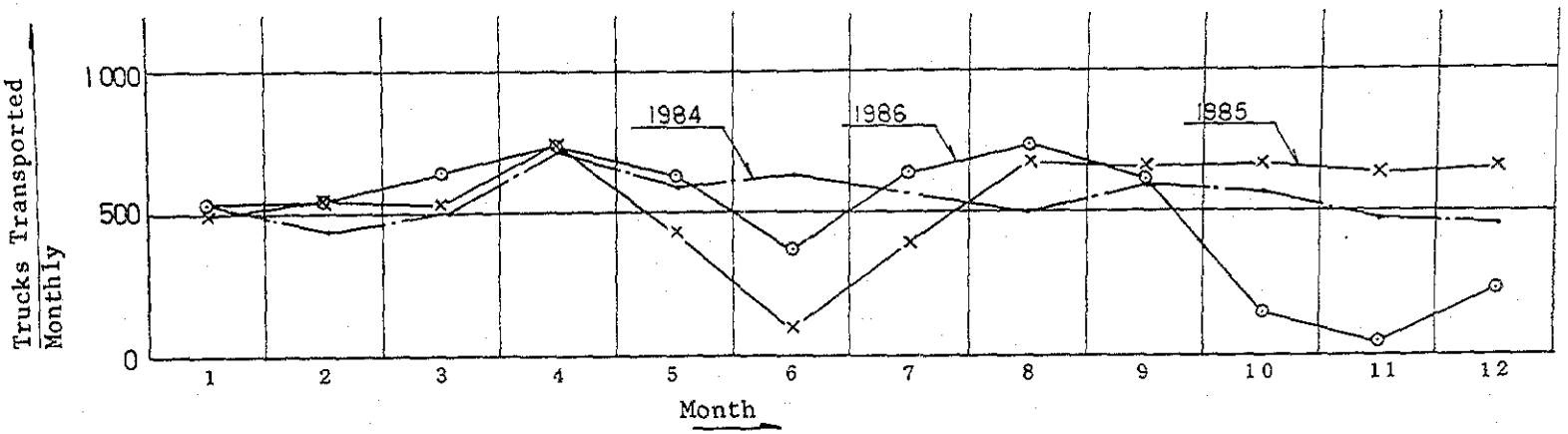


Fig. A-5 Record of Vehicles Transported Monthly in 1984, 1985 and 1986



Ferryboat Vehicle Carrying Operational Periods

Fig. A-6 Record of Trucks Transported Monthly in 1984, 1985 and 1986



Ferryboat Truck Carrying Operational Periods

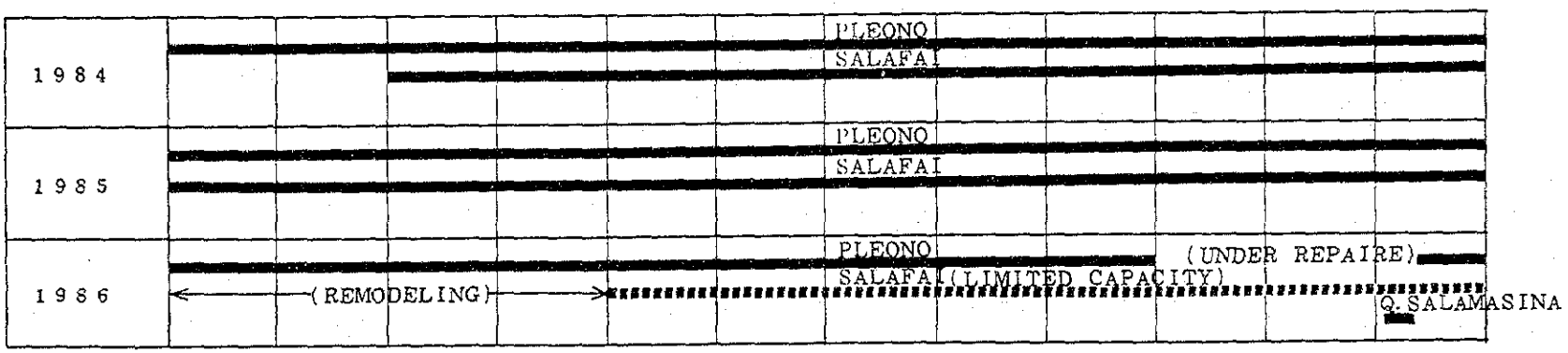
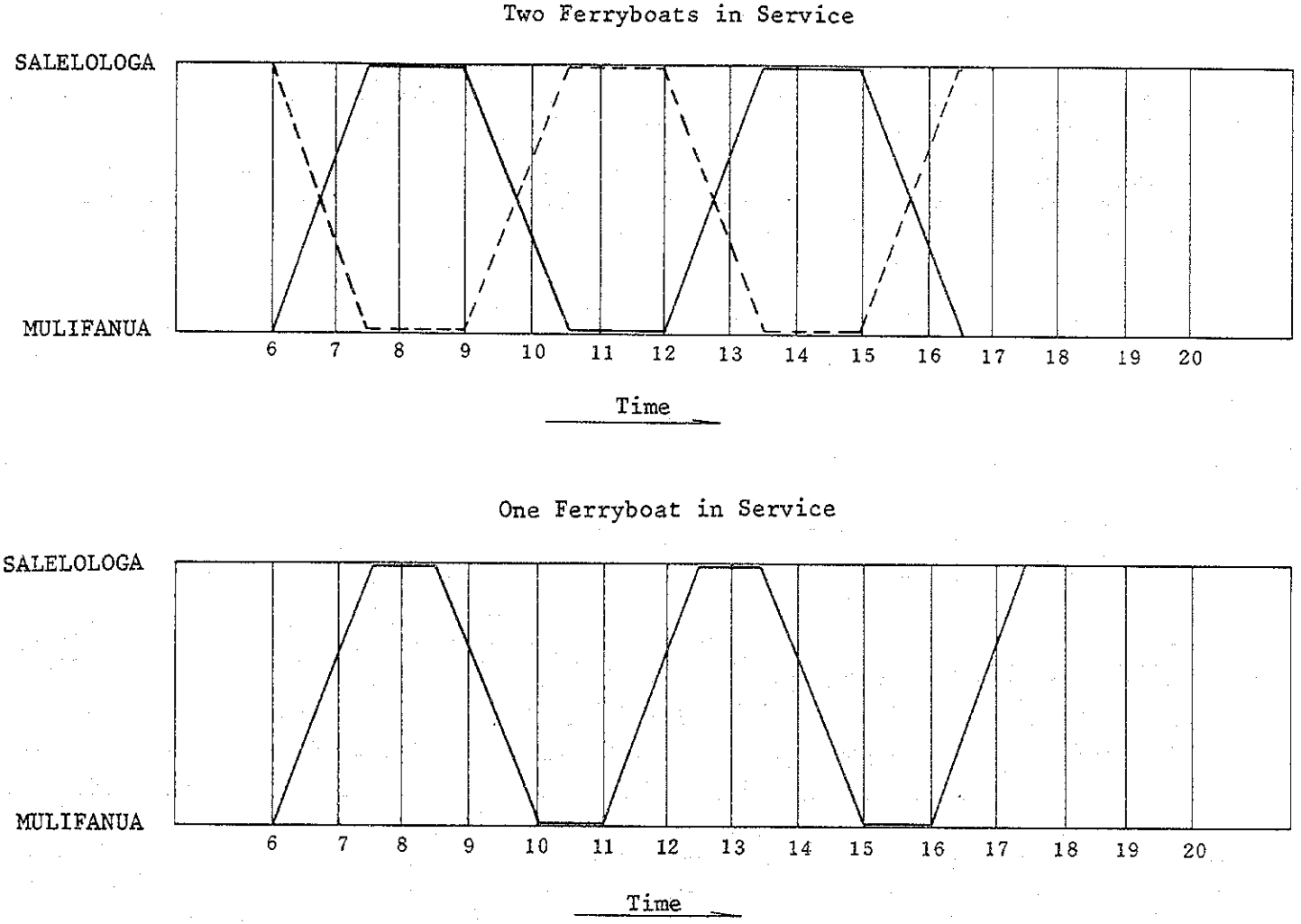


Fig. A-7 Present Ferryboat Service Schedule



8-4 Revenue and Cost Estimation Data for Domestic Ferryboat Transportation After Introducing New Ferryboat

The estimated revenue and costs of ferryboat operation after introducing a new ferryboat are as follows:

1 Four Year Operation of Salafai

Table A-2 Estimated Four Year Operation of Salafai

	88	89	90	91	88-91
Fare Revenue	440,400	462,800	483,200	505,600	1,892,000
Operating Costs	134,000	138,000	142,200	146,400	560,600
Balance	306,400	324,800	341,000	359,200	1,331,400
Crew Fee	20,000	20,600	21,218	21,855	83,673
Ship Supply	20,000	20,600	21,218	21,855	83,673
Lube Oil	10,000	10,300	10,609	10,927	41,836
Repair Cost	150,000	20,000	150,000	20,000	340,000
Rental Fee	12,000	12,000	12,000	12,000	48,000
Tax	0	0	0	0	0
Insurance	30,000	30,000	30,000	30,000	120,000
Management Fee	39,000	40,170	41,375	42,616	163,161
SUBTOTAL	281,000	153,670	286,420	159,253	880,343
TOTAL COSTS	281,000	153,670	286,420	159,253	880,343

Depreciation:

Depreciation Costs	0	0	0	0	0
Profit Before Depreciation	25,400	171,130	54,580	199,947	451,057
TOTAL	25,400	196,530	251,110	451,057	
Costs with Depreciation	281,000	153,670	286,420	159,253	880,343
Balance After Depreciation	25,400	171,130	54,580	199,947	451,057
NET BALANCE	25,400	196,530	251,110	451,057	

2 Four Year Operation of New Ferryboat

Table A-3 Estimated Four Year Operation of New Ferryboat

	88	89	90	91	88-91
Fare Revenue	1,414,600	1,493,200	1,574,800	1,656,400	6,136,00
Operating Costs	572,000	589,200	606,800	625,000	2,393,000
Balance	839,600	904,000	968,000	1,031,400	3,743,000
Crew Fee	20,000	20,600	21,218	21,855	83,673
Ship Supply	30,000	30,900	31,827	32,782	125,509
Lube Oil	10,000	10,300	10,609	10,927	41,836
Repair Cost	45,000	180,000	45,000	180,000	450,000
Rental Fee	0	0	0	0	0
Tax	0	0	0	0	0
Insurance	51,000	51,000	51,000	51,000	204,000
Management Fee	91,000	93,730	96,542	99,438	380,710
SUBTOTAL	247,000	386,530	256,196	396,002	1,285,728
TOTAL COSTS	247,000	386,530	256,196	396,002	1,285,728

Depreciation

Depreciation Costs	450,000	450,000	450,000	450,000	1,800,000
Profit Before Depreciation	592,600	517,470	711,804	635,398	2,457,272
TOTAL	592,600	1,110,070	1,821,874	2,457,272	
Costs with Depreciation	697,000	836,530	706,196	846,002	3,085,728
Balance After Depreciation	142,600	67,470	261,804	185,398	657,272
NET BALANCE	142,600	210,070	471,874	657,272	

3 Four Year Operation of Two Ferryboats

Table A-4 Estimated Four Year Operation of Two Ferryboats

	88	89	90	91	88-91
Fare Revenue	1,852,000	1,956,000	2,058,000	2,162,000	8,028,000
Operating Costs	706,000	727,200	749,000	771,400	2,953,600
Balance	1,146,000	1,228,800	1,309,000	1,390,600	5,074,400
Crew Fee	40,000	41,200	42,436	43,709	167,345
Ship Supply	50,000	51,500	53,045	54,636	209,181
Lube Oil	20,000	20,600	21,218	21,855	83,673
Repair Cost	195,000	200,000	195,000	200,000	790,000
Rental Fee	12,000	12,000	12,000	12,000	48,000
Tax	0	0	0	0	0
Insurance	81,000	81,000	81,000	81,000	324,000
Management Fee	130,000	133,900	137,917	142,054	543,871
SUBTOTAL	528,000	540,200	542,616	555,254	2,166,070
TOTAL COSTS	528,000	540,200	542,616	555,254	2,166,070

Depreciation

Depreciation Costs	450,000	450,000	450,000	450,000	1,800,000
Profit Before Depreciation	618,000	688,600	766,384	835,346	1,908,330
TOTAL	618,000	1,306,600	2,072,984	2,908,330	
Costs with Depreciation	978,000	990,200	992,616	1,005,254	3,966,070
Balance After Depreciation	168,000	238,600	316,384	385,346	1,108,330
NET BALANCE	168,000	406,600	722,984	1,108,330	

8-5 Origine and Destination Survey of Ferryboat Passengers

The study team conducted the following O/D surveys with cooperation from the Ministry of Transport of Western Samoa and the Western Samoa Shipping Corporation:

1) Date of Survey: December 13, 1986 (Saturday)
December 17, 1986 (Wednesday)

2) Method of Survey:

At Mulifanua Port, we handed out, at random, survey papers to 732 passengers (approximately 70% of the total daily number of passengers). When they were filled in, we collected them.

3) Survey Results:

(1) Sixty-four (64) percent of the passengers boarded in the morning. Approximately fifty (50) percent boarded between the hours of 6 to 10 AM.

(2) Purpose of Travel:

Fifty-four (54) percent of the passengers were visiting relatives. Twenty-one (21) percent travelled for their own business reasons; mainly to sell their agricultural products at the markets of Apia. Ten (10) percent travelled for educational purposes. The majority of passengers travelled for their own personal reasons.

(3) Origin and Destination of Passengers:

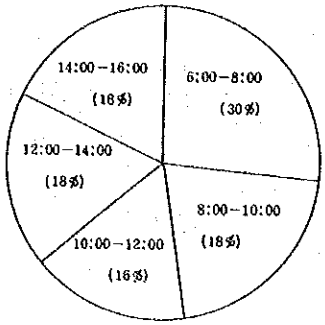
The majority of passengers returned to their original starting points. Seventy-seven (77) percent departed from Apia and Tuamasaga on Upolu Island and were bound for various destinations on Savaii Island.

(4) Nineteen (19) percent of the passengers waited less than one hour for the ferry, while more than fifty-eight (58) waited from two to three hours. None of the passengers waited more than one day.

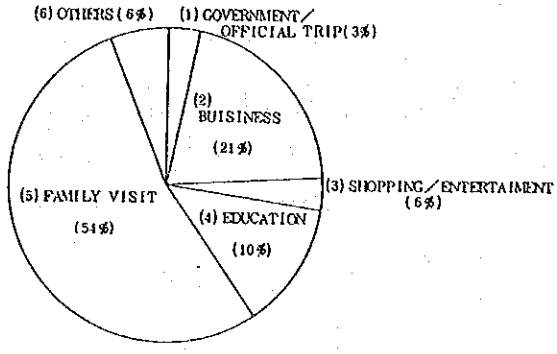
(5) Thirty-nine (39) percent of the passengers travelled alone, while sixty-one (61) travelled in company with others.

(6) Most of the passengers came to the ferry terminal either by bus or by light vehicle; 50% by bus and 42% by light vehicle (sedans or pickup trucks).

1 Passenger Arrival Time at Ferryboat

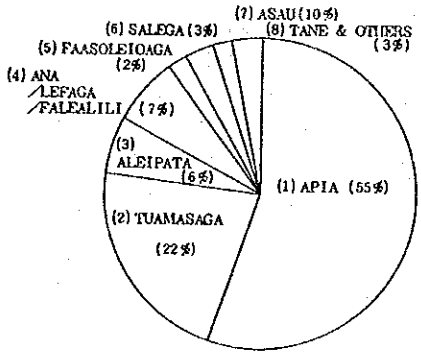


2 Purpose of Travel

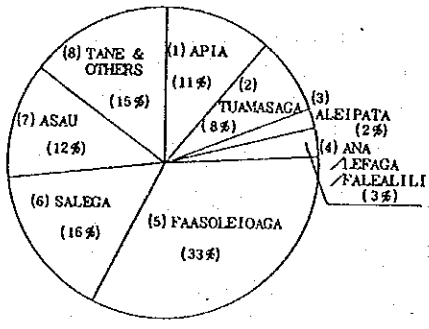


3 Origin and Destination of Passengers (See Appendix Fig. 8)

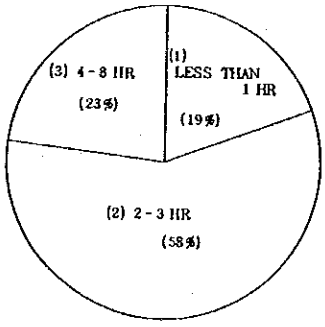
Origin



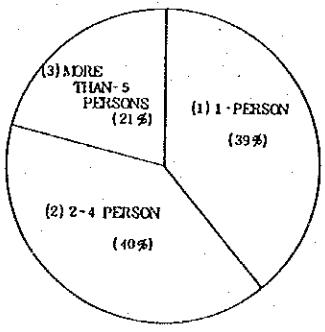
Destination



4 Waiting Time



5 Passenger Travelling Companions



6 Passengers' Methods of Transportation to the Ferryboat Terminal

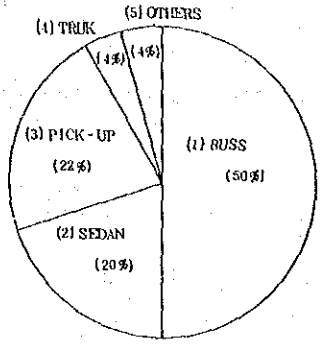
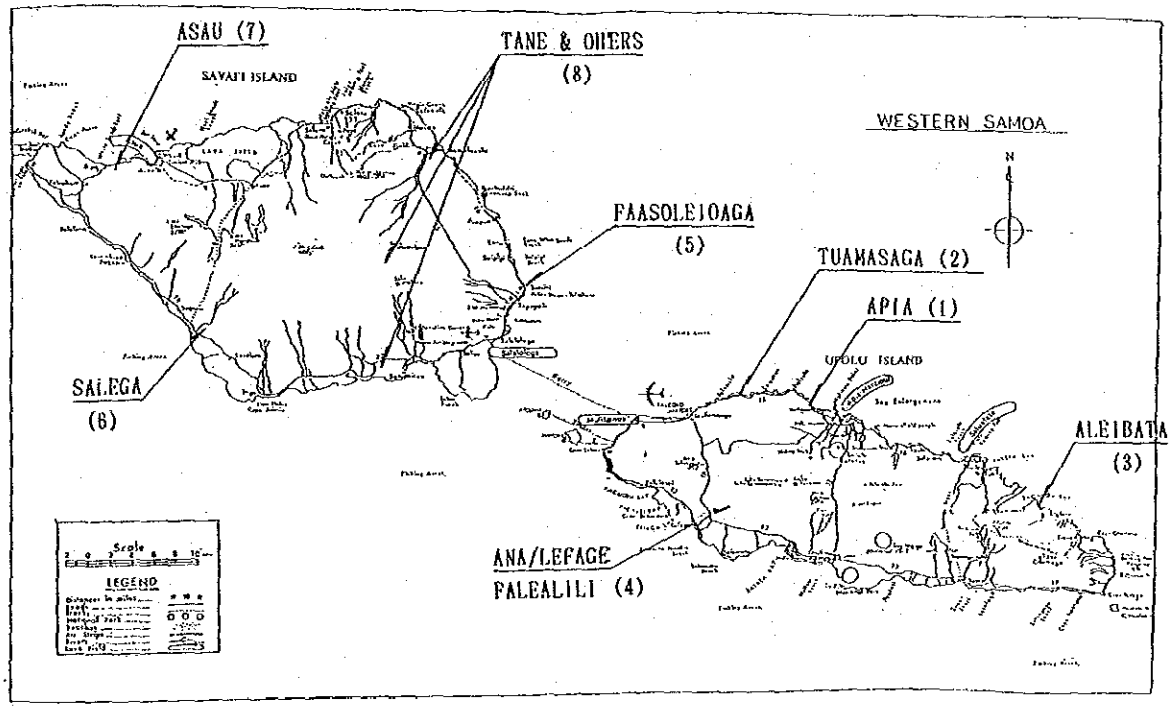


Fig. A-8 Area Map of Passengers' Origin and Destination



8-6 Ship Repair Facilities in American Samoa and Fiji

Table A-5 Ship Repair Facilities in American Samoa and Fiji

	AMERICAN SAMOA (PAGOPAGO)	FIJI (SUVA)
	South WEST MARINE INC	SUVA PUBLIC SLIPWAY
Founded Date	1955	1960
Number of Ships Repaired in 1985	65 (including small boats)	58 (including small boats)
Slipway	3,000 tons	1,000 tons
	800 tons	500 tons 200 tons 100 tons

Table A-6 Number of Registered Vehicles

Year	Private Cars	Pick-Ups	Trucks	Buses	Taxis	Motor Cycles	Tractors	All other Vehicles 2/	Total
1979	1,146	1,564	287	131	427	114	81	26	3,776
1980	1,188	1,628	301	128	395	121	68	257	4,086
1981	1,242	1,889	378	139	573	133	59	58	4,471
1982	1,076	1,532	253	157	353	104	5	442	3,922
1983	1,258	1,800	358	193	264	105	15	23	4,016
1984	1,498	1,909	398	187	297	144	11	26	4,470
1985 1/	1,406	1,969	432	192	351	165	8	14	4,537

Source: Department of Police and Prisons

1/ Provisional figures
2/ Includes Landrovers, forklifts and Government vehicles of 1980 and 1982

8-7 Registered Vehicles

8-8 Domestic Air Transportation Volume and Fare

Table A-7 Domestic Air Transportation Volume and Fare

Domestic Air Transportation Volume Record

AIRWAY	1982	1983	1984	1985
FAGALII - ASAU	2,721	3,302	3,964	3,201
FAGALII - MAOTA	3,051	3,796	4,362	3,620
FAGALII - FALEOLO	NIL	NIL	NIL	NIL
FALEOLO - MAOTA	3,103	5,408	5,922	3,246
FALEOLO - ASAU	312	780	109	104
MAOTA - ASAU	35	58	26	21
TOTAL	9,222	13,344	14,383	10,192
(UPOLU - SAVAII)	(9,187)	(13,286)	14,357	10,171

Source: Polynesian Airline

Air Fare

AIRWAY	ONE WAY	RETURN	O.W.	RETURN
FAGALII - MAOTA	$ 16.0	$ 32.0	$ 20.00	$ 40.00
FAGALII - ASAU	$ 29.4	$ 58.8	$ 39.00	$ 78.00
FALEOLO - MAOTA	$ 10.4	$ 20.8	$ 15.00	$ 30.00
FALEOLO - ASAU	$ 26.3	$ 52.6	$ 32.00	$ 64.00
FAGALII - FALEOLO	$ 14.8	$ 29.6	$ 10.00	$ 20.00

Source: Polynesian Airline