

**Inland Water Transport
Republic of the Union of Myanmar**

**PREPARATORY SURVEY REPORT
ON
THE PROJECT FOR
UPGRADING FERRYBOAT IN YANGON CITY
IN
THE REPUBLIC OF THE UNION OF MYANMAR**

March 2013

JAPAN INTERNATIONAL COOPERATION AGENCY

FISHERIES ENGINEERING CO.,LTD.

PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey and entrust the survey to Fisheries Engineering Co., Ltd.

The survey team held a series of discussion with the officials concerned of the Government of the Republic of the Union of Myanmar, and conducted field investigations. As a result of further studies in Japan, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of the Union of Myanmar for their close cooperation extended to the survey team.

March, 2013

Kazunori MIURA
Director General
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Summary

① Country profile

Republic of the Union of Myanmar, total land area of about 68 km², compared to 1.8 times of Japan, lies between latitudes 9° and 29°N and longitudes 92° and 102°E topographically long in north and south. It is bordered by China, Thailand, Lao, India and Bangladesh with total of about 4,600 km border line; and has a coastline along the Gulf of Martaban, the Bay of Bengal and the Indian Ocean of total about 2,000 km. Much of the country lies between the Tropic of Cancer and the Equator, but temperature and rainfall change in different regions.

In the middle of the land runs the Ayeyarwady River, starting from southern end of the Himalayan Range and flowing into the the Gulf of Martaban. Yangon is the largest city in Myanmar along the Yangon River, a branch of the Ayeyarwady River. Inland river ship transport system is as such important infrastructure in Myanmar.

In Myanmar, Nominal GDP is about US\$ 50.2 billion, per capita GDP is about US\$ 800, annual economic growth rate is about 5.5 % and unemployment rate is about 4 % (IMF 2011). GDP consists of 40% by the primary sector industry, 20 % by the secondary sector and 40 % by the tertiary sector. Major industry in Myanmar is the agriculture, and 60% of farmlands are covered by rice paddies. Major export items are crops (rice, etc.), LNG and wood (teak, etc.), and major import items are oils, machinery, industrial products and metals.

Population of Myanmar is 62.42 million (IMF, 2011) steadily increasing at an annual rate 1.3 – 2.4 %. Increase in Yangon and neighboring areas is higher than entire Myanmar.

② Background, history and Project outline

In the Ayeyarwady River and other large rivers, cargo vessels and cargo barges are operated long distance to transport cargoes, and various ferries are operated locally to transport people to their opposite banks.

Inland Water Transport (IWT) under the organization of the Ministry of Transport undertakes major part of such inland water cargo transport, passenger transport and ferry services. IWT also operates shipyards for drydocking and building new vessels. The ferry business of IWT is, in particular among various IWT businesses, considered as the lifeline for local residents.

The subject ferries of this Project (called Dalla ferry) is the ferry linking central part of Yangon and Dalla area, residential area in the opposite side of Yangon River. Mainly people living in Dalla area and neighboring farmland are taking the Dalla ferry to work or to go to school; totaling more than 30 thousand people in a day. In the morning and evening rush hours, however, overloading of

passengers more than license capacity has been unsafely happening every day.

IWT owns 236 motor driven vessels, among which 109 vessels are aged over 50 years old. Further, existing four Dalla ferries of this project, all built in 1945 and now aged 67, is quite over the useful life. The hull is deteriorated with many damages including frequent accidents of flooding caused by corrosion hole on the bottom shell, which seldom occurs normally. It is found that the existing Dalla ferries are, especially as the public service ferries, unsafe and thereby stable operation is difficult.

Each Dalla ferry dry docks three months every year thereby leaving three ferries in the crossing site. Those three ferries work in rotation, i.e. two days operation and one day rest/standby/maintenance. Two ferries start crossing service from 5:00 am to 9:30 pm, at every 20 minutes thereby total 46 crossing a day.

The Government of Myanmar, under above background, requested ferries replacing existing old ferries, number at least two, to the Government of Japan. A pair of two-way approaching bridges at Dalla side and Yangon side was also included in the request.

③ Summary of the survey result and the contents of the Project

The Government of Japan decided to implement the preparatory survey and JICA dispatched the preparatory survey team to Myanmar from June 24th to July 20th 2012.

From the survey at site, necessity, adequacy and urgency of the ferry replacement were confirmed as mentioned above. Regarding the two-way approaching bridges, Myanma Port Authority (MPA), who is responsible for such shore facility, has been planning redevelopment of bank area including Yangon side ferry terminal and the question has been under discussion with IWT and thereby this component of the request was withdrawn.

Operations of ferries for two years, with one new ferry case, two new ferry case and three new ferry case, were studied, and the result showed that:

In the one new ferry case, three existing old ferries will have to work nine months or longer in a year, thereby almost no improvement can be expected from the current situation; and

In the two new ferry case, two existing old ferries will have to work six months or longer in a year, and two new ferries service at same time will be only one day in three days, while two days are served by one old and one new; and

In the three new ferry case, almost all days will be served by the new ferries, without relying on old ferries.

Length of dry docking for vessels of this kind being normally one month in every two years, and thereby the new ferries being away from the crossing site only for short time, operational rotation can be built up employing three new ferries only. Short time, when the new ferry goes to drydock, a

ferry in other service route may come to help the Dalla crossing service. Reliability being quite high, operation of two ferries only will also be possible without help of other ferry even when one new ferry is in the drydock. However, regular rest must be given to the crew.

From above discussion and from the prime target of the Project to improve safety, two new ferry case, which must continue four ferry system as currently done relying on two existing old ferries, is found coping halfway with the safety problem by renewing half of the existing old ferries, whereas three new ferry case, by which the Dalla crossing is all served by the new ferries, can satisfy the Project target by coping with the safety problem and upgrading reliability of the ferry transport greatly.

Accordingly, it is concluded that the Project should procure three ferries of 1,200 passenger capacity. PMP (Preventive maintenance Policy) should be adopted and thereby periodical maintenance program should be established and exchange parts necessary for PMP should be included in the scope of the Project. To cope with the problem of quick rusting of bottom hull, a high-pressure water blasting machine and a sand blasting machine as the de-rusting equipment for the ferry maintenance tool should also be included in the scope of the Project

Base on the result of the survey, JICA carried out an outline design study in Japan including hull design and specifications, shipbuilding schedule and estimation of the Project cost, and then dispatched a team to Myanmar for the explanation of the outline design, procedures of the Project implementation including responsibilities on the Myanmar side in the Project, for the period from December 9th to 21st, 2012. Myanmar side satisfied and agreed with the explanation.

Main particulars of the New Ferry are as follows.

Number to be built	3
Length overall	41.35 m
Breadth, molded	9.40 m
Depth, molded	2.60 m
Gross tonnage, international	290 tons
Passenger capacity	1,200 persons
Passenger decks	2 stories
Main engine horsepower	200kW (270HP) x 2

④ Project period and Project cost estimate

The schedule will be as follows:

From the Exchange of Notes (E/N) and the Grant Agreement (G/A) to the Contract	From the Contract to the completion of constructing three ferries	Preparation of the transport, transport sailing, local inspection and turn-over	Total schedule from the E/N and G/A to turn-over of the three ferries to the Myanmar Government
5 months	15 months	1 months	21 months

Cost at the Myanmar side is limited to the bank commissions of about JPY1,200, 000, equivalent to US\$ 14,000.

⑤ Project evaluation

The subject ferry service in the Project links central part of Yangon and Dalla area, residential area in the opposite side of Yangon River, and about 33 thousand people take the ferry in a day. This trunk ferry link is, however, relies on 67 years old ferries, which are, as the public service ferries, unsafe and thereby stable operation is difficult. Besides, in the morning and evening rush hours, overloading of passengers are unsafely happening every day, requiring improvement as soon as possible.

The New Ferries procured under the Project are of ferries with high safety, with improvements on problems in the existing ferries, with higher onboard comfort and with higher fuel efficiency. It is concluded, therefore, that the implementation of the Project under the Grant Aid cooperation by Japan employing shipbuilding technology and industries of Japan is appropriate.

Dalla crossing service needs three ferries at site, but existing ferries, due to their age, must stay longtime in the dock away from the crossing site, and thereby four ferries have been assigned for the service. For the New Ferries, however, long docking leave is not necessary, and thereby three New Ferries can cover the crossing service. Reduction in the cost of maintenance and repair can also be expected.

From the qualitative view, three New Ferries, not only bring safety, but also bring stable operation without risk of unexpected stop and onboard comfort, thereby bring benefit for passengers in the increased convenience.

Finally, it is concluded that the Project is high in appropriateness and in effectiveness.

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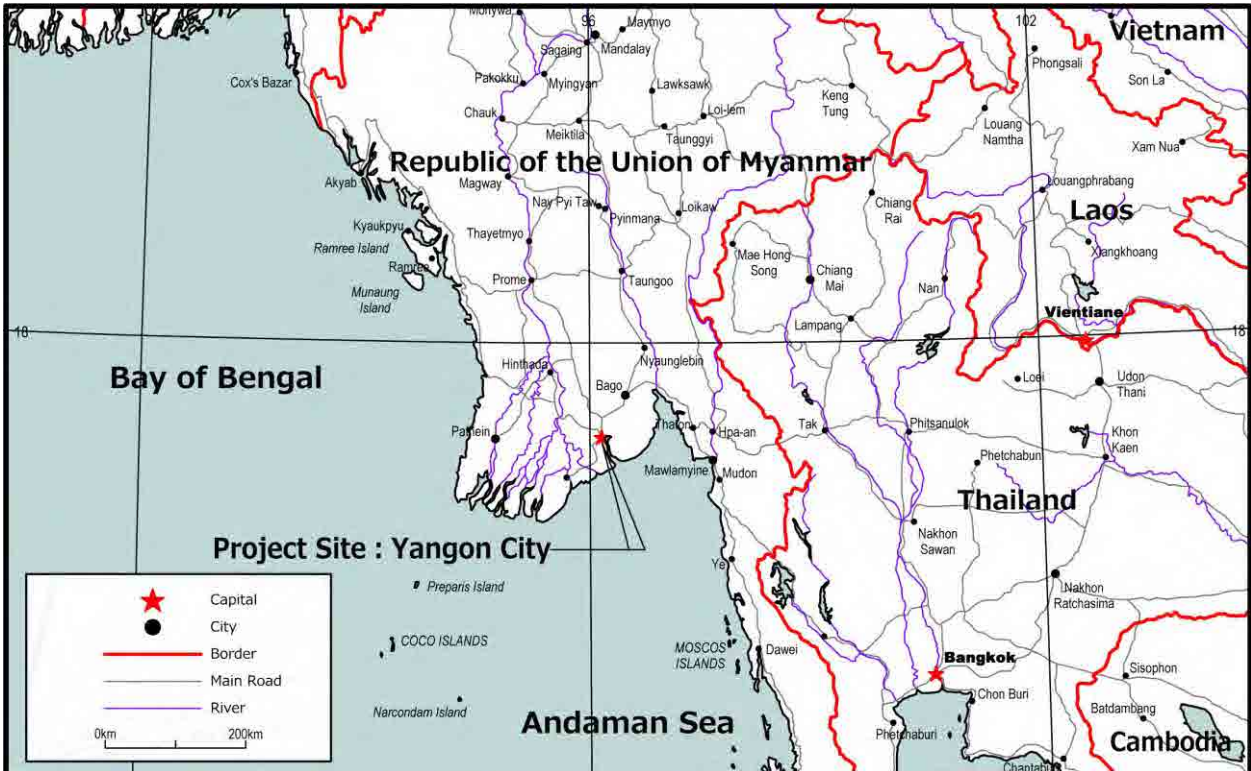
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Abbreviations

AIS	Automatic Identification System
DMA	Department of Marine Administration
EIA	Environmental Impact Assessment
EPIRB	Emergency Position Indicating Radio Beacon
FO	Fuel Oil
GDP	Gross Domestic Product
GMDSS	Global Maritime Distress and Safety System
GPS	Global Positioning System
IMF	International Monetary Fund
HK	Nippon Hakuyohin Kentei Kyokai
HW	High Water
IMO	International Maritime Organization
IWT	Inland Water Transport
JICA	Japan International Cooperation Agency
JIS	Japanese Industrial Standards
Ks	Kyat
LO	Lubricating Oil
LW	Low Water
MARPOL	International Convention for the Prevention of Pollution from Ships
MOT	Ministry of Transport
MPA	Myanma Port Authority
MSL	Mean Sea Level
MV	Motor Vessel
NC	Numerical Control
NK	Nippon Kaiji Kyokai
NOx	Nitrogen Oxide
PMP	Preventive Maintenance Policy
SART	Search and Rescue Radar Transponder
SOLAS	International Convention for the Safety of Life at Sea
VHF	Very High Frequency

Chapter 1 Background of the Project

1-1 Background of the Project

The Government of the Republic of the Union of Myanmar requested replacement of the ferries linking the central part of Yangon and Dalla residential area in the opposite side of Yangon River (hereinafter referred to as the Dalla Ferries) to the Government of Japan, because of their old ages and the lack of safety. Considering to the necessity, adequacy and urgency of the request, the Government of Japan decided to implement the preparatory survey and dispatched the preparatory survey team to Myanmar from June 24th to July 20th 2012.

The summary of the request and the result of the discussion are as follows:

Table 1-1 Summary of the Request and Result of Discussion

Item	Request	Result of Discussion
Background of the request	Need to replace Dalla Ferries, which are aged and difficult to undertake safe and reliable operation.	Confirmed remarkable deterioration and lack of safety, and acknowledged the necessity of replacement (1)
Request for land facility	Install 2 additional jetties on Dalla and Yangon side each	Withdrawn (2)
Request for ferry	At least two ferries	At least two ferries to be replaced (3)
Soft component	Training and familiarization to the New Ferry	Training and familiarization to the New Ferry to be carried out as a part of shipbuilding program thereby not to be dealt with as the soft component (4)

- (1) Since all four Dalla ferries, which were built in 1945, are suffering heavy hull corrosion and structural buckling all over the vessels, there is considerable concern regarding safety operation. Lack of reliability requires four-ferry operation with two working, one reserve and one under dock. The replacement of the ferries is highly urgent.
- (2) The request of two additional jetties is for the two-way operation with four ferries instead of the current one-way operation with two ferries at Dalla crossing to cope with pax increase in future. However Mynma Port Authority (MPA), who is responsible for shore facilities, has been planning redevelopment of bank area including Yangon side ferry terminal. As the location of planned facility is still fluid and the two-way operation is not urgent demand, this request was withdrawn.
- (3) According to the site survey, necessity of the ferry replacement was confirmed. For the number of the ferries to be replaced, it was agreed that the question be left to further study in Japan. The case of two New Ferries must depend on help of two existing ferries thus total four ferries as current situation, i.e. the project will be just covering half of the project policy of improving safety of transport. Because of

the New Ferries' short docking period, in the case of three New Ferries, the Dalla crossing will be served by those three New Ferries, so that the Project policy of the safety will be fully satisfied. For the detailed study, refer to 3-2-1-1.

- (4) In the shipbuilding under Japan's Grant Aid, Japanese shipbuilders generally invite the captain and chief engineer to their shipyards and carries out training / familiarization as the shipbuilding process required by the shipbuilding contract. Thereby the training is not to be dealt with as the soft component.

1-2 Outline of the New Ferry

Main particulars of the New Ferries and existing ferries are as follows:

Table 1-2 Main particulars of new/existing ferries

Ferry Name	New Ferries	Anaw Ya Htar	Tapin Shwee Hti	Kyan Sit Thar	Hti Hlaing Shin
Type	Pax ferry	Pax ferry	Pax ferry	Pax ferry	Pax ferry
Built	2014 (expected)	1945	1945	1945	1945
Length oa	41.35 m	40.6 m	41.3 m	40.6 m	39.7 m
Breadth	9.40 m	9.1 m	9.0 m	9.1 m	9.3 m
Depth	2.60 m	1.80 m	1.80 m	1.80 m	1.80 m
Gross ton	290	334.19	257.14	249.67	138.85
Pax Capacity	1,200	455	720	742	433
Pax deck	2 stories	2 stories	2 stories	2 stories	2 stories
Main Engine	270 HP×2	250 HP x 2	250 HP x 2	250 HP x 2	297 HP x 2

Pax license of the existing four Dalla ferries are, though their hulls are of almost same size, 433, 455, 720 and 742 pax. However, Dalla ferries are carrying 1,000 pax always in the morning and evening rush hours, and the survey team counted 1,166 pax as maximum. In the Project, the capacity of the New Ferry may not be determined based on overloading, but should be designed covering known peak demands, say 1,200 pax. The hull size of the existing ferry is sufficient to provide the floor area for 1,200 pax in accordance with the standard of Japanese Maritime Safety Law. As the Dalla crossing requires swift maneuverability, the New Ferries should be of a size similar to the existing ferries to maintain agile controllability. Adequate lifesaving appliances should be provided for 1,200 pax.

Under the fast current of Yangon River, which was observed 4.5 knots downstream and 3.0 knots upstream on the Field Survey, ferries are required special maneuverability. All the existing ferries equip 360° azimuthing propulsor and ferry crews depend on this propulsor to provide safe service. It is found that the similar propulsor is indispensable also for the New Ferries.

1-3 Natural Condition

(1) Outline

Myanmar is located in Asian Monsoon region, two thirds of which is in the tropical zone and the rest in the temperate zone. Under the strong influence of the monsoon, the rain of rainy season between May and October brings 95% of annual rainfall.

The depths of rivers in the country start increasing from May and June, reach deepest in July and August, and decline from September and October.

The Port of Yangon is situated on the Yangon River, about 32km inland from the Elephant Point on the gulf. In the dry season blackish water runs up into the upper reaches of the river at the north of Yangon city area. The depth of the anchorage is 8m to 13m and 16m is the deepest part of the port.

(2) Climate

<Atmospheric Temperature / Relative Humidity / Precipitation>

Yangon lies in the tropical monsoon climate zone. The annual mean temperature is 27.6°C, the warmest month is April, which averages 30.9°C and the coolest month is January, averaging 25.0°C. The weather has distinct dry season and wet season. 96% of the annual rainfall is brought during the wet season.

Table 1-3 Climate of Yangon

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Mean	Sum
Mean Atmospheric Temperature (°C)	25.0	26.7	29.0	30.9	29.9	27.5	26.9	26.9	27.4	27.8	27.3	25.4	27.6	---
Relative Humidity (%)	62.0	59.3	63.2	65.1	72.7	87.4	85.9	90.1	86.7	82.8	74.5	66.9	74.7	---
Precipitation (mm)	1.4	4.8	8.6	15.7	268.0	521.9	599.9	606.7	347.5	182.8	63.0	3.8	---	2624

Source: Department of Meteorology and Hydrology, Yangon (Kabaaye) Station (1978-1998)

<Wind Condition>

From January till June, west wind of the monsoon prevails in Yangon.

Table 1-4 Wind direction and velocity of Yangon (Yangon Airport)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Mean
Prevailing Wind Direction	↙	➤	↘	↘	↘	↘	☉	☉	☉	☉	☉	☉	➤
Probability of Wind Occurrence Stronger than Beaufort Scale 4 (%)	0	0	0	0	0	0	n/a	n/a	n/a	n/a	n/a	n/a	0
Mean Wind Velocity (m/sec)	3.0	4.0	5.0	5.0	4.0	5.0	n/a	n/a	n/a	n/a	n/a	n/a	4.0
	Dry Season				Wet Season						Dry Season		

(3) Sounding survey

Sounding surveys were carried out in way of Dalla ferry crossing (approx. 750m x 750m) using broadband

echo sounder connected with GPS. The results are shown on the next graph. The figures are corrected according to the lowest water level during dry season and indicate the annual shallowest water depth. According to the result, the depths around the jetties are 5.0m and the depth at the center of the river is more than 10m. No shallows or sunken ship were found during the surveys. Therefore the New Ferries with 1.2m draft are able to operate safely on the Dalla crossing.

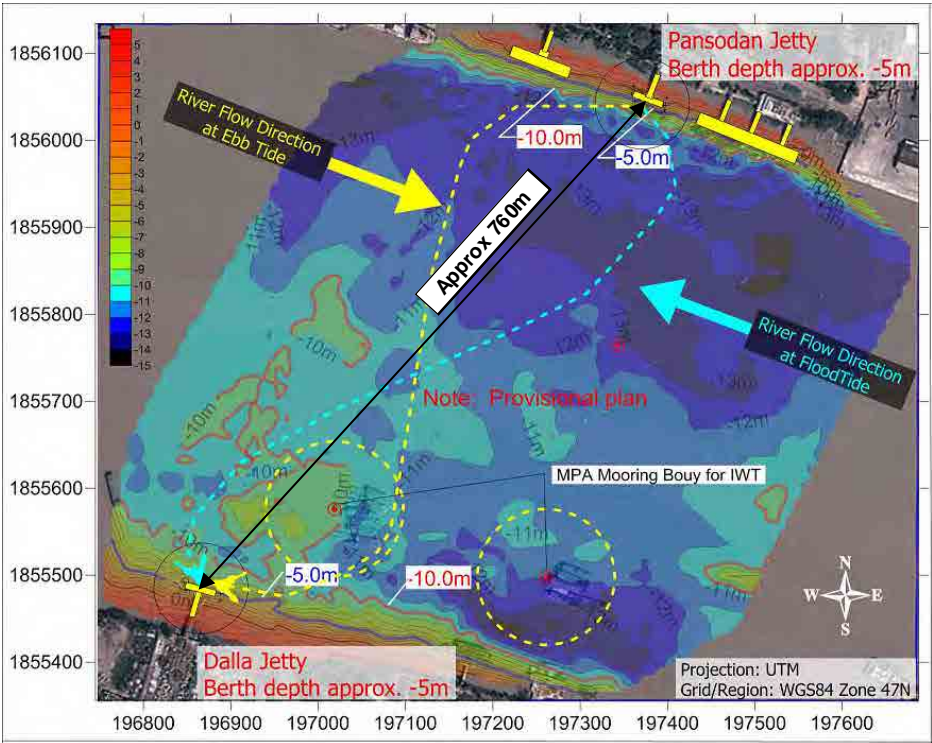
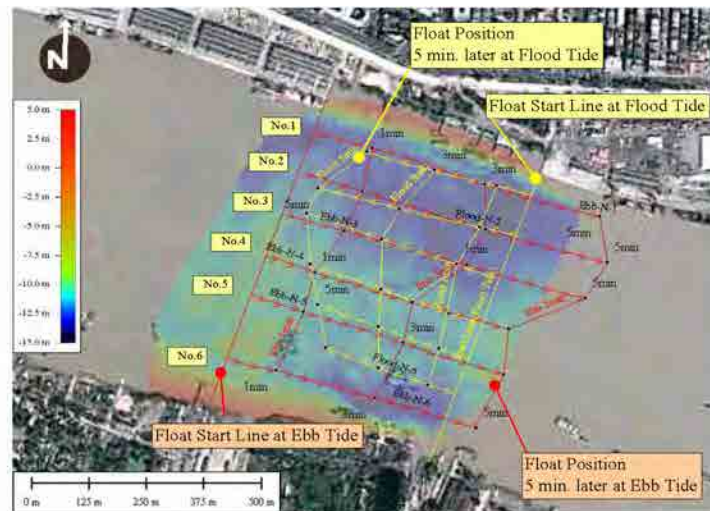


Fig. 1-1 Sounding Survey Results of Dalla Ferry Crossing (on July, 2012)

(4) Current survey

The stationary observation of current direction and velocity using electro-magnetic current meter and the flow tracking surveys using GPS logged floats were carried out. The results show the current speeds are in close connection with flood and ebb tide. The maximum velocities are 4.5 knots downstream and 3.0 knots upstream.



Red: Ebb tide, Yellow: Flood tide, Float positions after 1/3/5 min later

Fig. 1-2 Track of GPS Floats

Table 1-5 Results of GPS Floats Surveys

Float No.	1	2	3	4	5	6
Ebb speed (knot)	4.21	4.54, max	4.45	3.58	3.73	3.65
Flood speed (knot)	2.41	2.94, max	2.81	2.58	2.29	1.95

Measured 4 July 2012

(5) Properties of water

The table2-12 shows analyzed results of the properties of surface water which were collected at Dalla Jetty and Pansodan Jetty.

Although collected water was suspended brown, there is no indication of pollution for biological aspect. The samples collected in July (wet season) show low salinity, specific gravity and electric conductivity. The water is confirmed not so corrosive for steel. However during dry season, the salinity rises to 15.9‰ and the blackish water is corrosive enough for bare steel plate.

Table 1-6 Analyzed Results of Water Properties

Sample No.	St.-1-1	St.-2-1	St.-1-2	St.-2-2
Date	July 3, 2012	July 3, 2012	July 4, 2012	July 4, 2012
Time	11:20	10:50	15:00	15:40
Station	Dalla Jetty	Pansodan Jetty	Dalla Jetty	Pansodan Jetty
Tide Level above CDL	Spring flood +3.41m	Spring flood +2.50m	Spring Ebb +6.43m	Spring Ebb +6.57m
Temp. (deg.C)	28.1	28.1	28.1	28.1
Salinity (‰)	N/D	N/D	N/D	N/D
Specific Gravity	1.004	1.004	1.002	1.002
DO (mg/L)	9.0	9.0	7.0	9.0
COD (mg/L)	16.8	16.0	14.8	13.2
EC (μS/cm)	112.2	111.1	114.1	134.4
pH	7.4	6.9	7.2	6.8
SS (g/L)	0.15	0.19	0.17	0.18

Table 1-7 Explanation for Analyzed Items

Item	Explanation (reference values are according to Japanese autonomy's standard)
Salinity	Sea water: 30~35‰, Fresh water: 0.5‰, Blackish water: 0.5~30‰
Specific Gravity	Sea water: 1.024, Pure water: 1.000
DO	Dissolved oxygen: Viable for fish DO>3mg/L、 Good Condition DO>5mg/L, DO<5mg/L malodor
COD	Chemical oxygen demand: Water service COD< 3mg/L, Agricultural water COD<6mg/L (preferably)
EC	Electric conductivity: 50-100μs/cm Upper reaches of river、 200-400μs/cm Lower reaches of river
pH	Hydrogen power: Neutral water pH=7 Acid water <pH7< Alkaline water, Suitable for fishery (river) pH6.0-7.5
SS	Suspended solids: Lager value shows more suspended, Suitable for fishery SS<2.5mg/L

Table 1-8 Seasonal Variation of Salinity

	Tide	Salinity (‰)				Mean
		Max.		Min.		
		Surface	Bottom	Surface	Bottom	
Dry Season	Spring flood	14.3	14.5	3.3	3.8	8.9
	Spring Neap	15.9, max	14.6	3.6	5.4	9.9
Wet Season	Spring flood	0.1	0.1	0.0	0.1	0.0
	Spring Neap	0.1	0.1	0.1	0.1	0.1

Remark: - Salinity is converted from chlorine density (Salinity= 1.80655 x Chlorine density)

- Measuring location: Ahlon (5km upstream from Pansodan)

Source: Myanmar Port Authority (MPA)

(6) Properties of Soil

The table2-15 shows analyzed results of the properties of soil which were collected at the bank near Dalla Jetty and Pansodan Jetty.

Table 1-9 Analyzed Results of Soil Properties

Station	Pansodan River Bank	Dalla River Bank
EC (μS/cm)	435.0	172.6
pH	5.4	3.9
Humus (%)	2.49	2.26

The results show soils are highly acid. It seems base is easily elute into the river because of the tropical bank characteristic. The soils have low humus and have no putrid smell.

1-4 Environmental Consideration

The New Ferries, which are procured under this project, have less environmental impact than existing vessels in every respect. There is no foreseeable adverse effect on regional community.

Regarding the prevention of environmental pollution, the following requirements of "International convention for the prevention of pollution from ships" (MARPOL) should be applied as far as applicable;

- Annex-I Prevention of pollution by oil:

Notwithstanding the regulations are for vessels more than 400 gross tons and above, the New Ferries, about 290 gross tons, should be designed to prevent oil discharge from machinery space by the segregation of oil and water systems.

- Annex-VI Prevention of air pollution from ships:

The New Ferries should be equipped with diesel engines which comply with the latest MARPOL regulations for exhaust gas emission.

As there is no Environmental Impact Assessment (EIA) system in Myanmar, the Project needs not to process EIA procedure.

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

2-1-1 Overall Goal and Project Purpose

On March 2011 in the House of Representatives of the Republic of the Union of Myanmar, President of Myanmar gave an address and stressed the importance to correct gap between rich and poor, between regions and between ethnic groups. This Project for Upgrading Ferryboat in Yangon City (hereinafter called “the Project”) intends primarily to improve safety and reliability of the ferry service crossing the river through replacement of existing old ferries in Yangon with New Ferries, thereby to improve infrastructure for daily life of Yangon people especially for Dalla area where many lower income people are living. It is realized that the Grant Aid assistance to renew the subject public service ferries fully used by such people coincides with the said policy of the Myanmar Government, raises unity mind in Myanmar, and further contributes towards the stable social life.

2-1-2 Outline of the Project

Inland Water Transport (IWT) under the organization of the Ministry of Transport undertakes major part of the inland water transport operating 236 power driven vessels and 155 barges. Those vessels are, however, generally very old: 109 vessels in the power driven vessels are 50 years old or older. In those old vessels, four Dalla ferries, subject of the replacement in the Project, are further older, 67 years old born in 1945, but shouldering the trunk river crossing to link Yangon central and Dalla area. Hulls of 67 years old vessels are, as their age, having considerable bucklings and damages in their steel structure, and even suffering sometimes from flooding from hole on the bottom shell plate, which is very rare in the ordinary young vessels. Dalla crossing is thus barely maintained by the four hyper-old ladies, who are quite over the working age but continue hard working supporting each other. It is recognized that the ferries are unsafe and stable operation to be an adequate means of public transport is difficult.

Each old four Dalla ferries goes to drydock every year for about three months, leaving always three ferries at the crossing site. Each of the three ferries at site works two days and stops one day for standby, rest and maintenance. Working time is daily 16.5 hours from 5:00 am to 9:30 pm at every 20 minutes interval services thus total 46 times crossing in a day.

The Project plans to build three New Ferries to renew existing old ferries. Each of three New Ferries works in rotation: two days in operation at site and one day in rest near the crossing site for standby, rest and maintenance. As young New Ferries stay in drydock only for short period (about a month every two years), help by a ferry in other service route for such short period may be necessary but most of the time the Dalla crossing is served only by the three New Ferries, thereby removing unsafe situation relying on the existing old ferries.

For the maintenance of the New Ferries, PMP (Preventive Maintenance Policy) will be adopted. PMP calls

for overhauling and maintenance regularly notwithstanding breakdown or malfunction, aiming for no sudden machinery breakdown thereby longer life. Machinery parts necessary for the PMP will be procured by the Project. PMP will be mainly undertaken by the Dalla Dockyard who belongs to IWT.

Existing Dalla ferries suffer from extraordinary corrosions on the hull bottom, requiring changing of bottom shell plates in wide areas at every annual drydock. Dalla Dockyard had no mechanical descaling equipment and thereby considerable rust scales had remained even after drydock. It was concluded that such rusted shell bottom surface had accelerated further rust, in the Yangon River water, not fresh water but brackish with considerable high salinity sufficient to corrode steels. To avoid this unfavorable situation, which should not be repeated on the New Ferries, the Project will procure high-pressure water cleaning device and sand-blasting device

By utilizing the PMP and the de-rusting devices, it is expected that the docking period of the New Ferries will be shortened to about one month at every two years from the current docking period of three months every year, thereby allowing Dalla crossing ferry serviced smoothly by the three New Ferries of the Project.

2-2 Outline Design of the Requested Japanese Assistance

2-2-1 Design policy

2-2-1-1 Capacity of the New Ferry

(1) Operation of the existing ferries

1) Operation time and fare

Two Dalla ferries are operating to link 760 m crossing between Pansodan Jetty at Yangon side and opposite Dalla jetty.

Time to operate	From Dalla 1 st departure at 05:00 to the last departure at 21:30 From Yangon 1 st departure at 05:30 to the last departure at 21:30
Interval to operate	30 minutes: 05:00 ~ 06:00 and 19:00 ~ 21:30; 20 minutes: 06:00 ~ 19:00
No. of crossings	46 times/each ferry
Operation time	6 ~ 8 min. for running, 5 ~ 7 min for disembarkation and embarkation and 5 ~ 9 min for waiting.
Fare	50 Ks/one person, free for monk, 100 ~ 500 Ks for parcel

Passengers are business persons, students, workers, merchants, farmers. monks, foreign tourists, etc., mainly of Dalla habitants who go to their workplaces and schools in Yangon and produces rush hours on the morning ferries from Dalla and on the evening ferries from Yangon.

On Saturday and Sunday, students are few but shopping people from Dalla and people visiting parents' house from Yangon are added.

There are always people rushing to get ferry. Captain normally waits few minutes for them to leave the wharf.

2) Number of operation days

Four ferries are currently assigned to the Dalla ferry service: MV Anaw Ya Htar, MV Tapin Shwee Ht, MV Kyan Sit Thar and MV Hti Hlaing Shin. Each four Dalla ferries goes to drydock every year for about three months, leaving always three ferries at the crossing site. Each of the three ferries at site works two days and stops one day for standby, rest and maintenance.

Their operation days were as follows.

Table 2-1 Operation days of Dalla ferries

Ferry name	Anaw Ya Htar	Tapin Shwee Hti	Kyan Sit Thar	Hti Hlaing Shin	Total
FY 2010 (04.2010 - 03.2011)	282	270	287	280	1,119days
FY 2011 (04.2011 - 03.2012)	286	295	291	288	1,160days

Operation days of existing Dalla ferries are 270 days (8.9 months) ~ 291 days (9.6 months), average of 285 days (9.5 months).

3) Record of counting number of passengers

The survey team counted number of ferry passengers for whole voyages from 05:00 to 21:30 in a week.

Table 2-2 Peak time and nos. pax in a week

<Dalla→Yangon>

Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
Time	Nos. Pax	Time	Nos. Pax	Time	Nos. Pax	Time	Nos. Pax	Time	Nos. Pax	Time	Nos. Pax	Time	Nos. Pax
08:00	963	07:40	989	07:40	948	07:20	993	08:00	864	07:40	793	07:20	629

<Yangon→Dalla>

Monday		Tuesday		Wednesday		Thursday		Friday		Saturday		Sunday	
Time	Nos. Pax	Time	Nos. Pax	Time	Nos. Pax	Time	Nos. Pax	Time	Nos. Pax	Time	Nos. Pax	Time	Nos. Pax
18:20	1166	17:40	1062	18:00	1273	18:00	961	19:00	975	18:40	898	18:20	756

Result of pax counting is summarized as follows.

- Passengers and peak time Mainly of business persons, students, workers, etc.
Peak time at 07:00 ~ 08:00 from Dalla, and at 17:40 ~ 19:30 from Yangon, on weekdays.
- Total nos. pax in a day 32,000 ~ 33,000 pax, average of 32,800 pax for a week.
- Peak nos. pax (week average) 1,018 pax (including abnormal peak on Thursday)
- Peak nos. pax (weekday average) 1,049 pax (excluding abnormal peak on Thursday)
- Max. peak nos. pax 1,166 pax (excluding abnormal peak on Thursday)
- Abnormal peak On Thursday evening departure delayed due to heavy rain and limited visibility, which made waiting people more and all rushed to the leaving ferry. Boarding gate had to control and limit passengers.
- Saturday Peak is lower than the weekdays, but still business persons are

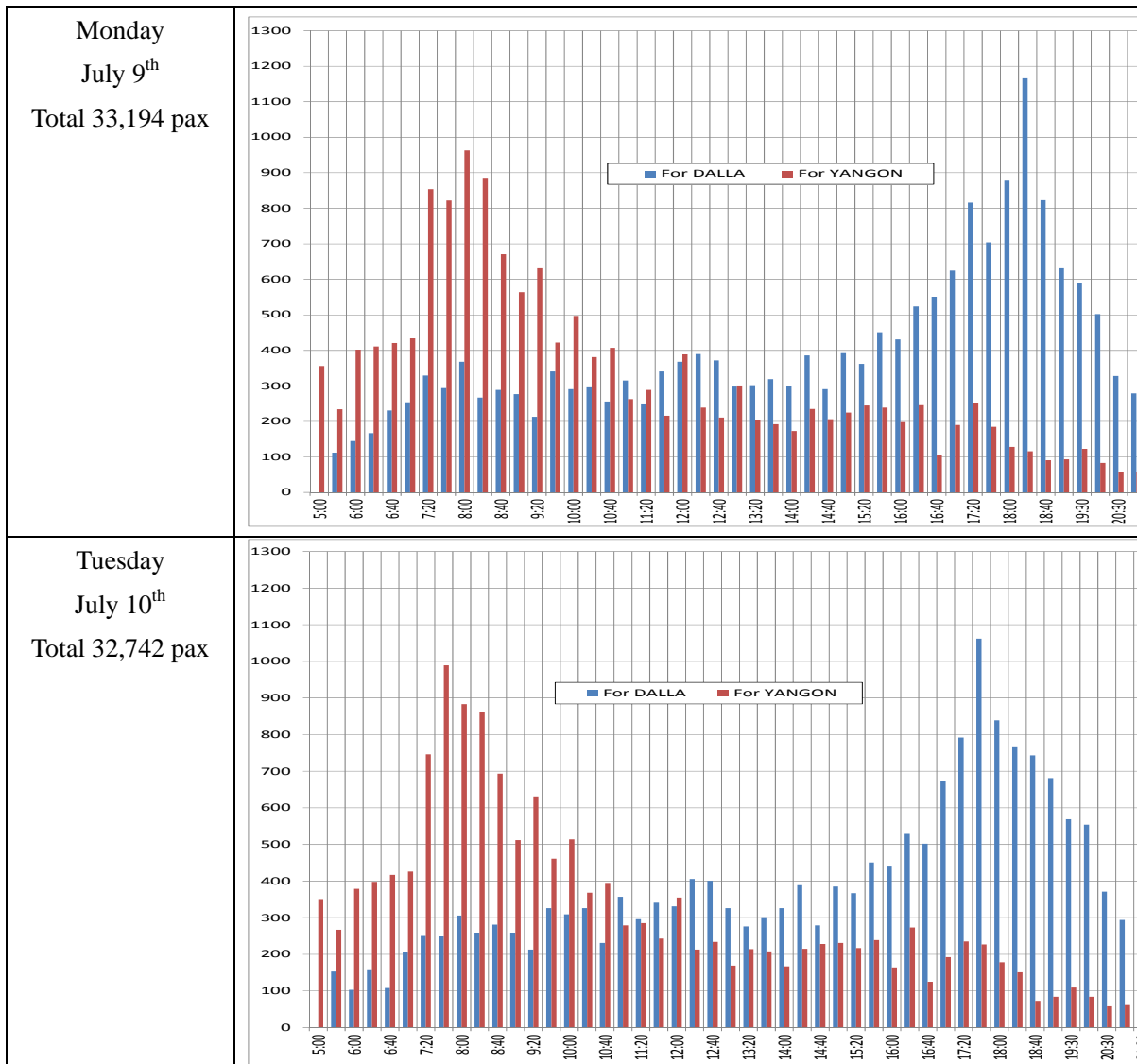
many, resulting in over pax than licensed no.

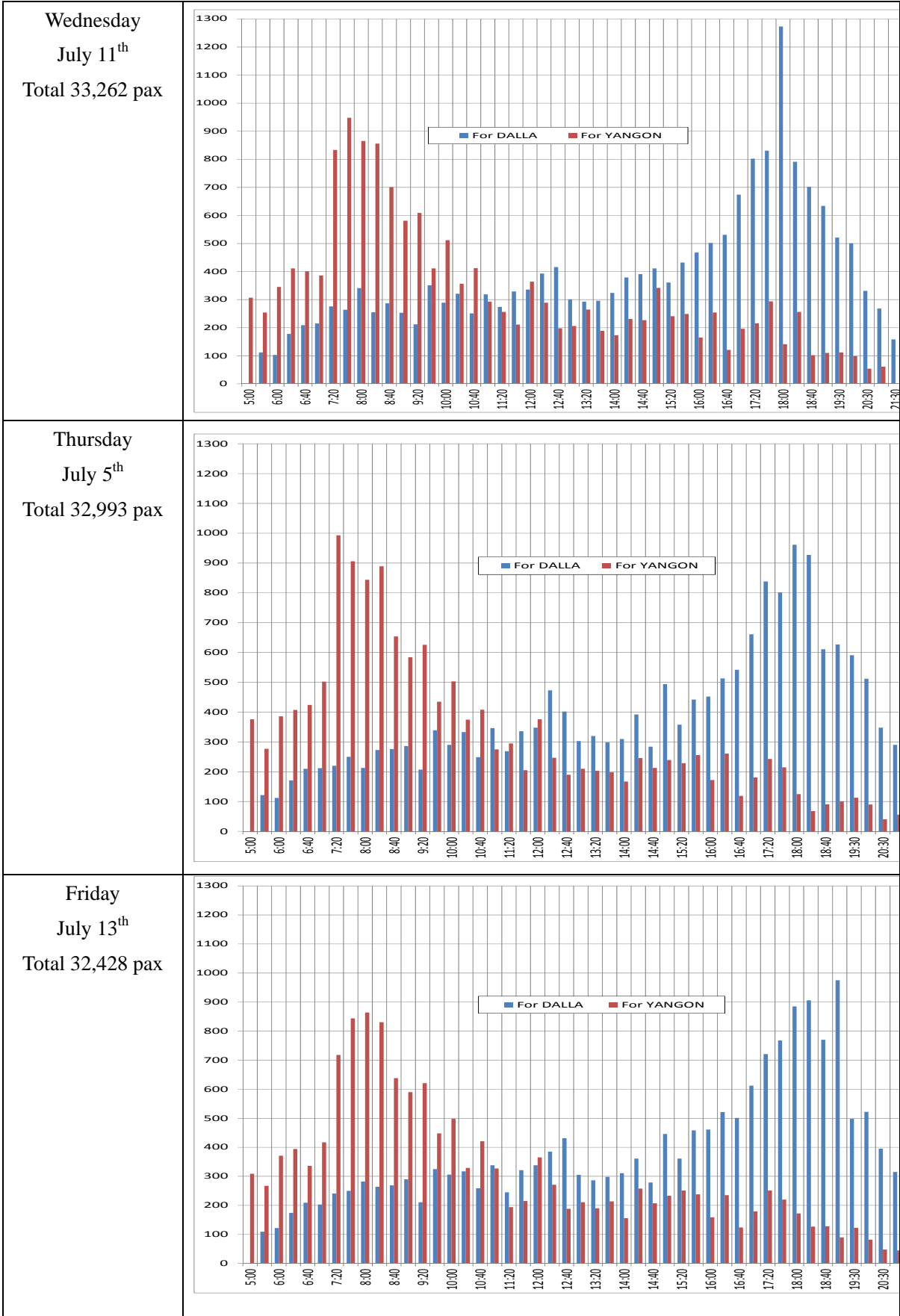
- Sunday

Low peaks in the morning and evening.

In October after rainy season Dalla side farm area comes to harvest season, and some farmers moves to the Yangon side with their crops by the Dalla ferry, but their traveling time is normally early morning and dyatime not causing overlap on the ferry peak time. After the rainy season, tourists increase but their traveling time to use the Dalla ferry is mostly in the daytime not causing overlap on the ferry peak time.

Graphs in the next show nos. pax for all ferry services from the 1st ferry on 05:00 to the last ferry on 21:30, from Monday to Sunday. The graphs clearly show pax are mainly of Dalla people. Population of Yangon is increasing but living cost in Yangon is expensive so that many people start to live in inexpensive Dalla area and use the Dalla ferry to get to the Pansodan wharf, the entrance to the Yangon central.





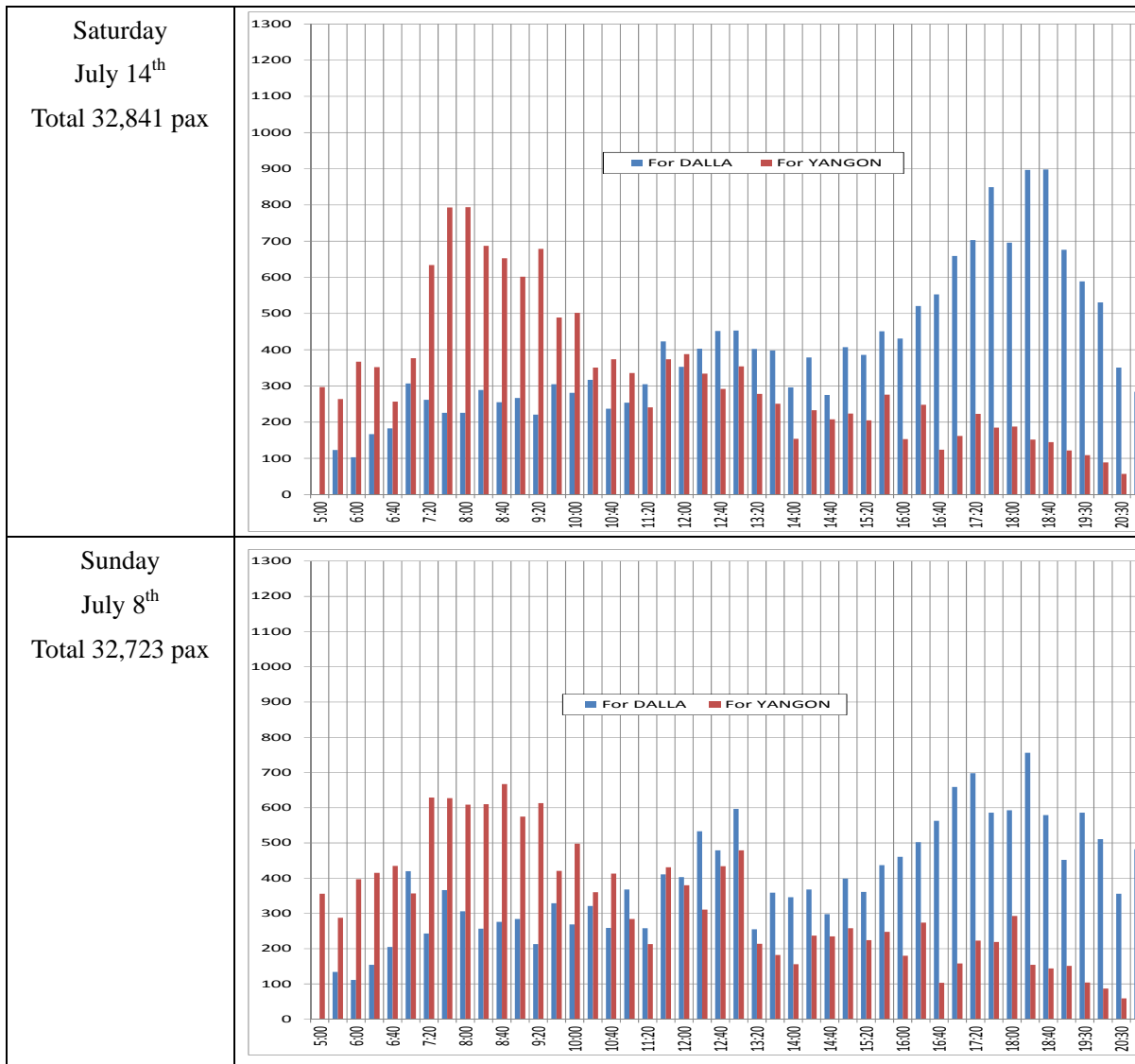


Fig. 2-1 Number of pax in a week

(2) Ferry demand

As stated in the last paragraph, total number of pax in a day as an average of a week was 32,800 pax, peak number of pax in a day as an average of a week was 1,049 pax and max pax peak in a day was 1,166 pax appeared on Monday.

In future, demand for the Dalla Ferries will increase almost proportional to the population increase in Dalla area. Projection of population in the next 10 years is 13 ~ 24 % for entire Myanmar (from population statistic of Jan Lahmeyer, right)), and 20 % in Yangon (Japan Transport Cooperation Association). Dalla area being a residential area of Yangon, Dalla population will increase similar to Yangon.

According to above, demand for the Dalla Ferries in the next 10 years can be about 39,000 pax in a day from the current 32,800

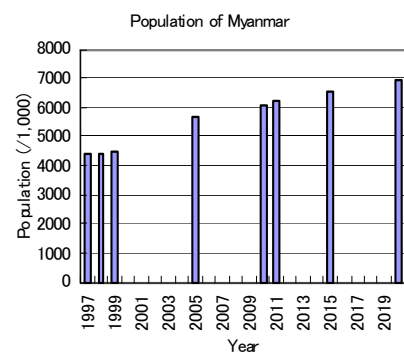


Fig. 2-2 Population statistics

pax, and peak demand can be about 1,400 pax from current 1,166 pax.

Against the increase of demand for the Dalla Ferries due to population increase in future, IWT intends to cope with the demand increase by adding services, i.e. 2 ferries x 2 pairs at same time, instead of current 2 ferries x 1 pair. A pair of additional jetties necessary for two pairs services is under discussion with Myanma Port Authority (MPA), who is the Government to own and manage shore facility.

(3) Capacity of the New Ferry

Pax license of the existing four Dalla Ferries are, though their hulls are of almost same size, 433, 455, 720 and 742 pax. However, Dalla Ferries are carrying 1,000 pax always in the morning and evening rush hours, and the survey team counted 1,166 pax as maximum.

Overloading of pax on board vessels is in Japan subject to penalty of imprisonment or fine, severer than cases on trains and buses, taking overloading of vessels more dangerous on passengers' life. In the Project, the capacity of the New Ferry may not be determined foreseeing pax overloading, but should be determined covering known peak demands.

The New Ferries shall be of a hull similar size as the existing ferries, pax capacity shall be about 1,200, pax floor area shall satisfy the standard of Japanese Maritime Safety Law, and stability/fire/lifesaving system shall also satisfy the same Japanese standards, considering following.

- Though the maximum pax capacity among the existing ferries is 742, existing ferries have deck areas for 1,200 pax according to the Japanese Maritime Safety Law (floor area of 0.30m²/person);
- Ferry hull should be of a size similar to the existing ferries from view that the ferries should maintain their swift maneuverability with similar hull;
- IWT intends to strengthen gate control to avoid over pax loading;

(4) Number of the new Dalla ferries

It is concluded adequate for the Project to procure three ferries of 1,200 pax capacity according to the following discussions.

Rotation of Dalla ferries for two years will be as following for four cases, i.e. current existing ferries, one New ferry renewed, two New Ferries renewed and three New Ferries renewed.

○ Current existing ferries

Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Existing												Dock												Dock
Existing								dock													Dock			
Existing				Dock													Dock							
Existing	Dock																	Dock						

○ One new ferry renewed

Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
New																						Dk		
Existing								Dock													Dock			
Existing				Dock													Dock							
Existing	Dock																	Dock						

- Each of three existing ferries must be operated nine months or longer.
- In the operation site, rotation of one new ferry and two existing ferries, still almost relying on old ferries.

○ Two new ferries renewed

Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
New																				Dk				
New																						Dk		
Existing				Dock													Dock							
Existing	Dock																	Dock						

- Each of two existing ferries must be operated six months or longer.
- In the operation site, rotation of two new ferries and one existing ferry, still relying considerably on the existing ferry.

○ Three new ferries renewed

Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
New													Dk											
New														Dk										
New															Dk									
Existing temporary																								

- Three new ferries are in rotation at the operation site, asking help from ferry in the other service route for 3 months in two years.
- Safe operation by only new ferries in operation without old ferries.

Fig. 2-3 Ferry rotation cases for different number of New Ferries

In case when two New Ferries are procured, two existing ferries must be joined. Crossing site needs three ferries and adding one ferry in drydock, total four ferries must be assigned for the Dalla ferry service. Docking period of the New Ferries is short but two old existing ferries will stay in drydock for six months (three months /one ferry) annually. In the three days rotation at crossing site, one day will be the day operated by two New Ferries, and two days will be operated by one new and one existing ferry.

In case when three ferries are procured, Dalla crossing will be operated almost by only new three ferries. As the length of drydocking will be only one month at every two years (as normally so in the ordinary vessels), operational rotation only by the three New Ferries will be available. Passengers will enjoy safe and comfortable services only by the New Ferries. When a New Ferry goes to drydock, some ferry in other service route may help for short period. Reliability of the New Ferries being high, operation only by two New Ferries without help of existing ferry may be possible, even when one New Ferry is in drydock.

However, crew must be changed and regular rest must be given for them as currently done.

The case of two New Ferries must depend on help of two existing ferries thus total four ferries as current situation, i.e. the project will be just covering half of the Project policy of improving safety of transport.

In the case of three New Ferries, the Dalla crossing will be served by those three New Ferries, so that the Project policy of the safety will be fully satisfied.

Further, costwise, considerable reduction is expected, i.e. <four ferries x fixed cost + high repair cost of old ferries> → <three ferries x fixed cost + low repair cost of New Ferries>. New Ferries will allow low maintenance and repair cost, and besides in the three New Ferry service system, fixed cost for one ferry (crew cost, firewood expense, survey fee, depreciation cost, etc.) will be entirely eliminated. Following shows estimate of accounting balance for the two cases: <two New Ferries + two existing ferries> and <three New Ferries>. Revenue is kept unchanged from the one in the FY 2011.

Table 2-3 Accounting balance of four and three ferries operation cases

Unit in million Kyat

	Revenue	Expenditure	Balance	
FY 2011 account	455.261	221.541	233.720	
Four ferries (2 new + 2 old)	455.261	212.856	242.404	Expenditure cut by about 4 %
Three ferries (3 new)	455.261	192.807	262.453	Expenditure cut by about 13 %

Table 2-4 Breakdown of the account (existing ferries)

Revenue and expenditure of IWT Dalla ferry, FY 2011

Ferry name	HHS	KST	TSH	AYH	TOTAL	Average
Revenue	121.414	125.330	103.096	105.421	455.261	113.815
Expenditure						
Crew wages	6.101	5.763	7.074	6.320	25.258	6.315
Firewood Expenses	0.007	0.008	0.010	0.008	0.033	0.008
Survey Fees	0.003	0.010		0.093	0.106	0.027
Registration & License	0.010	0.010	0.010	0.010	0.040	0.010
Fuel Used	36.909	40.175	36.291	33.744	147.119	36.780
Oil & Lubricants Used	1.463	2.344	1.099	1.166	6.072	1.518
Maintenance & Repair	8.613	2.962	5.285	4.522	21.382	5.346
Depreciation	3.953	5.974	1.918	3.446	15.291	3.823
Port Dues & Wharfage	0.522	0.615	0.495	0.552	2.184	0.546
Steamer Tickets & Forms	1.014	1.014	1.014	1.014	4.056	1.014
Total	58.595	58.875	53.196	50.875	221.541	55.387

Table 2-5 Breakdown of the account projection (New Ferries)

Account projection for two new ferry case

Ferry name	Existing-1	Existing-2	New-1	New-2	TOTAL
Revenue	113.815	113.815	113.815	113.815	455.260
Expenditure					
Crew wages	6.315	6.315	6.315	6.315	25.260
Firewood Expenses	0.008	0.008	0.008	0.008	0.032
Survey Fees	0.027	0.027	0.027	0.027	0.108
Registration & License	0.010	0.010	0.010	0.010	0.040
Fuel Used	36.780	36.780	36.780	36.780	147.120
Oil & Lubricants Used	1.518	1.518	1.518	1.518	6.072
Maintenance & Repair	5.346	5.346	1.000	1.000	12.692
Depreciation	3.823	3.823	3.823	3.823	15.292
Port Dues & Wharfage	0.546	0.546	0.546	0.546	2.184
Steamer Tickets & Forms	1.014	1.014	1.014	1.014	4.056
Total	55.387	55.387	51.041	51.041	212.856
Balance	58.428	58.428	62.774	62.774	242.404

Account projection for three new ferry case

Ferry name	Existing-1	New-1	New-2	New-3	TOTAL
Revenue	18.969	145.430	145.430	145.430	455.260
Expenditure					
Crew wages	1.579	6.315	6.315	6.315	20.524
Firewood Expenses	0.002	0.008	0.008	0.008	0.026
Survey Fees	0.007	0.027	0.027	0.027	0.088
Registration & License	0.003	0.010	0.010	0.010	0.033
Fuel Used	6.130	46.997	46.997	46.997	147.120
Oil & Lubricants Used	0.253	1.940	1.940	1.940	6.072
Maintenance & Repair	1.337	1.000	1.000	1.000	4.337
Depreciation	0.956	3.823	3.823	3.823	12.425
Port Dues & Wharfage	0.137	0.546	0.546	0.546	2.184
Steamer Tickets & Forms	0.254	1.296	1.296	1.296	4.056
Total	10.655	60.665	60.665	60.665	192.807
Balance	8.314	84.765	84.765	84.765	262.453

2-2-1-2 Rules and regulations to apply

Regarding rules and regulations to apply for the New Ferries, the survey team discussed with DMA (Department of Marine Administration) and had following understandings. Refer to the Appendix 2 Memorandum of discussion with DMA.

- (1) For inland water vessels, no safety regulation is specified in Myanmar. The New Ferries of the Project may apply Class NK rules and Japanese maritime regulations.
- (2) Design drawings of the New Ferries already approved by the Class NK shall be sent to DMA for final approval. DMA inspector will visit shipyard two times as maximum for the new building inspection.




- (3) DMA shall issue a letter of authorization for Class NK to inspect the Ferry on behalf of DMA.
- (4) DMA does not allow inland water vessels of Myanmar flag sailing the ocean even in single voyage permission. Regarding transportation of the New Ferries from Japan to Myanmar, refer to 2-1-7 Transportation.

2-2-1-3 Feed back from the existing ferries

A number of issues were raised surveying existing ferries. Those issues will be taken up and reflected on the New Ferry designs.

Table 2-6 Feedback issues

No.	Issues on the existing ferries	Countermeasures in the New Ferry
1.	<p>Ferries are carrying passengers much more than the licensed capacity. Ferries accept excessive passengers especially when a river passage is so crowded or visibility is so limited due to heavy rain that ferry had to wait long at the jetty and waiting passengers get more. The survey team counted maximum 1,166 passengers in excess of licensed capacity (433 ~ 742 depending on each ferry).</p>	<p>Capacity of the New Ferry shall be 1,200 pax covering counted max number 1,166.</p>
2.	<p>Dalla Dock has no sandblasting machine and rusts are removed by hand so unsatisfactorily that corrosion of the bottom shell grows quickly. Dalla ferries are changing 1/3 ~ 1/4 part of the bottom shell plates annually. Ferry crews are careful with the corrosion hole and flooding, and check flooding every morning opening manholes.</p> <p>Excessive corrosion spoils vessel safety and makes repair cost high.</p> <p>Without countermeasure, the New Ferries will trace same problem of corrosion like existing ferries.</p>	<p>High pressure water cleaning device and sand blasting device shall be included in the Project as the tool for the New Ferry.</p>
3.	<p>Way of maneuvering on berthing and leaving the jetty is rather rough and shipside fenders are strongly hit against the jetty, so that steel shipside fender is considerably damaged, even giving a risk of damage on the main hull structure.</p>	<p>Based on the survey result on the way of maneuvering, fender structure and rubber fender shall be reviewed.</p> <p>IWT crew shall be invited to Japan by the Project to conduct training for safe way of maneuvering.</p>

No.	Issues on the existing ferries	Countermeasures in the New Ferry
		
4.	<p>Height difference between the passenger deck and pontoon jetty is sometimes big so that transfer of passengers, bikes, wheel chairs are inconvenient or difficult.</p> <p>Freeboard of the pontoon jetty is 1.4m ~ 1.5m and that of the ferries is 1.1m ~ 1.4m, giving step height of 40cm as maximum.</p> 	<p>The New Ferry shall be designed for having freeboard of 1.40m ~ 1.50m in way of gangways.</p>
5.	<p>Two existing ferries have rainwater collecting tank and crew can enjoy clean water for shower and washing, whereas two other ferries can only use cloudy river water, which may be unhygienic.</p>	<p>Large rainwater collecting tank shall be fitted for crew and canteen use.</p>
6.	<p>No heat insulations are provided for wheelhouse and crew cabins wall and deckhead, so that inside becomes very hot.</p>	<p>Heat insulations shall be fitted for crew comfort.</p>
7.	<p>Seatings are not arranged on the main deck but arranged only on the upper deck. To get there passengers must use stairway. Wheelchair or aged people have to use pay chairs or stand up.</p> 	<p>Several seatings shall be fitted also on the main deck, as the priority seats.</p>

No.	Issues on the existing ferries	Countermeasures in the New Ferry
8.	In the existing ferries, diesel generator is stopped in the daytime so that no alternate current electricity is available and no common electric equipment can be used.	Main engine driven generator shall be installed. Without working diesel generator, AC power becomes available allowing public addressor, refrigerator, etc. Solar powered generator shall also be planned.
9.	In the wheelhouse navigation equipment like radar, GPS or echo sounder is not fitted. Without such equipment, possibility of operation is limited in case of heavy fog and heavy rain.	The New Ferry shall be fitted with radar, GPS and echo sounder.
10.	No public addressing system is installed on board so that means of giving instructions to the passengers is limited.	The New Ferry shall be fitted with a public addressing system and DVD safety information system.
11.	No direct means of communication between the wheelhouse and the engine room is fitted. Crews are using transceivers and mobile phones.	The New Ferry shall be fitted with a fixed reliable direct telephone.

2-2-1-4 Feedback from the Onboard Passengers and Crew

Table 2-7 Feedback from passengers

No	Comment from passengers	Countermeasures in the New Ferry
1.	Toilets are dirty, no water and dark (7)	Discharge from the main engine cooling raw water shall be led to the toilet. Toilets shall be fitted with lights.
2.	Crowded in the rush hours (5)	New Ferries will be of similar size and don't improve the crowded situation.
3.	Passenger decks are dark (2)	Main engine driven generator supplying AC power also in the daytime will allow lights at necessary positions.
4.	There should be more free seatings (2)	Several fixed seatings shall be fitted on the main deck.
5.	Good to see TV on board.(2)	TVs for safety instruction will be installed. Arrangement to show ordinary TV broadcasting will be undertaken by IWT as necessary.
6.	Rain comes into passenger space (2)	Fore end and canteens space sides shall be fitted with rain shields.

Table 2-8 Feedback from crew

№	Comment from crew	Countermeasures in the New Ferry
1.	Maneuvering using HYDROMASTER is good. The New Ferry should also be the same system. (3)	Similar propulsor system shall be adopted.
2.	Steering wheelhouse should be on the 3 rd deck. (3)	Shall be designed as commented.
3.	Good have AC power in the day time but the diesel generator should be stopped in the day time. (3)	Main engine driven AC generator shall be planned to allow AC power supply in the day time leaving diesel generator only for the night time use.
4.	Good if radar and GPS are fitted in case of bad visibility and in the night. (4)	Radar and GPS shall be fitted.
5.	Corrosion hold and flooding is not good. (2)	De-rusting equipment shall be supplied by the Project and used in the Dalla Dock.
6.	For washing and shower, rainwater is preferable rather than the river water. (2)	Rainwater tank shall be fitted.

2-2-1-5 Long life policy

Inland water transports are active in Myanmar and there are many shipbuilding and repair facilities supporting water transport. However, agents of ship machinery makers are limited not allowing prompt servicing and spare parts delivery. Once essential machinery should be damaged, fixing takes time. Regular and proper maintenance is, therefore, important for steady operation of the New Ferries.

Dalla ferries rely on Dalla Dock for regular maintenance and repair including dry docking. Workshop tools and machinery are generally of old type but mechanics are so competent as to undertake major overhauling of diesel engines.

In this Project, PMP (Preventive maintenance Policy) ¹ shall be established. Dalla Dock can undertake periodical maintenance along the PMP program.

The Project will procure spare parts for periodical PMP maintenance. Two entire main engine assemblies together with gaskets and engine attached pumps will be included in the spare parts. For small engines, it is common to remove entire engine and overhaul it in the workshop ashore rather than overhauling on board vessel. When main engines of the New Ferry have run 10,000 hours (about 2 years in Dalla ferries), the Ferry drydocks in Dalla Dock and remove two main engines and land them in the workshop. Two main engines which had been overhauled and stowed in the Dalla Dock are installed on board the ferry waiting in the Dock. The removed engines are then overhauled for next exchange. This procedure will allow better servicing and period to stay in the Dock will be much shorter than the current period of three months long.

¹ PMP is the vessel maintenance system, on which machine is overhauled regularly even if the machine in question is damaged or not. PMP manual is prepared to show weekly, monthly, annual and long term maintenance schedule. Life of machinery and spare parts can be longer by PMP.

2-2-1-6 Instructions for familiarization with the New Ferry and for PMP

In this project, PMP (Preventive Maintenance Policy) is intended. Exchange parts, PMP program, and instruction of PMP to each Ferry crew are planned.

Two crew, normally the captain and the chief engineer for each Ferry and a technical staff of IWT (also as an interpreter), shall be dispatched to Japan for a month before the completion of the New Ferry for instructions for familiarization with the New Ferry and for PMP. After the building of the Ferry has completed in Japan, the Ferry shall sail from Japan to Myanmar by its own propulsion manned by Japanese legal crew, and the Myanmar crew shall return to the homeport on board the New Ferries for further familiarization.

Abovementioned instructions for Myanmar crew shall be undertaken by the shipbuilding contractor as a work required by the shipbuilding contract, and thereby subject instructions shall not be dealt with as a soft component of the Project.

After turning-over the New Ferries, two engineers, deck and machinery part, shall be dispatched by the shipbuilding Contractor to Myanmar for 15 days as the guarantee engineers to cope with machinery malfunctions which usually concentrate in the early time after the delivery. Those engineers will give instructions on PMP, operation of machinery, system and maintenance as far as possible.

As such, PMP shall be undertaken by the shipbuilding contractor as a work required by the shipbuilding contract, and thereby not be dealt with as a soft component of the Project.

2-2-1-7 Transportation

Following shall be observed for the transportation of the New Ferries from Japan to Myanmar:

The New Ferries shall be registered under the Myanmar flag after completion, and sail from the shipyard of Japan to Myanmar by their own propulsion.

To sail the ocean, the construction and outfitting of the ferries shall be upgraded to the ocean going vessels form the inland water vessels, i.e. hull structure, watertight integrity, navigation equipment, radio apparatus, etc. at higher standard, and the New Ferries shall be manned by six Japanese crews comprising three deck officers and three engineer officers, all having international STCW license.

All work of transporting the New Ferries shall be included in the shipbuilding contract thereby undertaken by the contractor (shipyard).

For the transportation, the New Ferries shall be fully insured for the hull, equipment, personnel on board and third party liability.

IWT crews (captain and chief engineer) shall return to Myanmar on board the New Ferries continuing training after having training program in Japan.

The New Ferries are to sail by their own propulsion from Japan to Yangon passing East China Sea, Strait of Malacca and Andaman Sea. The Ferries will sail in convoy taking a course close to the land outside the territorial waters, and carry satellite communication equipment for acquisition of weather forecast and communication with the land. In heavy seas, the Ferry may take refuge in the nearest sheltered port. For refueling, the Ferry will call ports.

Assuming about 9 knots speed on the mileage of about 4,050 nautical miles (7,500 km), the Ferry will take about 23 days including refueling stop of about 4 days.

2-2-1-8 Country of origin for machinery and equipment

Machinery and equipment suitable to adopt for the New Ferries being not available in Myanmar, they shall be in general of Japanese products expect for following two items from third countries, which are included in the list of potential makers.

- (1) Propulsor from HYDROMASTER in the United Kingdom
HYDROMASTER is the maker of the propulsor on board the existing Dalla ferries. Equivalent propulsor being available from two Japanese makers, HYDROMASTER is one of those options.
- (2) Main engine from DOOSAN in the Republic of Korea
DOOSAN is the standard main engine adopted by HYDROMASTER. As two Japanese makers offer workable engines, DOOSAN engine is one of those options.

In Yangon, agent of marine machinery is limited now, but some makers plan opening of agent office in Yangon. Even without agents in Yangon, most of makers have agent or service station in Singapore or Bangkok, therefore there will not be inconveniences on the makers support.

2-2-2 Basic Plan

- (1) Main particulars of the New Ferries and existing ferries

Table 2-9 Main particulars of new/existing ferries

Ferry Name	New Ferries	Anaw Ya Htar	Tapin Shwee Hti	Kyan Sit Thar	Hti Hlaing Shin
Type	Pax ferry	Pax ferry	Pax ferry	Pax ferry	Pax ferry
Class	ClassNK	No class	No class	No class	No class
Built	2014 (expected)	1945	1945	1945	1945
Built in	Japan (expected)	Myanmar	Myanmar	Myanmar	Myanmar
Length oa	41.35 m	40.6 m	41.3 m	40.6 m	39.7 m
Breadth	9.40 m	9.1 m	9.0 m	9.1 m	9.3 m
Depth	2.60 m	1.80 m	1.80 m	1.80 m	1.80 m
Draft	1.20 m	0.6 ~ 1.0 m	0.6 ~ 1.0 m	0.6 ~ 1.0 m	0.6 ~ 1.0 m
Gross ton	290	334.19	257.14	249.67	138.85
Pax capacity	1,200	455	720	742	433
Crew	14	14	14	14	14
Pax deck	2 stories	2 stories	2 stories	2 stories	2 stories
Main engine	Ab 200kW x 2 (ab 270 HP x 2)	Dorman (UK) LETCA 250 HP x 2			MWM (Germany) TBD 234 V6 297 HP x 2
Propulsor	Equivalent to Hydromaster	Hydromaster 360°azimuthing x 2			

(2) Style of the New Ferries

The New Ferries must be fitted with the propulsor of Hydromaster or equivalent, the navigation bridge on the top deck, and its hull must be of similar size for maneuverability, and thereby the style becomes similar with the existing Ferries.

Regarding alternatives of passenger deck, i.e. single story, two story and three story,

Single story layout needs hull of much larger length and breadth for the same passenger capacity, thereby uneconomical; and

Three story layout needs larger breadth to compensate high center of gravity, and much shorter length for same passenger capacity, thereby abnormally short and beamy hull.

It is concluded that two story layout is adequate for ferries of 1200 passenger capacity.

(3) Hull form

Existing ferries are of operating draft of about 0.80m, on which hull buoyancy has to support entire weight of the ferry, and thereby hull form had to be very full suffering high water resistance and high fuel oil consumption.

It was found in the in the survey of the natural conditions (see right), however, that the water depth is quite sufficient and the operating draft can be much deeper, and thereby the draft of the New Ferry is deepened to 1.20m, on which the hull form will be of slim, low water resistance, fuel economy

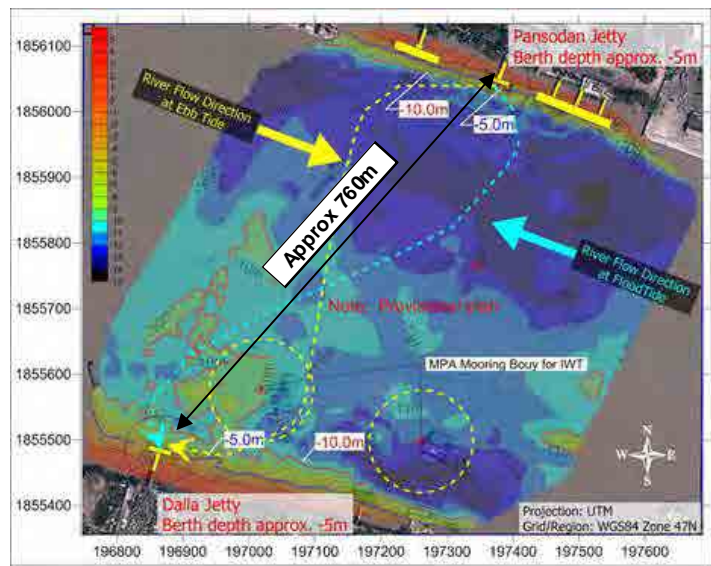


Fig. 2-4 Water depth in way of Dalla ferry crossing (July, 2012)

(4) Hull structure

The New Ferries sail from Japan to Myanmar passing East China Sea and Andaman Sea by their own propulsion, the hull must not be suitable just for sailing inland water but suitable for sailing the ocean.

Superstructure needs consideration on watertight integrity, e.g. enclosing engine room by steel wall to watertight.

(5) Rules to apply and classification

Department of Maritime Authority, Ministry of Transport, Myanmar (DMA) has a regulation of hull structure but no further regulations. Since DMA generally approves reference to the Japanese Maritime Rules and ClassNK rules, DMA approves the registration of the New Ferries if the New Ferries has certificate of inspection by the ClassNK.

According to above, the New Ferries shall be designed and built according to the ClassNK rules and Japanese maritime rules, and third party inspection during construction shall be entrusted to the ClassNK. DMA does not approve inland water vessels to sail in the ocean, i.e. sea transport of the New Ferries by their own propulsion is not permitted, and thereby the New Ferris shall be built as the sea going vessel, provisionally registered under the Myanmar flag before departing Japan having a provisional certificate of registry, and shall sail the ocean to Myanmar.

(6) Stability

Stability performance of the New Ferries carrying 1,200 passengers on board shall satisfy the stability regulations of Japan, including stability in damaged condition requiring safety without capsizing even when any one watertight compartment under the main deck should be damaged and flooded.

(7) Lifesaving and firefighting

According to the lifesaving regulation of Japan for inland water vessels, buoyant apparatuses, life jackets (10% of the total complement on board) and lifebuoys shall be provided, and according to the firefighting regulation of Japan, fire pumps, hydrants and fire extinguishers shall be provided.

(8) Passenger capacity

For passenger vessel of sailing time less than 1.5 hours, according to the Japanese regulations for equipment for ships, area of the passenger deck must satisfy 0.3m² per one standing person. Where existing ferries have fixed bench seating (free of charge) for 160 persons on the upper deck, the New Ferries shall have fixed bench seating for 160 persons on the upper deck and 40 persons on the main deck, thus total 200 person seating capacity, thereby standing passenger capacity becomes 1,000 persons for which available deck area will be about 0.38m² per person.

Portable chairs (now charged at Ks 50) will also be prepared as existing ferries for use when spaces are available. Fixed bench seats on the main deck are priority seats for aged or handicapped people for whom access to the upper deck is difficult, and placed at such positions as away from people passage in boarding and leaving.

(9) Speed performance, engine and propeller

Current speed in way of the Dalla crossing is about 4.5 knots. Speed of the New Ferries must be about 10 knots as existing ferries to cross the river of such fast current. The propulsion unit must consist of two sets, each of about 200kW (270 ps), to keep running even in case of failure on one engine and also to allow good maneuverability operating two propellers independently.

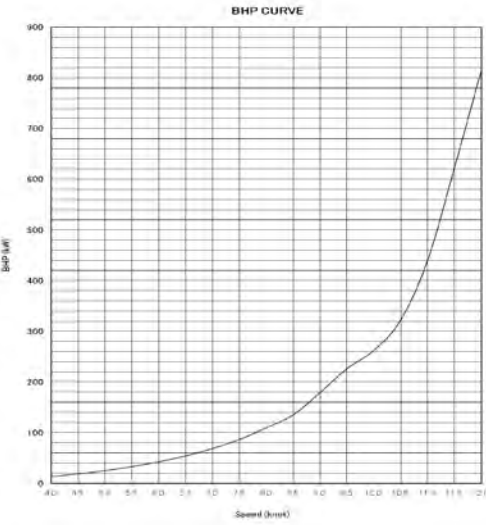


Fig. 2-5 Speed and power calculation

(10) Maneuvering system

Existing ferries are not using conventional propeller but using 360° azimuthing propulsor. Ferry crews are comfortably operating this propulsor to cross the river, berth with and unberth from the jetty under the fast current. It is found that the similar propulsor is indispensable also for the New Ferries. Ferry propeller frequently catches fish net or the like. To remove tangled nets, propeller must be fitted with a mechanism of tilting up above the water as propulsors of existing ferries.

(11) Passenger facilities

As existing ferries, fixed bench seating (now free) and portable seats (now charged) are provided for passengers. The fixed seats shall be arranged mainly on the upper deck and some on the main deck as priority seats for aged or handicapped people.

Three men's toilets and three women's toilets shall be arranged.

A canteen shall be arranged on the upper deck and provided with modern electric equipment.

(12) Crew facilities

On board the existing ferries, crew cabins are of simple construction with simple furniture and sleeping facility is not sufficient in some ferry. In the New Ferries, all crew have their bed and comfortable accommodation shall be provided.

Considering rank and work of each crew, two single rooms for captain and chief engineer, two 4-bunk rooms and two 2-bunk rooms for ordinary crew shall be provided.

Toilets shall be common with passengers'. A shower room shall be provided for crew.

(13) Electric supply

In the existing ferries, electric generator is stopped in the daytime to lighten load on the generator, and thereby no electric lights in the dark toilets and no electric equipment like fridge are possible to use.

In the New Ferries, however, a solar power system and main engine driven generators are installed to supply AC power in the daytime thereby allowing to use water pump, fuel oil pump, fridge, water boiler, public addressor, DVD, etc.

The solar power system shall be of an effective capacity of about 4kW to cover lighting small power equipment. When the onboard power demands exceed the solar power output, the main engine driven generator shall backup the power shortage.

The main engine driven generator is Vee-belt driven fitted on each main engine, and fitted with frequency converter for constant AC frequency. Either one is connected on the line while the other is in standby.

One set of diesel generator shall be provided for the power supply in the night when the main engines are not running.

The solar power system does not involve any moving parts allowing low risk of failure, and thereby many systems had been installed in developing countries where servicing facilities are limited. The solar system

planned in the Project is of a type commonly used and no risk particular in this Project is expected.

Fuel oil saving by the solar power system corresponding to the fuel oil consumption of diesel generator at an output equal to the output of the solar power system is about 2,350 liters ($=4^{\text{kW}} \times 50\% \times 230^{\text{g/kWh}} \times 12^{\text{h}} \times 10^{-3} \div 0.86^{\text{lit/kg}} \times 365^{\text{day}}$).

Frequency of the electric power on board shall be 60Hz, where 50Hz electric power is supplied in Myanmar. The 60Hz was adopted considering that 50Hz marine generator of 20kVA class capacity is not common, marine equipment such as pumps and navigation equipment are generally of 60Hz, and no serious problems are expected on household 50Hz equipment running on 60Hz.

(14) Piping system

Bilge suction	Two bilge/fire pumps are installed and take suction of bilges from any of the watertight compartments.
Fire hydrant	The Two bilge/fire pumps supply water to the fire main line.
Fuel oil	The main tank is filled by tank barge at every several weeks, and the service tank is filled every morning from the main tank operating electric fuel oil pump.
Rainwater	Rainwater on the bridge deck is collected in the rainwater tanks on the upper deck aft, and used for crew washing, shower and canteen.
Toilet flushing	Cooling raw water is led to toilets before discharging overboard.
Sewage holding	Toilet water is discharged once into small tank just under the toilets, then transferred to the sewage holding tank by the transfer pump, and then discharged to the shore facility by the discharging pump
Main engine cooling	The main engine shall be water cooled. Jacket coolant is cooled by raw water taking suction from the river by the cooling raw water pumps.

(15) Navigation equipment

Except for ferries which have equipment supplied by JICA for training purpose, existing ferries including Dalla Ferries have almost no navigation equipment.

On board the New Ferries, navigation equipment necessary for sailing the ocean, e.g. magnetic compass, GPS compass, radar, GPS, echo sounder, shall be installed in addition to the equipment just necessary for inland water vessels, to allow sailing East China Sea, Andaman Sea, etc. by their own propulsion.

Those equipment additionally installed on board for ocean sailing will be useful also in the ferry crossing service especially in the night and heavy fogs, and thereby those equipment shall be kept on board.

(16) Tools, PMP spare parts and the Equipment

Further to the procurement of the New Ferry itself, the Project shall procure the tools, PMP spare parts and equipment, all for the New Ferries.

The tools comprise hull part, machinery part and electric part tools as listed in the Table 2-10.

PMP spare parts comprise main engine and other machinery/equipment parts as listed in the Table 2-10.

The Equipment comprises de-rusting equipment, main engine assembly and portable pax chairs as listed in

the Table 2-11. Procurement of the Equipment will be dealt with separate from the New Ferry with the tools.

2-2-3 Proposed Design of the New Dalla Ferry

2-2-3-1 Design Specification

Table 2-10 Specification of the New Ferries

Item	Specification	
1. General item		
Kind of the vessel	Inland water passenger ferry	
Service	Pansodan – Dalla passenger ferry, Myanmar	
Flag	Republic of the Union of Myanmar	
Classification survey	Class NK (Nippon Kaiji Kyokai)	
Rules to apply	Myanmar Ship Safety Regulations	
	Japanese maritime regulations applicable to the vessel	
	NK classification rules	
	International tonnage measurement rule (non convention)	
	International regulations to prevent collisions at sea	
	MARPOL regulations as applicable	
Length overall	41.35m	
Length bp	38.50m	
Breadth, molded	9.40m	
Breadth, extreme	9.80m	
Depth, molded,	Main deck	2.60m
	Upper deck	5.00m
	Bridge deck	7.40m
Draft, molded	1.20m	
Gross tonnage	290t, International	
Service speed	About 10 knots on 75% output of the main engines	
Main engine	About 200kW (270 ps) x 2	
Complement on board	Total 1,214 persons	
Passengers	1,200 persons	
Crew	14 persons	
Tanks		
Fuel oil tank	30 m ³ (7,900 gal)	
Rainwater tank	4 m ³ (1,060 gal)	
Sewage holding tank	40 m ³	

Item	Specification
2. Passenger space and crew space	
Passenger space	Main deck: fixed timber benches (1.60mB x 10) and portable plastic chairs Upper deck: fixed timber benches (1.60mB x 40) and portable plastic chairs
Canteen	Selling counter, shelves, sink, tables (4) and chairs (16) 1 - Fridge, 500 lit 1 - Water boiler, 10 lit, 1kW 1 - Microwave oven, 700W 1 – Electromagnetic cooker, 1.3kW
Crew space	1 - Captains room, single bunk and private locker 1 - Chief engineers room, single bunk and private locker 2 - Crew’s room, 4 bunks, double tier bunks and private lockers 2 - Crew’s room, 2 bunks, double tier bunk and private lockers An electric fan in each room.
Toilet (for pax and crew)	3 - WCs for women 3 - WCs for men 1 - Shower room for crew, with 1 washing machine
Deck finish	Deck paint, anti slip
Lining and deckhead ceiling	Lining and ceiling: in crew accommodation and wheelhouse Ceiling: deckhead of the upper pax space
3. Deck machinery	
Bower anchor	1 x 495kg Danforth or AC14
Anchor chain	1 x class II 22mmD x 165m
Towing line (rule)	1 x 20mmD SWR (6x12) x 180m
Mooring line (rule)	4 x 27mmD synthetic rope x 120m
Mooring line (working)	35mmD synthetic rope x (6 m x 2 + 50 m x 2)
Windlass	7.5kW e. motor driven x 1 1 x chain wheel, 2 x warping heads
Bollard	8 x 200mmD 2-post type
4. Side fender	
Steel fender	200mmW rectangle section steel fender welded at the main deck level
Tire fender	15 x used tires about 7500mmD on each side, hung at shipside by chain

Item		Specification
5. Safety equipment		
Lifesaving apparatus	Buoyant apparatus	56pc x 22p capacity (> 100% of total complement)
	Lifejacket	126pc (> 10% of total complement + 4)
Firefighting equipment	Life ring	11 pc
	Hydrant and fire hose set	2 sets (main deck and upper deck)
	Portable fire extinguisher	8pc (2 in engine space, 4 in pax space, 1 in canteen and 1 in wheelhouse)
6. Ventilation		
Main engine space		Natural
Pump room		Natural
Canteen		Natural
Crew accommodation		Natural
7. Window		
Window	Wheelhouse	Front 1 x 1,100mmW x 750mmH (fixed) 4 x 750mmW x 750mmH (2 fixed and 2 openable) Sides 2 x 600/410mmW x 750mmH <input type="checkbox"/> (fixed)
	Crew cabin	6 x 350mmW x 500mmH (openable)
	Passenger deck	Upper deck fore 4 x 350mmW x 500mmH (openable)
Rain shield		Steel framed polycarbonate plastic glass, at upper deck fore, canteen sides and aft
Window wiper		1 x swing type, about 0.9m width, on wheelhouse front window
8. Engine room machinery		
Main engine		Medium speed diesel about 200kW (270 ps) x 1900 rpm x 2 Cylinder bore 130mm x stroke 165mm x 6 cylinder in line IMO Tier II Nox emission control Electric cell motor starting Water cooling by raw water/jacket coolant heat exchanger. Cell motor starting.
Clutch		Fitted
Propulsor		2 x Hydromaster type propulsor, 360 steering, tilting Propeller diameter 0.90m
Main engine driven generator		2 x About 20kVA x 225V x 60Hz x 3ph Driven by each main engine by Vee belt.
Frequency converter		Fitted to each main engine driven generator to obtain stable 60Hz frequency.

Item	Specification
	To work from idling rev up to max rev. Fitted with noise filter.
Diesel generator	1 x 15kVA x 225V x 60Hz x 3ph Prime mover of air cooled, cell motor stated diesel engine of about 15kW.
Cooling raw water pump	3 x centrifugal, 2.2kW e.motor driven, 25m ³ /h x 15mH With soft starter. 2 working and 1 standby.
Bilge/fire pump	2 x centrifugal, 5.5kW e.motor driven, 20m ³ /h x 40mH With soft starter.
Fuel oil transfer pump	1 x centrifugal, 0.4kW e.motor driven, 1m ³ /h x 8mH 1 x Hand pump
Sewage transfer pump	2 x centrifugal, 0.75kW e.motor driven, 6m ³ /h x 8mH
Sewage discharge pump	2 x centrifugal, 0.75kW e.motor driven, 6m ³ /h x 8mH
Engine control	Main engine Start/stop Local Clutch Local and wheelhouse Engine rev. Local and wheelhouse Emergency stop Wheelhouse Engine order telegraph <W/H : Local> x 2 engines, 4 points, push button Propeller Steering Local and wheelhouse Diesel generator Start/stop Local
9. Piping system	
Bilge suction	Independent piping from each watertight compartment to the valve manifold and to the bilge/fire pumps in the pump room,
Fire hydrant	Fire main line is led from the bilge/fire pump to the main deck and upper deck. Two fire hydrants are arranged on those decks.
Fuel oil	Fuel oil transfer from the main tank to the service tank using fuel oil transfer pump every day before starting crossing service. Hand pump available in case of failure of the electric fuel oil transfer pump. Fuel oil filling pipe on the main deck to accept bunker hose.
Rainwater	Rainwater leading pipe from the bridge deck roof into the rainwater tanks. Toilets, canteen and shower are served from the rainwater tank.

Item	Specification
Toilet flushing	Discharge of the cooling raw water is led to toilets for flushing.
Sewage holding	Toilet water shall be discharged once into small tank (2m ³ x 2) just under the toilets, then transferred to the sewage holding tank (40m ³) in the forward by the transfer pump, and then discharged to the shore facility by the discharging pump. Direct overboard discharge piping shall also be provided.
Main engine cooling raw water	Electric raw water pump→M/E heat exchanger→Discharge
10. Electric supply	
Generator	2 x M/E driven generator, 20kVA x 60Hz x 3ph AC 1 x Diesel generator, 15kVA x 60Hz x 3ph AC
Solar power	4kW x 60Hz x 3ph AC Solar power module panels installed on the bridge deck. The output power connected to the main switchboard via a power controller, allowing priority use of the solar power and insufficient power is automatically fed from the generator power.
E. supply	AC: 220V 3ph, 220V 1ph DC: 24V
Main switchboard	3-Gen and 1-Supply No parallel running of two generators
Transformer	None
Battery for starting	2 set x main engine starting, charged by engine driven dynamo 1 set x diesel generator, charged by main engine driven dynamo
Battery for general use	1 x 100Ah, for emergency lights and navigation equipment, Float charging
11. Inboard communication	
Common battery telephone	Wheelhouse: engine room
Crew call	Wheelhouse: 4 crew rooms at once
Public addressor	1 x 30W amplifier and microphone in the wheelhouse 13 x 2W speakers in pax decks 2 x 10W loud speakers on the bridge deck sides Pax deck sparkers and loud speakers are for alternative use.
Engine alarm	From engine room to wheelhouse
Safety video	DVD Player : 1 About 40" monitor: 1 in main deck pax space and 1 in upper deck pax space
12. Lighting	
Navigation light	1 x Masthead light, class-II, 40W incandescent

Item	Specification
	2 x Sidelights, class-II, 40W incandescent 1 x Sternlight, class-II, 20W incandescent 1 x Anchor light, class-II, 20W incandescent 2 x Red lights, class-II oil lamp
Inverter for nav. light	1 x 24V DC/220V AC
Ceiling lights	All LED lights
Searchlight	1 x 1 kW, manual remote control
Projector	100 W x 4, Halogen to light shipside gangway
13. Navigation equipment	
Magnetic compass	1 x table mount type, 125mmD, with spare bowl
GPS compass	1 set
Radar	1 x X-band, 4kW, 3.9ft aerial, 10" LCD monitor
GPS	1 x 10" LCD monitor
Echo sounder	1 x 10" LCD monitor, 200kHz, may be common with the GPS
Electric horn	1 x Electric magnetic horn, class-III
Wheelhouse consol	2 x Main engine controls for speed, clutch and emergency stop 2 x Main engine rev meter 2 x Propulsor steering control and angle indicator Telephone Public addressor mic Engine alarms
14. Radio apparatus	
VHF radio telephone	1 x international channels
EPIRB	1
15. Materials	
Hull	Steel, classification certified marine grade
Piping	
Raw water	Steel
Fresh water	Plastic PVC
Paint	
Bottom	Epoxy AC + Tin-free SPC AF
Shipside	Epoxy
Pax space	Epoxy
Superstructure	Modified epoxy
Decks	Modified epoxy for deck
Space under main deck	Epoxy
Anti corrosion	Zinc anodes

Table 2-11 Specification of tools and PMP spare parts

The shown number below denotes the number for each of the New Ferries.

1. Tools		
	Hull part	Smith work tools x 1 set Paint touch up tool x 1 set Piping repair tools x 1 set Navigation tools x 1 set
	Machinery part	Machinery overhauling tools x 1 set
	Electric part	Electric measuring equipment x 1 set Electric repair tools x 1 set
2. Exchange parts for preventive maintenance policy (PMP spare parts)		
	Main engine	4 sets x O-rings and gaskets, necessary for removing, e.g. pistons and cylinder liner on special survey 8 sets x Paper filters for FO and LO 2 sets x Pressure gauges 2 sets x Thermometers 2 sets x Pressure and thermo switches 2p sets x Tachometer 2 sets x Coolant chemicals 2 sets x Zinc bars
	Shafting	2 sets x Universal joint
	Propulsor	2 sets x Seal rings
	Diesel genset	2 sets x Paper filters for FO and LO
	Zinc anode	1 set x 5.9kg zinc anode for hull bottom
	Lighting bulb	1 set x Navigation lights etc. 10% of LED lights on board ferry

Equipment is the items not fixed on board the New Ferries but the loose items to be used for the operation or the maintenance of the New Ferries, and dealt with separately from the New Ferries.

The shown number below denotes the total number of equipment to be procured for the Project.

Table 2-12 Specification of the Equipment

(1)	De-rusting equipment (Procured to Dalla Dock)	1 set x High pressure water blasting machine, mobile type About 30kW e.motor driven water pump About 30MPa x 40 lit/min water delivery With about 20m water hose and nozzle
		1 set x Sand blasting machine, consisting of: 1 x Air compressor, mobile type About 60kW diesel driven About 0.7MPa x 7.5m ³ /min air delivery and 1 x Sand pot, mobile type About 300 lit (sand capacity of about 420kg) With about 20m sand hose and nozzle
(2)	Main engine assembly (to be used as PMP parts)	2 sets x Main engine assembly including clutch and exhaust bellows, complete with all engine attached auxiliaries, chassis, fuel oil tank, cooling raw water tank, starting battery, etc. allowing engine running in the workshop.
(3)	Potable Pax chairs	1,500pcs x plastic seats, stackable

2-2-3-2 Design Drawings

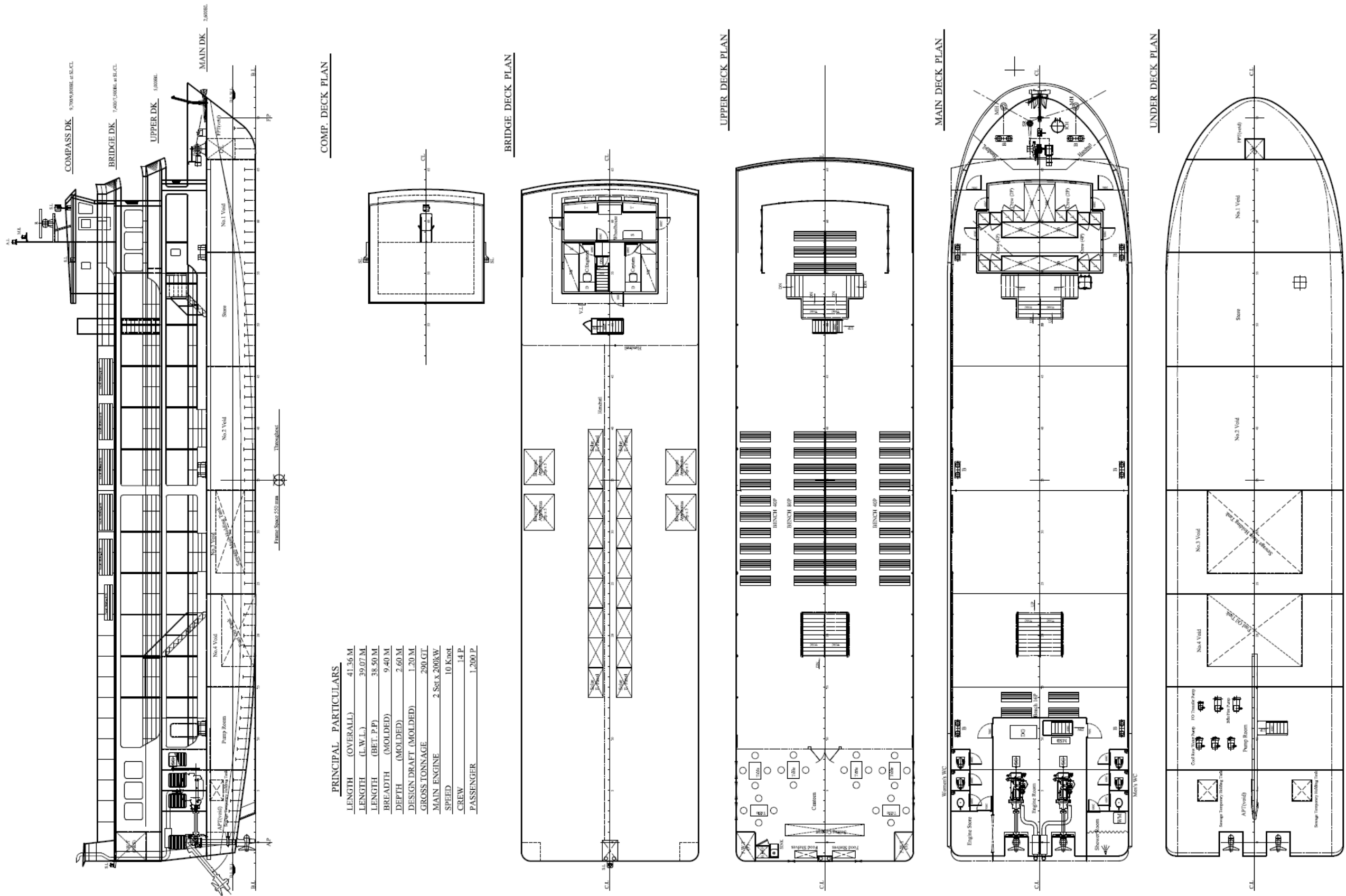


Fig. 2-6 General Arrangement Plan

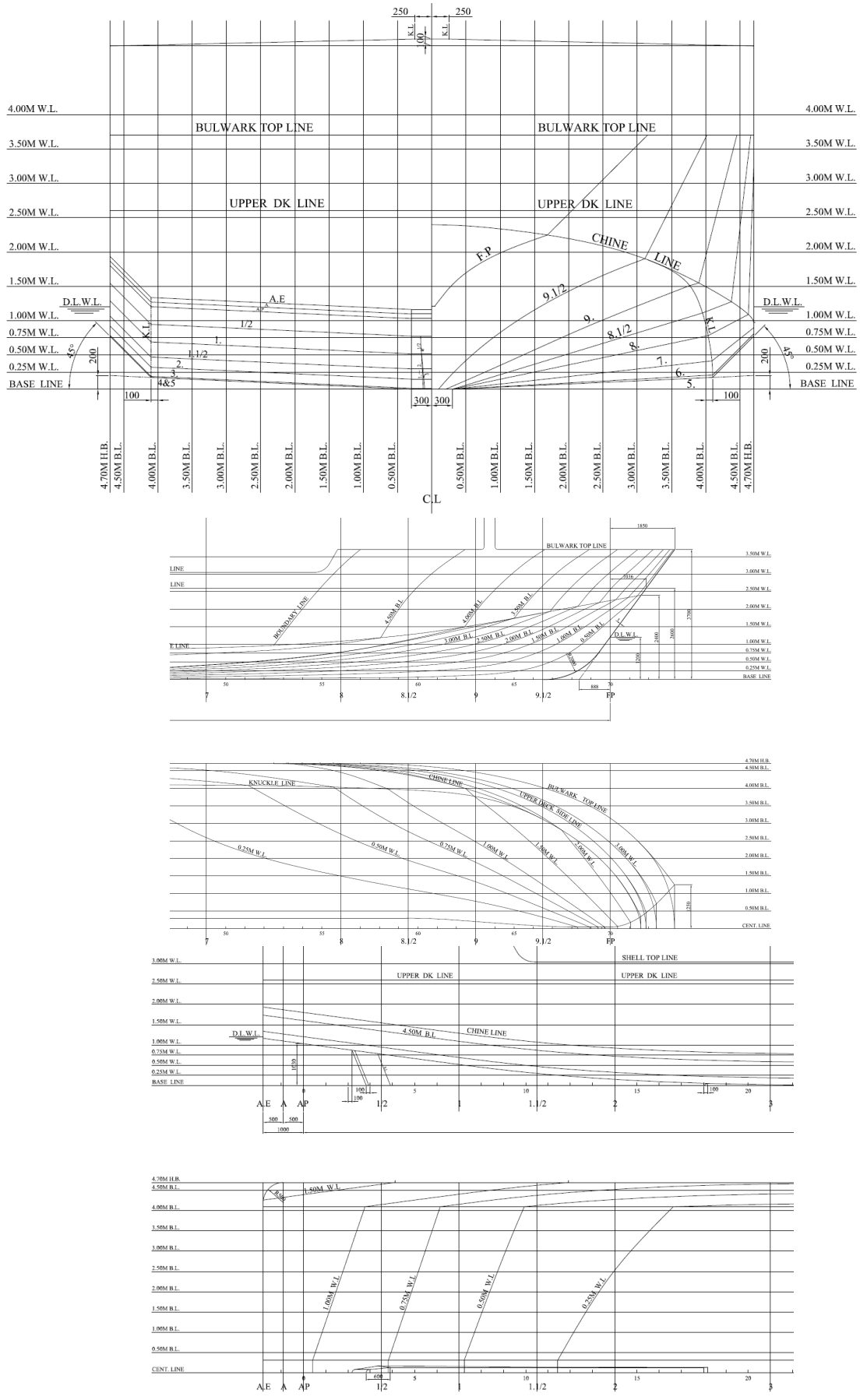


Fig. 2-7 Lines Plan

Forward section

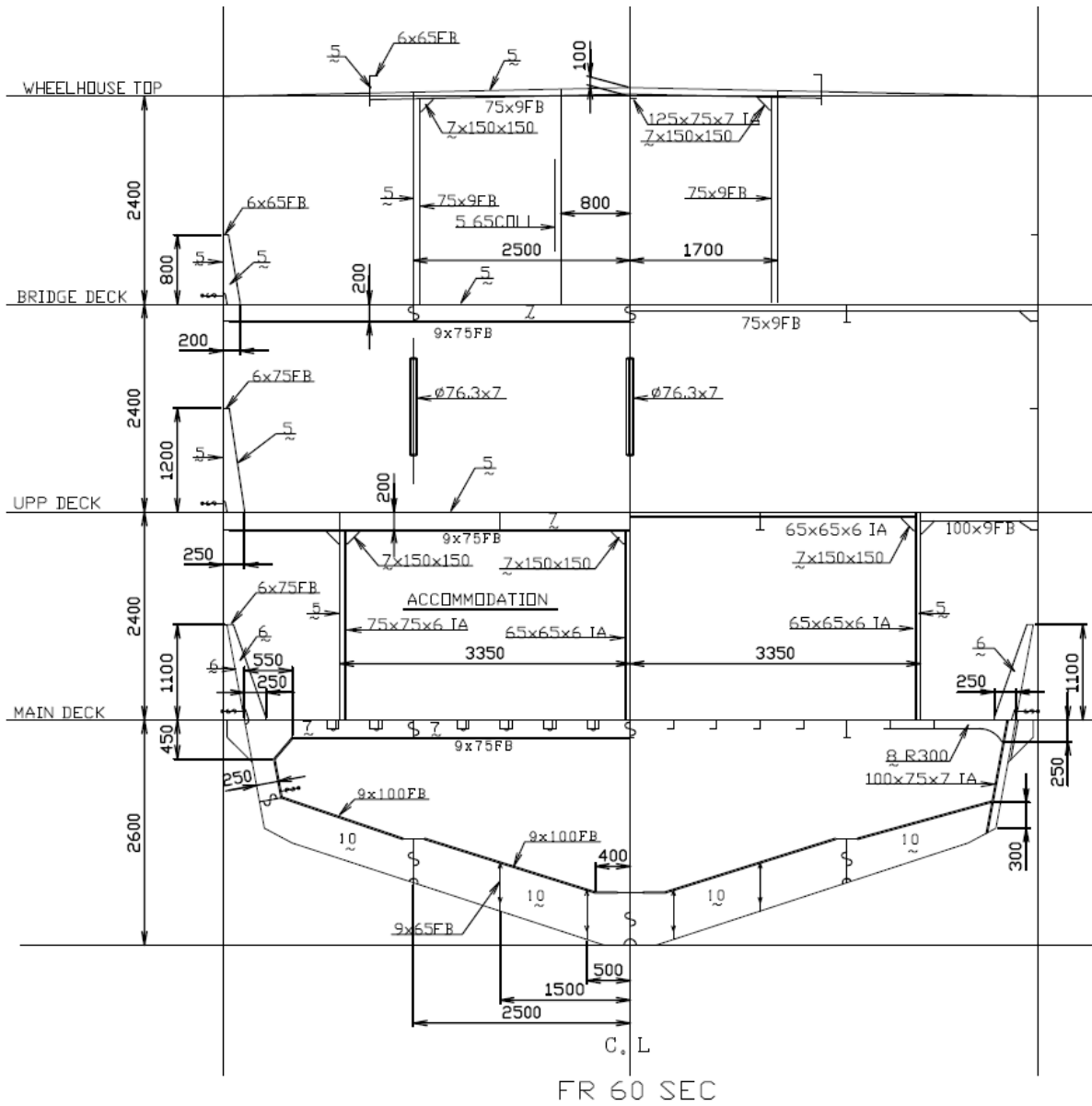


Fig. 2-8 Structural Sections

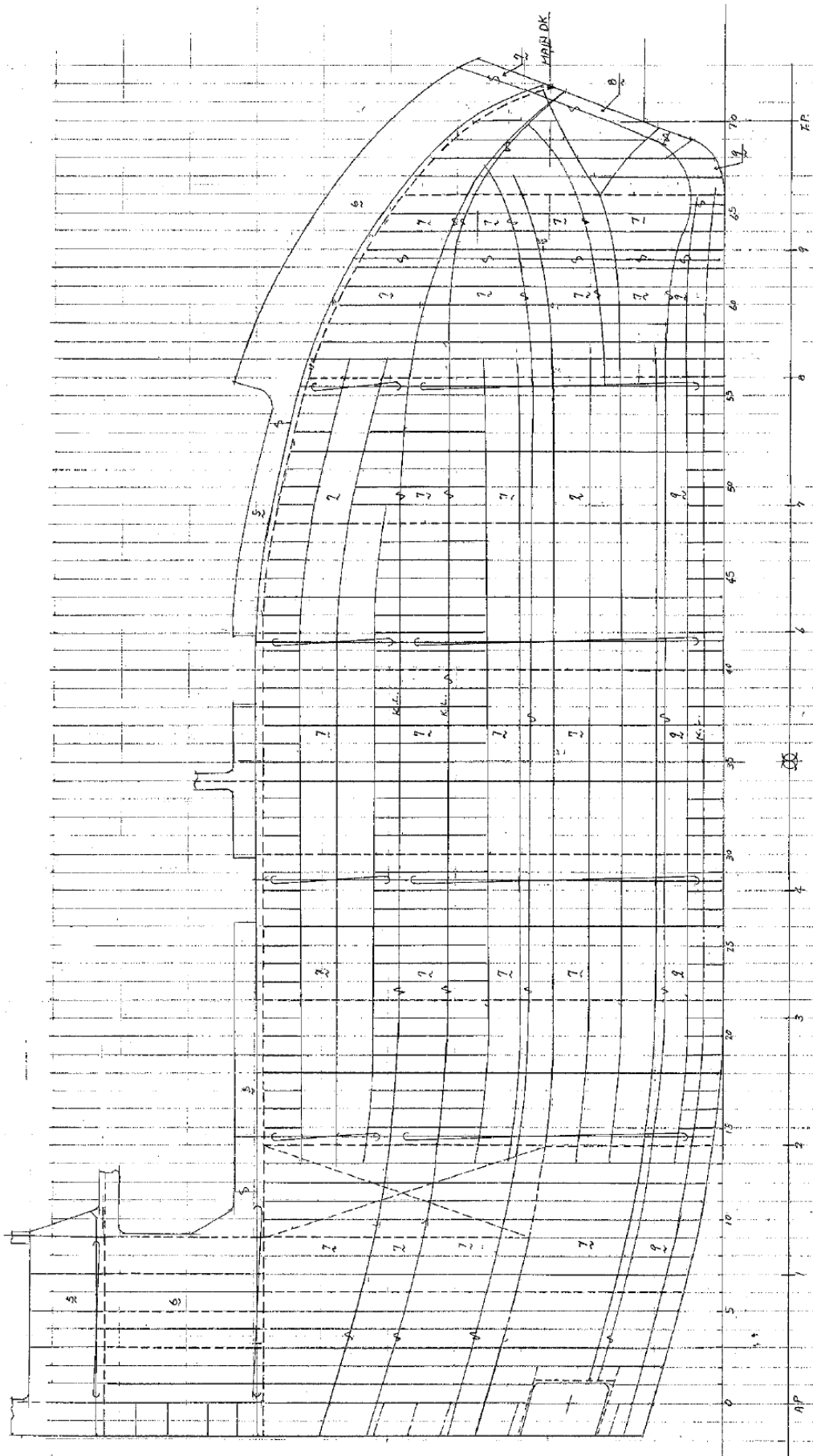


Fig. 2-9 Shell Expansion Plan

Upper deck and bridge deck plan

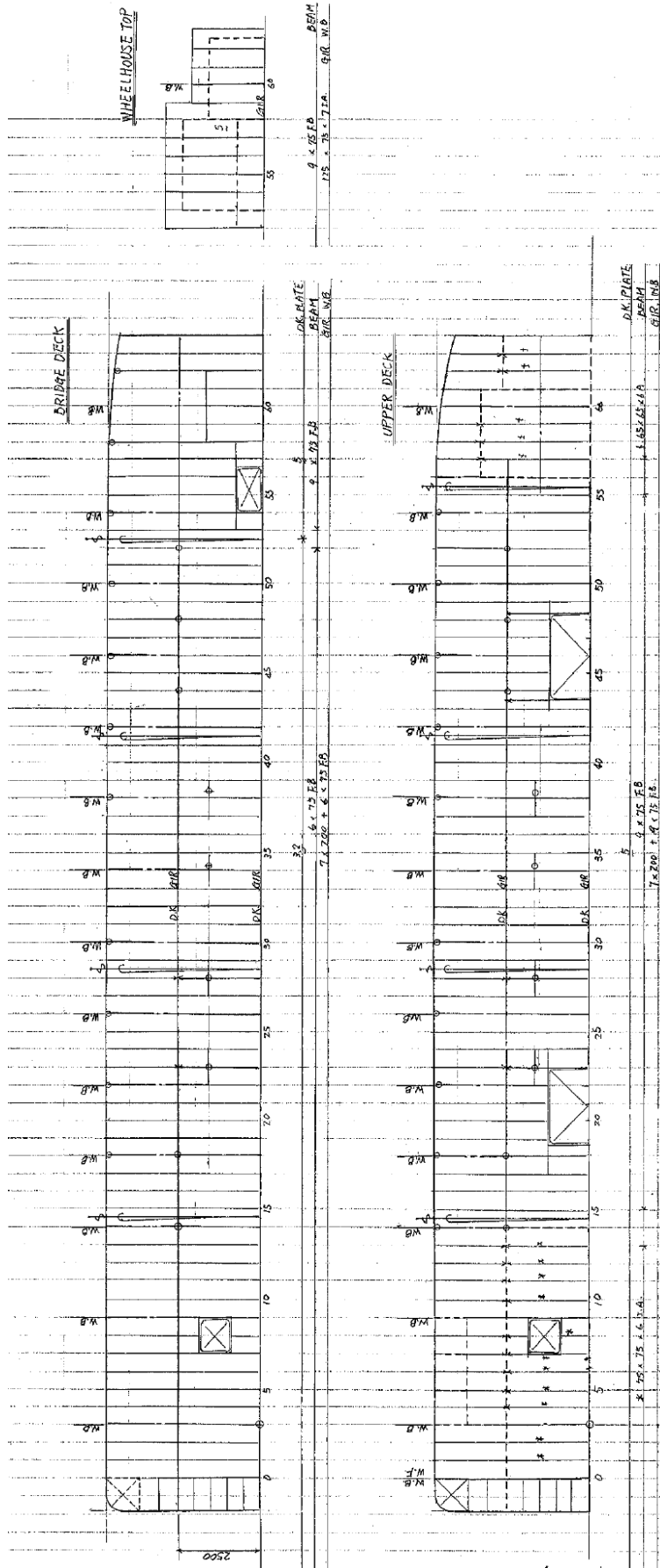


Fig. 2-10 Construction Profile and Deck Plans

2-2-4 Implementation Plan

All three ferries procured under the Project are of identical design and construction. Aiming at all three on same quality and lowering shipbuilding cost, all three ferries shall be ordered at once from one shipyard, through a single tender for three ferries including tools, PMP spare parts and the Equipment.

2-2-4-1 Implementation Policy

(1) Procedure

The New Ferries shall be planned, documented and constructed along following procedure under the Japanese Grant Aid scheme.

- 1) Exchange of Notes between the Government of Japan and the Myanmar Government and Grant Agreement between JICA and the Myanmar Government, for the implementation of the Project.
- 2) Conclusion of a Consultant Agreement between a Consultant recommended by JICA and the Project Implementing Agency of Myanmar Government, for the Consultant's work to implement the Project.
- 3) Verification of the Consultant Agreement by JICA.
- 4) The Consultant prepares detail designs and draft tender documents, and obtains approval from the Myanmar Government. They include methods of pre-qualification, technical specifications, general arrangement plan, project cost estimates, and draft shipbuilding contract.
- 5) Based on the approved tender qualification procedure, the Consultant conducts tender qualification for applicants and determines applicants eligible to participate in the tender. The Applicant must be Japanese ship building firm.
- 6) The Consultant carries out the tender process, in the presence of the Myanmar Government, and examines the tender documents submitted by the applicants. Based on the results of the tender, the Consultant recommends the appropriate contractor to the Myanmar Government.
- 7) The Consultant assists the Myanmar Government with the procedure for the contract and witnesses the shipbuilding contract.
- 8) Verification of the signed shipbuilding contract by JICA.
- 9) Based on the shipbuilding contract, the contractor builds and conducts sea trials of the ferries, and hand-over the ferries together with the Equipment. The Consultant, in accordance with the Consultant Agreement, provides supervision on the construction including sea trials, and witnesses the hand-over of the Ferries in Japan.
- 10) The Ferries with Equipment on board departs Japan to Myanmar by their own propulsions.

(2) Basic provisions related to the Project procedures

Basic items related to the Project procedures under Japan's Grant Aid scheme are as follows.

1) Responsible Agency and Project implementing Agency for the Project

The Responsible Agency and the implementing agency of the Myanmar Government for the Project is Inland Water Transport (IWT). IWT deals with all documents and give approval for the Project implementation.

2) Consultant

Following the Grant Agreement, a Consultant Agreement is concluded between IWT and the Consultant, as a Japanese consultant firm recommended by JICA. As the proxy of IWT, the Consultant prepare the tender documents including technical specifications and give assistance as necessary in the tender bidding and contractual phases, and further provide continuous supervision of the Ferry construction. For the purposes of carrying out this supervisory function, the Consultant dispatches responsible engineers and outfitting experts to the shipyard, as necessary during the construction process.

3) The building of the New Ferries and the procurement of the Equipment

For building the Ferries and procuring the Equipment, qualification data submitted by Japanese firm(s) will be evaluated first, and those who had passed the qualification appraisal are allowed to participate in the tender bidding. The tender will be conducted along with the procedure established in advance. The successful tenderer signs the Contract for building the Ferries and procurement of the Equipment. The Contractor builds the Ferries, conducts sea trials, procures the Equipment and transports the Ferries with the Equipment on board to Myanmar for turnover.

4) Building plan of the New Ferries

To build the Ferries, the Contractor, pursuant to the contract and technical specifications, designs the hull and outfittings for building in the Contractor's shipyard facilities. Following preparation of the construction design by the Contractor, the Ferries are built along shipbuilding process: steel hull construction, outfitting (deck, machinery and electrical), tests, and then transport to Myanmar. The following areas must be given careful consideration when examining the Construction Plan.

- a) As this Project is being implemented under the Japanese Grant Aid scheme, strict adherence to the construction schedule is the major premise. The building plan must be prepared so as to fulfill all contract conditions within the term validity stipulated in the Grant Agreement.
- b) With regard to the delivery schedule of machinery and equipment on board the Ferry, careful consideration must also be given to preventing disruption of the construction work flow by maintaining tight control of machinery and equipment procurement and linking the hull construction and outfitting program to delivery schedules of the relevant machinery and equipment.
- c) Various tests must be performed as required by Myanmar and Classification Society. The

required sea trial must be performed upon completion of the construction phase to confirm performance of the Ferry.

- d) In the final stage of the construction, two engineers (captain and chief engineer of the Ferry) appointed for each Ferry and a technical staff of IWT (also as an interpreter for the Myanmar crew) are invited to Japan to participate in the final outfittings work and sea trials as well as receiving instructions from various makers of machinery and equipment, all for familiarization with the New Ferry systems and performance. The New Ferries sail from Japan to Myanmar manned by six Japanese seafarers, comprising three deck officers and three engine officers all with seafarer license for ocean going international voyages, and the two Myanmar engineers travel aboard the New Ferries back to Myanmar, for further familiarization.
- e) Receiving the Provisional Certificate of Nationality from the Myanmar Government, the Contractor transports the Ferries, at his own responsibility, from the Contractor's quay (wharf) to Yangon, the Ferry's homeport. The transportation crew shall be all Japanese crew possessing the international STCW certificate. After arrival at Yangon, final inspection will be immediately conducted by the consultant and thereafter the Ferries will be turned over to IWT.

5) Procurement plan of the Equipment

The Contractor procures the Equipment for each Ferry based on the Contract and technical specification.

6) Dispatch of guarantee engineers

After turning-over the Ferries, two engineers, deck and machinery part, shall be dispatched by the shipbuilding Contractor to Myanmar for 15 days as the guarantee engineers to cope with machinery malfunctions which usually concentrate in the early time after the delivery. Those engineers will give instructions on PMP, operation of machinery, system and maintenance as far as possible.

2-2-4-2 Special consideration with regard to Construction and Procurement

Following shall be observed in building the Ferries and reflected in controlling work schedule.

- (1) The procedure of hull assembly and outfitting shall be established taking into consideration of the Ferries layout and special features.
- (2) For those materials, machinery and equipment, whose delivery is not very firm, delivery possibility shall be followed up frequently and the change shall be reflected to the work schedule promptly.
- (3) Quay tests for various machinery and equipment and sea trials shall be in detail planned and included in the work schedule.
- (4) The work schedule shall be regularly (at least once in a week) followed up and updated.

2-2-4-3 Scope of Works

Scope of works at the Japan side and the Myanmar side is generally as follows.

- Building of the Ferries, procurement of the Equipment and their transportation from Japan to Myanmar shall be all undertaken by the Japan side.
- Myanmar side shall undertake arrangement of license necessary to build and transport the Ferries.

As mentioned above, after the shipbuilding contract, the Project implementation does not rely on the work to be shared by the Myanmar side, except for the Provisional Certificate of Nationality and Radio Station License, which must be issued by the Myanmar Government.

Undertakings at the Myanmar side are the works necessary for the operation of the New Ferries, which must be completed before commissioning of the New Ferries in Myanmar.

Following is the further breakdown of the works at Japan side and the Myanmar side.

(1) Scope of work at Japan side

Followings are the scope of work at Japan side, as the Project under the Japan's Grant Aid scheme.

- Design and construction of the New Ferries.
- Procurement of the Equipment for the New Ferries.
- Transportation of the New Ferries. Each Ferry sails from Japan to Myanmar carrying Equipment on board.
- Consultant services for detail design, assistance in tender and supervision during shipbuilding and Equipment procurement.

(2) Scope of work at the Myanmar side

Followings are the scope of work at Myanmar side.

(Arrangement during implementation of the Project)

- Conclusion of Banking Arrangement with an authorized foreign exchange bank in Japan, issuance of a authorization to pay, and bearing necessary commissions to the bank, for the Consultant Agreement and Shipbuilding contract verified by JICA in relation with this Project.
- Acquisition of licenses and certificates of the Myanmar Government, necessary for building and transporting the New Ferries, e.g. Provisional Certificate of Nationality, and Radio Station License.

(Arrangements when the New Ferries have arrived Myanmar)

- Exemption of the New Ferries and Equipment from customs duties, internal taxes and fiscal levies, and prompt customs clearance.
- Exemption of Japanese nationals from customs duties, internal taxes and fiscal levies for their services in Myanmar.

(Related facilities in the Republic of the Union of Myanmar)

- Dalla Dockyard shall be prepared to accept spare parts and tools for the New Ferries and to be ready to serve the New Ferries as the workshop for them.

(Other)

- Any other items which are not covered under the Project.

2-2-4-4 Consultant Supervision

(1) Basic Concept of the Consultant Supervision

The Consultant will verify that the construction and procurement schedule have been designed based on the Japan's Grant Aid scheme. Supervision plan of both shipbuilding and equipment procurement will be prepared on this basis. The Consultant will check whether the quantities, plans, and specifications satisfy the contract documents. The supervision programs will be conducted as follows.

1) Approvals of drawings and technical specifications

The Consultant shall examine, approve and/or gives instructions to correct the construction plan, work schedule, production design drawings and specifications promptly, and shall reply to the questions from the Contractor promptly as well, so as to prevent disruption in the project schedule.

2) Work schedule supervision

The Consultant is always to grasp progress of the work schedule, and direct whenever necessary to adjust working schedule to ensure on-time completion.

3) Quality inspection

Along with building progress, the supervisor(s) in charge of outfitting and equipment shall be dispatched for the necessary periods to workshops and the shipyard to inspect construction at site, checking machinery and outfitting work with the contract drawings, specifications, and approval documents. The supervisor(s) shall conduct inspections of the equipment and outfitting work, based on the approved test procedure and the Contractor's in-house standards.

4) Turnover business

After transporting the Ferries to Yangon, Myanmar, the Consultant shall be present at all inspections at the wharf and issue the certification documents required for the local turnover.

5) Construction report

The Consultant shall prepare monthly reports on construction progress and scheduled work for the succeeding month, appending factory photos. The reports shall be submitted to IWT and JICA.

(2) Supervisory arrangement

The Consultant shall establish a project team consisting of the project manager, naval architect, outfitting staff, machinery staff, electric staff, etc. as necessary, and prepare implementing detail design and conducts supervision over the construction and procurement activities.

2-2-4-5 Quality Control Plan

Quality control of raw materials and machinery / equipment for the Ferries and Equipment shall be conducted as follows.

Items		Quality control
Materials	Structural steel	To use steel materials with certificate of inspection (mill sheet) for every plate and every bar section according to the ClassNK standard.
	Pipes and valves	To use pipes and valves with JIS certificate.
	Timber	Consultant to inspect on arrival of the materials.
	Fire protection	Fireproof bulkhead, lining, insulation, fire door etc., for structural fire protection to be of SOLAS and ClassNK standards, for which prototype tests had been conducted and have type approval.
Onboard equipment and outfittings	Diesel engine	Designed according to ClassNK standards, prototype tests had been conducted, type-approved, and manufactured in the qualified by ClassNK. Completed diesel engines to be load-tested including overload for necessary duration on test bench according to the standard program of ClassNK.
	Auxiliaries	Designed according to ClassNK standards, manufactured in the factory qualified by ClassNK, and have certificate of ClassNK.
	Fire extinguishers /Lifesaving appliances	Designed according to SOLAS regulation, and have type-approval No. of HK (The ship Equipment Inspection Society of Japan).
	Inventories	Type-approved by HK.
	Deck outfitting	Designed according to JIS, and the Consultant to inspect equipment.
Equipment	Sandblast and High Pressure Washers	Operation tests based on the makers' spec

2-2-4-6 Equipment Procurement Plan

Machinery and equipment suitable to adopt for the New Ferries being not available in Myanmar, they will be in general of Japanese products expect for following two items from third countries, which are included in the list of potential makers.

- (1) Propulsor from HYDROMASTER in the United Kingdom

HYDROMASTER is the maker of the propulsor on board the existing Dalla ferries. Equivalent propulsor being available from two Japanese makers, HYDROMASTER is one of those options.

- (2) Main engine from DOOSAN in the Republic of Korea

DOOSAN is the standard main engine adopted by HYDROMASTER. As two Japanese makers offer workable engines, DOOSAN engine is one of those options.

2-2-4-7 Operational Guidance Plan

After turning-over the Ferries, two engineers, deck and machinery part, shall be dispatched by the shipbuilding Contractor to Myanmar for 15 days as the guarantee engineers to cope with machinery malfunctions which usually concentrate in the early time after the delivery. Those engineers will give instructions on operation of machinery, system and maintenance as far as possible.

2-2-4-8 Soft Component (Technical Assistance) Plan

No soft component and technical assistance are included in the Project.

2-2-4-9 Implementation Schedule

- (1) Portion of work at the Myanmar side in building the Ferries

After the shipbuilding contracts, the Project implementation will not rely on the work to be shared by the Myanmar side, except for the Provisional Certificate of Nationality and Radio Station License, which must be issued by the Myanmar Government. Undertakings at the Myanmar side are the works necessary for the operation of the New Ferries, which must be completed before the commissioning of the New Ferries in Myanmar.

Refer further to section 2-4-3 Scope of Works, regarding detail of work at Japan side and the Myanmar side.

- (2) Detail of building schedule of the New Ferries

In building the New Ferries, the shipbuilding Contractor first carries out production designs of steel hull structures and various outfittings based on the contract and technical specification, and besides based on the shipbuilder's own facility. With the completed production design drawings, hull construction, deck outfitting, machinery outfitting and electric outfitting follow as below.

- 1) Hull construction

Hull is the watertight structure with internal volume as buoyancy, and with strength to withstand sea loads in static and dynamic conditions. The building work starts from marking on raw steel material, cutting, sub-assembly and block assembly on shipbuilding berth.

2) Deck outfitting

This work is performed after completion of the hull construction work. It comprises mooring arrangements, steering system, accommodation work, lifesaving apparatus, firefighting equipment, etc.

3) Machinery outfitting

This work comprises machinery installation, piping and associated work of main engines, diesel generators, pumps, etc. mainly in the engine room

4) Electric outfitting

This work is for installation of electric apparatus, control panels, etc. and for electric cable installation to supply electric power to all electric equipment on board.

5) Transport

After completion of the construction work at the shipyard and necessary tests, the New Ferries shall be handed-over to IWT. The Ferries shall be registered provisionally under the Myanmar flag, the Ferries shall sail from Japan to Myanmar by its own propulsion manned by Japanese legal crew under the responsibility of the shipbuilding Contractor, and the Myanmar crew who had been dispatched to Japan for familiarization training shall return to the homeport on board the New Ferries.

Implementing schedule of the three Ferries is as shown below.

From the Exchange of Notes (E/N) and the Grant Agreement (G/A) to the Contract	From the Contract to the completion of constructing three ferries	Preparation of the transport, transport sailing, local inspection and turn-over	Total schedule from the E/N and G/A to turn-over of the three ferries to the Myanmar Government
5 months	15 months	1 months	21 months

The projected building schedule of the Ferries is as shown on the following diagram

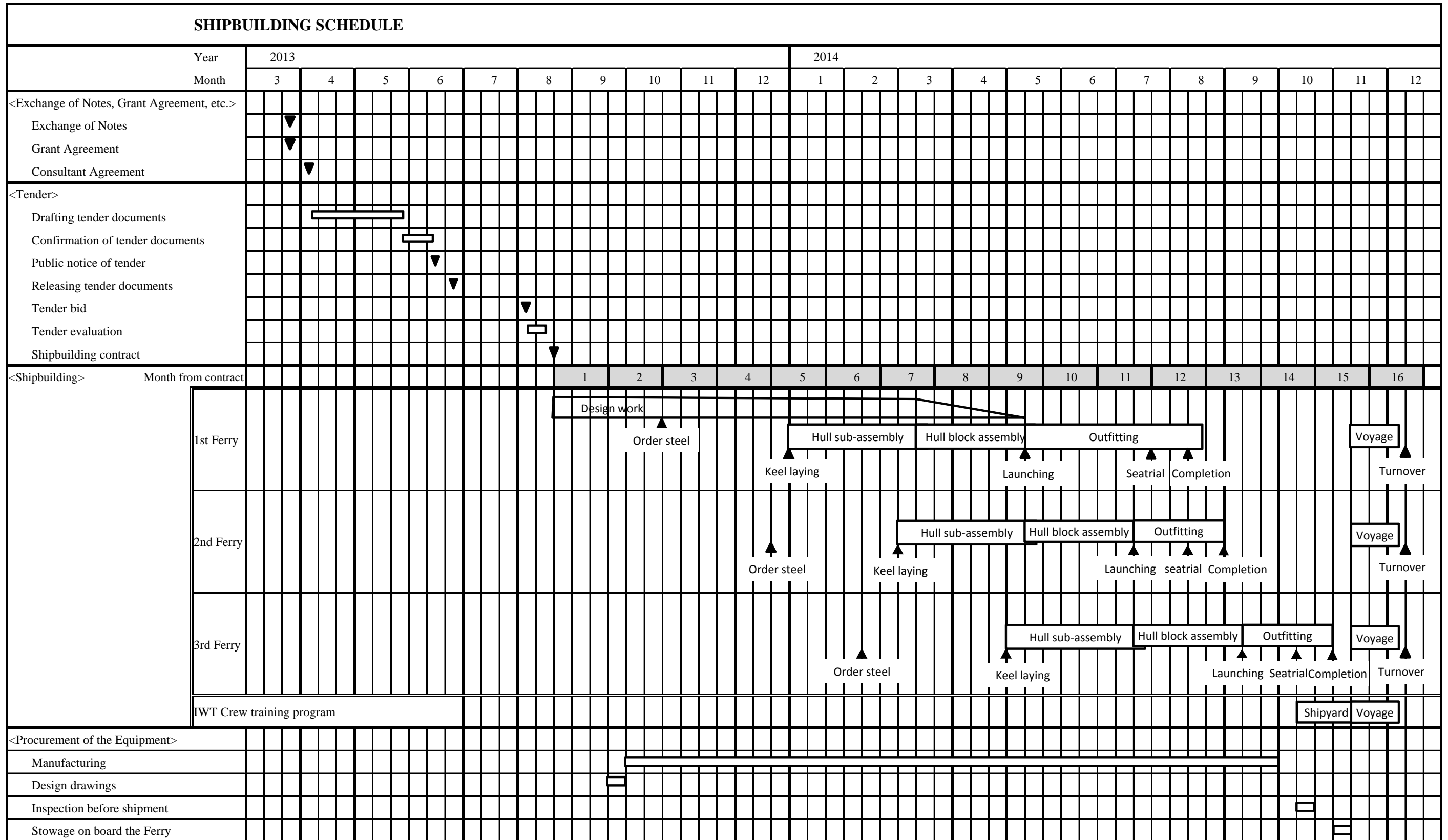


Fig. 2-11 Projected building schedule

2-3 Obligations of recipient country

As the building of the New Ferries is all undertaken by the Japan side, the Myanmar side is not necessary to take part in the shipbuilding work.

There are two existing pontoon jetties, Yangon side and Dalla side, which the New Ferries will use. The side plates of the pontoon are not badly corroded, but the top plating is partly so corroded considerably as requiring repairs. The boarding bridges connected to the pontoons don't have bad damage to repair. Water depth around the pontoons for berthing, connecting waters and the crossing passage are so deep for the Dalla ferries as not requiring any dredging.

Accordingly, obligation of the Myanmar side is limited to banking arrangement including payment of bank commissions, exemption from custom duties and issuing the necessary certificates and licenses, as referred to in the Minutes of Discussion signed on July 20, 2012.

2-4 Project Operation Plan

IWT will keep bearing the duty of Inland water transportation in Myanmar in future, including the operation of new Dalla ferries procured by the Project.

Dalla Dock under IWT will also keep engaging in dock work and repair of IWT Dalla ferries, and will be responsible for Preventive Maintenance Policy for the New Ferries.

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

(1) Cost at the Japan side

The cost is not disclosed hereupon keeping confidential until completion the shipbuilding contract through the tender process.

(2) Cost at the Myanmar side

All shipbuilding cost including transportation from Japan to Yangon shall be borne by the Japan side. The cost to be borne by the Myanmar side will be only for the bank commission and charges estimated about JPY1,200, 000, equivalent to US\$ 14,000.

2-5-2 Operation and Maintenance Cost

Account balance of IWT Dalla ferries in the fiscal year 2011 is shown below. The account was the deficit balance in the previous year, however, turned to surplus in the fiscal year 2011 as a result of

raising fares from 10Ks to 50Ks.

Table 2-13 Revenue and expenditure of IWT Dalla ferry, FY 2011

Unit in mill. Ks

Ferry name	HHS	KST	TSH	AYH	TOTAL	Average
Revenue	121.414	125.330	103.096	105.421	455.261	113.815
Expenditure						
Crew wages	6.101	5.763	7.074	6.320	25.258	6.315
Firewood Expenses	0.007	0.008	0.010	0.008	0.033	0.008
Survey Fees	0.003	0.010		0.093	0.106	0.027
Registration & License	0.010	0.010	0.010	0.010	0.040	0.010
Fuel Used	36.909	40.175	36.291	33.744	147.119	36.780
Oil & Lubricants Used	1.463	2.344	1.099	1.166	6.072	1.518
Maintenance & Repair	8.613	2.962	5.285	4.522	21.382	5.346
Depreciation	3.953	5.974	1.918	3.446	15.291	3.823
Port Dues & Wharfage	0.522	0.615	0.495	0.552	2.184	0.546
Steamer Tickets & Forms	1.014	1.014	1.014	1.014	4.056	1.014
Total	58.595	58.875	53.196	50.875	221.541	55.387
Balance	62,819	66,455	49,900	54,546	233,720	58,430

New Ferries will allow low maintenance and repair cost, and besides in the three New Ferry service system, fixed cost for one ferry (crew cost, firewood expense, survey fee, depreciation cost, etc.) will be entirely eliminated. Following shows estimate of accounting balance for the two cases: <two New Ferries + two existing ferries> and <three New Ferries>. Revenue is kept unchanged from the one in the FY 2011.

Table 2-14 Account projection after the procurement of New Ferries

Unit in mill. Ks

Account projection for two new ferry case					
Ferry name	Existing-1	Existing-2	New-1	New-2	TOTAL
Revenue	113.815	113.815	113.815	113.815	455.260
Expenditure					
Crew wages	6.315	6.315	6.315	6.315	25.260
Firewood Expenses	0.008	0.008	0.008	0.008	0.032
Survey Fees	0.027	0.027	0.027	0.027	0.108
Registration & License	0.010	0.010	0.010	0.010	0.040
Fuel Used	36.780	36.780	36.780	36.780	147.120
Oil & Lubricants Used	1.518	1.518	1.518	1.518	6.072
Maintenance & Repair	5.346	5.346	1.000	1.000	12.692
Depreciation	3.823	3.823	3.823	3.823	15.292
Port Dues & Wharfage	0.546	0.546	0.546	0.546	2.184
Steamer Tickets & Forms	1.014	1.014	1.014	1.014	4.056
Total	55.387	55.387	51.041	51.041	212.856
Balance	58.428	58.428	62.774	62.774	242.404

Account projection for three new ferry case

Ferry name	Existing-1	New-1	New-2	New-3	TOTAL
Revenue	18.969	145.430	145.430	145.430	455.260
Expenditure					
Crew wages	1.579	6.315	6.315	6.315	20.524
Firewood Expenses	0.002	0.008	0.008	0.008	0.026
Survey Fees	0.007	0.027	0.027	0.027	0.088
Registration & License	0.003	0.010	0.010	0.010	0.033
Fuel Used	6.130	46.997	46.997	46.997	147.120
Oil & Lubricants Used	0.253	1.940	1.940	1.940	6.072
Maintenance & Repair	1.337	1.000	1.000	1.000	4.337
Depreciation	0.956	3.823	3.823	3.823	12.425
Port Dues & Wharfage	0.137	0.546	0.546	0.546	2.184
Steamer Tickets & Forms	0.254	1.296	1.296	1.296	4.056
Total	10.655	60.665	60.665	60.665	192.807
Balance	8.314	84.765	84.765	84.765	262.453

The result is summarized in following table. The expenditure of three New Ferry case is expected to be reduced by about 13% relatively from the fiscal year 2011, while in the two New Ferry case only at about 4% less from the fiscal 2011.

Table 2-15 Account projection for two New Ferry case and three New Ferry case

Unit in mill. Ks

	Revenue	Expenditure	Balance	
Actual account in FY 2011	455.261	221.541	233.720	
Account projection for two New Ferry case	455.261	212.856	242.404	About 4% of expenditure is expected to reduce
Account projection for three New Ferry case	455.261	192.807	262.453	About 13% of expenditure is expected to reduce

Chapter 3 Project Evaluation

3-1 Preconditions and Necessary Inputs by the Recipient Country

Ship building work and procurement of the related equipment are all undertaken by the Japan side, and the work shared by the Myanmar side is as follows:

[Arrangement during implementation of the Project]

- (1) Conclusion of Banking Arrangement with an authorized foreign exchange bank in Japan, issuance of a authorization to pay, and bearing necessary commissions to the bank, for the Consultant Agreement and Shipbuilding contract verified by JICA in relation with this Project.
- (2) Acquisition of licenses and certificates of the Myanmar Government, necessary for building and transporting the New Ferries, e.g. Provisional Certificate of Nationality, and Radio Station License.

[Arrangements when the New Ferries have arrived Myanmar]

- (3) Exemption of the New Ferries and Equipment from customs duties, internal taxes and fiscal levies, and prompt customs clearance.
- (4) Exemption of Japanese nationals from customs duties, internal taxes and fiscal levies for their services in Myanmar.

[Related facilities in the Republic of the Union of Myanmar]

- (5) Dalla Dockyard shall be prepared to accept spare parts and tools for the New Ferries and to be ready to serve the New Ferries as the workshop for them.

[Other]

- (6) Any other items which are not covered under the Project.

3-2 Project Evaluation

3-2-1 Relevance

Relevance of the Project, as the Grant Aid Cooperation Project of the Japanese Government, is considered as follows.

- (1) The subject ferry service in the Project links central part of Yangon and Dalla area, residential area in the opposite side of Yangon River, and about 33 thousand people take the ferry in a day. This trunk ferry link is, however, relies on 67 years old ferries, which are, as the public service ferries, unsafe and thereby stable operation is difficult. Besides, in the morning and evening

rush hours, overloading of passengers are unsafely happening every day, requiring improvement as soon as possible.

The Project aims at improvement of such unsafe and unstable situation of the Yangon ~ Dalla ferry, and the benefits of the Project will extend direct to the 33 thousand passengers in a day, particularly for Dalla people, where many are low-income. Indirectly, the benefit extends to people of several times as large as the ferry passengers.

- (2) The Project will achieve the replacement of the existing old ferries with the New Ferries, improving safety and reliability of the transport, further favorably giving effect on improving living infrastructure, and besides contributing stable social life, and in the medium / long term view, coinciding with the Myanmar Government's policy of correcting gaps between people, e.g. gaps between rich and poor, between regions.
- (3) IWT is the organization undertaking major part of the inland water transport with their high competence to operate vessels, and will satisfactorily operate and utilize the New Ferries to be procured under the Project, and Dalla Dock under the IWT will satisfactorily undertake maintenance of the New Ferries, and thereby no problem is expected in the operation of the New Ferries after the delivery.
- (4) The New Ferries will be designed and constructed realizing high safety, onboard comfort, durability, environment friendliness, fuel economy, improving of unfavorable matters on the existing ferries, and thereby the New Ferries will show improvements on all sides: safety side, economical side and environmental side, from the existing ferries..

From above, it is concluded that the relevance of the project is found quite high.

3-2-2 Effectiveness

(1) Quantitative effect

As an indicator of safety improvement of passenger transportation, one of the project objectives, reduction of the overload operation rate is considered suitable.

In the Dalla Ferry, there is always demand of passenger notwithstanding new or old ferry, and thereby number of passengers carried is not a suitable indicator representing transport outcome.

The New Ferries are expected to work longer with short drydock leave, unlike the existing ferries who work only about nine months a year staying long in drydock, and thereby longer days of operation (including days in standby at site) is considered appropriate as an indicator representing transport outcome.

As an indicator to represent outcome of conducting maintenance work, cost of the maintenance and repair (an item of expenditure in the IWT account book, including docking fee in the Dalla Dock) is considered appropriate.

Table 3-1 Indicator of quantitative effect

No.	Indicator	Standard indicator (2011)	Target indicator (2017) (3 years after delivery)	Reference
1	Reduction of percentage of overloaded operation	10.6%	0%	Fig. 2-1
2	Increase of working days (operation + standby at site)	9.4 month/year/ferry (FY2010,FY2011)	11.5 month/year/ferry	2-2-1-1 (1) 2)
3	Reduction of cost of the maintenance and repair (mill. Ks/year)	21.4 mill. Ks (FY 2011)	Ks 4.3 mill. Ks	2-5-2

(2) Qualitative effect

Qualitative effects brought by the Project are expected as follows.

- ① Safe hull and well prepared safety equipment make entire ferry safe.
- ② Stoppage due to sudden breakdown decreases, and reliability of on-time operation becomes higher.
- ③ No dark spots, well outfitted canteen, etc. increase passenger comfort.

From above, it is concluded that the effectiveness of the project is found quite high.

APPENDICES

- 1 . Member List of the Study Team
- 2 . Study Schedule
- 3 . List of parties Concerned in the Recipient Country
- 4 . Minutes of Discussions

1. Member List of the Study Team

1-1 Preparatory Study

Name	Function	Organization
Mr. Satoshi WAKASUGI	Leader	Deputy Director Transport and ICT Division 1, Economic Infrastructure Department, JICA
Mr. Masanori KAWANO	Planning Management	Deputy Assistant Director Transport and ICT Division 1, Economic Infrastructure Department, JICA
Mr. Toyonori WATANABE	Chief Consultant/ Water Transport Planning/Operation and Management Planning	Director Fisheries Engineering Co., Ltd
Mr. Akio MARUYAMA	Hull and Machinery Design	Executive Adviser Fisheries Engineering Co., Ltd
Mr. Akio Yamada	Equipment and procurement planning/Cost estimation	Senior Consultant Fisheries Engineering Co., Ltd
Mr. Toru KAZAMA	Outfitting and Electric Design	Technical Adviser Fisheries Engineering Co., Ltd
Mr. Toshihito INKI	Natural Condition Survey	Executive Consultant Fisheries Engineering Co., Ltd

1-2 Explanation of Draft Report

Name	Function	Organization
Mr. Satoshi WAKASUGI	Leader	Advisor Transport and ICT Division 1, Economic Infrastructure Department, JICA
Mr. Masanori KAWANO	Planning Management	Deputy Assistant Director Transport and ICT Division 1, Economic Infrastructure Department, JICA
Mr. Toyonori WATANABE	Chief Consultant/ Water Transport Planning/Operation and Management Planning	Director Fisheries Engineering Co., Ltd
Mr. Akio MARUYAMA	Hull and Machinery Design	Executive Adviser Fisheries Engineering Co., Ltd

2. Study Schedule

2-1 Preparatory Study

MM	DD	Wk	(JICA + Chief Consultant)	Consultant staff	
				Ferry	Natural condition
6	24	Sun	JICA and Consultant (except Inki, natural condition staff) arrived Yangon		
	25	Mon	Meeting with JICA Office, courtesy call on Embassy of Japan (EOJ) and Explanation of Inception Report to IWT		
	26	Tue	Meeting with DMA Survey Dalla Dock	Survey Dalla Dock	
	27	Wed	Meeting with IWT	Internal meeting for survey plan	
	28	Thu	Meeting with IWT	Survey Dalla ferry	Arrive Yangon
	29	Fri	Discussion with IWT about Minutes Report to Embassy of Japan, JICA Office	Survey Dalla ferry	Meeting with IWT
	30	Sat	Survey Dalla terminal		Trial measurement
7	1	Sun	JICA member left Yangon	Survey Dalla ferry	Preliminary analysis
	2	Mon	Survey Dalla ferry		Bathymetric survey
	3	Tue	Survey Dalla ferry in Dalla Dock		Deploy current meter
	4	Wed	Internal discussion for new ferry design and pax counting method		GPS float buoy survey
	5	Thu	Pax counting		Recover GOS float buoy
	6	Fri	Data analysis; internal discussion		Data analysis; survey
	7	Sat	Onboard survey of ferries of other service routes		
	8	Sun	Data analysis		Additional survey
	9	Mon	Pax counting; survey Dalla ferry		Survey Dalla Dock
	10	Tue	Pax counting; survey Dalla ferry		Left Yangon
	11	Wed	Pax counting; survey Dalla ferry		
	12	Thu	Discussion with DMA; data analysis		
	13	Fri	Pax counting; survey Dalla ferry		
	14	Sat	Pax counting; survey Dalla ferry		
	15	Sun	Internal discussion; data analysis		
	16	Mon	Meeting with IWT about new ferry design		
	17	Tue	Meeting with IWT		
	18	Wed	Meeting with IWT; Discussion with DMA		
	19	Thu	Data analysis		
	20	Fri	Signing Minutes by IWT / JICA; Meeting with DMA; Report to JICA and EOJ; left Yangon		

2-2 Explanation of Draft Report

MM	DD	Wk	(JICA)	Consultant	
				Chief Consultant	Hull and Machinery Design
12	1	Sat		Ar. Yangon	
	2	Sun		Internal meeting	
	3	Mon		Explanation of Draft report to IWT	
	4	Tue		Explanation of Draft report to IWT	
	5	Wed		Explanation of Draft report to IWT	
	6	Thu		Discussion with IWT	
	7	Fri		Discussion with IWT	
	8	Sat		Internal meeting	
	9	Sun	Ar. Yangon, Internal meeting		
	10	Mon	Discussion with IWT		
	11	Tue	Final discussion with IWT		
	12	Wed		Signing of M/D, Report to JICA Office, Embassy of Japan Lv. Yangon → Bangkok →	
	13	Thu		Ar. Narita	

3. List of parties Concerned in the Recipient Country

Name	Organization	Position
U Winn Pe	IWT	Managing Director
U See Myint	IWT	Deputy General Manager, Engineering Dept.
U Lay Thwin	IWT	Deputy General Manager, Transport Dept.
U Myint Swe	IWT	Marine Superintendent, Marine Dept.
U Win Thein	IWT	Deputy Marine Superintendent
U Kyaw Kyaw	IWT	Manager (Administration), Administration Dept.
U Thi La Thaein	IWT	Deputy General Manager, Administration Dept.
U Tin Wa	IWT	Deputy Marine Superintendent
Daw Sandar Nyunt Wai	IWT	Deputy General Manager (Finance)
U Aung Kyaw Soe	IWT	Assistant Marine Superintendent
U Yan Lin Aung	IWT	Fleet Officer, Marine Department
U Maung Maung Oo	DMA	Director General
U Capt. Htay Win	DMA	Director, Master Mariner
U Zaw Myint Thein	DMA	Director, Engineering Department
U So Naing	DMA	Deputy Director
U Htay Aung	Dalla Dock	Command Engineer
U Zaw Moe Myint	Dalla Dock	Deputy Command Engineer
Hideaki Matsuo	Embassy of Japan	Counsellor
Kiyotomi Tada	Embassy of Japan	Second Secretary
Masahiko Tanaka	JICA, Myanmar	Chief Representative
Katsuyoshi Saito	JICA, Myanmar	Senior Representative
Hajime Matsuoka	JICA, Myanmar	Representative

- 4. Minutes of Discussions
- 4-1 Preparatory Survey

**MINUTES OF DISCUSSIONS
ON THE PREPARATORY SURVEY
FOR THE PROJECT FOR UPGRADING FERRYBOAT
IN YANGON CITY
IN REPUBLIC OF THE UNION OF MYANMAR**

In response to a request from the Government of Republic of the Union of Myanmar (hereinafter referred to as “Myanmar”), the Government of Japan decided to conduct a Preparatory Survey on the Project for Upgrading Ferryboat in Yangon City (hereinafter referred to as “the Project”) and entrusted the survey to Japan International Cooperation Agency (hereinafter referred to as “JICA”).

JICA sent the Preparatory Survey Team for the Field Survey (hereinafter referred to as “the Team”), which is headed by Mr. Satoshi WAKASUKI Deputy Director, Transportation and ICT Division 1, Transportation and ICT Group, Economic Infrastructure Department, JICA, and is scheduled to stay in the country from June 24th to July 20th, 2012.


The Team held discussions with the officials concerned of Myanmar side, and conducted a field survey at the Project site.

In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare a Draft Report of the Preparatory Survey.

Yangon, July 20, 2012



Masahiko Tanaka
Chief Representative
Japan International Cooperation Agency
Myanmar Office



U Winn Pe
Managing Director
Inland Water Transport
Ministry of Transport
Republic of the Union of Myanmar

ATTACHMENT

1. Objective of the Project

The objective of the Project is to upgrade ferryboat(s) for safety and reliability of transportation on inland waterway.

2. Project Site

The site of the project is located at Yangon which is shown in Annex-1.

3. Responsible and Implementing Organizations

The responsible and implementing organization is Inland Water Transport (IWT) under Ministry of Transport (MoT).

The organization charts are shown in Annex-2.

4. Project Component

- 4-1. After discussions with the Team, the Myanmar side requested the following to replace the current ferries in service between Yangon and Dalla.

Item	Specification
Ship Type	Passenger Ferry
Number	Two (2)
Length overall	Specification shall be set based on current ferries' capacity and future demand
Breadth	
Depth to upper deck	
Draft	
Passenger Capacity	

JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

- 4-2. Two-way approach bridge requested will not be included in the Project, as Myanma Port Authority has development Plan of Yangon Port area.

5. Japan's Grant Aid Scheme

- 5-1. The Myanmar side understands the Japan's Grant Aid Scheme and necessary measures to be taken by the Myanmar side. The Team explained the procedures for the Project described in Annex-3 and 4.
- 5-2. Myanmar side agreed to take the necessary measures, as described in Annex-5 for smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented.

6. Schedule of the Study

- 6-1. The Team will proceed with further studies in Myanmar until July 20, 2012.
- 6-2. JICA will prepare the draft report and the draft specification in English and dispatch a mission in order to explain their contents around December, 2012.
- 6-3. If the contents of the report are accepted in principle by Myanmar side, JICA will complete the final report and send it to Myanmar by March, 2013.

7. Official request from the Myanmar side

- 7-1. The Japanese side explained procedures and application form necessary to officially request the Project to the Japanese government.
- 7-2. The Myanmar side already submitted the official request of the Project to relevant authority.
- 7-3. The Myanmar side acknowledged that the official request of the Project must be submitted to the Japanese Government (To: Embassy of Japan in Myanmar, CC: JICA Myanmar Office) by end of October, and agreed to follow up the procedure within Myanmar government.

8. Other Relevant Issues

- 8-1. In principle, by Japan's Grant Aid Scheme, new ferry is constructed and granted to the recipient country. The Myanmar side confirmed the advantages and disadvantages of procuring secondhand ferry, and requested to construct new ferry.
- 8-2. Both sides confirmed that it is essential that Myanmar side will undertake daily and periodic maintenance (including major overhaul) for the procured ship(s) and keep their (its) classification(s) properly. Myanmar side made a commitment to secure a necessary annual budget for the ship maintenance and their continuous classification. The Team requested Myanmar side to notify the expected annual budget plan to JICA Myanmar office by the end of November, 2012, and Myanmar side agreed to do so.
- 8-3. Both sides confirmed that the ferries procured through the Project will replace the ferries currently in service, namely "Tapin Shwe Hti", "Kyan Sit Thar", "Hti Hlaing Shin" and "Anawyahtar" (hereinafter referred to as "current ferries"), and current ferries should not be engaged in passenger transportation service unless they are adequately repaired and maintained.
- 8-4. The Myanmar side shall secure the necessary personnel and budget for operation and maintenance.
- 8-5. Both sides shall study appropriate procedure for the registration of the ferryboats with the Myanmar flag, i.e. registration in Japan before transportation or

8-6. The Japan side shall study the means of transporting the new ferryboats from Japan to Myanmar, i.e. sailing by their own propulsion, towage or stowage on board a cargo vessel.

Annex-1 Project Site

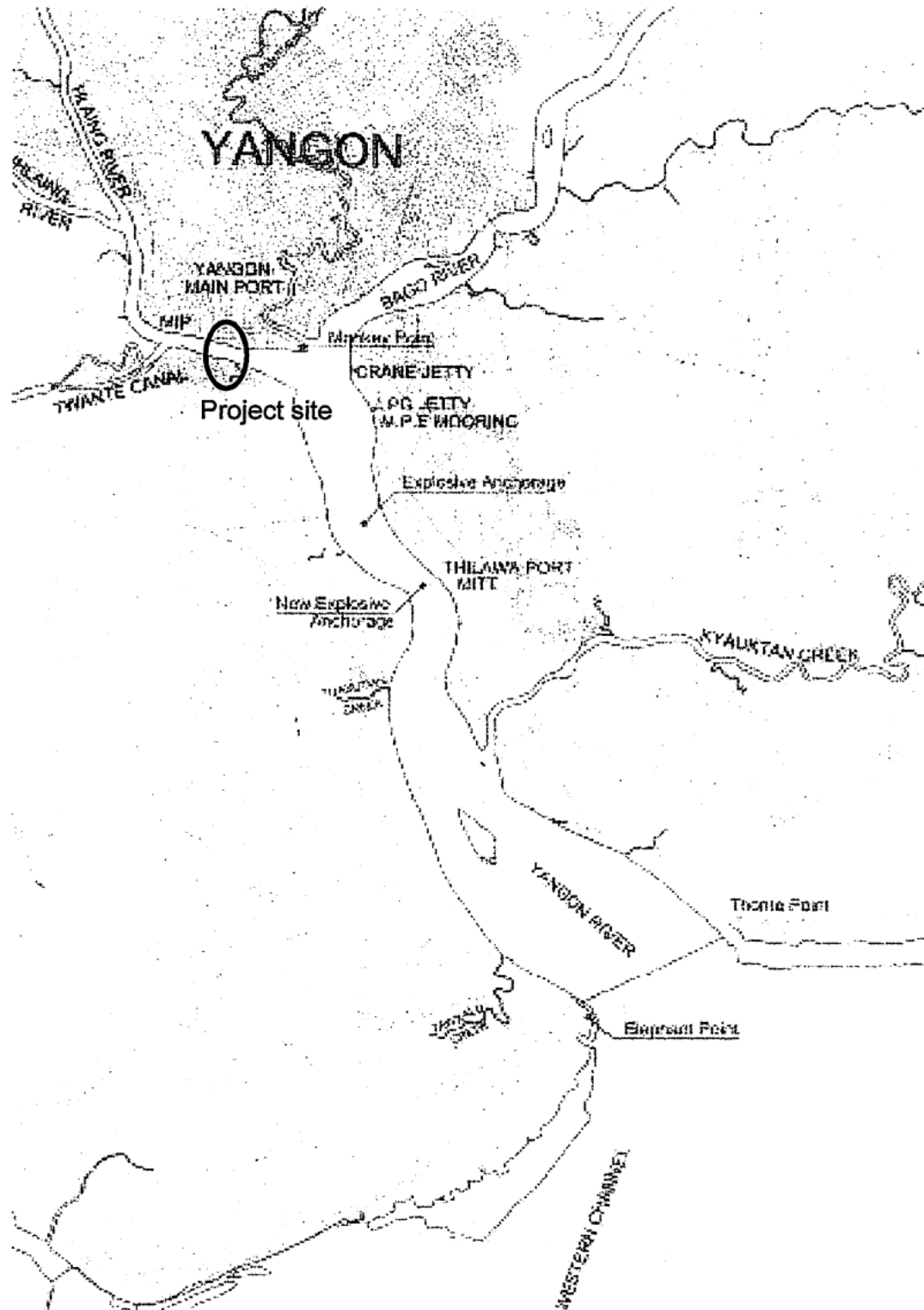
Annex-2 Organization Charts (MoT and IWT)

Annex-3 Japan's Grant Aid

Annex-4 Flow Chart of Japan's Grant Aid Procedures

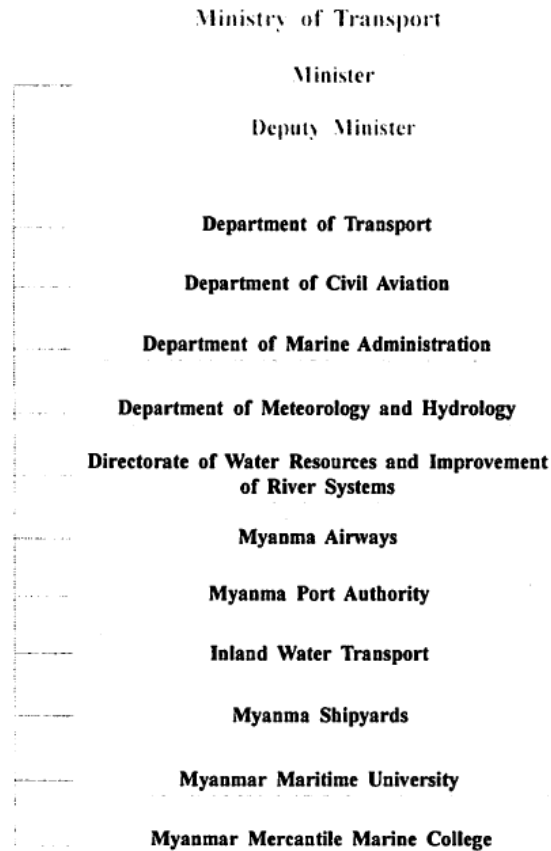
Annex-5 Major Undertakings to be taken by Each Government

Annex-1 Project Site

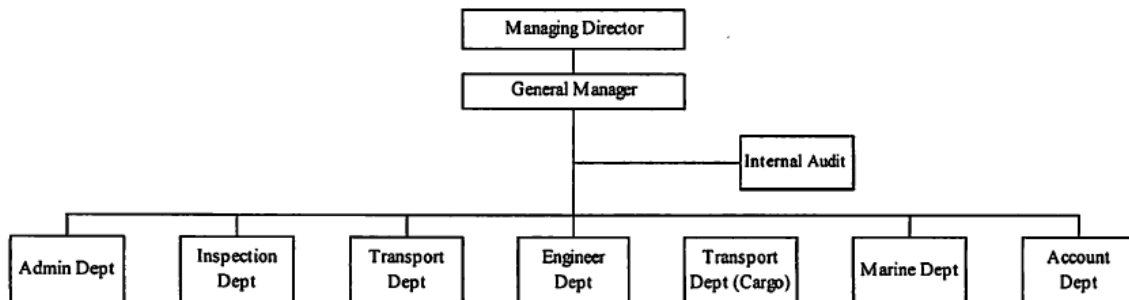


Annex-2 Organization Structure (IWT and MoT)

Organization Structure of MoT



Organization Structure of IWT



JAPAN'S GRANT AID

The Government of Japan (hereinafter referred to as “the GOJ”) is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures :

- Preparatory Survey
 - The Survey conducted by JICA
- Appraisal & Approval
 - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
 - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as “the G/A”)
 - Agreement concluded between JICA and a recipient country
- Implementation
 - Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japan's Grant Aid Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be signed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

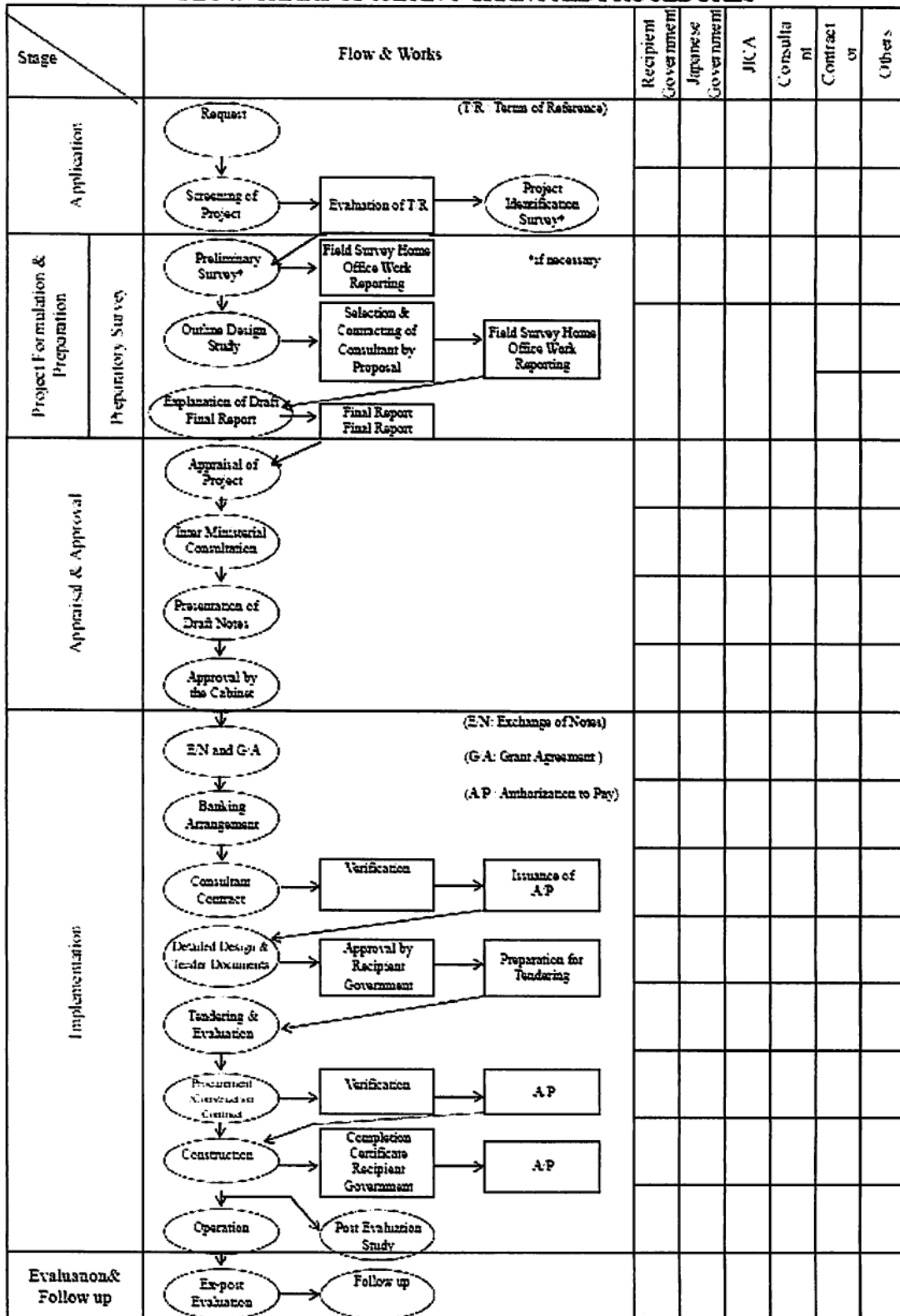
The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

Annex-4 Japanese Grant Aid Flow Chart

FLOW CHART OF JAPAN'S GRANT AID PROCEDURES



Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To design and construct vessel(s)	●	
2	To procure equipment to be covered under the Project	●	
3	Any items which are not covered under the Project, e.g. rehabilitation of existing wharf, etc.		●
4	Allocate the appropriate budget and/ or subsidies and conduct the undertakings in a timely manner necessary for proper operation and maintenance of vessel(s) to be provided (procurement of fuel, spare parts and overhaul of the vessel(s))		●
5	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in recipient country and to assist internal transportation of the products		
	1) Marine (Air) transportation of the products from Japan to the recipient country (Sailing of the new vessel(s) with equipment on board by their own propulsion ¹)	●	
	2) Tax exemption and custom clearance of the products (vessels with equipment on board) at the port of disembarkation (homeport)		●
6	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted / be borne by the Authority without using the Grant		●
7	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
8	To ensure that the vessel(s) be maintained and used properly and effectively for the implementation of the Project		●
9	To undertake procedures to register the vessels with the Myanmar flag issuing relevant certificates		●
10	To bear all the expenses, other than those covered by the Grant, necessary for implementation of the Project		●
11	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●

(B/A : Banking Arrangement, A/P : Authorization to pay)

4-2 Explanation of Draft report

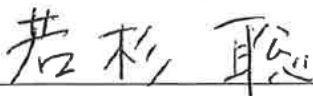
**MINUTES OF DISCUSSIONS
ON THE PREPARATORY SURVEY
FOR THE PROJECT FOR UPGRADING FERRYBOAT IN YANGON CITY
IN REPUBLIC OF THE UNION OF MYANMAR**

In June 2012, the Japan International Cooperation Agency (hereinafter referred to as “JICA”) dispatched the Preparatory Survey Team on the Project for Upgrading Ferryboat in Yangon City (hereinafter referred to as “the Project”) to the Republic of the Union of Myanmar (hereinafter referred to as “Myanmar”) and through discussions, field survey and technical examination of the results in Japan, JICA prepared a draft report of the survey.

In order to explain and to consult with the concerned officials of the Government of Myanmar (hereinafter referred to as “the Myanmar side”) on the contents of the draft report, JICA sent to Myanmar the Explanation Team of Draft Report of the Preparatory Survey (hereinafter referred to as “the Team”), which is headed by Mr. Satoshi WAKASUGI, Advisor, Transportation and ICT Division 1, Economic Infrastructure Department, JICA, from December 3 to December 12, 2012.

As a result of discussions, both sides confirmed the main items described in the attached sheets.

Yangon, December 12, 2012



Satoshi WAKASUGI
Leader
Preparatory Survey Explanation Team
Japan International Cooperation Agency



U Winn Pe
Managing Director,
Inland Water Transport
Ministry of Transport
Republic of the Union of Myanmar

ATTACHMENT

1. Contents of the Draft Report

The Myanmar side agreed and accepted in principle the contents of the draft report of the Preparatory Survey and draft specification of the ferries explained by the Team.

In addition, both sides agreed on change of the bridge design and installation of sewage tank system to be considered.

2. Japan's Grant Aid Scheme

The Myanmar side reconfirmed the Japan's Grant Aid scheme and the necessary measures to be taken by the Myanmar side as explained by the Preparatory Survey Team and described in the Annex-5 of the Minutes of Discussions signed by both sides on July 20, 2012.

3. Schedule of the Study

JICA will complete the Final Report in English, in accordance with the confirmed items and send it to the Myanmar side through JICA Myanmar Office by end of March, 2013.

4. Cost Estimation

Both sides agreed that, in order to secure a fair and equitable procurement, the Project Cost Estimation as attached in Annex-1 should never be duplicated or released to any third parties before the signing of all the Contract(s) for the Project.

5. Rules and regulations to apply

Both sides agreed followings regarding rules and regulations to apply for the new ferries.

- (1) The new ferries may apply ClassNK rules and Japanese maritime regulations.
- (2) Design drawings of the new ferries already approved by the ClassNK shall be sent to Department of Marine Administration (hereinafter referred to as "DMA"). DMA inspector will visit shipyard two times as maximum for the new building inspection.
- (3) DMA shall issue a letter of authorization for ClassNK to inspect and survey the new ferries, and to issue statutory certificates on behalf of DMA.

6. Transportation of the new ferries

6-1. Both sides confirmed that the Myanmar side will allow the new ferries of the Myanmar flag sailing the ocean by their own propulsion from Japan to Myanmar if the Japanese side will take necessary measures as the followings. For more details, refer to Annex-2.

- (1) To design, construct and outfit new ferries as the seagoing vessel with satisfying seagoing vessel standards for hull, navigation equipment and radio equipment;
- (2) To be manned by six Japanese crews comprising three deck officers and three engineer officers, all

having international STCW license;

- (3) To carry satellite communication equipment temporary for transportation, which allows the sailing ferries to acquire weather forecast, and to communicate with Japan on voice and internet;
 - (4) To bear the costs, such as fuel, incurred during the transportation from Japan to Myanmar;
 - (5) To sail in convoy, and take a course near the coast outside territorial waters allowing the new ferries to refuel and to escape to the haven port in special cases in the sea; and
 - (6) To fully insure for the hull, machinery and personnel on board, and third party liability.
- 6-2. The Myanmar side shall issue a provisional certificate of registry, single voyage permission, radio station license and GMDSS number as necessary, for each ferry installed with necessary measures as stated in 6-1 above.

7. Other Relevant Issues

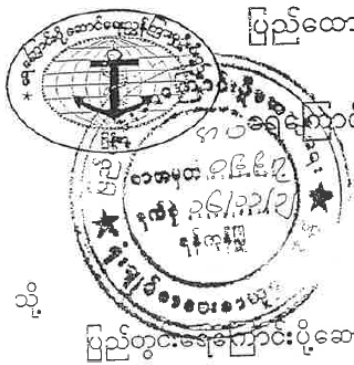
- 7-1. Both sides confirmed that the following undertakings should be taken by the Myanmar side at the Myanmar side expenses for the implementation of the Project.
- (1) Banking Arrangements (with an authorized foreign exchange in Japan), issuance of Authorization to Pay and bearing commissions to the Bank.
 - (2) Exemption of the new ferries from custom duties, internal taxes, fiscal levies and prompt customs clearance.
 - (3) Exemption of Japanese nationals from customs duties, internal taxes, fiscal levies for their services in Myanmar.
- 7-2. The Myanmar side shall secure necessary budget and personnel for operation and maintenance for ferries granted through the Project.
- 7-3. The Myanmar side confirmed that when more than licensed number of passengers (1,200) boards the new ferries procured by the Project, Myanmar side will take necessary action to secure the safety of all the passengers and receive sailing permit from relevant authorities in the Myanmar.
- 7-4. In accordance with the recommendation from DMA (Annex-3), the Myanmar side agreed to properly maintain and utilize the sewage tank system when the new legislation on water pollution is promulgated in the near future.



Annex-1 : Project Cost Estimation

This page is closed due to the confidentiality.

Annex - 2



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
 ပို့ဆောင်ရေးဝန်ကြီးဌာန
 ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်
 သယံဆောင်ရေးနှင့် သယ်ယူပို့ဆောင်ရေး ဝန်ကြီးဌာန

စာအမှတ်၊ ရက/သင်္ဘော(မှတ်ပုံတင်)/၆၁၃
 ရက်စွဲ၊ ၂၀၁၂ ခုနှစ်၊ နိုဝင်ဘာလ (၁၂) ရက်

သို့

ပြည်တွင်းရေးကြောင်းပို့ဆောင်ရေး

အကြောင်းအရာ။ ပန်းဆိုးတန်း - ဒလ ကူးတို့ရေယာဉ် (၂) စီး (သို့မဟုတ်) (၃) စီးအား ဂျပန်
 နိုင်ငံတွင် တည်ဆောက်၍ မြန်မာနိုင်ငံသို့ သယ်ဆောင်ရန်ကိစ္စ

ရည်ညွှန်းချက်။ ပြည်တွင်းရေးကြောင်းပို့ဆောင်ရေး၏ ၂၀၁၂ခုနှစ်၊ အောက်တိုဘာလ (၂) ရက်
 နေ့စွဲပါ စာအမှတ်၊ အခ - ၈မ / ၁၉ / ၁၀၂၇

အထက်အကြောင်းအရာပါကိစ္စနှင့် စပ်လျဉ်း၍ ပြည်တွင်းရေးကြောင်း ပို့ဆောင်ရေးသို့
 Japanese Grant Aid ဖြင့် ပံ့ပိုးကူညီမည့် ပန်းဆိုးတန်း - ဒလ ကူးတို့ရေယာဉ် (၂)စီး (သို့မဟုတ်)
 (၃)စီးအား၊ ဂျပန်နိုင်ငံတွင် တည်ဆောက်၍ မြန်မာနိုင်ငံသို့ သယ်ဆောင်ရန် ပင်လယ်ပြင် ဖြတ်သန်း
 ကာ မောင်းနှင်လာနိုင်ရေး ယာယီမှတ်ပုံတင်ခွင့်ပြုနိုင်ရန် မှတ်ပုံတင်မည့်သူ (သို့မဟုတ်) မှတ်ပုံတင်
 မည့်ဌာနမှ လျှောက်လွှာနှင့်အတူ အောက်ပါအတိုင်း ဆောင်ရွက်သွားရမည်ဖြစ်ပါကြောင်း
 အကြောင်းကြားအပ်ပါသည် -

- (က) တည်ဆောက်မည့် ရေယာဉ်ပုံစံများအား Class NK မှ အတည်ပြုပြီးပါက ရေကြောင်း
 ပို့ဆောင်ရေး ညွှန်ကြားမှုဦးစီးဌာနသို့ ပေးပို့ပြီး Plan Approval ဦးစွာ ရယူရန်
 (Stability Calculation အား ရေယာဉ်တည်ဆောက်ပြီးစီးပါက Approval ရယူရန်)
- (ခ) ရေကြောင်းပို့ဆောင်ရေး ညွှန်ကြားမှုဦးစီးဌာနမှ Class NK သို့ "Letter of
 Authorization" ထုတ်ပေးနိုင်ရေးအတွက် လျှောက်ထားရန်
- (ဂ) ရေယာဉ် စတင်တည်ဆောက်စဉ်နှင့် တည်ဆောက်ဆဲကာလအတွင်း ရေယာဉ်အား
 စစ်ဆေးခြင်းလုပ်ငန်းကို Class NK မှ ရေကြောင်းပို့ဆောင်ရေး ညွှန်ကြားမှု ဦးစီးဌာန
 ကိုယ်စား ဆောင်ရွက်ရန်
- (ဃ) Class NK မှ ရေကြောင်းပို့ဆောင်ရေးညွှန်ကြားမှုဦးစီးဌာန ကိုယ်စား အောက်ပါ
 Interim Certificate များကို ရေယာဉ်အား တိုင်းတာစစ်ဆေးပြီး ထုတ်ပေးရန်
 - (၁) Tonnage Certificate
 - (၂) Loadline Certificate (or) Sea Worthiness Certificate
 - (၃) Cargo Ship Safety Equipment Certificate
 - (၄) Cargo Ship Safety Construction Certificate
 - (၅) Tonnage (၄၀၀)ကျော်လျှင် IOPP Certificate

(၈)

- (င) Builder Certificate နှင့် Bill of Sale သို့မဟုတ် အလားတူ ပိုင်ဆိုင်မှုနှင့် ပတ်သက်သော သက်သေခံအထောက်အထား တင်ပြရန်
- (စ) ရေယာဉ်အာမခံကို ဂျပန်နိုင်ငံမှ မြန်မာနိုင်ငံသို့ ခရီးစဉ်အတွက် ပြုလုပ်ရန်
- (ဆ) သင်္ဘောတွင် ကာဝန်ထမ်းဆောင်မည့် နိုင်ငံခြားသားများအတွက် COE ထုတ်ယူ ရရှိရေး ဆောင်ရွက်ရန်
- (ဇ) ရေယာဉ်မှူးအား Article ဖွင့်နိုင်ရန် Letter of Authorization စာထုတ် ပေးရန်
- (ဈ) ဆက်သွယ်ရေးဦးစီးဌာနမှ ရေယာဉ်၏ Call Sign ရယူရန်
- (ည) ရေယာဉ်အား မြန်မာနိုင်ငံအလံလွှင့်ထူနိုင်ရေးအတွက် Flag In ပြုလုပ်ရာတွင် Port Registry, Master Name, Ship Particulars, Approval of Ship Name, Carving Note for Marking တို့ကို ရေကြောင်း ပို့ဆောင်ရေးညွှန်ကြားမှုဦးစီးဌာန၊ Surveyor ရေယာဉ်သို့သွားရောက် စစ်ဆေးခြင်း ခံယူရန်
- (ဋ) Safe Manning Document နှင့် သင်္ဘောယာယီ မှတ်ပုံတင်အား ရေကြောင်း ပို့ဆောင်ရေး ညွှန်ကြားမှုဦးစီးဌာနမှ ထုတ်ယူရန်
- (ဌ) မြန်မာနိုင်ငံသို့ ရေယာဉ်ရောက်ရှိပြီးလျှင် ပြည်တွင်းရေကြောင်းသွား ခရီးသည်တင် ရေယာဉ်အဖြစ် မှတ်ပုံတင်နိုင်ရေးအတွက် Passenger Ship Stability Calculation နှင့်အတူ လျှောက်ထားရန်


 မောင်မောင်ဦး
 ညွှန်ကြားရေးမှူးချုပ်

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The Republic of the Union of Myanmar
Ministry of Transport
Directorate of Marine Administration

Subject: Delivery of 3 numbers of passenger ferries from Japan to Myanmar

1. It is agreed that 3 numbers of passenger ferries are to be built in Japan and delivered to Yangon passing the sea.
2. DMA is responsible for the issue of necessary provisional register and some other documents to Japan side to facilitate the official delivery of those ferries using Myanmar flag.
3. The followings are to be fulfilled by Japan side:
 - (a) After the approval of the ferry designs by Class NK, the designs are to be sent to DMA to get Plan Approval first and then stability calculations are to be sent to DMA for approval after the ferries are constructed.
 - (b) Japan side shall apply to DMA to issue "Letter of Authorization" to Class NK.
 - (c) Class NK shall take inspection measures throughout the process of construction of the ferries on behalf of DMA.
 - (d) The following "Interim Certificates shall be issued by Class NK after surveying the ferries on behalf of DMA.
 - (i) Tonnage Certificate.
 - (ii) Load line Certificate (or) Seaworthiness Certificate.
 - (iii) Cargo Ship Safety Equipment Certificate.
 - (iv) Cargo Ship Safety Construction Certificate.
 - (v) If over 400 Tonnage, IOPP Certificate
 - (e) Builder Certificate and Bill of Sale(or)similar Certificates shall be provided to DMA for evidence of ownership.
 - (f) Necessary insurance shall be made for all ferries and crew by Japan side for sea voyage from Japan to Myanmar.

(w)

- (g) To make sure COE for all crew on board the ferries are in hand.
- (h) Letter of Aultorization to be issued to the captains of ferries to open Article.
- (i) To get ships' call signs from Department of Communications.
- (j) To do "flag in" , port registry , master name, ship particulars, approval of ship name, carving note for marking shall be inspected by DMA surveyor.
- (k) Safe manning document and provisionary registry to be obtained from DMA.
- (l) Inland passenger vessel register shall be applied to DMA together with passenger ship stability calculations after arriving at Myanmar.

Director General

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Annex -3



MINISTRY OF TRANSPORT
DEPARTMENT OF MARINE ADMINISTRATION
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Date: 10th December 2012

To

Mr. Winn Pe
Managing Director,
Inland Water Transport

Subject: Control of sewage discharge for passenger ferries from Japan to Myanmar

Dear Mr. Winn Pe,

With reference to the project for new passenger ferries from Japan to Myanmar, this Department recommends IWT to consider means to control discharge of sewage into the river. The legislation imposing river vessels to control sewage discharge is not currently promulgated, but this Department has concern about the pollution of the Yangon River, and foresees that the new legislation can be promulgated in the near future.

Considering that retrofitting work to add equipment to control sewage discharge is not simple work for existing vessels, this Department considered this recommendation for IWT to consider a work to prepare for such future requirement.

For Director General,
Mr. Htay Win
Department of Marine Administration

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