

Appendices

Appendices

Appendix-1: Member List of the Survey Team

(1) Field Survey (From June 9 to August 20, 2014)

Name	Position	Organization
Mr. Yukihiro Koizumi	Leader	Director, Transportation and ICT Division 1, Economic Infrastructure Department, Japan International Cooperation Agency
Mr. Yoshimoto Koyanagi	Co-Leader	Deputy Director, Transportation and ICT Division 1, Economic Infrastructure Department, Japan International Cooperation Agency
Mr. Masahiko Koshimizu	Chief Consultants / Port Maintenance & Port Planner	Port and Harbor Department Global Consulting H.Q. Oriental Consultants Co., Ltd
Mr. Hiromi Namiki	Port Facility Designer	Port and Harbor Department Global Consulting H.Q. Oriental Consultants Co., Ltd
Mr. Nobuhiro Kanamaru	Ship Maintenance Specialist	Port and Harbor Department Global Consulting H.Q. Oriental Consultants Co., Ltd (JMS)
Mr. Ryota Mizuno	Natural Conditions Survey / Team Coordinator	Project Management Department Global Consulting H.Q. Oriental Consultants Co., Ltd
Mr. Yoichi Harada	Environmental Specialist	Port and Harbor Department Global Consulting H.Q. Oriental Consultants Co., Ltd (IDES)
Mr. Toshitsugu Shimodaira	Construction Planner/ Cost Estimator	Port and Harbor Department Global Consulting H.Q. Oriental Consultants Co., Ltd

Note: Organizations were at the time of the field survey conducted. “Transportation and ICT Division 1, Economic Infrastructure Department” of the Japan International Cooperation Agency (JICA) was replaced by “Transportation and ICT Group, Infrastructure and Peacebuilding Department” on August 1, 2013. “Global Consulting H.Q. of Oriental Consultants Co., Ltd.” was a split-up company of “Oriental Consultants Global Co., Ltd.” on October 1, 2014. The new Organizations are described for the Draft Outline Design Explanation Survey in below.

(2) Draft Outline Design Explanation Survey (From January 17 to 25, 2015)

Name	Position	Organization
Mr. Yoshimoto Koyanagi	Leader	Deputy Director, Transportation and ICT Group, Infrastructure and Peacebuilding Department, Japan International Cooperation Agency
Mr. Masahiko Koshimizu	Chief Consultants / Port Maintenance & Port Planner	Port and Harbor Department Oriental Consultants Global Co., Ltd
Mr. Hiromi Namiki	Port Facility Designer	Port and Harbor Department Oriental Consultants Global Co., Ltd

Appendix-2: Survey Schedule

(1) Field Survey (from June 29 to August 20, 2014)

Date	Leader	Co-Leader	Chief Consultant/Port Maintenance & Port Planner	Port Facilities Designer	Ship Maintenance Specialist	Natural Condition Survey /Team Coordinator	Environmental Specialist	Construction Planner / Cost Estimator	
	Mr. Yukihiko Koizumi	Mr. Yoshimoto Koyanagi	Mr. Masahiko Koshimizu	Mr. Hiromi Namiki	Mr. Nobuhiro Kanamaru	Mr. Ryota Mizuno	Mr. Yoichi Harada	Mr. Toshitsugu Shimodaira	
6/29 Sun		Move (by Air SQ637/SQ285 Tokyo - Auckland)	Move (by Air NZ90 Tokyo - Auckland)			Move (by Air NZ90 Tokyo - Auckland)			
6/30 Mon	Move (by Air NZ 090 Tokyo - Auckland)		Arr. at Apia by Air NZ992 20:35			Same as Chief Consultant			
7/1 Tue	Arr. At Apia by Air NZ992 20:35		Embassy - JICA , Discussion with the SPA			Ditto			
7/2 Wed			Minutes Discussions / Field Survey			Ditto			
7/3 Thu			Minutes Discussions / Field Survey			Ditto			
7/4 Fri			Minutes Discussions and Signing	[6]Preparation of Natural Condition Survey		[6]Preparation of Natural Condition Survey			
7/5 Sat	Move (by Air NZ997 Apia - Auckland)	Move (by Air NZ297/S-Q282 Apia - Singapore)	[8]Preparation of Site Condition Survey , Internal Meeting			[8]Preparation of Site Condition Survey , Internal Meeting			
7/6 Sun	Move (by Air NZ099 Auckland - Tokyo)	Move (by Air SQ632 Singapore - Tokyo)	Documentation			Documentation			
7/7 Mon			[6]Preparation of Natural Conditions Survey			[6]Preparation of Natural Conditions Survey			
7/8 Tue			[8]Site Condition Survey			[8]Site Condition Survey			
7/9 Wed			Ditto			Ditto			
7/10 Thu			Ditto			Ditto			
7/11 Fri			Ditto			Ditto	Move (by Air NZ90 Tokyo - Auckland - Apia)		
7/12 Sat			Documentation			Documentation	Arr. At Apia by Air NZ990 20:35		
7/13 Sun			Internal meeting			Internal meeting			
7/14 Mon			[6]Site Condition Survey			[6]Natural Condition Survey/ [8]Site Condition Survey	[7]Environmental and Social Consideration/		
7/15 Tue			Ditto			Ditto	Ditto		
7/16 Wed			Ditto			Ditto	Ditto		
7/17 Thu			Ditto		Move (Tokyo - Oakland)	Ditto	Ditto		
7/18 Fri			Ditto		Arr.at Auckland(by Air NZ090 .8:15)	Ditto	Ditto		
7/19 Sat			Documentation		Arr.At Apia (by Air NZ 99419.00:45)	Documentation			
7/20 Sun			Internal meeting						
7/21 Mon			[6]Site Condition Survey			[6]Natural Condition Survey/ [8]Site Condition Survey	[7]Environmental and Social Consideration/		
7/22 Tue			Ditto			Ditto	Ditto		
7/23 Wed			Ditto			Ditto	Ditto		
7/24 Thu			Ditto			Ditto	Ditto		
7/25 Fri			Ditto			Ditto	Ditto		
7/26 Sat			Organize Data						
7/27 Sun			Internal meeting		Internal Meeting			Move (Arr.at Oakland by Air NZ990 8:15)	
7/28 Mon			[6]Site Condition Survey			[6]Natural Condition Survey/ [8]Site Condition Survey	[7]Environmental and Social Consideration/	Move (Arr.at Apia by Air NZ992 20:35)	
7/29 Tue			Ditto			Ditto	Ditto	[8]Site Condition Survey (Equipment procurement)	
7/30 Wed			Ditto			Ditto	Ditto	Ditto	
7/31 Thu			Ditto			Ditto	Ditto	Ditto	
8/1 Fri			Ditto			Ditto	Ditto	Ditto	
8/2 Sat			Organize Data						
8/3 Sun			Internal meeting						Move (Arr.at Oakland by Air NZ990 8:15)
8/4 Mon			[6]Site Condition Survey			[6]Natural Condition Survey/ [8]Site Condition Survey	[7]Environmental and Social Consideration/	Move (Arr.at Apia by Air NZ992 21:05)	
8/5 Tue			Ditto			Ditto	Ditto	[8]Site Condition Survey (Equipment procurement)	
8/6 Wed			Compilation of the report./Job roll each						Ditto
8/7 Thu			Discussion with SPA./Compilation of the report./job roll each						Ditto
8/8 Fri			Discussion with SPA, JICA, Embassy Report						Internal Meeting
8/9 Sat			Move from Apia to Tokyo (Arr. At Tokyo by Air NZ991 16:50)						Documentation
8/10 Sun									Ditto
8/11 Mon									Attend for custom Clearance for Soil Investigation Equipment
8/12 Tue									[8]Site Condition Survey / Supervisory of Soil Investigation
8/13 Wed									Ditto
8/14 Thu									Ditto
8/15 Fri									Ditto
8/16 Sat									Documentation / Supervise for Soil Investigation
8/17 Sun									Documentation
8/18 Mon									[8]Site Condition Survey
8/19 Tue									JICA/Move from Apia (by NZ995, Arr. Auckland 15:05)
8/20 Wed									Arr.At Naitia (by Air NZ 099,16:50)

(2) Draft Outline Design Explanation Survey (from January 17 to 25, 2015)

Day	Date		Leader	Cheaf Consultant/Port Maintenance & Port Planner	Port Facilities Designer
			Mr.Yoshimoto Koyanagi	Mr.Masahiko Koshimizu	Mr.Hiromi Namiki
1	1/17	Sat	Move by SQ637 & SQ285 Tokyo - Singapore - Auckland	Move by SQ631 & SQ285, Tokyo - Singapore - Auckland	
2	1/18	Sun	Move by SQ285 Singapore - Auckland, Arr. Apia by NZ992 at 20:45		
3	1/19	Mon	10:00 JICA Samoa Office, 11:00 EOJ, 13:00 MWTI, 15:00 MOF, 16:00 SPA		
4	1/20	Tue	SPA, Draft Report Explanation, Minutes Discussions		
5	1/21	Wed	SPA, Draft Report Explanation, Minutes Discussions		
6	1/22	Thu	SPA, Draft Report Explanation, Minutes Discussions		
7	1/23	Fri	14:00 Minitues Signing, 16:00JICA, 16:30 EOJ, Leave from Apia by NZ997 at 21:45	Leave from Apia by NZ995 at 14:45	
8	1/24	Sat	Move by NZ997 & SQ286, Apia - Auckland - Singapore	Move by SQ4282 & SQ12 Arrival at Tokyo at 17:05	
9	1/25	Sun	Move by SQ 638, Tokyo at 7:40	Move by SQ 636, Tokyo at 6:30	

Appendix-3: List of Parties Concerned in the Recipient Country

(1) List of Met Person

Prime Minister of Samoa:

Mr. Hon. Tuilaepa Dr. Lupesoliai Neioti Aiono Sailele Malielegaoi, Prime Minister of Samoa

MOF: Ministry of Finance

Mr. Hon. Tuilaepa Dr. Lupesoliai Neioti Aiono Sailele Malielegaoi, Minister

Ms. Numea Simi, Assistant Chief Executive Officer

Mr. Tupa'imatuna Iulai Lavea, Chief Executive Officer (CEO)

MWTI: Ministry of Works, Transport and Infrastructures

Mr. Hon. Manu'alesagalala Enokati Posala, Minister

Mr. Vaaelua Nof Vaaelua, Chief Executive Officer (CEO)

Mr. Fepuleai Faleniu Mark Alesana, Assistant Chief Executive Officer, Maritime Division

MOE: Ministry of Natural Resources and Environment

Mr. Mulipola Ausetalia Titimaea, Assistant Chief Executive Officer,

Meteorology Division

Mr. Fata Sunny Seuseu, Head of Climate Services, Meteorology Division

PUMA: Planning and Urban Management Agency

Mr. Kirisimasi Seumanutafa, Acting Chief Executive Officer,

SPA: Samoa Ports Authority

Mr. Tufuga To'oalo Fagaloa Tufuga, General Manager

Mr. Sainafolava Capt. Lotomau Tomane, Port Master/AECO Maritime

Capt. Herman Overhoff, Deputy Port Master

Mr. Galuvao Uili Isara, Commercial & Marketing Manager

Mr. Mavaega Mavaega, Principal Marketing Officer

Ms. Samoana Jane Meredith, Senior Statistical Officer

Mr. Jerry Epa, Principal Manifest & Cargo Analyst,

Ms. Nimei Iosefa Failagi, Principal Payable Officer

Ms. Taimalelagi Talele Saaga, Corporate Service Manager,

Mr. Toavalu Esera, PFSO

Mr. Tuova Losefa, Chief Electrical

Mr. Adrian Sammons, Commercial Advisor (from PRIF)

Tug Boat, ATAFA:

Capt. Logisi Tauinaola,	Captain
Mr. Alaifatu Seisola,	Assistant Captain,
Mr. Pita Cione,	Chief Engineer
Mr. Tarita Saipele,	Engineer

Tug Boat, TAFOLA:

Capt. Siaki Malietulu,	Captain
Mr. Mareko Alefosio,	Assistant Captain
Mr. Ioritana Mariko,	Chief Engineer
Mr. Herbert Lees,	Engineer

PRIF (Pacific Region Infrastructure Facility)

Mr. C. Sanjivi Rajasingham,	Director, PRIF Coordination Office,
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Embassy of Japan

Mr. Kazumasa Shibuta	Ambassador
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JICA Samoa Office

Mr. Hideyuki Suzuki	Chief Representative
Mr. Tetsuji Nakasone	Project Formulation Advisor,
Ms. Rebecca Nun Yan	Assistant Programme Coordinator

**MINUTES OF DISCUSSIONS
ON THE PREPARATORY SURVEY
FOR THE PROJECT FOR THE ENHANCEMENT OF SAFETY OF APIA PORT
IN THE INDEPENDENT STATE OF SAMOA**

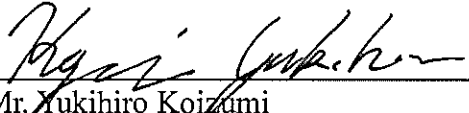
In response to a request from the Government of Independent State of Samoa (hereinafter referred to as “Samoa”), the Government of Japan decided to conduct a Preparatory Survey on “The Project for the Enhancement of Safety of Apia Port” (hereinafter referred to as “the Project”). In accordance with this decision, Japan International Cooperation Agency (hereinafter referred to as “JICA”) decided to commence the survey.

JICA sent the Preparatory Survey Team for the Field Survey (hereinafter referred to as “the Team”), which is headed by Mr. Yukihiro KOIZUMI, Director, Transportation and ICT Division 1, Transportation and ICT Group, Economic Infrastructure Department, JICA, and is scheduled to stay in the country from June 30th to August 9th, 2014.


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

In the course of discussions and field survey, the both sides 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.

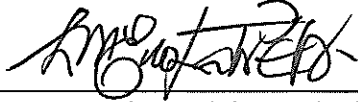
Apia, July 4, 2014




Mr. Yukihiro Koizumi
Leader
Preparatory Survey Team
Japan International Cooperation Agency



Hon. Tuilaepa Dr. Lupesoliai Aiono Naioti
Sailele Malielegaoi
Prime Minister/ Minister of Finance
Independent State of Samoa



Mr. Manualesagalala Enokati Posala
Minister
Ministry of Works, Transport and Infrastructure
Independent State of Samoa



Mr. Tufuga To'oalo Fagaloa
General Manager
Samoa Ports Authority
Independent State of Samoa

ATTACHMENT

1. Objective of the Project

The objective of the Project is to enhance the safety of Apia Port.

2. Project Site

The Project site is Apia Port as shown in Annex-1.

3. Responsible and Implementing Authority

3-1. The responsible ministry is the Ministry of Works, Transport and Infrastructure (MWTI).

3-2. The implementing agency is Samoa Ports Authority (SPA).

3-3. The Samoan side explained to the Team that SPA is an autonomous body which is responsible for port development and maintenance, and that MWTI is the administrative and regulating body.

3-4. The organization chart of SPA is shown in Annex-2.

4. Item requested by the Government of Samoa

4-1. The original request made by the Government of Samoa were i) rehabilitation of old wharf and ii) construction of new container yard. However, according to the discussion in the preliminary survey conducted in February 2014, the following basic agreement have been made:

- a) Extension of the new wharf instead of rehabilitation of old wharf to be considered due to the safety point of view of ship berthing and operating conditions of the existing wharves.
- b) Improvement of the space behind extended new wharf instead of the new container yard construction to be considered, since the existing container yard capacity is sufficient for container handling currently operating.

4-2. After discussions with the Team by taking into considerations the above mentioned view, the Government of Samoa requested the items below.

- Extension of new wharf
- Container yard rehabilitation
- Rehabilitation of fenders
- Upgrade of mooring facilities
- Passenger flow separation
- Life-prolonging treatment of existing tug boats
- Rehabilitation and upgrade of navigation aids
- Port basin rehabilitation (Dredging if necessary)

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4-3. JICA will assess the necessity, relevance and degree of urgency of the above requested items through the survey and will report to the Government of Japan.

5. Project Title

Taking into considerations the above mentioned project item, the both sides agreed to change the Project title as follows;

(Original Title)

The Project for the Rehabilitation of Old Wharf and Construction of New Container Yard at Apia Port

(New Title)

The Project for the Enhancement of Safety of Apia Port

6. Japan's Grant Aid Scheme

6-1. The Samoan side understood the Japan's Grant Aid scheme explained by the Team as described in Annex-3 and Annex-4.

6-2. The Samoan side agreed to take the necessary measures, as described in Annex-5 for the smooth implementation of the Project, as a condition for the Japan's Grant Aid to be implemented.

7. Schedule of the Study

7-1. The Team will proceed with further field survey until August 9th, 2014.

7-2. JICA will prepare the draft report and dispatch a mission in order to explain their contents around January, 2015.

7-3. If the contents of the report are accepted in principle by the Government of Samoa, JICA will complete the final report and send it to Samoa around May, 2015.

8. Environmental and Social Considerations

8-1. The Samoan side agreed to give due environmental and social considerations during implementation of the Project, and after completion of the Project, in accordance with the JICA Guidelines for Environment and Social Considerations (April, 2010).

8-2. The Samoan side agreed to conduct the necessary procedure concerning the environmental assessment and submit required environmental report of the Project to the Ministry of Natural Resources & Environment (Planning Urban Management Agency; PUMA). The period required from the request of approval till the obtainment of approval will be further examined, and the Samoan side agreed to obtain the approval from Ministry of Natural Resources & Environment and submit it to JICA Samoa Office preferably before the Cabinet approval of the Project by the Government of Japan which is scheduled on April, 2015.

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9. Others

- 9-1. The Samoan side explained to the Team that the Project is very important as it can only add value to the Government of Samoa's infrastructure plans not only enhancement of safety but also promotion of tourism such as the Waterfront Beautification Scheme.
- 9-2. The Japanese side explained to the Samoan side that the current issue in Apia Port is to enhance the safety on i) ship maneuvering, ii) ship berthing and mooring, iii) cargo handling and passenger flow, and also explained that the Apia Port can afford the future cargo handling demand up to around 80,000TEU and has sufficient potential and capacity to play a role of the main international port in South Pacific region.
- 9-3. The Samoan side explained to the Team about their operation and maintenance structure such as organization, number of personnel, budget allocation in recent years, technical skills, present asset conditions, etc. The Samoan side also explained to the Team that they shall operate and maintain the provided facilities and equipment by the Project in a proper manner by ensuring the i) organization structures, ii) capacity development of the personnel for maintenance and operation, and iii) necessary budget allocation by means of such as port charge increase (where necessary and applicable), after completion of the Project.
- 9-4. The Samoan side explained to the Team that the port charges are determined by SPA and approved by the Cabinet of the Government of Samoa. The Samoan side shall take necessary action to review the port charges if required to secure the necessary budget for operation and maintenance of the facility and equipment provided by the Project.
- 9-5. The Samoan side explained to the Team that the container handling work is conducted by the stevedores with their own container handling equipment, and also explained to the Team that SPA will be responsible for maintenance of the port facilities.
- 9-6. The Samoan side explained to the Team that the new oil tanks are under construction, and the existing oil tanks will be property of SPA and will be utilized for another service such as reservation of waste water tank, fire prevention tank, etc., and also explained to the Team that the existing oil tanks cannot be removed from the current location.
- 9-7. If the dredging work in front of the wharf is required to secure the water depth (C.D. -11m), the Samoan side shall secure the dumping area for the dredged soil which accords to the environmental condition and requirement.
- 9-8. The Samoan side agreed that customs duties, internal taxes and other fiscal levies which may be imposed in Independent State of Samoa are exempted under mutual agreement of Exchange of Note (E/N). If any temporary expenses stated before are caused by some reasons such as the delay of execution of tax exemption, the Samoan side (Ministry of Finance/ MWTI/ SPA) shall bear the cost.

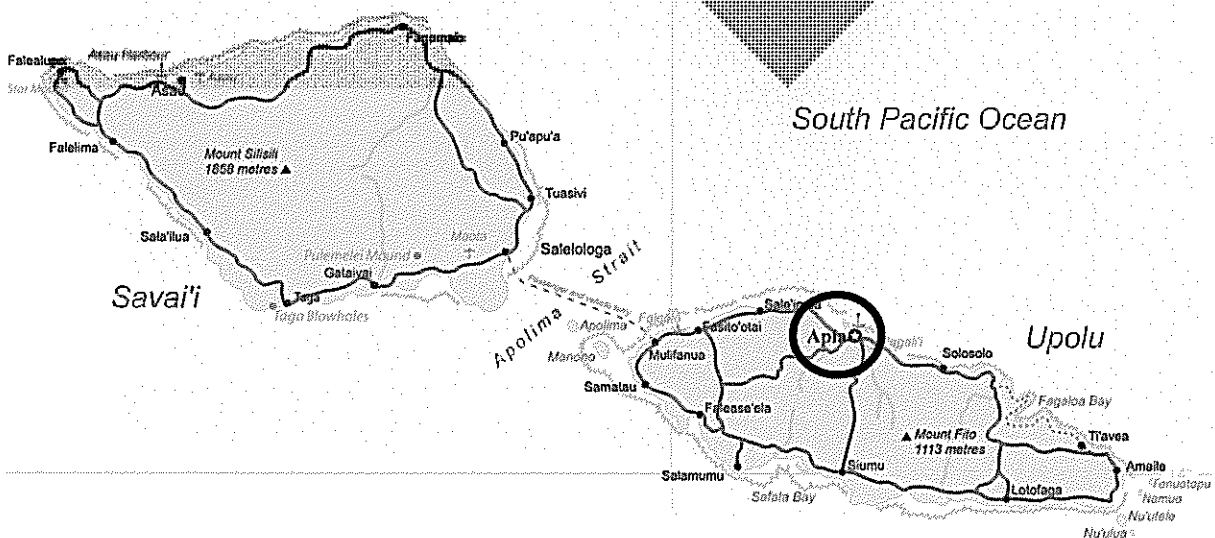
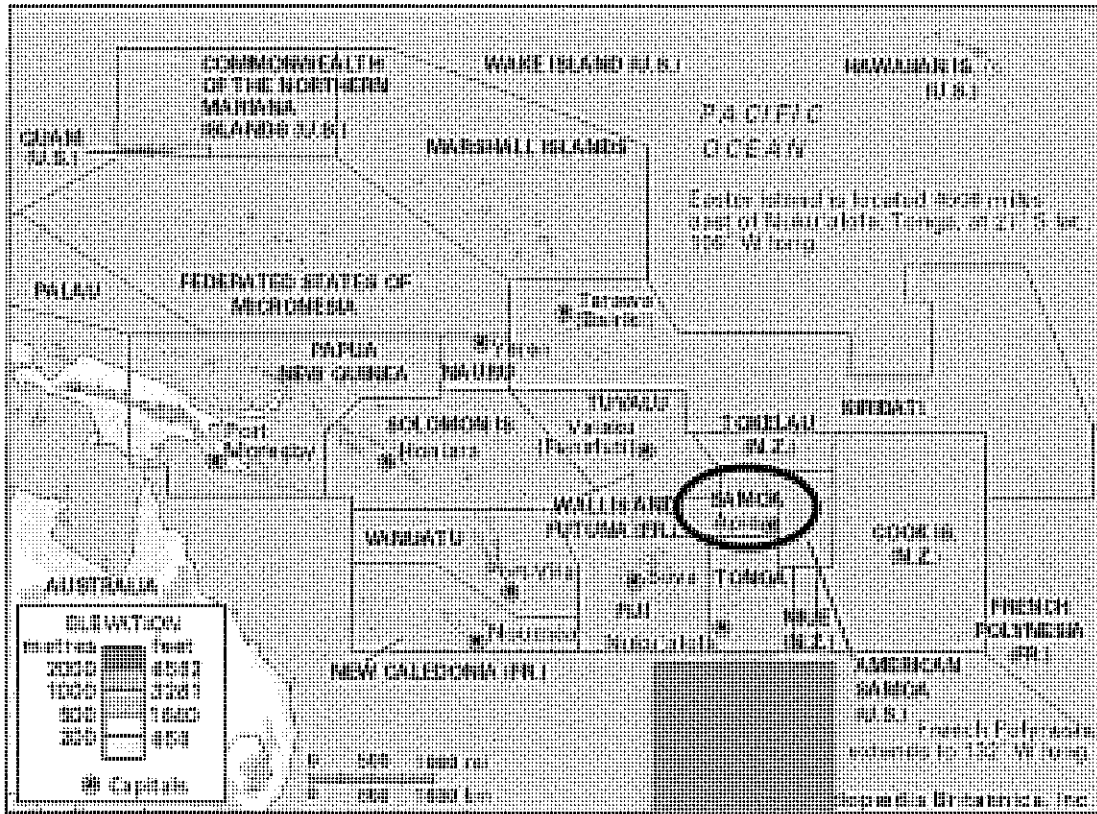
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- Annex-1 Project Site
- Annex-2 Organization Charts
- Annex-3 Japan's Grant Aid
- Annex-4 Flow Chart of Japan's Grant Aid Procedures
- Annex-5 Major Undertakings to be taken by Each Government

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Project Site



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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.



FLOW CHART OF JAPAN'S GRANT AID PROCEDURES

Stage	Flow & Works	Recipient Government	Japanese Government	JICA	Consultant	Contractor	Others
Application	Request (T/R : Terms of Reference)	✓					
	Screening of Project → Evaluation of T/R → Project Identification Survey*		✓	✓			
Project Formulation & Preparation	Preparatory Survey	Preliminary Survey* → Field Survey Home Office Work Reporting *if necessary	✓	✓	✓		
		Outline Design Study → Selection & Contracting of Consultant by Proposal → Field Survey Home Office Work Reporting	✓	✓	✓	✓	
		Explanation of Draft Final Report → Final Report Final Report	✓	✓	✓	✓	
Appraisal & Approval	Appraisal of Project		✓	✓			
	Inter Ministerial Consultation		✓				
	Presentation of Draft Notes	✓	✓				
	Approval by the Cabinet		✓				
Implementation	E/N and G/A (E/N: Exchange of Notes, G/A: Grant Agreement)	✓	✓	✓			
	Banking Arrangement	✓					✓
	Consultant Contract → Verification → Issuance of A/P	✓		✓	✓		
	Detailed Design & Tender Documents → Approval by Recipient Government → Preparation for Tendering	✓		✓	✓		
	Tendering & Evaluation	✓		✓	✓	✓	
	Procurement /Construction Contract → Verification → A/P	✓		✓	✓	✓	
	Construction → Completion Certificate Recipient Government → A/P	✓		✓	✓	✓	
	Operation → Post Evaluation Study	✓		✓			
	Ex-post Evaluation → Follow up	✓	✓	✓			

Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure land and water area (project site, temporary yard and etc.)		•
2	To clear, level and reclaim the site when needed		•
3	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	•	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		•
4	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		•
5	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		•
6	To ensure that the facilities and equipment be maintained and used properly and effectively for the implementation of the Project		•
7	To give due environmental and social consideration in the implementation of the Project		•
8	To bear all the expenses, other than those covered by the Grant, necessary for implementation of the Project		•
9	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)

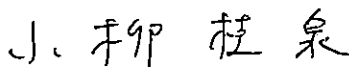
**MINUTES OF DISCUSSIONS
ON THE PREPARATORY SURVEY
FOR THE PROJECT FOR THE ENHANCEMENT OF SAFETY OF APIA PORT
IN THE INDEPENDENT STATE OF SAMOA
(EXPLANATION OF THE DRAFT OUTLINE DESIGN REPORT)**

On the basis of the discussions and field survey in the Independent State of Samoa (hereinafter referred to as “Samoa”) in July, 2014, and the subsequent technical examination of the results in Japan, Japan International Cooperation Agency (hereinafter referred to as “JICA”) prepared a draft Preparatory Survey Report on the Project for the Enhancement of Safety of Apia Port (hereinafter referred to as “the Draft Report”).

In order to explain and discuss with the Samoan side on the contents of the draft report, JICA sent to Samoa the draft report explanation team (hereinafter referred to as “the Team”), which is headed by Mr. Yoshimoto KOYANAGI, Deputy Director, Transportation and ICT Group, Infrastructure and Peacebuilding Department, JICA, from January 18 to 23, 2015.

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

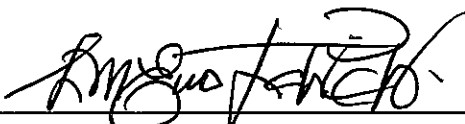
Apia, January 23, 2015



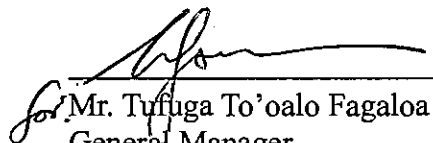
Mr. Yoshimoto KOYANAGI
Deputy Director
Japan International Cooperation Agency



Hon. Tuilaepa Dr. Lupesoliai Aiono Naioti
Sailele Malielegaoi
Prime Minister/ Minister of Finance
Independent State of Samoa



Mr. Manualesagalala Enokati Posala
Minister
Ministry of Works, Transport and Infrastructure
Independent State of Samoa



Mr. Tufuga To'oalo Fagaloa
General Manager
Samoa Ports Authority
Independent State of Samoa

ATTACHMENT

1. Components of the Draft Outline Design Report

The Samoan side agreed and accepted in principle the contents of the Draft Report explained by the Team.

2. Japan's Grant Aid Scheme

The Samoan side reconfirmed the Japan's Grant Aid scheme. The Samoan side reassured to take necessary measurements as described in Annex-4 and Annex-5 of the Minutes of Discussions (M/D) signed by both sides on July 4, 2014.

3. Schedule of the Study

JICA will complete the Final Outline Design Report of the Preparatory Survey in accordance with the confirmed items and send it to the Samoan side around April, 2015.

4. Cost Estimation

4-1. The Japanese side explained to the Samoan side the rough estimate of the Project Cost described in Annex-1; however, the final Project Cost described in the Exchange of Notes (hereinafter referred to as "E/N") would be appraised by the Government of Japan.

4-2. The both sides agreed that in order to secure a fair and equitable procurement, the Project Cost Estimation attached in Annex-1 should never be duplicated or released to any third party before the signing of all the Contract(s) for the Project.

5. Undertakings by the Samoan side

5-1. The Samoan side will undertake the necessary arrangement/work for the Project listed in Annex-2 at its own expenses based on the contents of the Draft Report.

5-2. The Samoan side agreed to obtain the required environmental report of the Project from the Ministry of Natural Resources & Environment (Planning Urban Management Agency; PUMA) by the end of April, 2015.

5-3. The Samoan side agreed to obtain the construction including execution permit from Ministry of Works, Transport and Infrastructure by the time of tender notice scheduled in October, 2015.

5-4. The Samoan side explained to the Team that SPA will secure the temporary yard (minimum 3,000m²) and inform the location to the Team by the end of May, 2015.

5-5. The Samoan side explained to the Team that the rehabilitation of access road has



already completed.

5-6. The Samoan side agreed to report about the progress of the undertakings by the Samoan side to JICA Samoa office till all the works will be done. Report shall be in accordance with the progress chart in Annex-3.

6. Operation and Maintenance of the Facilities and Equipment

6-1. The Samoan side will secure enough staff and budget necessary for operation and maintenance of the facilities and equipment to be provided by the Project. The annual operation and maintenance costs are estimated as Annex-4, and details are mentioned in the Draft Report.

6-2. The Samoan side explained to the Team that SPA has plan to appoint the civil engineer and establish the civil engineering sub-division under the Port Maintenance Service section as shown in Annex-5.

7. Environmental and Social Considerations

7-1. The Samoan side explained to the Team that the public consultation was conducted in January 16, 2015 and the basic concept of the Project was accepted by the participants, and the Samoan side agreed to finalize the necessary documents for the development consent and to obtain the approval from Ministry of Natural Resources & Environment (Planning Urban Management Agency; PUMA) and submit it to JICA Samoa Office by the end of April, 2015.

7-2. The both sides agreed to the contents of the Environmental Checklist as shown in Annex-6.

7-3. The Samoan side agreed that monitoring for environmental and social considerations will be conducted by the responsibility of SPA in accordance with the Environmental Monitoring Plan described in the draft report. The results of monitoring will be provided to JICA Samoa Office by filling in the Monitoring Form attached as Annex-7, during construction phase and after completion of the Project.

7-4. The Samoan side agreed that JICA may disclose the monitoring results and may disclose further information as well on demand from the third parties.

8. Disclosure of Information

Both sides confirmed that the study results excluding the Project cost will be disclosed to the public after completion of the Preparatory Survey. All the study results including the Project cost will be disclosed to the public after all the contracts for the Project are concluded.



9. Others

The Samoan side requested that fenders installation for existing new wharf would be done as soon as possible which will require partial hand over to the Samoan side prior to other facilities and equipment. The Team will further examine the construction schedule taking into considerations the Samoan side's request.

- Annex-1 Project Cost Estimation
- Annex-2 Major Undertakings and Cost Estimation to be taken by Samoan side
- Annex-3 Progress Chart for the Undertakings by the Samoan side
- Annex-4 Annual Maintenance Cost
- Annex-5 Organization of Port and Marine Division, SPA (Plan)
- Annex-6 Environmental Checklist
- Annex-7 Environmental Monitoring Form




**CONFIDENTIAL
(HIDDEN)****(2) Cost Borne by the Government of Samoa**

Description	Estimated Cost (Samoan Tala)	Converted to JPY (million Yen)
Rehabilitation of access road	230,000	10.3
Alternation of usage of oil tank from oil storage to water storage		
TOTAL	230,000	10.3

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(HIDDEN)**

Major Undertakings and Cost Estimation to be borne by the Samoan side

Items	Samoan Tala	Converted to Japanese Yen
Obtainment of environmental approval from PUMA	2,000	90,000
Obtainment of construction including execution permit from Ministry of Works, Transport and Infrastructure	-	-
Preparation of temporary yard	-	-
Necessary arrangement and coordination on the Port Operation during construction works		
- Safety notice to the port users		
- Coordination of ship berthing operation	-	-
- Coordination of mooring line positioning of container ships and tankers		
- Loading/unloading operation by Ro-Ro ramp		
Assignment of technical staff for repair and rehabilitation work of tug boats	-	-
Bank fees (B/A, A/P and payment commissions)	338,300	15,100,000
Total	340,300	15,190,000




Annex-3 Progress Chart for the Undertakings by the Samoan side

Undertakings	Year	2015				2016				2017				
		3	6	9	12	3	6	9	12	3	6	9	12	
Project Implementation (Grant Aid)	E/N, G/A		▲											
	Detailed Design													
	Tender Notice			▲										
	Contract with Contractor				▲									
Construction and Procurement Work														
Obtainment of environmental approval from PUMA		▽												
Obtainment of construction and execution permit from Ministry of Works, Transport and Infrastructure				▽										
Preparation of temporary yard			▽											
Rehabilitation of access road (already completed)														
Alteration of usage of oil tank from oil storage to water storage									▽					
Necessary arrangement and coordination on the Port Operation during construction works	Safety notice to the port users			▽										
	Coordination of ship berthing operation													
	Coordination of mooring line positioning of container ships and tankers													
	Loading/unloading operation by Ro-Ro ramp													
Assignment of technical staff for repair and rehabilitation work of tug boats														
Bank fees		▽B/A, A/P												
Open bank account and arrange Authorization to Pay									▽ A/P					

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Annual Maintenance Cost (including Existing Facilities)

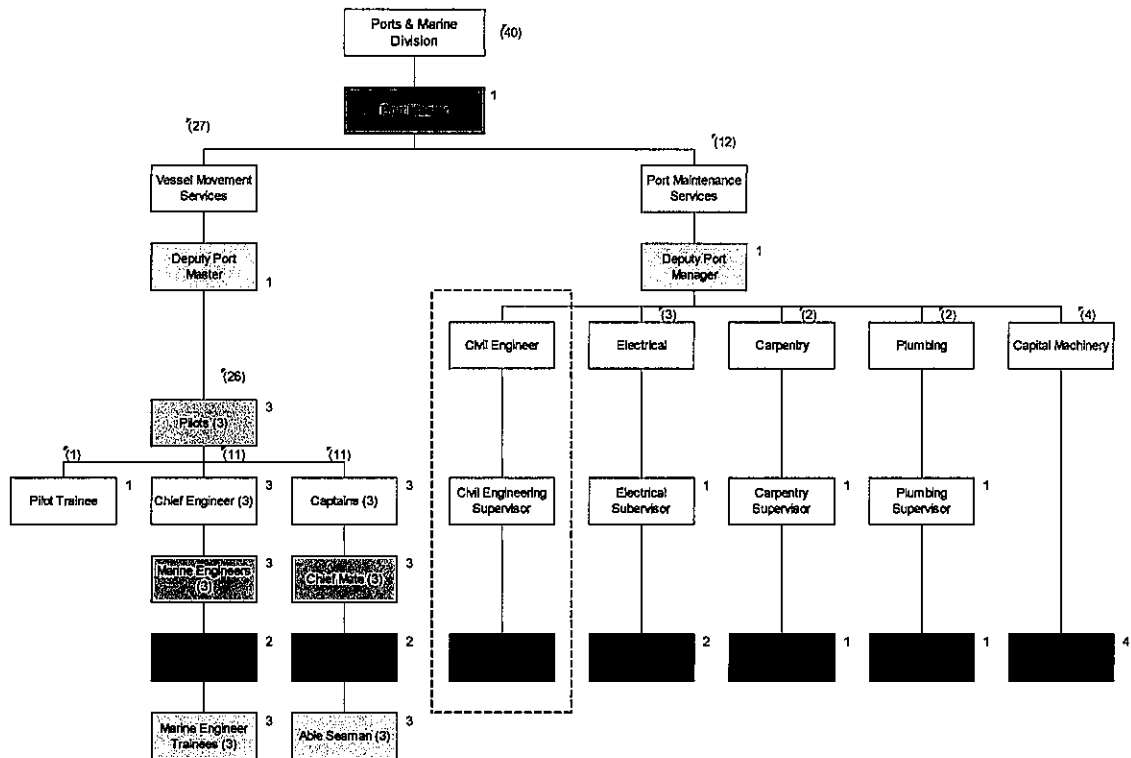
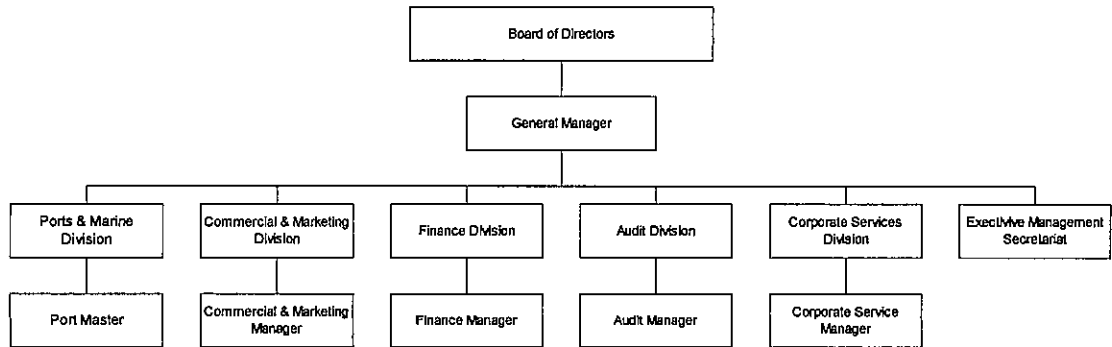
Facility	Maintenance Items	Samoan Tala	Converted to Japanese Yen
Fender	<ul style="list-style-type: none"> - Regular inspection and replacement as necessary of frontal frame - Regular inspection and replacement as necessary of fixing devices, chain and others - Maintenance paints of steel members 	25,000	1,116,000
Bollard and Bit	<ul style="list-style-type: none"> - Regular paint for corrosion protection paints 	5,000	223,000
Navigation Aids	<ul style="list-style-type: none"> - Regular inspections - Battery replacement - Generator panel maintenances 	25,000	1,116,000
Wharf concrete	<ul style="list-style-type: none"> - Repair of concrete crack - Repair of pile head of old wharf and other parts as a maintenance 	50,000	2,232,000
Container Yard	<ul style="list-style-type: none"> - Maintenance (repair) of concrete pavement, re-paint of marker paints - Replacement of yard light lumps, plugs of reefer containers - Maintenance of pipelines 	90,000	4,418,000
Road and Fences	<ul style="list-style-type: none"> - Overlay of asphalt pavement - Maintenance paints of fences - Regular inspection and replacement as necessary of rollers of movable fences 	50,000	2,232,000
Tug Boats	<ul style="list-style-type: none"> - Regular maintenance at dock yard (every two years) - Removal of stuck obstacles to the ship bottom - Maintenance paints to the ship bodies and other parts as necessary - Regular maintenances of engines, pumps, regular replacement of lubricant oils - Regular maintenance of rigging and/or fitting devices 	135,000	6,026,000

Organization Improvement (Civil Engineer & Staff)	- Civil Engineer (1 person) - Staff (2 persons)	120,000	5,356,000
Total		500,000	22,719,000

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Organization of Port and Marine Division, SPA (Plan)



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Annex-6 Environmental Checklist

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1 Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process?	(a) N	(a) An EIA report will be prepared based on the requirement of the environmental procedure in Samoa by the end of January, 2015. (b) SPA will be responsible for the procedure and it is expected to get the approval by the end of April, 2015. (c) The requirements from PUMA are covered. Therefore, no additional condition for the approval is considered. (d) Approval of Development Consent by PUMA is sufficient.
		(b) Have EIA reports been approved by authorities of the host country's government?	(b) N	
	(c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied?	(c) N		
(d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(d) N			
2 Pollution Control	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders?	(a) Y	(a) SPA held a stakeholder meeting to explain the project and to get agreements from the stakeholders on January 16, 2015. (b) SPA answered to the opinions and concerns on the stakeholder meeting, and will include them into the plan of the project if necessary.
		(b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(b) Y	
	(3) Examination of Alternatives	(a) Y	(a) Alternative plans at neighbor areas have been examined including environmental and social items.	
2 Pollution Control	(1) Air Quality	(a) Do air pollutants, such as sulfur oxides (SOx), nitrogen oxides (NOx), and soot and dust emitted from ships, vehicles and project equipment comply with the country's emission standards? Are any mitigating measures taken?	(a) Y	
		(a) Do effluents from the project facilities comply with the country's effluent and environmental standards?	(a) Y	(a) Any facilities will not be modified or constructed, so that the volume of effluent won't change. Since Samoa does not have effluent standard and environmental standard, Australian standard was applied to compare with the present situation in the port area, which almost parameters satisfy the standard. Coliform bacteria exceeds the standard due to influence of river water.
		(b) Do effluents from the ships and other project equipments comply with the country's effluent and environmental standards?	(b) Y	(b) Although there is no effluent standard and environmental standard in Samoa, discharged water from ships will be regulated based on the MARPOL Convention (Annex IV) and Marine Pollution Prevention Act 2008.
		(c) Does the project prepare any measures to prevent leakages of oils and toxicants?	(c) Y	(c) Existing drainage ditches will perform to trap sediment and oil from land area. Oil spill prevention plan will be prepared.
		(d) Does the project cause any alterations in coastal lines and disappearance/appearance of surface water to change water temperature or quality by decrease of water exchange or changes in flow regimes?	(d) N	(d) Since reclamation is not planned and extended part of the wharf will be pile structure, which direction of the extended area is along with flow regime, the impact to the water exchange will be minor.
(e) Does the project prepare any measures to prevent polluting surface, sea or underground water by the penetration from reclaimed lands?	(e) N	(e) Reclamation will not be performed.		

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)	
2 Pollution Control	(3) Wastes	(a) Are wastes generated from the ships and other project facilities properly treated and disposed of in accordance with the country's regulations? (b) Is offshore dumping of dredged soil properly disposed in accordance with the country's regulations? (c) Does the project prepare any measures to avoid dumping or discharge toxicants?	(a)Y (b)Y (c)Y	(a)Wastes will be controlled based on MARPOL Convention (Annex V), Marine Pollution Prevention Act 2008 and Waste Management Act 2010. (b)Dredging is not planned in this project. (c)Same as of (a).	
	(4) Noise and Vibration	(a) Do noise and vibrations from the vehicle and train traffic comply with the country's standards?	(a)Y	(a)Noise will be controlled based on the Noise Policy 2011. Although a regulation for vibration does not exist in Samoa, the level will satisfy the regulation level in Japan, according to the prediction. During pile driving construction, which is the biggest emission source of noise and vibration, monitoring using equipment will be performed to confirm that noise and vibration by the construction satisfy the standard/regulation.	
	(5) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a)N	(a)Extraction of ground water will not be performed.	
	(6) Odor	(a) Are there any odor sources? Are adequate odor control measures taken?	(a)Y	(a)On the contents conversion of existing oil tanks, specialized agency will perform using equipment such as vacuum, paying attention not to leak the contents into the environment.	
	(7) Sediment	(a) Are adequate measures taken to prevent contamination of sediments by discharges or dumping of hazardous materials from the ships and related facilities?	(a)Y	(a)Waste water and wastes will not be discharged/dumped from ships/facilities based on the MARPOL Convention (Annex IV, V), Marine Pollution Prevention Act 2008 and Waste Management Act 2010.	
	3 Natural Environment	(1) Protected Areas	(a) Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a)Y	(a)The site is not located in a protected area, while a marine protected area exists behind the project area separated by a sea wall. Although any construction work such as dredging, which generates turbidity, is not planned, visual observation to confirm whether the construction impacts the area, including generation of turbidity, will be conducted during the construction.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
3 Natural Environment	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?	(a) Y	(a) Measures will be considered to avoid the impact by the project, since coral communities exist at the other side of the project site. (b) No habitats of endangered species designated by the country's laws or international treaties and conventions in the project area. At the river mouth at the other side of the project area, rare fish species was found. The area is turbid all the time and the impact by the project is not considered. (c) Although significant ecological impact is not considered, visual observation to confirm no existence of turbid area will be conducted. (d) ditto (e) No adverse affect to coastal flora and wildlife is considered.
		(b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?	(b) N	
		(c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?	(c) Y	
		(d) Is there a possibility that the project will adversely affect aquatic organisms? Are adequate measures taken to reduce negative impacts on aquatic organisms?	(d) Y	
		(e) Is there a possibility that the project will adversely affect vegetation or wildlife of coastal zones? If any negative impacts are anticipated, are adequate measures taken to reduce the impacts on vegetation and wildlife?	(e) N	
4 Social Environment	(3) Hydrology	(a) Do the project facilities affect adversely flow regimes, waves, tides, currents of rivers and etc if the project facilities are constructed on/by the seas?	(a) N	(a) Since the construction is extension of existing wharf, alongside of tidal current direction, adverse impact to flow resume, wave and tide is considered. (a) The project does not require any large scale changes of topographic/geographic features or cause disappearance of the natural seashore. (a)-(j) Land acquisition and resettlement are not necessary, because the site is within the existing port area and owned by the project owner.
		(4) Topography and Geology	(a) N	
		(1) Resettlement	(a) N	
		(1) Resettlement	(a) N	
		(1) Resettlement	(a) N	
4 Social Environment	(1) Resettlement	(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?	(a) N	(a) N (b) N (c) N (d) N (e) N (f) N (g) N (h) N (i) N (j) N
		(b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?	(b) N	
		(c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?	(c) N	
		(d) Are the compensations going to be paid prior to the resettlement?	(d) N	
		(e) Are the compensation policies prepared in document?	(e) N	
4 Social Environment	(1) Resettlement	(f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?	(f) N	(a) N (b) N (c) N (d) N (e) N (f) N (g) N (h) N (i) N (j) N
		(g) Are agreements with the affected people obtained prior to resettlement?	(g) N	
		(h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?	(h) N	
		(i) Are any plans developed to monitor the impacts of resettlement?	(i) N	
		(j) Is the grievance redress mechanism established?	(j) N	

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
4 Social Environment	(2) Living and Livelihood	(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?	(a) Y	(a) Although adverse impact to the traffic near to the site is considered during the construction, the influence will be minor as the increment of number of vehicle is small. The construction schedule will be informed to the public in advance. (b) Adverse impact to the use of water area will not be considered. (c) Same as of (a). (d) Immigration from other area by the project is not considered.
		(b) Is there a possibility that changes in water uses (including fisheries and recreational uses) in the surrounding areas due to project will adversely affect the livelihoods of inhabitants?	(b) N	
		(c) Is there a possibility that port and harbor facilities will adversely affect the existing water traffic and road traffic in the surrounding areas?	(c) Y	
		(d) Is there a possibility that diseases, including infectious diseases, such as HIV will be brought due to immigration of workers associated with the project? Are considerations given to public health, if necessary?	(d) N	
	(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(a) N	(a) There is no archeological, historical, cultural, and religious heritage near the site.
		(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N
(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples?	(a) Y	(a) Since indigenous fisher men manages informal small scale net fishing at the river mouth in the bay head, consideration will be measured on construction phase, such as operation of construction vessels, not to impact their activity.	
	(b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(b) N	(b) No adverse impacts on the land and resources of ethnic minorities and indigenous peoples is considered, because any villages of them do not exist near the site.	
(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project?	(a) Y	(a) The project proponent will follow the related laws/regulations of Samoa.	
	(b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials?	(b) Y	(b) Safety measures such as installment of protection fence for the management building and caution signboard are planned.	
(6) Working Conditions	(c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.?	(c) Y	(c) Safety training, including traffic safety and public health, and education program for respect to the local society for workers are planned.	
	(d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(d) Y	(d) Local employment will be prioritized and respect to local culture will be instructed to the workers.	

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
	(1) Impacts during Construction	<p>(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?</p> <p>(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?</p> <p>(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?</p>	<p>(a) Y (b) N (c) N</p>	<p>(a) Construction load will be minimized and environmental monitoring such as dust, noise/vibration, fume and turbid water will be performed daily basis by equipment or observation to confirm no adverse impact to the surrounding area.</p> <p>(b) It is considered that adverse impact to ecosystem will be minor by conducting daily monitoring for turbid water. Other impact to the natural ecosystem is not considered.</p> <p>(c) Although traffic increment during construction is small, measures to minimize the impact will be considered and the impact will be confirmed by the periodical interview with the residents.</p>
5 Others	(2) Monitoring	<p>(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?</p> <p>(b) What are the items, methods and frequencies of the monitoring program?</p> <p>(c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?</p> <p>(d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?</p>	<p>(a) Y (b) Y (c) Y (d) Y</p>	<p>(a) Monitoring plan for noise and vibration has been established. Since other impact factors, such as turbid water, dust and traffic are minor, qualitative monitoring are planned.</p> <p>(b) Area and methodology to know the influence of the impact have been determined, considering the construction method and characteristic of the impact by the construction.</p> <p>(c) As the impact by the project is comparatively minor and the duration is not long, self monitoring by the contractor and the project owner are planned.</p> <p>(d) Format and frequency for monitoring report to the regulatory authorities are identified in the Environmental Management Plan.</p>

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
6 Note	Note on Using Environmental Checklist	<p>(a) Where necessary, impacts on groundwater hydrology (groundwater level drawdown and salinization) that may be caused by alteration of topography, such as land reclamation and canal excavation should be considered, and impacts, such as land subsidence that may be caused by groundwater uses should be considered. If significant impacts are anticipated, adequate mitigation measures should be taken.</p> <p>(b) If necessary, the impacts to transboundary or global issues should be confirmed, if necessary (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).</p>	(a)N (b)N	<p>(a) Influence to the ground water system, such as decrease of water level or salination, or ground subsidence by usage of ground water is not considered.</p> <p>(b) Possibility of transboundary impact by the project is not considered, because the site is located at north side of the central point of the main island.</p>



- 1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made.
In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).
- 2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.



Environmental Monitoring Form (Pre-construction and Construction Phase)

(1) Response/Actions to Comments and Guidance from Government Authorities and the Public

Monitoring Item	Monitoring Results during Report Period
Number and contents of formal comments made by the public	
Number and contents of responses from Government agencies	

(2) Pollution

Air quality

Business day	Situation of air quality, dust	Diagnosis and measures
1		
2		
3		
.		

Water quality, protected area, Ecosystem

Business day	Precipitation	Status of water quality	Status of water drainage	Diagnosis and measures
1	Yes / No			
2	Yes / No			
3	Yes / No			
.				

Water quality (Abnormal situation)

Business day	Parameter	Unit	St.1	St.2	St.3	St.4	St.5	Standard value*	Judgment
Day 1	Turbidity	NTU						1-20	
Date:	pH	-						8.0-8.4	
	T-N	mg/L						0.1	
	T-P	mg/L						0.015	
	COD	mg/L						-	
	Oil and grease	mg/L						-	
	Chromium Hexavalent	mg/L						0.020	
	Lead	mg/L						0.007	

Business day	Parameter	Unit	St.1	St.2	St.3	St.4	St.5	Standard value*	Judgment
Day 3 Date:	Turbidity	NTU						1-20	
	pH	-						8.0-8.4	
	T-N	mg/L						0.1	
	T-P	mg/L						0.015	
	COD	mg/L						-	
	Oil and grease	mg/L						-	
	Chromium Hexavalent	mg/L						0.020	
	Lead	mg/L						0.007	
Day 5 Date:	Turbidity	NTU						1-20	
	pH	-						8.0-8.4	
	T-N	mg/L						0.1	
	T-P	mg/L						0.015	
	COD	mg/L						-	
	Oil and grease	mg/L						-	
	Chromium Hexavalent	mg/L						0.020	
	Lead	mg/L						0.007	
Day 7 Date:	Turbidity	NTU						1-20	
	pH	-						8.0-8.4	
	T-N	mg/L						0.1	
	T-P	mg/L						0.015	
	COD	mg/L						-	
	Oil and grease	mg/L						-	
	Chromium Hexavalent	mg/L						0.020	
	Lead	mg/L						0.007	

*: Since an environmental standard is not available in Samoa, Australian and New Zealand Environment and Conservation Council (ANZECC), 2000, Australian and New Zealand Guidelines for Fresh and Marine Water Quality – Chapter 3 – Aquatic Ecosystem, Tropical Australia were referred. The values for Chromium Hexavalent and Lead were referred to the values of the Level of protection=90 % species in the guideline mentioned above, which are similar values of the Environmental Quality Standards for Human Health by the Ministry of Environment, Japan.

Waste (Construction area)

Business day	Waste contents	Volume (m ³)	Way of treatment
1			
2			
3			
:			

On

By

Soil pollution and Odor during tank content conversion

Business day	Method	Status of soil pollution	Status of odor generation	Diagnosis and measures
1				
2				
.				

Noise and vibration

Item (Unit)	Measured value (Average)	Measured value (Max)	Local standard	Other standard*	Frequency (Pile driving)	Equipment	Location
Noise (dB)			75 (7AM-6PM)	-	10 minutes 2 times/day	Sound meter	Boundary
			65 (7AM-6PM)	-			Road side
Vibration (dB)			-	75 (7AM-7PM)		Vibration meter	Boundary
			-	70 (7AM-7PM)			Road side

Note: L_{eq} for Noise level and L_{v10} for Vibration level shall be used as an average.

*: Control criteria of the Vibration Regulation Law (Ministry of Environment, Japan, 1976) are referred.

Sediment pollution

Business day	Situation of disturbance of sea bed	Diagnosis and measures
1		
2		
3		
.		

(3) Social environment

Category	Item	Method	Frequency	Status
Living and Livelihood	Traffic jam	Observation	1 time/week	
	Noise and vibration	Interview		
Ethnic Minorities and Indigenous Peoples	Inconvenience of fishing	Interview	As required	

Category	Item	Method	Frequency	Status
Working conditions	Status of HSE program	Confirmation of monthly construction report	1 time/month	
Accident	Status of HSE program	Confirmation of monthly construction report	1 time/month	

HSE: Health, Safety and Environment




Monitoring Form (Operation Phase)

(1) Response/Actions to Comments and Guidance from Government Authorities and the Public

Monitoring Item	Monitoring Results during Report Period
Number and contents of formal comments made by the public	
Number and contents of responses from Government agencies	

(2) Social environment

Category	Item	Method	Frequency	Status
Accident	Status of HSE program Safety of passenger circulation	Confirmation of monthly operation report	1 time/month	

Op

ly

Memorandum of Discussions for the Outline Design
on
the Preparatory Survey for
the Project for the Enhancement of Safety in Apia Port
in the Independent State of Samoa

Samoa Ports Authority (hereinafter called “SPA”) and the Oriental Consultants Co., Ltd. on behalf of JICA Survey Team (hereinafter called “the Team”) are confirmed the following items.

1 Outline Design

The outline design of the Project will be conducted in Japan based on the Minutes of Discussions which was signed on July 4, 2014 between the JICA and the Samoan Government (hereinafter “the Minutes”) and the survey results which was conducted by the Team during their stay (from July 1 to August 8, 2014) in Samoa.

The Team explained to SPA about their survey results and preliminary concept for the outline design of the Project as hereunder. However, contents, components, scale and dimensions and other details of the Project are subject to further study to be finalized based on the discussions in Japanese side.

(1) Extension of New Wharf

The new wharf extension was planned as shown in the Appendix-01, General Concept of Port Layout Plan. The wharf length was determined by the frequently called ship sizes, simultaneous berthing conditions and cruiser ship dimensions. The analysis of vessel dimensions and berthing patterns are conducted by the available actual vessel calling records with ship dimensions from February 2013 to January 2014.

(2) Container Yard Rehabilitation

1) General Concept for the Rehabilitation

The rehabilitations of existing container yard were considered in the Project. The main components of the rehabilitations were i) rehabilitation/smoothing of the damaged area, ii) smoothing of the different yard elevation area and, iii) rehabilitation of damaged pile supported deck area. Basic concept for the yard rehabilitation is as shown in the Appendix-02. In addition to this, behind area of the extended the new wharf was planned to utilize as the container yard area.

The results of the inspection of the under deck concrete conditions of the pile supported deck type container yard area are as shown in Appendix-03. As shown in the Appendix-03, the covered concrete of mostly in all area of the under deck concrete slab were pealed-off and reinforcement bars were disposed and heavily corroded. This facility is structurally very dangerous situations, therefore, as similar as the present operations, it is recommended that the area shall be strictly controlled as the no admittance area until the rehabilitation of the deck is completed to avoid accident. All beam and slab concrete members will be replaced in the Project as shown in the Appendix-04.



2) Comments by the Team

New container lot layout is recommended as shown in the Appendix-05. Container yard capacity can be increased by the yard rehabilitation and construction of the behind area of extension new wharf. For the safety and smooth movement of container trailer and container cargo handling equipment, space for the container stacking lots shall be minimum 15m as shown in the Appendix-05.

As stated in the Minutes, Apia Port can afford the future cargo handling demand up to around 80,000 TEU and has sufficient potential and capacity to play a role of the main international port in the South Pacific region.

(3) Fender Rehabilitation

Fenders of the existing new wharf will be rehabilitated with the same type fender of the extension wharf. Durable fender type will be selected considering the vessel movement during berthing due to strong winds and swell.

(4) Mooring Facilities

An additional mooring dolphin with 100-tons-capacity was planned at the location indicated in the Appendix-01. Similar capacity bollards of existing new berth will be provided along the extended wharf.

(5) Passenger Flow

Separation of passenger flow and cargo handling operations should be ensured from the safety point of view. A concept for the passenger flow route was recommended as shown in Appendix-05. The passenger path from wharf to the front of maritime office building, the area where is alternatively used for cargo handling operations and passenger path, shall be indicated as the passenger path lane on the paved surface and passenger flow separation shall be ensured by the movable fence during cruiser ship entering to the port. Approximately 70m movable fence will be considered in the Project. Permanent fence for separation of the container yard area and passenger route is improving by SPA with their own expense at present.

(6) Tug Boats

Based on the inspection of the tug boats, the Team identified the items to be maintained and repaired are summarized as shown in the Appendix-06. According to the present conditions, the Team considered the followings;

1) Life-prolonging treatment and maintenance concept in the Project

About 10 years life-prolonging by the minimum expense were planned in this Project. The components are:

1. Bulwark and deck repair

Bulwark and deck repair works should be prioritized. The necessary materials of the repair works are to be supplied by the Project and the repair works are to be carried out by SPA.

2. Engine Maintenance

Engine maintenance on board by the specialist will be planned by the Project.



3. Equipment Repair

The important and minimum required equipment such as radar, compass (magnet type only) and GPS will be repaired by the Project.

Echo sounders will not be included in the Project considering to the present operation conditions.

2) Insulation Resistance Test

Before conducting bulwark and deck repair, the Team recommended execution of insulation resistance test by SPA with its expense.

3) Request by the Team

The Team pointed out that SPA can be and should be take appropriate actions for maintenance and repair of the Tug Boats. Among the items summarized in the Appendix-06, there are many items that SPA can be done by their own skills and efforts. The team requested to SPA to perform the possible works as soon as practical, especially:

1. To record log book accordingly
2. To ensure the maintenance records of the tug boats
3. To conduct regular replacement of lubricant
4. To manage the engine cooling water temperature
5. To remove biofouling of underwater ship bottom by diver one time per year
6. Other necessary routine maintenance works stated in the Appendix-05

(7) Navigation Aids

The concept for the rehabilitation and the upgrading of navigation aids are as follows. The locations of these aids are as shown in the Appendix-07.

1) Leading light

Front: No treatment was planned since the present conditions is good

Rear: Existing lump will be replaced to the LED lump.

2) Marker lights at the port entrance

Two (2) marker beacons (red and green) with pile supported, LED lumps will be installed..

3) Others

Followings beacons and buoys will be installed.

- a. One (1) marker beacons at shallow area
- b. Breakwater food indicator buoy

(8) Port Basin

About less than 5,000 cu.m (exact volume to be studied) dredging is necessary to maintain the -11.0m water depth in front of wharf area. The planned dredging areas are as shown in the Appendix-08.



(9) Others

1) Oil Fence

SPA requested the Team to provide oil fence for enhancing the safety against oil spills by the ship. SPA pointed out that the oil fence shall be equipped to meet the requirements of MARPOL Conventions.

The Team explained that silt fence, which is necessary for the dredging work for avoiding dispersion of turbidity, can be used for the oil fence, although this matter shall be discussed with JICA in Japan.

2) Pipelines

The Japanese side will provide oil supply pipe duct. Modification and installation of pipes will be by Samoan side. (Oil pipes owned and managed by PPS.)

2 Environmental Matters

As stated in the Minutes signed on July 4, 2014 between JICA and Samoan Government, SPA requested to conduct the necessary procedure concerning the environmental assessment and submit required environmental report of the Project to the PUMA. SPA and the Team were confirmed the following necessary items, procedures and schedule.

1) Development consent

The Planning and Urban Management Agency (PUMA) Act 2004 regulates the responsibility of a project owner (SPA) to submit a Development Consent Application Form upon implementation of construction project. Other documents, such as project components, drawings, EIA report (IEE report will be used instead, this time) and a report of stakeholder meeting, shall be attached with the application form.

2) Stakeholder meeting (Public consultation)

According to the PUMA guideline 2007, SPA is requested to conduct a stakeholder meeting and a report of stakeholder meeting (public consultation) shall be attached with the application form mentioned above. SPA requested a draft of the outline of the Project to be made available for public consultation in the beginning of December or earlier. The Team will provide the power point presentation of project outline (draft) by the end of November or earlier.

3) Report

SPA requested that the report by the Project including IEE report shall be finalized by the beginning of January 2015. So that SPA will be able to submit the Development Consent Application Form to PUMA by the end of January 2015.

4) Development consent approval

The approval of the Development Consent including EIA report (IEE report will be used instead, this time) is supposed to be obtained by SPA before April 2015, which the Cabinet approval of the Project by the Government of Japan is scheduled.

5) Disposal land area of the dredged material

SPA and the Team discussed about the land area for the disposal of dredged material. At moment, SPA plans the backyard of the SPA head office as the candidate site.



The site will be decided by SPA and reported to the Team by the end of September 2014.

In case the backyard area is used as the disposal site, necessary measures to reduce turbid water from the dredged material will be considered by SPA. Especially, measures to avoid discharge of seepage water to the Palolo Deep (Marine Protected Area) will be carefully considered by SPA.

6) Port area registration

SPA was requested to register newly developed area to be available for the Project implementation according to the Land Registration Act 1992/1993.

Further details are as shown in the Appendix-09.

3 Necessary Permissions for the Project

(1) Development consent

SPA was requested to obtain the Development consent, including EIA report, approval for the Project implementation as confirmed as above item 2.

(2) Port area registration

SPA was requested to register the port area as necessary for the Project implementation as confirmed as above item 2.

(3) Construction Permit

SPA was requested to obtain necessary permits for the Project implementations such as construction permit of wharf extensions, beacons and buoys installations, dredging and dumping of the dredged materials and others as necessary.

4 Operation and Maintenance

It was confirmed that the basic operation and maintenance conditions conducted by the SPA are as follows.

(1) Jurisdiction of operation and maintenance

Jurisdiction of operation and maintenance of the facilities and/or equipment provided by the Project under the SPA organization is Port and Maritime Division.

(2) Technical Staff in SPA

In the Ports and Marine Division, there are two (2) sub-divisions of Vessel Movement Services and Port Maintenance Services. Vessel Movement Service Division provides the services of pilot, tug attend and tug boat maintenance for vessel calling to the Apia port. Port Maintenance Services Division has responsible for the maintenance of all the port facilities.

Under the Port Maintenance Service Sub-Divisions, there are four (4) Sections namely, Electrical, Carpentry, Plumbing and Capital Machinery, however, there are no civil engineering sections and personnel.

SPA explained that the SPA is taking effort to hiring the clarified civil engineers to maintain the sustainability and the modifications of the organizations is considering as indicated in the Appendix-10. SPA also explained that SPA employees the Civil Engineer and the Consultants from time to time as necessary at present.



(3) Necessary Cost and Budget Allocations

The Team explained maintenance costs preliminarily as shown in the Appendix-11. The necessary costs will be studied further by the Team and will be presented in the Draft Report which will be submitted and explained in January 2015 (scheduled). SPA was requested to ensure the proper use and maintenance of the facilities and/or equipment provided by the Project including the budget allocations of the necessary costs.

5 Questionnaire Survey

The team explained about “the Baseline Survey” and its necessity for the Project Evaluation by comparing the evaluation indices before and after the Project. Questionnaire survey to the ship crew and terminal operators are conducting as the baseline survey to set up the Project Evaluation Indices. During stay of the Team in Apia, the Team conducted 9 surveys to the ship crews and 6 surveys to the port users. The tentative results and the Questionnaires are as shown in the Appendix-12. The Team requested to SPA to continue the survey until by the end of October to expand the number of samples. SPA agreed to conduct the survey and collected the answers of questionnaires and will be sent to the Team by e-mail. Person in charge of this survey in SPA is Commercial & Marketing Manager.

6 Undertakings between Japanese side and Samoan side

“Major Undertakings to be taken by Each Government” stated in Annex-5 of the Minutes which was signed on July 4, 2013 should be reminded as agreed.

Followings are the further details of the said undertakings and confirmed as follows between SPA and the Team.

- 1) To prepare the Project Area (land and water area) including necessary port area registration as confirmed in the above item 6) in 2.
- 2) To obtain the Development Consent approval, including EIA for the Project implementation as confirmed as above item 2 and item (1) in 2.
- 3) To obtain the necessary construction permit for the Project as confirmed in the above item (2) in 3.
- 4) To ensure all the necessary operation and maintenance with staffing and budget allocations as confirmed in the above item 4.

7 Coordination during Implementation Stage

Since the port operations will not be able to stop during the implementation period. On the other hand, only the existing new berth will be available to use for ship berthing and loading and unloading operations during the construction period since the new berth will be extended in front of the old wharf. SPA and the Team discussed and confirmed the followings.

1) Cruise ship berthing

When the cruiser ship entering to the port, the Japanese side will consider to provide temporary protections may be as shown in the Appendix-13. The protections are only for ship body protection, no functions to absorb the force of ship berthing. Therefore, SPA was requested to coordinate with the cruiser ship for careful operations i) to take anchor (incase portside berthing) or to take mooring line to the

existing mooring buoy (incase starboard berthing) to avoid hit to the temporary protection and ii) to ask for available passenger bridge is limited only two.

2) Ro-Ro ship berthing

Based on the present operation conditions, one Ro-Ro ship (Coral Islander II) is calling about once a month. Because of the dimensions of ship and wharf, Ro-Ro rump is able to use only on the old wharf, therefore, the ship will not be able to operate her Ro-Ro rump during the implementation period. In this regard, the Team presented an idea to provide the temporary deck for the Ro-Ro rump operation, however, SPA pointed out that during rough sea seasons, the loading and unloading operations are conducted by ship gears not by the rump, therefore, SPA may be able to coordinate with shipping line for operation using for the ship gears.

3) Other necessary coordination

During implementation of the Project, simultaneous ship berthing will not be available, and it may be necessary for safety coordination with the ship operations and construction works such as pile driving, concrete casting, dredging and other works. SPA and the Team confirmed that the further detailed and necessary coordination will be conducted by the related parties (SPA, the Consultants and the Contractor when the implementation stage) as necessary and effectively.

8 Necessary expenses to be born by the Samoan side

Inconformity with the Japanese Grant Aid Scheme, fees and expenses of the following items shall be born by the Samoan side. The necessary cost will be estimated by the Team in this Preparatory Survey and will be informed to the SPA. SPA will review all the necessary expenses and reflect to their budget allocations and/or coordinates with Samoan government if necessary.

(1) Implementation stage

- 1) Bank commissions for B/A and A/P
- 2) Exemption taxes
- 3) Cost for supervisory works of SPA personnel
- 4) Fee for trainee for Initial Guidance (accommodation and transportation costs if necessary)

(2) Operation and maintenance cost

- 1) Staff salary
- 2) Repair and treatment cost for tag boats
- 3) Annual maintenance fee for facilities and/or equipment

Necessary cost for the operation and maintenance will be presented in the draft report which is scheduled to submit on January 2015. SPA will allocate the necessary budget based on the inputs by the draft report.




Above items were confirmed and agreed between SPA and the Oriental Consultants Co., Ltd. on behalf of JICA Survey Team.

Apia, August 6, 2013



Mr. Tufuga To'oalo Fagaloa Tufuga
General Manager
Samoa Ports Authority
Independent State of Samoa

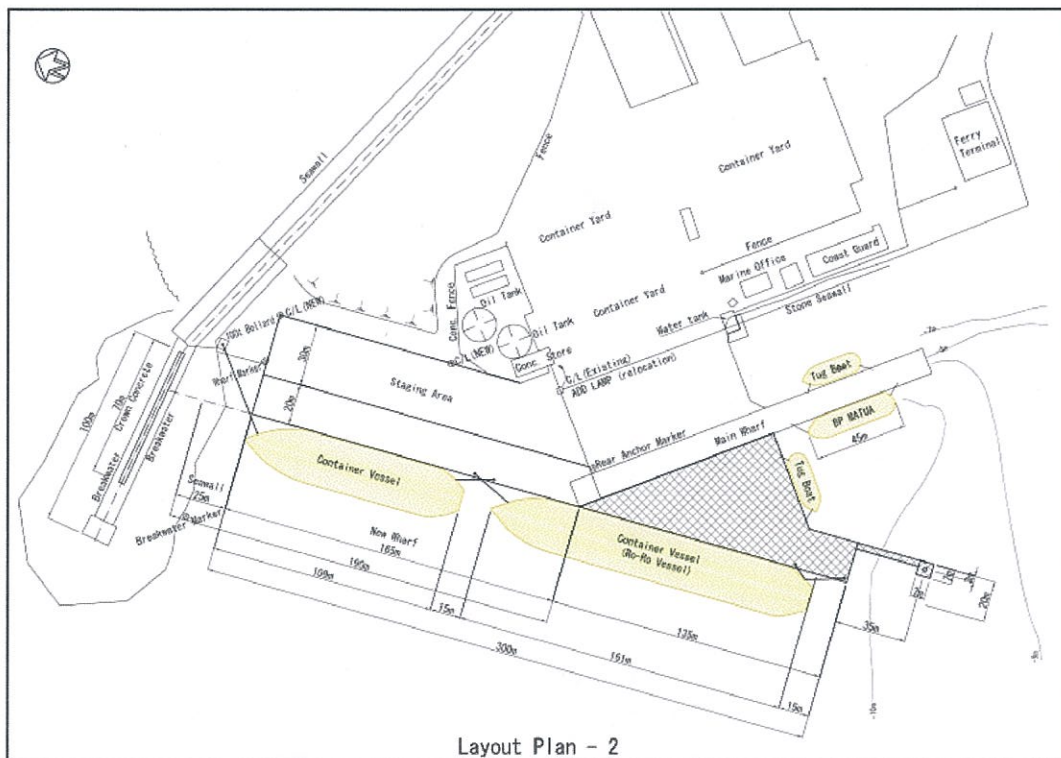
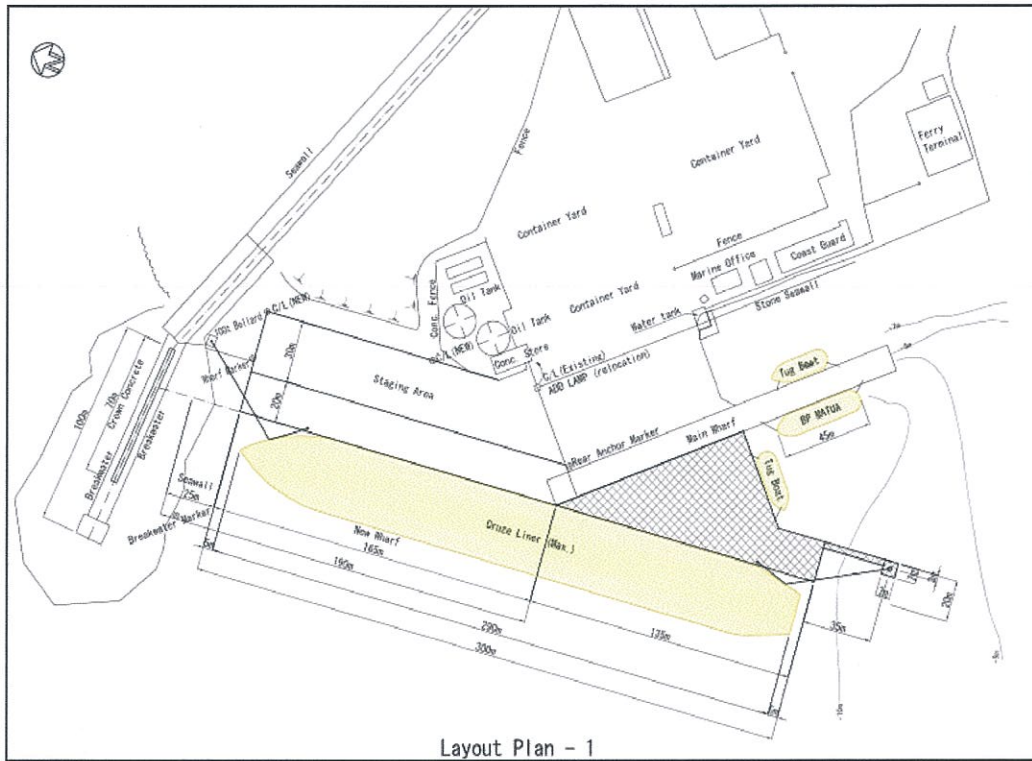


Mr. Masahiko Koshimizu
Chief Consultants
Oriental Consultants Co., Ltd.
on behalf of
JICA Survey Team

Appendices

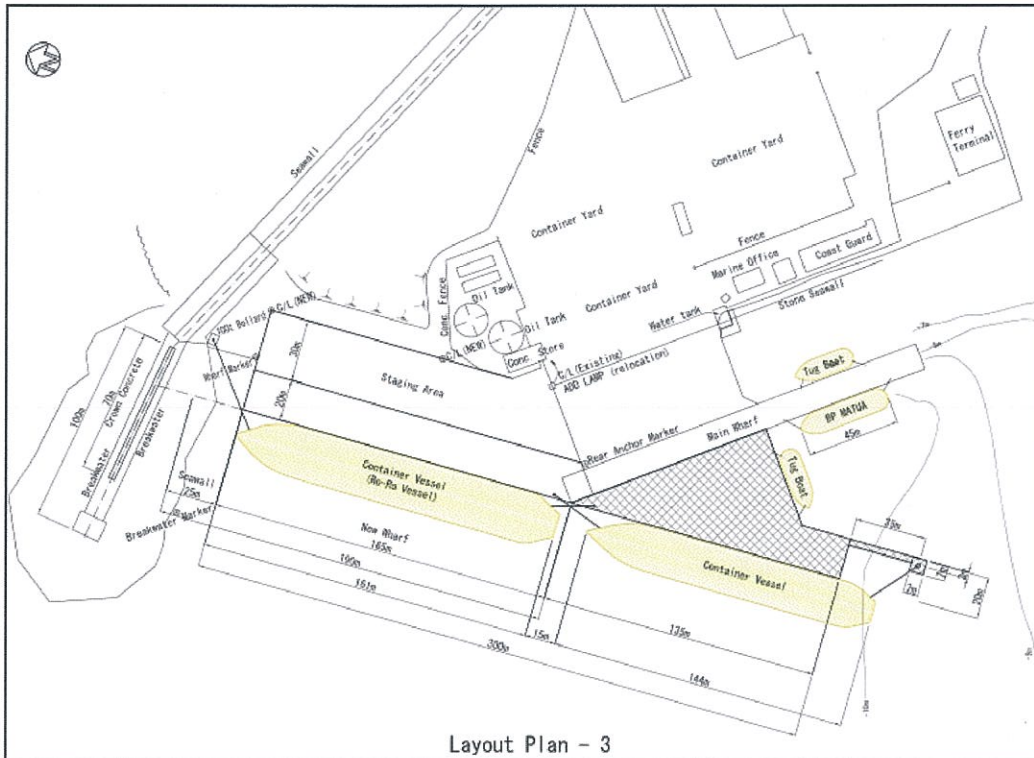
- Appendix-01 General Concept of Port Layout Plan
- Appendix-02 Basic Concept of Container Yard Rehabilitation
- Appendix-03 Inspection Results of Under Deck Conditions of Pile Supported Deck Type Container Yard
- Appendix-04 General Concept for the Rehabilitation of the Damaged Pile Supported Deck Type Container Yard
- Appendix-05 Recommendation for the Container Terminal Operations and Recommended Concept for Passenger Flow
- Appendix-06 Inspection Results of Tug Boats
- Appendix-07 Rehabilitation and Upgrading Concept of Navigation Aids
- Appendix-08 Planned Dredging Area
- Appendix-09 Necessary Process for Development Consent Approval to be conducted by SPA
- Appendix-10 Improvement Plan of SPA Organization for Civil Engineering Division
- Appendix-11 Preliminary Estimation of Necessary Annual Maintenance Costs
- Appendix-12 Tentative Results of Questionnaire Survey (Baseline Survey) and Questionnaires
- Appendix-13 Concept for Ship Berthing Operations during Implementation

General Concept of Port Layout Plan



A01-1

A4-3-9



Layout Plan - 3

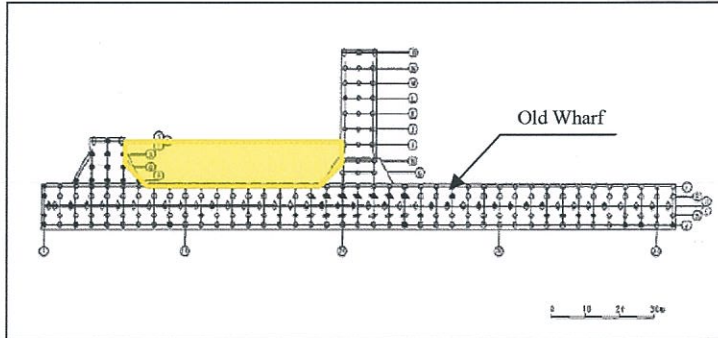
A01-2

A4-3-10

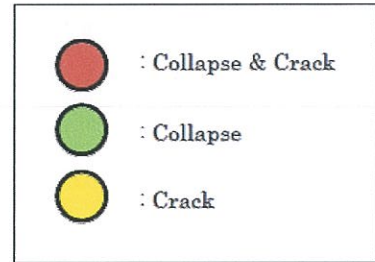
Basic Concept of Container Yard Rehabilitation



Inspection Results of Under Deck Conditions of Pile Supported Deck Type Container Yard



Key Plan



Legend

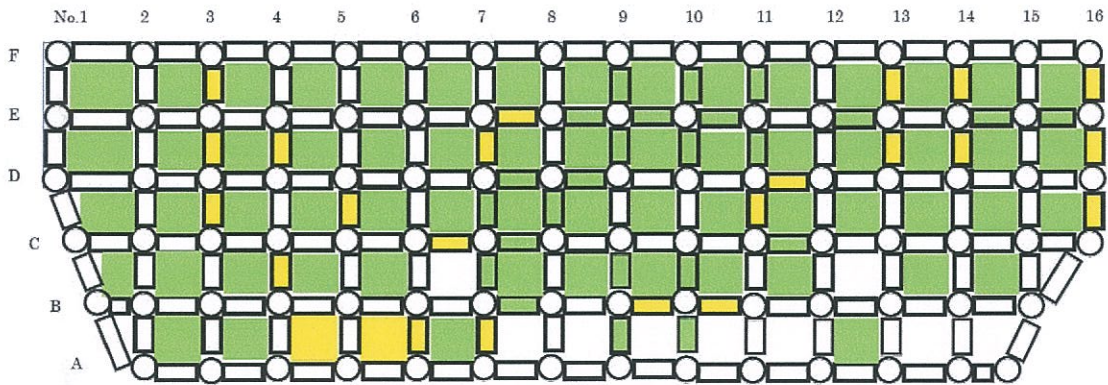


Photo-1 : Under Deck Slab Condition
Almost similar situations of collapsed slab concrete. Covered concrete was peeled off and re-bar was exposed and corroded. Very danger conditions.

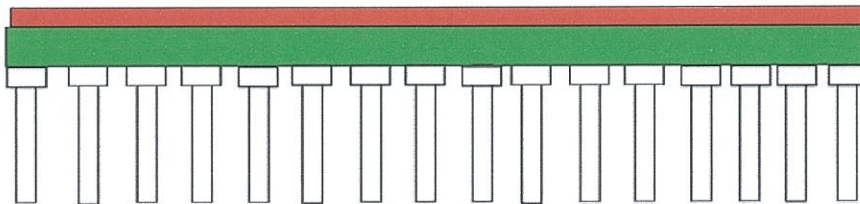
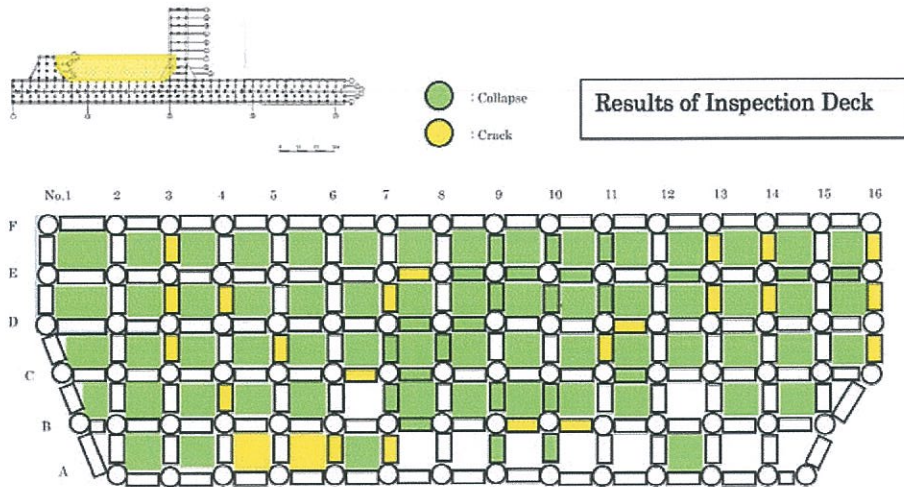


Photo-2 : Beam and Pile Head
Almost all pile heads are relatively good but some part of beams are damaged and danger situations.

A03-1

A4-3-12

General Concept for Rehabilitation of the Damaged Pile Supported Deck Type Container Yard



Planned to be replaced

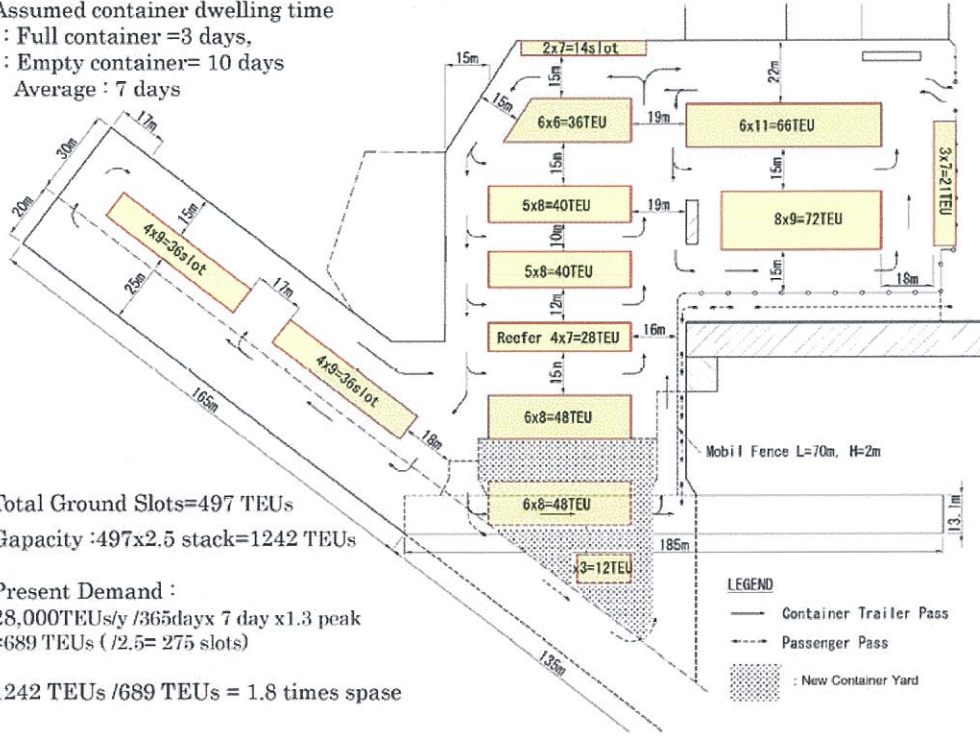
- ← Concrete (RC) Slab : All of Slab shall be replaced
- ← Concrete (RC) Beam : All of Beam shall be replaced

Heavy damages and Loading conditions has been changed.

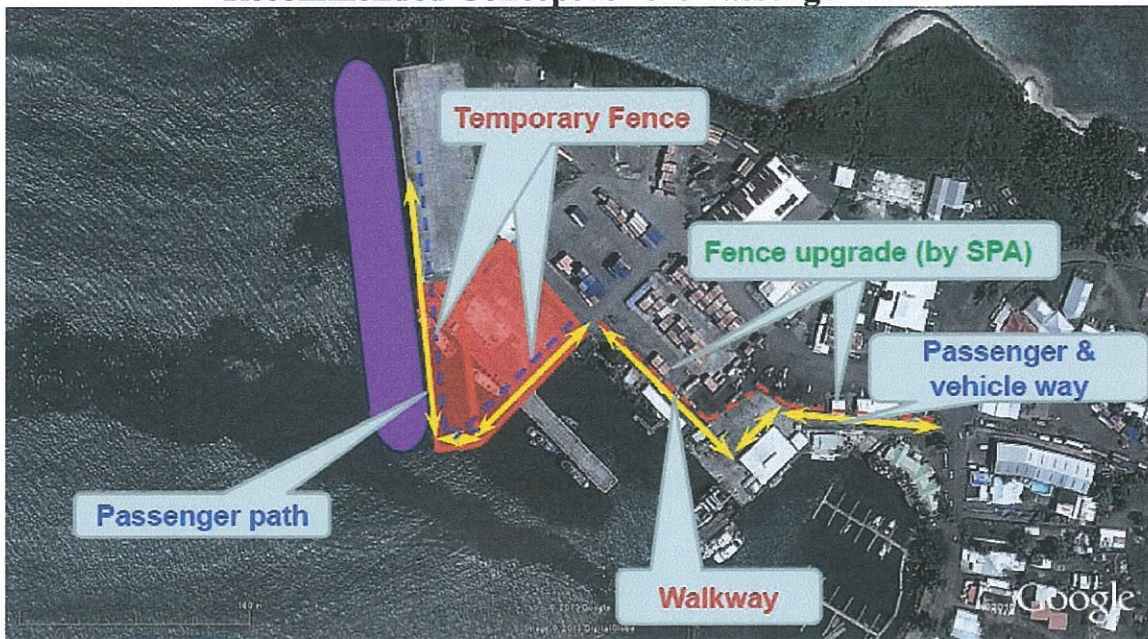
Recommendation for the Container Yard Operations

Assumed container dwelling time
 : Full container = 3 days,
 : Empty container = 10 days
 Average : 7 days

Total Ground Slots = 497 TEUs
 Capacity : 497 x 2.5 stack = 1242 TEUs
 Present Demand :
 28,000 TEUs / y / 365 days x 7 day x 1.3 peak
 = 689 TEUs (/ 2.5 = 275 slots)
 1242 TEUs / 689 TEUs = 1.8 times space



Recommended Concept for the Passenger Flow



T/B TAFOLA
MAINTENANCE GUIDANCE

1. Outside shell plate painting(Starboard side & Port side)

Rust removal (Grinder) → AC paint (TU) 2 coat → OA paint (TU) 1 coat → OA paint 1 coat
外板は錆を除去し錆止め塗装(タッチアップ)2回後上塗り塗装(タッチアップ)1回、全体的に1回を塗布する。

2. Rubbe fender (Fore side)

Renew

船首部筒形ゴムフェンダーは亀裂破損個所有りのため新替え
φ16SUSチェーン、φ16SUSシャックルを必要分手配する。 サモア独立国では入手不可能

3. Rubbe fender (Aft side)

Renew

船首部筒形ゴムフェンダーは亀裂破損個所有りのため新替え
φ16SUSチェーン、φ16SUSシャックルを必要分手配する。 サモア独立国では入手不可能

4. Upper deck bulwark & bulwark stay (Starboard side & Port side Fr3-Fr37)

Renew

Bulwark plate	6.0t x 34.00m ²
Bulwark stay plate	6.0t x 14.40m ²
Bulwark top plate	9.5t x 10.50m ² Valve plate 9.5x180 (cut)
FB75x6t	38.50m
FB75x9t	38.50m
FB50x6t	11.00m
60x30 HRB	38.50m
200A SCH40	17.50m
φ12.0RB	40.00m

ブルワーク及びブルワークステーは新替え(左右舷 Fr3-Fr37)

5. Upper deck (Starboard side & Port side FrC-Fr40)

Renew

FrC-Fr12 Deck plate	7.0t x 55.00m ²
Fr12-Fr14 Deck plate	8.0t x 2.70m ²
Fr14-Fr40 Deck plate	7.0t x 42.20m ²

上甲板はすべて新替え(左右舷 FrC-Fr40)

6. Bollard (Fore side & Aft side)

Repair

ボラード修理

7. Mooring pipe (Fore side & Aft side)

Renew

係船索パイプ新替え(JIS F 2007 A250 : 4個、A200 : 1個)

8. Goose neck ventilator (Fore side & Aft side)

Repair

グースネック型通気筒修理

9. Windlass & Base

Renew

揚錨機・架台・制御装置及び制鎖器新替え

10. Capstan
Renew
キャプスタン新替え
11. Navigation control panel
Maintenance
航海操船制御盤整備(機関回転数制御ハンドル交換、機関回転数メーター回路点検)
12. GPS
Renew
GPS新替え
13. Radar & Display unit
Renew
レーダー装置新替え
14. Magnetic compass
Renew (Portable type)
マグネットコンパス新替え(軽装型)
15. Echosounder
Renew at ship yard maintenance
潮流計はドック整備時に調査し交換を決める。
※船底付き発信機(トランスデューサー)及び電線回路の水密性・絶縁抵抗測定が必要
16. Navigation bridge deck plate (Fr13-Fr31)
Repair(Doubling plate welding)
Fr13-Fr31 Deck plate 6.0t x 9.00m²
航海船橋甲板腐食部ダブリング溶接修理
17. Deck crane
Repair (Parts change)
デッキクレーン部品交換
18. Search light
Renew
探照灯(メタハラバラスト型)新替え
19. Water nozzle
Maintenance (65A Butterfly valve change)
消防ノズル整備(65A バタフライ弁交換)
20. Steering gear hydraulic oil cylinder
Maintenance (Piston cylinder seal change)
操舵機油圧シリンダーシール新替え
21. Electric water boiler in galley
Renew
電気温水器新替え(小型)
22. Air conditioning unit (Package type)
Renew and maintenance
空気調和装置(エアコン ユニット)新替え
※空気調和装置本体、冷却水ポンプ、冷却水ポンプ始動器及びダクト装置点検

23. Bos'n store
Repair(Painting)
船首倉庫内発錆部塗装
24. Main engine & Reduction gear (Starboard side & Port side)
Maintenance(G2 Parts change)
主機関及び減速機整備(部品交換)
25. Generator engine (Starboard side & Port side)
Maintenance(G2 Parts change)
発電機関(部品交換)
26. Fresh water cooler & Lub. oil cooler (Starboard side & Port side)
Maintenance(G2 Parts change and tube cleaning)
清水冷却器及び潤滑油冷却器部品交換、チューブ掃除
27. Fire pump
Renew
消防ポンプ新替え
28. Electric switch panel in engine room
Maintenance & measurement(Insulation resistance test)
機関室内電気主配電盤の絶縁抵抗測定(メガテスト)の実施
29. Under water area
Bottom outside shell, Propeller, Propeller stern shaft, Shaft bracket, Kort nozzle, Stern tube, Rudder, Rudder stock, Zinc anode plate and sea chest
Maintenance(G2 Parts change)
High pressure water cleaning and rust removal
Outside shell plate, Shaft bracket, Rudder, Sea chest : Painting
Propeller, Propeller stern shaft : grinder
Stern tube : Gap measurement
Zinc anode : Weight measurement
水中部の船底外板、プロペラ、プロペラシャフト、シャフトブラケット、コルトノズル、舵板、舵軸、防蝕亜鉛板、海水箱
※高圧清水洗浄し発錆部の除去
※外板部、プロペラ軸受け、舵板、海水箱は塗装
※プロペラ、プロペラ軸はグラインダによる研磨
※船尾管は間隙計測
※防蝕亜鉛板は重量計測による電飾率の計測

The Preparatory Survey for the Project for Enhancement of Safety in Apia Port

Tug Boat Inspection Report T/B TAFOLA



August 2014

Oriental Consultants Co., Ltd.

A handwritten signature in blue ink, consisting of stylized initials and a surname.

Main particulars

Ship's Name	T/B TAFOLA		
Owner	Government of SAMOA		
Classification society	Lloy's Register of Shipping (LR)		
Port of registry	APIA		
IMO No.	Nil		
Official No.	0032		
CALL SIGN	5WCX		
Navigation Area	Port of APIA ship's turning area		
Loa (length over-all)	25.90	m	
Lpp (length between perpendiculars)	23.10	m	
B (moulded)	6.80	m	
D (moulded)	2.80	m	
d (design moulded)	2.10	m	
Gross Tonnage	120	ton	
Speed (trial max. at light condition)	12.0	knots	
Towing power	205	kN (20.9 tf)	
Complement	7	P	
Main engine	4 cycle marine diesel engine	2	sets
	Max. power	588	kW (800ps)
	Rated revolution	900	min-1
Generator engine	4 cycle marine diesel engine	1	sets
	Max. power	45.60	kW (62ps)
	Rated revolution	1500	min-1
	4 cycle marine diesel engine	1	sets
	Max. power	27.93	kW (38ps)
	Rated revolution	1500	min-1
Propeller	4-braid fixed pitch propeller D=1,500 P=1,450 Nakashima	2	sets
Rudder	Hydraulic oil steering gear system with kort nozzle type	2	sets
Tank capacity	Fuel oil tank	25.97	m ³
	Lubricating oil tank	*	m ³ (Oil pan type)
	Fresh water tank	13.39	m ³
Builder	Kanagawa dry dock Co.,Ltd. Kobe JAPAN		
Year built	1988		
Captain	Mr. Siaki Malietulu Mr. Mareko Alefosio		
C/Engineer	Mr. Ioritana Mariko Mr. Herbert Lees		

No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
1	Outside shell	Starboard Side	8.0t	No good	Repair

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
2	Outside shell	Port side	8.0t	No good	Repair

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
3	Outside shell	Rubber fender (Fore)	SHIBATA L=9000 11x780 OD : ϕ 500 ID : ϕ 250/90	No good	Repair (60x30)

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
4	Outside shell	Rubber fender (Aft)	SHIBATA L=11000 17x630 OD : ϕ 300 ID : ϕ 150/75	No good	Repair (60x30)

Photograph



Handwritten signature

No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
5	Upper deck (Fore)	Bulwark & Bulwark stay Deck plate	Deck : 7.0t B. Top : 9.5t B. Stay : 6.0t	Curve damage & Corrosive	Repair

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
6	Upper deck midship area (Port side)	Bulwark & Bulwark stay Deck plate	Deck : 7.0t B. Top : 9.5t B. Stay : 6.0t	Curve damage & Corrosive Corrosive damage	Repair

Photograph



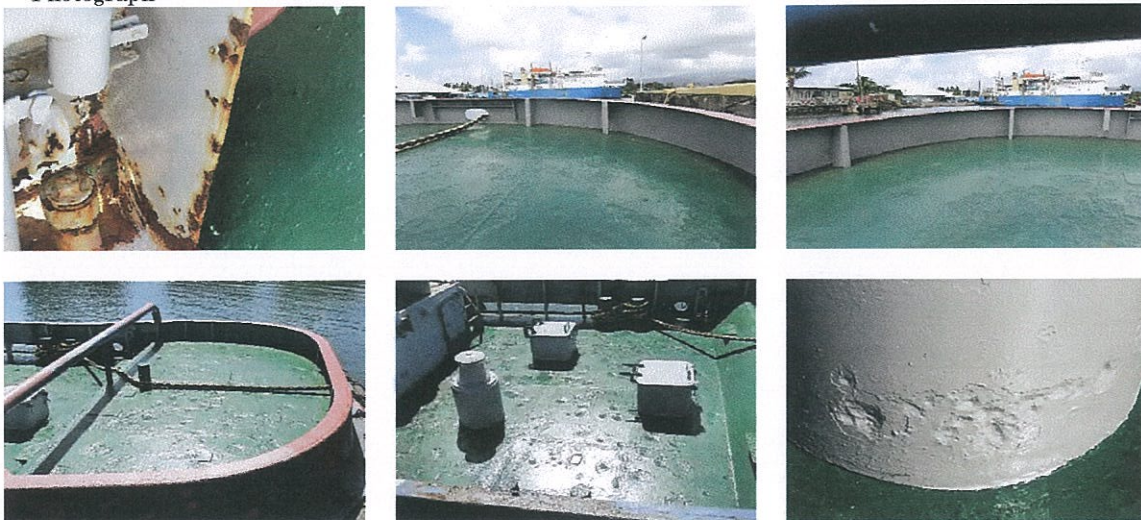
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
7	Upper deck midship area (Starbord side)	Bulwark & Bulwark stay Deck plate	Deck : 7.0t B. Top : 9.5t B. Stay : 6.0t	Curve damage & Corrosive Corrosive damage	Repair

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
8	Upper deck (Aft)	Bulwark & Bulwark stay plate Deck plate Capstan Hatch	Deck : 7.0t B. Top : 9.5t B. Stay : 6.0t	Curve damage & Corrosive Corrosive damage No Good Corrosive	Repair

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
9	Upper deck (Fore)	Bollard	200A(Sch40) h : 550	Corrosive damage	Repair
Photograph 					
10	Upper deck (Aft)	Bollard	250A(Sch40) h : 550 150A(Sch40) h : 150	Corrosive damage	Repair
Photograph 					
11	Upper deck (Fore)	Mooring pipe	JIS F 2007-A250	Corrosive damage	Repair
Photograph 					
12	Upper deck Aft	Mooring pipe	JIS F 2007-A250	Corrosive damage	Repair
Photograph 					



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
13	Upper deck Fore	Windlass	MASADA IRON WORKS CO.,LTD Type : MSW-1 1.5T x 9m/min Motor : 5.5kw x 935rpm	Corrosive damage	Renew

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
14	Upper deck Fore	Windlass base	Steel	Corrosive damage	Renew

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
15	Upper deck Fore	Windlass controler	MASADA IRON WORKS CO.,LTD	No good	Repair or Renew

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
16	Navigation bridge deck Wheel house	Navigation control panel GPS	YAMAMOTO Type : YME 40TN-ER	Good Remove	Engine power handle lever renew Renew

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
17	Navigation bridge deck Wheel house Radar mast	Radar display unit Radar scanner	JRC JMA-1310-4 Serial No. LH53510 JRC	No good No good	Renew Renew

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
18	Navigation bridge deck Wheel house	Steering gear Switch panel Air horn time Controller	IBUKI KOGYO	Good Good	

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
19	Navigation bridge deck Wheel house	Magnetic compass	DAIKO KEIKI SEISA-KUSHO CO.,LTD Type : SP-165PDK S. No. : 6365	No Good	Renew Simple potable magnetic compass

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
20	Navigation bridge deck Wheel house	Echosounder	JRC Type : JFE-5703	No Good	Insulation resistance test (Monitor - Cable - Transducer)

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
21	Navigation bridge deck Wheel house	Nvi. & Comm. dist panel Light switch panel		Good Good	

Photograph



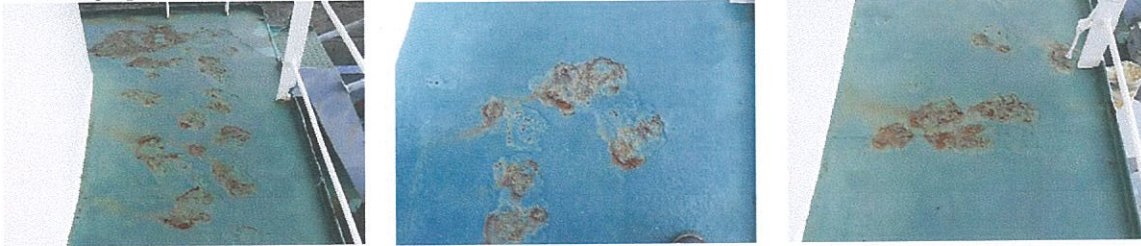
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
22	Navigation bridge deck Wheel house	Automatic antenna VHF Transeiver HF Receiver	ICOM AT-120 ICOM IC-M120 ICOM M700	Good Good Good	

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
23	Navigation bridge deck	Deck plate	Deck : 6.0t	No good	Repair

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
24	Navigation bridge deck	Life raft EPIRB Radar Transponder		Good Good Good	

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
25	Navigation bridge deck	Funnel & sky light Deck crane	NIPPON ICAN M. No. 40702089 Capacity : 1.0Tx3.0M	Good No good	Repair

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
26	Navigation bridge deck	Towing hook	Type : 25T	Good	

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
27	Wheel House Top	Serch light	Made in Korea(now)	No Good Electric Bulb Without	Renew

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
28	Wheel house top	Water nozzle(65A)		Good	Maintenance Butterfly valve(65A)

Photograph



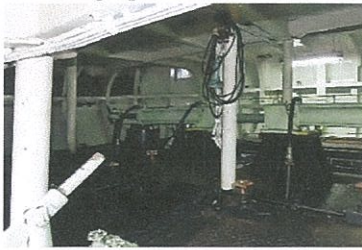
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
29	Wheel house top	Speaker		Good	

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
30	Steering gear room	Steering gear unit		Good	Hydraulic oil cylinder (Starboard Side) Rod small scar

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
31	Steering gear room	Hydraulic oil pump unit & emergency hand pump Side shell plate & frame	YAMANOTO IRON Type : YME-4.0TNW-ER 100kgf/cm ² M. No.: 9077	Good Good	

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
32	Upper deck Accommodation space	Mess room		Good	Repiar of sofa

Photograph



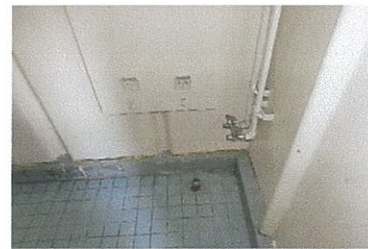
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
33	Galley Space	Electric water boiler Electric refrigertor Electric range Sink	TOSHIBA NPLD210	No good Good Good Good	Repiar

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
34	Upper deck Accommodation space	Toilet Shower room		Good Good	

Photograph



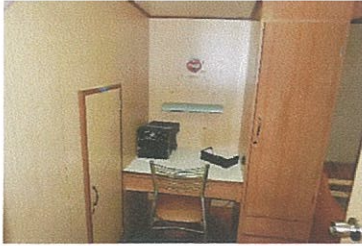
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
35	Upper deck Accommodation space	Air conditionig unit & Cooling water pump switch		No good	Renew

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
36	Hold	C/Enginner room & Crew's room		Good	

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
37	Hold	Bosn's store	Floor Shell plate & Frame	No good Good	Painting repair

Photograph



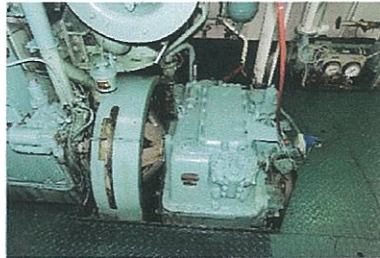
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
38	Hold	Chain locker		Good	

Photograph



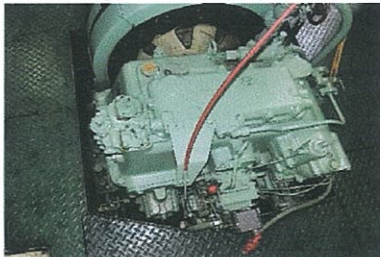
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
39	Engine room	Main engine & Reduction gear (Starboard side)	YANMER M200-SN 800PSx900min-1 E. No. : FNK-0201 R/G : V50U 2N 8722 S/C : IHI-BBC	Good	Maintenance (Parts)

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
40	Engine room	Main engine & Reduction gear (Port side)	YANMER M200-SN 800PSx900min-1 E. No. : FNK-0202 R/G : V50U 2N 9725 S/C : IHI-BBC	Good	Maintenance (Parts) Supercharger noise & Reduction gear noise check (Shaft & Ball bearing)

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
41	Engine room	Generator engine & Generator (Center)	YANMAR 6CHL-N 62ps 1500rpm E.No. 0385 TAIYO FB-26B M. No.:GL-1441 50KVA	Good	Maintenance (Parts)

Photograph



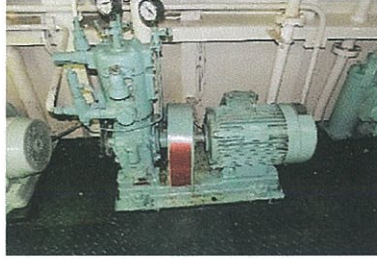
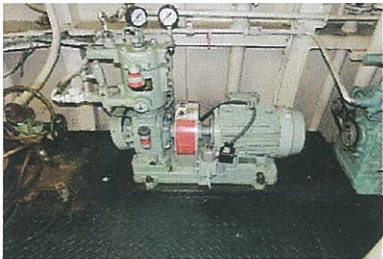
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
42	Engine room	Generator engine & H. Generator (Poat Side)	YANMAR 4CHL-N 38ps 1500rpm E. No. : 00634 TAIYO FB-244 30KVA	Good	Maintenance (Parts)

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
43	Engine room	Air compressor	MATSUBARA Type : MS70R	Good	2012(Fore) 1989(Aft)

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
44	Engine room	Air compressor tank		Good	

Photograph



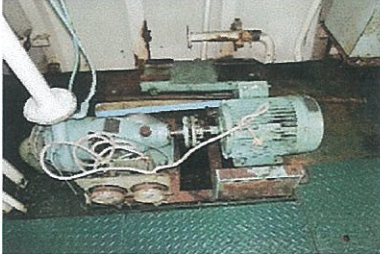
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
45	Engine room	Fresh water cooler (Above) & Lub. oil cooler(Under) (Starboard Side)	YANMER Type : YFW-8-A	Good	Maintenance (Parts)

Photograph



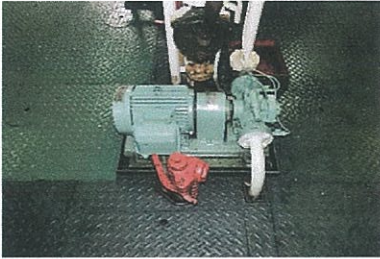
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
46	Engine room (Starboard Side)	Fire pump	PUMP DAIICHI TY-15 MOTOR HANSHIN ELECT. Type : MLA6135 5.5kw x 1460rpm M. No. : 44385 Fream : 1324	No good	Renew

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
47	Engine room	Fuel oil transfer pump	HANSHIN ELECT. Type : MLA-6107 950rpm S. No. : 44383 Fream : 1001	Good	

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
48	Engine room	Bilge & G.S pump	PUMP NANIWA PUMP Type : SGH80 M. No. : 89/2259 MOTOR HANSHIN ELECT. Type : MLA-6133 3.7kw x 1460rpm	Good	

Photograph



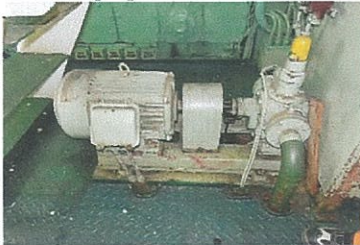
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
49	Engine room	Fresh water cooler (Above) & Lub. oil cooler(Under) (Starboard Side)	YANMER	Good	

Photograph



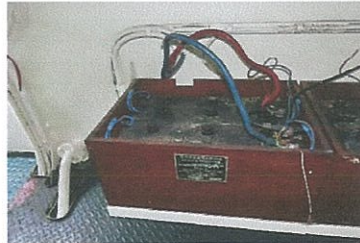
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
50	Engine room	Stanby LO pump		Good	

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
51	Engine room	Battery charger		Good	

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
52	Engine room	Stern tube, Propeller shaft & Intermediate shaft bearing		Good	Noise check (Shaft & Bearing)

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
53	Engine room	Electric switch panel		Good	Maintenance Insulation resistance test

Photograph



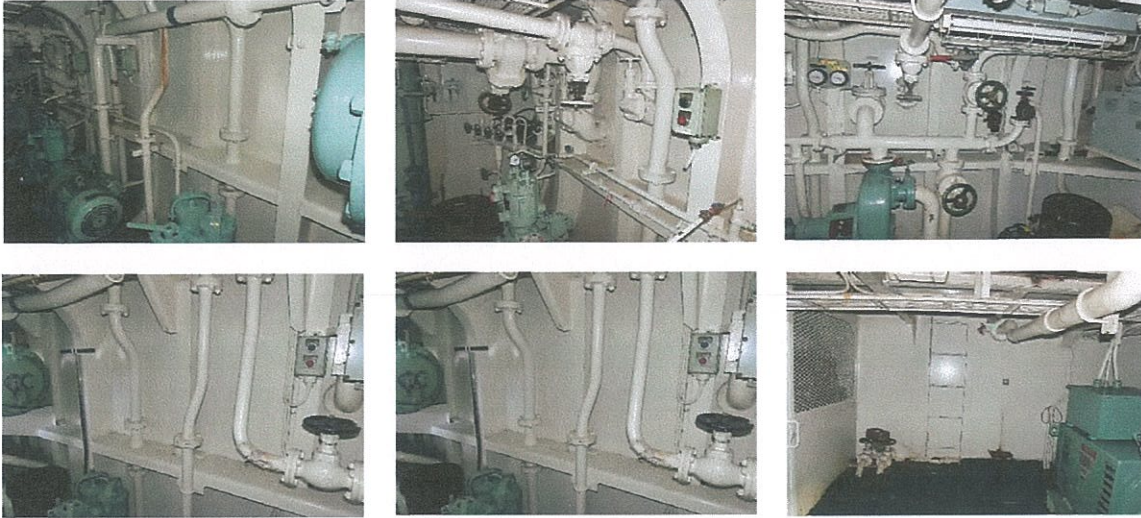
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
54	Engine room	Side shell plate & Frame		Good	

Photograph



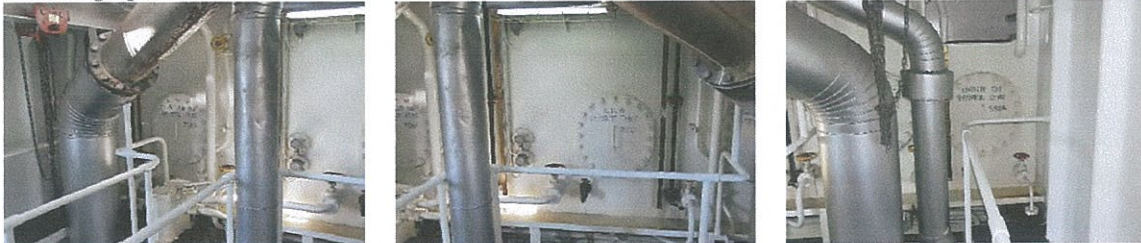
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
55	Engine room	Side shell plate & Frame		Good	

Photograph



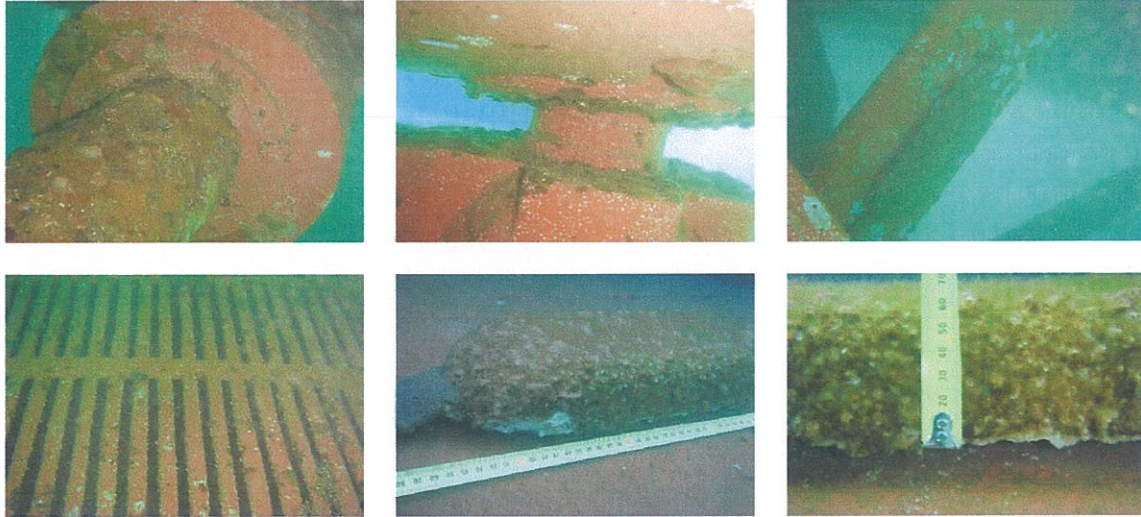
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
56	Engine room	Tanks	M/E Lub. oil service tank 700L AFO Service tank 900 L M/E Lub. oil service Tank 700L Light oil service Tank 330L	Good	

Photograph



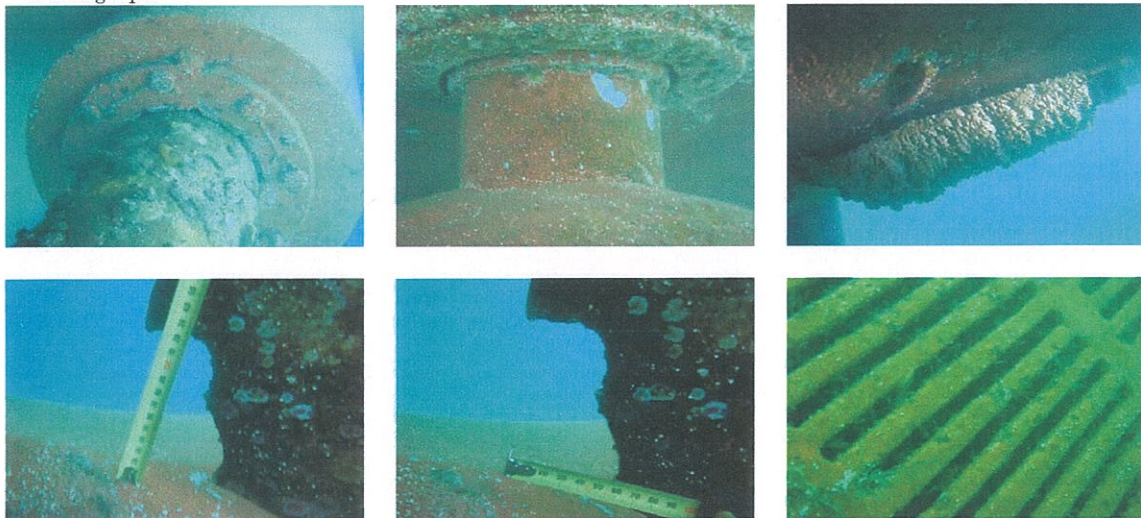
No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
57	After Equipment (Port side)	Propeller Propeller stern shaft Shaft bracket Kort nozzle Stern tube Rudder Rudder stock Zinc anode plate	FPP D=1500 P=1450 50x150x300 T.Qty:23		Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance

Photograph



No	LOCATION	NAME	SPECIFICATION	CONDITION	REMARK
58	After Equipment (Starboard side)	Propeller Propeller stern shaft Shaft bracket Kort nozzle Stern tube Rudder Rudder shaft Zinc anode plate	FPP D=1500 P=1450 50x150x300 T.Qty:23	Damage	Repiar Maintenance Maintenance Maintenance Maintenance Maintenance Maintenance

Photograph



T/B ATAFA
MAINTENANCE GUIDANCE

1. Outside shell plate painting(Starboard side & Port side)
Rust removal (Grinder) → AC paint (TU) 2 coat → OA paint (TU) 1 coat → OA paint 1 coat
外板は錆を除去し錆止め塗装(タッチアップ)2回後上塗り塗装(タッチアップ)1回、全体的に1回を塗布する。
2. Rubbe fender (Fore side)
Renew
船首部筒形ゴムフェンダーは亀裂破損個所有りのため新替え
φ16SUSチェーン、φ16SUSシャックルを必要分手配する。 サモア独立国では入手不可能
3. Rubbe fender (Aft side)
Renew
船首部筒形ゴムフェンダーは亀裂破損個所有りのため新替え
φ16SUSチェーン、φ16SUSシャックルを必要分手配する。 サモア独立国では入手不可能
4. Upper deck bulwark & bulwark stay (Starboard side & Port side Fr3-Fr37)
Repair

Bulwark plate	6.0t x 0.00m ²
Bulwark stay plate	6.0t x 0.00m ²
Bulwark top plate	9.5t x 0.00m ² Valve plate 9.5x180(cut)
FB75x6t	0.00m
FB75x9t	38.50m
FB50x6t	11.00m
60x30 HRB	0.00m
200A SCH40	17.50m
12 φ RB	0.00m


 ブルワーク及びブルワークステーは不良個所修理(左右舷 Fr3-Fr37)
5. Upper deck (Starboard side & Port side FrC-Fr34)
Renew

FrC-Fr12Deck plate	7.0t x 50.00m ²
Fr12-Fr14 Deck plate	8.0t x 1.35m ²
Fr14-Fr34 Deck plate	7.0t x 22.00m ²

 上甲板は新替え(右舷 FrC-Fr34)、不良個所のみダブリング溶接(FrC-Fr34)
6. Bollard (Fore side & Aft side)
Repair(Paint)
ボラード修理
7. Mooring pipe (Fore side & Aft side)
Repair(Paint)
係船索パイプ点検 (JIS F 2007 A250 : 4個、A200 : 1個)
8. Goose neck ventilator (Fore side & Aft side)
Repair(paint)
グースネック型通気筒修理
9. Windlass & Base
Maintenance & Repair(Front gear case)
揚錨機・架台・制御装置及び制鎖器整備



10. Capstan
Renew
キャプスタン新替え
11. Navigation control panel
Maintenance
航海操船制御盤(機関回転数メーター回路点検)
12. GPS
Maintenance
GPS点検
13. Radar & Display unit
Renew
レーダー装置新替え
14. Gyro compass
Renew
ジャイロコンパス新替え
15. Echosounder
Maintenance
潮流計点検
※指示器(ディスプレイ)画面修理
16. Navigation bridge deck plate (Fr28-Fr31)
Repair(Doubling plate welding)
Fr13-Fr31 Deck plate 6.0t x 4.00m²
航海船橋甲板腐食部ダブリング溶接修理
17. Deck crane
Repair (Hydraulic cylinder parts change)
デッキクレーン油圧シリンダーシール新替え
18. Search light
Repair (Reflection mirror change)
探照灯無い反射鏡新替え
19. Water nozzle
Maintenance
消防ノズル整備
20. Steering gear hydraulic oil cylinder
Maintenance (Piston cylinder seal change)
操舵機油圧シリンダーシール新替え
21. Electric water boiler in galley
Maintenance
電気温水器点検
22. Air conditioning unit (Package type)
Maintenance
空気調和装置(エアコン ユニット)整備
※空気調和装置本体、冷却水ポンプ、冷却水ポンプ始動器及びダクト装置点検



23. Bos'n store
Repair(Painting)
船首倉庫内発錆部塗装
24. Main engine & Reduction gear (Starboard side & Port side)
Maintenance(G2 Parts change)
主機関及び減速機整備(部品交換)
25. Generator engine (Starboard side & Port side)
Maintenance(G2 Parts change)
発電機関(部品交換)
26. Fresh water cooler & Lub. oil cooler (Starboard side & Port side)
Maintenance(G2 Parts change and tube cleaning)
清水冷却器及び潤滑油冷却器部品交換、チューブ掃除
27. Fire pump
Renew & Crutch Equipment renew
消防ポンプ新替え及び原動機付クラッチ装置新替え
28. Electric switch panel in engine room
Maintenance & measurement(Insulation resistance test)
機関室内電気主配電盤の絶縁抵抗測定(メガテスト)の実施
29. Under water area
Bottom outside shell, Propeller, Propeller stern shaft, Shaft bracket, Kort nozzle, Stern tube, Rudder, Rudder stock, Zinc anode plate and sea chest
Maintenance(G2 Parts change)
High pressure water cleaning and rust removal
Outside shell plate, Shaft bracket, Rudder, Sea chest : Painting
Propeller, Propeller stern shaft : grinder
Stern tube : Gap measurement
Zinc anode : Weight measurement
水中部の船底外板、プロペラ、プロペラシャフト、シャフトブラケット、コルトノズル、舵板、舵軸、防蝕亜鉛板、海水箱
※高圧清水洗浄し発錆部の除去
※外板部、プロペラ軸受け、舵板、海水箱は塗装
※プロペラ、プロペラ軸はグラインダによる研磨
※船尾管は間隙計測
※防蝕亜鉛板は重量計測による電飾率の計測