

資料4. 討議議事録

資料4-1 第1次現地調査時議事録

Minutes of Discussions
on the Implementation Review Study
on the Project for Enhancement of Vessel Traffic System in Malacca and Singapore Straits
in Indonesia


The Government of Japan decided to conduct the Implementation Review Study Team on the Project for Enhancement of Vessel Traffic System in Malacca and Singapore Straits (hereinafter referred to as "the Project") to Indonesia and entrusted the study to Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Indonesia the Implementation Review Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Toshiyuki Iwama, Director, Transportation and ICT Division 3, Economic Infrastructure Department, JICA, and is scheduled to stay in the country from October 9th to November 12th, 2008.

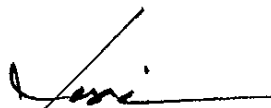
The Team held discussions with the officials concerned of the Government of Indonesia and conducted a field survey at the study areas.

In the course of discussions, both sides confirmed the main items described in the attached sheet.

Jakarta, October 13th, 2008



Toshiyuki IWAMA
Leader
Implementation Review Study Team
Japan International Cooperation Agency



Yuri GUNADI
Director of Navigation
Directorate General of Sea Transportation
Ministry of Transportation

ATTACHMENT

1. Components of the Project

Components of the Stage-1 that has been already approved by the Government of Japan and awaiting the Exchange of Notes between Indonesia and Japan will not be changed in principle. In case the necessary situation arises such as cost overrun, quantity and/or specification of the component might be adjusted or modified.

For Stage-2 Tanjung Parit will be AIS Station. The reason is explained in Section 4.1. AIS data from Tanjung Parit will be sent to Dumai VTS Sub-Center, thus Bengkalis VTS Sub-Center will be removed, however, repeater station may be included if necessary and after further analysis on AIS data transmission. Indonesian side agrees on this approach.

Indonesian side requests to remove FM Transmitting Devices (On-time Broadcasting System) from the Project. Component of the Project is show below, and the list of equipment and facilities are in Annex-1.

	Component/Site
Stage-1	VTS Sensor Site : Hiyu Kecil, Takong Kecil, Tanjung Berakit
	VTS Center : Batu Ampar (including VTS Sensor)
Stage-2	VTS Sensor Site : Tanjung Medang
	AIS Site : Tanjung Parit
	VTS Sub-Center : Dumai

2. Japan's Grant Aid Scheme

2-1. The Indonesian side reconfirmed the Japan's Grant Aid scheme explained by the Team, as described in Annex-2.

2-2. The Indonesian side will take the necessary measures, as described in Annex-3, in a timely manner.

3. Schedule of the Study

3-1 The Team will visit Indonesia again around the middle of December, 2008 for the site surveys of the newly planned repeater stations under Stage-2.

3-2 The Team will prepare the draft report on Stage-1 of the Project in English, and if necessary, dispatch a mission to Indonesia in order to explain its contents around February 2009. In case the contents of the report are accepted in principle by the Government of Indonesia and JICA confirms the result of the study as appropriate, JICA will recommend the Government of Indonesia as appropriate consultant for the implementation of the Project.

3-3 The Team will prepare the draft report on Stage-2 of the Project in English and dispatch a mission to Indonesia in order to explain its contents around March 2009. In case the contents of the report are accepted in principle by the Government of Indonesia, JICA will complete the final report and send it to both Government of Japan and Government of Indonesia by May, 2009

4. Other Relevant Issues Discussed

4-1 Feasibility on Radar Sensor Station at Tg. Parit

The Team visited Tg. Parit to find more reasons for justification. The only justification has been that this location has been selected by the Indonesia side because it is between Tg. Medang and Hiyu Kecil, and there is a lighthouse, and the site is already owned by DGST. The coast along Tg. Parit is covered by mangrove and palm trees, and there are a few small bay formed by river that flows into the sea. Small number of wooden boats can be seen in the bay and on the sea close to the coast. TSS of the Malacca Strait is far away from the coast, so the large vessels passing TSS do not interfere with the small boats.

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This observation matches the result of the vessel count survey conducted at this site during the Basic Design Study.

Based on these facts the Team Leader pointed out that although the importance of the vessel monitoring on the Malacca Strait is well understood, the benefit of establishing a VTS radar sensor at Tg. Parit is almost nil compared to the high investment cost. The VTS monitor would display large vessels with AIS on TSS only under the present situation. If DGST wants to monitor the movement of the large vessels on the Malacca Strait, AIS will be more suitable solution, and its cost/benefit can also be justified.

The Team Leader recommended that AIS will be set up at Tg. Parit at the Stage-2 of the Project. The AIS information will be sent to Dumai VTS Sub-Center so that DGST can monitor the movement of large vessels along the Malacca Strait for the first time. The current study will also explore the best possibility of the continuous vessel monitoring along the Malacca Strait, like the one that will be developed for the Singapore Strait under the Stage-1 of the Project. Possibilities of data transmission along the coast line from Bengkalis to Dumai will also be studied. Priority of the sites will be put based on the monitoring needs. The result with the estimated cost and any alternative options will be presented to the Indonesia side at the end of the Study on Stage-2 so that the Indonesia side can make appropriate decisions for the future.

The coverage area by Stage-1 and Stage-2 of the Project is shown in Annex-4.

4-2 Transmitting System

Indonesian side explained that use of the satellite link is very limited due to the high operation cost. At this moment, only Pulau Jemul (Jemul Island) in North Sumatra is planned by a satellite link. Therefore the Project shall cover microwave link between the VTS Sensor Station and VTS Center or Sub-Center. The Team will continue technical analysis of transmitting link.

4-3 Land acquisition for the future repeater station

The Indonesian side has already secured Selincing and budgeted to acquire Sepahat as the candidate locations of the future repeater stations.

4-4 Major undertakings to be taken by the Indonesian side

The Team requested the Indonesian side to carry out following undertakings particularly necessary to implement the Project;

<Common for Stage-1 and 2>

- Entry permit to the construction area and execution permit for the construction
- Acquisition of radio frequency and permission to use the radar, the multiplex radio for data communication, VHF radio for vessels and internet connection between Dumai and Batu Ampar

<For Stage-1>

- Permission to use the existing jetty at Hiyu Kecil and Takong Kecil for material transportation, and permission to reclaim to provide a temporary yard for material stocking.
- Tapping of commercial power supply for the VTS center in Batu Ampar and the VTS sub-center in Dumai
- Demolition and removal of the existing fence in Takong Kecil
- Demolition and relocation of the road in the yard in Tanjung Berakit
- Proclamation and remedial measures to be undertaken during the relocation work and re-installation of the existing lantern in Tanjung Berakit.

<For Stage-2>

- Permission to construct a temporary jetty which is required for material handling in Tanjung

Medang.

- Demolition and removal of the existing warehouse in Tanjung Medang
- Relocation of the volley ball court in Dumai
- Provision of openings for the connection of the existing office building with the new building
- Provision of internet connection between Dumai and Batu Ampar

4-5 Operation and Maintenance

The Indonesian side reconfirms allocation of necessary staff and budget as agreed at the Basic Design Study.

4-6 Technical Training and/or Soft Component

The Indonesian side explained that some DGST staff are sent to Australia for the training on VTS operation. Any further training will be discussed with the Team.

4-7 Coordination with MEH Project

Indonesia side requested to make use of the VTS Center at Batu Ampar for the MEH data center as well. The Team replied to consider the request by minor modification of the basic design.

4-8 Confidentiality of the specifications and the Project Cost Estimate

Both sides confirmed again that draft detailed specifications and the project cost estimate are confidential and shall neither be duplicated nor released to any outside party in order to secure the fairness of the tender of the Project. And the Indonesian side agreed.

END

Annex-1. Component of the Project at the Basic Design

Annex-2. Japan's Grant Aid Scheme

Annex-3. Major undertakings by each Government

Annex-4. Coverage Area under Stage-1 and Stage-2 of the Project

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Outline of Equipment to be Procured by the Project

Equipment	Unit	Quantity	Stage-1				Stage-2		
			1	2	3	4	5	6	7
			Hiyu Kecil	Takong Kecil	Batu Ampar	Tanjung Berakit	Tanjung Medang	Tanjung Parit *	Dumai
Radar System	Set	5	1	1	1	1	1		
VHF Marine Radio System	Set	5	1		1	1	1	1	
AIS Base Station System (AIS System)	Set	5	1		1	1	1	1	
CCTV Camera Equipment (CCTV System)	Set	2		1			1		
Meteorological Sensor Unit with Data Logger	Set	3	1			1	1		
Tracking System	Set	2			1				1
Multi-funcn Console with VHF Radio Communication Unit	Set	8			6				2
Printer System (Monochrome and Color)	Set	2			1				1
Data Base for Vessel Information	Set	2			1				1
AIS Server System (AIS System)	Set	2			1				1
CCTV Video Display Equipment (CCTV System)	Set	2			1				1
Meteorological Monitor Console	Set	2			1				1
Record and Playback System for Vessel Traffic	Set	2			1				1
Resource Management System	Set	2			1				1
Multiplex Radio Equipment (Data Communication System)	Set	9	1	2	2	1	1	1	1
Web Server System	Set	1			1				
Connecting Devices for Internet Communication for Dumai-Batu Ampar	Set	2			1				1
Equipment Desk and Others	Set	6	1	1	1	1	1		1
Takong Kecil Light House	Set	1		1					
Tanjung Berakit Light House	Set	1				1			
Air Conditioner for Radar Sensor Station	Set	10	2	2		2	2	2	
Diesel Engine Generator	Set	5	1	1		1	1	1	
	Kva. & Unit		15 KVA x 4	15 KVA x 4		15 KVA x 4	15 KVA x 4	15 KVA x 4	

* For Tanjung Parit to be studied further.

Outline of Facilities to be Constructed by the Project

Facilities	Unit	Quantity	Stage-1				Stage-2		
			1	2	3	4	5	6	7
			Hiyu Kecil	Takong Kecil	Batu Ambar	Tanjung Berakit	Tanjung Medang	Tanjung Parit	Dumai
VTS Center	Unit	1			1				
	m ²	414			414.00				
VTS Sub-Center	Unit	1							1
	m ²	207.4							207.36
Equipment Building	Unit	5	1	1		1	1	1	
	m ²	211.3	42.25	42.25		42.25	42.25	42.25	
Generator Building	Unit	6	1	1		1	1	1	1
	m ²	320	55.00	55.00		55.00	55.00	55.00	45.00
Air Conditioners (for VTS Center and Sub-Center)	Unit	2			1				1
Diesel Engine Generator (Emergency Backup)	Unit	2			1				1
	Kva, Units				60 KVA x 1				45 KVA x 1
Fuel Tank (Outdoor)	Unit	7	1	1	1	1	1	1	1
	m ³		6.0	6.0	2.0	6.0	6.0	6.0	2.0
Fuel Supply System	Unit	2	1	1					
	m ³		1.0	1.0					
Water Reservoir	Set	2			1				1
	m ³				1.5				1.0
Septic Tank	Set	2			1				1
	m ³				8.0				4.0
Steel Tower for Radar and Communications	Unit	7	1	1	1	1	1	1	1
	m		38.00	49.00	30.00	73.00	106.00	78.00	106.00

* For Tanjung Parit to be studied further.

JAPAN'S GRANT AID

The Grant Aid scheme provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles 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

Japan's Grant Aid scheme is executed through the following procedures:

Application	(Request made by the recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by the Cabinet)
Determination of Implementation	(The Note exchanged between the Governments of Japan and recipient country)

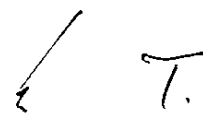
Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study) using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Scheme, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes (E/N) signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.



2. Basic Design Study

(1) Contents of the study

The aim of the Basic Design Study (hereafter referred to as "the Study") conducted by JICA on a requested project (hereafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Study are as follows:

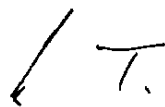
- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical,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

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of the Japan's Grant Aid scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure 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 in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA. The consultant firm(s) used for the Study is (are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.



3. Japan's Grant Aid Scheme

(1) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

(2) "The period of the Grant Aid" means the one fiscal year, which the Cabinet approves, the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed. However, in case of delays in delivery, installation or construction due to unforeseen factors such as national disaster, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

(3) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When the two Governments 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, consulting, constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

(4) Necessity of "Verification"

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

(5) Undertakings required of 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 the following:

- a) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction,
- b) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,
- c) To secure buildings prior to the procurement in case the installation of the equipment,
- d) To ensure all the expenses and prompt excursion for unloading, customs clearance at the port of

disembarkation and internal transportation of the products purchased under the Grant Aid,

- e) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts,
- f) To accord Japanese nationals, whose services may be required in connection with the supply of the products and services under the Verified contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(6) "Proper Use"

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

(7) "Re-export"

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

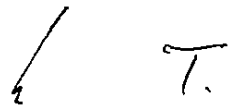
(8) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan 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 the Government of Japan 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 to the Bank.

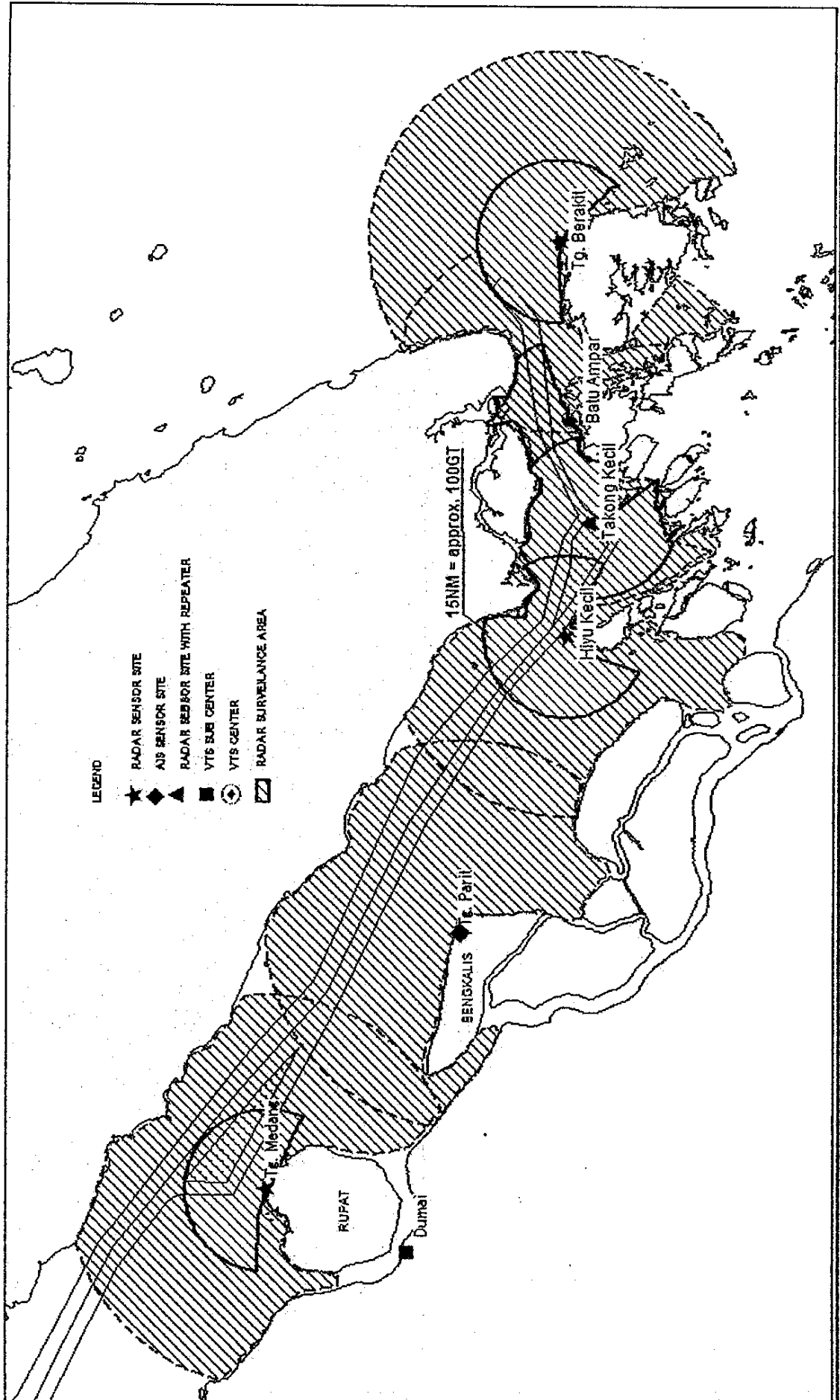
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Major undertakings to be taken by each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1.	To secure land		•
2.	To clear, level and reclaim the site when needed		•
3.	To construct gates and fences in and around the site		•
4.	To construct the parking lot	•	
5.	To construct roads		
	1) Within the site	•	
	2) Outside the site		•
6.	To construct the buildings (and/or tower)	•	
7.	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities		
	1) Electricity		
	a. The distributing line to the site		•
	b. The drop wiring and internal wiring within the site	•	
	c. The main circuit breaker and transformer	•	
	2) Water Supply		
	a. The city water distribution main to the site		•
	b. The supply system within the site (receiving and elevated tanks)	•	
	3) Drainage		
	a. The city drainage main (for storm, sewer and others) to the site		•
	b. The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	•	
	4) Gas Supply		
	a. The city gas main to the site		•
	b. The gas supply system within the site	•	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		•
	b. The MDF and the extension after the frame/panel	•	
	6) Furniture and Equipment		
	a. General furniture		•
	b. Project equipment	•	
8.	To bear the following commissions to the Japanese foreign exchange bank for the banking services based upon the B/A		
	1) Advising commission of A/P		•
	2) Payment commission		•
9.	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	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		•
	3) Internal transportation from the port of disembarkation to the project site	•	
10.	To accord Japanese nationals, whose services may be required in connection with the supply of the products and the services under the verified contract, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.		•
11.	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts.		•
12.	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant.		•
13.	To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and installation of the equipment.		•

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



7.

**Minutes of Discussions
on the Second Implementation Review Study
on the Project for Enhancement of Vessel Traffic System
in Malacca and Singapore Straits
in Indonesia**

Japan International Cooperation Agency (hereinafter referred to as "JICA") sent to Indonesia the Second Implementation Review Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Toshiyuki Iwama, Director, Transportation and ICT Division 3, Economic Infrastructure Department, JICA, and is scheduled to stay in the country from November 30 to December 24, 2008.

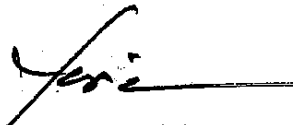
The Team held discussions with the officials concerned of the Government of Indonesia and conducted a field survey at the study areas.

In the course of discussions, both sides confirmed the main items described in the attached sheet.

Jakarta, December 23, 2008



Toshiyuki IWAMA
Leader
Implementation Review Study Team
Japan International Cooperation Agency



Yuri GUNADI
Director of Navigation
Directorate General of Sea Transportation
Ministry of Transportation

ATTACHMENT

1. Components of the Project

Exchange of Notes for the Components of the Stage-1 (hereinafter referred to as "E/N") has been already signed by two Governments. The Team explained that some spare parts and equipment for maintenance for Stage-1 needs to be moved to Stage-2 in order to keep the estimated cost within the cost limit specified in the E/N.

The Team proposed the Indonesian side to acquire a site at Tg.Sair to be an additional repeater station for Stage-2 in order to ensure the quality of the transmitted radar image from Tg. Medang. The Team also recommends coordinate with GMDSS project because transmitting tower at Dumai and Selincing can be jointly used. In this case the specification of the towers at Dumai and Selincing by the GMDSS project needs to be changed. The Team will provide necessary information by January 2009. The final decision must be made and agreed by March 2009, when the Draft Explanation Team arrives in Jakarta.

2. Schedule of the Study

2-1 Schedule of Stage-1

The Team will prepare the draft report on Stage-1 of the Project in English and send it by February 2009. In case the contents of the report are accepted in principle by the Government of Indonesia and JICA confirms the result of the study as appropriate, JICA will recommend the Government of Indonesia as appropriate consultant for the implementation of the Project.

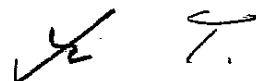
2-2 Schedule of Stage-2

The Team will prepare the draft report on Stage-2 of the Project in English and dispatch a mission to Indonesia in order to explain its contents around March 2009. In case the contents of the report are accepted in principle by the Government of Indonesia, JICA will complete the final report and send it to both Government of Japan and Government of Indonesia by May, 2009

3. Other Relevant Issues Discussed

3-1 Land acquisition for the future repeater station

The Indonesian side commits the budgeting process for obtaining the site at Sepahat and Tg.Sair as the candidate locations of the future repeater stations. The Indonesian side has already obtained agreement from the landowners to sell the land. The Team again explained that the land must be available for construction of the repeater tower by March 2010.



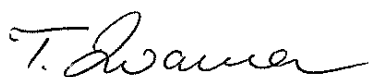
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**Report on Discussions
on the Third Visit of the Implementation Review Study Team
on the Project for Enhancement of Vessel Traffic System
in Malacca and Singapore Straits
in Indonesia**

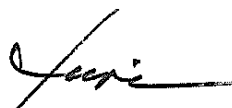
Japan International Cooperation Agency (hereinafter referred to as "JICA") sent to Indonesia the Implementation Review Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Toshiyuki Iwama, and is scheduled to stay in the country from March 15 to March 25, 2009.

The Team held discussions with the officials concerned of the Government of Indonesia and conducted a field survey at the study areas.

In the course of discussions, the Team summarized the main items described in the attached sheets and asks for clearance by the Indonesian side and a written confirmation.



Prepared by:
Toshiyuki IWAMA
Leader
Implementation Review Study Team
Japan International Cooperation Agency



Received by:
Mr. Yuri GUNADI
Director of Navigation
Directorate General of Sea Transportation
Ministry of Transportation

Date: March 25, 2009

Handwritten date: 25/3-09

ATTACHMENT

1. Background and Objective of the Mission

At the previous visit in November the Team pointed out that the transmitting towers at Dumai and Selincing to be elected by the GMDSS project could be jointly used. Since the specification of the towers at Dumai and Selincing by the GMDSS project needs to be changed, a teleconference was held on 16 February 2009 to explain the necessary items for modifications. In response DGST sent a letter to the Team as attached as Annex 1.

2. Result of the Site Survey

The Team conducted the necessary site surveys around the new site (Site A) and other technical surveys in order to assess the appropriateness of using a new site.

The preliminary result of the site and technical survey is attached as Annex 2 and 3.

The team explained the major findings as follows;

- (1) Site A cannot be reached because there is no access road.
- (2) The Team used a different site called C1 located nearby the Site A for the link budget analysis and found out that the tower height will be more than 100m if the height of the tower at Selincing remains at 50m, because there is a ridge nearby Selincing. The Team pointed out that a tower height of more than 100m is not recommendable because the quality of data transmission will decrease. Instead, if the tower height at Selincing can be increased the tower height of the new site can be decreased and the transmission quality will be improved.
- (3) Among the 10 sites visited by the Team, Site No.2, 3a, 3b, 3c, 3d and 6 will be possible to use as a repeater station. The tower height of No.2 will be the lowest among these candidate sites.

The Team proposed the following:

- a. To increase the Tower height of Selincing by GMDSS project, or
- b. To cancel the tower at Selincing by GMDSS and construct the tower by the Stage-2 of the Grant Aid project, or
- c. To use the satellite communication link between Dumai and Tg.Parit, or
- d. To cancel VHF system at Tg. Parit so that AIS data can be transmitted by a GPRS.

DGST replied to consider the possibility of the option a. above and requested the Team to issue a letter. The Team Leader prepared a letter as attached as Annex 4. On the other hand DGST also requested exploring the possibility of re-considering the Benkalis Sub-Center, if the option a. cannot be realized.

3. Schedule of the Study

The Team explained that because of the additional surveys and analysis, the draft report on Stage-2 of the Project will be available in May. JICA will dispatch a mission to Indonesia in order to explain its contents around May 2009. In case the contents of the report are accepted in principle by the Government of Indonesia, JICA will complete the final report and send it to both Government of Japan and Government of Indonesia by July, 2009

4. Other Relevant Issues Discussed

4-1 Land acquisition for the future repeater station

The Indonesian side commits the budgeting process for obtaining a new site including the temporary access during the construction of the tower as the candidate location of the future repeater station (instead of Sepahat) in addition to Tg. Sair, according to the final result of the implementation study. The Indonesian side has already obtained verbal consent from the landowners to sell the land. The Team again explained that the land must be available for construction of the repeater tower by March 2010.

END

7 T.

DGST Response after teleconference last week,

Concerning the Tanjung Parit – Dumai Rx Microwave Link Case in Malacca Strait VTS Project (Grant)

Principles

1. Existing and/or on-going project equipment and/or facilities which to be used by other projects come after shall be understood as an input and/or constrain of any design in such new come after projects.
2. The designers or engineers of the new come after projects shall endeavor their best effort and engineering resources to overcome and find solutions to any technical or natural or environment barriers in engineering manner without requires any conditions or requirements or causing any interruption to the existing and/or on-going project. Such condition or requirement may necessary a complicated modification and arrangement not only relating to technical and engineering matters but also non technical, such as contract amendment, project's audit, etc.
3. However, if the design is related to the project which has not signed its contract yet, the coordination between the related projects is highly appreciated in order to share the common equipment and/or facilities, where the earlier project shall take the responsibility of such shared equipment and/or facilities.

Maximization of Design

The design and survey particularly site or field survey shall be maximized in such that the existing and/or on-going contracted project shall not be interrupted and shall not be required by the new conditions or requirements from other new come after project. In regard to the maximization of design for microwave link between Tanjung Parit and Dumai Rx, DGST suggests alternative designs, instead of requires on-going project to adopt new conditions which requires contract amendment. The final design shall be selected from the optimal of the following alternatives:

1. Alternative design – 1: To construct higher tower in the proposed Sepahat site without requiring any tower modification in Selincing,
2. Alternative design – 2: To shorten the distance from Selincing to the next repeater on the direction to Tanjung Parit by means to cancel Sepahat site,
3. Alternative design – 3: To rearrangement link to the north side of Bengkalis.

Alternative Design – 3

Relating to the alternative design – 3, DGST suggests the microwave link to be routed from Selincing to point A in the following drawing and to Tanjung Parit from point A. The following conditions or requirements may be applied:

1. Point A shall be a non-attendance microwave repeater powered by Solar cell/panel with maintenance-free Battery for 5 days operation (around 1500AH).

A T.

2. Solar panel may be mounted in the roof of battery house with double fences.
3. Highest tower needed for point A (depend on the final location selected) will be 60m SST (self supported tower).
4. Security device may be provided for intruder detection and send the signal to Supervisor in Tanjung Parit or Dumai Rx.

Under this alternative, one repeater station will be reduced including land, building, Radio equipment, tower and emergency E/G.

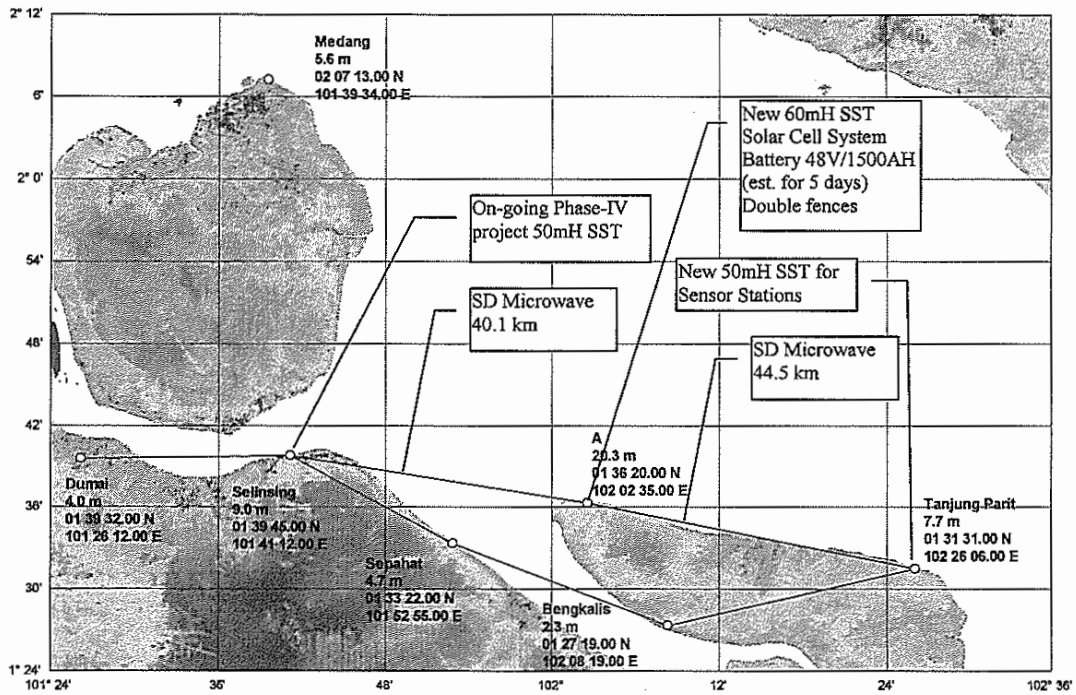


Figure 1
Site Plan for Alternative Design -3

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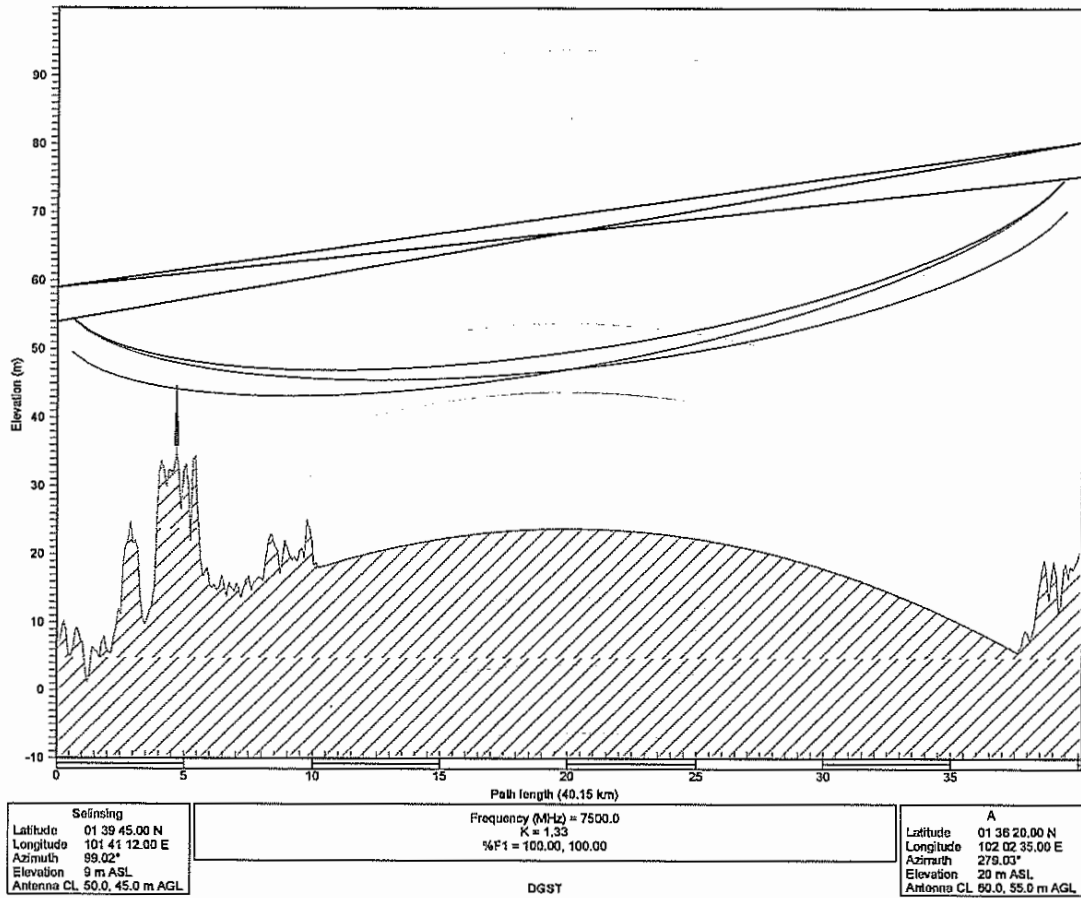


Figure 2
Path profile between Selinsing to Point A

7.

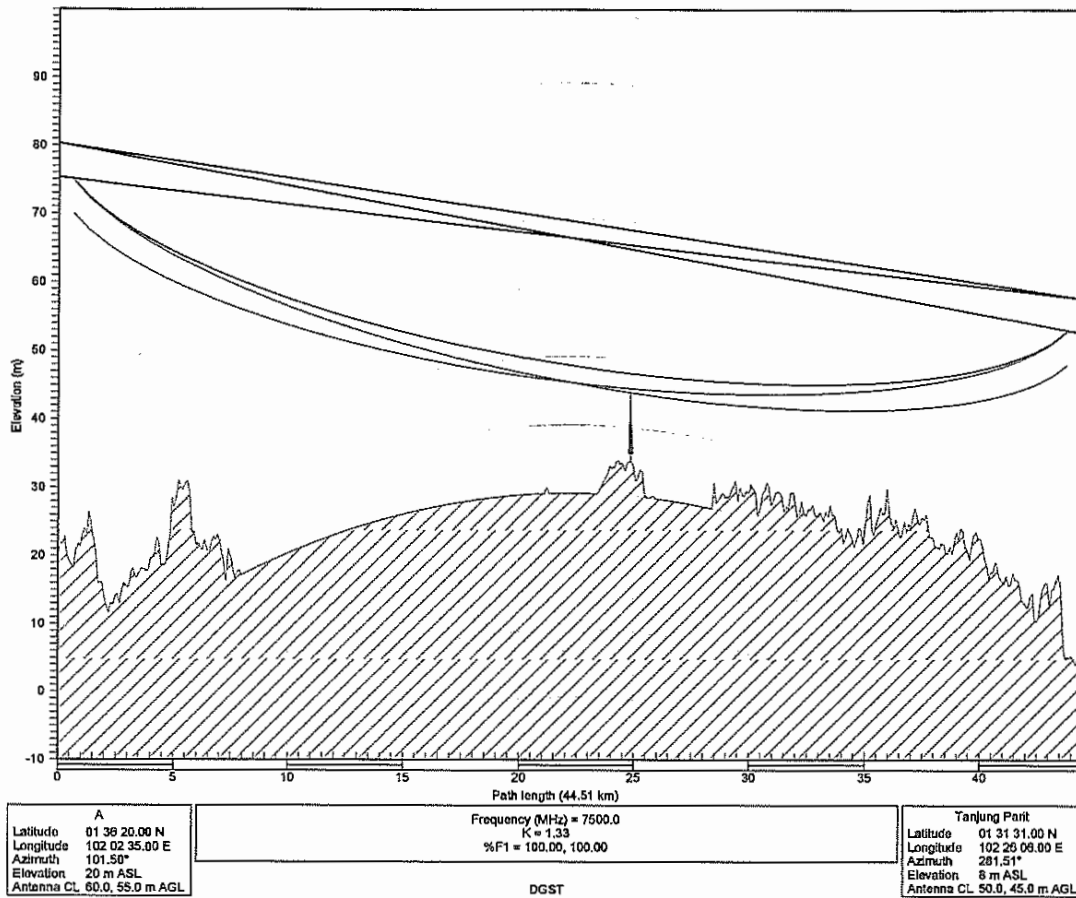
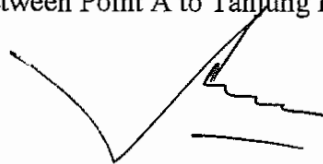


Figure 3
Path profile between Point A to Tanjung Parit



February 24, 2009

Ir. ALAMSYA SASMITO
Section head of Equipment and Maintenance
Sub-Director of Marine telecommunication,
Directorate of Navigation

7.

Table 1 Study on New Repeater Station "Site A"

1. Preliminary Study

ID	Lat.	Long.	EL(m) (GPS)	Required antenna height			Data Source	Considerations	Remarks	
				Est	Site	Tg. Part				
Site A	1 36 20.0 N	102 2 35.0 E		Pre	50	60	50	OK	It is considered that the SRTM data is included in the tree	Can not reached to Site A, since there is no access.
C1	1 35 43.4 N	102 2 53.5 E		Pre	50	110	80	70	NG	+15 tree height is considered. Land elevation shall be confirmed by the site survey
C1	1 35 43.3 N	102 2 53.5 E		Pre	50	50	60	60	OK	It is considered that the SRTM data is included in the tree

2. Surveyed Sites

ID	Lat.	Long.	EL(m) (GPS)	Required antenna height			Access to site	Site Conditions	Security	Environment		Land		Remarks
				Est	Site	Tg. Part				Natural	Social	Ownership	Secure	
No.1	1 35 41 N	102 2 54 E	15	Pre	50	110	80	70	NG	NG	NC	NG	Access is difficult. No residential area.	
No.2	1 35 1.7 N	102 2 52 E	9	Pre	50	120	90	70	NG	OK	OK	OK		
No.3a	1 34 24 N	102 0 45 E	12	Post	55	100	72	70	OK	OK	OK	OK		
No.3b	1 34 26 N	102 0 47 E	9	Pre	50	130	110	70	NG	OK	OK	OK		
No.3c	1 34 25 N	102 0 45 E	10	Pre	50	130	110	70	NG	OK	OK	OK		
No.3d	1 34 37 N	102 0 47 E	13	Pre	50	130	110	70	NG	OK	OK	OK		
No.4	1 36 0.9 N	102 0 22 E	5	Pre	50	90	110	70	NG	NG	NC	NG	Heavy coastal erosion. Access is difficult.	
No.5a	1 36 8.7 N	102 3 29 E	12	Pre						OK	NG	NC	Private company area. Secure the land may be difficult.	
No.5b	1 36 0.9 N	102 3 29 E	10	Pre						OK	NG	NC		
No.6	1 33 50 N	102 11 11 E	7	Pre						OK	OK	OK	Site may not suitable since the distance from Selincing is too far.	

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ANNEX 3

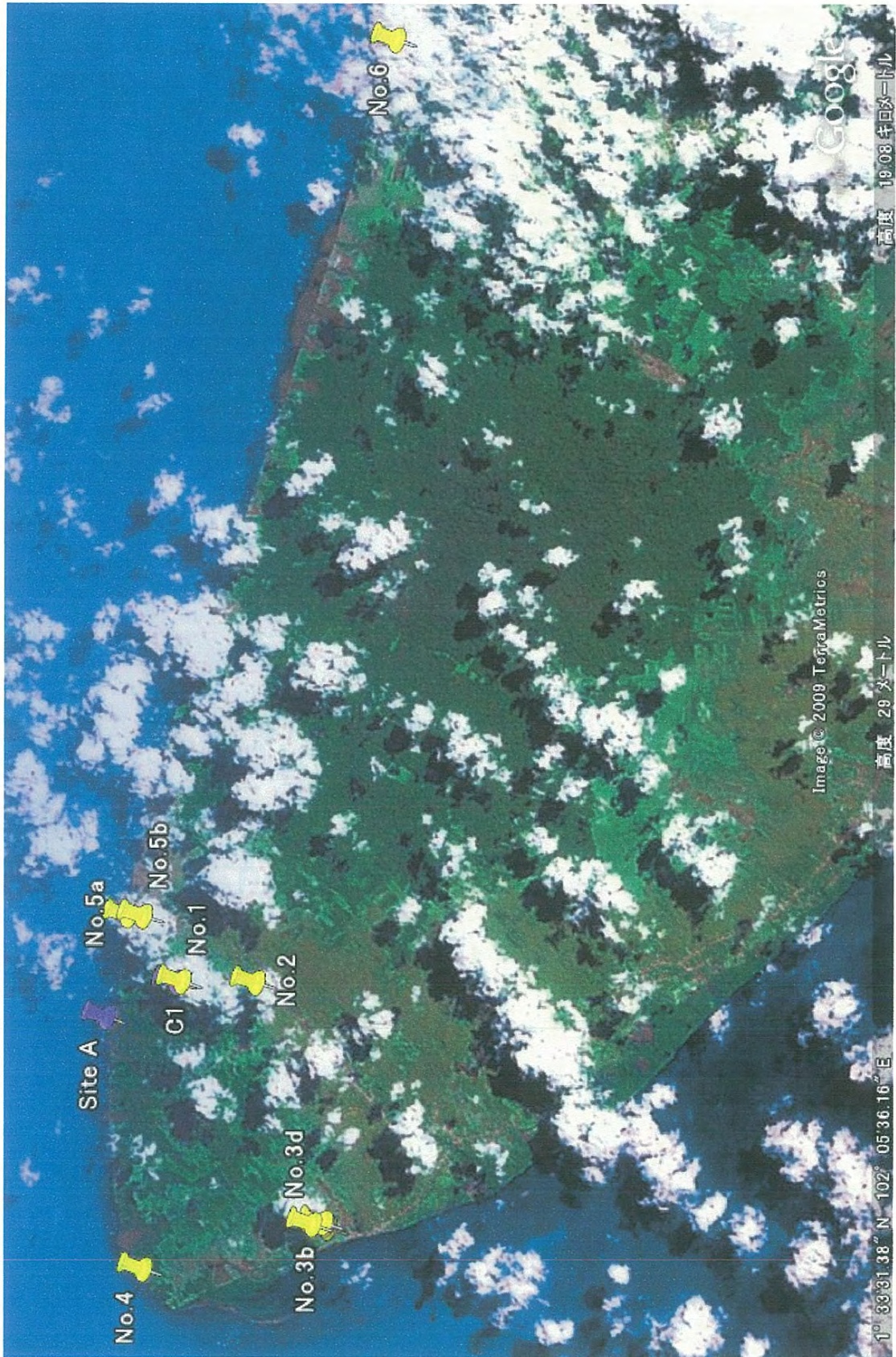


Fig. 1 Surveyed Sites

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Jakarta, March 24, 2009

Ir. ALAMSYA SASMITO
Section Head of Equipment and Maintenance
Sub-Director of Marine Telecommunication,
Directorate of Navigation
Ministry of Transport

Dear Sir,

I am writing to request your consideration of facilitating the installation of necessary antennae planned under the Grant Aid project for "Enhancement of Vessel Traffic System in Malacca and Singapore Straits" to the GMDSS towers at Selincing and Dumai for following reasons.

Under Implementation Review Study of the Grant Aid project for "Enhancement of Vessel Traffic System in Malacca and Singapore Straits" a link budget analysis was made between Selincing and a site on Benkalis Island. The result shows that the height of the tower at Selincing needs to be increased by about 5m in order to overcome a ridge located near Selincing.

For Dumai, the tower height does not need to be changed, but the tower needs to be designed and constructed to carry the additional weight of the antennae.

Kindly consult this matter with relevant parties and reply the result within 10 days, so that we can adjust the contents of the implementation review accordingly.

Your kind understanding and cooperation will be highly appreciated.

Sincerely,



Toshiyuki IWAMA
Leader
Implementation Review Study Team
Japan International Cooperation Agency

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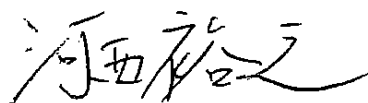
**Minutes of Discussions
on the Implementation Review Study
on the Project for Enhancement of Vessel Traffic System
in Malacca and Singapore Straits
in Indonesia
(Explanation of Draft Report)**

In October, December 2008, and March 2009, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Implementation Review Study Team on the Project for Development of Vessel Traffic System in Malacca and Singapore Straits (hereinafter referred to as "the Project") to Indonesia, and through discussions, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the study.

In order to explain and to consult with concerned officials of the Government of Indonesia on the components of the draft report for Stage-2 of the Project, JICA sent to Indonesia the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Hiroyuki KAWANISHI, Senior Representative, JICA Indonesia Office, from May 25 to 29, 2009.

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

Jakarta, May 27, 2009



Hiroyuki KAWANISHI,
Leader
Implementation Review Study Team
Japan International Cooperation Agency



Mr. Boedhi Setiajid
Director of Navigation
Directorate General of Sea Transportation
Ministry of Transportation

ATTACHMENT

1. Components of the Draft Final Report

The Indonesian side agreed and accepted the components of the draft report explained by the Team.

2. Cost Estimation

Both sides agreed that the Project Cost Estimation as attached in Annex-1 should never be disclosed to any third parties before the signing of all the contract(s) for the Project.

3. Japan's Grant Aid Scheme

The Indonesian side understood the Japan's Grant Aid scheme and the necessary undertakings to be taken by the Government of Indonesia as explained by the Team and described in the Report of Discussions signed by both sides on October 13th, 2008.

4. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the Government of the Indonesia by August, 2009.

5. Other Relevant Issues

5-1. Coordination with Maritime Telecommunication System Development Project Phase IV (hereinafter called "MTSDP Phase IV"¹)

The Team explained that the tower height and strength mentioned in 5-1-2 and the schedule for tower construction mentioned in 5-1-3 are necessary conditions to ensure the implementation of the Project. The Indonesian side and the Team confirmed and agreed the followings.

5-1-1. Scope

The Scope of the construction of the facilities, procurement and installation of the equipment by the MTSDP Phase IV and the Project are as follows:

- The facilities including steel towers at Selincing and Dumai will be constructed by MTSDP Phase IV which will be commonly used to maintain the communication between Selincing and Dumai for both projects.
- Equipment which is required to maintain data communication link between Dumai and Selincing will be commonly used equipment provided by the MTSDP Phase IV. However, the Project shall provide E1-RJ45 interface for both ends at Dumai and Selincing.

¹ MTSDP Phase IV: In the Minutes of Discussion of 13th October and 23rd December, 2008 "Maritime Telecommunication System Development Project Phase IV" is described as "the GMDSS project". But the Indonesian side requested to describe as "MTSDP Phase IV" during this discussion,

5-1-2. The height and the strength of the towers at Selincing and Dumai

The Project will install the antennae to the towers at Selincing and Dumai. To maintain the data communication links between Tanjung Parit and Dumai, the Team requested the followings.

- The Indonesian side shall assure the necessary strength of the towers at Selincng and Dumai so that the antennae for the Project can be accommodated to the towers.
- The tower height at Dumai and Selincing is 50m above the ground elevation.

5-1-3. Schedule of the installation

The Team requested the Indonesian side to complete tower construction by MTSDP Phase IV before October 2010, because the antenna installation to the towers at Selincing and Dumai are planned to start on November, 2010. The Indonesian side agreed.

5-2. Major undertakings to be taken by the Indonesian side

5-2-1 Land acquisition for the future repeater stations

The Team explained that the land for Tg. Sair and Simpang Ayam must be ready for construction of repeater station by March 2010 or earlier. The Indonesian side already proposed to Ministry of Finance additional budget for purchasing the land for Tg. Sair and Simpang Ayam.

The Indonesian side has already obtained agreement from the landowners to sell the land. The Indonesian side explained the budgeting is in process.

5-2-2 Obligations of Indonesian side

The Team requested the Indonesian side to carry out the following undertakings particularly necessary to implement the Project;

- Entry permit to the construction area and execution permit for the construction immediately after the contract signing with the Contractor.
- Acquisition of radio frequency and permission to use the radar, the multiplex radio for data communication, VHF radio communication for vessels from Ministry of Communications and information immediately after the contract signing with the Contractor.
- Permission to construct a temporary jetty which is required for material handling in Tanjung Medang and Tanjung Parit immediately after the contract signing with the Contractor.
- Relocation of the volley ball court in Dumai before starting the execution of building.
- Provision of openings for the connection of the existing office building with the new VTS Sub-Center building in Dumai prior to commencement of building work.
- Provision of access to high speed circuit (internet connections) between Dumai and Batu Ampar immediately after the contract signing with the Contractor.
- Provide furniture and fixtures in the Buildings after handover.

5-3. Staffing for Operation and Maintenance of the VTS System

The Team requested the Indonesian side to assign the appropriate number of staff with appropriate level of skill for operation and maintenance of VTS system as discussed between both sides. The Indonesian side agreed and will assign the necessary staff before the installation of VTS.

5-4. Technical Training

The Indonesian side requested the training should comply with IALA recommendation V-103 which consists of;

1. VTS Basic Training which will be carried out at the accredited training institute as enacted by IALA.
2. On-the-job-training which will be carried out at the appropriate VTS center.

These training shall be accommodated in the Project to ensure the VTS System compliance with IMO, once the system is ready for operation.

The Team explained that there is no accredited training institute as enacted by IALA in Japan. However, the Project contains the initial guidance of maintenance and operation by the Contractor, and the technical training through the soft component. The soft component is planned in accordance with the Japan's Grant Aid scheme during the implementation of Stage-2 by using the VTS equipment at Batu Ampar which will be provided by the Stage-1 Project. This training course is designed for VTS operator of the Project after IALA Model Course V-103/1, but is a part of the whole model course. The Japanese expert may assist to development of necessary knowledge about IALA.

The Team explained that the Indonesian side shall prepare travel expenses and accommodation for the trainees and space for training according to the Grant Aid scheme. The Indonesian side will try to propose the additional budget for the expenses.

5-5. Confidentiality of the specifications

The Team handed two copies of the draft detailed specifications of the equipment and the facilities to the Indonesian side, the components of which are as attached in Annex-2, and stated that these draft detailed specifications are confidential and shall neither be duplicated nor released to any outside party in order to secure the fairness of the tender of the Project. And the Indonesian side agreed.

Annex-1: Project Cost Estimate

Annex-2: Components of the Project

Py (6) 1

ANNEX-1 Project Cost Estimate

The table below shows the rough cost estimates for the construction of the Project. This cost estimate is provisional and will be subject to review by the Japanese Government prior to the approval of the proposed Grant Aid..

1) Cost to be borne by Japan

The estimated cost to be borne by the Japanese side is tentative. The estimation was conducted as follows:

(Unit: Japanese Yen Million)

Item	Amount
1. Building Construction	618.6
2. Equipment Procurement	754.5
3. Detailed Design and Supervision	180.3
Total (1+2+3)	1,553.4

2) Cost to be borne by the Recipient Country

- Relocation of the volley ball court located in the yard of Dumai
- Provision of an opening of the existing office building for connection with the new VTS Sub-Center building in Dumai.
- Acquisition of high speed circuit between Dumai and Batu Ampar
- Furniture in the Buildings and others
- Bank commissions

The cost for the above works is estimated at about Rp.178.9 million.

3) Bases of the Cost Estimates

- 1) Base date December 2008
- 2) Exchange Rate
1 US Dollar=105.71 Yen
1 Rp.=0.0122 Yen
- 3) Construction period See Implementation Schedule
- 4) Others The project will be implemented in accordance with the procedures of grant aid projects of the Japanese Government.

ANNEX-2 Components of the Project

Table 1 Outline of Equipment to be Procured by the Project

Equipment	1	2	3	4	5	6
	Tanjung Medang	Tanjung Sair	Dumai	Selincing	Simpang Ayam	Tanjung Parit
Equipment for VTS Sensor and Repeater Stations						
Radar System	○					
VHF Marine Radio System	○					○
AIS Base Station System (AIS System)	○					○
CCTV Camera Equipment (CCTV System)	○					
Area Surveillance Camera		○			○	
Meteorological Sensor Unit with Data Logger	○					
Air Conditioner for Radar Sensor Station	○					
Diesel Engine Generator	○					
Solar Power Generator		○			○	○
Housing Unit (with accessories)		○			○	○
Equipment for VTS Sub-Center						
Tracking System			○			
Multi-function Console with VHF Radio Communication Unit			○ ¹⁾			
Data Base for Vessel Information			○			
Record and Playback System for Vessel Traffic			○			
AIS Server System (AIS System)			○			
CCTV Video Display Equipment (CCTV System)			○			
Meteorological Monitor Console			○			
Resource Management System			○			
Printer System (Monochrome and Color)			○			
Connecting Devices for Internet Communication between Dumai and Batu			○ ²⁾			
Equipment for VTS Sub-Center, Sensor and Repeater Stations						
Equipment Desk and Others			○			
Multiplex Radio Equipment (Data Communication System)	○	○	○ ³⁾	○ ³⁾	○	○

1) 2) One another unit will be installed at Batu Ampar VTS Center

3) Equipment installed by MTSD Project IV will be used for data Transmission between Dumai and Selincing.

Table 2 Outline of the Facilities to be Constructed by the Project

Facilities	Unit	Quantity	1	2	3	4	5	6
			Tanjung Medang	Tanjung Sair	Dumai	Selincing	Simpang Ayam	Tanjung Parit
VTS Sub-Center	Unit	1			1			
	m ²	207.4			207.36			
Equipment Building	Unit	1	1					
	m ²	42.25	42.25					
Generator Building	Unit	2	1		1			
	m ²	100	55.00		45.00			
Air Conditioners (for VTS Sub-Center)	Unit	1			1			
Diesel Engine Generator (Emergency Backup)	Unit	1			1			
	Nos.	1			1			
Fuel Tank (Outdoor)	Unit	2	1		1			
	m ³	2	6.0		2.0			
Water Reservoir	Set	1			1			
	m ³	1			1.0			
Septic Tank	Set	1			1			
	m ³	1			4.0			
Steel Tower for Radar and Communications	Unit	3	1	1			1	1
	m	3	72.50	84.50	-	-	84.00	86.50

Report of Working Group Discussions
on
the Implementation Review Study
on
the Project for Enhancement of Vessel Traffic System
in Malacca and Singapore Straits

DGST and the JICA Study Team have discussed from October 14 to October 24, 2008 and agreed as follows:

1 Review of the Stage-1 Project

(1) Hiyu Kecil Lighthouse

The JICA Study Team pointed out that the black sector of the existing light house is not same as the indication of sea chart. Existing light house provides a 360-degree service. The JICA Study Team requested DGST to clarify the reason why the discrepancy was caused, DGST explained that light have been changed from simplex to revolving since Feb. 4, 1974, however, regardless the situation and reason of the discrepancy, JICA Study Team explained that the steel tower will be designed to minimize the obstruction.

(2) Tg. Berakit Lighthouse

DSGT requested the JICA Study Team to modify from a partially complemented lantern to a fully complemented one. The DGST required that the tower design will be suitable to fit lantern.

(3) Building layout plan of Takong Kecil

DGST requested the JICA Study Team to modify the building layout of Takong Kecil according to the coordination with Navigation District. Requested plan is shown in Attachment-1.

(4) DGST confirmed to conduct the lantern performance test from sea side after completion of the installation.

2 Relevant Issues to be Clarified for Stage-2 Project

(1) Rationality for the establishment of VTS-Sensor Station at Tg. Parit

The issues are agreed as stated as the Minutes of Discussions on the Implementation Review Study on the Project for Enhancement of Vessel Traffic System in Malacca and Singapore Straits in Indonesia on October 13, 2008 (hereinafter called "the Minutes of Discussions").

(2) Proposed future repeater stations

DGST explained that the Indonesian side has already secured Selincing in GMDSS IV project and budgeted to acquire Sepahat as the candidate locations of the future repeater station.

DGST explained that the GMDSS IV project plans to construct communication links between Selincing and Dumai coastal radio station. JICA Study Team pointed out if the communication facilities between these two sites can be shared by both Projects, it will be high cost benefit. In this point of view, the JICA Study Team asked DGST availability of relay station such as Morong. DGST stated that utilize of the land of pilot station in Morong is not agreeable due to view point of fuel supply and maintenance. However, from the above mentioned point of view, DGST agreed to consider an additional repeater station between Tg. Medang and Dumai.

DGST and the JICA Study Team confirmed the proposed repeater station positions as shown in Attachment-2. The site conditions identified at the site are as follows and shown in the sketch drawings in Attachment-3.

1) Selincing

Presently there are no facilities inside of the land. Electrical power and water supply is not available.

2) Sepahat

There are no facilities at the site. Electrical power by PLN is available from 17:00 to 7:00.

3) Morong

The site is used for pilot station and land is owned by PT. PELINDO I.

(3) Land Acquisition for Stage-2 project

DGST has already secured the lands of Tg. Medang, Dumai, Bengkalis, Tg. Parit, Selincing and ready to use of this Project. For Sepahat, only after the JICA Study Team confirm, DGST will arrange the land.

3 Obligations of the Recipient Country

The followings are the mutual understandings in the Report of Discussions on December 2007. DGST agreed to arrange and to conduct the followings in the implementation stage.

3.1 Common for Stage-1 and Stage-2

- (1) To support to issue the entry permit to the construction area and execution permit for construction
- (2) To arrange and to obtain the following licenses:
 - 1) Transmission frequency of Radar Transmitter (9GHz Band)
 - 2) Radio frequency for multiplex radio link (7.5GHz band, 5GHz band is not possible)
 - 3) VHF marine radio communication channels for Hiyu Kecil, Batu Ampar and Tanjung Berakit sensor sites. Assigned channel will be directed by DGST in beginning of implementation stage.

3.2 For Stage-1

- (1) Permissions to use the existing jetty at Hiyu Kecil and Takong Kecil for material transportation, and permission to reclaim to provide a temporary yard for material stocking,
- (2) Tapping of commercial power supply for the VTS center in Batu Ampar,
- (3) Demolition and removal of the existing fence in Takong Kecil,
- (4) Demolition and relocation of the road in the yard in Tanjung Berakit,
- (5) Land acquisition for Stage-1

Lands of Hiyu Kecil, Takong Kecil, Batu Ampar, and Tg. Berakit are secured and owned by DGST and ready to use of the Project.

3.3 For Statge-2

- (1) Permission to construct a temporary jetty which is required for material handling in Tanjung Medang and Tanjung Parit,
- (2) Demolition and removal of the existing warehouse in Tanjung Medang,
- (3) Relocation of the volley ball court in Dumai,
- (4) Provision of openings for the connection of the existing office building with the new building,
- (5) Internet Connections between Dumai and Batu Ampar

4 Implementation

4.1 Schedule

The JICA Study Team explained the expected implementation schedule of Stage-1 and Stage-2 and Japan's Grant Aid Scheme.

4.2 Budget

The JICA Study Team explained the necessary amount to be prepared by DGST for the implementation of the Project.

4.3 Responsible Persons for the Project

DGST explained the JICA Study Team that DGST will establish "Satuan Kerja" (working unit) for the project implementation. Satan Keja consisted of (i) KPA (authority of budgeting user), (ii) PPK (project manager, contract signer), (iii) BENDAHRA (treasurer), (iv) SPM (in charge of treasury) and (v) staff.

5 Others

- (1) Operation and Maintenance Structure

Staffing schedule for operation and maintenance is still under consideration.

- (2) Technical Training and/or Soft Component

DGST requested, (i) training for technicians to build skills of fixing any trouble and maintain of hardware and software by themselves, (ii) training for VTS operators to improve their skills on operation.

(3) MEH Demonstration Project

1) Progress of the Project

The Project is stacked due to some reasons in procurement system.

2) AIS

AIS installation to Hiyu Kecil and Tg. Medang is still in the scope of the MEH Project.

3) MEH Data Center

DGST requested to make use of the VTS Center at Batu Ampar for the MEH data center as follows:

a. Data center which is currently provided in the existing office building at Batu Ampar Coastal Radio Station, will be moved to VTS Center when the building facility will be ready for use.

b. DGST has plan re-locate of existing coastal radio station to the VTS Center building.

The JICA Study Team will consider the floor plan by minor modification of the basic design.

(4) Others

1) The JICA Study Team requested DGST the followings:

a. Arranging to permits to conduct radio communication links survey at all the candidate sites and natural conditions survey (topographic survey and soil investigations) at Selincing and Sepahat by Indonesian engineering firms on behalf of the JICA Study Team,

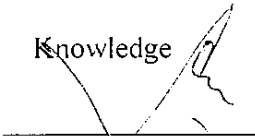
b. DGST cooperation for the study, including site visit to Batu Ampar and Tg. Berakit, conducted by Mr. Toshitsugu Shimada, Building Planning Specialist, who will be dispatched from November 3 to 12, 2008.

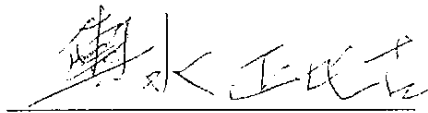
2) Components of the Stage-2 Project

Equipment and facilities to be composed at for Tg. Medang, Tg. Parit and necessary repeater stations for Stage-2 will be recommended by the JICA Study Team after conducting further studies and discussions in Japan.

October 24, 2008

Knowledge


Ir. Alamsyah Sasmito, MM
Section head of Equipment and Maintenance
Sub-Directorate of Marine Telecommunication
Directorate of Navigation, DGST


Mr. Masahiko Koshimizu
Chief Consultant
On behalf of
The JICA Study Team

List of Attendance

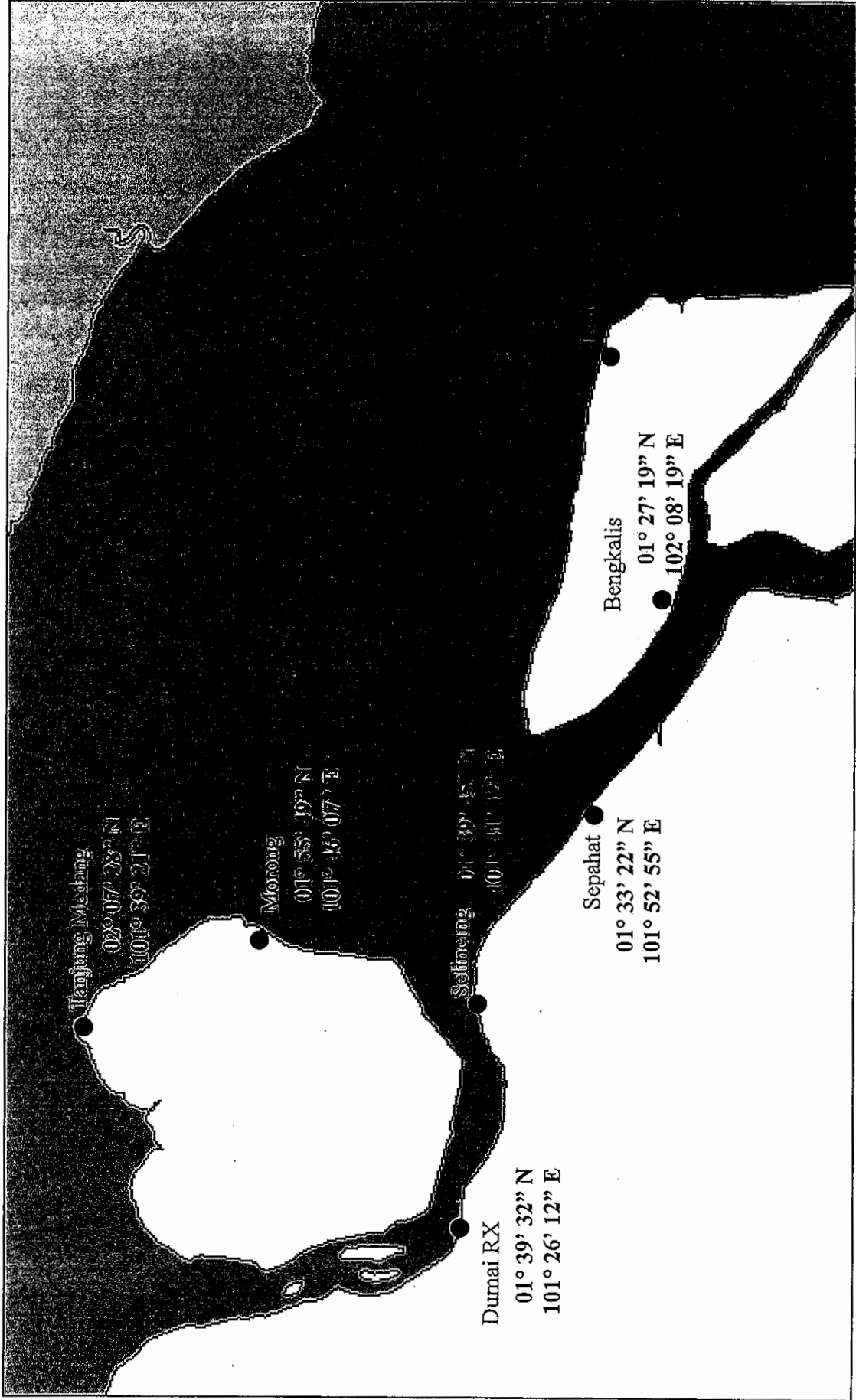
Directorate General of Transportation (DGST)

Ir. Alamsyah Sasmito,	Head of Section Equipment and Maintenance Sub-Directorate of Maritime Telecommunication Directorate of Navigation
Mr. Tofan Rindoyo	Head of Section Operation Sub-Directorate of Maritime Telecommunication Directorate of Navigation
Mr. Raymond Ivan H.A.S	Head of Equipment & Maintenance Section Sub-Directorate of Aids to Navigation Directorate of Navigation
Mr. Ketut Aries,	Staff of Sub-directorate of Maritime Telecommunication
Mr. Tony Rafiq,	Staff of Sub-directorate of Maritime Telecommunication
Mr. Andi Aswad	Staff of Sub-directorate of Aids to Navigation
Mr. Leonard S.	Staff of Sub-directorate of Aids to Navigation
Mr. Kazuyuki Tanaka	JICA Expert
The JICA Study Team	
Mr. Masahiko Koshimizu,	Chief Consultant, Maintenance, Operation and Management Specialist
Mr. Mitsumasa Noguchi,	Equipment Planning Specialist I
Mr. Kazuma Inoue,	Equipment Planning Specialist II
Mr. Jun Yamauchi,	Transmission Facilities Specialist
Mr. Satrio Steyawan.	Engineer

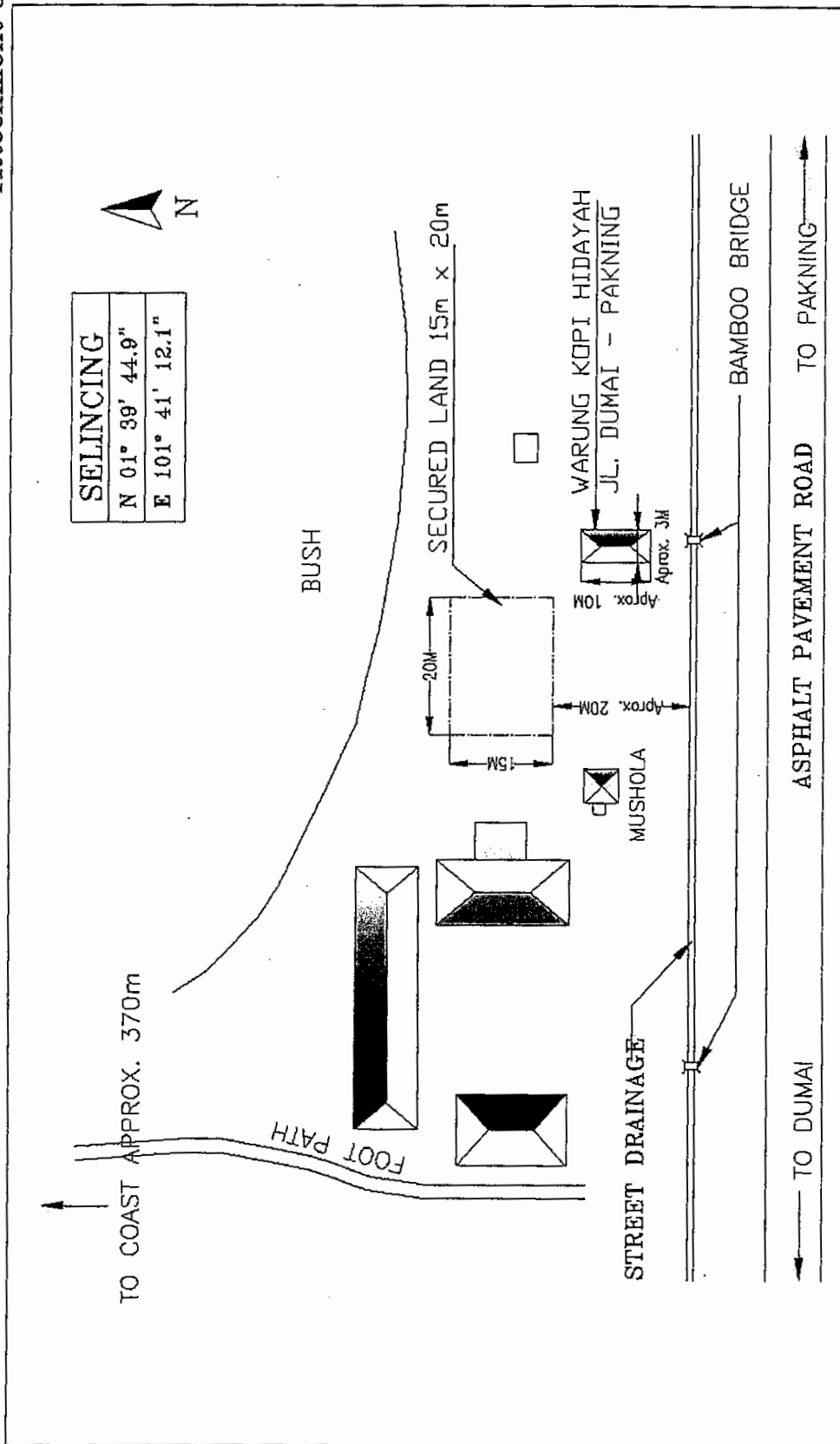
Attachments

- Attachment-1 DGST request for generator building relocation at Takong Kecil
- Attachment-2 Locations of Proposed Repeater Station
- Attachment-3 Sketch Drawings of Site Conditions (Selincing, Sepahat and Morong)
- Attachment-4 Site Visit Schedule

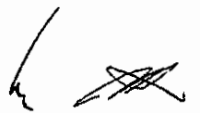


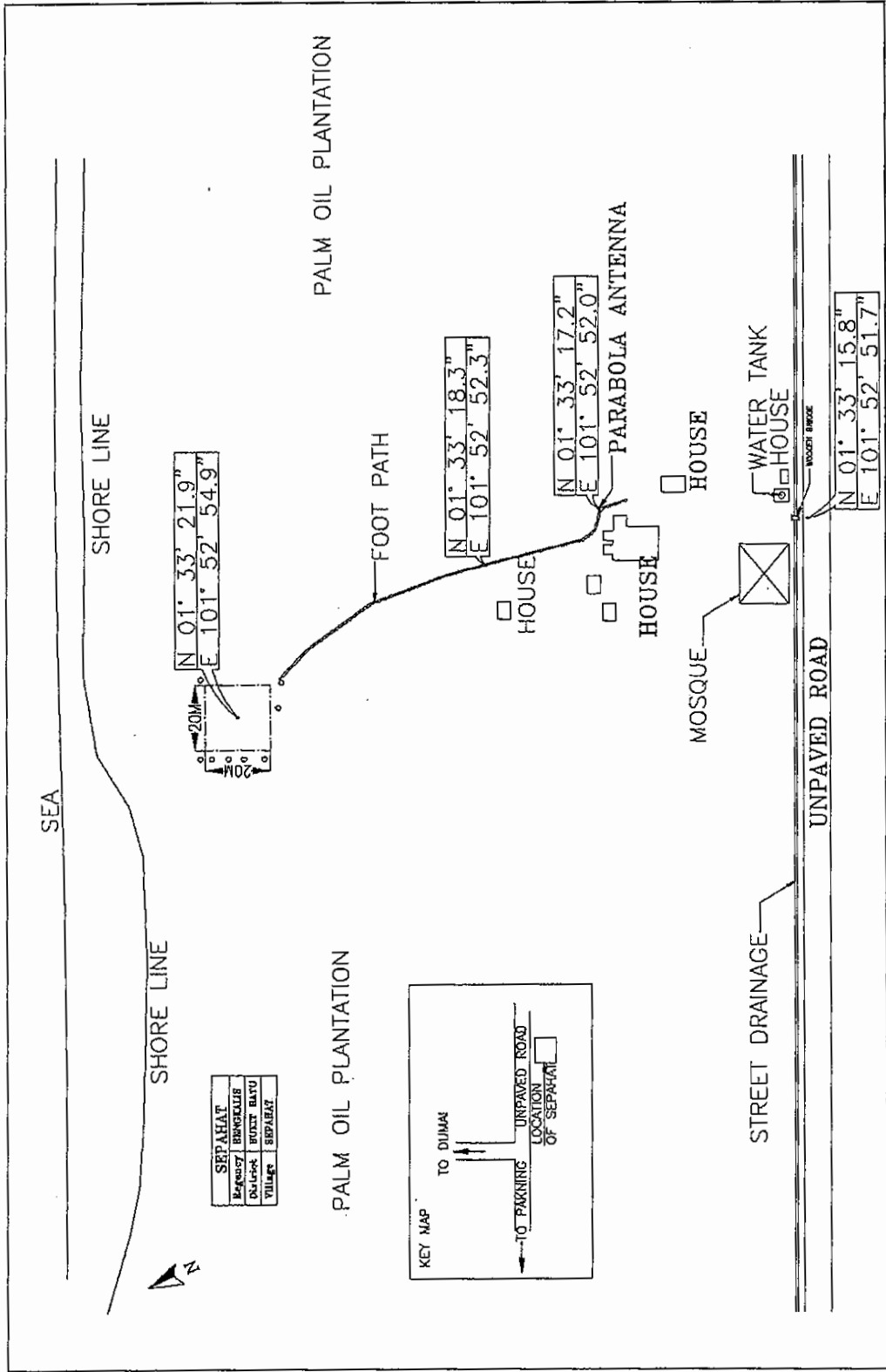


Locations of Proposed Repeater Stations



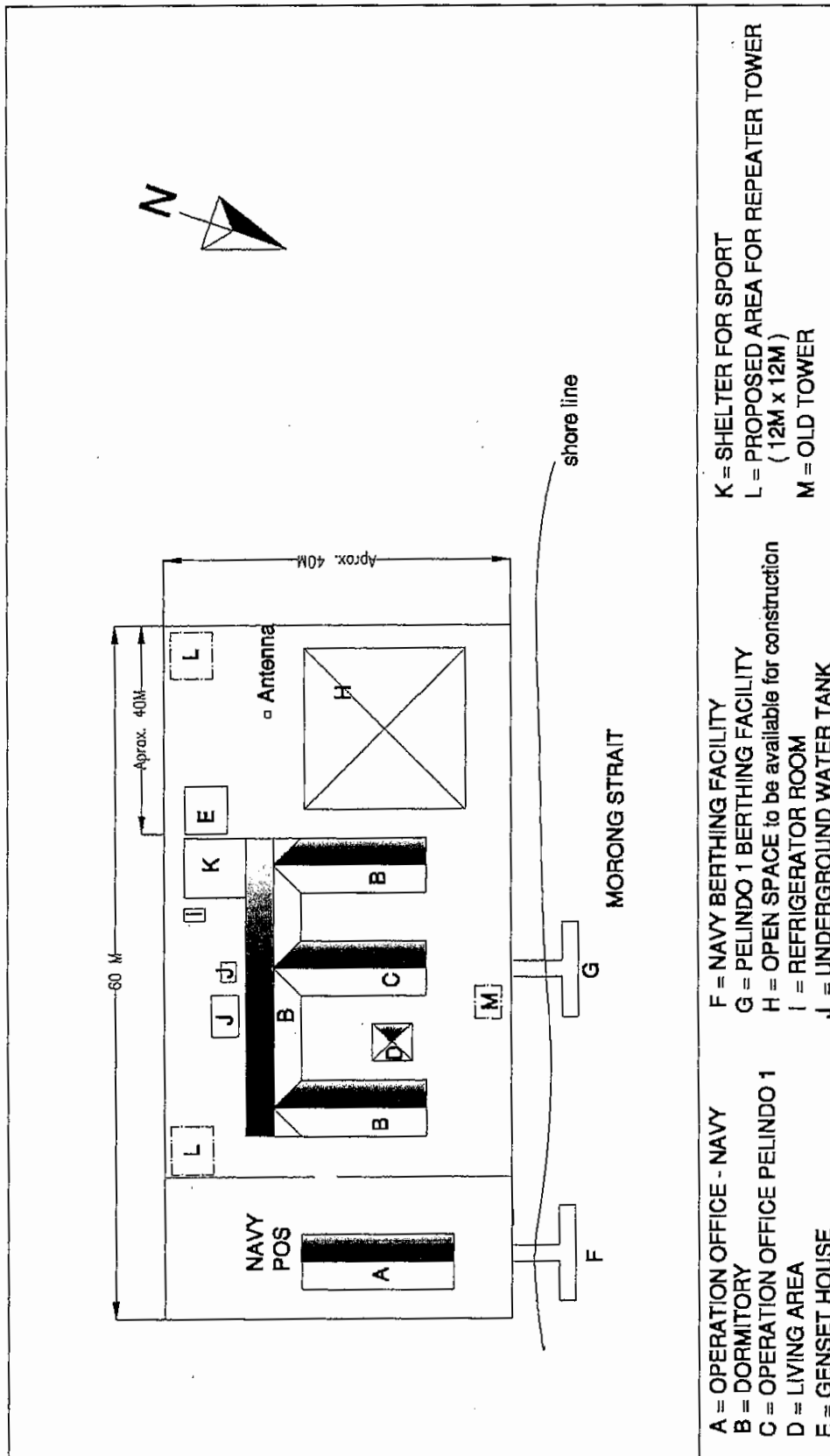
Site Conditions of Selincing





Site Conditions of Sepahat





Site Conditions of Morong



Site Visit Schedule
for
Implementation Review Study on the Project for Enhancement of Vessel Traffic System
in
Malacca and Singapore Straits

1 Schedule

(1) Team I, for Phase II sites

Mr. Masahiko Koshimizu, Mr. Kazuma Inoue (JICA Study Team)

Mr. I.Ketut Aries Nakula, Mr. Leonard.S (DGST)

Ms. Piping Nurhandayani (JICA Study Team)

Date and time	Activities	Remarks	Sites
Oct. 17, 2008	<u>Travel to Dumai</u> Leave from Hotel		
5:00	Travel from Jakarta to Pekanbaru by Air GA 170 (07:00 – 08:35)	Air Ticket	
7:00	Mr. Leonard S Mandala RI 072 14.40 – 16.15		
9:30	Move to Dumai by car (Arrival at Dumai 14:00)	Rental Car	
14:30	Lunch		
15:00	Vist to Dumai Coastal Radio Station		
16:00	Site Survey for Site of VTS Sub-center (Dumai RX) Stay at Dumai, Grand Zuri Dumai (0765-31999)		District Navigation Office
Oct. 18, 2008	<u>Survey of Tg. Medang and Teluk Klecah (Morong) Pilot Station</u>		
8:15	Move from Dumai to Tg. Medang by Boat (Arrival at Tg. Medang 10:30)	Rental boat	Tg. Medang
10:30	Site survey in Tg. Medang and surrounding area		
12:00	Move from Tg. Medang to Morong Pilot station by boat, Lunch on the boat (Arrival on Morong at 14:00)		Morong Pilot station (PELINDO I)
14:00	Site survey in Morong Pilot station		
15:00	Move to Dumai by boat (Arrival on Dumai at 16:30) Stay at Dumai, Grand Zuri (0765-31999)		
Oct. 19, 2008	<u>Survey of Selincing and Sepahat Proposed Repeater Station and Dumai Coastal Radio Station</u>		
8:00	Move to Selincing by Car	Rental Car	
9:30	Site survey of proposed repeater station of Selincing		Selincing (proposed repeater station)
10:30	Move from Selincing to Sepahat by Car	Rental Car	
11:00	Survey of propose repeater station of Sepahat Village		Sepahat village (Proposed repeater station)
12:00	Move to Dumai by car		
15:00	Arrival at Dumai Stay at Dumai, Grand Zuri (0765-31999)		

Date and time	Activities	Remarks	Sites
<p>Oct. 20, 2008</p> <p>7:00</p> <p>9:30</p> <p>11:00</p> <p>12:30</p> <p>14:00</p> <p>15:30</p> <p>16:00</p> <p>17:00</p>	<p><u>Visit to Survey of Bengkalis and Tg. Parit</u></p> <p>Move from Dumai to Bengkalis by regular boat (arrival at Bengkalis at 8:50)</p> <p>Move from Bengkalis to Tg. Parit by Car</p> <p>Site Survey in Tg. Parit</p> <p>Move from Tg. Parit to Bengkalis by car</p> <p>Vist and Survey of Bengkalis Coastal Radio Station</p> <p>Lunch</p> <p>Move from Bengkalis to Sungai Pakning by regular boat (Arrival at S. Pakning 16:50)</p> <p>Move from Sungai Pakning to Pekanbaru by car (Arrival at Pekanbaru 21:30)</p> <p>Stay at Hotel Grand Zuri Pekanbaru (0761)860988</p>	<p>Regular Boat</p> <p>Rental Car</p>	<p>Coastal Radio Station at Bengkalis</p> <p>Tg. Parit Proposed VTS sensor station</p>
<p>Oct. 21, 2008</p> <p>14:30</p>	<p><u>Return Back to Jakarta</u></p> <p>Move from hotel to Pekanbaru</p> <p>Travel from Pekanbaru to Jakarta by Air GA 175 14:30-16:00</p> <p>Mr. Leonard travel Pekanbaru - Jakarta Mandala RI 073 16.45 – 18.20</p>	<p>Regular Boat</p> <p>Air Ticket</p>	

(2) Team IIA for Phase I sites

Mr. Mitsumasa Noguchi, Mr. Jun Yamauchi (JICA Study Team)

Mr. Kazuyuki Tanaka (DGST JICA Expert), Mr. Andi Aswad (DGST)

Mr. Satrio Setyawan (JICA Study Team)

Date and time	Activities	Remarks	Sites
Oct. 17, 2008	<u>Travel to Batam and Visit Navigation District 1 Office Tanjung Pinang</u>		
8:30	Leave from Hotel		
11:05	Jakarta to Batam by Air, GA 152 11:05 – 12:35 Mr. Andi Aswad Mandala airlines RI 140 - 9.30 – 11.00	Air Ticket	
12:40	Move from Airport to Telaga Punggur	Taxi	
13:00	Move from Telaga Punggur to Tg. Pinang by Regular Boat (1 hour). Informal meet with Mr. Benny T in the same boat		
14:00-15:30	Navigation District for meeting at Kijang (1.5 hour)		Navigation Distrikt at Kijang
15:30	Move from District Navigation Office to Tanjung pinang		
16:00	Stay at Tanjung Pinang Hotel Comfort (0771-41234)		
Oct. 18, 2008	<u>Survey of Tg. Berakit</u>		
8:00	Leave from Hotel Tanjung Pinang to Tg. Berakit by Car accompany by 1 staf of District Navigation 1- Kijang – Mr Sumbar Jati (2 hours)	Rental Car	
10:00	Site survey at Tg. Berakit (1-2 hours)		
12:00	Move from Tg Berakit to Tg Uban Move from Tg Uban to Telaga Punggur By Regular boat (1 hour)		
13:00	Move from Telaga Punggur to Hotel		
16:30	Stay at Batam (Hotel Novotel) (0778)425555 Preparation for site survey Hiyu Kecil and Takong Kecil (find rental boat)		
	Contact Mr. Sudiantoro Head of Batu Ampar Coastal radio Station by phone and Refereed to Mr. Mulyanto		

Date and time	Activities	Remarks	Sites
Oct. 19, 2008	<p><u>Survey of Takong Kecil & Hiyu Kecil</u> <u>(Mr. Noguchi, Mr. Yamauchi, Mr. Tanaka, Mr. Satrio, Mr Andi Aswad and Mr. Sumbar Jati)</u></p> <p>7:00 Move from Hotel to Sekupang</p> <p>8:00 Move from Sekupang to Takong Kecil by Rental Boat (2 hours)</p> <p>9:00 Site survey of Takong Kecil (1-2 hours) and lunch on boat(One staff accompany from Kijang)</p> <p>11:00 Move from Takong Kecil to Hiyu Kecil rental boat (2 hours)</p> <p>13.00 Site survey of Hiyu Kecil (1-2 hours)</p> <p>15.00 Mr. Sumbar Jati move to Tanjung Pinang by rental boat.</p> <p>Move from Hiyu Kecil to Sekupang by Rental Boat (2-3 hours)</p> <p>18:00 Move from Sekupang to Hotel by car Stay at Batam (Hotel Novotel) (0778)425555</p>	<p>Taxi Rental Boat</p> <p>Rental Car</p> <p>Rental Boat</p>	<p>Takong Kecil</p> <p>Hiyu Kecil</p>
Oct. 20, 2008	<p><u>Mr. Yamauchi, Mr. Tanaka and Mr. Andi Aswad</u></p> <p>8:00 Move from Hotel to Batu Ampar Coastal Radio Station by Car</p> <p>8:30 Survey of Batu Ampar Coastal Radio Station (1 hour)</p> <p>12:30 Move from Hotel to Air Port Move from Batam to Jakarta by GA 153 (13:10-14:45)</p> <p><u>Mr. Andi Aswad move from Batam to Jakarta</u> Mandala RI 175 14.40 – 16.10</p>	<p>Taxi</p>	<p>Batu Ampar Coastal radio Station</p>

Date and time	Activities	Remarks	Sites
Oct 20, 2008	<u>Mr. Noguchi and Mr. Satrio, Move to Dumai</u>	Taxi	
5.00	Move from Hotel to Sekupang by car (30 min.)		
7.45	Move from Sekupang to Dumai by regular boat (7 hours)		
14.45	Move from Dumai Port Terminal to District Navigation Office – Dumai Visit to Navigation Office Dumai, meeting with Mr. Sugito (acting Head of navigation Office), Mr. Purwadi , mr. Subroto (acting Chief of Dumai Coastal Radio Station).		
15.00 – 16.30	Move from District Navigation Office Dumai to Selincing by rental car, accompany by Mr. Subroto. Survey Selincing site.		Selincing (Propose repeater station)
17.00 – 17.45	Move from Selincing to Sepahat Survey Sepahat site		Sepahat (Propose repeater station)
18.15	Move from Sepahat to Dumai Visit Mr. Sugito Dinner with officer Mr. Sugito, Mr. Purwadi and Mr. Subroto		
	Move to / Hotel Grand Zuri(0761)860999 Documentation Stay in Dumai		
Oct. 21, 2008	<u>Return Back to Jakarta</u>		
10.00	Move from Hotel to Pekanbaru -Airport by rental car.	Rental Car Air Ticket	
17:55	Travel to Jakarta by Air GA 177 17.55-19.25		

2 Team Members

(1) Team I for Phase II sites

1) JICA Study Team

Mr. Masahiko Koshimizu

Mr. Kazuma Inoue

2) DGST

Mr. I.Ketut Aries Nakula , Mr. Leonard S

- 3) JICA Study Team Local Staff Assistant (Translator/Engineer)
Mr. Piping Nurhandayani
- (2) Team II for Phase I sites
 - 1) JICA Study Team
Mr. Mitsumasa Noguchi
Mr. Jun Yamauchi
Mr. Kazuyuki Tanaka (JICA Expert)
 - 2) DGST Team
Mr. Andi Aswad
 - 3) JICA Study Team Local Staff Assistant (Translator/Engineer)
Mr. Satrio Setyawan



Record of Working Group Discussions
on
the Implementation Review Study
on
the Project for Enhancement of Vessel Traffic System
in Malacca and Singapore Straits

DGST and the JICA Study Team have discussed from December 9 to December 19, 2008 and agreed as follows:

1 Stage-1 Project

1.1 Scope of the Project

The project cost outlook which is currently under review after the basic design study is estimated about 1.5% exceeded the amount of Exchange of Notes for the Components of the Stage-1 (hereinafter referred to as "E/N"). Main component of the Stage-1 Project is to proceed as per the original scope of works except the minor modifications listed in the next paragraph 1.2 which have been confirmed on the discussions and agreements of Report of Working Group Discussions on the Implementation Review Study on the Project for Enhancement of Vessel Traffic System in Malacca and Singapore Straits signed on October 24, 2008 (hereinafter called as "the Report on December 24"). However, some spare parts and measuring equipment for maintenance for Stage-1 are necessary to be moved into Stage-2, since the estimated cost shall be in the cost limit specified in the E/N.

1.2 Items to be confirmed and/or modified of the Basic Design

1.2.1 Relations with the lighthouse functions

Following matters are confirmed

(1) Hiyu Kecil Lighthouse (Attachment-1)

Radar's tower is to be located within the black sector based on the stipulations indicated on the relevant sea charts. DGST agreed the position of the plan.

(2) Takong Kecil (Attachment-2)

According to the DGST request, the compensation light design shall be modified as follows instead of the current design conducted by the JICA Study Team.

- 1) Red color sector of the existing light house shall be closed as black sector.
- 2) The existing red sector of the light shall be maintained by installing a sector light at the radar tower. The light currently designed as the compensation light is used as the sector light.
- 3) In this regard, synchronizations of compensation light with the existing light is not

required.

- 4) Red color sector shall be maintained the same angle as indicated on the relevant sea charts and the Indonesian List of Light (Daftar Suar).
 - 5) Lighting character and specification shall be in accordance with the specifications indicated on the relevant sea charts and the Indonesian List of Lights (Daftar Suar Indonesia).
 - 6) LED lantern type is accepted. However, luminous range shall be maintained minimum 18 nautical miles.
 - 7) It will be assigned as two aids to navigation on Takong Kecil Island, the notice to mariners and the modification of the sea charts as well as the Indonesian List of Lights will be responsible by DGST.
- (3) Tg. Berakit Lighthouse (Attachment-3)

- 1) Considering the technical aspect in respect with the effectiveness of the Aids to Navigations, it is prioritized (as option no.1) to establish the new radar's tower within the black sector of the existing lighthouse. Should the radar's tower established at this position, additional lantern is not necessary to be installed on the new radar tower.

For this purpose, in accordance with the Japan's Grant Guideline, site clearance including replacement of the existing generator house and warehouse shall be done by Indonesia before starting the construction works of radar tower and the necessary expenses in regards shall be borne by Indonesia.

DGST will make discussion and coordination internally regarding to the above availability, when available DGST may request to modification of the radar tower position in D/D stage. However, Review Basic Design Study will be conducted based on the option 2 stated in below to avoid the delay of the basic design works.

- 2) Alternatively, as the 2nd option, should the 1st option above could not be fulfilled; since the radar tower will obstruct the existing light, a rotating (revolving) lantern shall be installed on the radar tower. The lantern shall be designed in accordance with the specification indicated in the relevant sea charts and Indonesian List of Lights (Daftar Suar Indonesia), to maintain same angle, range, elevation and light character. Particular platform (balcony) shall be installed at the required level of the new radar tower. The platform (balcony) shall be designed appropriately to guarantee ease of access, security and personnel safety. Further consultation will be carried out during the design.

- (4) Tg. Medang (Attachment-4)

Radar tower position shall be modified south side of existing generator house.

- (5) Tg. Parit

Radar tower position shall be considered to avoid obstructions of existing light house. Planned location is no problem.

1.2.2 Buildings

- (1) Site layout plans of Takong Kecil and Tg. Berakit

- 1) Takong Kecil

Building construction location of Takong Kecil is modified as shown in Attachment-2 according to the DGST request.

2) Tg. Berakit

Based on the discussions at site on November 6, building construction location of Tg. Berakit is modified as shown in Attachment-3.

(2) Floor layout plan of Batu Ampar VTS Center

The floor layout plan is modified as shown in Attachment-5 according to the DGST's request to accommodate office staff for MEH project in the building,

1.2.3 Equipment

(1) FM radio broadcasting system

The equipment is deleted from the scope of work according to the DGST's request.

(2) Multifunction console

A multi-function console to extend Dumai VTS Sub-Center information to Batu Ampar VTS Center and to be installed in Batu Ampar is moved into Stage-2 Project from Stage-1 Project.

1.3 Task team for the Project implementation

(1) Signer of the Contract

It is expected that the signer of the Documents in the Implementation Stage will be Director General of Sea Transportation or Director of Navigation.

(2) Working Unit

DGST explained the JICA Study Team that DGST would establish "Satuan Kerja" (working unit) for the project implementation. Satuan Kerja is usually consisted of (i) KPA (authority of budgeting user), (ii) PPK (project manager, contract signer), (iii) BENDAHARA (treasurer), (iv) SPM (in charge of treasury) and (v) staff.

The working unit arrangement is ready for proceed. Further administrative process will be conducted after signing of the Contract.

1.4 Expected Schedule

1.4.1 Stage-1 Project

The draft report on Stage-1 of the Project in English and send it by February 2009. In case the contents of the report are accepted in principle by the Government of Indonesia and JICA confirms the result of the study as appropriate, JICA will recommend the Government of Indonesia as appropriate consultant for the implementation of the Project. After issue the JICA recommendation, the Project is ready to start for implementation stage.

1.4.2 Stage-2 Project

The draft report on Stage-2 of the Project in English and dispatch a mission to Indonesia in order to explain its contents around March 2009. In case the contents of the report are accepted in principle by the Government of Indonesia, JICA will complete the final report and send it to both Government of Japan and Government of Indonesia by May, 2009

2 Stage-2 Project

2.1 Tg. Sair Repeater Station

According to the survey conducted jointly by DGST and the JICA Consultant Team, the Team has confirmed that Tg. Sair (Lat. 1°54' 30" N, Long.101°22' 59" E, Site-A in Attachment-6) is recommendable for relay station site for data transmission between Tg. Medang and Dumai.

2.2 Land Preparation for Tg. Sair

DGST will arrange the land by the budget for fiscal year 2010. It is expected that the land will be ready to use before the construction work.

3 Obligations of the Recipient Country

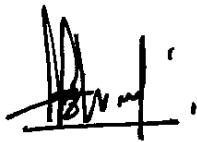
(1) Obligations

DGST and the JICA Study Team have confirmed again the details of Obligations of the Recipient Country which are described in "the Report on December 24". .

(2) Land Acquisition for Stage-2 Project

DGST has already secured the lands of Tg. Medang, Dumai, Bengkalis, Tg. Parit, Selincing and ready to use of this Project. The JICA Study Team has received copies of the registration documents for Batu Ampar, Tg. Berakit, and Selincing. DGST is requested to prepare the copies of the certificates at the remaining sites.

December 19, 2008



Mr. Raymond Ivan H.A.S.
Head of Equipment and
Maintenance of Section
Sub-Directorate of
Aids to Navigation
Directorate of Navigation,
DGST



Ir. Alamsyah Sasmito, M.M.
Section Head of Equipment
and Maintenance
Sub-Directorate of Marine
Telecommunication
Directorate of Navigation,
DGST



Mr. Masahiko Koshimizu
Chief Consultant
on behalf of
The JICA Study Team

List of Attendance

Directorate General of Transportation (DGST)

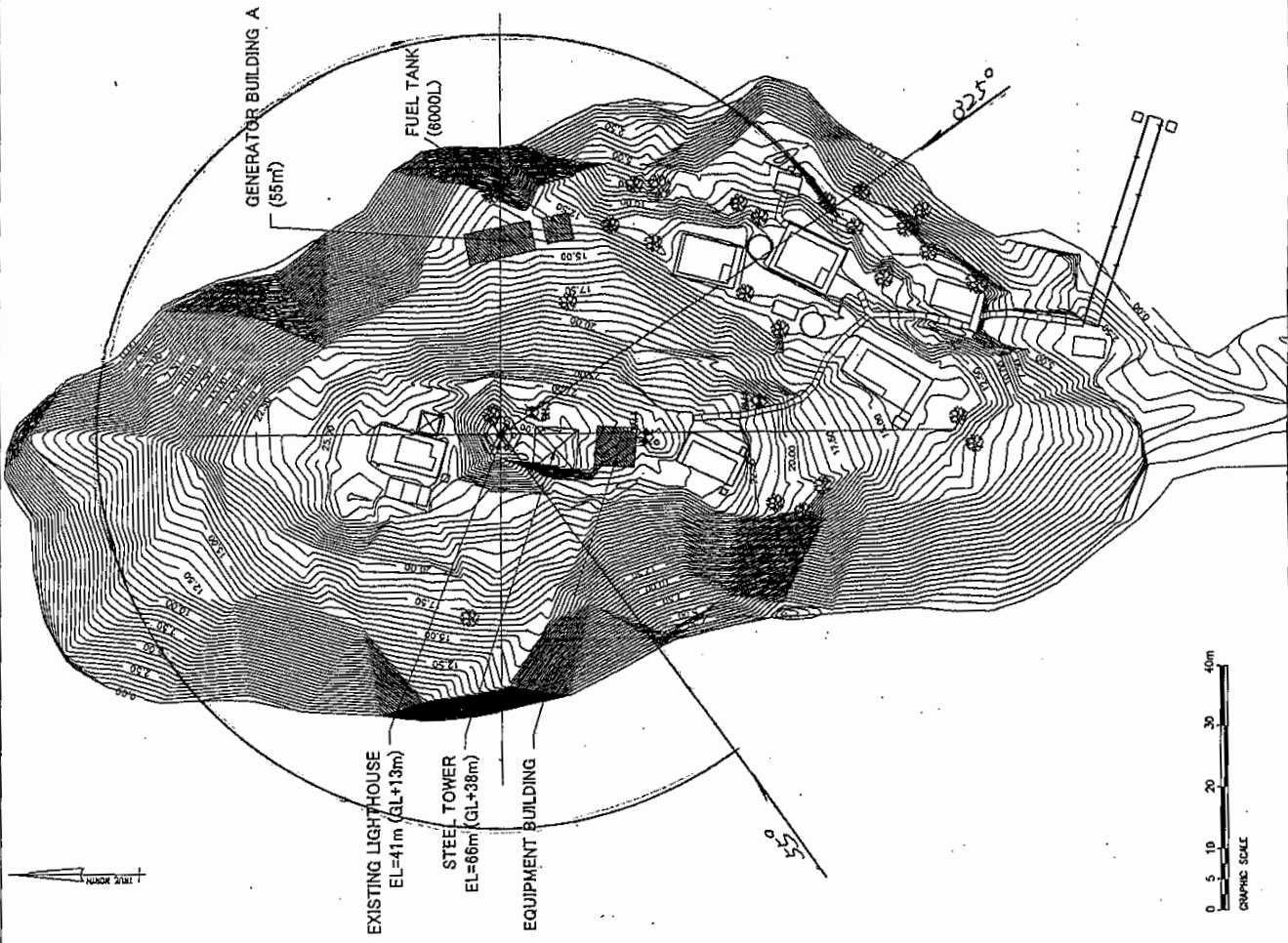
Ir. Alamsyah Sasmito, M.M	Head of Section Equipment and Maintenance Sub-Directorate of Maritime Telecommunication Directorate of Navigation
Drs. Tofan Rindoyo	Head of Section Operation Sub-Directorate of Maritime Telecommunication Directorate of Navigation
Mr. Raymond Ivan H.A.S	Head of Equipment & Maintenance Section Sub-Directorate of Aids to Navigation Directorate of Navigation
Mr. Ketut Aries S.T.,	Staff of Sub-directorate of Maritime Telecommunication
Mr. Tony Rafiq S.T.,	Staff of Sub-directorate of Maritime Telecommunication
Mr. Andi Aswad	Staff of Sub-directorate of Aids to Navigation
Mr. Leonard S.	Staff of Sub-directorate of Aids to Navigation
Mr. Rudi H. Irwansyah	Staff of Sub-directorate of Aids to Navigation
Mr. Kazuyuki Tanaka	JICA Expert
The JICA Study Team	
Mr. Masahiko Koshimizu,	Chief Consultant, Maintenance, Operation and Management Specialist
Mr. Jun Yamauchi,	Transmission Facilities Specialist
Mr. Sumio Morita,	Procurement and Estimation Engineer
Mr. Takatsugu Shimada,	Building Planning Specialist
Mr. Keiji Yamazaki,	Electrical Engineer
Mr. Satrio Steyawan.	Engineer

Attachments

- Attachment-1 Site Plan of Hiyu Kecil
- Attachment-2 Site Plan of Takong Kecil
- Attachment-3 Site Plan of Tg. Berakit
- Attachment-4 Site Plan of Tg. Medang
- Attachment-5 Floor Plan of Batu Ampar VTS Center
- Attachment-6 Proposed Repeater Site at Tg. Sair and Photographs
- Attachment-7 Site Visit Schedule from Dec. 2 to Dec.7
- Attachment-8 Site Visit Schedule from Dec. 11 to Dec. 15



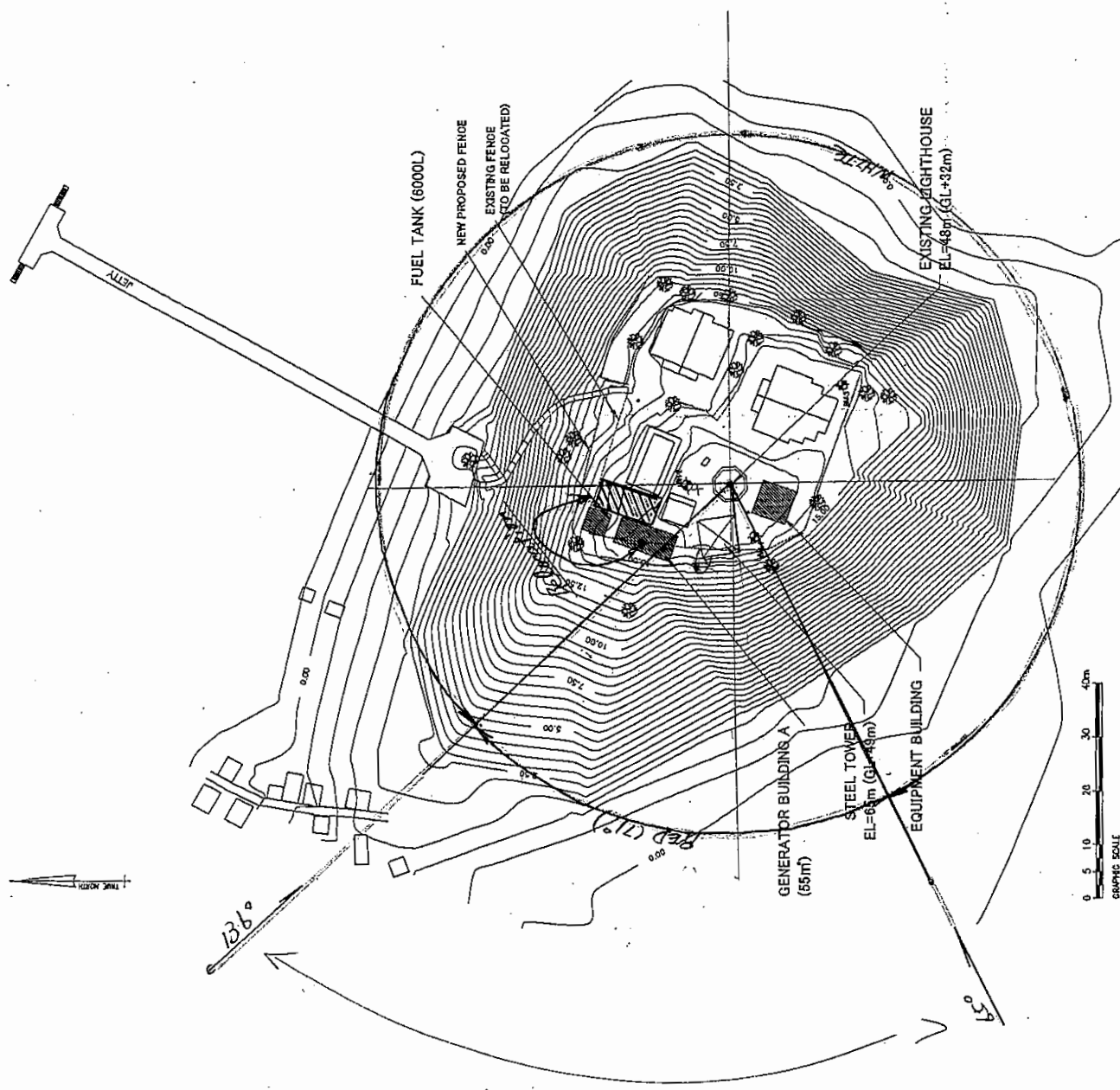
ATTACHMENT - 1



PROJECT TITLE	Implementation/Review Study on the Project for Enhancement of Vessel Traffic System in Malacca and Singapore Straits in Indonesia		
GENERAL NOTE			
SCALE	1/800	DWG TITLE	HIYU KECIL SITE PLAN
DATE	2008/11	DESIGNED BY	ORIENTAL CONSULTANTS CO. LTD
DRAWING BY		CHECKED BY	JAPAN AIDS TO NAVIGATION ASSOCIATION
PROJECT NO.		DWG NO.	A-5

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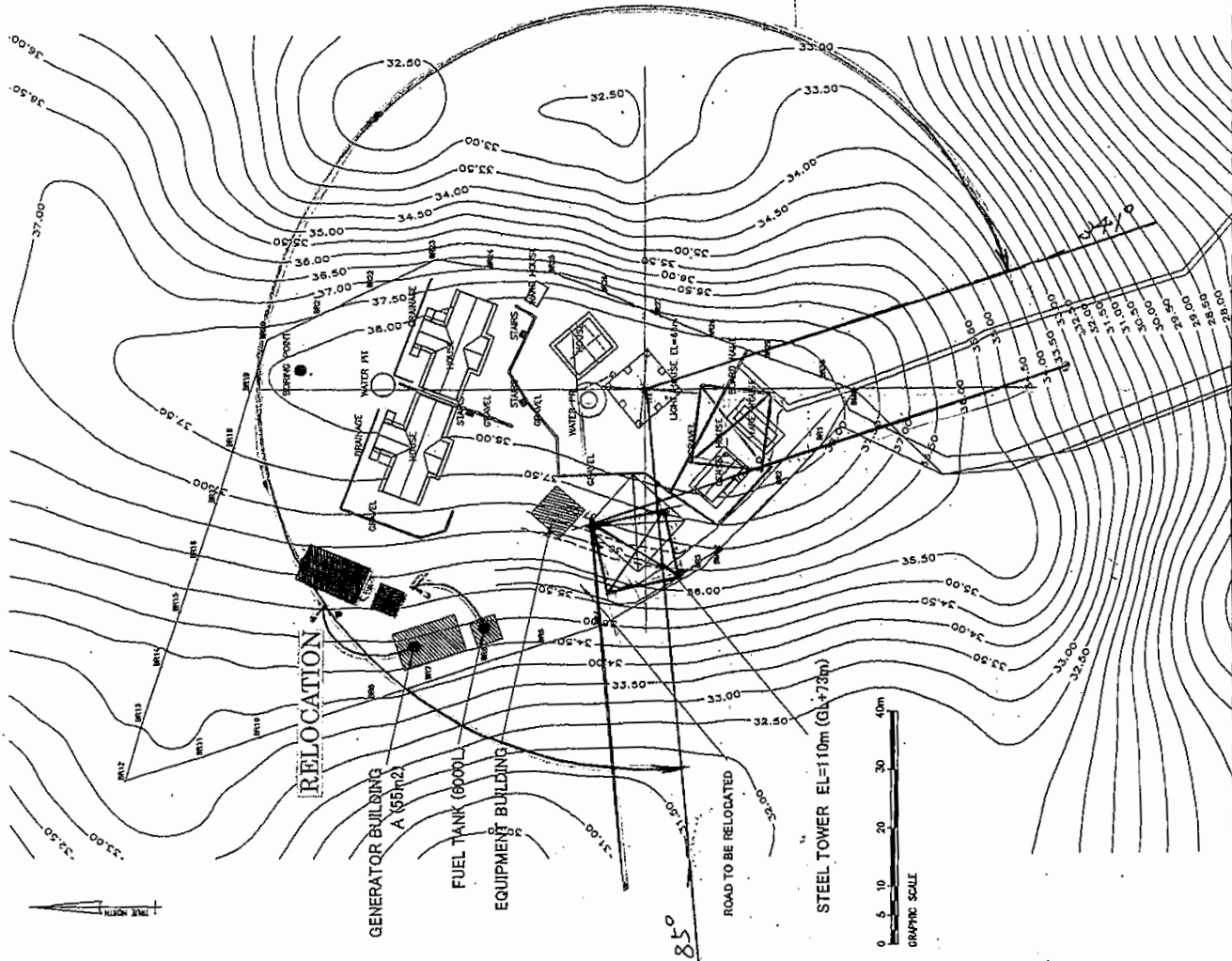
ATTACHMENT-2



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GENERAL NOTE	
SCALE	1/800
DATE	2008/11
DRAWING BY	
CHECKED BY	
DATE	
BY	
PROJECT NO.	
DWG TITLE	TAKONG KECIL SITE PLAN
DWG NO.	A-8
DESIGNED BY	ORIENTAL CONSULTANTS CO., Ltd
CHECKED BY	JAPAN AIDS TO NAVIGATION ASSOCIATION

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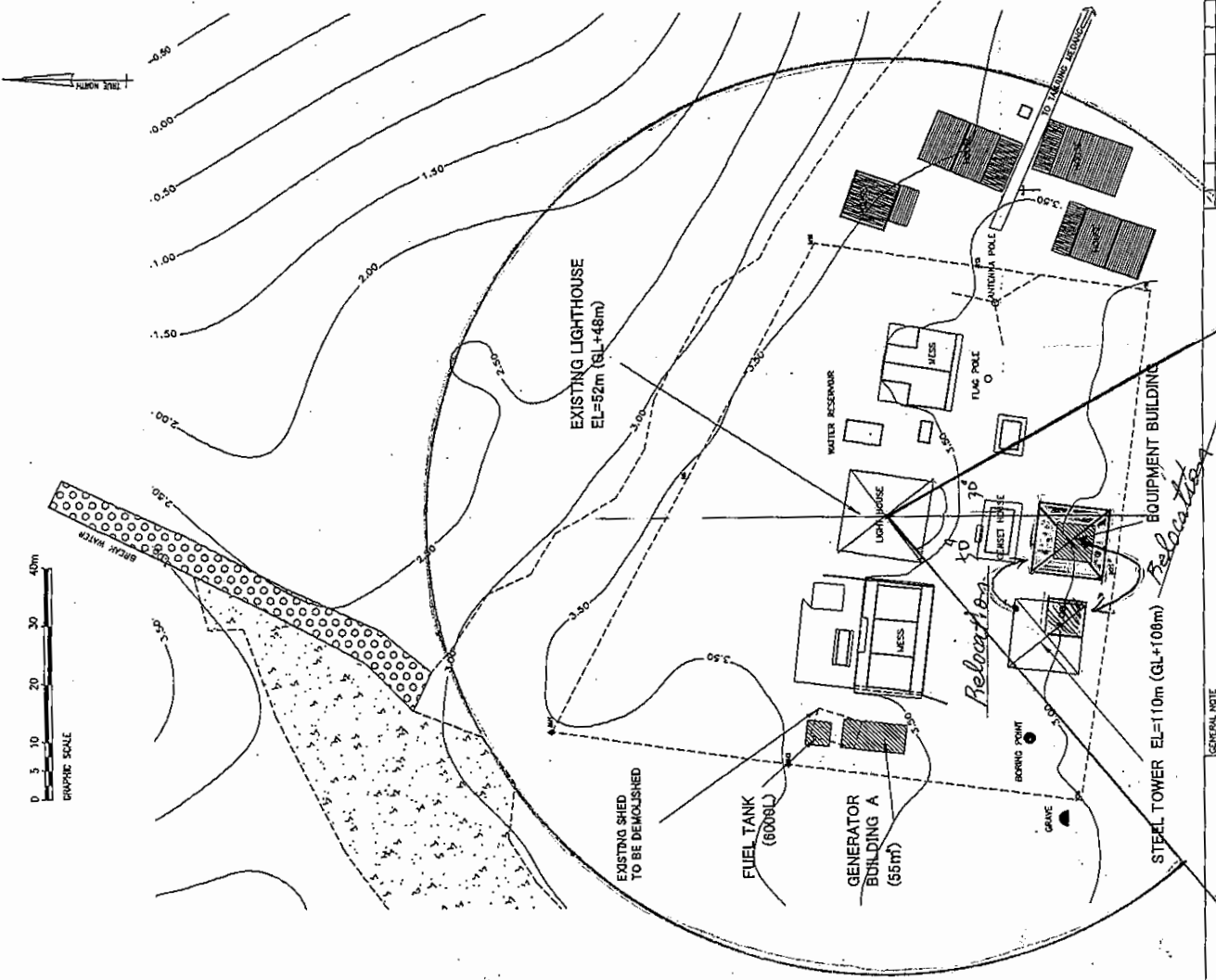
ATTACHMENT-3



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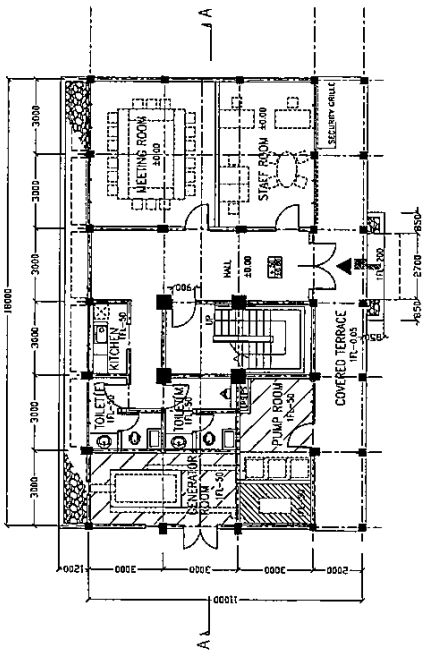
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SCALE	1/800
DATE	2008/11
DRAWING BY	
CHECKED BY	
APPROVED BY	
DESIGNED BY	ORIENTAL CONSULTANTS CO., LTD
DESIGNED BY	JAPAN AIDS TO NAVIGATION ASSOCIATION
DWG NO	A-8

ATTACHMENT - 7

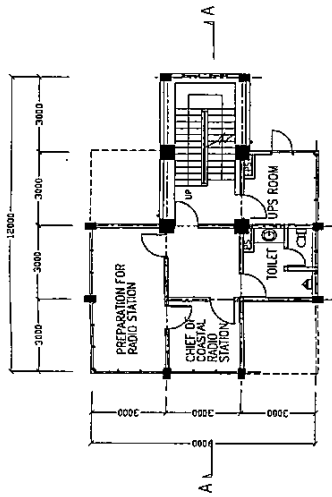


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GENERAL NOTE	
SCALE	1/100
DATE	2008/11
DRAWING BY	
CHECKED BY	
DATE	
PROJECT NO.	A-9
DWG TITLE	TANJUNG MEDAN SITE PLAN
DESIGNED BY	ORIENTAL CONSULTANTS CO., Ltd.
JAPAN AIDS TO NAVIGATION ASSOCIATION	

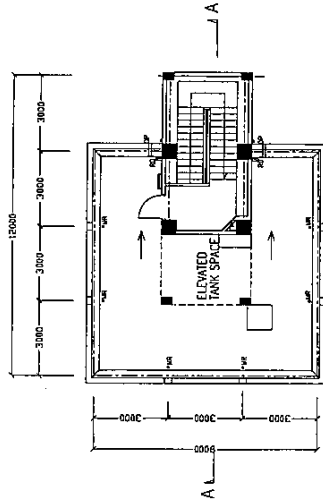
ATTACHMENT -5



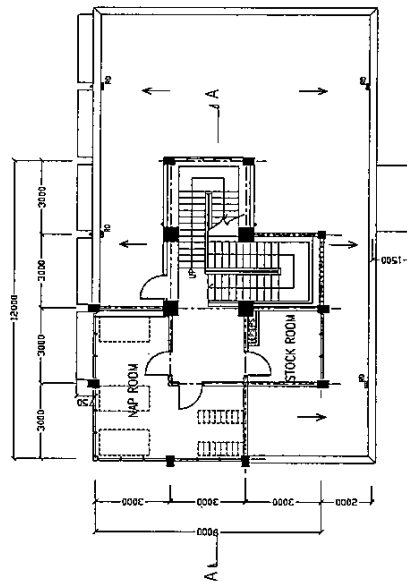
1 ST FLOOR



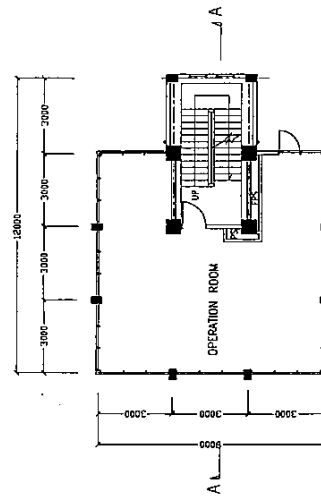
3 RD FLOOR



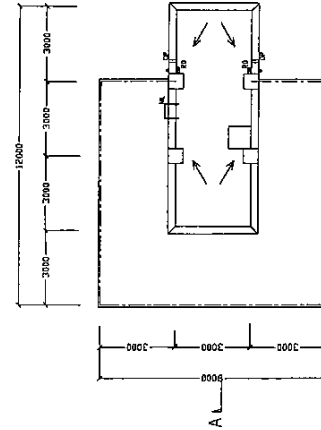
PENTHOUSE FLOOR



2 ND FLOOR



4 TH FLOOR



ROOF FLOOR

LEGEND

- RD : ROOF DRAIN
- OP : OVER-FLOW PIPE
- MR : MAINTENANCE RING
- ML : MAINTENANCE LADDER

PROJECT TITLE		GENERAL NOTE	
Implementation/Review Study on the Project for Enhancement of Vessel Traffic System in Malacca and Singapore Straits in Indonesia			
DWG NO	DATE	DWG TITLE	DWG NO
A-1	2008/11	BATU AMPAR CENTER-1	A-1
DRAWN BY	CHECKED BY	DESIGNED BY	DESIGNED BY
		ORIENTAL CONSULTANTS CO. LTD.	
		JAPAN AIDS TO NAVIGATION ASSOCIATION	

ATTACHMENT-6

Table: Location and Coordinates

Point	N	E	Condition	Utilization	Remarks
A	N 1 54 30.0	E 101 22 59.4	Wooden Jetty	—	
B	N 1 54 30.9	E 101 23 2.8	Chinese Temple	—	
C	N 1 54 30.8	E 101 23 24.0	Road Crossing	—	
L	N 1 54 38.6	E 101 23 25.9	Road Crossing	—	
M	N 1 54 42.6	E 101 23 19.7	Palm Field	L~M	Proposed-A
N	N 1 54 44.1	E 101 23 19.7	Personal Yard	Middle	
O	N 1 54 45.2	E 101 23 20.3	Back Yard	Low	Proposed-B
P	N 1 54 40.7	E 101 23 22.9	Personal Yard	M~H	
Q	N 1 54 31.9	E 101 23 23.1	Badminton Court	Middle	Proposed-C
③	N 1 54 49.5	E 101 23 14.6	Meley Corps	Middle	
④	N 1 54 44.4	E 101 23 10.2	Ranzeland	Low	
⑤	N 1 54 30.8	E 101 23 24.2	Coordinates Origin	—	

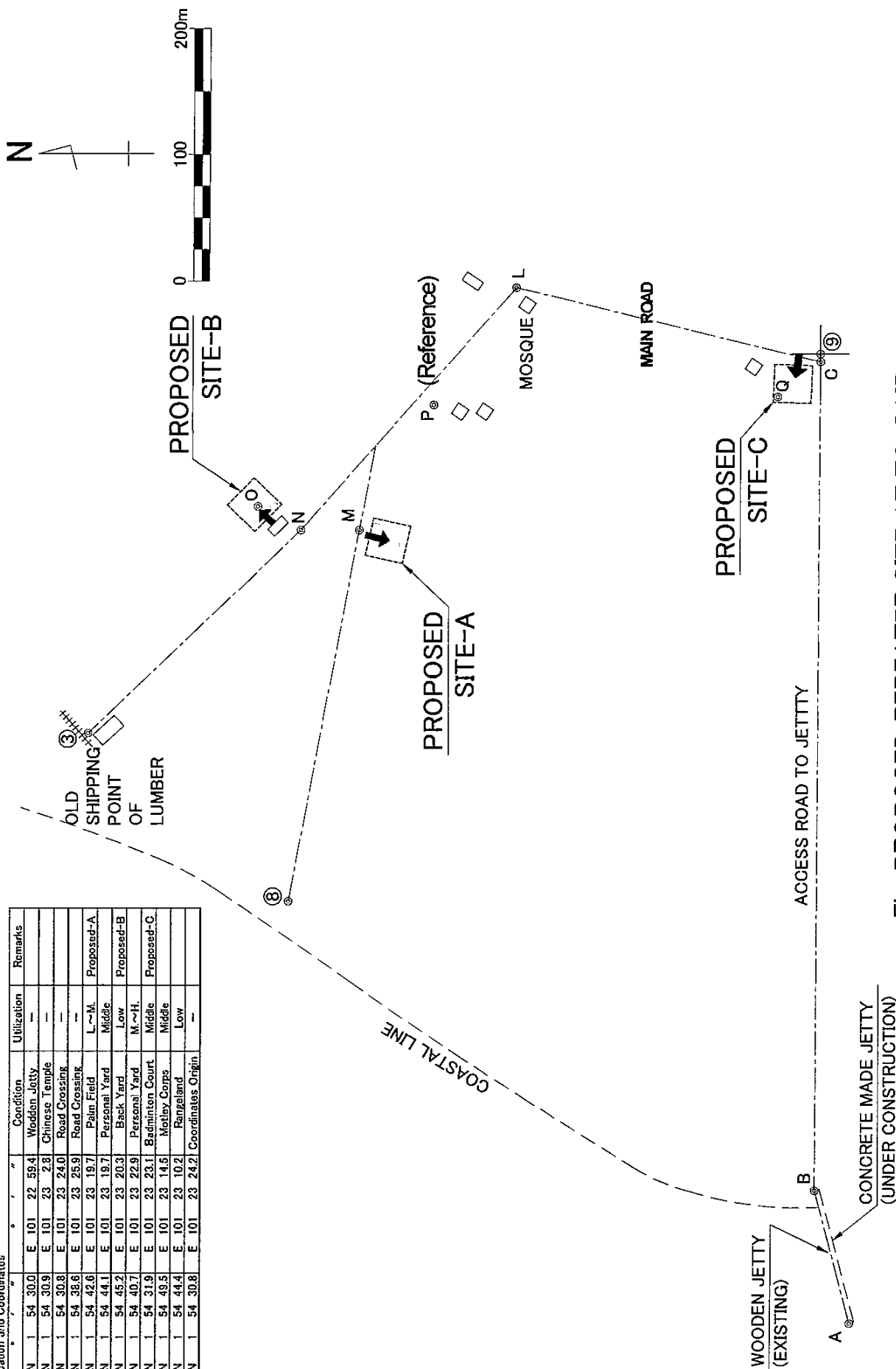


Fig. PROPOSED REPEATER SITE AT TG. SAIR

Scale = 1:4,000

Tg. Sair Site Photograph



M: SITE-A



N: SITE B (FRONT)

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O: SITE-B (BACK)



Q: SITE-C



P: REFERENCE

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Site Visit Schedule (Actual) for

Implementation Review Study on the Project for Enhancement of Vessel Traffic System
in Malacca and Singapore Straits

For Mr. Jun Yamauchi

1 Schedule

Date and time	Activities	Remarks	Sites
Dec. 2, 2008 5:00	<u>Travel to Dumai</u> <u>Mr. Jun Yamauchi, Mr. Kardiawan S & Mr.Satrio S</u> Leave from Hotel	Air Ticket	
7:00	Travel from Jakarta to Pekanbaru by Air GA 170 (07:00 – 08:35)		
9:30	Move to Dumai by car (Arrival at Dumai 14:00) Lunch		
14:30	District Navigation Office		District Navigation Office
15:00	Vist to Dumai Coastal Radio Station	Rental Car	
16:00	Site Survey for Site of VTS Sub-center (Dumai RX) Stay at Dumai, Grand Zuri Dumai (0765-31999)		
Dec. 3, 2008 7:30	<u>Survey of Tg. Sair/Tg Medang</u> Leave from Hotel to Dumai port		
8:00	Move from Dumai to Tg. Medang by Boat (Arrival at Tg. Medang 9:30)	Rental boat	Tg. Sair
9:30	Site survey of Tg. Medang and surrounding area		
12:00	Lunch		
13:00	Move to Tg Sair Site survey of Tg. Sair and its surrounding area.		
16:00	Move to Dumai by boat (Arrival on Dumai at 16:30) Stay at Dumai, Grand Zuri (0765-31999)		



Attachment-7

Date and time	Activities	Remarks	Sites
<p>Dec. 4, 2008</p> <p>8:00</p> <p>9:30</p> <p>10:30</p> <p>11:00</p> <p>12:00</p> <p>13:00</p> <p>13.30</p>	<p><u>Mr. Kardiawan leave from Pekanbaru to Jakarta</u></p> <p><u>Mr. Jun Yamauchi & Mr. satrio.S</u></p> <p><u>Survey of Seilincing and Sepahat Proposed Repeater Station</u></p> <p>Leave from Hotel and move to Selincing by Car</p> <p>Site survey of proposed repeater station of Selincing</p> <p>Move from Selincing to Sepahat by Car</p> <p>Survey of propose repeater station of Sepahat Village</p> <p>Lunch</p> <p>Move to Dumai by car (Arrival at Dumai at 15:00)</p> <p>Stay at Dumai, Grand Zuri (0765-31999)</p>	<p>Rental Car</p> <p>Rental Car</p>	<p>Seilincing (proposed repeater station)</p> <p>Sepahat village (Proposed repeater station)</p>
<p>Dec. 5, 2008</p> <p>8.00</p> <p>15.00</p>	<p><u>Survey of Tg Sair</u></p> <p>Leave from Hotel to Dumai port</p> <p>Move from Dumai to Tg. Sair by Boat</p> <p>Site survey of Tg. Sair and its surrounding area.</p> <p>Move to Dumai by boat (Arrival on Dumai at 16:30)</p> <p>Stay at Dumai, Grand Zuri (0765-31999)</p>		
<p>Dec. 6, 2008</p> <p>6:15</p> <p>7:00</p> <p>9:30</p> <p>11:00</p> <p>12:00</p>	<p><u>Visit to Survey of Bengkalis and Tg. Parit</u></p> <p>Leave from Hotel to Dumai Ferry Terminal</p> <p>Move from Dumai to Bengkalis by regular boat (arrival at Bengkalis at 8:50)</p> <p>Move from Bengkalis to Tg. Parit by Car</p> <p>Site Survey in Tg. Parit</p> <p>Visit and Survey of Bengkalis Coastal Radio Station</p> <p>Move to PekanBaru by Regular boat (4 hours)</p>	<p>Regular Boat</p> <p>Rental Car</p>	<p>Tg. Parit Proposed VTS sensor station</p>

Attachment-7

16:00	<u>Return Back to Jakarta</u> Move from Pekanbaru port to Airport by taxi Travel from Pekanbaru to Jakarta by Air GA 177 16:35- 18:15		
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2 Team Members

1) JICA Study Team

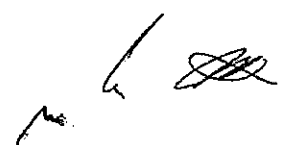
Mr. Jun Yamauchi

2) DGST

Mr. Kardiawan S

3) JICA Study Team Local Staff Assistant (Translator/Engineer)

Mr. Satrio Setyawan



Site Visit Schedule for

Implementation Review Study on the Project for Enhancement of Vessel Traffic System
in Malacca and Singapore Straits

For : Mr. Takatsgu Shimada, Mr. Sumio Morita, Mr. Keij Yamasaki

1 Actual

Date and time	Activities	Remarks	Sites
Dec. 11,2008 5:00	<u>Travel to Dumai</u> Leave from Hotel		
	<u>Mr. Morita/S,Shimada/T,Yamasaki/K , Mr. Satrio S.</u>	Air Ticket	
7:00	Travel from Jakarta to Pekanbaru by Air GA 170		
9:30	(07:00 – 08:35) Move to Dumai by car (Arrival at Dumai 14:00)		
14:30	Lunch		
15:00	Vist to Dumai Coastal Radio Station Site Survey for Site of VTS Sub-center (Dumai RX)		District Navigation Office
16:00	Stay at Dumai, Grand Zuri Dumai (0765-31999)	Rental Car	
Dec. 12, 2008	<u>Survey of Tg Medang , Tg Sair</u>		
7:30	Leave from Hotel to Dumai port		
8:00	Move from Dumai to Tg. Medang by Boat (Arrival at Tg. Medang 9:30)	Rental boat	Tg Medang
9:30	Move to Tg Sair		Tg. Sair
12:00	Site survey of Tg. Sair and surrounding area		
13:00	Lunch (Lunch box to be prepared at Dumai) Site survey of Tg. Sair and its surrounding area.		
15:00	Move to Dumai by boat (Arrival on Dumai at 16:30) Grand Zuri (0765-31999)		

Attachment-8

Date and time	Activities	Remarks	Sites
<p>Dec. 13, 2008</p> <p>7.30</p> <p>8:00</p> <p>10:30</p> <p>12:00</p> <p>14:00</p>	<p><u>Survey of Selincing and Sepahat Proposed Repeater Station</u></p> <p>Leave from Hotel and move to Selincing by Car</p> <p>Site survey of proposed repeater station of Selincing</p> <p>Move from Selincing to Sepahat by Car</p> <p>Survey of propose repeater station of Sepahat Village</p> <p>Lunch (Lunch box to be prepared at Dumai)</p> <p>Move to Dumai by car (Arrival at Dumai at 15:00)</p> <p>Stay at Dumai, Grand Zuri (0765-31999)</p>		<p>Selincing</p> <p>(proposed repeater station)</p> <p>Sepahat village</p> <p>(Proposed , repeater station)</p>
<p>Dec. 14, 2008</p> <p>7.00</p> <p>8:00</p> <p>9:30</p> <p>10:30</p> <p>11:00</p> <p>12:00</p> <p>15:00</p>	<p><u>Visit to Survey of Bengkalis and Tg. Parit</u></p> <p>Leave from Hotel to Dumai Ferry Terminal</p> <p>Move from Dumai to Bengkalis by regular boat (arrival at Bengkalis at 8:50)</p> <p>Move from Bengkalis to Tg. Parit by Car</p> <p>Site Survey in Tg. Parit</p> <p>Move from Tg. Parit to Bengkalis by car (Lunch on the way)</p> <p>Visit and Survey of Bengkalis Coastal Radio Station</p> <p>Move to Hotel</p> <p>Stay at Bengkalis (Wisma Mahendra) Jl. HOS Cokroaminoto. (0766)7007120 – Mr. Azimuddin HP : 0812-6895196</p>	<p>Taxi (Becha)</p> <p>Regular Boat</p> <p>Rental Car</p>	<p>Tg. Parit</p> <p>Proposed VTS sensor station</p> <p>Coastal Radio Station atBengkalis</p>
<p>Dec. 15, 2008</p> <p>6:15</p> <p>7:00</p> <p>12.00</p>	<p><u>Return Back to Jakarta</u></p> <p>Leave from Hotel to Bengkalis port</p> <p>Travel from Bengkalis to Pekanbaru by boat (4-5 hours)</p> <p>Move from Pekanbaru port to Airport by taxi</p> <p>Travel from Pekanbaru to Jakarta by Air GA 175 14.30 – 16.10</p>	<p>Regular Boat</p> <p>Taxi</p> <p>Air Ticket</p>	

2 Team Members

1) JICA Study Team

Mr. Takatsugu Shimada

Mr. Sumio Morita

Mr. Keij Yamasaki

2) DGST

Mr. Suyono (District Navigation 1 – Dumai)

3) JICA Study Team Local Staff Assistant (Translator/Engineer)

Mr. Satrio Setyawan

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**Record of Working Group Discussions
on
the Implementation Review Study
on
the Project for Enhancement of Vessel Traffic System
in Malacca and Singapore Straits**

DGST and the JICA Study Team have discussed and agreed as follows:

(1) Repeater Station Sites and Route for Data Transmission:

The sites of the repeater stations and the route for the data communication links shall be as follows:

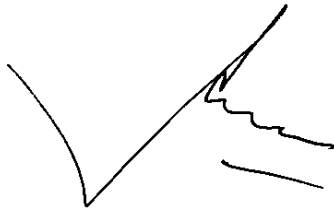
- 1) Tg. Parit – Simpang Ayam (New Repeater Station No.2)– Selincing – Dumai
- 2) Tg. Medang – Tg. Sair – Dumai

(2) Coordination with Maritime Telecommunication System Development Project / IV

- 1) Antennae for data communication link of the Grant Aid Project at Dumai and Selincing can be installed at the tower constructed by the Maritime Telecommunication System Development Project / IV.
- 2) The height of the towers do not need to be changed, however, DGST will discuss with the Consultants and the Contractor of Maritime Telecommunication System Development Project Phase IV to assure the necessary strength of the towers so that the antennae for the VTS Project can be accommodated to the towers.

(3) Equipment at the Repeater Stations

- 1) DGST requested the study team as follows:
 - a. To consider the power source by solar cell system,
 - b. To consider the CCTV cameras (web cameras) can be controlled from Dumai or Tg. Parit for security purpose of the repeater stations. Because DGST has plan to establish as unmanned repeater stations,
- 2) The equipment necessary for the repeater stations, the Study Team will select, design and will report on the draft explanation.



Ir. Alamsyah Sasmito, MM
Section Head of Equipment and Maintenance
Sub-Directorate of Marine Telecommunication
Directorate of Navigation, DGST

April 8, 2009



Mr. Masahiko Koshimizu
Chief Consultant
on behalf of
The JICA Study Team

Attachment: Information for No.2 Repeater Stations (Table 1 and Fig. 1 to 3)

Table 1 Study on New Repeater Station "Site A"

1. Surveyed Sites

ID	Lat.	Long.	EL(m) (gfs)	Required antenna height		Site		Tg. Parit	Evaluation	Access		Security	Environment		Land		Remarks
				Est	Post	Sellencing	Site			to site	for construction		Natural	Social	Ownership	Secure	
No.1	1 35 40.7 N	102 2 54.1 E	15	Pre	Post	50	110	80	70	NG	NG	NG	OK	NG	NG	Secure	Access is difficult. No residential area.
No.2	1 35 1.7 N	102 2 53.6 E	9	Pre	Post	50	120	90	70	NG	OK	OK	OK	OK	OK	OK	
No.3a	1 34 24.2 N	102 0 44.5 E	12	Pre	Post	50	130	110	70	NG	OK	OK	OK	OK	OK	OK	
No.3b	1 34 26.4 N	102 0 47.2 E	9	Pre	Post	50	130	110	70	NG	OK	OK	OK	OK	OK	OK	
No.3c	1 34 25 N	102 0 45.4 E	10	Pre	Post	50	130	110	70	NG	OK	OK	OK	OK	OK	OK	
No.3d	1 34 36.6 N	102 0 46.9 E	13	Pre	Post	50	130	110	70	NG	OK	OK	OK	OK	OK	OK	
No.4	1 36 0.9 N	102 0 22.4 E	5	Pre	Post	50	90	110	70	NG	NG	NG	NG	OK	OK	NG	Heavy coastal erosion. Access is difficult.
No.5a	1 36 8.7 N	102 3 28.8 E	12	Pre	Post	50	120	90	70	NG	OK	OK	OK	OK	OK	NG	Private company area. Secure the land may be difficult.
No.5b	1 36 0.9 N	102 3 28.5 E	10	Pre	Post	50	120	90	70	NG	OK	OK	OK	OK	OK	NG	
No.6	1 33 49.6 N	102 11 10.5 E	7	Pre	Post	50	90	110	70	NG	OK	OK	OK	OK	OK	OK	Site may not suitable since the distance from Selharing is too far.

Simpang
Ayam

2. Preliminary Evaluated Sites

ID	Lat.	Long.	EL(m) (gfs)	Required antenna height		Site		Tg. Parit	Evaluation	Estimated by	Data Source	Considerations	Remarks
				Est	Post	Sellencing	Site						
C1	1 35 43.3 N	102 2 53.5 E		Pre	Post	50	110	80	70	NG	SRTM	+15 tree height is considered.	
C2	1 34 47.0 N	102 2 35.7 E		Pre	Post	50	120	90	70	NG	SRTM	+15 tree height is considered.	
C3	1 34 16.4 N	102 0 45.4 E		Pre	Post	50	130	110	70	NG	SRTM	+15 tree height is considered.	
C4	1 36 48.6 N	101 59 48.6 E		Pre	Post	50	90	110	70	NG	SRTM	+15 tree height is considered.	

3. Reference

ID	Lat.	Long.	EL(m) (gfs)	Required antenna height		Site		Tg. Parit	Evaluation	Estimated by	Data Source	Considerations	Remarks
				Est	Post	Sellencing	Site						
Site A	1 36 20.0 N	102 2 35.0 E		Pre	Post	50	60	60	50	OK	SRTM	It is considered that the SRTM data is included in the tree height.	Can not reached to Site A, since there is no access.
C1	1 35 43.4 N	102 2 53.5 E		Pre	Post	50	110	80	70	NG	SRTM	+15 tree height is considered.	Land elevation shall be confirmed by site survey
C1	1 35 43.3 N	102 2 53.5 E		Pre	Post	50	50	60	60	OK	SRTM	It is considered that the SRTM data is included in the tree height.	



Fig. 1 Surveyed Sites (1)

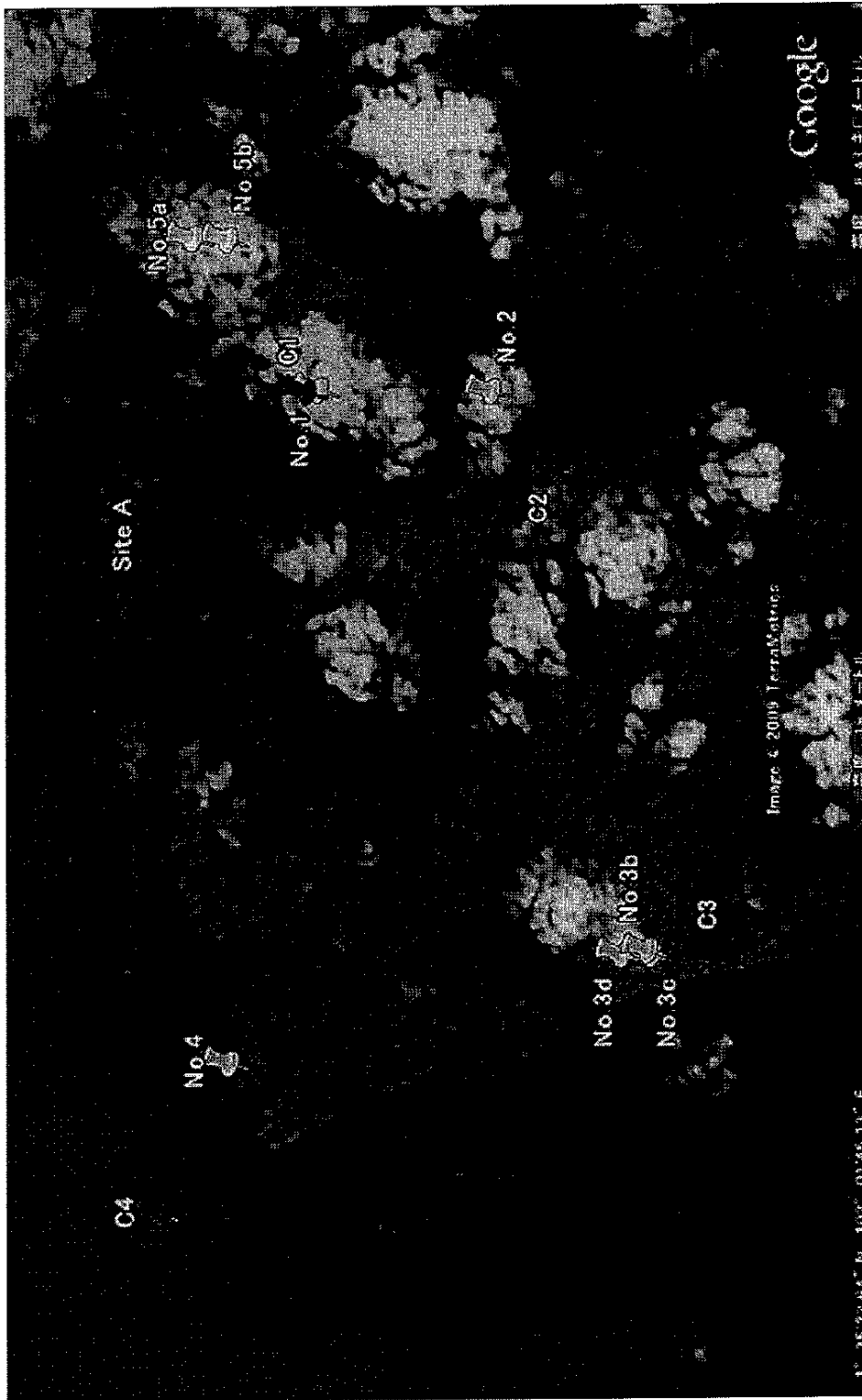


Fig. 2 Surveyed Sites (2)

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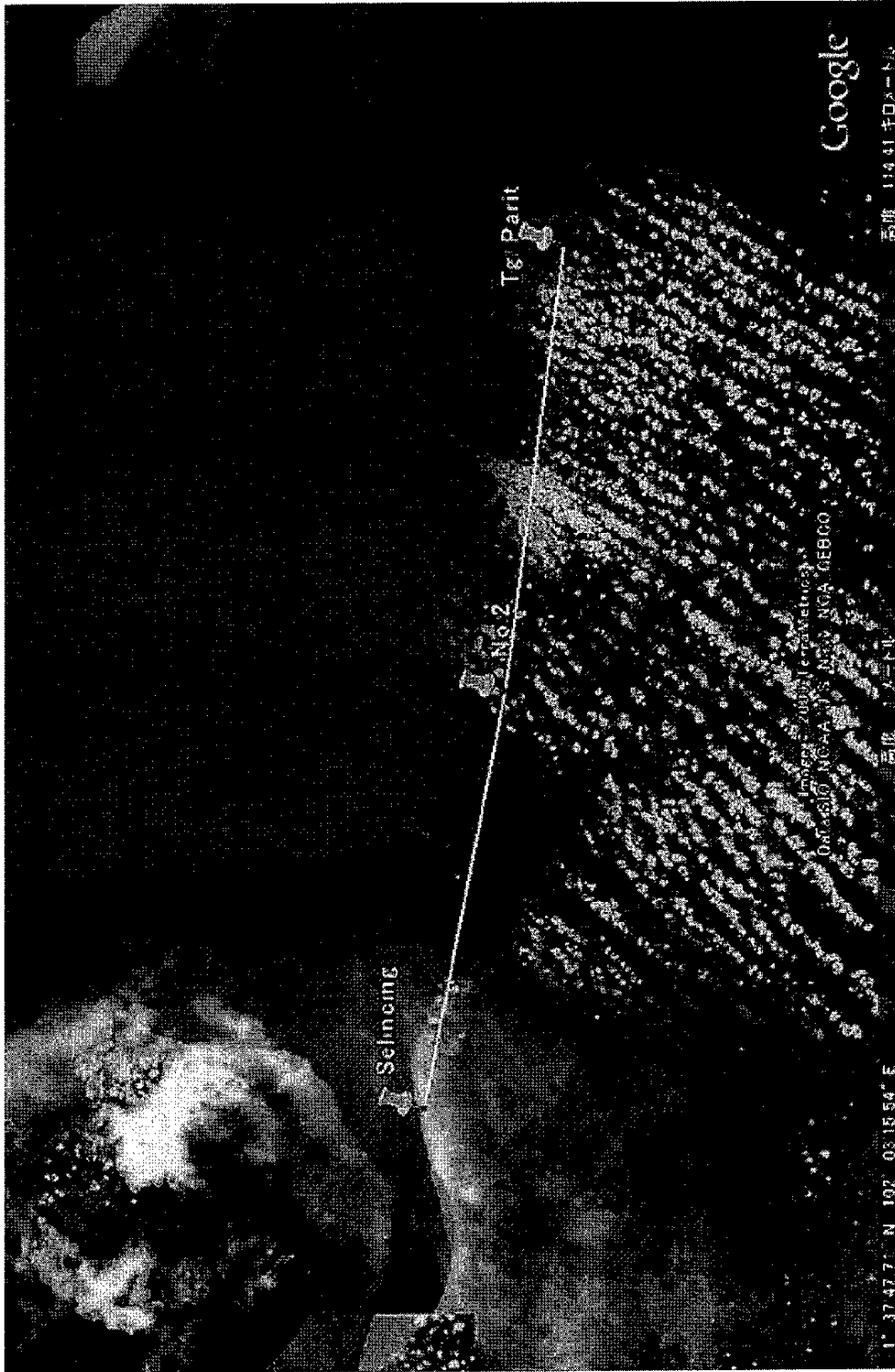


Fig. 3 Available Route for Communication Link

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Jakarta, March 24, 2009

Ir. ALAMSYA SASMITO
Section Head of Equipment and Maintenance
Sub-Director of Marine Telecommunication,
Directorate of Navigation
Ministry of Transport

Dear Sir,

I am writing to request your consideration of facilitating the installation of necessary antennae planned under the Grant Aid project for "Enhancement of Vessel Traffic System in Malacca and Singapore Straits" to the GMDSS towers at Selincing and Dumai for following reasons.

Under Implementation Review Study of the Grant Aid project for "Enhancement of Vessel Traffic System in Malacca and Singapore Straits" a link budget analysis was made between Selincing and a site on Benkalis Island. The result shows that the height of the tower at Selincing needs to be increased by about 5m in order to overcome a ridge located near Selincing.

For Dumai, the tower height does not need to be changed, but the tower needs to be designed and constructed to carry the additional weight of the antennae.

Kindly consult this matter with relevant parties and reply the result within 10 days, so that we can adjust the contents of the implementation review accordingly.

Your kind understanding and cooperation will be highly appreciated.

Sincerely,



Toshiyuki IWAMA
Leader
Implementation Review Study Team
Japan International Cooperation Agency

T. J.

JICA Study Team for the Project for Enhancement of Vessel Traffic System in Malacca and Singapore Straits in Indonesia



ORICONSUL - JANA JV



ORICONSUL

12-1, HONMACHI 3-CHOME, SHIBUYA-KU, TOKYO, 151-0071, JAPAN
Tel: +81-3-6311-7889 Fax: +81-3-6311-8043 e-mail: intl@oriconsul.co.jp

Jakarta, April 2, 2009

Mr. Alamsyah Sasmito,
Section Head of Equipment and Maintenance
Sub-Director of Marine Telecommunication,
Directorate of Navigation
Directorate General of Sea Transportation
Ministry of Transport

Sub: Tower at Dumai and Selincing for Repeater Stations in Stage-2 Project
Re : Implementation Review Study on the Project for Enhancement of Vessel Traffic System in Malacca and Singapore Straits in the Republic of Indonesia

Dear Sir,

In relation to the letter on March 24, 2009 issued by Mr. Toshiyuki Iwama, Leader of the Implementation Review Study Team, Japan International Cooperation Agency, we, Consultants, conducted further detailed studies for the data communication link between Selincing – New Repeater Station (No.2 Simpang Ayam) – Tg. Parit.

Considering to our study, we would like to inform you our requirements, and we would politely request for your considerations to construct the towers at Dumai and Selincing by the GMDSS Project as follows.

(1) Tower strength

Please consider that the towers shall have the sufficient strength against the additional loads of the antennae will be installed by the Grant Aid Project.

(2) Dimensions, weight and necessary installation height of antennae by the Grant Aid Project

The requirements for estimation of the additional loads by the antennae of the Grant Aid Project are as follows.

Received

3/4/09

JICA Study Team for the Project for Enhancement of Vessel Traffic System in Malacca and Singapore Straits in Indonesia



ORICONCONSUL - JANA JV



ORICONCONSUL

12-1, HONMACHI 3-CHOME, SHIBUYA-KU, TOKYO, 151-0071, JAPAN
Tel: +81-3-6311-7889 Fax: +81-3-6311-8043 e-mail: intl@oriconsul.co.jp

Site	Antennae	Diameter (m)	Weight (kg)	Install height(m)	unit
Dumai	Main	1.8 m	Approx. 110	50	1
	SD	1.2 m	Approx. 110	40	1
Selincing	Main	1.8 m	Approx. 110	50	1
	SD	1.2 m	Approx. 110	40	1

Note: Antennae dimensions and weights stated in the above table are approximate. Exact value can be known after clarified the supplied products by tender of the Project.

(3) Tower height at Selincing

According to our further detailed studies, it can be concluded that required antennae installation heights of the Grant Aid Project are possible to cover the 50m tower height. Therefore, the tower height planned by the GMDSS project is not requested to change.

If the tower at Dumai and Selincing are not sufficiently strong, we can not recommend to install the antennae on these towers from the technical point of view.

Therefore, we would like to request you

- 1) to provide the tower with sufficient strength to satisfy the above mentioned requirements, and
- 2) to guarantee the tower strength by DGST.

We wait your considerations after your discussions in the relevant stakeholders of the GMDSS project.

Your kind understanding and cooperation will be highly appreciated.

Yours Faithfully,

Masahiko Koshimizu
Chief Consultant
on behalf of
The JICA Study Team

CC:

1. Leader, Implementation Review Study Team, JICA Tokyo Office
2. Mr. Naoki Kakioka, JICA Indonesia Office



DEPARTEMEN PERHUBUNGAN
DIREKTORAT JENDERAL PERHUBUNGAN LAUT
SATUAN KERJA MARITIME TELECOMMUNICATION SYSTEM
DEVELOPMENT PROJECT
GEDUNG KARYA LANTAI 13

Jl. Merdeka Barat No. 8 Tel. 3507201, 3505550, Pst. 4062/4068 Fax. 3506534, 3507201
Jakarta 10110

Jakarta, April 8, 2009

Ref. No: 34/UM/MTSDP/IV/09

Mr. Toshiyuki IWAMA
Leader
Implementation Review Study Team
Japan International Cooperation Agency

Dear Sir,

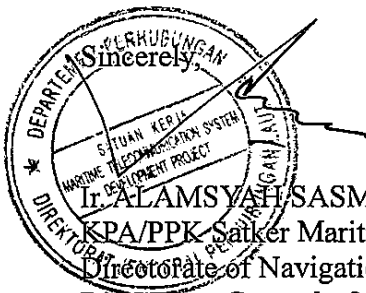
I would like to reply for your request letter on March 24, 2009, for facilitating the installation of necessary antenna planned under the Grant Aid Project for "Enhancement of Vessel Traffic System in Malacca and Singapore Straits" (hereinafter called "VTS Project") to the towers constructed by Maritime Telecommunication System Development Project Phase IV (GMDSS Project Phase IV) at Selincing and Dumai.

Based on the detailed technical analysis made by the Consultants working for the Implementation Review Study, and their letter on April 2, 2009, the height of the towers at Selincing and Dumai do not need to be changed.

We, DGST are under process for discussion with the Consultants and the Contractor of Maritime Telecommunication System Development Project Phase IV to assure the necessary strength of the towers so that the antennae for the VTS Project can be accommodated to the towers.

If we reached our final conclusion of this matter, we will inform you soon.
Please kindly understand our situations.

Your kind understanding and cooperation will be highly appreciated.



Sincerely,
Ir. ALAMSYAH SASMITO, MM
KPA/PPK Satker Maritime Telecommunication System Development Project (IV)
Directorate of Navigation
Directorate General of Sea Transportation
Ministry of Transportation

CC :

1. Director of Navigation
2. Head of Sub-Director of Marine Telecommunication, Directorate of Navigation

Jakarta, March 24, 2009

Ir. ALAMSYA SASMITO
Section Head of Equipment and Maintenance
Sub-Director of Marine Telecommunication,
Directorate of Navigation
Ministry of Transport

Dear Sir,

I am writing to request your consideration of facilitating the installation of necessary antennae planned under the Grant Aid project for "Enhancement of Vessel Traffic System in Malacca and Singapore Straits" to the GMDSS towers at Selincing and Dumai for following reasons.

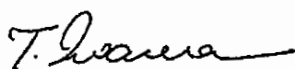
Under Implementation Review Study of the Grant Aid project for "Enhancement of Vessel Traffic System in Malacca and Singapore Straits" a link budget analysis was made between Selincing and a site on Benkalis Island. The result shows that the height of the tower at Selincing needs to be increased by about 5m in order to overcome a ridge located near Selincing.

For Dumai, the tower height does not need to be changed, but the tower needs to be designed and constructed to carry the additional weight of the antennae.

Kindly consult this matter with relevant parties and reply the result within 10 days, so that we can adjust the contents of the implementation review accordingly.

Your kind understanding and cooperation will be highly appreciated.

Sincerely,



Toshiyuki IWAMA
Leader
Implementation Review Study Team
Japan International Cooperation Agency

T. J.

資料5. 事業事前計画表（事業化調査設計時）

1. 案件名
インドネシア国 マラッカ海峡及びシンガポール海峡船舶航行安全システム向上計画(第2期)
2. 要請の背景（協力の必要性・位置け）
<p>マラッカ・シンガポール海峡（以下「マ・シ」海峡）は、年間 90,000 隻以上の船舶が航行し、我が国の関係船舶も年間約 14,000 隻が往来する国際的な海運の大動脈である。しかしながら、「マ・シ」海峡は狭隘な水路の上、浅瀬、岩礁、沈船等が多く、タンカーやコンテナ船などの大型船舶が密集して航行している状況で、常に海難事故の危険にさらされている。また近年、減少傾向にはあるものの、全世界の約4%～7%の海賊事件が発生している海域である。</p> <p>このような状況の下、2005年9月のインドネシアのジャカルタ（第1回）に続いて、2006年9月にマレーシアのクアラルンプール（第2回）においてIMO（国際海事機構）と沿岸国の共主催による、「マラッカ・シンガポール海峡に関する国際会議」が開催されている。クアラルンプール会議には沿岸3カ国と共に、我が国を初め合計28カ国が参加している。</p> <p>同会議は2009年9月4日～6日にシンガポールにおいて第3回目（最終回）が実施され、「マ・シ」海峡における航行安全、セキュリティ及び、環境保護を推進するために、TTEG（沿岸3カ国専門家会合）の取り組みを支持することのほか、①フォーラム、②プロジェクト調整委員会、③航行援助施設基金からなる新たな国際的な協力のメカニズムが設立されるとともに、沿岸国、利用国、海運業界及びその他の利害関係者は自発的に協力メカニズムへの参加・貢献に努めることが合意され「シンガポール声明」として採択された。</p> <p>また、海賊対策としては、2006年9月4日には、2001年に我が国が提案した「アジア海賊対策地域協定」(ReCAAP) が発効し、同年11月にシンガポールの情報共有センターの運営が開始された。これにより、従来の国際海事局による民間ベースでの情報提供に加え、政府間での情報共有体制が新たに構築されることとなった。沿岸国の連携としては、2004年7月から「マ・シ」海峡沿岸3カ国共同での連携パトロール「MALSINDO」の実施、沿岸3カ国にタイ国も参加した4カ国による航空機での海峡パトロール「Eyes in the Sky」の実施等、国境を越えた海賊対策の重要性が既に沿岸各国に認識され、沿岸各国はその体制整備を行うべく努力している。</p> <p>このような動きの中、インドネシア国政府（以下「イ」国）は、2004年から2009年までの「中期開発計画」(RPJM : Rencana Pembangunan Jangka Menengah Tahun 2004-2009) において、①安全で平和な国家の構築、②民主的かつ公正な社会の確立、③経済的かつ社会的に繁栄した国家の形成、の3つのアジェンダを掲げており、同計画を受け、運輸省では、「運輸省戦略計画 2005年～2009年（運輸大臣令：Keputusan Menteri Perhubungan, KM.41 Tahun 2005, Tentang Rencana Strategis Departemen Perhubungan Tahun 2005 - 2009）」を策定している。</p> <p>運輸省海運総局航行援助局は、VTS システム網を全国に設置する構想を掲げているが、特に「マ・シ」海峡へのVTS システムの設置は、同海峡を航行する船舶の安全確保に向けた体制構築のため、優先的に着手するものとして位置づけており、運輸省戦略計画における具体的な開発計画の一つとしていることから、2005年国家開発計画庁（BAPPENAS）発行の「ブルーブック」(List of Project and Technical Assistance Proposals) にも掲載されている。</p>

しかしながら、「イ」国にはこれまで海峡等を航行する船舶の動静をモニターすることを目的とした VTS システムの導入実績がないこと、「マ・シ」海峡における海岸線の長さ、入り組んだ地形、広い海域面積など技術的難易度の高い条件であること、また財政力が脆弱であることなどから、現状では計画の具体化に至っていない。「イ」国政府は以上のような状況を鑑み、「マ・シ」海峡における船舶の航行安全に供するレーダー局の設置、通信システムの確立を含む VTS システムの構築を我が国政府に要請してきた。

3. プロジェクトの全体計画概要

(1) プロジェクト全体計画の目標(裨益対象の範囲及び規模)

「マ・シ」海峡のうちマラッカ海峡(以下「マ」海峡)側の「イ」国沿岸域を航行する船舶について、VTS システムによる監視活動が開始され、航行する船舶の安全が確保される。また、船舶利用者、乗務員の安全が確保され、船舶、積荷等の財産が保護される。

(2) プロジェクト全体計画の成果

- ① 「マ・シ」海峡沿岸3カ国の中で、唯一 VTS が整備されていなかった「イ」国沿岸域に VTS システムが導入・整備される。
- ② VTS システムの構築により、「マ」海峡「イ」国沿岸域を航行する船舶の監視活動が可能となる。
- ③ レーダーにより「マ」海峡「イ」国沿岸域を航行する船舶の動静把握が可能となる。
- ④ 「マ」海峡「イ」国沿岸域を航行する AIS 搭載船の情報をモニターすることが可能となる。
- ⑤ 気象情報を収集し、VHF、AIS などを通じて「マ」海峡「イ」国沿岸域付近航行船舶への情報提供活動が可能となる。
- ⑥ 「マ」海峡「イ」国沿岸域での事故船舶の位置、状況等に関する迅速な情報把握、提供及び関係機関との連携体制構築が行えるようになる。

(3) プロジェクト全体計画の主要活動

- ① 「マ」海峡の2箇所(タンジュン・メダン及びタンジュン・パリット)に VTS センサー局を設置する。船舶航行監視用機器として、タンジュン・メダンにレーダー及び AIS を、タンジュン・パリットには AIS を設置する。
- ② ドマイに VTS サブセンターを構築し、船舶航行監視用のマルチファンクションコンソールを設置する。
- ③ タンジュン・サイール、シリンチン、シンパン・アヤムに中継局を設置する。
- ④ バツ・アンパール VTS センター、ドマイ VTS サブセンター及び、ジャカルタの航行監視センターにおいて、「マ・シ」海峡における船舶航行を監視する。
- ⑤ システム・機材の運用および維持管理を行う。
- ⑥ ドマイ及びシリンチンの通信用鉄塔及び通信機器類については、別案件(沿岸無線開発第4期事業:有償)により設置される予定のものを利用する。

(4) 投入(インプット)

- ① 日本側: 無償資金協力 15.12 億円

- ② インドネシア側： 839.3 百万円 (688.0 百万ルピア)
- (ア) 必要な人員： 約 24 名
 - (イ) 建設資機材： 特になし
 - (ウ) 施設・機材の運営管理に係る経費(年間) 61.9 百万円

(5) 実施体制

主管官庁及び実施機関： 運輸省 海運総局 航行援助局

4. 無償資金協力の内容

(1) サイト

- レーダーセンサー局： タンジュン・メダン、タンジュン・パリット
- VTS サブセンター： ドマイ
- 中継局：タンジュン・サイール、シリンチン、シンパン・アヤム

(2) 概要

- タンジュン・メダン及び、タンジュン・パリットへのレーダーセンサー局の建設。
- ドマイへの VTS サブセンターの建設
- タンジュン・メダン、タンジュン・サイール、シンパン・アヤム、タンジュン・パリット各サイトへの通信用鉄塔(タンジュン・メダンはレーダー用を兼ねる)の建設。
- タンジュン・メダン VTS センサー局へのレーダー、AIS、VHF 船舶無線システム、CCTV カメラシステム、気象センサー、電力供給システム(ディーゼル発電機)等の調達、据付。
- タンジュン・パリット VTS センサー局への AIS、VHF 船舶無線システム、電力供給システム(太陽光発電)等の調達、据付。
- ドマイ VTS サブセンターへのトラッキングシステム、マルチファンクションコンソール、船舶情報データベース、リソース管理システム等の調達、据付。
- 各中継局及び VTS センサー局、VTS サブセンターへの多重無線通信システムの調達、据付。

(3) 相手国負担事項

- ドマイ VTS サブセンターにおける商用電源の確保
- タンジュン・メダン及びドマイの既設施設の一部撤去、移設及び改築
- 高速回線(ドマイ～バツ・アンパール間の専用回線)の確保
- ドマイ及びシリンチンの鉄塔建設、通信機器設置

(4) 概算事業費

概算事業費 15.12 億円 (無償資金協力 15.12 億円、インドネシア側負担 839.3 百万円)

(5) 工期

詳細設計・入札期間を含め約 21 ヶ月(予定)

(6) 貧困、ジェンダー、環境及び社会面の配慮

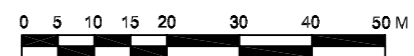
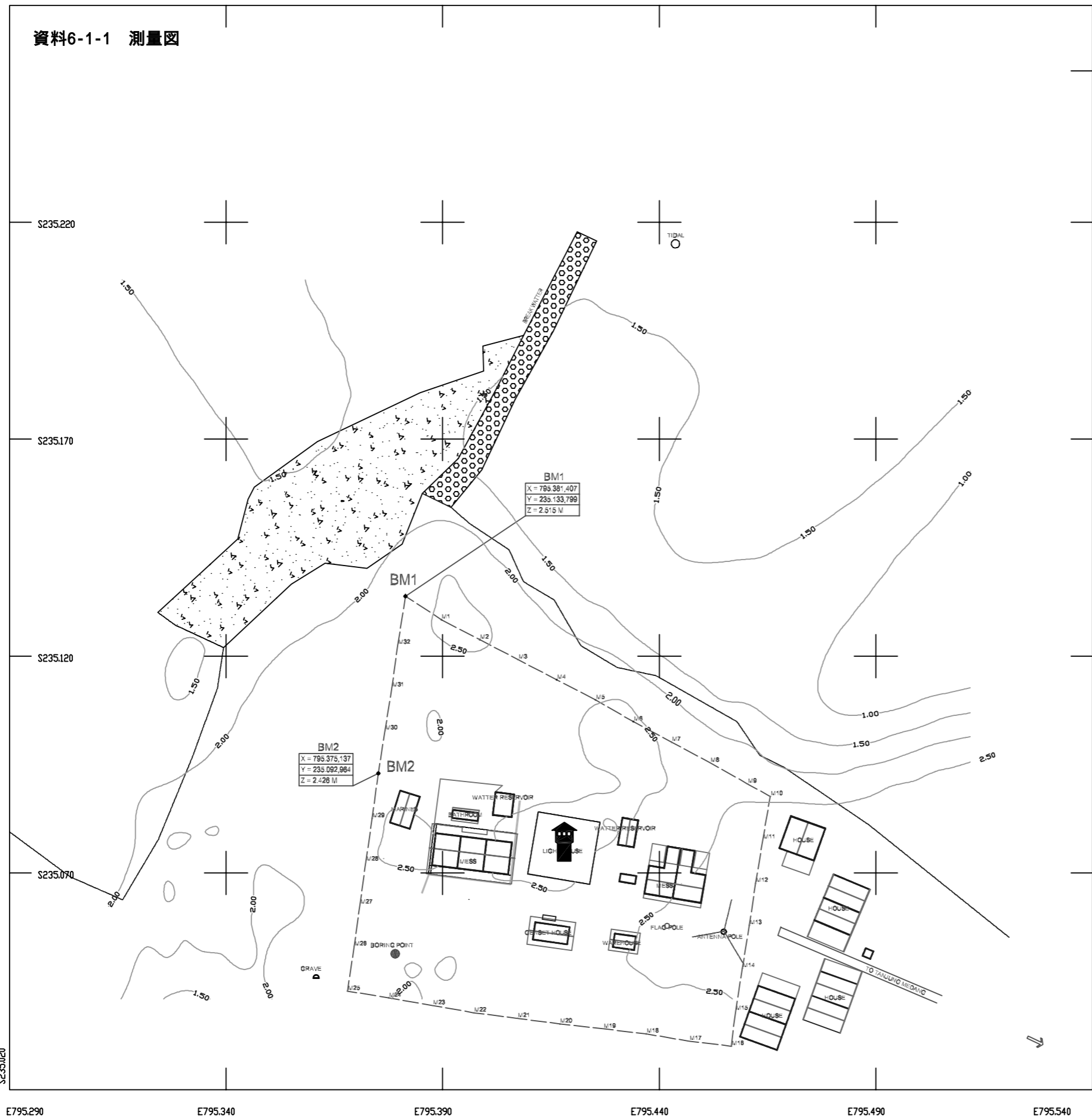
特になし

5. 外部要因リスク（プロジェクト全体計画の目標の達成に関するもの）		
沿岸無線開発第4期事業の進捗。ドマイ及びシリンチンの通信用鉄塔及び通信機器は、沿岸無線開発第4期事業で設置される施設を共同利用することとなっている。		
6. 過去の類似案件からの教訓の活用		
特になし		
7. プロジェクト全体計画の事後評価に係る提案		
(1) プロジェクト全体計画の目標達成を示す成果指標		
指 標	現 状 (2008 年度)	目標年における 計画値 (2012 年度)
1 導入された VTS システムの運用状況、船舶航行監視の実施状況、監視活動の実施時間数 (「マ・シ海峡」の VTS センサー局周辺海域を対象として)	監視活動を行うための VTS システムがない。	導入されたシステムの運用により監視活動が可能となる。
① レーダーによる海峡内航行船舶の監視隻数	0	レーダーによる監視が可能となる。
② AIS 搭載船舶からの情報受信船舶数	0	情報受信、モニター、記録が可能となる。
2 気象情報など、船舶への安全情報の提供件数 (「マ・シ海峡」の VTS センサー局周辺海域を対象として)	0	情報提供が可能となる。
3 VTS システムを活用した警備・救難担当機関との連携回数 (「マ・シ海峡」の VTS センサー局周辺海域を対象として)	0	事故船舶の位置、状況等に関する迅速な情報把握、提供、関係機関との連携体制構築が可能となる。
(2) その他の成果指標		
なし		
(3) 評価のタイミング		
2011 年 3 月以降(施設完工 1 年後)		

資料6-1 参考資料

S235.270

資料6-1-1 測量図



GRAPHIC SCALE

Proyeksi : Transvers Mercator
 Gridding System : Grid Universal Transvers Mercator
 Datum Horizontal : WGS 84
 Datum Vertical : Tidal Observation
 levelling : Meter
 Contour interval : 0.5 Meter

CLIENT :



CONSULTANT :



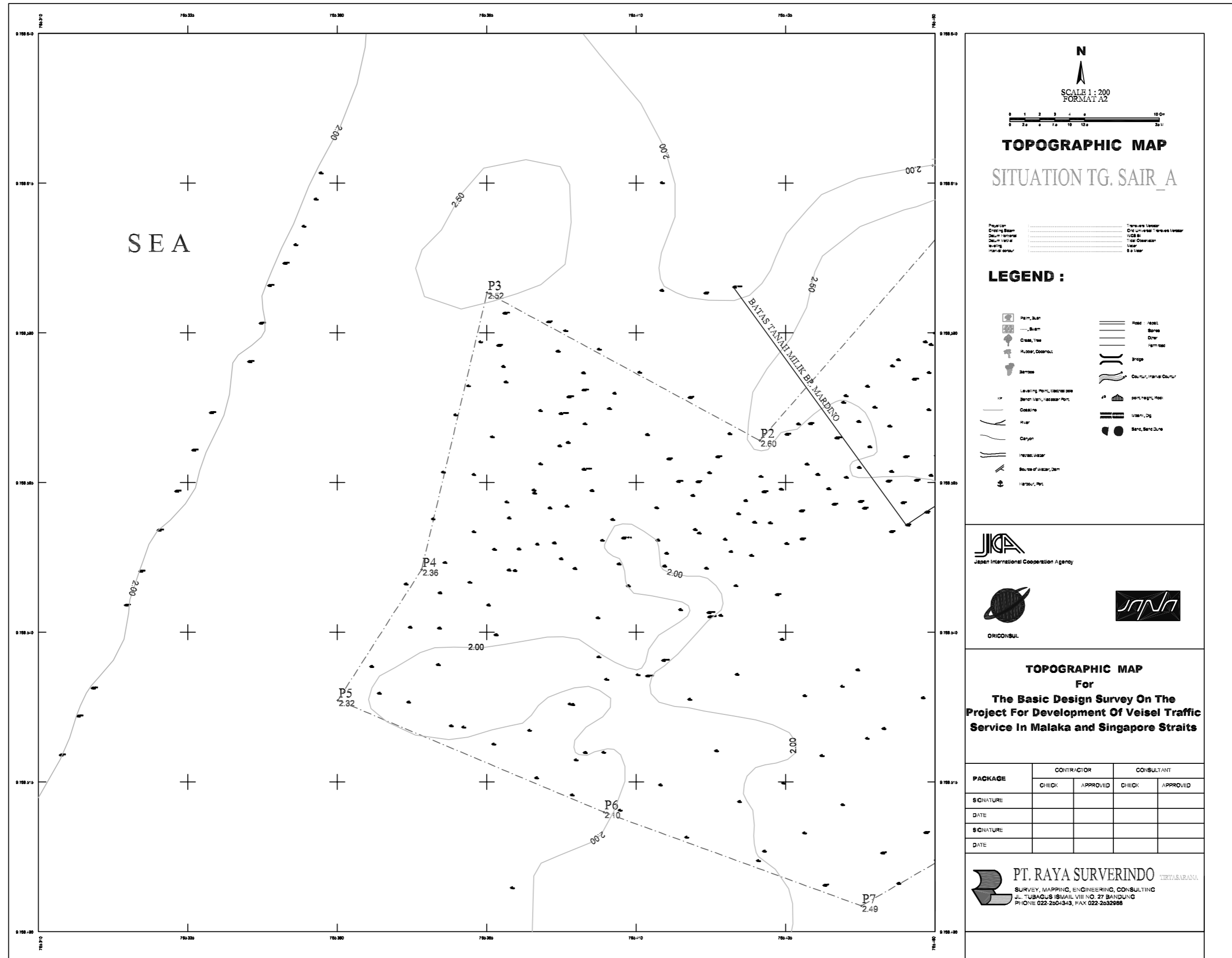
PROJECT :

TOPOGRAPHIC MAP
 For
The Basic Design Survey On The
Project For Development Of Vessel Traffic
Service In Malaka and Singapore Straits

DRAWING TITLE :

TOPOGRAPHIC MAP
 AT TJ. MEDANG LIGHT HOUSE

SCALE :	1 : 1.000
DRAWN :	SUHARTO
SURVEYED :	RASIDI
CHEKED :	SURANTO
APPROVED :	BAMBANG IRAWAN
DRAWING NO. :	DATE 6 FEBRUARI 2009
WORK NO. :	PRINTED DATE :
FILE TJ_MEDANG_A3.DWG	SHEET 1 / 1

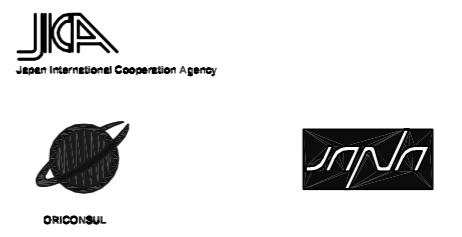


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 FORMAT A2
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 0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0

TOPOGRAPHIC MAP
 SITUATION TG. SAIR_A

Projection: Transverse Mercator
 Grid Unit: Meter
 Datum: WGS 84
 Contour Interval: 0.5 Meter
 Year: 2014

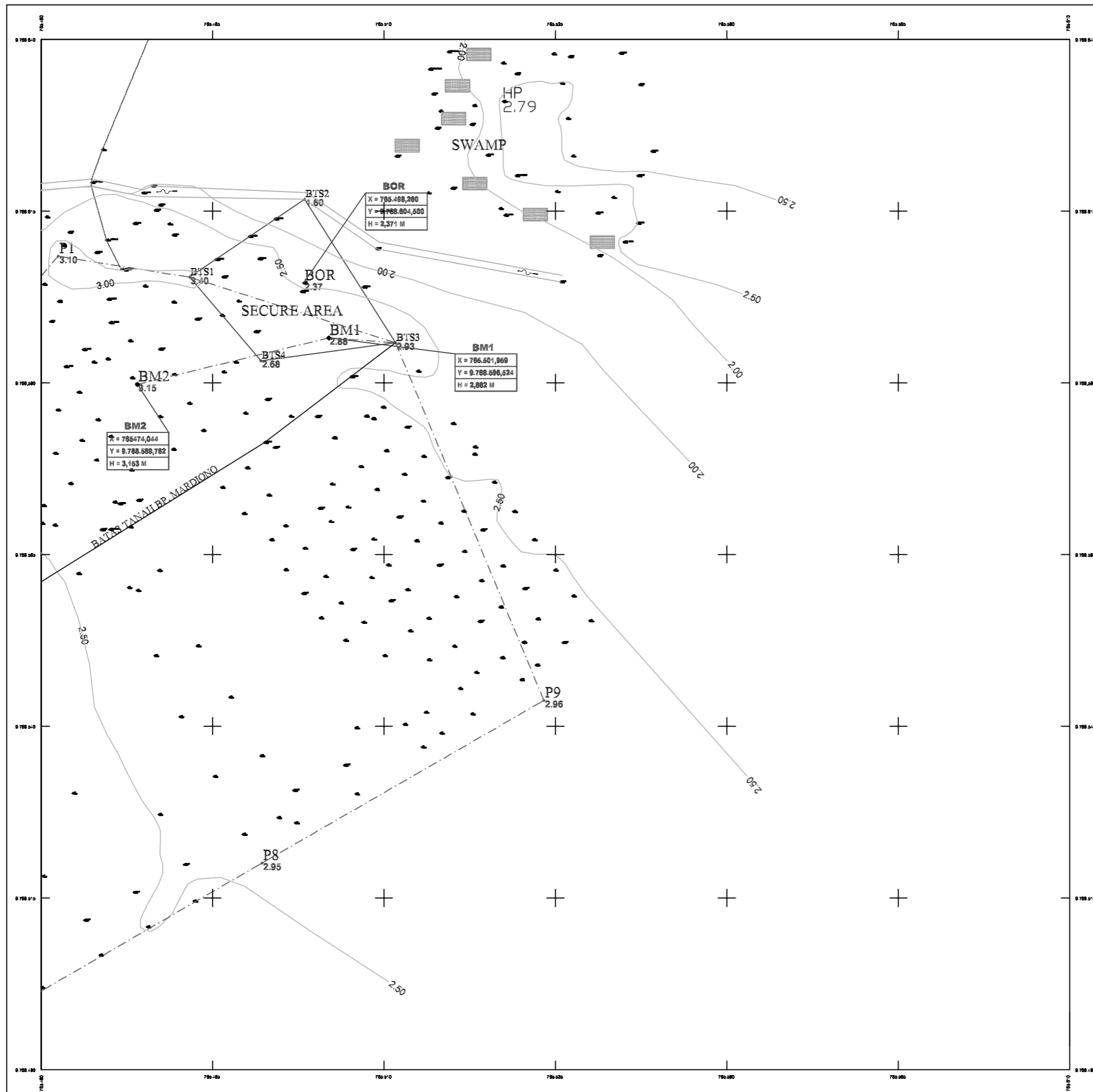
- LEGEND :**
- Point, Bull
 - Spot Height
 - Contour Line
 - River
 - Canal
 - Road
 - Bridge
 - Dam
 - Embankment
 - Trench
 - Ditch
 - Drainage Channel
 - Watercourse
 - Sand, Sand Dune



TOPOGRAPHIC MAP
 For
**The Basic Design Survey On The
 Project For Development Of Veisel Traffic
 Service In Malaka and Singapore Straits**

PACKAGE	CONTRACTOR		CONSULTANT	
	CHECK	APPROVED	CHECK	APPROVED
SIGNATURE				
DATE				
SIGNATURE				
DATE				

PT. RAYA SURVERINDO TERTASARANA
 SURVEY, MAPPING, ENGINEERING, CONSULTING
 J.L. TUBAGUS ISMAIL VIII NO. 27 BANDUNG
 PHONE 022-2504343, FAX 022-2532988



N
 SCALE 1 : 200
 FORMAT A2

TOPOGRAPHIC MAP
 SITUATION TG. SAIR_B

Position	—————	Triangular Marker	—————
Existing Beam	—————	Circle Universal Triangular Marker	—————
Secure Internal	—————	Circle	—————
Beam Visible	—————	Circle	—————
Leveling	—————	Circle	—————
Internal Control	—————	Circle	—————

LEGEND :

	Palm, Bush		Road / Asphalt
	Stone		Ditch
	Cross, Tree		Fences
	Rubber, Coconut		Slope
	Bamboo		Contour, Internal Contour
	Leveling Point, Benchmark		Bench Mark, Neapmark Point
	Contour		Masonry, Dig
	River		Sand, Sand Dune
	Canyon		
	Internal Water		
	Source of Water, Dam		
	Harbour, Port		



TOPOGRAPHIC MAP
 For
The Basic Design Survey On The
Project For Development Of Veisel Traffic
Service In Malaka and Singapore Straits

PACKAGE	CONTRACTOR		CONSULTANT	
	CHECK	APPROVED	CHECK	APPROVED
SIGNATURE				
DATE				
SIGNATURE				
DATE				

PT. RAYA SURVERINDO TRITASARANA
 SURVEY, MAPPING, ENGINEERING, CONSULTING
 JL. TUBAQUUS ISMAIL VIII NO. 27 BANDUNG
 PHONE 022-2504343, FAX 022-2532988

S183.675

S183.625

S183.575

S183.525

S183.475

S183.425

E771.000

E771.050

E771.100

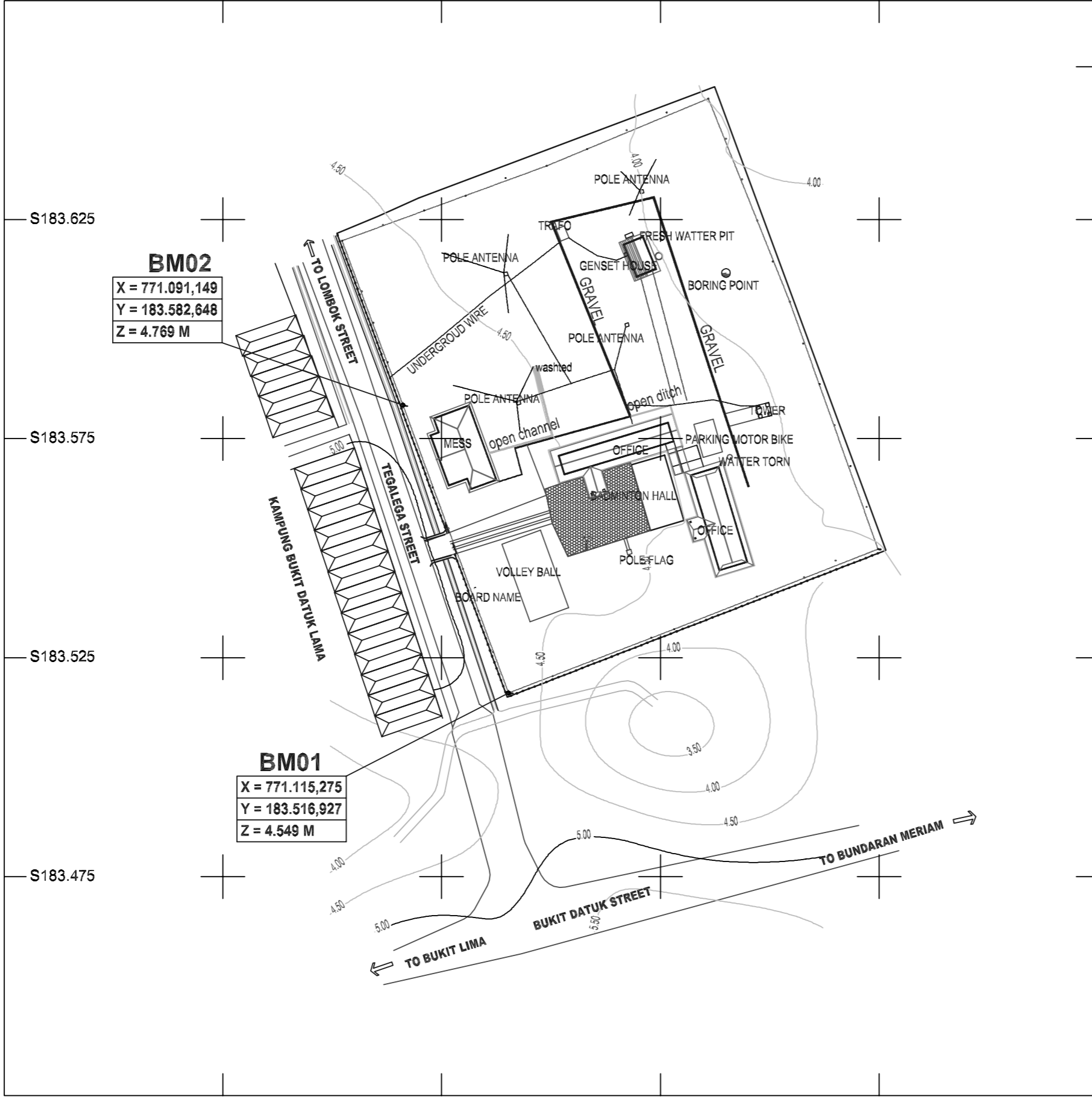
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E771.200

E771.250

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 Z = 4.769 M

BM01
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 Y = 183.516,927
 Z = 4.549 M



GRAPHIC SCALE

Proyeksi : Transvers Mercator
 Gridding Sistem : Grid Universal Transvers Mercator
 Datum Horizontal : WGS 84
 Datum Vertikal : Tidal Observation
 levelling : Meter
 Contour interval : 1 Meter

CLIENT :



PCI
 PACIFIC CONSULTANTS INTERNATIONAL



JAPAN AIDS TO NAVIGATION ASSOCIATION

CONSULTANT :



PT. RAYA SURVERINDO TERTABARANA
 SURVEY, MAPPING, ENGINEERING, CONSULTING
 JL. TUBAGUS I (SMA) NO. 27 BANDUNG
 PHONE 022-2601313, FAX 022-2632088

PROJECT :

TOPOGRAPHIC MAP
 For
The Basic Design Survey On The
Project For Development Of Vessel Traffic
Service In Malaka and Singapore Straits

DRAWING TITLE :

TOPOGRAPHIC MAP
 AT DUMAI RADIO STATION

SCALE	: 1 : 1.000
DRAWN	: SUHARTO
SURVEYED	: RASIDI
CHEKED	: SURANTO
APPROVED	: BAMBANG IRAWAN
DRAWING NO.	DATE SEPTEMBER, 2007
WORK NO.	PRINTED DATE :
FILE DUMAI_A3.DWG	SHEET 1 / 1

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S168.830

S168.780

S168.730

S168.680

S168.630

E214.450

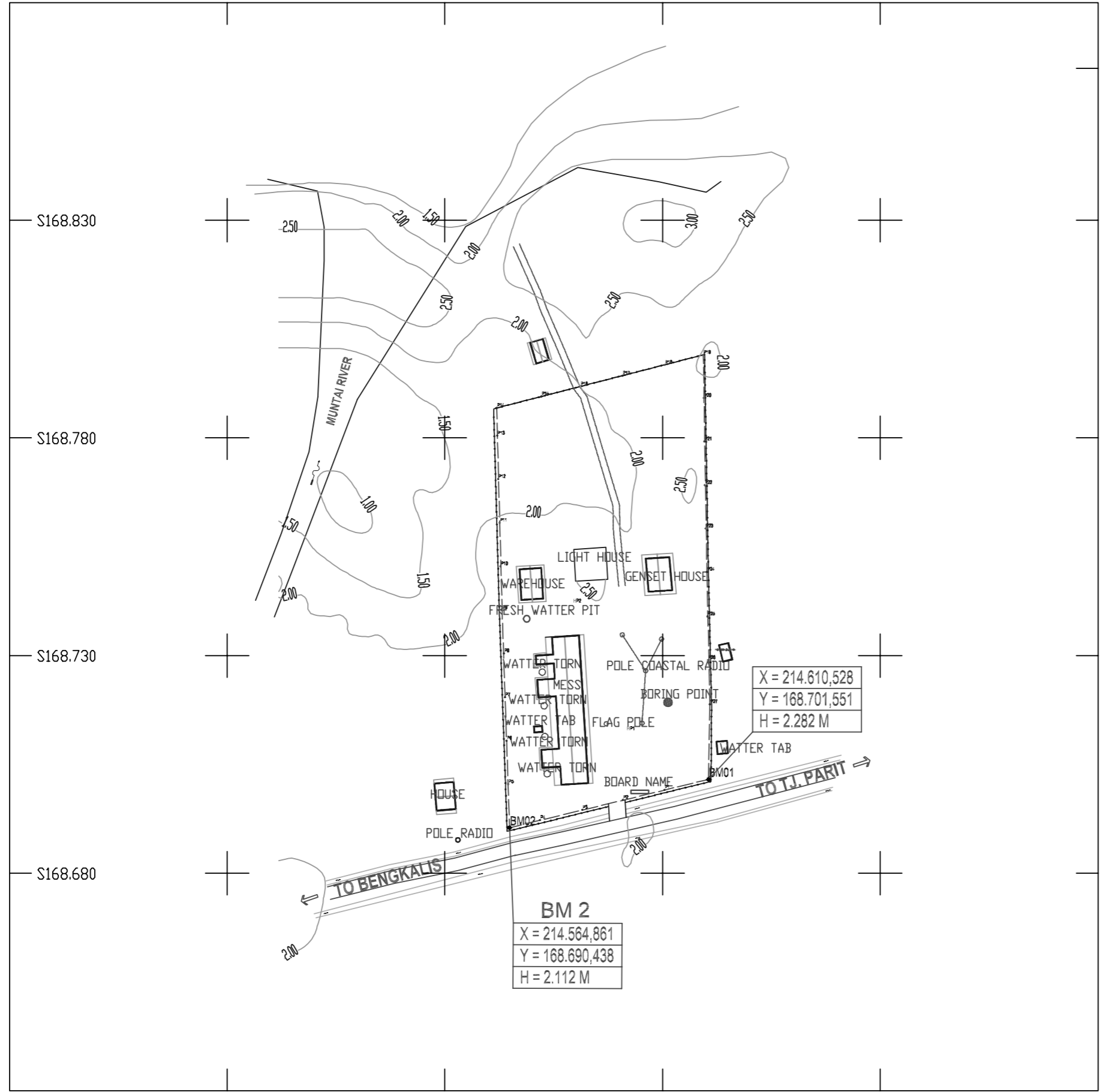
E214.500

E214.550

E214.600

E214.650

E214.700



GRAPHIC SCALE

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 Gridding Sistem : Grid Universal Transvers Mercator
 Datum Horizontal : WGS 84
 Datum Vertikal : Tidal Observation
 levelling : Meter
 Contour interval : 0.5 Meter

CLIENT :



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JAPAN AIDS TO NAVIGATION ASSOCIATION

CONSULTANT :



PT. RAYA SURVERINDO TERTASARANA
 SURVEY, MAPPING, ENGINEERING, CONSULTING
 JL. TUBAGUIS I/SMAL VII NO. 27 BANDUNG
 PHONE 022-2504343, FAX 022-2532995

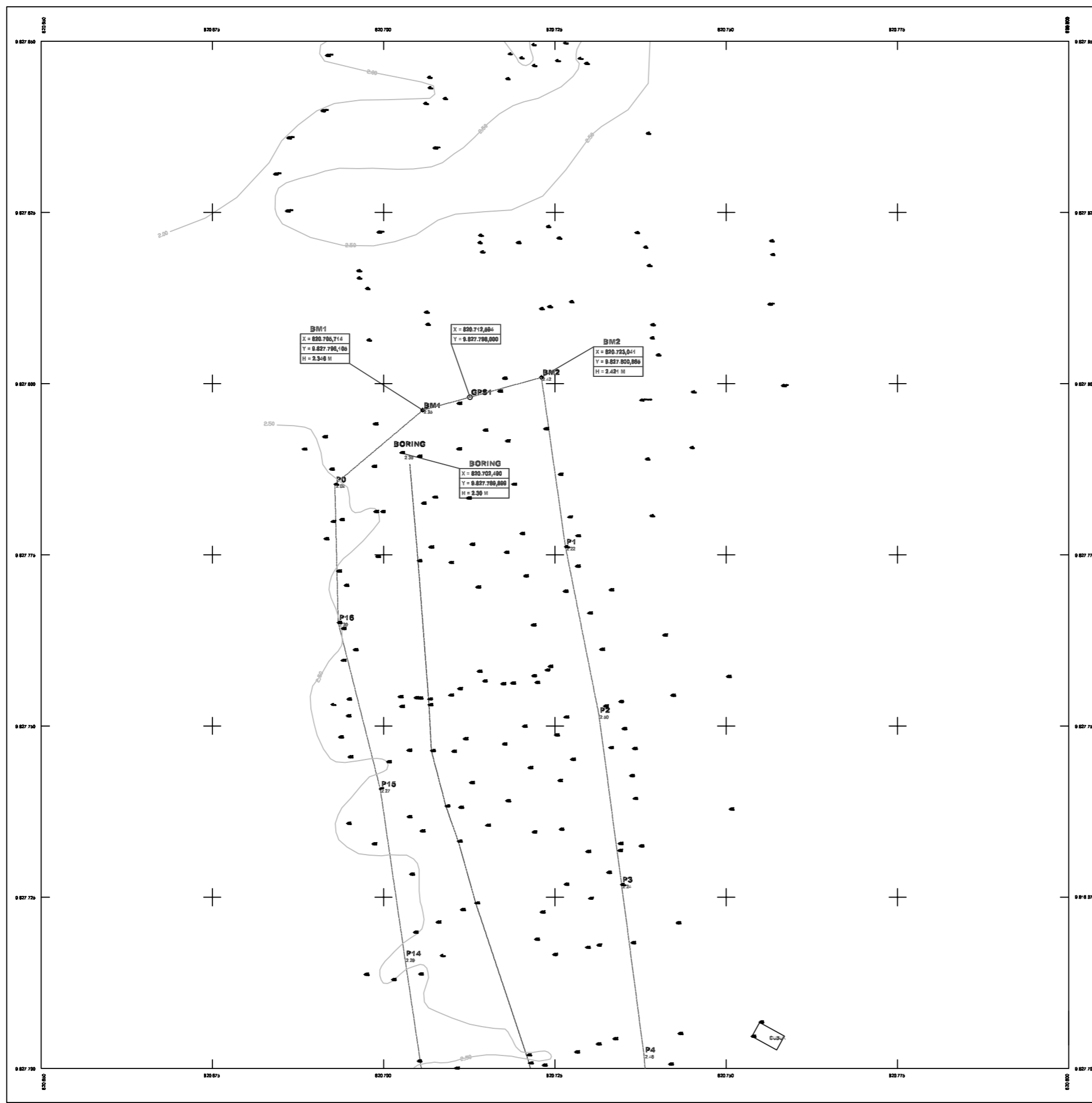
PROJECT :

TOPOGRAPHIC MAP
 For
The Basic Design Survey On The
Project For Development Of Vessel Traffic
Service In Malaka and Singapore Straits

DRAWING TITLE :

TOPOGRAPHIC MAP
 AT T.J. PARIT LIGHT HOUSE

SCALE	: 1 : 1.000
DRAWN	: SUHARTO
SURVEYED	: RASIDI
CHEKED	: SURANTO
APPROVED	: BAMBANG IRAWAN
DRAWING NO.	DATE SEPTEMBER, 2007
WORK NO.	PRINTED DATE :
FILE TJ_PARIT_A3.DWG	SHEET 1 / 1



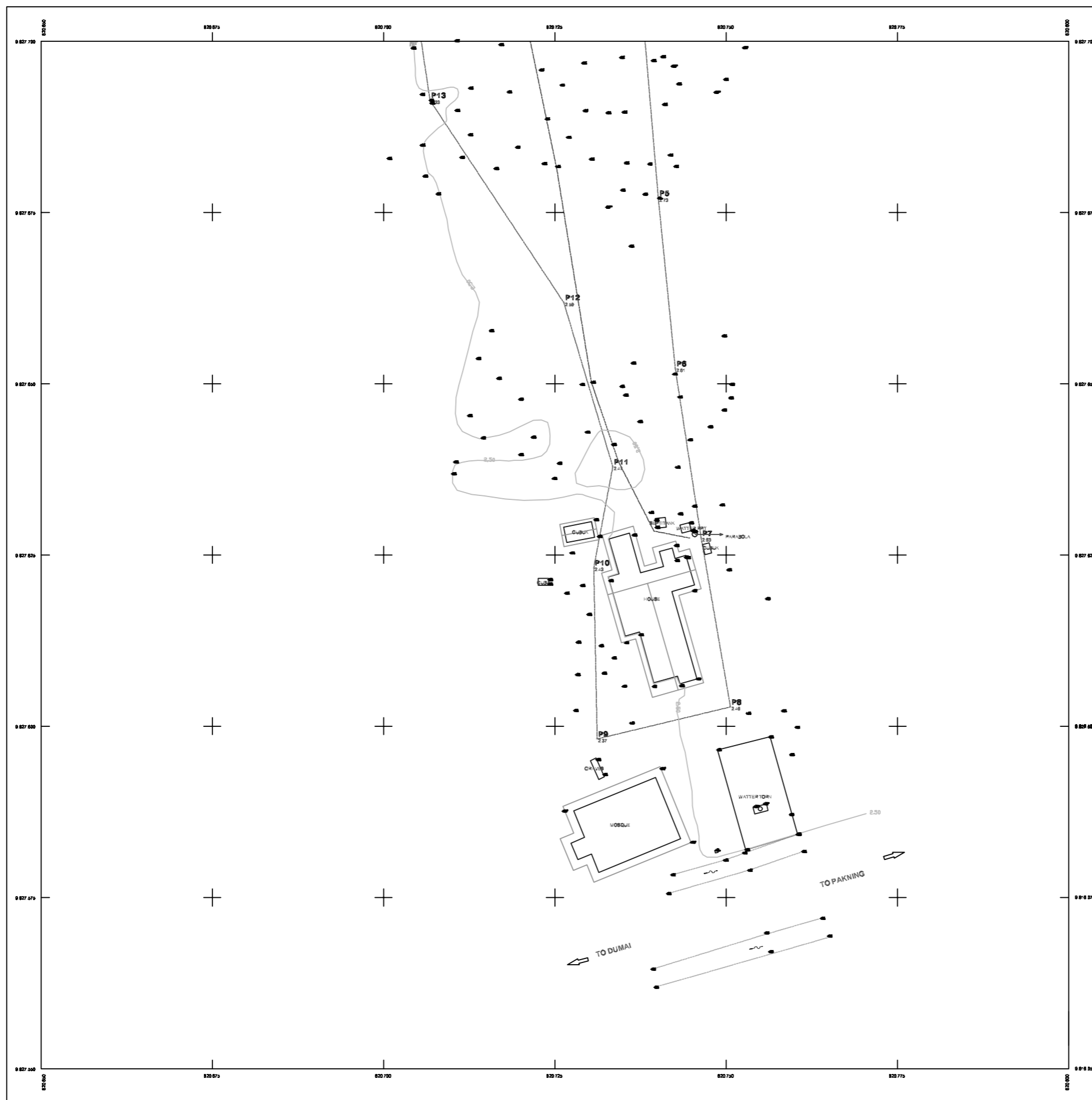
JICA
Japan International Cooperation Agency

TOPOGRAPHIC MAP
For
The Basic Design Survey On The
Project For Development Of Veisel Traffic
Service In Malaka and Singapore Straits

PACKAGE	CONTRACTOR		CONSULTANT	
	CHECK	APPROVED	CHECK	APPROVED
SIGNATURE				
DATE				
SIGNATURE				
DATE				

PT. RAYA SURVERINDO TIRTASARANA
SURVEY, MAPPING, ENGINEERING, CONSULTING
JL. TUBAGUS ISMAIL VIII NO. 27 BANDUNG
PHONE 022-250-4343, FAX 022-2532988

N



N
SCALE 1 : 200
FORMAT A2

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

TOPOGRAPHIC MAP
SITUATION SEPAHAT_B

Polygon
 Crossing Beam
 Datum National
 Datum Local
 Walling
 Internal contour

Trenches, Trenches
 Grid Uninvested Trenches
 VCS in
 Trench Operation
 Level
 8.0 Meter

LEGEND :

Palm, Bush
 Bush
 Creek, Tree
 Rubber, Coconut
 Banana
 Leveling Point, Benchmark
 Bench Mark, National Point
 Contourline
 River
 Deyan
 Internal Water
 Source of Water, Dam
 Harbour, Port

Road, Road
 Street
 Over
 Railway
 Slope
 Contour, Internal Contour
 Port, Height, Road
 Water, Dg
 Sand, Sand, Dune

JICA
Japan International Cooperation Agency

ORICON

JRPA

TOPOGRAPHIC MAP
For
The Basic Design Survey On The
Project For Development Of Veisel Traffic
Service In Malaka and Singapore Straits

PACKAGE	CONTRACTOR		CONSULTANT	
	CHECK	APPROVED	CHECK	APPROVED
SIGNATURE				
DATE				
SIGNATURE				
DATE				

PT. RAYA SURVERINDO TIRTASARANA
SURVEY, MAPPING, ENGINEERING, CONSULTING
JL. TUBAGUS ISMAIL VIII NO. 27 BANDUNG
PHONE 022-250-4343, FAX 022-2532988

THE BASIC STUDY ON THE PROJECT FOR DEVELOPMENT VESSEL TRAFFIC SERVICE
IN MALACCA AND SINGAPORE STRAITS IN THE REPUBLIC OF INDONESIA

Project : PCI		Coordinate x : 795.379,0340		Drilling Machine : YSO 1											
Location : Tanjung Medang		Coordinate y : 235.051,3820		Bor Master : Dadang Somantri											
Number of bor hole : BH. 1		Sheet Number : 1		Description by : Dadang Somantri											
GWL elevation : + 1.558 m		Day/Date : (20/08-24/08) 2007		Check by : Irawan											
Elevation from MSL (m)	Depth from ground level (m)	Bor Profile	Description of Strata	Number of Blow			Sum of Blow	SPT - N Graphic						Remarks	
				N1	N2	N3		0	10	20	30	40	50		60
+ 3.558	0.00														
+ 2.558	- 1.00		Clay, Silt, fine sand, grey.	2 / 15	8 / 15	13 / 15	21 / 30								SPT-1 : (1.00-1.45)
+ 1.558	- 2.00			3 / 15	5 / 15	5 / 15	10 / 30								SPT-2 : (2.00-2.45)
+ 0.558	- 3.00			4 / 15	6 / 15	7 / 15	13 / 30								SPT-3 : (3.00-3.45)
- 0.442	- 4.00			3 / 15	3 / 15	4 / 15	7 / 30								SPT-4 : (4.00-4.45)
- 1.442	- 5.00			5 / 15	5 / 15	8 / 15	13 / 15								SPT-5 : (5.00-5.45)
- 2.442	- 6.00			1 / 15	2 / 15	2 / 15	4 / 30								SPT-6 : (6.00-6.45)
- 3.442	- 7.00			5 / 15	7 / 15	7 / 15	14 / 30								SPT-7 : (7.00-7.45)
- 4.442	- 8.00			4 / 15	5 / 15	7 / 15	12 / 30								SPT-8 : (8.00-8.45)
- 5.442	- 9.00			2 / 15	6 / 15	9 / 15	15 / 30								SPT-9 : (9.00-9.45)
- 6.442	- 10.00			3 / 15	6 / 15	12 / 15	18 / 30								SPT-10 : (10.00-10.45)
- 7.442	- 11.00		5 / 15	8 / 15	11 / 15	19 / 30								SPT-11 : (11.00-11.45)	
- 8.442	- 12.00		6 / 15	12 / 15	17 / 15	29 / 30								SPT-12 : (12.00-12.45)	
- 9.442	- 13.00		4 / 15	9 / 15	13 / 15	22 / 30								SPT-13 : (13.00-13.45)	
- 10.442	- 14.00		7 / 15	11 / 15	18 / 15	29 / 30								SPT-14 : (14.00-14.45)	
- 11.442	- 15.00		9 / 15	12 / 15	19 / 15	31 / 30								SPT-15 : (15.00-15.45)	
- 12.442	- 16.00		4 / 15	6 / 15	9 / 15	15 / 30								SPT-16 : (16.00-16.45)	
- 13.442	- 17.00		6 / 15	7 / 15	12 / 15	19 / 30								SPT-17 : (17.00-17.45)	
- 14.442	- 18.00		7 / 15	9 / 15	14 / 15	23 / 30								SPT-18 : (18.00-18.45)	
- 15.442	- 19.00		5 / 15	8 / 15	13 / 15	21 / 30								SPT-19 : (19.00-19.45)	
- 16.442	- 20.00		7 / 15	12 / 15	19 / 15	31 / 30								SPT-20 : (20.00-20.45)	
- 17.442	- 21.00		4 / 15	6 / 15	9 / 15	15 / 30								SPT-21 : (21.00-21.45)	
- 18.442	- 22.00		5 / 15	9 / 15	12 / 15	21 / 30								SPT-22 : (22.00-22.45)	
- 19.442	- 23.00		Clay, silt, grey.												
- 20.442	- 24.00		Undisturbed sample (24.00-24.60 m.)	6 / 15	17 / 15	35 / 15	52 / 30							SPT-23 : (24.60-25.05)	
- 21.442	- 25.00			9 / 15	28 / 15	47 / 15	>60 / 30							SPT-24 : (25.50-25.95)	
- 22.442	- 26.00		Clay, Silt, fine sand, grey.	18 / 15	34 / 15	57 / 15	>60 / 30							SPT-25 : (26.50-26.95)	
- 23.442	- 27.00			14 / 15	25 / 15	45 / 15	>60 / 30							SPT-26 : (27.50-27.95)	
- 24.442	- 28.00			5 / 15	15 / 15	32 / 15	47 / 30							SPT-27 : (28.50-28.95)	
- 25.442	- 29.00		Undisturbed sample (30.00-30.50 m.)	8 / 15	17 / 15	35 / 15	52 / 30							SPT-28 : (29.50-29.95)	
- 26.442	- 30.00			7 / 15	15 / 15	34 / 15	49 / 30							SPT-29 : (30.50-30.95)	
- 27.442	- 31.00			9 / 15	21 / 15	42 / 15	>60 / 30							SPT-30 : (31.50-31.95)	
- 28.442	- 32.00			11 / 15	25 / 15	45 / 15	>60 / 30							SPT-31 : (32.50-32.95)	
- 29.442	- 33.00			12 / 15	27 / 15	43 / 15	>60 / 30							SPT-32 : (33.00-33.45)	
- 30.442	- 34.00			9 / 15	20 / 15	35 / 15	55 / 30							SPT-33 : (34.00-34.45)	
- 31.442	- 35.00		Clay, grey.	11 / 15	23 / 15	44 / 15	>60 / 30							SPT-34 : (35.00-35.45)	
- 32.442	- 36.00			7 / 15	19 / 15	30 / 15	49 / 30							SPT-35 : (36.00-36.45)	
- 33.442	- 37.00			8 / 15	21 / 15	34 / 15	55 / 30							SPT-36 : (37.00-37.45)	
- 34.442	- 38.00			10 / 15	35 / 15	43 / 15	>60 / 30							SPT-37 : (38.00-38.45)	
- 35.442	- 39.00			10 / 15	22 / 15	40 / 15	>60 / 30							SPT-38 : (39.00-39.45)	
- 36.442	- 40.00														












DRILLING LOG

THE IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR ENHANCEMENT OF VESSEL TRAFFIC SYSTEM
IN MALACCA AND SINGAPORE STRAITS IN THE REPUBLIC OF INDONESIA

Project : ORI CONSUL		Coordinate x : 765.498.260		Drilling Machine : YSO 1	
Location : TG. SAIR		Coordinate y : 9.788.604.500		Bor Master : Samsuhadi	
Number of bor hole : B. 1		Sheet Number : 1/2		Description by : Samsuhadi	
GWL elevation : 3.50 m		Day/Date : (29/12-1/1) 2009		Check by : Irawan	

Elevation from LWS (m)	Depth from ground level (m)	Bor Profile	Description of Strata	Number of Blow			Sum of Blow	SPT - N Graphic	Remarks
				N1	N2	N3			
+ 2.371	0.00								
+ 1.371	- 1.00		Clay, brown	2 / 15	4 / 15	4 / 15	8 / 30	8	SPT-1 : (1.00-1.45) m
+ 0.371	- 2.00			2 / 15	2 / 15	2 / 15	4 / 30	4	SPT-2 : (2.00-2.45) m
- 0.629	- 3.00		Undisturbed sample (3.45-4.00 m.)	1 / 15	2 / 15	1 / 15	3 / 30	3	SPT-3 : (3.00-3.45) m
- 1.629	- 4.00		Clay, silt, grey	2 / 15	2 / 15	2 / 15	4 / 30	4	SPT-4 : (4.00-4.45) m
- 2.629	- 5.00		Undisturbed sample (5.45-6.00 m.)	1 / 15	2 / 15	1 / 15	3 / 15	3	SPT-5 : (5.00-5.45) m
- 3.629	- 6.00			1 / 15	2 / 15	1 / 15	3 / 30	3	SPT-6 : (6.00-6.45) m
- 4.629	- 7.00			1 / 15	1 / 15	1 / 15	2 / 30	2	SPT-7 : (7.00-7.45) m
- 5.629	- 8.00		Undisturbed sample (8.45-9.00 m.)	1 / 15	1 / 15	1 / 15	2 / 30	2	SPT-8 : (8.00-8.45) m
- 6.629	- 9.00			1 / 15	1 / 15	1 / 15	2 / 30	2	SPT-9 : (9.00-9.45) m
- 7.629	- 10.00		Clay, silt, organic matter, dark grey	1 / 15	2 / 15	1 / 15	3 / 30	3	SPT-10 : (10.00-10.45) m
- 8.629	- 11.00		Undisturbed sample (11.45-12.00 m.)	1 / 15	2 / 15	1 / 15	3 / 30	3	SPT-11 : (11.00-11.45) m
- 9.629	- 12.00			1 / 15	2 / 15	2 / 15	4 / 30	4	SPT-12 : (12.00-12.45) m
- 10.629	- 13.00			2 / 15	2 / 15	2 / 15	4 / 30	4	SPT-13 : (13.00-13.45) m
- 11.629	- 14.00		Clay, silt, grey	2 / 15	2 / 15	2 / 15	4 / 30	4	SPT-14 : (14.00-14.45) m
- 12.629	- 15.00		Undisturbed sample (14.45-15.00 m.)	6 / 15	9 / 15	11 / 15	20 / 30	20	SPT-15 : (15.00-15.45) m
- 13.629	- 16.00			7 / 15	10 / 15	12 / 15	22 / 30	22	SPT-16 : (16.00-16.45) m
- 14.629	- 17.00		Fine sand, grey	8 / 15	10 / 15	13 / 15	23 / 30	23	SPT-17 : (17.00-17.45) m
- 15.629	- 18.00			8 / 15	11 / 15	12 / 15	23 / 30	23	SPT-18 : (18.00-18.45) m
- 16.629	- 19.00			10 / 15	12 / 15	17 / 15	29 / 30	29	SPT-19 : (19.00-19.45) m
- 17.629	- 20.00			10 / 15	12 / 15	16 / 15	28 / 30	28	SPT-20 : (20.00-20.45) m

 UDS Sample	 SPT Test	 Clay	 Sand	 Shell fragment/Organic matter.
 DS Sample		 Silt	 Gravel	 Andesit rock

DRILLING LOG

THE IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR ENHANCEMENT OF VESSEL TRAFFIC SYSTEM
IN MALACCA AND SINGAPORE STRAITS IN THE REPUBLIC OF INDONESIA

Project : ORI CONSUL		Coordinate x : 765.498.260		Drilling Machine : YSO 1	
Location : TG. SAIR		Coordinate y : 9.788.604.500		Bor Master : Samsuhadi	
Number of bor hole : B. 1		Sheet Number : 2/2		Description by : Samsuhadi	
GWL elevation : 3.50 m		Day/Date : (29/12-1/1) 2009		Check by : Irawan	

Elevation from LWS (m)	Depth from ground level (m)	Bor Profile	Description of Strata	Number of Blow			Sum of Blow	SPT - N Graphic	Remarks		
				N1	N2	N3					
- 18.629	- 21.00		Fine sand, grey	12/ 15	16/ 15	19/ 15	35/ 30	35	SPT-21 : (21.00-21.45) m		
- 19.629	- 22.00			13/ 15	14/ 15	17/ 15	31/ 30	31	SPT-22 : (22.00-22.45) m		
- 20.629	- 23.00			12/ 15	15/ 15	23/ 15	38/ 30	38	SPT-23 : (23.00-23.45) m		
- 21.629	- 24.00			15/ 15	19/ 15	24/ 15	43/ 30	43	SPT-24 : (24.00-24.45) m		
- 22.629	- 25.00			12/ 15	16/ 15	21/ 15	37/ 30	47	SPT-25 : (25.00-25.45) m		
- 23.629	- 26.00			13/ 15	17/ 15	23/ 15	40/ 30	40	SPT-26 : (26.00-26.45) m		
- 24.629	- 27.00			12/ 15	18/ 15	22/ 15	40/ 30	40	SPT-27 : (27.00-27.45) m		
- 25.629	- 28.00			13/ 15	16/ 15	19/ 15	35/ 30	35	SPT-28 : (28.00-28.45) m		
- 26.629	- 29.00			12/ 15	17/ 15	20/ 15	37/ 30	37	SPT-29 : (29.00-29.45) m		
- 27.629	- 30.00			Clay, grey	Clay, grey	11/ 15	14/ 15	16/ 15	30/ 30	30	SPT-30 : (30.00-30.45) m
- 28.629	- 31.00					13/ 15	15/ 15	16/ 15	31/ 30	31	SPT-31 : (31.00-31.45) m
- 29.629	- 32.00			Fine sand, light grey	Fine sand, light grey	18/ 15	20/ 15	22/ 15	42/ 30	42	SPT-32 : (32.00-32.45) m
- 30.629	- 33.00					18/ 15	20/ 15	22/ 15	42/ 30	42	SPT-33 : (33.00-33.45) m
- 31.629	- 34.00					19/ 15	23/ 15	24/ 15	47/ 30	47	SPT-34 : (34.00-34.45) m
- 32.629	- 35.00					19/ 15	23/ 15	24/ 15	47/ 30	47	SPT-35 : (35.00-35.45) m
- 33.629	- 36.00					20/ 15	40/ 10	- -	>50	50	SPT-36 : (36.00-36.45) m
- 34.629	- 37.00					21/ 15	24/ 15	27/ 15	53/ 30	53	SPT-37 : (37.00-37.45) m
- 35.629	- 38.00					22/ 15	23/ 15	30/ 15	53/ 30	53	SPT-38 : (38.00-38.45) m
- 36.629	- 39.00					23/ 15	27/ 15	31/ 15	58/ 30	58	SPT-39 : (39.00-39.45) m
- 37.629	- 40.00			20/ 15	25/ 15	30/ 15	55/ 30	55	SPT-40 : (40.00-40.45) m		

	UDS Sample		SPT Test		Clay		Sand		Shell fragment/Organic matter.
	DS Sample		Silt		Gravel		Andesit rock		

DRILLING LOG

ドマイ (基本設計調査で実施)

THE BASIC STUDY ON THE PROJECT FOR DEVELOPMENT VESSEL TRAFFIC SERVICE IN MALACCA AND SINGAPORE STRAITS IN THE REPUBLIC OF INDONESIA

Project : PCI		Coordinate x : 771.164,970		Drilling Machine : YSO 1					
Location : Dumai Coastal Radio Station		Coordinate y : 183.612,820		Bor Master : Dadang Somantri					
Number of bor hole : BH. 1		Sheet Number : 1		Description by : Dadang Somantri					
GWL elevation : + 2.340 m		Day/Date : (09/08-15/08) 2007		Check by : Irawan					
Elevation from MSL (m)	Depth from ground level (m)	Bor Profile	Description of Strata	Number of Blow			Sum of Blow	SPT - N Graphic	Remarks
				N1	N2	N3			
+ 3.840	0.00								
+ 2.840	-1.00		Organic matter, black-brown.	1 / 15	1 / 15	1 / 15	2 / 30	2	SPT-1 : (1.00-1.45)
+ 1.840	-2.00			1 / 15	1 / 15	2 / 15	3 / 30	3	SPT-2 : (2.00-2.45)
+ 0.840	-3.00		Undisturbed sample (3.00-3.50 m.)						
- 0.160	-4.00			1 / 15	1 / 15	1 / 15	2 / 30	2	SPT-3 : (3.50-3.95)
- 1.160	-5.00		Clay, dark grey, very soft.	1 / 15	1 / 15	1 / 15	2 / 30	2	SPT-4 : (4.50-4.95)
- 2.160	-6.00			1 / 15	1 / 15	2 / 15	3 / 15	3	SPT-5 : (5.50-5.95)
- 3.160	-7.00			1 / 15	1 / 15	1 / 15	2 / 30	2	SPT-6 : (6.50-6.95)
- 4.160	-8.00		Undisturbed sample (8.00-8.50 m.)						
- 5.160	-9.00		Clay, organic matter, brownish black.	2 / 15	2 / 15	3 / 15	5 / 30	5	SPT-7 : (7.50-7.95)
- 6.160	-10.00			7 / 15	7 / 15	7 / 15	14 / 30	14	SPT-8 : (9.00-9.45)
- 7.160	-11.00		Silt, fine sand, grey.	1 / 15	18 / 15	45 / 15	>60 / 30	>60	SPT-9 : (10.00-10.45)
- 8.160	-12.00			6 / 15	35 / 15	51 / 15	>60 / 30	>60	SPT-10 : (11.00-11.45)
- 9.160	-13.00		Fine sand, light grey.	5 / 15	24 / 15	41 / 15	>60 / 30	>60	SPT-11 : (12.00-12.45)
- 10.160	-14.00			7 / 15	32 / 15	45 / 15	>60 / 30	>60	SPT-12 : (13.00-13.45)
- 11.160	-15.00		Fine sand, organic matter, grey-black.	6 / 15	11 / 15	14 / 15	25 / 30	25	SPT-13 : (14.00-14.45)
- 12.160	-16.00			8 / 15	17 / 15	22 / 15	39 / 30	39	SPT-14 : (15.00-15.45)
- 13.160	-17.00		Fine sand, dark grey.	7 / 15	11 / 15	14 / 15	25 / 30	25	SPT-15 : (16.00-16.45)
- 14.160	-18.00			5 / 15	11 / 15	14 / 15	25 / 30	25	SPT-16 : (17.00-17.45)
- 15.160	-19.00		Clay, grey. Undisturbed sample (19.00-19.50 m.)						
- 16.160	-20.00			5 / 15	7 / 15	9 / 15	16 / 30	16	SPT-17 : (18.00-18.45)
- 17.160	-21.00			6 / 15	8 / 15	10 / 15	18 / 30	18	SPT-18 : (19.50-19.95)
- 18.160	-22.00		Fine sand, silt, grey.	5 / 15	6 / 15	9 / 15	15 / 30	15	SPT-19 : (20.50-20.95)
- 19.160	-23.00			8 / 15	11 / 15	19 / 15	30 / 30	30	SPT-20 : (21.55-22.00) SPT-21 : (22.00-22.45)
- 20.160	-24.00			6 / 15	7 / 15	9 / 15	16 / 30	16	SPT-22 : (23.00-23.45)
- 21.160	-25.00		Clay, fine sand, grey.	9 / 15	11 / 15	12 / 15	23 / 30	23	SPT-23 : (24.00-24.45)
- 22.160	-26.00			7 / 15	9 / 15	14 / 15	23 / 30	23	SPT-24 : (25.00-25.45)
- 23.160	-27.00			10 / 15	15 / 15	19 / 15	34 / 30	34	SPT-25 : (26.00-26.45)
- 24.160	-28.00		Clay, grey, stiff.	9 / 15	14 / 15	18 / 15	32 / 30	32	SPT-26 : (27.00-27.45)
- 25.160	-29.00			10 / 15	13 / 15	19 / 15	32 / 30	32	SPT-27 : (28.00-28.45)
- 26.160	-30.00			12 / 15	18 / 15	28 / 15	46 / 30	46	SPT-28 : (29.00-29.45)
- 27.160	-31.00		Silt, fine sand, grey, dense.	15 / 15	25 / 15	40 / 15	>60 / 30	>60	SPT-29 : (30.00-30.45)
- 28.160	-32.00			14 / 15	28 / 15	43 / 15	>60 / 30	>60	SPT-30 : (31.00-31.45)
- 29.160	-33.00			17 / 15	35 / 15	42 / 15	>60 / 30	>60	SPT-31 : (32.00-32.45)
- 30.160	-34.00			16 / 15	31 / 15	40 / 15	>60 / 30	>60	SPT-32 : (33.00-33.45)
- 31.160	-35.00			8 / 15	17 / 15	22 / 15	39 / 30	39	SPT-33 : (34.00-34.45)
- 32.160	-36.00		Clay, grey, stiff.	11 / 15	21 / 15	22 / 15	43 / 30	43	SPT-34 : (35.00-35.45)
- 33.160	-37.00			13 / 15	25 / 15	45 / 15	>60 / 30	>60	SPT-35 : (36.00-36.45)
- 34.160	-38.00			14 / 15	35 / 15	51 / 15	>60 / 30	>60	SPT-36 : (37.00-37.45)
- 35.160	-39.00			16 / 15	37 / 15	55 / 15	>60 / 30	>60	SPT-37 : (38.00-38.45)
- 36.160	-40.00			14 / 15	42 / 15	58 / 15	>60 / 30	>60	SPT-38 : (39.00-39.45) SPT-39 : (40.00-40.45)












DRILLING LOG

THE IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR ENHANCEMENT OF VESSEL TRAFFIC SYSTEM
IN MALACCA AND SINGAPORE STRAITS IN THE REPUBLIC OF INDONESIA

Project : ORI CONSUL		Coordinate x : 798.940,970		Drilling Machine : YSO 1	
Location : SELINCING		Coordinate y : 9.816.098,934		Bor Master : Samsuhadi	
Number of bor hole : BH. 1		Sheet Number : 1/3		Description by : Samsuhadi	
GWL elevation :-		Day/Date : (19/11-25/11) 2008		Check by : Irawan	

Elevation from LWS (m)	Depth from ground level (m)	Bor Profile	Description of Strata	Number of Blow			Sum of Blow	SPT - N Graphic	Remarks
				N1	N2	N3			
+ 1.984	0.00								
+ 0.984	- 1.00			1 / 15	1 / 30	- -	1 / 30	1	SPT-1 : (1.00-1.45) m
- 0.016	- 2.00		Undisturbed sample 1.45 - 2.00 m	1 / 45	- -	- -	1 / 30	1	SPT-2 : (2.00-2.45) m
- 1.016	- 3.00		Clay, silt, organic matter, black	1 / 45	- -	- -	1 / 30	1	SPT-3 : (3.00-3.45) m
- 2.016	- 4.00			1 / 45	- -	- -	1 / 30	1	SPT-4 : (4.00-4.45) m
- 3.016	- 5.00			1 / 15	1 / 15	1 / 15	2 / 30	2	SPT-5 : (5.00-5.45) m
- 4.016	- 6.00		Undisturbed sample 5.45 - 6.00 m	1 / 15	1 / 15	2 / 15	3 / 30	3	SPT-6 : (6.00-6.45) m
- 5.016	- 7.00			1 / 15	1 / 15	1 / 15	2 / 30	2	SPT-7 : (7.00-7.45) m
- 6.016	- 8.00			1 / 45	- -	- -	1 / 30	1	SPT-8 : (8.00-8.45) m
- 7.016	- 9.00		Undisturbed sample 8.45 - 9.00 m	1 / 45	- -	- -	1 / 30	1	SPT-9 : (9.00-9.45) m
- 8.016	- 10.00		Undisturbed sample 9.45 - 10.00 m	1 / 45	- -	- -	1 / 30	1	SPT-10 : (10.00-10.45) m
- 9.016	- 11.00			1 / 45	- -	- -	1 / 30	1	SPT-11 : (11.00-11.45) m
- 10.016	- 12.00		Undisturbed sample 11.45 - 12.00 m	1 / 15	1 / 15	1 / 15	2 / 30	2	SPT-12 : (12.00-12.45) m
- 11.016	- 13.00			1 / 15	1 / 15	2 / 15	3 / 30	3	SPT-13 : (13.00-13.45) m
- 12.016	- 14.00		Undisturbed sample 13.45 - 14.00 m	1 / 15	1 / 15	2 / 15	3 / 30	3	SPT-14 : (14.00-14.45) m
- 13.016	- 15.00			1 / 15	1 / 15	2 / 15	3 / 30	3	SPT-15 : (15.00-15.45) m
- 14.016	- 16.00		Clay, silt, grey	1 / 15	1 / 15	1 / 15	2 / 30	2	SPT-16 : (16.00-16.45) m
- 15.016	- 17.00			1 / 15	1 / 15	2 / 15	3 / 30	3	SPT-17 : (17.00-17.45) m
- 16.016	- 18.00			1 / 15	1 / 15	1 / 15	2 / 30	2	SPT-18 : (18.00-18.45) m
- 17.016	- 19.00			1 / 15	2 / 15	1 / 15	3 / 30	3	SPT-19 : (19.00-19.45) m
- 18.016	- 20.00			1 / 15	2 / 15	2 / 15	4 / 30	4	SPT-20 : (20.00-20.45) m
- 19.016	- 21.00			1 / 15	1 / 15	2 / 15	3 / 30	3	SPT-21 : (21.00-21.45) m
- 20.016	- 22.00			1 / 15	1 / 15	1 / 15	2 / 30	2	SPT-22 : (22.00-22.45) m
- 21.016	- 23.00			1 / 15	1 / 15	2 / 15	3 / 30	3	SPT-23 : (23.00-23.45) m
- 22.016	- 24.00			1 / 15	1 / 15	2 / 15	3 / 30	3	SPT-24 : (24.00-24.45) m
- 23.016	- 25.00		Peat, organic matter, black	3 / 15	5 / 15	7 / 15	12 / 30	12	SPT-25 : (25.00-25.45) m
- 24.016	- 26.00			3 / 15	6 / 15	7 / 15	13 / 30	13	SPT-26 : (26.00-26.45) m
- 25.016	- 27.00			4 / 15	5 / 15	6 / 15	11 / 30	11	SPT-27 : (27.00-27.45) m
- 26.016	- 28.00		Clay, silt, grey	2 / 15	3 / 15	4 / 15	7 / 30	7	SPT-28 : (28.00-28.45) m
- 27.016	- 29.00			3 / 15	4 / 15	4 / 15	8 / 30	8	SPT-29 : (29.00-29.45) m
- 28.016	- 30.00			3 / 15	4 / 15	3 / 15	7 / 30	7	SPT-30 : (30.00-30.45) m

 UDS Sample	 SPT Test	 Clay	 Sand	 Shell fragment/Organic matter.
 DS Sample		 Silt	 Gravel	 Andesit rock

DRILLING LOG

THE IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR ENHANCEMENT OF VESSEL TRAFFIC SYSTEM
IN MALACCA AND SINGAPORE STRAITS IN THE REPUBLIC OF INDONESIA

Project : ORI CONSUL		Coordinate x : 798.940,970		Drilling Machine : YSO 1	
Location : SELINCING		Coordinate y : 9.816.098,934		Bor Master : Samsuhadi	
Number of bor hole : BH. 1		Sheet Number : 2/3		Description by : Samsuhadi	
GWL elevation :-		Day/Date : (19/11-9/12) 2008		Check by : Irawan	

Elevation from LWS (m)	Depth from ground level (m)	Bor Profile	Description of Strata	Number of Blow			Sum of Blow	SPT - N Graphic	Remarks
				N1	N2	N3			
-29.016	-31.00		<i>Clay, silt, grey</i>	3 / 15	4 / 15	7 / 15	11 / 30	11	SPT-31 : (31.00-31.45) m
-30.016	-32.00			4 / 15	5 / 15	6 / 15	11 / 30	11	SPT-32 : (32.00-32.45) m
-31.016	-33.00			4 / 15	7 / 15	7 / 15	14 / 30	14	SPT-33 : (33.00-33.45) m
-32.016	-34.00		4 / 15	6 / 15	8 / 15	14 / 30	14	SPT-34 : (34.00-34.45) m	
-33.016	-35.00		<i>Peat, organic matter, black</i>	6 / 15	7 / 15	7 / 15	14 / 30	14	SPT-35 : (35.00-35.45) m
-34.016	-36.00			3 / 15	4 / 15	3 / 15	7 / 30	6	SPT-36 : (36.00-36.45) m
-35.016	-37.00		3 / 15	3 / 15	3 / 15	6 / 30	6	SPT-37 : (37.00-37.45) m	
-36.016	-38.00		<i>Clay, silt, fine sand, grey</i>	2 / 15	4 / 15	6 / 15	10 / 30	10	SPT-38 : (38.00-38.45) m
-37.016	-39.00			4 / 15	6 / 15	9 / 15	15 / 30	15	SPT-39 : (39.00-39.45) m
-38.016	-40.00			2 / 15	3 / 15	5 / 15	8 / 30	8	SPT-40 : (40.00-40.45) m
-39.016	-41.00			4 / 15	6 / 15	7 / 15	13 / 30	13	SPT-41 : (41.00-41.45) m
-40.016	-42.00			5 / 15	6 / 15	8 / 15	14 / 30	14	SPT-42 : (42.00-42.45) m
-41.016	-43.00			4 / 15	5 / 15	7 / 15	12 / 30	12	SPT-43 : (43.00-43.45) m
-42.016	-44.00			4 / 15	8 / 15	10 / 15	18 / 30	18	SPT-44 : (44.00-44.45) m
-43.016	-45.00			9 / 15	10 / 15	12 / 15	22 / 30	22	SPT-45 : (45.00-45.45) m
-44.016	-46.00			9 / 15	11 / 15	13 / 15	24 / 30	24	SPT-46 : (46.00-46.45) m
-45.016	-47.00			10 / 15	13 / 15	15 / 15	28 / 30	38	SPT-47 : (47.00-47.45) m
-46.016	-48.00		<i>Fine sand, grey</i>	11 / 15	14 / 15	16 / 15	30 / 30	30	SPT-48 : (48.00-48.45) m
-47.016	-49.00			12 / 15	13 / 15	14 / 15	27 / 30	37	SPT-49 : (49.00-49.45) m
-48.016	-50.00			13 / 15	15 / 15	16 / 15	31 / 30	31	SPT-50 : (50.00-50.45) m

	UDS Sample		SPT Test		Clay		Sand		Shell fragment/Organic matter.
	DS Sample		Silt		Gravel		Andesit rock		

DRILLING LOG

THE IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR ENHANCEMENT OF VESSEL TRAFFIC SYSTEM
IN MALACCA AND SINGAPORE STRAITS IN THE REPUBLIC OF INDONESIA

Project : ORI CONSUL		Coordinate x : 798.940,970		Drilling Machine : YSO 1	
Location : SELINCING		Coordinate y : 9.816.098,934		Bor Master : Samsuhadi	
Number of bor hole : BH. 1		Sheet Number : 3/3		Description by : Samsuhadi	
GWL elevation :-		Day/Date : (19/11-9/12) 2008		Check by : Irawan	

Elevation from LWS (m)	Depth from ground level (m)	Bor Profile	Description of Strata	Number of Blow			Sum of Blow	SPT - N Graphic	Remarks
				N1	N2	N3			
-49.016	-51.00	[Symbol]	<i>Fine sand, grey</i>	12/ 15	17/ 15	14/ 15	31/ 30	31	SPT-51 : (51.00-51.45) m
-50.016	-52.00	[Symbol]		13/ 15	16/ 15	20/ 15	36/ 30	36	SPT-52 : (52.00-52.45) m
-51.016	-53.00	[Symbol]		14/ 15	15/ 15	18/ 15	33/ 30	33	SPT-53 : (53.00-53.45) m
-52.016	-54.00	[Symbol]		13/ 15	15/ 15	17/ 15	32/ 30	32	SPT-54 : (54.00-54.45) m
-53.016	-55.00	[Symbol]		14/ 15	16/ 15	18/ 15	34/ 30	34	SPT-55 : (55.00-55.45)
-54.016	-56.00	[Symbol]		18/ 15	19/ 15	22/ 15	41/ 30	41	SPT-56 : (56.00-56.45)
-55.016	-57.00	[Symbol]		17/ 15	20/ 15	23/ 15	43/ 30	43	SPT-57 : (57.00-57.45)
-56.016	-58.00	[Symbol]		16/ 15	20/ 15	22/ 15	42/ 30	42	SPT-58 : (58.00-58.45)
-57.016	-59.00	[Symbol]		18/ 15	25/ 15	27/ 15	52/ 30	52	SPT-59 : (59.00-59.45) m
-58.016	-60.00	[Symbol]		16/ 15	20/ 15	23/ 15	43/ 30	43	SPT-60 : (60.00-60.45) m
-59.016	-61.00	[Symbol]		17/ 15	23/ 15	27/ 15	50/ 30	50	SPT-61 : (61.00-61.45) m
-60.016	-62.00	[Symbol]		13/ 15	19/ 15	25/ 15	44/ 30	44	SPT-62 : (62.00-62.45) m
-61.016	-63.00	[Symbol]		16/ 15	21/ 15	24/ 15	45/ 30	45	SPT-63 : (63.00-63.45) m
-62.016	-64.00	[Symbol]		17/ 15	23/ 15	26/ 15	49/ 30	49	SPT-64 : (64.00-64.45) m
-63.016	-65.00	[Symbol]		14/ 15	24/ 15	27/ 15	51/ 30	51	SPT-65 : (65.00-65.45) m

[Symbol] UDS Sample	[Symbol] SPT Test	[Symbol] Clay	[Symbol] Sand	[Symbol] Shell fragment/Organic matter.
[Symbol] DS Sample		[Symbol] Silt	[Symbol] Gravel	[Symbol] Andesit rock

BORING LOG										P.T. SOILENS	
PROJECT		: SOIL INVESTIGATION FOR ADDITIONAL REPEATER STATION IN BENGKALIS ISLAND				WATER TABLE (M)		: - 1.30 m			
CLIENT		: JV.ORICONSUL & JANA				DATE		: April 03 to 06,2009			
LOCATION		: SIMPANG AYAM-BENGKALIS				BORING METHOD		: Coring, Sampling			
BORE HOLE NO.		: BH-1				SAMPLING METHOD		: Thin Walled Shelby Tube			
ELEVATION (M)		: +3.172 m				SPT		: Automatic Hammer (AH)			
COORDINATES		: E=171527.302; N=175284.710				DRILLER		: A.Zubaedi			
DEPTH (M)		: 51.45 m				LOGGER		: Y.Sumaryono			
						REVIEWED BY		: Djhn Page : 1 of 2			
SAMPLE DEPTH (meter)	USCS CHART	GRAPH SYMBOL	ROCK/SOIL DESCRIPTION	DEPTH (meter)	q _v (kg/cm ²)	SPT - N value		RECOVERY (%)			
						Depth (m)	BLOWS PER CM		N PER FOOT		
						40	80	40			
0.00	CH		CLAY, slightly silt, brown coloured, high plasticity, soft.	0.50	0.25						
1.00	CH		CLAY, light gray coloured, high plasticity, slightly silt, very soft.	1.00	<0.25	1/125					
2.25	CH			2.25	<0.25						
2.50	CH			2.50	<0.25						
3.20	CH			3.20	<0.25	1/80					
4.00	ML		SILT, gray coloured, low plasticity, trace fine grained sands, trace organic matter, very soft.	4.00	<0.25						
4.50	ML			4.50	<0.25	1/75					
5.25	ML			5.25	<0.25						
5.50	ML			5.50	<0.25						
6.00	ML			6.00	<0.25	2/30					
6.50	SC		CLAYEY SAND, gray coloured, low plasticity, fine grained sands, slightly silt, loose.	6.50	-	6/30					
6.95	SC			6.95	-						
7.50	SC		CLAY with SAND, gray coloured, some silt, low plasticity, fine grained sands, soft to medium stiff.	7.50	-						
8.20	CL			8.20	0.75	3/30					
8.80	CL			8.80	0.50						
9.00	CL			9.00	0.50	2/30					
9.55	CL			9.55	0.25						
10.00	CL			10.00	0.25	2/30					
10.50	CL			10.50	0.25						
11.00	CL			11.00	0.25	2/30					
11.50	CL			11.50	0.25						
12.00	CL			12.00	0.25						
12.70	CL			12.70	0.25	3/30					
13.25	CL			13.25	0.25						
13.50	CL			13.50	0.25	3/30					
13.95	CL			13.95	0.25						
14.50	CL			14.50	0.25	3/30					
15.00	CL			15.00	0.25						
15.50	CL			15.50	0.25	4/30					
15.95	CL			15.95	0.25						
16.50	CL			16.50	0.25	5/30					
16.95	CL			16.95	0.25						
17.50	CL			17.50	0.50						
18.20	SM		SILTY SAND, gray coloured, slightly clay, fine grained sands, uncemented, loose.	18.20	1.00	11/30					
18.65	SM			18.65	-						
19.00	SM			19.00	-	10/30					
19.45	SM			19.45	-						
20.00	CH		CLAY, light gray coloured, high plasticity, soft.	20.00	-	3/30					
20.45	CH			20.45	0.25						
21.00	CH			21.00	0.50						
21.70	CH			21.70	0.50	3/30					
22.15	CH			22.15	0.50						
22.50	CH			22.50	0.50	4/30					
22.95	CH			22.95	0.50						
23.50	CH			23.50	0.50	4/30					
23.95	CH			23.95	0.50						
24.50	CH			24.50	0.50	4/30					
24.95	CH			24.95	0.50						
25.00			END OF THIS PAGE CONTINUED TO THE NEXT PAGE								

Plate

BH-1.BOR - AvantGrade-Dent

BORING LOG

P.T. SOILENS

PROJECT	: SOIL INVESTIGATION FOR ADDITIONAL REPEATER STATION IN BENGKALIS ISLAND	WATER TABLE (M)	: - 1.30 m
CLIENT	: JV.ORICONSUL & JANA	DATE	: April 03 to 06,2009
LOCATION	: SIMPANG AYAM-BENGKALIS	BORING METHOD	: Coring, Sampling
BORE HOLE NO.	: BH-1	SAMPLING METHOD	: Thin Walled Shelby Tube
ELEVATION (M)	: +3.172 m	SPT	: Automatic Hammer (AH)
COORDINATES	: E=171527.302; N=175284.710	DRILLER	: A.Zubaedi
DEPTH (M)	: 51.45 m	LOGGER	: Y.Sumaryono
		REVIEWED BY	: Djhn Page : 2 of 2

SAMPLE DEPTH (meter)	USCS CHART	GRAPH SYMBOL	ROCK/SOIL DESCRIPTION	DEPTH (meter)	qt (kg/cm ²)	SPT - N value		RECOVERY (%)		
						Depth (m)	BLOWS PER CM		N PER FOOT	
						40	80	40	80	
25.00	CH		CLAY, light gray coloured, high plasticity, soft to stiff.	25.50	0.50	25.70	5/40			
26.00			0.50	26.65	4/30					
26.50			0.50	26.95	0.50					
27.50			0.50							
28.20			0.75	28.35	5/30					
28.65			0.75							
29.00			0.50	29.15	4/30					
29.45			0.50							
30.00			0.50	30.15	3/30					
30.45			0.25							
31.00			<0.25	31.15	2/30					
31.50			<0.25							
32.00			<0.25							
32.70			0.25	32.85	5/30					
33.15			0.25							
33.50			0.25	33.65	5/30					
33.95			0.50							
34.50			0.50	34.70	4/30					
35.00			0.50							
35.50			0.50	35.65	4/30					
35.95			0.50							
36.50			0.50	36.65	5/30					
36.95			0.50							
37.50			0.50							
38.20			1.00	38.35	7/30					
38.65			1.00							
39.00			1.00	39.15	8/30					
39.45			1.00							
40.00			1.00	40.15	9/30					
40.45			1.25							
41.00	1.50	41.15	10/30							
41.45	1.50									
42.00	1.50	42.15	10/30							
42.45	1.50									
43.00	1.25									
43.70	1.50	43.85	10/30							
44.15	1.50									
44.50	-	44.65	13/30							
44.95	-									
45.50	-	45.65	15/30							
45.95	-									
46.50	-	46.65	16/30							
46.95	-									
47.50	-	47.65	48/30							
47.95	-									
48.50	-	48.65	63/30							
48.95	-									
50.00	-	50.15	75/30							
50.45	-									
51.00	-	51.15	80/30							
51.45	-									
51.45			END OF THIS BORING CASING DOWN TO -50.00 METERS IN DEPTH							

BH-1A.BOR - AvantGarde-Demi

Plate

DRILLING LOG

THE BASIC STUDY ON THE PROJECT FOR DEVELOPMENT VESSEL TRAFFIC SERVICE
IN MALACCA AND SINGAPORE STRAITS IN THE REPUBLIC OF INDONESIA

Project : PCI		Coordinate x : 214.601,2663		Drilling Machine : YSO 1												
Location : Tanjung Parit		y : 168.719,2605		Bor Master : Samsuhadi												
Number of bor hole : BH. 1		Sheet Number : 1/2		Description by : Samsuhadi												
GWL elevation : + 2.090 m.		Day/Date : (25/08-02/09) 2007		Check by : Irawan												
Elevation from MSL (m)	Depth from ground level (m)	Bor Profile	Description of Strata	Number of Blow			Sum of Blow	SPT - N Graphic						Remarks		
				N1	N2	N3		0	10	20	30	40	50		60	
+ 4.549	0.00															
+ 3.549	-1.00		<i>Silty clay, organic matter, brownish grey.</i>	1 / 15	1 / 15	1 / 15	2 / 30									SPT-1 : (1.00-1.45)
+ 2.549	-2.00			1 / 15	1 / 15	1 / 15	2 / 30									SPT-2 : (2.00-2.45)
+ 1.549	-3.00			1 / 15	1 / 15	1 / 15	2 / 30									SPT-3 : (3.00-3.45)
+ 0.549	-4.00		Undisturbed sample (4.50-5.00 m.)	1 / 15	1 / 15	2 / 15	3 / 30									SPT-4 : (4.00-4.45)
- 0.451	-5.00		<i>Clay, grey.</i>	1 / 15	1 / 15	1 / 15	2 / 30									SPT-5 : (5.00-5.45)
- 1.451	-6.00			1 / 15	1 / 15	2 / 15	3 / 30									SPT-6 : (6.00-6.45)
- 2.451	-7.00			1 / 15	1 / 15	2 / 15	3 / 30									SPT-7 : (7.00-7.45)
- 3.451	-8.00		<i>Clay, grey.</i>	1 / 15	1 / 15	1 / 15	2 / 30									SPT-8 : (8.00-8.45)
- 4.451	-9.00			1 / 15	1 / 15	2 / 15	3 / 30									SPT-9 : (9.00-9.45)
- 5.451	-10.00			1 / 15	2 / 15	1 / 15	3 / 30									SPT-10 : (10.00-10.45)
- 6.451	-11.00		<i>Clay, grey.</i>	1 / 15	2 / 15	2 / 15	4 / 30									SPT-11 : (11.00-11.45)
- 7.451	-12.00			1 / 15	2 / 15	3 / 15	5 / 30									SPT-12 : (12.00-12.45)
- 8.451	-13.00			1 / 15	2 / 15	2 / 15	4 / 30									SPT-13 : (13.00-13.45)
- 9.451	-14.00		<i>Clay, grey.</i>	1 / 15	2 / 15	3 / 15	5 / 30									SPT-14 : (14.00-14.45)
- 10.451	-15.00			1 / 15	2 / 15	2 / 15	4 / 30									SPT-15 : (15.00-15.45)
- 11.451	-16.00			2 / 15	2 / 15	2 / 15	4 / 30									SPT-16 : (16.00-16.45)
- 12.451	-17.00		<i>Clay, grey.</i>	2 / 15	2 / 15	3 / 15	5 / 30									SPT-17 : (17.00-17.45)
- 13.451	-18.00			1 / 15	2 / 15	2 / 15	4 / 30									SPT-18 : (18.00-18.45)
- 14.451	-19.00			2 / 15	2 / 15	3 / 15	5 / 30									SPT-19 : (19.00-19.45)
- 15.451	-20.00		<i>Clay, grey.</i>	2 / 15	2 / 15	2 / 15	4 / 30									SPT-20 : (20.00-20.45)
- 16.451	-21.00			2 / 15	2 / 15	3 / 15	5 / 30									SPT-21 : (21.00-21.45)
- 17.451	-22.00			2 / 15	3 / 15	3 / 15	6 / 30									SPT-22 : (22.00-22.45)
- 18.451	-23.00		<i>Clay, grey.</i>	3 / 15	3 / 15	2 / 15	5 / 30									SPT-23 : (23.00-23.45)
- 19.451	-24.00			2 / 15	3 / 15	3 / 15	6 / 30									SPT-24 : (24.00-24.45)
- 20.451	-25.00			2 / 15	2 / 15	3 / 15	5 / 30									SPT-25 : (25.40-25.45)
- 21.451	-26.00		<i>Clay, grey.</i>	2 / 15	2 / 15	3 / 15	5 / 30									SPT-26 : (26.00-26.45)
- 22.451	-27.00			2 / 15	2 / 15	2 / 15	4 / 30									SPT-27 : (27.00-27.45)
- 23.451	-28.00			2 / 15	2 / 15	3 / 15	5 / 30									SPT-28 : (28.00-28.45)
- 24.451	-29.00		<i>Clay, grey.</i>	2 / 15	3 / 15	3 / 15	6 / 30									SPT-29 : (29.00-29.45)
- 25.451	-30.00			2 / 15	2 / 15	3 / 15	5 / 30									SPT-30 : (30.00-30.45)

UDS Sample
 SPT Test
 Clay
 Sand
 Shell fragment/Organic matter










DS Sample
 Silt
 Gravel
 Andesit rock

DRILLING LOG

THE BASIC STUDY ON THE PROJECT FOR DEVELOPMENT VESSEL TRAFFIC SERVICE IN MALACCA AND SINGAPORE STRAITS IN THE REPUBLIC OF INDONESIA

Project : PCI		Coordinate x : 214.601,2663		Drilling Machine : YSO 1	
Location : Tanjung Parit		Coordinate y : 168.719,2605		Bor Master : Samsuhadi	
Number of bor hole : BH. 1		Sheet Number : 2/2		Description by : Samsuhadi	
GWL elevation : + 2.09 m.		Day/Date : (25/08-02/09) 2007		Check by : Irawan	

Elevation from MSL (m)	Depth from ground level (m)	Bor Profile	Description of Strata	Number of Blow			Sum of Blow	SPT - N Graphic						Remarks
				N1	N2	N3		0	10	20	30	40	50	
- 25.451	- 30.00	30	Clay, grey.	2 / 15	2 / 15	3 / 15	5 / 30	5						SPT-30 : (30.00-30.45)
- 26.451	- 31.00	31		2 / 15	3 / 15	3 / 15	6 / 30	6						SPT-31 : (31.00-31.45)
- 27.451	- 32.00	32		2 / 15	2 / 15	3 / 15	5 / 30	5						SPT-32 : (32.00-32.45)
- 28.451	- 33.00	33		2 / 15	3 / 15	3 / 15	6 / 30	6						SPT-33 : (33.00-33.45)
- 29.451	- 34.00	34		2 / 15	3 / 15	3 / 15	6 / 30	6						SPT-34 : (34.00-34.45)
- 30.451	- 35.00	35		2 / 15	2 / 15	3 / 15	5 / 30	5						SPT-35 : (35.00-35.45)
- 31.451	- 36.00	36		2 / 15	3 / 15	3 / 15	6 / 30	6						SPT-36 : (36.00-36.45)
- 32.451	- 37.00	37		2 / 15	2 / 15	3 / 15	5 / 30	5						SPT-37 : (37.00-37.45)
- 33.451	- 38.00	38		2 / 15	3 / 15	3 / 15	6 / 30	6						SPT-38 : (38.00-38.45)
- 34.451	- 39.00	39		2 / 15	3 / 15	3 / 15	6 / 30	6						SPT-39 : (39.00-39.45)
- 35.451	- 40.00	40	Clay, grey.	2 / 15	3 / 15	3 / 15	6 / 30	6						SPT-40 : (40.00-40.45)
- 36.451	- 41.00	41		2 / 15	2 / 15	4 / 15	6 / 30	6						SPT-41 : (41.00-41.45)
- 37.451	- 42.00	42		2 / 15	2 / 15	7 / 15	9 / 30	9						SPT-42 : (42.00-42.45)
- 38.451	- 43.00	43		2 / 15	3 / 15	2 / 15	5 / 30	5						SPT-43 : (43.00-43.45)
- 39.451	- 44.00	44		2 / 15	4 / 15	4 / 15	8 / 30	8						SPT-44 : (44.00-44.45)
- 40.451	- 45.00	45		8 / 15	16 / 15	19 / 15	35 / 30	35						SPT-45 : (45.00-45.45)
- 41.451	- 46.00	46		6 / 15	13 / 15	19 / 15	32 / 30	32						SPT-46 : (46.00-46.45)
- 42.451	- 47.00	47		7 / 15	17 / 15	21 / 15	38 / 30	38						SPT-47 : (47.00-47.45)
- 43.451	- 48.00	48		7 / 15	15 / 15	19 / 15	34 / 30	34						SPT-48 : (48.00-48.45)
- 44.451	- 49.00	49		8 / 15	18 / 15	19 / 15	37 / 30	37						SPT-49 : (49.00-49.45)
- 45.451	- 50.00	50	8 / 15	16 / 15	19 / 15	35 / 30	35						SPT-50 : (50.00-50.45)	

 UDS Sample	 SPT Test	 Clay	 Sand	 Shell fragment/Organic matte
 DS Sample		 Silt	 Gravel	 Andesit rock

DRILLING LOG

THE IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR ENHANCEMENT OF VESSEL TRAFFIC SYSTEM
IN MALACCA AND SINGAPORE STRAITS IN THE REPUBLIC OF INDONESIA

Project : ORI CONSUL	Coordinate x : 820.702,490	Drilling Machine : YSO 1
Location : SEPAHAT	y : 9.827.789,899	Bor Master : Samsuhadi
Number of bor hole : DH. 1	Sheet Number : 1/3	Description by : Samsuhadi
GWL elevation : + 2.50 m	Day/Date : (10/11-14/11) 2008	Check by : Irawan

Elevation from LWS (m)	Depth from ground level (m)	Bor Profile	Description of Strata	Number of Blow			Sum of Blow	SPT - N Graphic							Remarks	
				N1	N2	N3		0	10	20	30	40	50	60		
+ 2.300	0.00							0								
+ 1.300	- 1.00		Clay, very soft, grey	1 / 45	- -	- -	1 / 30	1								SPT-1 : (1.00-1.45) m
+ 0.300	- 2.00		Undisturbed sample (1.45-2.00 m.)	1 / 45	- -	- -	1 / 30	1								SPT-2 : (2.00-2.45) m
- 0.700	- 3.00			1 / 45	- -	- -	1 / 30	1								SPT-3 : (3.00-3.45) m
- 1.700	- 4.00		Undisturbed sample (3.45-4.00 m.)	1 / 45	- -	- -	1 / 30	1								SPT-4 : (4.00-4.45) m
- 2.700	- 5.00			1 / 45	- -	- -	1 / 15	1								SPT-5 : (5.00-5.45) m
- 3.700	- 6.00		Undisturbed sample (5.45-6.00 m.)	1 / 45	- -	- -	1 / 30	1								SPT-6 : (6.00-6.45) m
- 4.700	- 7.00			1 / 45	- -	- -	1 / 30	1								SPT-7 : (7.00-7.45) m
- 5.700	- 8.00		Undisturbed sample (7.45-8.00 m.)	1 / 45	- -	- -	1 / 30	1								SPT-8 : (8.00-8.45) m
- 6.700	- 9.00			1 / 45	- -	- -	1 / 30	1								SPT-9 : (9.00-9.45) m
- 7.700	- 10.00		Undisturbed sample (9.45-10.00 m.)	1 / 45	- -	- -	1 / 30	1								SPT-10 : (10.00-10.45) m
- 8.700	- 11.00			1 / 45	- -	- -	1 / 30	1								SPT-11 : (11.00-11.45) m
- 9.700	- 12.00		Undisturbed sample (11.45-12.00 m.)	1 / 45	- -	- -	1 / 30	1								SPT-12 : (12.00-12.45) m
- 10.700	- 13.00			1 / 15	2 / 15	2 / 15	4 / 30	4								SPT-13 : (13.00-13.45) m
- 11.700	- 14.00			1 / 15	2 / 15	1 / 15	3 / 30	3								SPT-14 : (14.00-14.45) m
- 12.700	- 15.00		Clay, very soft, grey	1 / 15	1 / 15	1 / 15	2 / 30	2								SPT-15 : (15.00-15.45) m
- 13.700	- 16.00			1 / 15	2 / 15	2 / 15	4 / 30	4								SPT-16 : (16.00-16.45) m
- 14.700	- 17.00			1 / 15	1 / 15	2 / 15	3 / 30	3								SPT-17 : (17.00-17.45) m
- 15.700	- 18.00			1 / 15	1 / 15	2 / 15	3 / 30	3								SPT-18 : (18.00-18.45) m
- 16.700	- 19.00			1 / 15	1 / 15	2 / 15	3 / 30	3								SPT-19 : (19.00-19.45) m
- 17.700	- 20.00			1 / 15	2 / 15	1 / 15	3 / 30	3								SPT-20 : (20.00-20.45) m
- 18.700	- 21.00			1 / 15	1 / 15	1 / 15	2 / 30	2								SPT-21 : (21.00-21.45) m
- 19.700	- 22.00			1 / 15	2 / 15	2 / 15	4 / 30	4								SPT-22 : (22.00-22.45) m
- 20.700	- 23.00			1 / 15	2 / 15	1 / 15	3 / 30	3								SPT-23 : (23.00-23.45) m
- 21.700	- 24.00			1 / 15	1 / 15	2 / 15	3 / 30	3								SPT-24 : (24.00-24.45) m
- 22.700	- 25.00			1 / 15	1 / 15	2 / 15	3 / 30	3								SPT-25 : (25.00-25.45) m
- 23.700	- 26.00			1 / 15	1 / 15	1 / 15	2 / 30	2								SPT-26 : (26.00-26.45) m
- 24.700	- 27.00			1 / 15	1 / 15	1 / 15	2 / 30	2								SPT-27 : (27.00-27.45) m
- 25.700	- 28.00		Clay, very soft, grey	1 / 15	1 / 15	2 / 15	3 / 30	3								SPT-28 : (28.00-28.45) m
- 26.700	- 29.00			1 / 15	2 / 15	2 / 15	4 / 30	4								SPT-29 : (29.00-29.45) m
- 27.700	- 30.00			1 / 15	1 / 15	2 / 15	3 / 30	3								SPT-30 : (30.00-30.45) m










UDS Sample	SPT Test	Clay	Sand	Shell fragment/Organic matter.
DS Sample	Silt	Gravel	Andesit rock	

DRILLING LOG

THE IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR ENHANCEMENT OF VESSEL TRAFFIC SYSTEM
IN MALACCA AND SINGAPORE STRAITS IN THE REPUBLIC OF INDONESIA

Project : ORI CONSUL		Coordinate x : 820.702,490		Drilling Machine : YSO 1	
Location : SEPAHAT		Coordinate y : 9.827.789,899		Bor Master : Samsuhadi	
Number of bor hole : DH. 1		Sheet Number : 2/3		Description by : Samsuhadi	
GWL elevation : 2.50 m		Day/Date : (15/11-3/12) 2008		Check by : Irawan	



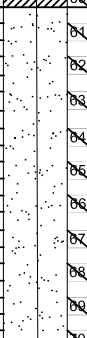
Elevation from LWS (m)	Depth from ground level (m)	Bor Profile	Description of Strata	Number of Blow			Sum of Blow	SPT - N Graphic							Remarks		
				N1	N2	N3		0	10	20	30	40	50	60			
-28.700	-31.00	31	<i>Clay, very soft, grey</i>	1 / 15	1 / 15	2 / 15	3 / 30	2								SPT-31 : (31.00-31.45) m	
-29.700	-32.00	32		1 / 15	1 / 15	2 / 15	3 / 30	3									SPT-32 : (32.00-32.45) m
-30.700	-33.00	33		1 / 15	1 / 15	1 / 15	2 / 30	2									SPT-33 : (33.00-33.45) m
-31.700	-34.00	34		1 / 15	1 / 15	2 / 15	3 / 30	3									SPT-34 : (34.00-34.45) m
-32.700	-35.00	35		1 / 15	2 / 15	2 / 15	4 / 30	4									SPT-35 : (35.00-35.45) m
-33.700	-36.00	36		1 / 15	2 / 15	2 / 15	4 / 30	4									SPT-36 : (36.00-36.45) m
-34.700	-37.00	37		1 / 15	2 / 15	3 / 15	5 / 30	5									SPT-37 : (37.00-37.45) m
-35.700	-38.00	38		1 / 15	2 / 15	2 / 15	4 / 30	4									SPT-38 : (38.00-38.45) m
-36.700	-39.00	39		1 / 15	2 / 15	2 / 15	4 / 30	4									SPT-39 : (39.00-39.45) m
-37.700	-40.00	40		1 / 15	1 / 15	2 / 15	3 / 45	3									SPT-40 : (40.00-40.45) m
-38.700	-41.00	41		1 / 15	2 / 15	2 / 15	4 / 30	4									SPT-41 : (41.00-41.45) m
-39.700	-42.00	42		1 / 15	2 / 15	1 / 15	3 / 30	3									SPT-42 : (42.00-42.45) m
-40.700	-43.00	43		1 / 15	2 / 15	1 / 15	3 / 30	3									SPT-43 : (43.00-43.45) m
-41.700	-44.00	44		1 / 15	2 / 15	2 / 15	4 / 30	4									SPT-44 : (44.00-44.45) m
-42.700	-45.00	45		1 / 15	1 / 15	2 / 15	3 / 30	3									SPT-45 : (45.00-45.45) m
-43.700	-46.00	46		1 / 15	1 / 15	2 / 15	3 / 30	3									SPT-46 : (46.00-46.45) m
-44.700	-47.00	47		1 / 15	1 / 15	2 / 15	3 / 30	3									SPT-47 : (47.00-47.45) m
-45.700	-48.00	48		1 / 15	2 / 15	2 / 15	4 / 30	4									SPT-48 : (48.00-48.45) m
-46.700	-49.00	49		1 / 15	2 / 15	2 / 15	4 / 30	4									SPT-49 : (49.00-49.45) m
-47.700	-50.00	50		1 / 15	2 / 15	2 / 15	4 / 30	4									SPT-50 : (50.00-50.45) m








 UDS Sample	 SPT Test	 Clay	 Sand	 Shell fragment/Organic matter.
 DS Sample		 Silt	 Gravel	 Andesit rock

DRILLING LOG

THE IMPLEMENTATION REVIEW STUDY ON THE PROJECT FOR ENHANCEMENT OF VESSEL TRAFFIC SYSTEM
IN MALACCA AND SINGAPORE STRAITS IN THE REPUBLIC OF INDONESIA

Project : ORI CONSUL		Coordinate x : 820.702,490		Drilling Machine : YSO 1	
Location : SEPAHAT		Coordinate y : 9.827.789,899		Bor Master : Samsuhadi	
Number of bor hole : DH. 1		Sheet Number : 3/3		Description by : Samsuhadi	
GWL elevation : 2.50 m		Day/Date : (15/11-3/12) 2008		Check by : Irawan	

Elevation from LWS (m)	Depth from ground level (m)	Bor Profile	Description of Strata	Number of Blow			Sum of Blow	SPT - N Graphic	Remarks
				N1	N2	N3			
-48.700	-51.00		<i>Clay, very soft, grey</i>	1 / 15	2 / 15	2 / 15	4 / 30	4	SPT-51 : (51.00-51.45) m
-49.700	-52.00			1 / 15	2 / 15	2 / 15	4 / 30	4	SPT-52 : (52.00-52.45) m
-50.700	-53.00			1 / 15	2 / 15	2 / 15	4 / 30	4	SPT-53 : (53.00-53.45) m
-51.700	-54.00			1 / 15	2 / 15	1 / 15	3 / 30	3	SPT-54 : (54.00-54.45) m
-52.700	-55.00			1 / 15	2 / 15	2 / 15	4 / 30	4	SPT-55 : (55.00-55.45) m
-53.700	-56.00			1 / 15	2 / 15	3 / 15	5 / 30	5	SPT-56 : (56.00-56.45) m
-54.700	-57.00			1 / 15	2 / 15	2 / 15	4 / 30	4	SPT-57 : (57.00-57.45) m
-55.700	-58.00		<i>Clay, grey</i>	2 / 15	4 / 15	7 / 15	11 / 30	11	SPT-58 : (58.00-58.45) m
-56.700	-59.00			4 / 15	6 / 15	8 / 15	14 / 30	14	SPT-59 : (59.00-59.45) m
-57.700	-60.00			8 / 15	14 / 15	17 / 15	31 / 30	31	SPT-60 : (60.00-60.45) m
-58.700	-61.00		<i>Fine sand, light grey</i>	14 / 15	17 / 15	24 / 15	41 / 30	41	SPT-61 : (61.00-61.45) m
-59.700	-62.00			9 / 15	15 / 15	21 / 15	36 / 30	36	SPT-62 : (62.00-62.45) m
-60.700	-63.00			11 / 15	16 / 15	23 / 15	39 / 30	39	SPT-63 : (63.00-63.45) m
-61.700	-64.00			14 / 15	19 / 15	26 / 15	45 / 30	45	SPT-64 : (64.00-64.45) m
-62.700	-65.00			16 / 15	20 / 15	27 / 15	47 / 30	47	SPT-65 : (65.00-65.45) m
-63.700	-66.00			15 / 15	19 / 15	25 / 15	44 / 30	44	SPT-66 : (66.00-66.45) m
-64.700	-67.00			18 / 15	21 / 15	27 / 15	48 / 30	48	SPT-67 : (67.00-67.45) m
-65.700	-68.00			17 / 15	24 / 15	28 / 15	52 / 30	52	SPT-68 : (68.00-68.45) m
-66.700	-69.00			16 / 15	23 / 15	25 / 15	48 / 30	48	SPT-69 : (69.00-69.45) m
-67.700	-70.00			15 / 15	22 / 15	27 / 15	49 / 30	49	SPT-70 : (70.00-70.45) m

 UDS Sample	 SPT Test	 Clay	 Shell fragment/Organic matter.
 DS Sample		 Silt	 Sand

Required Modifications due to Common Use of the Facilities and Equipment of Sea Com (GMDSS) Project and VTS Project

Table A: Selincing

Facilities/Equipment	Current Plan by Sea Com Project	Requirements by VTS Project	Requirements for Common Use	Required Modifications due to Common Use	Remarks
Tower Height	AGL (m)	85m	85m	Tower height to be modified from 50m to 85m AGL (+ 35m)	VTS Project requirements.
	MSL (m)	87m	87m		
Antenna Installation Height	Direction	to Dumai RX	to Dumai RX	Number of antenna to increase from 2 to 4 units (+ 2 units, design loads will increase)	Two (2) units of parabola antenna to be borne by VTS Project are needed for radio communication link between Selincing and Sepahat.
	AGL (m)	49.0m, 44.0m	57m, 47m		
Communication Circuit and Devices	MSL (m)	59m, 49m	59m, 49m	Not Required	Additional 1 set of communication device is needed for the communication link between Selincing and Sepahat. (Born by VTS Project)
	Circuit	AIS by LAN, Voice & SV/Cont Signals of VHF System by E1 (LAN + E1x1)	Specifications of Sea Com Project are applicable for VTS Project		
Air Conditioner	Multiplex Eq.	1 Set	1 Set	Not Required	
	Router	1 Unit	MUX Unit		
Other Devices	1 Unit (Installed by DGST)	1 Unit	1 Unit	Not Required	As necessary for each project.
	3 Units of VHF Transceiver				
	SHF Radio (1+1)				
Electrical Devices	AIS Base Station (Dual-Transponder)			To be modified accordingly.	Load consumption is estimated based on the assumption that the same building will be used for both projects.
	Lighting and socket outlet etc.	Lighting and socket outlet etc.	Lighting and socket outlet etc.		
	Equipment (kW)	1.1	2.0		
Load Consumption	Building (kW)	1.0	1.0	1.8 kW increase	
	Total Load (kW)	2.1	3.0		
Engine Generator	Single Phase 220V, 5kVA	2 Units	Single Phase 220V, 5kVA	To be modified to 7.5 kVA	
	Battery	UPS	UPS		
Buildings	Generator/Equipment Build. (10.0m x 8.0m provided by DGST)	Generator/Equipment Build. (11.0m x 5.0m: tentative)	Generator/Equipment Build. (10.0m x 8.0m)	Not Required	The planned area by Sea Com Project is 30m x 20m while the area secured for the Project is 20m x 15m.
	Fuel Tank	1,800 liters	1,800 litre		

Sea Com Project : Marine Telecommunication System Development (MTSD) Project (Phase IV)
 VTS Project : The Project for Enhancement of Vessel Traffic System in Malacca and Singapore Straits in Indonesia
 AGL : Above Ground Level
 MSL : Mean Sea Level

Required Modifications due to Common Use of the Facilities and Equipment of Sea Com (GMDSS) Project and VTS Project

Table B: Dumai

Facilities/Equipment	Current Plan by Sea Com Project	Requirements by VTS Project	Requirements for Common Use	Required Modifications due to Common Use	Remarks
Tower Height	AGL (m)	50m	50m	50m	VTS Project Requirements
	MSL (m)	54m	54m	54m	
Antenna Installation Height	Direction	to Selincing	to Selincing	to Selincing	Two (2) units of parabola antenna to be borne by the VTS Project are needed for radio communication link between Dumai and Tg. Saïr.
	AGL (m)	49.5m, 44.5m	50m, 40m	50m, 40m	
Communication Circuit and Devices	MSL (m)	53.5m, 48.5m	54m, 44m	54m, 44m	Additional 1 set of communication device is needed for the communication link between Dumai and Tg. Saïr. (Born by VTS Project)
	Circuit	AIS by LAN, Voice & SV/Cont Signals of VHF System by E1 (LAN + E1x1)	LAN	Specifications of Sea Com Project are applicable for VTS Project	
Air Conditioner	Multiplex Eq.	1 Set	1 Set	1 Set	Not Required
	Router	1 Unit	1 Unit	1 Unit	
Other Devices		Existing (by DGST)	5 Units Installed in the VTS Sub-Center Build.		Not Required
		GMDSS Devices installed in the existing building	VTS System Installed in the VTS Sub-Center Building		
Electrical Devices		Lighting and socket outlet etc.	Lighting and Socket (except existing buildings)		Not Required
	Equipment (kW)	5.8	16.0		
	Building (kW)	14.9	24.0		
Load Consumption	Total Load (kW)	20.7	40.0		Not Required
		Replacement of Existing E/G	3 Phase 4W 380/220V 45KVA 1 Unit		
Engine Generator		Utilize the existing building	Construction of VTS Sub-Center Building and Generator Building		Not Required
	Buildings		2,000 liters		
Fuel Tank		Existing tank is not available (by DGST)			Not Required

Sea Com Project : Marine Telecommunication System Development (MTSD) Project (Phase IV)
VTS Project : The Project for Enhancement of Vessel Traffic System in Malacca and Singapore Straits in Indonesia
AGL : Above Ground Level
MSL : Mean Sea Level

資料 6-3 マラッカ海峡側における VTS 局についての提言

(1) 基本設計時の考え方

実施機関側は当初、「シ」海峡側 3 箇所、「マ」海峡側 2 箇所にレーダーを設置して、「マ・シ」海峡全域を監視するシステムを構築したいとの意向をもっており、これが本案件の要請時における実施機関側の基本的な考え方であった。

基本設計においては、「本プロジェクトで導入される VTS により、TSS を横断航行する小型船を監視し、「マ・シ」海峡の船舶航行安全を向上させる。」とする実施機関側の意向を反映させ、監視対象船舶を 100GT の小型船舶としたことから、対象船舶に対する監視可能海域はセンサー局から 15NM の範囲として設定されている。また、「イ」国側から要請された 5 箇所の各サイトについて、監視対象船舶の航行実態、航行監視の必要性から見たサイトの重要度、自然条件、インフラ施設の整備状況、土地所有権、多重伝送によるデータ通信確保の確実性などを総合的に勘案し、サイトの優先度が検討されている。「マ」海峡側との比較においては、「シ」海峡側の優先度は総じて高く、要請されたサイトにタコン・クチールを加えた 4 箇所に VTS センサー局を設置し、「シ」海峡のほぼ全域を連続して監視できるようなシステムとして計画されている。

一方、「マ」海峡側の 2 つのサイトのうち、タンジュン・メダンは、①「マ」海峡側の最狭部に位置すること、②TSS 東航及び西航航路内に浅瀬が点在し、東航する深喫水船や VLCC のために、タンジュン・メダン沖合約 3 海里に深喫水航路が設定されていることから、より優先度が高いとされているが、タンジュン・パリットについては、①TSS がセンサー局から離れており、レーダーによる監視対象船舶の視認範囲外となること、②基本設計で実施した船舶の航行量実態調査の結果を踏まえても、ブンカリス島前面海域を航行する船舶が極端に少ないこと等の理由により、要請された 5 つのサイトの中で、最も優先度が低く、レーダー設置の必要性に対する説明がつかない状況にあった。

(2) 本プロジェクトにおける計画の現状

無償資金協力の場合、プロジェクトに必要な土地は、先方政府の責任により準備される必要があることから、本調査における「イ」国側による VTS センサー局のサイト選定の意思決定プロセスが、船舶の航行監視のために必要となるサイトであるかどうかと言う視点より、実施機関が所有する土地であるか否かと言う視点が優先されてしまい、VTS 局の候補地が必ずしも理想的な配置とならない傾向にあった。

タンジュン・パリット VTS センサー局へのレーダー設置の是非については、基本設計の後に実施された事業化調査において、上述した理由を踏まえて、レーダーでなく AIS のみの設置とすることが費用対効果の面からも望ましいことを、「イ」国側に改めて申し入れた

ところ、「イ」国側がこれを了承したことで決着した。

この結果、本無償資金協力により導入される VTS センサー局のレーダー及び AIS による監視可能海域は図資料 6-2-1 の通りとなっている。協力対象サイトの一つである、タンジュン・メダン VTS センサー局は、同局に設置するレーダー、AIS 及び、CCTV 等の機器類が、「イ」国領海に近接する TSS 深喫水航路を航行する大型船に対する安全対策を講じるために必須の装備となり得る。一方、タンジュン・パリット VTS センサー局に設置される AIS により、TSS 航行船舶の AIS 搭載船の情報を収集し、監視することが可能となる。

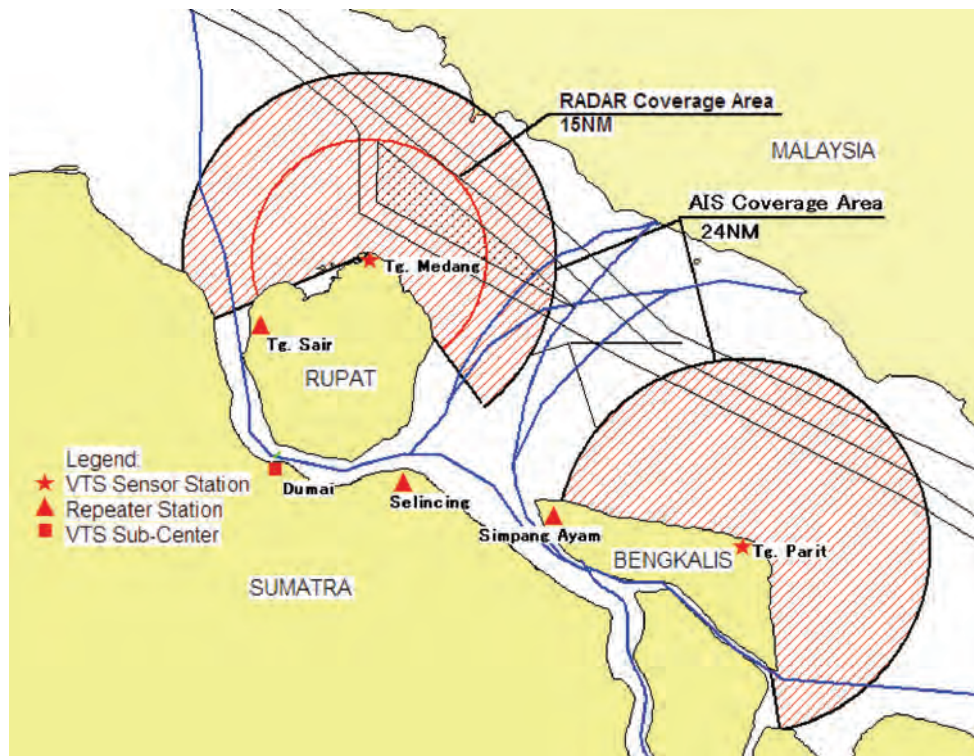


図 資料 6-2-1 VTS センサー局による監視可能海域

(3) 将来に向けた提言

タンジュン・メダンの監視対象海域近傍に位置するドマイ港は、「イ」国にとって重要な資源の輸出港であるばかりでなく、小型の旅客船の往来も多いことから、将来的に、例えばドマイ、シリンチン等に VTS センサー局 (AIS システム、VHF 無線通信システム、CCTV カメラシステム及びレーダーシステム) を導入することにより、①TSS 航行船舶とドマイ入出港船舶との行き会い調整、②沿岸を航行する小型 (旅客) 船への航行支援などが可能となる。このことから、ドマイ港入出港船の安全対策を軸とする同港前面海域及び、その周辺海域における船舶の航行監視・支援システムを導入することは有意義であると考えられる。こ

の視点より、シリンチン及びシンパン・アヤム近傍に VTS センサー局を設置した場合のレーダー及び AIS による監視可能範囲を示すと図 4-1-2 の通りとなり、上記の目的を達成することが可能となると共に、タンジュン・メダンからタンジュン・パリットに沿った沿岸域を包括した監視が可能となる。ただし、同図からも明らかな通り、TSS を航行する船舶をレーダーで監視するためには、洋上への VTS センサー局の設置が必要となる。

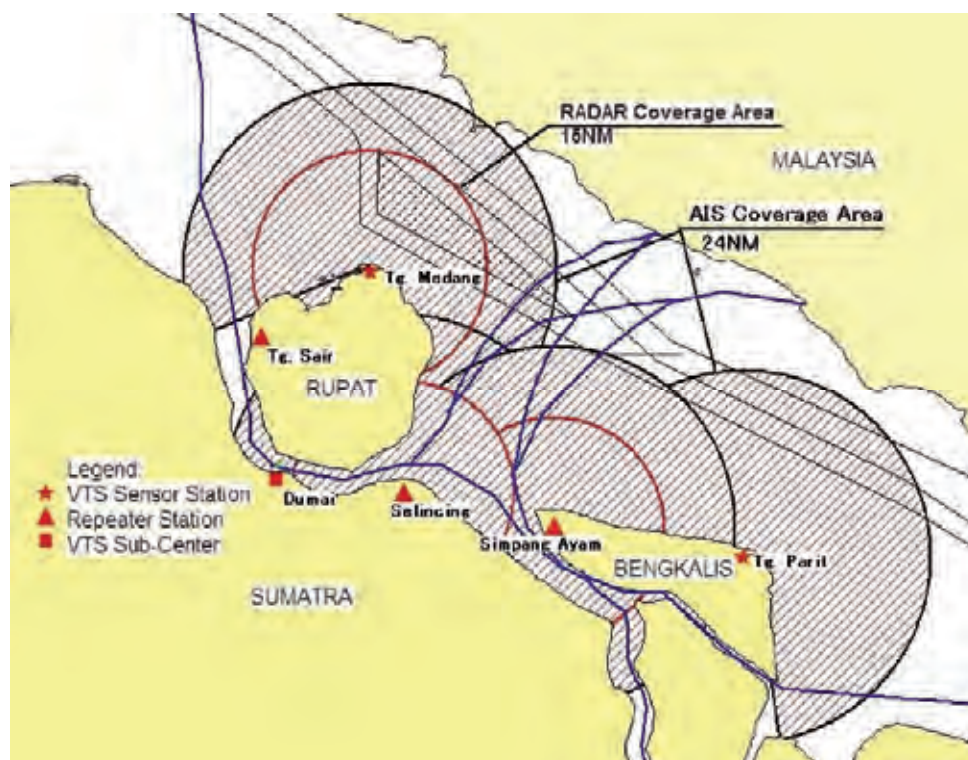


図 資料 6-2-2 VTS センサー局の追加により可能となる監視海域

新たな VTS の設置に際しては、今回実施したのと同様もしくはそれ以上の調査が必要となるが、上記の視点に鑑み、本無償資金協力で供与された VTS システムをベースに、「イ」国側の自助努力により、将来的に VTS 網がさらに発展されることが期待される。

独立行政法人国際協力機構

インドネシア国

マラッカ海峡及びシンガポール海峡船舶航行安全システム
向上計画

ソフトコンポーネント計画書

2009年4月21日

株式会社 オリエンタルコンサルタンツ

財団法人 日本航路標識協会

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I. ソフトコンポーネントを計画する背景

本無償資金協力で、インドネシア国（以下、「イ国」という）に整備される Vessel Traffic Service（以下、「VTS」という）は、マラッカ・シンガポール海峡（以下、「マ・シ海峡」という）を航行する船舶の動静を把握して、航行船舶の安全を図るためのシステムであり、シンガポール海峡側には、バツ・アンパールVTSセンター局とヒュー・クチール、タコン・クチール、バツ・アンパール、タンジュン・ブラキットの4箇所それぞれに設置されるセンサー局とで構成されるシステムが、また、マラッカ海峡側にはタンジュン・メダン及びタンジュン・パリットをセンサー局とし、これを監視するためのVTSサブセンター局（ドマイに整備）とで構成されるシステムが整備されることになっている。

これらシステムの全体構成は、以下の図Iのとおりである。

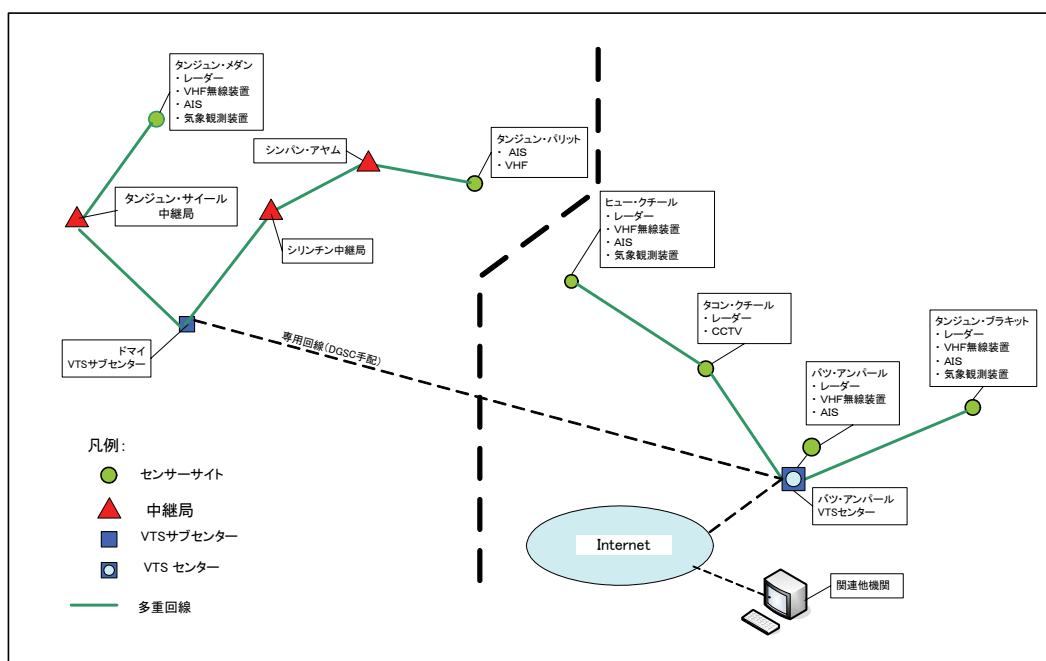


図 I : マ・シ海峡 VTS 全体構成図

マ・シ海峡を通過する船舶のみならず船舶の運航には、国際的な性格があり、VTS運用に携わる運用要員は、国際的に共通な方法による船舶へのアプローチと国際的に同意されている専門的なVTS運用基準に対する理解が必要である。

VTSが国際ルールに基づいて適切かつ確実に運用され、VTSの本来の目的である航行船舶の安全確保と運航能率の向上に寄与するためには、VTS要員が、船舶の運航に係る国際性を理解するとともに、VTS運用に係る専門的な知識と技術を有して

いることが必要不可欠である。

しかしながら、V T S施設は、イ国では初めての施設であり、その運用に携わった経験が皆無であることから、V T Sに関連するこのような専門知識、技術のレベルは総じて低く、V T Sの運用開始にあたっては、V T S要員に対する知識、技術レベル向上のための支援が望まれている。また、イ国におけるV T Sを持続的かつ円滑に運用するためには、先方政府の自助努力を促しイ国側の研修指導者を育成するとともに、その指導者による要員の研修が有効な手段の一つであると思料される。V T Sの継続的な運用を可能とする環境醸成、技術伝承の体制確立の礎を築いていく技術支援が必要であると考えられる。よって、ソフトコンポーネントを実施することが必要と判断される。

II. ソフトコンポーネントの目標

本無償資金協力は、複数年度に亘り、実施され、機材が段階的に導入されることから、本ソフトコンポーネントは、第一段階としてV T Sの基本理解及び運用に係る基礎を座学で実施する研修と第二段階としてバツ・アンパールV T Sセンターに機材が整備された後、導入された機材を活用した運用研修の二段階の研修として計画した。

本ソフトコンポーネントの実施に当たっては、プロジェクトの円滑な立ち上げ支援としてのV T S業務に係る研修に鑑みて、その達成目標を次のように設定する。

目標：

1. オペレータの基本的操作能力の向上

V T Sの基本事項・運用方法の理解、各機器の機能の活用方法・機器操作慣熟訓練の実施について研修を実施することとするが、期待される成果として少なくともV T Sを常時活用でき、運用方法（航法指導）の違いによって航行船舶にどのような影響を与えるか、その結果を予測できる業務実施が可能となるレベルを達成することを目標とする。

なお、I A L A（国際航路標識協会）勧告、I A L A V-103/1では、V T S研修に関し、その習熟度に応じてレベル1からレベル5までの5段階の達成目標（研修科目は共通）が定められている。レベル1とは、研修生が、「定例的な業務実施が可能で、事実と原則を理解し、データが暗示する将来の顛末を推測できる、また、正当な方法と手順によりV T Sの運用ができる」レベルであり、プロジェクトの円滑な立ち上げ支援としてのV T S業務に係る研修として、同勧告で規定するレベル1を目標として、緊急に必要な項目を優先させた研修を計画する。

なお、同勧告が定める研修科目及びそれらの達成レベル（レベル1～5）の概要を別表第4（（I A L A勧告、I A L A V-103/1（V T S基本研修））に示す。

2. 適正かつ持続的運用に向けたイ国側研修指導者の能力向上

VTS の機能維持を図り、持続的な適正運用を図るためには、センター要員が運用の要領、手順、また、加えて施設機器の点検保守方法等に精通し、センターの共通認識として、これらを業務の中で確実に実施していく必要がある。このためには、その指針となる要領、マニュアル等が必要であり、研修の過程で運用に必要不可欠な運用要領、保守点検マニュアル、緊急事態対応要領等のガイドライン的文書の策定に協力していく。

また、これら一連の訓練を通じて、イ国側指導者を育成し自助努力及び自立発展に向けた取組みへのトリガーとする。

なお、イ国における VTS の運用を、より着実かつ効果的なものとするためには、運用維持管理等においてオペレータの技能向上、運用指導者レベル向上のソフト面での引き続きの支援が望ましく、中期的な我が国の技術協力支援が継続されることが強く望まれる。

3. 研修に使用した教材のイ国側要員養成プログラムへの汎用化

研修における訓練プログラム及び使用した教材を、イ国海運総局が行う要員の養成プログラムに転用できる内容とし、イ国として実施する研修を汎用的なものにすることが重要である。

Ⅲ. ソフトコンポーネントの成果

本ソフトコンポーネント実施により、完了時に次の成果が期待できる。

1. 上位目標

マ・シ海峡における船舶交通の安全性が向上し、船舶の能率的な運航に寄与する。

2. 期待される成果

(1) VTS 運用要員に V T S の基本、また、船舶運航の方式、ルール、VTS に係る各種関係法令、国際的基準及び運用手順が理解され、適正運用化に向けたイメージが構築される。

(2) VTS の構成・各機器の機能及び運用に係る基本的事項が理解され、V T S 運用が開始される。V T S 要員は、下記への課題対応が可能となる。

1) マ・シ海峡のイ国沿岸域を航行する船舶の動静監視（レーダーによる動静監視、A I S 搭載船の情報モニター）ができる。

2) レーダー、AIS等から収集した船舶情報、気象情報等を理解し、これら
を関係機関から収集した安全情報（航路標識の異常、海難事故発生の実態・
航行制限の区域設定等の情報）とともに適切、タイムリーに船舶提供するこ
とができる。

3) 動静監視等で収集した船舶情報及びVTSセンターから発信した安全情報
等を保存、蓄積して、目的別に編集、分析することによって将来のVTS運
用の向上に活かすことができる。

(3) VTS 運用要員に点検・保守に係る点検・チェック項目、点検の方法が理解され、
実施のための要領、マニュアル作成のレジメ、指針の必要性が認識される。

(4) 本ソフトコンポーネントを通じてVTS 運用要員のイ国側指導者が育成される
礎が築かれる。

(5) VTS 運用要員指導用の研修プログラムが作成される。

IV. 成果達成度の確認方法

本ソフトコンポーネントの成果は、以下の方法により確認する。

1. 評価試験（第一段階研修終了時及び第二段階の実習研修終了時に実施する評価試
験）及びアンケートにより、システムに関する理解度、操作技術・慣熟度並びに運
用能力レベルを測る。
2. 研修の中で計画するテーマ・課題別研究、ケーススタディーなどの実践的な実習
を通じた事案、特異事例等への状況判断対応能力の確認
3. 運用マニュアル、保守・点検要領等の文書作成に着手される。

なお、上記1. の第一段階研修で実施する中間評価の結果は、次の実習研修プログ
ラムの中に反映させ、理解度・慣熟度が未達成の分野については、強化した研修を実
施する計画とする。

V. ソフトコンポーネントの活動（投入計画）

1. 活動の概要

本無償資金協力事業で整備の VTS は、航行船舶から航海・動静情報を収集する機器、収集データを監視装置に表示させる機器、レーダー映像及びAISのデータを保存しこれを再生する機器、船舶の通信を傍受し、交信する機器等多種多様の複雑な機器から構成されている。

VTS 要員の資格要員として、機器機能を理解し、操作に慣熟していること、国際的性格を有する船舶の運航形態、航行特性を理解していること、また、VTS 監視下に置く海域の地理的状況及び船舶交通のルールを把握していること、さらには船舶の航行形態に対応した瞬時の状況判断及び船舶への適切な情報提供等ハード及びソフトの両面に係る能力、技術力が求められている。

このため、IMO（国際海事機関）では、IMO 決議 A 857（20）で VTS の整備と運用に指針を与え、また、IALA では、VTS を運用する各国の経験と反省点等を集約して、この IMO 決議をより具体的した VTS 運用要員の研修のための模範コースを策定している。

本ソフトコンポーネントは、この IALA 勧告（IALA VTS 模範研修コースの基本研修（IALA V-103/1）（別表第4参照））に準拠した内容とし、イ国にとって初めての施設となる VTS の運用の立ち上げ技術支援として実施する。

2. 基本方針

本ソフトコンポーネントの実施に当たっては、以下の事項を基本方針とする。

(1) プレイング（祈り）時間を設ける等研修生がモチベーションと興味を持続させ、効果・効率的な研修が実施できる環境を醸成する。

(2) 研修員の理解度を助長する系統だったプログラムによる実施、判り易い教材の活用

VTS への基本理解を座学で実施して、それをベースとした実践的な運用実習を実施する。研修の実施に当たっては、研修員の理解を促進するためパワーポイントなどの視聴覚教材を有効的に活用するなど判り易い研修の実施に努める。

(3) 相手国の政府関係者、研修員と十分なコミュニケーションをとり、意思の疎通を図りながら、先方の希望、意向に沿った研修の実施に努める。

3. 活動の内容

(1) 研修場所及び時期（期間）

本ソフトコンポーネントの実施場所は、先方政府との協議を要するが、現時点では座学研修をジャカルタ（海運総局本局又はタンジュンピナン地方航路標識事務所を想定）で実施する。第二段階の運用実習は、バツ・アンパールVTSセンターに機材が整備された後、同センターの機材を活用した計画とする。

実施時期及び期間は次のとおり。

1) 第一段階の座学研修

2010年7月19日より8月18日（31日間）

2) 第二段階の実習研修

2011年3月5日より3月15日（11日間）

(2) 研修の内容

I A L A V-103/1のレベル1（別表第4参照）で設定する内容を基本として、運用立ち上げ技術支援として緊急に必要と思料される以下の分野をカバーする。達成目標は、研修員がVTSオペレータとして、VTSを常時活用でき、運用方法の違いによって航行船舶にどのような影響を与えるかを予測できる業務実施が可能で、事実と原則を理解し、データーが暗示する将来の顛末を推測しながら、正当な方法と手順によりVTSの運用が出来るレベルを目標とする。

○研修科目

1) VTS 概論

2) VTS の動向

3) VTS 装置・機器

- レーダー
 - ・ 概論
 - ・ 探知に影響を及ぼす要因
 - ・ 解釈に影響を及ぼす要因
- 追尾システム
 - ・ 概論と操作
 - ・ 自動追尾システム概要
 - ・ プロットィング（MFC）及び情報管理
- 音声、映像及びその他センサー
 - ・ 音声、映像装置
 - ・ 記録/再生装置
 - ・ 気象センサー

4) 船舶運航管理

- VTS 関連法規
- VTS の役割と責任
- VTS 環境
 - ・ 管轄区域の限界、境界、分離通航海域通航レー

ン、水路

・禁止又は危険水域、安全水域、錨泊・制限区域

- 水路及び通航管理の原則

- 船舶運航

- 通航の監視及び編成

・通航パターン

・安全通行パラメーター

5) 海事知識

- 海図

・海図の種類、情報及び用語

・海図への位置プロット

・通行の流れ

6) 通信

- VHF 通信

- 日誌及び記録の保持

7) 緊急事態

- 不測事態への対応と対策

- 状況への優先順位付与及び対応

- 緊急事態発生時における安全水路の確保

- 航行警報

8) 野外実習

- レーダーセンサーサイト実習

- 管轄区域内フィールド調査

(3) 従事者（実施リソース）

V T S 要員には、V T S の理解、運用・点検保守技術のみならず海図、航路標識などの海事知識さらには船舶の運航に関する原則、国際的ルールなどの幅広い知識、技術力が求められる。従って、研修指導員には、それぞれの分野に精通した技術者をあてる計画とする。

実施リソースとしては、イ国では V T S に係る専門的知識、技術力を有する人材の確保が困難であることから、本無償資金協力で V T S 機材 1（レーダー・管制卓）のコンサルタントを担当した（財）日本航路標識協会の直接支援として計画する。指導員には、システムの構成・機器機能に精通する者、V T S の運用に携わった経験を有し運用技術に精通する者、V T S 運用に必要な不可欠な海図及び航路標識などの海事分野に精通する者及び船舶の運航に従事した経験を有する者の中から人材を選定して、それぞれの専門分野からの効果・効率的研修の実施に努める。

指導員の担当分野は、次のとおり計画する。

VTS 要員教育訓練（施設機器指導）

VTS 要員教育訓練（VTS 運用指導）

VTS 要員教育訓練（海事知識指導）

VTS 要員教育訓練（船舶運航指導）

座学研修には、施設機器指導、VTS 運用指導及び船舶運航指導の3名の指導員を、また、運用実習研修には、施設機器指導、VTS 運用指導及び海事知識指導の3名の指導員を当てる計画とした。（別表第1の指導員別研修科目参照）

なお、補助的要員として、イ国側からカウンターパート（2名）の派遣を受けて、イ国研修指導員として育成するための技術支援を行っていく。

(4) 先方参加者

VTSは、瞬時の状況把握とそれに基づく適切な対応、行動を行う業務とも言える。このため、運用卓で実際の業務に従事するオペレータには、どのような状況下でも瞬時に事案に対応できる運用能力、技術力が必須の資格要件となっている。従って、本ソフトコンポーネントの実施にあたっては、VTS 運用に直接携わる予定の職員全員を対象として計画した。

また、研修参加人数については先方政府とも協議するが、現時点では、基本設計調査時において先方政府から提示された要員配置計画（I期、II期の対象局合わせて75名）の中から、直接VTS 運用に携わると思料される職員を25名と想定した計画とした。

第一段階として実施する座学研修では、課題・テーマ別研究、ケーススタディーを予定しており、小人数での実施が望ましいこと、また、第二段階の実習研修は、限られた機材を有効・効果的に活用する観点から、いずれの研修とも研修員を2グループ（1グループは13名程度で構成）に分けた計画とする。

なお、研修員の理解を助長するため、それぞれのグループに通訳を配置し英語からインドネシア語への逐次通訳を行う。

研修参加予定者内訳

- | | |
|--------------------------------------------------------------------------------------------|-----|
| 1) 本省航行援助局職員 | 2名 |
| 2) バツ・アンパール VTS センター局、ヒュー・クチール、
タコン・クチール、タンジュン・ブラキット各センサー
局及びドマイ VTS サブセンター局へ配属予定の職員 | 23名 |

(5) 実施期間（時期及び M/M）

2010年7月中旬～8月中旬（座学）、2011年3月初旬から3月中旬（実習）、
合計7.44 M/M（指導員4人）

内訳

国内準備作業（資料収集、研修教材、教科書等作成）

4. 10M/M

現地研修

3. 34M/M

なお、別表第3に本ソフトコンポーネントの実施工程を示す。

(6) 実施方法

本ソフトコンポーネントで実施する研修の一連の流れを準備段階から、研修完了報告書提出までをステップ別に整理すると次のとおりである。

ステップ1：国内事前準備作業

研修教材、教科書の作成、海運総局との事前協議・調整、教科書の印刷、製本作業

なお、研修用として準備、作成する資料、教科書等は、次のものを想定する。

- 1) 我が国及び世界のVTSの現状、IALA等国際機関におけるVTSの動向及び環境
- 2) VTSの役割、運用、責務
- 3) 海事知識
- 4) 船舶運航
- 5) VTS施設・機器、運用

なお、不測事態への対応、緊急事態対応等のケーススタディー用教材については、我が国海上保安庁が運用するVTSセンターでの特異事例、衝突、乗り上げ回避事例などの情報を収集して、これをイ国VTSに応用できる形での教材として取りまとめる。

ステップ2：海運総局との事前協議（現地）

海運総局関係者との事前協議

- 1) 研修実施に係る詳細事項の再確認、円滑かつ効果的な実施への協力再依頼
- 2) カウンターパート派遣の再確認、

ステップ3：第一段階（座学）の研修会場設営、準備及び研修の実施

- 1) 会場準備、設営作業、研修資機材準備
- 2) 研修の実施

- 期間： 2010年7月19日から8月18日

- 場所：海運総局本局会議室又はタンジュン・プリオク地方航路標識局（ジャカルタ）

- 3) 研修員：V T S 配属予定職員約 25 名
- 4) 指導員：施設・機器指導、V T S 運用指導及び船舶運航指導の 3 名による分担指導
- 5) 研修日程、研修内容、時間割り

別表第 2-1（研修日程）に示すとおり。

なお、研修は、月曜日から金曜日までとし、下記の時間割りで実施する。

月曜日～木曜日

0900～1200 研修

1200～1300 プレーイング、昼食

1300～1500 研修

1500～1520 休憩

1520～1700 研修

金曜日

0830～1130 研修

ステップ 4：海運総局への中間報告・協議

海運総局への中間実施状況の報告、協議

相手国政府へのプログレスレポートの提出

貴機構へのソフトコンポーネント実施状況報告書の提出

なお、上記報告書には、中間の進捗状況等次の事項を記載する。

- 1) 当初定めた目標
- 2) 当初定めた投入・活動の履行状況
- 3) 今の時点の成果
- 4) 成果発現の阻害要因の分析と対応
- 5) 今後の予定
- 6) プログレスレポートに対する施主側コメント

ステップ 5：第二段階（実習）の研修会場準備及び研修の実施

- 1) 海運総局との協議、会場準備作業

会場準備、設営、研修資器材準備

- 2) 研修の実施

－期間：2011年3月5日から3月15日の間

－場所：バツ・アンパールV T Sセンター局

- －研修員： V T S 配属（予定）職員約 2 5 名（研修員は第一段階（座学）の参加者と同じ職員を想定する）
- －指導員： 施設・機器指導、V T S 運用指導及び海事知識指導の 3 名による分担指導

3) 研修日程、研修内容、時間割り

別表第 2－1（研修日程）に示すとおり。研修は、導入機材を活用した実践的運用研修とし、併せてセンサーサイトの現場実習及び管轄区域内のフィールド調査を予定する。

なお、時間割りについては、第一段階（座学）と同じとする。サイト現場実習、フィールド調査の実施要領、時間割りは別途作成する。

ステップ 6：ソフトコンポーネントの成果品の作成、提出

相手国政府へ提出する Final Report 及び貴機構に提出するソフトコンポーネント完了報告書の作成、提出

なお、両報告書には、ソフトコンポーネントの実施により得られた成果とともに、今後における V T S の持続的運用に向けた課題、取組み方法及び課題解決のための方策について提言する。

VI. ソフトコンポーネントの実施リソースの調達方法

VTS 要員には、VTS 機器、運用方法、海図などの海事知識さらには船舶の運航及び国際的ルールなどに亘る幅広い知識、技術力が求められ、これら要員の研修にあたる研修指導員には、VTS 運用に係るそれぞれの分野に精通していることが求められている。しかしながら、VTS 運用の経験が皆無であるイ国では、このような専門技術を有した人材の確保は困難であることから、本無償資金でコンサルタントに従事した（財）日本航路標識協会の直接支援で実施する。

なお、海運総局職員から適当な人材の派遣を受けて、カウンターパートとして準備段階から終了までプログラムに参画させ共同作業を行うことによって意識、認識の共有を図りながら、より効果的な技術移転を図る計画とした。

VII. ソフトコンポーネントの実施工程

前項に示した実施方法に基づいて、実施工程を別表第 3 に示す計画で設定した。

実施工程に示すとおり、本ソフトコンポーネントは、座学研修及び本無償資金協力でバツ・アンパール V T S センターに機器が設置された後に同センターの機材を活用

した運用実習の２段階の研修計画とした。

座学研修及び運用実習それぞれで実施する指導項目は、次の分野とする。

１．座学研修

- (１) VTS 概論
- (２) VTS の動向
- (３) VTS 装置・機器（レーダー）
- (４) VTS 装置・機器（音声・映像、センサー）
- (５) VTS 装置・機器（追尾システム）
- (６) VTS 装置・機器（VHF,AIS）
- (７) 通信
- (８) 船舶通航管理（VTS 環境、水路及び通航管理の原則）
- (９) 緊急事態（事案の概要、不測事態対策への対応、優先順位の付加、水路の確保、航行警報）
- (10) 海図知識（海図、衝突関係等規則）

２．運用実習

- (１) VTS 機器の運用実習（レーダー、追尾システム、音声・映像、センサー、電源システム）
- (２) 船舶通航管理実習（船舶通航、諸規則、航路標識）
- (３) センサーサイト現場実習
- (４) VTS 管轄区域のフィールド調査

VIII. ソフトコンポーネントの成果品

ソフトコンポーネントの活動結果をとりまとめて、**Final Report** として先方政府へ提出するとともに、ソフトコンポーネント完了報告書として貴機構に提出する。完了報告には、下記の内容を記載する。

- １．活動計画と活動実績
- ２．計画した成果と成果の達成度
- ３．成果の達成度に影響を与えた要因
- ４．効果を維持・発展させるための今後の課題・提言等

また、同報告書には、当該ソフトコンポーネントの活動から得られた下記の成果を含むものとする。

- １．中間及び研修終了後のテスト、アンケート結果
- ２．研修を通じてイメージされた VTS 運用、点検・保守要領等の概要
- ３．VTS 要員育成プログラム一覧

IX. ソフトコンポーネントの概算事業費

概算事業費: 18,216,552円

内訳

直接経費 5,926,440円

直接人件費 6,126,614円

間接費 6,163,498円

X. 相手国実施機関の責務

以下の事項に係る経費の負担が挙げられる。

1. 研修会場、研修用機材の提供（座学及び実習の両研修の実施場所、施設・機材の提供）
2. カウンターパート2名の派遣（研修地までの派遣、滞在に要する費用）
3. 研修受講者の派遣、滞在に要する費用

表1 指導員別研修科目

番号	研修科目、目的、範囲	研修の内容	施設機器 指導員	VTS運用 指導員	海事知識 指導員	船舶運航 指導員	研修日数(I段階 /II段階)
1	● VTS概論		○				2/0
2	● VTSの動向			○			2/0
3	● VTS装置、機器 目的：VTS機器の基本的な動作原理、探知能力の限界、 収集データの理解と解釈、データの活用方法を理 解し、船舶動静監視などを行うことができる。 範囲：データ収集のための機器の理解及び収集データ の種類、解釈、記録、活用方法等	○レーダー -概論 -探知に影響を及ぼす要因 -解釈に影響を及ぼす要因 ○追尾システム -概論と操作 -自動追尾システム概要 -プロットイング(MFC)及び情報管理 ○音声、映像及びその他のセンサー -音声、映像装置 -記録再生装置 -気象センサー ○VHF及びAIS概論	○				5/実習
4	● 船舶通航管理 目的：船舶運行に関する知識と、現状況を分析し船 舶運行知識に基づく基本的技術を身につける。 範囲：管轄区域の限界、通航レーン、安全海域、通 航分離方式、地理上の制約など管轄区域 内における通航管理の概要	○VTS関連法理 ○VTSの役割と責任 ○VTS環境 -管轄区域の限界、境界、分離通 航海域通航レーン、水路 -禁止又は危険水域、安全海域、 錨泊・制限区域 ○水路及び通航管理の原則 ○船舶運行			○ ○		6/実習

番号	研修科目、目的、範囲	研修の内容	施設機器 指導員	VTS運用 指導員	海事知識 指導員	船舶運航 指導員	研修日数(Ⅰ段階 /Ⅱ段階)
5	<p>● 海事知識</p> <p>目的：VTS運用に必要な海事知識を身につける。</p> <p>範囲：海図関連、衝突予防関連運規則類、浮標と電波標識との航路標識、船舶搭載航法装置</p>	<p>○通航の監視及び編成</p> <p>-通航パターン</p> <p>-安全運行パラメーター</p> <p>○海図</p> <p>-海図の種類、情報及び用語</p> <p>-海図への位置プロット</p> <p>-通航の流れ</p> <p>○衝突関連運規則類</p> <p>○航路標識</p> <p>-国際海上浮標識</p> <p>-衛星測位</p>			○	○	2/0
6	<p>● 通信</p> <p>目的：国際的なルールに従って船舶との通信ができる。</p> <p>範囲：情報提供業務、航行援助業務、通航管理業務を支援するための通信の理論と実際</p>	<p>○VHF通信</p> <p>○日誌及び記録の維持</p>		○			1/実習
7	<p>● 緊急事態</p> <p>目的：VTS管轄区域内で発生する可能性がある緊急事態への対応ができる。</p> <p>範囲：遭難、汚染防止等の緊急事態の種類と規模を判断し、適切な対応ができる。</p>	<p>○不測事態対策への対応</p> <p>○状況への優先順位付与及び対応</p> <p>○緊急事態中における安全水路</p> <p>○航行警報</p>		○			2/実習
8	<p>● 野外実習</p> <p>レーダーセンサーサイト実習</p> <p>管轄区域内フィールド調査・通信実習</p>		○	○			0/実習

表2-(1) 研修日程(第一段階(VTSの基本理解(座学及びケーススタディ))

日数	月日	曜日	施設・機器指導員	VTS運用指導員	船舶運航指導員
1	2010/7/19	月	移動(東京→ジャカルタ)		
2	7/20	火	JICA事務所報告、海運総局との協議		
3	7/21	水	研修会場設置、準備、ブリーフィング		
4	7/22	木	● VTS概論 I (GpA)	● VTSの動向 I (GpB)	
5	7/23	金	● " II (GpA)	● " II (GpB)	
6	7/24	土			
7	7/25	日			
8	7/26	月	● VTS概論 I (GpB)	● VTSの動向 I (GpA)	
9	7/27	火	● " II (GpB)	● " II (GpA)	
10	7/28	水	● VTS装置・機器 (レーダー) (GpA)	● VTS装置・機器 (音声・映像、センサー) (GpB)	
11	7/29	木	● " (レーダー) (GpB)	● " (音声・映像、センサー) (GpA)	
12	7/30	金	● VTS装置・機器 (追尾システム I) (GpA)	● VTS装置・機器 (VHF及びAIS) (GpB)	
13	7/31	土			
14	8/1	日			
15	8/2	月	● VTS装置・機器 (追尾システム I) (GpB)	● VTS装置・機器 (VHF及びAIS) (GpA)	
16	8/3	火	● VTS装置・機器 (追尾システム II) (GpA)	● 通信 (GpB)	
17	8/4	水	● VTS装置・機器 (追尾システム II) (GpB))	● 通信 (GpA)	
18	8/5	木	● 船舶通航管理 I (VYS環境)		
19	8/6	金	● 船舶通航管理 II (VTS環境)		
20	8/7	土			
21	8/8	日			移動(東京→ジャカルタ)
22	8/9	月	● 船舶通航管理 III (VTS環境)		● 船舶通航管理 I (水路及び通航管理の原則))
23	8/10	火	● 船舶通航管理 IV (VTS環境)		● " II
24	8/11	水	● 緊急事態 I (事案の概要、不測事態対策への対応、優先順位付与及び対応、航行水路、航行警報)		● 海事知識 I (海図、衝突関連規則)
25	8/12	木	● 緊急事態 II		● " II
26	8/13	金	中間評価試験		● 質疑応答
27	8/14	土			移動(ジャカルタ→東京)
28	8/15	日			東京着
29	8/16	月	JICA事務所報告、海運総局報告、プログレスレポート提出、		
30	8/17	火	移動(ジャカルタ→東京)		
31	8/18	水	東京着		

注1. カッコ内のGpA、GpBは、グループを示す。

表2-(2) 研修日程((第二段階(VTの実践的運用実習))

日数	月日	曜日	施設・機器指導員 & VTS運用指導員	海事知識指導員
1	3/5	土	移動(東京⇒バタム(シンガポール経由))	
2	3/6	日	会場設営、研修用資機材・資料準備	移動((東京⇒バタム(シンガポール経由))
3	3/7	月	● VTS装置・機器&運用実習 I (レーダー→追尾システム、音声・映像、センサー、電源システム)	● 船舶運航管理実習(船舶運航、諸規則、航路標識)
4	3/8	火	● "	● "
5	3/9	水	● "	● "
6	3/10	木	● センサーサイト現場実習、VTS管轄区域のフィールド調査	
7	3/11	金	● 質疑応答、評価試験	
8	3/12	土	移動(バタム⇒ジャカルタ)	移動((バタム⇒東京(シンガポール経由))
9	3/13	日	報告書作成	東京着
10	3/14	月	JICA報告、海運総局へ報告書の提出、移動(ジャカルタ⇒東京)	
11	3/15	火	東京着	

表4. IALA勧告 IALA V-103/1 (VTS基本研修) の概要

推奨される研修分野 (理論及び実習)

- | | |
|---------|---------------------------------------------------------------|
| 1. 言語 | 英語、通信用語等 |
| 2. 通航管理 | 役割と責任、水路及び通航管理の原則、通航の監視及び編成VTS環境等 |
| 3. 装置 | レーダー、音声、映像等のセンサー、情報管理システム追尾システム等 |
| 4. 海事知識 | 海図作業、衝突に関する規則、航路標識、船舶に関する知識等 |
| 5. 通信 | 無線装置の操作、VHF無線とそのVTSにおける使用、通信技術等 |
| 6. 緊急事態 | 内部/外部の緊急事態、不測事態への対応、状況についての優先順位付与及び対応、関係機関との調整、緊急事態中の安全水路の確保等 |

上記分野を共通として、各分野の理解度及び習熟度に応じて以下の研修レベルに分類されている。

◎レベル1 (ソフトコンポーネントが目標とするレベル)

指導目標：理解

学習成果：

事実と原則を理解する。データが暗示する将来の顛末を推測でき、正当な方法と手順によりVTSの定例的な運用ができる。

具体的な成果は、下記を目標とする。

- － マ・シ海峡のイ国沿岸域を航行する船舶の動静監視ができる。
- － レーダー、AISから収集した船舶情報、気象情報等の意味を理解し、船舶に対して必要とする安全情報を適切、タイムリーに提供することができる。
- － 収集データを目的別に解析して、将来のVTS運用に役立たせることができる。



◎レベル2

指導目標：適用

概念と原則とを新しい状況に適用できる。また、法律と理論を実際の状況に適用できる。

学習成果：

より重い個人の責任が含まれ、船舶から要求が強く行われる複雑で非定例的な業務の実施が可能となる。



◎レベル3

指導目標：複雑で公然とした事態に対応

学習成果：

広範囲に熟練した技法が要求される業務の実施ができる。複雑かつ非定例的な業務への対応ができる。



◎レベル4

指導目標：適合

通常の行動パターンを修正して、特別な要求に応える能力、または、問題のある状況に対応しての問題解決ができる。

学習成果：

複雑で技術的及び専門的な行動が求められる業務の実施が可能で個人の責任と自主性が求められる業務に対応できる。



◎レベル5

指導目標：独創

特定の状況または具体的な問題に適合する新しい実施方法、要領を作り出すことができる。高度に啓発された技能に基づく独創性を発揮する。

学習成果：

広範で予期できない複雑な業務に対応できる。専門的業務の実施、上級者の管理能力を備える。

収集資料リスト

調査名 インドネシア国 マラッカ海峡及びシンガポール海峡船舶航行安全システム向上計画事業化調査

番号	名 称	形態 図書・ビデオ 地図・写真集	オリジナル・コピー	発行機関	発行年
1	Daftar Suar Indonesia (Indonesian List of Lights)	図書	オリジナル	Directorate General of Sea Transportation, Ministry of Transportation	2007
2	JOURNAL (2008年版、インドネシア全地域の物価)	図書	オリジナル		2008