

**IMPLEMENTATION REVIEW STUDY REPORT  
ON  
THE PROJECT FOR ENHANCEMENT  
OF  
VESSEL TRAFFIC SYSTEM  
IN MALACCA AND SINGAPORE STRAITS  
IN  
INDONESIA  
  
STAGE-1**

February 2009

**JAPAN INTERNATIONAL COOPERATION AGENCY**

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**ORIENTAL CONSULTANTS CO., LTD.  
JAPAN AIDS TO NAVIGATION ASSOCIATION**

<b>EID</b>
<b>JR</b>
<b>09-043</b>

Directorate General of Sea Transportation (DGST)  
Ministry of Transportation  
The Republic of Indonesia

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## PREFACE

In response to a request from the Government of the Republic of Indonesia, the Government of Japan decided to conduct an implementation review study on the The Project for Enhancement of Vessel Traffic System in Malacca and Singapore Straits and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Indonesia a study team from October 9 to November 12, 2008 and November 30 to December 24, 2008.

The team held discussions with the officials concerned of the Government of Indonesia, and conducted a field study at the study area. After the team returned to Japan, further studies were made, and as this result, the present report was finalized.

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

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Indonesia for their close cooperation extended to the teams.

February, 2009

Eiji Hashimoto  
Vice-President  
Japan International Cooperation Agency

February, 2009

Letter of Transmittal

We are pleased to submit to you the implementation review study report on the Project for Enhancement of Vessel Traffic System in Malacca and Singapore Straits in the Republic of Indonesia.

This study was conducted by the Consortium of Oriental Consultants Company Limited and Japan Aids to Navigation Association, under a contract to JICA, during the period from October 2008 to February 2009. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Indonesia and formulated the most appropriate basic design for the project under Japan's Grant Aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

Masahiko Koshimizu  
Project Manager,  
Implementation Review Study Team  
on  
The Project for Enhancement of  
Vessel Traffic Sysytem in  
Malacca and Singapore Straits  
The Consortium of  
Oriental Consultants Co., Ltd. and,  
Japan Aids to Navigation Association

## **SUMMARY**

## SUMMARY

### **1 Background and Outline of Proposal for Official Grant Aid**

Malacca and Singapore Straits (hereafter called “the Straits”) are international shipping thoroughfares essential to world trade. More than 90,000 ships per annum pass through the Straits of which some 14,000 are Japanese cargo related vessels. The Straits however contain many obstructions including shoals, wreckage of ships and objects among others. As measure to enhance traffic safety, the Traffic Separation Scheme (TSS) was established by splitting inbound and outbound traffic and the Mandatory Ship Reporting System in the Straits (STRAITREP) was introduced in 1998. The STRAITREP calls for ships to report to the Vessel Traffic Service (VTS) Center upon entry to the operational area of responsibility of either Malaysia or Singapore.

The ships passing through the Straits are constantly subjected to high risks of accident because the Straits are narrow and shallow with presence of occasional sunken rocks and ships. Moreover, the high volume of marine traffic among the littoral states, including passenger ships, cargo vessels, fishing vessels and others crossing the TSS daily is posing high risk of disaster. In order to reduce the likelihood of possible accidents, “Precautionary Areas” was established so that large ships cruising the TSS will proceed with caution for crossing vessels.

With the foregoing situation in consideration, a Meeting on the Straits of Malacca and Singapore: Enhancing Safety, Security and Environmental Protections was organized by International Marine Organization (IMO) in co-operation with the three littoral states, namely Government of the Republic of Indonesia, the Government of Malaysia and the Government of the Republic of Singapore. The first meeting took place in Jakarta Indonesia in September, 2005 (the Jakarta Meeting). This was followed by a second meeting in September 2006 at Kuala Lumpur, Malaysia (the “Kuala Lumpur Meeting”). The final meeting was held on September 4 to 6, 2007 in Singapore. In that meeting, a resolution was adopted to enhance the safety and environmental protections of the Straits, that the work initiated by the TTEG on Safety of Navigation should continue to be supported and encouraged through Co-operative Mechanism, comprising: i) a Co-operation Forum, ii) a Project Co-ordination Committee and, iii) the Aids to Navigation Fund. The resolution should be supported and encouraged, by user States, shipping industry and other stakeholders and should endeavour to contribute, on a voluntary basis, to the work of the Co-operative Mechanism.

On the basis of the foregoing, the Indonesian Government requested for a Grant Aid Fund to the Japanese Government in March 2006 for the establishment of VTS System for equipment procurement and construction of VTS Center and related facilities to enhance traffic safety in the Indonesian side of the Straits. The request is summarized as follows:

Proposed Sites and Objectives:

[VTS Sensor (Radar) Station]: i) Tanjung Medang (Rupat Island), ii) Tanjung Parit (Bengkalis Island), iii) Jantan (Karimun Island) or Hiyu Kecil Island, iv) Batu Ampar (Batam Island), v) Tanjung Berakit (Bintan Island)

[Relay Stations]: Dangas (Batam Island)

[VTS Center]: Batu Ampar (Batam Island)

[VTS Sub-Center]: Dumai

Equipment

Radar system with GPS, radar tracking system, multi-function console, VHF radio communication system, transmission and communication links, AIS, CCTV camera system, VTS data system and web server, recording and playback unit, meteorological sensor, power generator, air conditioner.

In response to the request of the Indonesian Government, the Japanese Government deployed a JICA Study Team which conducted a basic design study from January 2007 to February 2008, and the basic design study was prepared and complied with the draft basic design report. The project was composed of two stages, and the Stage-1 Project was approved by the Cabinet on May 2008 and the Exchange of Notes were signed on November 2008.

To expedite execution of the project by ensuring the technical consistency from the basic design, the Consultants which shall be a Japanese national in accordance with E/N, is recommended to the Recipient for the Project. However, before starting implementation of the Project, it was required to re-select the Consultants.

After the re-selection of the Consultants, the Implementation Review Study Team was dispatched two times from October 9<sup>th</sup> to November 12<sup>th</sup> and November 30<sup>th</sup> to December 24<sup>th</sup>, 2008 respectively to Indonesia and a series of site inspections and discussions were made with the Directorate General of Sea Transportation (DGST) of the Ministry of Transportation, and other concerned agencies for the review of the basic design study, and verification and reconfirmation of the intent of the request of the Indonesian Government. After the team returned to Japan, the review of the basic design study was prepared and complied with the draft implementation review study report. On February 16, 2009, the results of the draft implementation review study and the contents of the Stage-1 Project were explained through TV conference connected JICA Jakarta and Tokyo offices.

## **2 Outline of the Study Results and Contents of the Project**

Followings are the components of the Stage-1 Project concluded in the implementation review study.

### (1) Project Sites

- Hiyu Kecil                      VTS Sensor Station
- Takong Kecil                  VTS Sensor Station
- Batu Ampar                    VTS Center and VTS Sensor Station
- Tanjung Berakit                VTS Sensor Station



(2) Outline of the Project Component

The table below shows the outline of the project component.

1) Main Equipment to be Procured

Equipment	Unit	Quantity	1	2	3	4
			Hiyu Kecil	Takong Kecil	Batu Ampar	Tanjung Berakit
Radar System	Unit	4	1	1	1	1
VHF Marine Radio System	Unit	3	1		1	1
AIS Base Station System	Unit	3	1		1	1
CCTV Camera System	Unit	1		1		
Meteorological Sensor Unit	Unit	2	1			1
Multi-function Console with VHF Radio Communication Unit	Unit	5			5	
Tracking System	Unit	1			1	
Data Base for Vessel Information	Unit	1			1	
AIS Server System (AIS System)	Unit	1			1	
CCTV Video Display Equipment (CCTV System)	Unit	1			1	
Meteorological Monitor Console	Unit	1			1	
Record and Playback System for Vessel Traffic	Unit	1			1	
Resource Management System	Unit	1			1	
Multiplex Radio Equipment (Data Communication System)	Unit	6	1	2	2	1

## 2) Scale of the Facilities

### a Buildings

Building	Structure Type	Function	Total Floor Area
VTS Center (Batu Ampar)	Reinforced Concrete, Four stories high	Operation room, Engineer room, UPS room, Staff room, meeting room, pump room, napping room, toilet etc.	414.00m <sup>2</sup>
Equipment Building (Hiyu Kecil, Takong Keil, Tanjung Berakit)	Reinforced concrete, one story	Machine room, UPS room	42.25m <sup>2</sup>
Generator House (Type A) (Hiyu Kecil, Takong Kecil, Tanjung Berakit)	Reinforced concrete, one story	Generator room	55.00m <sup>2</sup>

### b Steel Tower for the Radar and Communication Facilities

Steel towers will be erected for the radar scanners and parabola antennae needed for the multiplex communication links. The lists below show the required height of the steel tower for each site.

- Hiyu Kecili : 34.0m
- Takong Kecil : 45.5m
- Batu Ampar : 32.0m
- Tanjung Berakit : 66.0m

## 3 Implementation Schedule and Project Cost

The implementation schedule of the Project (Stage-1) is about 21 months for detailed designs, construction of building facilities and equipment procurement including manufacturing, transportation and installation. The cost of the Project provided to the Indonesian Government is roughly estimated at Rp. 225.3 million.

#### **4 Project Evaluation and Recommendations**

The Project will generate the following benefits:

(1) Direct Effect

- Indonesia will be having a VTS System of its own for the surveillance of marine traffic in the Straits for the enhancement of navigation safety.
  - The System will enable the surveillance of ship movements by radar and monitor console.
  - The System will enable the monitoring of vessel identity by AIS.
- The System will enable the dissemination of service information particularly on weather information through VHF and AIS for enhancement of traffic safety.
- It will be possible to provide of service information to related guard and rescue organizations for joint rescue cooperation in times of accidents.

(2) Indirect Effects

- The system will enhance navigation safety and will contribute to reduction of the risk of possible marine disasters in the Straits.
- The system will contribute to enhance rescue missions for saving lives and assets.
- The system will provide the needed deterrence against illegal acts in the Straits and will contribute enhancement law enforcement and communications among the littoral states against illegal ships and activities in the Straits.
- It will enhance the development of legal systems required for ship control within the territorial waters in Indonesia, coordination among three littoral states and international organizations and training of ship control operators.

### (3) Recommendations

The VTS System is envisioned to contribute to the safety of navigation in the Straits. To achieve the objective, the following is strongly recommended.

#### 1) Operation and Maintenance

- Enhancing the basic understanding of operators and administrators for the operation of the VTS System,
- Training of staffs for the efficient operation of the VTS System,
- Training of staffs for inspection, trouble shooting and maintenance of the VTS System,
- Establishment of operation and maintenance organization, preparation of operation and maintenance rules, manuals and, establishment of logistics system for fuel and consumer goods supply to each site for efficient VTS System operation,
- Preparation of training program for operators and supervisors for the operation of the VTS System,
- Establishment of pertinent laws for ship traffic in territorial waters of Indonesia,
- Coordination with other related organization in Indonesia including BAKORKAMLA.

#### 2) Cooperation and coordination with the littoral States and International Organizations

Malacca and Singapore Straits are international straits and any duly foreign registered vessel can pass through the Straits. Therefore, VTS operations for the Straits are necessary to be supported with appropriate agreement and collaboration among the littoral states and International Organizations including the IMO. Until such time that an agreement has been reached, operations of the VTS System shall be limited only for the monitoring of the Straits at the Indonesian Side.

The main purpose of the VTS System to be provided by this Project is for the surveillance of small vessels crossing the TSS which are posing hazard to safety of traffic particularly for very large vessels navigating along the TSS main routes. Under this concept, for the time being, the operations of the VTS System will be limited only for the monitoring of the Straits at the Indonesian Side. However, Indonesia may soon be jointing its colleagues (Malaysia and Singapore) which have already been operating their own VTS.

Considering the limited space in the Straits, the individual operation of VTS System will most likely create possible confusion in the surveillance of the Straits if joint operation is not pursued. The MEH project is also currently coordinating with littoral states and IMO in enhancing the safety navigations and environmental protections in the Straits.

Measures to enhance traffic safety, protection of marine environment in support to the search and rescue missions and oil pollution protection programs are topics of discussions in Tripartite Technical Experts Group (TTEG) meeting by the littoral states. Indonesian Government's initiative to promote effective VTS System operations through appropriate tripartite discussions, coordination and cooperation are highly desirable for concurrence by International Organizations.

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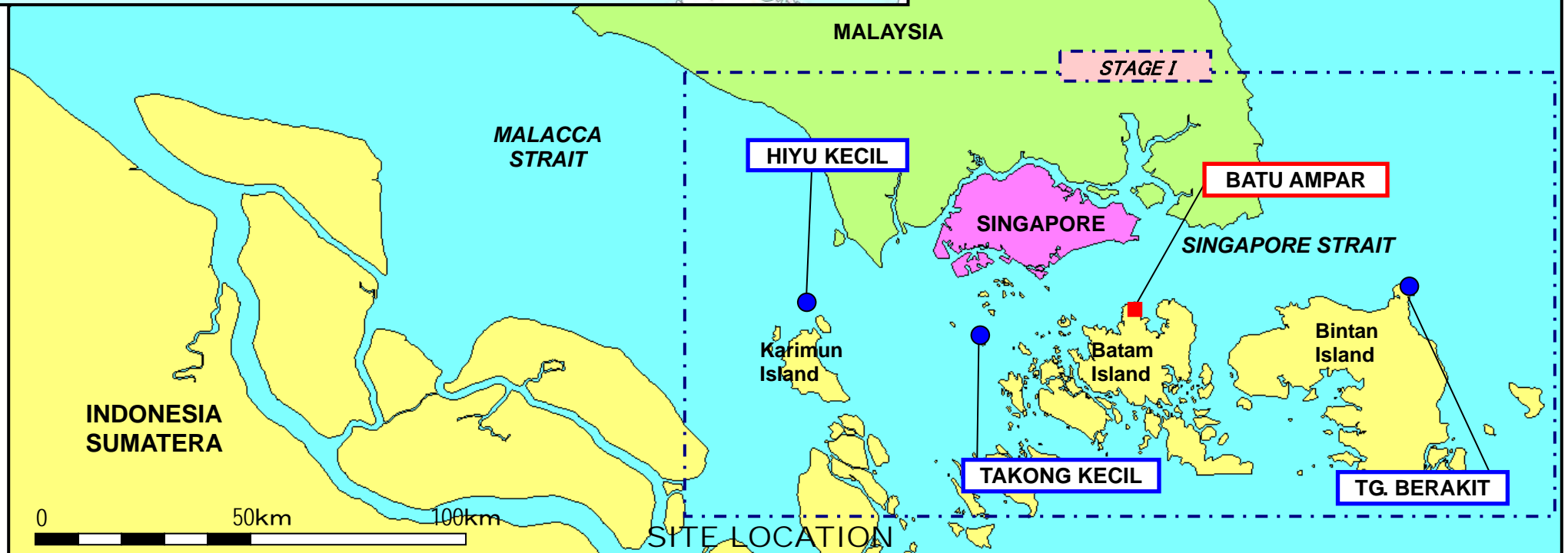


**LEGEND**

- : VTS CENTER
- : VTS SENSOR STATION
- : REPEATER STATION

**NOTE**

- VTS : Vessel Traffic Service
- Batu Ampar VTS center includes VTS sensor.







**Batu Ampar VTS Center**

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## ABBREVIATIONS

A	AIS	Automatic Identification System
B	BAKORKAMLA	Indonesian Maritime Security Coordinating Board (IMSCB) / Badan Koordinasi Keamanan Laut
	BAPPENAS	National Development Planning Agency / Badan Perencanaan Pembangunan Nasional /
	BIDA	Batam Industrial Development Authority
	CCTV	Closed-circuit Television
D	DGST	Directorate General of Sea Transportation
	DN	Directorate of Navigation
	DWT	Dead Weight Tonnage
G	GMDSS	Global Maritime Distress and Safety System
	GPS	Global Positioning System
	GT	Gross Tonnage
I	IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
	IMO	International Maritime Organization
	INDOSREP	Indonesia Ship Reporting System
M	MEH	Marine Electronic Highway
	MSC	Malacca Strait Council
P	PDAM	Perusahaan Daerah Air Minum
	PLN	PT. Perusahaan Listrik Negara
R	RPJM	Rencana Pembangunan Jangka Menengah Tahun/ Medium Term Development Strategy
S	SOLAS	International Convention for the Safety of Life at Sea
	SPT	Standard Penetration Test
	STRAITREP	Mandatory Ship Reporting System in the Straits of Malaccan and Singapore
T	TSS	Traffic Separation Scheme
	TTEG	Tripartite Technical Experts Group
V	VHF	Very High Frequency
	VLCC	Very Large Crude Oil Carrier
	VTIS	Vessel Traffic Information System
	VTS	Vessel Traffic Service

## **Chapter 1    Background of the Project**

## **Chapter 1 Background of the Project**

### **1-1 Present Conditions and Issues of the Sector**

#### **(1) Present Conditions of Sea Traffic of Malacca and Singapore Straits**

##### **1) Traffic Separation Scheme**

Malacca and Singapore Straits are International Shipping Thoroughfares and thereby allow the right of transit passage to any duly registered foreign vessel. Traffic safety and environmental protections in the Straits have always been a principal issue in Tripartite Technical Experts Group (TTEG) meetings among the three littoral states since 1977. The Traffic Separation Scheme (TSS) was established as a measure to enhance traffic safety by splitting inbound and outbound traffic. The system was implemented in 1977 through IMCO, NAV 20 and enforced in 1981. During the initial stages of enforcement, the TSS was established in two locations, i.e., the One Fathom Bank near the coast of Port Klang in the Malaysian side of the Strait and the other is in the Singapore Strait. The regulation which was amended in 1998 extended the range of the TSS from One Fathom Bank to Horsburgh Lighthouse in the off-shore of the eastern side of Singapore for an extent of about 263 miles or approx. 490 km which up to date is still operational.

##### **2) Mandatory Ship Reporting System**

The STRAITREP (Mandatory Ship Reporting System in the Straits of Malacca and Singapore) was introduced when the TSS regulation was amended in 1998. The STRAITREP calls for ships to report to the Vessel Traffic Information System (VTIS<sup>1</sup>) upon entry to the operational area of responsibility of either Malaysia or Singapore. The category of ships required to report are: i) 300 GT (Gross Tonnage) and above class, ii) vessels 50 meters or longer, iii) Tugs or pusher boats engaged in towing or pushing of 300GT vessel or more or with a combined length of 50 meter or more, iv) vessels of any tonnage but carrying hazardous cargo as defined in Paragraph 1.4 of resolution MSC. 43(64), v) all passenger vessels that are fitted with VHF, regardless of length or GT, and

---

<sup>1</sup> This report defined VTS based on Regulation 12, CHAPTER 12 of the International Convention of SOLAS. The System in Malaysia and Singapore however is termed as VTIS (Vessel Traffic Information System).

vi) any category of vessels less than 50 meters long or less than 300 GT but fitted with VHF which will use the TSS in the event of emergency to avoid risk of immediate danger.

### 3) Vessel Traffic

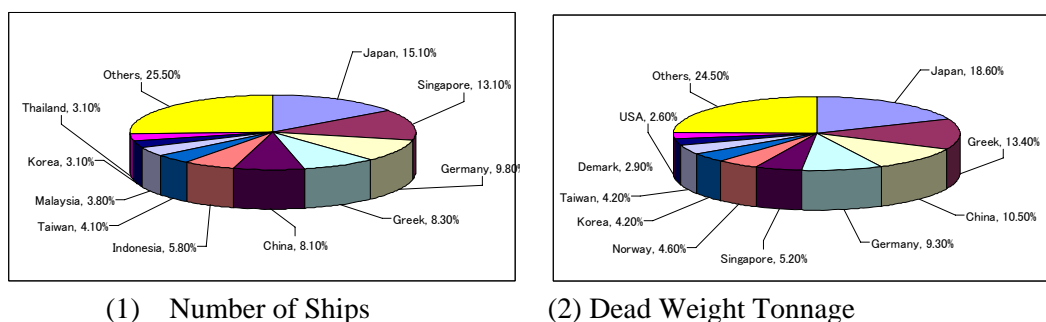
Table 1-1-1 shows the volume of traffic which passed through the TSS for the period covering 2001 to 2006. As can be seen, in 2006 more than 60,000 ships have passed through the TSS which is about 180 ships/day average. Tanker vessels and container ships occupied about 30 % respectively of the total traffic volume.

**Table 1-1-1 Record of Ships Passing the TSS in Malacca and Singapore Straits**

Type of Ships	2,001	2,002	2,003	2,004	2,005	2,006
VLCC	3,303	3,301	3,487	3,477	3,788	3,851
Other Tankers	14,276	14,591	15,667	16,403	14,759	14,784
LNG/LPG Tankers	3,086	3,141	3,277	3,343	3,099	3,297
Sub-total of Tankers	20,665	21,033	22,431	23,223	21,646	21,932
Container Ships	20,101	20,091	19,575	20,187	20,818	22,615
Others	18,548	18,910	20,328	20,226	20,157	21,102
Total Number of Ships (100%)	59,314	60,034	62,334	63,636	62,621	65,649
Average Ships per Day	163	164	171	174	172	180
Rate of Tanker	34.8%	35.0%	36.0%	36.5%	34.6%	33.4%
Rate of Container Ships	33.9%	33.5%	31.4%	31.7%	33.2%	34.4%

(Data Source: Web site Information of Marine Department Malaysia)

In 2006, the Ministry of Land, Infrastructure, Transport and Tourism jointly with Nippon Foundation conducted a Traffic Study for Malacca and Singapore Straits. Based on the study result, traffic volume rose from 75,061 in 1994 to 93,755 in 2004 or an increase of about 25%. Some 14,198 ships substantially owned by Japanese nationals accounted for the total traffic in 2004 or a total share of 15.1%. In terms of DWT (Dead Weight Tonnage), these ships at 18.6% occupied the largest share worldwide as shown in Fig. 1-1-1 below.



(Data Source: Web site of MLIT)

**Fig. 1-1-1 Traffic Volume Share in Malacca and Singapore Straits by Country**

(2) Present Conditions of Vessel Traffic Information System in Malacca and Singapore Straits

1) Malaysia and Singapore

Vessel traffic in the Straits is being monitored through VTIS by 19 radars of Singapore and Malaysia. Likewise, the STRAITREP is operated through VTIS providing the needed information to assist the cruising of vessels in the Straits to maintain and enhance traffic safety. The operational area of the STRAITREP covers the Straits of Malacca and Singapore between longitudes  $100^{\circ} 40' E$  and  $104^{\circ} 23' E$ . The area of operations is divided into nine segments with Malaysia responsible for 1 to 6 segments and Singapore for 7 to 9 segments. Upon entry to the operation area of responsibility, the ship is mandated to report in accordance with STRAITREP as sanctioned by the International Maritime Organization (IMO).

The VTIS Centers of Malaysia and Singapore calls for the mandatory reporting of vessels of their direction, speed and other navigational information upon entry to the operational area of responsibility of the STRAITREP. Information gathered by radar, AIS system and reported by ships are processed by computers and depicted on electronic screens for intensive monitoring/surveillance. Any risk of danger is relayed to the ships to avert/avoid the occurrence of possible accident. The VTIS also provides any service information based on the ships' request.

2) Status of VTS System in Indonesia

The similar system which are called VTIS have been established at five ports in Tg. Priok

(Jakarta), Tg. Perak (Surabaya), Belawan, Semarang, Makassar, Teluk Bayur and Balikpapan for monitoring the ships entering to and leaving from these ports, The system for monitoring of these ports information are established by connecting VSAT data transmission at 24<sup>th</sup> floor of the office building of the Ministry of Transport at Jakarta.. However, VTS System for monitoring ships passing through the Malacca and Singapore Straits are not established yet.

Under the Indonesia's Medium Term Development Strategy 2004 - 2009 (PRJM: Rencana Pembangunan Jangka Menengah Tahun 2004-2009), the Ministry of Transportation (MOT) draw up a "Strategic Development Plan 2005-2009" (Tentang Rencana Strategis Departemen Perhubungan Tahun 2005-2009) based on a Decree issued in 2005 by the Minister of Transportation (Keputusan Menteri Perhubungan, KM 41 Tahun 2005).

The Directorate of Navigation (DN) envisaged the introduction of VTS System for Sunda and Lombok Straits, Malacca and Singapore Straits, Pontianak, Toli-toli, Bitung, and Sorong recently. Among them, development of VTS System for Malacca and Singapore Straits are included in the "List of Project and Technical Assistance Proposals", commonly called "Blue Book", of the National Development Planning Agency (BAPPENAS) in 2005 together with Ship Reporting System. The establishment of VTS System for Malacca and Singapore Straits is therefore placed high priority project.

### (3) Present Conditions of Vessel Traffic Safety

The ships passing through the Straits of Malacca and Singapore are constantly subjected to high risks of accident due to the narrow navigational width and shallow depth coupled with occasional scattering of sunken rocks and ships. Moreover, many vessels from the adjoining states including passenger ships, cargo vessels, fishing vessels among others are crossing the TSS daily. For this reason, vessels traffic crossings as "Precautionary Areas" are provided with measures to avoid the risk of occurrence of possible accidents.

## **1-2 Background and Outline of Proposal for Official Grant Aid**

### (1) Background Information

Malacca and Singapore Straits are essential international shipping thoroughfares. Some 90,000 ships passed through the Straits per annum 14,000 of which are Japanese cargo related vessels.



However, shoals and shipwrecks coupled with the heavy traffic of tanker and container ships are threats facing the navigation of the Straits.

Under these circumstances, a Meeting on the Straits of Malacca and Singapore was organized by the IMO in co-operation with the three littoral states the objective of which is how to enhance safety, security and protection of the environment. The first meeting took place in Jakarta, Indonesia in September, 2005 (the “Jakarta Meeting”). The second meeting was held in September 2006 at Kuala Lumpur, Malaysia (the “Kuala Lumpur Meeting”). The three littoral states hosted the Kuala Lumpur Meeting, and twenty-eight countries including Japan participated. A resolution was arrived at to continue with the efforts to enhance safety of navigation and environmental protection and that the littoral States, user States, as well as the shipping industry and other stakeholders cooperation were sought towards the establishment of a mechanism for voluntary funding and/or burden sharing for the cost of the projects and the maintenance and the renewal/rehabilitation of the navigational aids system in the Straits.

The final meeting was held on September 4 to 6, 2007 in Singapore. In that meeting, the participants agreed to continue with the enhancement of safety and environmental protections of the Straits. A “Singapore Statement” was also adopted with the continuance of on-going works initiated by TTEG on Safety of Navigation. The works will be given support and encouragement by Co-operative Mechanism, to compose of the following: i) Co-operation Forum, ii) the Project Co-ordination Committee and iii) the Aids to Navigation Fund, from the adjoining states, user states, shipping industry and other stakeholders.

On the basis of the foregoing, the Indonesian Government requested for a Grant Aid to the Japanese Government in March 2006 for the establishment of VTS System for equipment procurement and construction of VTS Center and related facilities to enhance traffic safety in the Indonesian side of the Straits.

## (2) Composition of the Request

The proposed project locations as listed hereunder were confirmed during the basic design study. The locations are depicted in Fig. 1-2-1 hereafter

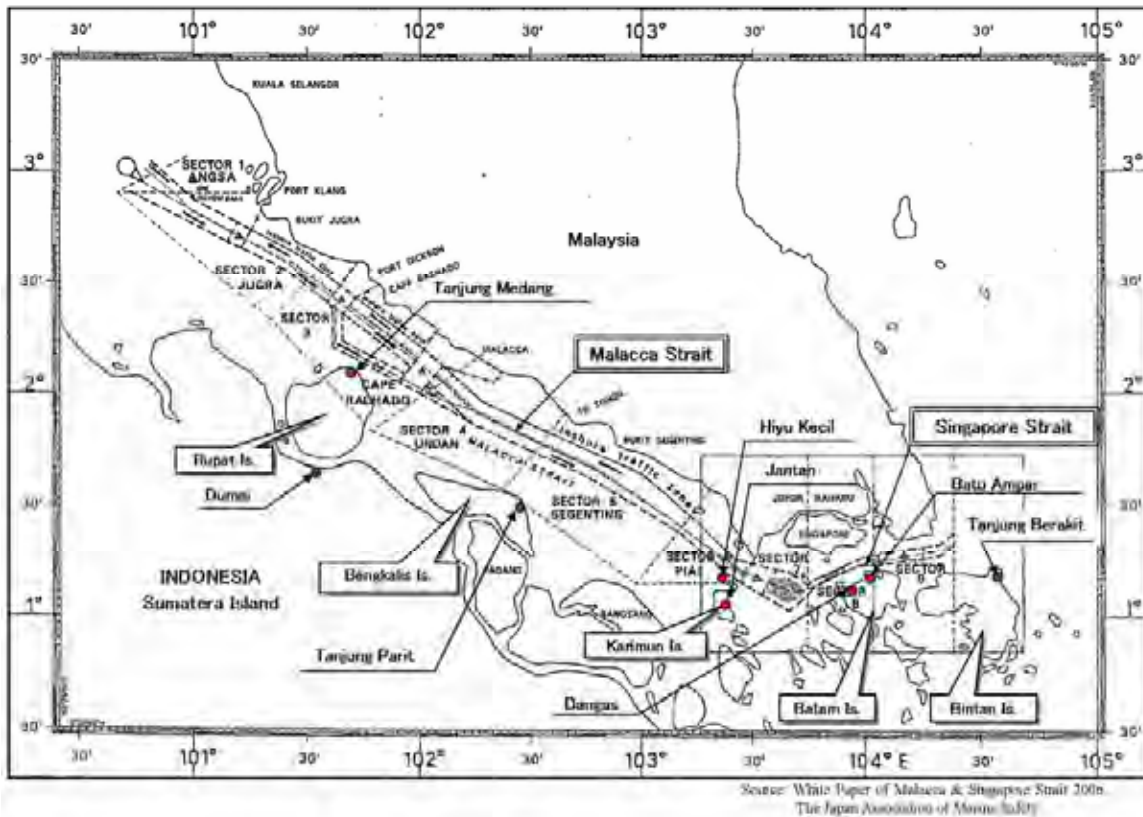
1) VTS Sensor Stations<sup>2</sup>:

(i) Tanjung Medang (Rupat Island), (ii) Tanjung Parit (Bengkalis Island), (iii) Jantan (Karimun Island) or Hiyu (Iyu) Kecil Island, (iv) Batu Ampar (Batam Island), (v) Tanjung Berakit (Bintan Island)

2) Relay Station: Dangas (Batam Island)

3) VTS Center: Batu Ampar (Batam Island)

4) VTS Sub-Center: Dumai



**Fig. 1-2-1 Location Map of the Proposed Project Sites**

<sup>2</sup> Sensor equipment such as radar scanner, AIS (Automatic Identification System) and others may be installed as additional for these five sites, while monitoring operations will be conducted in other sites. Therefore, these sites were defined as “VTS Sensor Stations” in the basic design study. Monitoring sites were termed similarly “VTS Center” and/or “VTS Sub-Center”.

## 5) Proposed Equipment for Possible Official Grant Assistance

Listed hereunder are the equipment requested by the Indonesian Government to the Japanese Government for possible assistance.

Radar System with GPS, radar tracking system, multi-function console, VHF radio communication system, transmission and communication links, AIS, CCTV camera system, VTS data system and web server, recording and playback unit, meteorological sensor, power generator, air-conditioner.

### **1-3 Official Assistance to Marine Transport Sector**

Japan (as a user state of the Straits) has continuously been cooperating for the enhancement of traffic safety and protection of environment in the Straits since the establishment of the Malacca Straits Council (MSC) in 1969. Japan collaborated with the littoral states for i) technical cooperation regarding bathymetry surveys including sea chart productions, tide and current measurements, ii) salvaging of wreck ships, iii) deepening of shallow depths, iv) installation and maintenance of navigation aids and , v) procurement of buoys, vi) contributed for buoy tender and others.

Of the 51 beacons and lighthouses in the Straits, 30 were installed by MSC. Annual maintenance of the facilities including replacement of spare parts is also being carried out in cooperation with littoral states and MSC. In 2003, a new buoy tender “Jadayat” was donated to the Indonesian Government by MSC under the full sponsorship of Nippon foundation. From 1996 to 1998, a resurvey was carried out through JICA technical assistance, and sunken ships and shoals were discovered. Electronic charts were produced and the charts are for sale in Japan and the littoral states since December 2005.

Additionally, Japan conducted the following cooperation for maritime transportation.

**Table 1-3-1 Japanese Cooperation for Maritime Transport**

Type	Year	Study
ODA Loan	2005 (Completed)	Disaster Prevention Ship Project
	2004 to 2009 (Planned)	Marine Telecommunication System Development Project (IV)
Development Study	2006	The Study on the Port Security Enhancement Program of Major Indonesian Trade Ports
	2001 to 2002	Maritime Traffic Safety System Development Plan Study
	1996 to 1998	Joint Survey of Critical Areas and Investigation of Dangerous / Unconfirmed Shoals and Wrecks in the Straits of Malacca and Singapore (Governments of Indonesia, Malaysia, Singapore and Japan.)
Grant Aid Project	2006	Provision of Patrol Ships for Anti-Piracy, Anti-Maritime Terrorism, and Non-Proliferation Project
	2003 to 2004	Security Equipment Improvement in Major Air & Sea Ports Project

#### **1-4 Current Situation of the Project Sites**

##### **1-4-1 Status of Infrastructures**

###### 1) Hiyu Kecil

Hiyu Kecil Island is about 6.5 air km north of Karimun Besar Island with a size of about 250m wide in the north-south direction and about 100m wide in the east west direction. The highest peak is approx. 30 m above sea level with rocky topography. A lighthouse constructed by Netherlands in 1888 exists in the Island and is being operated by Directorate of Navigation. Other facilities include a generator house, watch tower of the Navy for surveillance of the Strait, houses for employees of DN, water reservoir and others. Electrical power for the operation of the lighthouse is supplied by generators.

The island is accessible only by sea and has no infrastructure development except for small boats' jetty for the handling of Directorate of Navigation Staffs' goods and basic necessity. Based on ocular inspection, the jetty may not be capable of accommodating large vessels for construction purposes. Movements in the island are possible only by foot. Electrical power for the operation of the light house is supplied by diesel generators owned and operated by DN due to the absence of PLN power supply. Public water supply facilities are likewise not available. As such, rain water is collected for the daily necessities. There is no land line but mobile phone is usable.

## 2) Takong Kecil

The island is located in Phillip Channel (Selat Phillip), one of the most treacherous spots in the Straits for ship navigations. The island has a circumference of about 350m with an elevation of approx. 16m above sea level. A lighthouse operated by DN exists in the Island. There are no inhabitants except for the employees and families of the lighthouse staffs. Fishermen living in the vicinity of Takong Kecil which are using the Island as base of their fishing expeditions built about 10 shanties in the north-west corner of the island. Access to Takong Kecil is available only by sea and has no infrastructure development. The existing jetty is constructed of reinforced concrete for small boats for the handling of basic necessities for DN employees in the island. As stated earlier, the jetty may not be capable of accommodating large vessels for construction purposes. Infrastructure conditions in the island are almost similar with Hiyu Kecil.

## 3) Batu Ampar

The Coastal Radio Station is located at Batu Ampar. A radio building, generator house, substation, 3 sets of steel tower for VHF communications and employees' quarters exist in the premises of the station. The proposed VTS Center will be located inside the premises of the Radio Station. The road conditions are relatively good except for the access to/from the national road which is narrow and close to residential houses thus making it unsafe for construction use. PLN provides commercial power and water supply is provided by PDAM. Power supply is relatively stable and power failure seldom occurs.

## 4) Tanjung Berakit

A lighthouse operated by DN is located in Tanjung Berakit. The station is provided with a generator house, radio communication room, warehouse, living quarters, water reservoir; among others. Road and inland transportation is available but the road is rather narrow. The existing lighthouse which is constructed of steel is corroded. Electricity is supplied by generator. Electrical power supply by PLN is newly established and the power is supplied in a village near the proposed site, however there are no plans to connect to the commercial power to the proposed site when the Study Team inspected at the site. Water supply on the other hand is not yet developed.

### 1-4-2 Natural Conditions

Indonesia is the world's largest archipelago with more than 18,000 islands. Its total land area at 189.08 km<sup>2</sup> is five times that of Japan. Indonesia has two distinct climates. Wet season is from November to March and dry season is from June to October. Rainfall intensity at 1300 to 3200 north of the equator does not vary significantly. High temperature and humidity is prevalent throughout the year. Temperature ranges from 23 to 30 °C.

Weather in Malacca and Singapore Straits is hot and humid. Wet and dry season do not vary distinctively. The project sites which are close to the coast of Malacca and Singapore Straits are subjected to salty air breezes.

Topographic surveys and soil investigations have been conducted during the basic design studies. Characteristics of the sub-soil features are summarized as follows:

(1) Hiyu Kecil

The island appears to be resting on bedrock as evident by the exposed weathered rocks. Laboratory test results of specimens for compressive strength are used for the detail designs.

(2) Takong Kecil

Clay with mixture of gravely sand stratum with N-value of less than 10 is found from the ground surface up to about 4m depth. Clayey layer with N-value of about 15 is found at about 5m to 11m depths except for the 9m depth. Gravely layer with N-value of more than 30 is found at 12m depth and more than 50 at 14m depth. Softer layer with N-value of about 20 appears to exist at 15m to 16m depths and thereafter increases to 50. The stratum with N-value of more than 50 may be considered as the bearing layer for detail design purposes.

(3) Batu Ampar

Soft silty sand layer with N-value of less than 10 is found from the surface to about 5m depth. The layer with N-value of more than 10 also exists from 5m to 10m depth. Gravely layer with N-value of more than 50 exists at about 9m to 10m depths.

(4) Tanjung Berakit

Clay layer exist from a depth of 1m up to 11m depth with varying N-values of about 20 to 30. The N-value is about 40 from 12m depth. The N-value is more than 50 from 16m depth and below.

## **Chapter 2    Contents of the Project**



## **Chapter 2     Contents of the Project**

### **2-1    Basic Concept of the Project (Review of the Basic Design Study)**

#### **(1)    Objective of the Project**

Under the Indonesia's Medium Term Development Strategy 2004 – 2009 (RPJM: Rencana Pembangunan Jangka Menengah Tahun 2004-2009), the Ministry of Transport drew up a Strategic Development Plan (SDP) 2005-2009 (Tentang Rencana Strategis Departemen Perhubungan Tahun 2005-2009) based on a Decree issued in 2005 by the Minister of Transport (Keputusan Menteri Perhubungan, KM 41 Tahun 2005). The SDP has conceived the development of a VTS System for implementation in 2005 in 2 packages as described hereafter.

The VTS System will be established in seven locations, i.e., Sunda Strait, Lombok Strait, Malacca and Singapore Straits, Pontianak, Toli-toli, Bitung and Sorong. Among the candidate sites, the establishment of VTS System in Sunda Strait, Lombok Strait and, Malacca and Singapore Straits are given high priority due to the high density of traffic.

With Malacca and Singapore Straits as the focal areas, the DN has planned to install VTS System in: i) eight locations between Sabang in North Sumatra Island and Rupaat Island along the east coast of Sumatra, ii) seven locations between Batam Island and Bangka Strait along Sumatra Island and iii) five locations identified in this Study effort.

To pursue the SDP RPJM Priority Targets, the Indonesian Government applied for possible assistance to the Japanese Government for the establishment of VTS System for the aforesaid five locations. The developments are included in the “2005 List of Projects and Technical Assistance Proposals”, commonly called as the “Blue Book” of the National Development Planning Agency (BAPPENAS) together with the Indonesian Ship Reporting System. The establishment of VTS System for Malacca and Singapore Straits is accorded with high priority and hence is considered as a vital project of the Indonesian Government.

The primary objective of the project is to establish VTS System along the Indonesian side of the Malacca and Singapore Straits to enhance traffic safety.

(2) Outline of the Project established in the Basic Design Study

To accomplish the objective, the Stage-1 Project will consider four VTS Sensor Stations and one VTS Center to the Singapore Strait. The VTS System will comprise of radar images, AIS information and other data from each of the VTS Sensor Stations for relay to the VTS Center through multiplex communication links for intensive monitoring. Traffic monitoring in the Malacca and Singapore Straits are currently being conducted by nine radar stations in Malaysia and eleven radar stations in Singapore. With the establishment of the VTS System for this project, it will be possible to monitor the Indonesian side of the Strait which can not be monitored by the existing VTS System. The information on vessel movement using the VTS System to be provided for this Project is expected to contribute to enhance safety of traffic in the Malacca and Singapore Straits.

The project sites, system configurations, equipment procurement and construction of the facilities plans are described hereafter.

1) Project Sites

In response to the application of the Indonesian Government, a Basic Design Study Team was deployed for the ocular inspections and field surveys to assess the conditions of the candidate sites. On the basis of the survey results and several discussions with concerned Indonesian and Japanese Officials, the candidate sites as discussed below were identified for the basic design of VTS System to achieve the objectives of the Project. Fig. 2-1-1 hereunder shows the site locations.

- a. The four candidate sites for the establishment of VTS Sensor Stations at, Hiyu Kecil, Takong Kecil, Batu Ampar and Tanjung Berakit.
- b. One VTS Center to be located in Batu Ampar



Fig. 2-1-1 Project Sites

## 2) VTS System Plan

Radar scanners will be installed in four radar stations along the Singapore Strait in Hiyu Kecil, Takong Kecil, Batu Ampar and Tanjung Berakit. Data to be obtained from these radar stations will be transmitted to the VTS Center in Batu Ampar for intensive monitoring. A VTS Center and VTS Sensor Station will be provided in Batu Ampar.

Fig. 2-1-2 shows the VTS System configuration. The system details including the equipment to be installed are described hereafter.

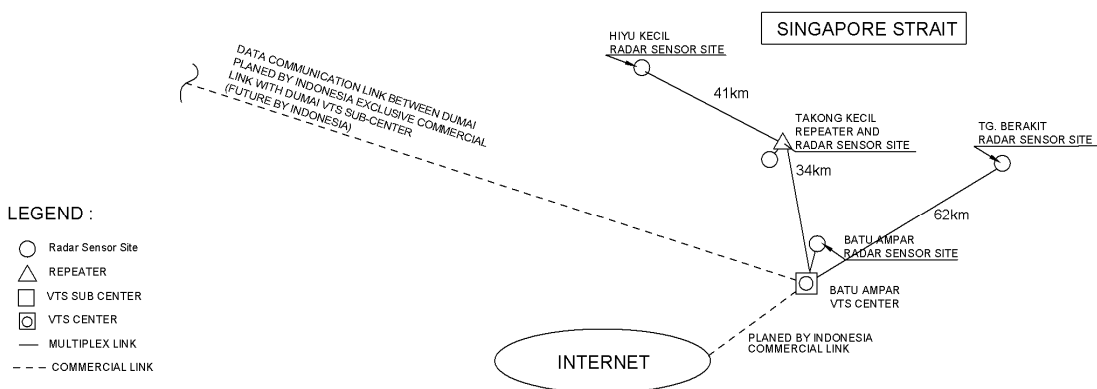


Fig. 2-1-2 VTS System Concept of Stage-1

## **2-2 Basic Design of the Requested Japanese Assistance**

### **2-2-1 Design Policy**

#### **2-2-1-1 Basic Concept**

##### **(1) Scope of Assistance Summarized in the Basic Design Study**

Based on information from DN scores of small vessels is frequently crossing the main route of the Malacca and Singapore Straits thus posing hazard to the safety of navigation of large ships cruising along the TSS. The objectives of DGST for the establishment of the VTS are: i) to monitor the ships passing the TSS and, ii) to monitor the crossing of the TSS by small vessels to enhance traffic safety.

The basic design study was therefore carried out pursuant to the DGST concept for “the monitoring of small vessels crossing the TSS” and based on this premise, the scope of cooperation was identified by providing three VTS Sensor Stations along Singapore Strait.

Site evaluations have been conducted in the following manner. Firstly, based on the request by the Indonesian Government, suitable sites were selected for possible Japanese Grant Aid considering land ownership, suitability of the site, absence of obstructions. Secondly, a study was conducted to determine the relations between the objective vessels and the available surveillance area by radar scanner to be provided with VTS in this project. Thirdly, a study was made on the importance/necessity of the location as VTS Sensor Station considering the physical conditions in the area and traffic conditions.

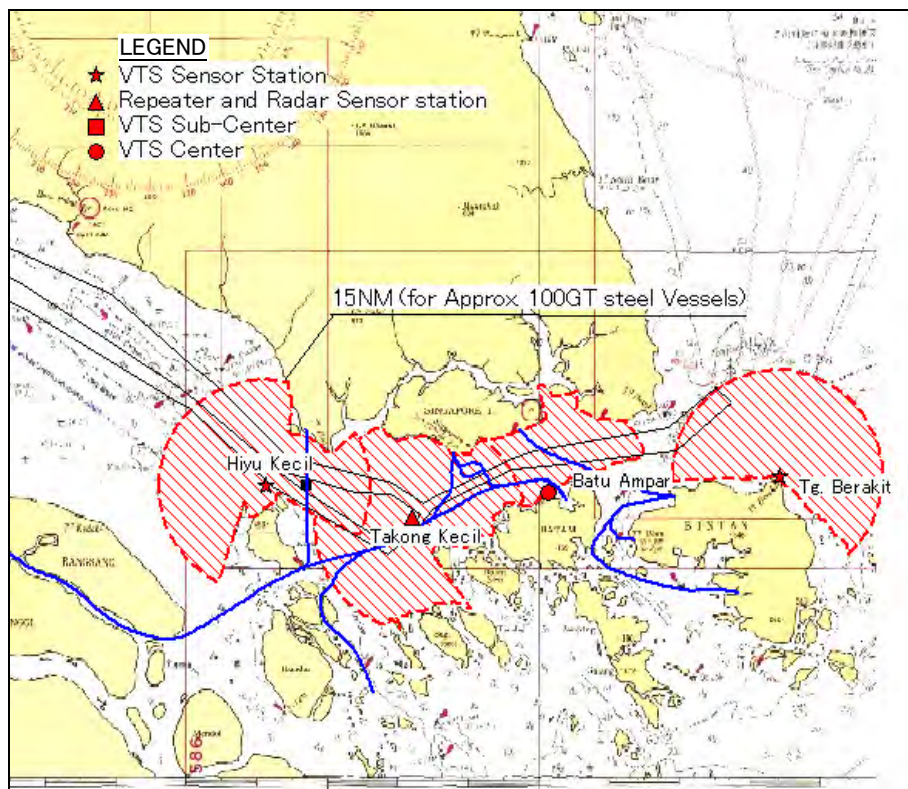
Based on the review and evaluations of the Basic Design Study, the scope of works of the Project for Stage-1 was established as follows.

- Hiyu Kecil                      VTS Sensor Station
- Takong Kecil                    VTS Sensor Station
- Batu Ampar                    VTS Center including and VTS Sensor Station
- Tanjung Berakit                VTS Sensor Station

(2) Radar Specifications, Objective Vessels and Target Area for Surveillance

The objective of the VTS System under this project is to monitor the crossings of small vessels of the TSS to enhance navigation safety in the Straits. Small vessels about 100 GT average comprising of international and domestic passenger shipping lines traversing between Tanjung Pinang and Singapore, and Batam and Singapore; crossing the TSS regularly and frequently are the primary targets of the surveillance system. Therefore, it was selected 100 GT steel vessels shall be objective vessels to determination of the radar specifications. Common radars recommended by IALA (International Association of Marine Aids to Navigation), available visible radius against the 100 GT steel vessels are about 15 nautical miles (about 27.8 km). Therefore, available surveillance area by the radar scanner is selected 15 nautical mile radius.

The relations between the available surveillance area at each VTS Sensor Station and the shipping routes of the passenger lines are as shown in Fig. 2-2-1. Further studies are conducted based on the Fig. 2-2-1.



**Fig. 2-2-1 VTS Radar System Radius of Operation**

### (3) Operational Concept of the VTS System

Described hereunder is the operational concept of the VTS System.

- 1) As mentioned above, the proposed VTS System for the surveillance of the Straits is the first undertaking of the Indonesian Government. In view thereof, continuous technical cooperation for the operation and maintenance of the VTS System is considered crucial.
- 2) Taking into account of the objective of the Project, the VTS System will be used to monitor small vessels particularly those crossing the TSS which are posing danger to navigation safety of large ships passing along the TSS.
- 3) Singapore Straits are declared as international shipping lanes. Taking this into account, it is highly desirable that the entire VTS System be integrated and jointly operated by the three littoral states to avoid possible confusion of traffic control in the Straits. This issue could be undertaken in TTEG or other appropriate meetings with the IMO. Until such time that a tripartite agreement has been reached, operations of the VTS System will be limited only for the monitoring of the Straits at the Indonesian Side to enhance safety of navigation.

### (4) Remedies against Possible Disasters to Facilities Arising from Natural Incidences

Indonesia lies in the tropics and all the sites are located adjacent to the coast. Lightning occurs frequently during the rainy season that could cause possible damage to the facilities. Taking this factor and other elements into account, the building facilities must be planned with due consideration to: i) strong sunshine, ii) heavy downpours during scours, wind gust, iii) salt air intrusion, among others.

The basic design was carried out based on the surveys and investigations to be conducted for topography and soil. The Indonesian Building Code of Practice for wind pressure and seismic intensity was adopted for the design of civil and building facilities instead of weather data from the meteorological station at Hang Nadim Batam and Tanjung Balai Karimun which do not provide sufficient detail as bases for the design.

(5) Policy for Socio-Economic Condition

Hiyu Kecil, Takong Kecil and Tanjung Berakit are provided with light houses while the coast along Batu Ampar is provided with radio station. Since the facilities are being managed and operated by DN, land acquisition and construction of additional facilities in the aforesaid areas is anticipated to pose no problems.

The steel towers to be erected for Takong Kecil and Tanjung Berakit for the radar and communication links will be higher than the lantern of the existing light house. As a result, light emissions from the lantern will be obstructed during construction of the steel tower. As remedial measure, the erection of a temporary structure maybe necessary for the installation of a lantern for the navigation aid of vessels during construction of the steel tower. A complementary lamp with the same flashing will be installed on the steel tower when construction of the structure has been completed.

(6) Procurement of Materials and Equipment

All equipment for the VTS System will be procured in Japan due to the absence of manufacturers in Indonesia. Construction materials which are available in Indonesia for civil and building works will be used to the extent applicable provided that the required function and quality are maintained.

(7) Local Construction Company

Local labour will be employed to the extent practicable for the installation, setting up, tuning and test operation of the equipment except for specialty works that will pursued by the manufacturers.

Construction of building facilities, movement and installation of equipment will be carried out by Indonesian firms to the extent possible.

**2-2-1-2 Basic Policy of Equipment Design**

The plan and basic design of the equipment has been conducted based on the concept described hereunder.

## (1) Basic Concept

As previously stated, radar scanners with radius of operation of 15 nautical miles will be installed in Hiyu Kecil, Takong Kecil, Batu Ampar and Tanjung Berakit for a total of six, for the surveillance of 100 GT steel vessels (minimum).

This is determined because of the purpose of the project is to monitor the small vessels which is crossing the TSS. However, in recent years, the meeting on the Straits of Malacca and Singapore was held at Jakarta in 2005, at Kuala Lumpur in 2006 and at Singapore in 2007, and in the meeting it was agreed about the Co-operative Mechanism for enhancement of safety, security and environmental protections in the Straits. Of this Project is cooperated between Indonesia and Japan, however, the VTS System established in the project is expected to contribute for navigation safety in the Straits including TSS in near future.

Therefore, the VTS System is designed also considering to conduct monitor the vessels which are passing through the TSS.

Furthermore, the configuration must be user friendly and stable for long period of operations because as stated earlier, the System is the first of its kind in Indonesia for the surveillance of the Straits.

## (2) Special Site Conditions

- 1) Access to the remote sites is quite difficult. Taking into account the severe environmental conditions, the facilities will be provided with adequate redundancy system to ensure continuity of operations in the event that one of the system components fails.
- 2) Commercial power is not available in the remote sites. With this in consideration, three sets of engine driven generator including a standby with automatic switch interchangeability will be provided to ensure a steady power supply.
- 3) Commercial power is available for the VTS Center and Sub-Center but considering the occurrence of occasional power failure, the system will be provided with UPS and automatic power shutdown system to avoid system crash. Re-starting the operation will be facilitated by a switch after the failure.



### (3) Reliability

The equipment will be provided with dual system except for a part of the antennae. The change over operation for the main and spare will be simple and will not require any special control.

### (4) Operational Aspects

VHF communication radio is a mandatory device of the VTS System for communication between shore and ships. STRAITREP has allocated VHF channels for communication between ships in TSS and VTS on shore. However, to avoid congestion and duplication of ship control information the practice currently in used by Malaysia and Singapore for radio channels are allocated by STRAITREP for receiving functions only. The functions and equipment necessary for transmissions for the channels are expandable should the need arises in the future after an appropriate international operational agreement has been concluded. Other channels are designed for bi-lateral communications.

### (5) Reduction in Operation Cost

Several options are available for data transmission such as multiplex data communication link, high speed exclusive satellite transmission system and low speed exclusive satellite transmission system among others. As mentioned earlier however, the use of satellite link for transmitting radar image, CCTV camera image information 3 channel voice signal is cost-wise very expensive, and for this reason, the Indonesian Government has decided the use of multiplex data communication link. As stated elsewhere in the Report, multiplex data communication link was adopted because while the initial investment cost is higher than satellite data link, the electrical cost or in this case the fuel cost for the operation of the generators for the operation of the VTS System will be much cheaper.

### (6) Grade of Equipment

As stated earlier, the objective of the VTS System under this project is to monitor the movements of small vessels crossing the TSS to enhance navigation safety of the Straits. However, the grade of the different types of electronic equipment for the VTS System will be

selected in accordance with IALA recommendations V-125 and V-128<sup>3</sup> considering the following:

- 1) To enhance navigation safety of ships in the area of responsibility and in the TSS, monitoring of the large ships passing through the TSS are inevitably necessary.
- 2) Data obtained by the VTS System may be shared with the VTS systems of Malaysia and Singapore in future after an international agreement has been reached

### **2-2-1-3 Basic Policy of Building Design**

#### (1) Design Policy

##### 1) Natural Conditions

All the sites are located in the tropics near the coast. It is therefore essential to protect the facilities against strong sunlight, heavy downpours, humidity, wind gust and salty air intrusion for durability and stable operation.

##### 2) User-Friendly System

The building facilities and the system configuration will be user-friendly to facilitate 24 hours operations. The VTS Center and Sub-Centers will be provided with closely integrated compartments taking into account minimum movements and to minimize the crossing of operators.

##### 3) Ease of Maintenance

The design is aimed at facilitating maintenance and minimizing the running cost. Especially for the Sensor Stations, durable materials will be used considering that the sites are located in remote areas in extremely harsh environment.

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<sup>3</sup> IALA Recommendation V-125 on The use and presentation of symbology at a VTS Center (including AIS) Edition 2, December 2004, and IALA Recommendation V-128 on Operational and Technical Performance Requirements for VTS Equipment, Edition 2.0, June 2005

Additionally, function, durability and economy are also considered and the facilities are designed based on the following concept.

(2) Design Concept

1) Arrangement of Compartments

Each compartment is planned with due consideration to efficient operation and maintenance of the VTS System equipment. Arrangement of the compartments for each building is planned based on integrated linkage of operation.

2) Reduction in Operation and Maintenance Cost

In order to reduce operation and maintenance cost, design of the facilities has been carried out considering the following:

- a. Buildings facilities are designed to use to the extent practicable materials and utilities locally available to reduce on cost and facilitate maintenance.
- b. Eaves as protection against sunlight, natural ventilations are designed appropriately to minimize the use of air conditioning and ventilation units.

**2-2-1-4 Basic Policy of Other Facilities Design**

(1) Steel Tower

The installation of radar scanner and parabola antenna for the multiplex communication link will require the erection of steel towers. The towers are designed based on the following considerations.

- 1) The tower design is standard based on common steel angles so that construction could be undertaken by local construction companies.
- 2) The height of the tower is designed to satisfy the required elevation of the radar scanner and parabola antenna needed to ensure the required functions.

- 3) The foundation of the tower is designed based on the soil conditions at site. However, special site conditions are also considered in the design, as for example, the difficulty in mobilizing heavy construction equipment to the sites due to limited land space and access particularly for Hiyu Kecil and Takong Kecil.

## (2) Fuel Supply System

VTS Sensor Stations where commercial electrical power supplies are not available will be provided with fuel storage tanks and supply system for the diesel engine generator to be operated on 24 hours basis. The required facilities are designed based on the following:

- 1) Capacity of the fuel storage tank is planned based on the required fuel quantity for power generation and supply frequency including accessibility for each site.
- 2) Must be weather-proof and durable considering that the sites are located in small isolated island and the equipment are located near shore.

## **2-2-2 Basic Plan for Equipment and Building Facilities**

### **2-2-2-1 Items modified from the Basic Design Study**

The following items are modified based on the result of the analysis and discussions during the Implementation Review Study Stage.

#### (1) Equipment

- 1) Deletion of one unit Multi-function console in Batu Ampar

One unit multi-function console in Batu Ampar for monitoring information from Dumai is deleted, because the Radar equipment in Tanjung Parit will be deleted from Stage-2 Project, and Bengkalis will be modified to a repeater station instead of VTS Sub-Center..

- 2) Deletion of FM transmitting devices

The FM transmitting devices were deleted based on the result of discussions and request by the Indonesian side.

3) Design modifications of compensation light for the existing light house in Takong Kecil and Tanjung Berakit

Based on the request by the Indonesian side and result of discussions with the Study team, the design of the compensation light for the existing light house in Takong Kecil and Tanjung Berakit are modified.

4) Data Communication Link

Parabolic antennae heights are re-calculated based on the same method of the Basic Design Study to confirm and ensure stable communication link.

(2) Building Facilities

1) Site layout plans at Takong Kecil and Tanjung Berakit

Based on the result of the discussions and request by the Indonesian Side, the location/positions of the generator building and fuel tank in Takong Kecil and Tanjung Berakit are modified.

2) MEH Data Center

Based on the request from the Indonesian Side, the space for MEH Project office staff is located in the Batu Ampar VTS Center Building

(3) Other Facilities

1) Steel Tower for Radar and Communications

Based on the results of the re-calculation of the data communication link, the tower heights are adjusted as required.

Details of the above modifications are described at relevant paragraph hereafter in *Italic* Fonts.

### **2-2-2-2 Basic Plan for Equipment**

#### **(1) System Configuration**

Radar scanners will be installed in four VTS Sensor Stations. Scanned data from the four sensor stations in Hiyu Kecil, Takong Kecil, Batu Ampar and Tanjung Berakit will be transmitted to the VTS Center in Batu Ampar for intensive monitoring. The concept of the VTS System is shown in Fig. 2-1-2.

#### **(2) Radar System**

The radius of operation of the radar systems is set at 15 nautical miles at normal conditions for the surveillance of 100 GT steel vessels minimum. The system however will be provided with a 20-mile detection capacity. Radar transmission and receiving devices are X band dual systems at 9 GHz which is allowed by Indonesian Authorities. The radar systems composed of the following apparatus.

- Radar Transmission and Receiver (TRX) (Dual System)
- Antenna Scanner (Single System)
- Radar Signal Control (Dual Method)
- PPI Monitor (Maintenance Monitor, Single System)

The radar system will be remotely controlled from the VTS Center to facilitate surveillance of ship movements. The sites will also be provided with radar image observation service monitor mechanism to facilitate maintenance.

#### **(3) VHF Marine Radio System**

Safety information for ship navigation safety will be provided from shore to ship and ship information such as vessel name, size, type, origin and destinations, and others will be provided from ship to shore. These communications will be conducted by VHF marine radio equipment. The VHF radio facilities will be installed at all the sites except Takong Kecil to cover a wide area of the Straits as much as possible. The multi-function console will be equipped with remote controlled system to enable the operator of the VTS Center to communicate with the ships at any time.

The Ship Reporting System (STRAITREP) in Malacca and Singapore Straits has already been established. VHF radio channel are allocated to ships accessing through the TSS. Ships entering the STRAITREP operation area are mandated to report to the VTS Centers through VHF channels as listed in Table 2-2-1 hereunder.

**Table 2-2-1 VHF Channel for STRAITREP**

Sector	Reporting End VTS Center	VHF CH No.	Country
1	Klang VTS	CH 66	Malaysia
2		CH 88	
3		CH 84	
4		CH 61	
5		CH 88	
6	Johor VTS	CH 88	
7	Singapore VTS	CH 73	Singapore
8		CH 14	
9		CH 10	

VHF communication radio is absolutely necessary for the VTS System for communication between shore and ships. STRAITREP has allocated VHF channels for communication between ships navigating in the TSS and the shore. However, to avoid congestion and duplication of ship control information currently being used by Malaysia and Singapore, the radio channels allocated by STRAITREP are designed for receiving functions only. The functions and equipment necessary for transmissions in these channels are expandable should the need arises in future when an appropriate international operational agreement has been concluded among the adjoining states. The system is designed so that communications between ships and shore are conducted by channels not allocated by the STRAITREP with Ch 16 as adopted internationally.

In conclusion, the VHS system are composed of VHF receiving devices for monitoring the channels of which are allocated by STRAITREP while bi-lateral radio communication devices will be adopting CH 16 and other channels, and spare VHF radio communication equipment.

The list of VHF channel allocation for each site is shown in Table 2-2-2 hereunder.

**Table 2-2-2 VHF Channel Allocation**

Purpose	CH Code			Remarks
Calling Channel	CH 16			Relaying/Receiving Possible
STRAITREP Monitoring Channel	Site	STRAITREP Sector	Reporting Channel	Exclusively for Receiving
	Hiyu Kecil	Sector 6&7	CH88&73	
	Batu Ampar	Sector 8&9	CH14 & 10	
	Tg. Berakit	Sector 9	CH 10	
Operating Channel	Separate Allocation at Every Site			Relaying/Receiving Possible

(4) Data Communication System

Data communication link will be made through 7.5GHz band frequency multiplex radio communication link, subject to availability. A parabolic antenna will be installed on the steel tower to be constructed for this purpose. Long distance relaying and communication at sea using the latest technology on space diversity will be considered to ensure reliability of the system.

Table 2-2-3 shows the sites and distances to be provided with multiplex communication link. Table 2-2-4 shows the estimated height of the parabolic antennae to ensure stable communication link. *The values are re-evaluated based on the re-calculation under the review design.*

**Table 2-2-3 Required Data Transmission Distance for Multiplex Communication Link**

Communication Section	Communication Distance (km)
Hiyu Kecil – Takong Kecil	42
Takong Kecil- Batu Ampar	34
Tanjung Berakit – Batu Ampar	63



**Table 2-2-4 Estimated Required Height of Parabolic Antennae**

Location	Required Height E.L. (m)	
	Upper Side	Lower Side
Hiyu Kecil	58	53
Takong Kecil	57	47
Batu Ampar	113	103
Tanjung Berakit	92	82

Note: E.L.: Elevation above mean sea level

(5) AIS system

The AIS System will be utilized to receive information on vessel movements in Singapore Straits. The system will also be used for relaying service information to vessels to enhance safety of navigation. The information as relayed will be saved in the AIS Server System of the VTS Center. The AIS information will finally be displayed on the multi-function console by radar echo information for the surveillance and management of vessel traffic in the subject area. The transponder shall be dual system for quick recovery function in times of trouble. The base system for the AIS will be provided in accordance with the latest international standard as listed hereunder:

- IMO MSC 74(69) Annex3, ITU-R M.1371-1,
- IALA Technical Clarifications on Recommendation ITU-R M 1371-1
- IALA Recommendation A-123
- IALA Recommendation A-124

(6) CCTV System

The navigation route at the western corridor in the vicinity of Takong Kecil is greatly varying and a DW route exists at the eastern side. Indonesian domestic passenger shipping lines frequently access the area. For this reason, the provision of a CCTV camera at Takong Kecil is necessary to allow visual surveillance of traffic.

The camera images gathered from each station by CCTV camera will be transmitted by multiplex communication link to Batu Ampar VTS Center for simultaneous monitoring. The CCTV system will be operated at day and night times at the multi-function console of the VTS Center. Surveillance is possible at any time through PC video imaging. Automatic tracking and zooming functions will also be provided.

#### (7) Record and Playback System for Vessel Traffic Information

The System will be provided with record and playback functions of data taken by the radars, AIS and voice communication via VHF maritime radio. The system will be used to review the records taken during an accident, observe the movement of suspicious vessels, review of radar and AIS data on ship movements and review of VHF communication data. For as long as the data gathered has no damage, information storing could be compressed in a hard disk. The record time is one month and will automatically erase when the prescribed time is reached. As the need arises, the system will be provided with a back up function to store important data through DVD-RAM medium. Under the system the data to be recorded will comprise of the following: i) video signal imaging, ii) radar pursuit data, iii) AIS pursuit data, iv) AIS transmitted / received messages, v) warning data, vi) VHF communication voice (8channels), ix) Others.

Data replay will be illustrated by electronic sea charts together with radar and AIS records including radar pursuit data, AIS pursuit data, VHF voice messages and others. Screen updating will be possible thorough synchronization of the image and the replay speed.

#### (8) Tracking System

Hiyu Kecil, Takong Kecil, Batu Ampar and Tanjung Berakit, a total of 4 sites on the side of the Singapore Strait will be provided with tracking system. The target track obtained by the individual radar system and AIS data will be assembled to create single data for the surveillance of the Strait.

#### (9) Multi-function Console

A multi-function console will be provided for Batu Ampar VTS Center for the surveillance of vessel navigation through the so called man-machine interface. The console will be provided with a display monitor to put on view the video image transmitted from each of the radar stations, synthesized AIS information showing the ship location as well as direction and speed. The system is also capable of displaying the time of passage, type of vessel, weather information, CCTV imaging among others to grasp the overall condition in the area under surveillance.

All symbols to be shown on the screen will be in accordance with IALA and IMO standard.

The display will also be provided with the needed information and indication system necessary for appropriate daily operation. To facilitate maintenance of the system, the console will be provided with remote controlled functions for the monitoring of the conditions of the equipment and devices in the sites, wireless VHF facility CCTV camera among others to for maintenance of the system.

The system monitoring capability is described as follows:

#### 1) Monitoring Capability

The surveillance by radar and AIS in Hiyu Kecil, Takong Kecil, Batu Ampar and Tanjung Berakit on the Singapore Side of the Strait will be monitored at Batu Ampar VTS Center. Each station will be capable of monitoring 500 vessels. The entire system in the Straits will be capable of monitoring 1500 vessels.

#### 2) Screen Display and Function

The console will be provided with three sets of graphics monitor, center processing device, key board and mouse, among others and will function as follows:

- Surveillance of the entire area will be divided into several images to be displayed on several monitor screens. As needed, the area to be monitored will be displayed continuously in three monitor displays as shown in Fig 2-2-2 hereunder.



**Fig. 2-2-2 Sample Display (Image Map)**

- At the option of the operator, vessel information, weather data, display of each VTS Station and radar image among others could be turned on by a switch.
- The unit will also be provided with VHF wireless communication operation device for communications with vessels.

*The basic design study, planned to provide one unit multi-function console for Batu Ampar VTS Center for monitoring information gathered from Dumai VTS Sub-Center. The Implementation Review Study however, deleted the Radar equipment in Tangung Parit from the scope of works of Stage-2 Project, and Bengkalis was modified to function as a repeater station instead of VTS Sub-Center.*

*Accordingly, the monitoring functions of the VTS Center in Batu Ampar are re-examined and as a result, one unit multi-function console was deleted in the scope of works of Stage-1 Project.*

#### (10) Vessel Information Data Base

The management surveillance system needs to be provided with vessel information data base to enable confirmation of vessel nationality, type and owner among others through radar, AIS and VHF radio communication devices. The base data could be procured initially from Lloyd but the record needs to be updated to include the region's history for accuracy of surveillance.

#### (11) Weather Observation System

For safety of navigation, the unit for Hiyu Kecil and Tanjung Berakit will be provided with data logger interface mechanism for the gathering of essential weather information for dissemination by VHF and AIS to all vessels cruising in the Straits. The observation items will include wind speed, wind direction, temperature, humidity and air pressure.

The data observed and collected will be forwarded to Batu Ampar VTS Center through the data communication link for display on the console screen.

#### (12) Resource Management System

The facility will be provided with resource management system to confirm the condition of the equipment for maintenance support purposes. Online observation of the operation of the system during normal operation will make it possible to determine control errors and early detection of possible breakdowns. This system will be provided for Batu Ampar VTS Center..

#### (13) FM Transmitting Devices (On-time Broadcasting System)

Most of the small vessels operating in Malacca and Singapore Straits are not equipped with

VHF transmitting/receiving devices. For this reason, communications in the event of a disaster is not possible. This issue needs to be addressed for the enhancement of traffic safety. Considering the above, the FM transmitting devices are planned for the dissemination of essential information to all vessels operating in the Straits.

*However, according to the discussions and request by the Indonesian side in the Implementation Review Design, the devices are cancelled.*

(14) Others

1) Web Server System

A Web Server System will be provided for the gathering of vessel traffic information obtained by the VTS System for possible dissemination of information through internet circuit as necessary. The provision of internet circuit for exclusive use will be borne by the Indonesian Government who will also be responsible for information sharing through the internet.

2) Air Conditioning Units

Considering that the sites are located in the tropics in remote areas along the sea shores, the precision electronic equipments must be provided with air conditioning units as protection against high temperature, high humidity and salty air intrusion to maintain a stable and reliable operation.

For durability and reliability, the air conditioning units must be rust resistant and must consume less power. The cooling system will be determined based on the heat value relative to cooling function to augment its reliability. Split type of air conditioning units with protection against weather elements and possible theft will be provided.

Since the VTS Sensor Stations are located in remote areas, fuel supply would be difficult. Therefore, the air conditioning units will be selected taking into account the energy-saving type. For the VTS Center, UPS and back up generators will be provided to maintain continuous operations in case of power is failure.

(15) Takong Kecil Lighthouse

An existing lighthouse is located in Takong Kecil with lantern coverage of 360° and red and white lamps. With the center of the lighthouse as reference, red light covers the extent of 245° to 316° while white light covers the other segments. The lantern is set at a height of 46.5 meters above mean sea level<sup>4</sup> and has a range of 19NM at 2 flashes per 10 seconds interval. The height of the steel tower for the installation of the radar scanner and parabola antennae will be higher than the lantern thus obstructing red light emissions. As a remedy, a steel tower was planned in the Basic Design for the provision of a partially synchronized complementary lamp of the same specifications.

*During the Implementation Review Study discussions however, DN was requested to modify the design of the compensation light from the JICA Study Team scheme to those listed hereunder:*

- 1) The red color sector of the existing light house will be closed as black sector. The existing red sector of the light will be maintained by the installation of a sector light on the radar tower. The light currently designed as the compensation light will be used for sector light. Synchronizations of the compensation light with the existing light will not be required under this scheme.*
- 2) LED type of lamp is acceptable provided that the luminous range is 18 nautical miles, minimum.*
- 3) Red sector will be maintained with the same coverage as indicated in the relevant sea charts and the Indonesian List of Light (Daftar Suar). Lighting character and specification shall be in accordance with the specifications indicated in the relevant sea charts and the Indonesian List of Lights (Daftar Suar Indonesia).*
- 4) Takong Kecil Island will then provided with 2 navigation aid towers. For this reason DGST needs to issue the corresponding notice to mariners and the revisions of the sea charts as well as the Indonesian Lists of Lights*

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<sup>4</sup> According to the “INDONESIAN LISTS OF LIGHTS (DAFTAR SUAR INDONESIA)” (EDITION 2007), the vertical distance between focal plane of the light and the level of mean height of Spring Water or Mean Higher High Water is 48m. The lantern elevation is estimated 46.5m above mean sea level, considering to the sea chart information of tidal range is about 3.0m.

(16) Tanjung Berakit Lighthouse

An existing lighthouse is also located in Tanjung Berakit with lamp coverage ranging from 265° to 161° in the clockwise direction from the north. The lamp has a range of 20 NM at 2 flashes per 10 seconds interval. The steel tower height will be higher than the elevation of the existing lighthouse lantern and available construction space of the steel tower is limited due to existing facilities, therefore, similar to Takong Kecil a part of light emissions from the lantern will be obstructed. Therefore, as in the case of Takong Kecil, the radar tower was planned to be provided with partially complementary lantern of the same specifications.

*However, during the Implementation Review Study stage, DN requested the JICA Study Team to modify the partially type of complementary lantern to a fully type of complementary lantern. Moreover, DN also requested for a revolving lantern to be installed on the radar tower because the tower will be obstructing the existing light. The lantern will be designed based on the specifications indicated in the relevant sea charts and Indonesian List of Lights (Daftar Suar Indonesia), to maintain same coverage, range, elevation and light character. The tower will be provided with appropriate platforms at certain levels to be determined during the detail designs.*

*DN emphasized during the discussions that priority should be given to the operational aspects of the facility to attain the desired level of performance of the navigation aids. The black sector of the existing lighthouse should be maintained in order to avoid the installation of additional lantern on the new radar tower.*

*The JICA Study Team explained that based on Japan's Grant Aid Guidelines, site clearance including replacement of the existing generator house and warehouse including associated expenses will be borne by the Indonesian Side prior to start of construction works for the radar tower. This matter was also discussed during the Basic Design Stage, and the location of the tower will currently remain the same and that DN will not consider changing the locations of the existing facilities until such time that DN has made a decision to modify the location of the radar tower during the detail design stage based on the results of internal discussions among concerned DN staffs.*

*The review of the Basic Design Study will be conducted based on the premise determined during the Basic Design Study and reiterated hereunder for immediate reference.*

(17) Radar Tower Position at Hiyu Kecil

During the Implementation Review Study, it was found that the black sector of the existing light house is not same as those indicated on the sea chart. The existing light house provides a 360-degree coverage and DN intends to continue with this operation. DN however, agreed with the present location of the radar tower based on the following considerations:

- 1) The location of the radar tower will be on the south side of the existing light house at the opposite side of the TSS.
- 2) Slight obstruction by the radar tower will pose no problem to ships passing through the Strait between the southern side of Hiyu Kecil and the northern side of Karimun Besar Island, because several Navigation Aids are installed thereat.

**2-2-2-3 Electrical Supply Facility**

The VTS Sensor Stations are located in remote areas and as such access is extremely difficult. Electrical supply which is also not yet available will be provided through generating sets. The generating sets will be fuel efficient, durable and stable considering the VTS 24 hours continuous operations, difficulty in providing maintenance and fuel which will be replenished once every 3 months.

Four generator sets will be provided for each site. Each unit will be capable of providing the required power. In order to reduce the incidences of normal wear and tear, the system will be provided with automatic interchangeability switchgear to activate the operation of the next generator on a prescribed time. As measure against instantaneous power breakdown during switch over of generating sets, the system will be automatically shut down and UPS will be provided to provide power for the computer system temporarily. This automatic operation the system will facilitate normal re-start when power is recovered.

While reliable commercial power is available for Batu Ampar VTS Center, one (1) standby generating set will be provided for emergency purposes.

Electrical power will be supplied from PDB to NFL with sufficient capacity to each equipment.



#### 2-2-2-4 Basic Plan of Building Facilities

##### (1) Batu Ampar VTS Center

###### 1) Site Layout

The existing facilities in Batu Ampar Coastal Radio Station comprise of administration office, generator building, two units of staff house and three sets of antenna tower. The northeast corner of the station was chosen for the location of the new VTS Center because it is the best observation post of Singapore Strait. The proposed location is also close to the PLN facility thus facilitating power supply tapping.

###### 2) Architectural Design

###### a. General

The VTS Center is planned and designed to facilitate maintenance and operation. The building structure to be resistant to fire and earthquake will be constructed of reinforced concrete.

###### b. Floor Plan

The operation room will be on the 4<sup>th</sup> floor to facilitate vessel traffic surveillance of the Singapore Strait. The 3<sup>rd</sup> floor will contain compartments for the UPS and the engineers as support to the operation of the 4<sup>th</sup> floor. The 2<sup>nd</sup> floor will contain the sleeping/napping area. The administration office, conference room with for a capacity of 10 to 20 persons, kitchen, pump room, generator room, toilet, kitchen and related services, will be located on the 1<sup>st</sup> floor. *Considering the DN's request, the MEH office staff space is located in the 3<sup>rd</sup> floor by partitioning the Engineers' room.*

Table 2-2-5 hereunder shows the required space which was determined based on the results of the site investigation and discussions with concerned Indonesian Officials. Drawings 14 and 15 show the layout plan, section and the elevation of the building.

**Table 2-2-5 Floor Area Schedule for Batu Ampar VTS Center**

									Total Floor Area
1st Floor	STAFF ROOM	MEETING ROOM	KITCHEN	TOILET	GENERATOR ROOM	PUMP ROOM	CORRIDOR	STAIRCASE	162.00 m2
Floor Area	24.00 m2	30.00 m2	4.50 m2	15.75 m2	23.40 m2	12.60 m2	33.75 m2	18.00 m2	
2nd Floor	NAP ROOM	STOCK ROOM	-	-	-	-	CORRIDOR	STAIRCASE	72.00 m2
Floor Area	27.00 m2	9.00 m2	-	-	-	-	9.00 m2	27.00 m2	
3rd Floor	ENGINEERS' ROOM	UPS ROOM	-	TOILET	-	-	CORRIDOR	STAIRCASE	72.00 m2
Floor Area	27.00 m2	9.00 m2	-	9.00 m2	-	-	9.00 m2	18.00 m2	
4th Floor	OPERATION ROOM	-	-	-	-	-	-	STAIRCASE	90.00 m2
Floor Area	72.00 m2	-	-	-	-	-	-	18.00 m2	
Penthouse Floor	-	-	-	-	-	-	-	STAIRCASE	18.00 m2
Floor Area	-	-	-	-	-	-	-	18.00 m2	
									414.00 m2

Note: Engineers' room at 3<sup>rd</sup> floor is included in the space for MEH project office staff.

(2) Equipment Building

1) Site Locations

Buildings to contain the equipments will be constructed in Hiyu Kecil, Takong Kecil and Tanjung Berakit for a total of 3 sites.

2) Site Layout

The equipment building is located as closely as possible to the steel tower where the radar and the antennae are installed to facilitate interconnection. Special attention was made for Hiyu Kecil, Takong Kecil and Tanjung Berakit due to the limited land space.

3) Architectural Design

a. General

The building to contain the VTS System was designed to facilitate maintenance. Considering the importance of the facility, reinforced concrete structure was conceived to be fire proof and resistant to seismic forces. The roof with wooden truss support is sloped to facilitate water drain in times of heavy downpour.

b. Floor Plan

The equipment building consists of two compartments, i.e., the equipment room and the UPS room. The equipment room will be air conditioned to protect the radar facilities against high temperature and humidity.

Table 2-2-6 below shows the floor area schedule which was determined based on the site survey and discussions with concerned Indonesian Officials. Drawing 17 shows the plan, section and the elevation of the equipment building.

**Table 2-2-6 Floor Area Schedule for Equipment Building**

			<b>Total Floor Area</b>
1st Floor	EQUIPMENT ROOM	UPS ROOM	<b>42.25 m2</b>
Floor Area	22.75 m2	19.50 m2	

(3) Generator Building (Types A and B)

1) Site Locations:

a. Generator House -Type (A)

The generator house for Hiyu Kecil, Takong Kecil and Tanjung Berakit is Type (A), 55sqm in area.

b. Generator House-Type (B)

Candidate site was not provided for Stage-1. A 45sqm area was provided for the generator house only for Stage-2 Project.

2) Site Layout

The generator house is located as closely as possible to the equipment building to shorten wiring connections. The design has considered the location of the exhaust and suppression of noise as measure against pollution.

*The layout plan for Takong Kecil and Tanjung Berakit are modified based on the result of the discussions and request by the Indonesian Side. The plans are indicated in Drawings 5 and 7 in 2.3 of the Basic Design Drawings.*

### 3) Architectural Design

#### a. General

The generator house was designed to facilitate operation and maintenance of the equipment. The house is located in an area to facilitate access for maintenance. The house will be constructed of reinforced concrete to be fire proof and corrosion resistant. The roof with wooden truss support is sloped to facilitate water drain in times of heavy downpour.

#### b. Floor Plan

The house has no compartment and will contain the generating sets, fuel tank, isolated transformer (IST) and automatic voltage regulator (AVR) among others. The location of openings was made with due consideration of protecting the facilities from salty air intrusion.

Table 2-2-12 shows the floor area schedule which was determined based on the site survey and discussions with concerned Indonesian Officials. Drawing 10 shows the plan, section and elevation of the generator house.

**Table 2-2-7 Floor Area Schedule for Generator House**

GENERATOR BUILDING - B		Total Floor Area	Piloti, Pouch, etc.	Total Construction Area
1st Floor	GENERATOR ROOM	45.00 m <sup>2</sup>	-	45.00 m <sup>2</sup>
Floor Area	45.00 m <sup>2</sup>		-	

### 2-2-2-5 Other Facilities

#### (1) Steel Tower for Radar and Communications

Steel tower will be erected to mount the radar scanner and parabola antennae for the data communication links. The tower will be constructed of steel angles commonly used in Indonesia so that fabrication and erection of the tower could be undertaken by local companies. The tower heights are determined to ensure performance of the radar scanner and parabola antennae. Table 2-2-8 shows the schedule of heights of the steel towers to be erected for each site. *Estimated Required Height of Parabolic Antennae*".

**Table 2-2-8 Study on the Required Height of Radar Towers**

Site	Level/Elevation					Tower Height	
	Ground Level (E.L.) m	Radar Scanner (E.L.) m	Parabolic Antenna (Upper) (E.L.) m	Parabolic Antenna (Lower) (E.L.) m	Tower Top (E.L.) m	from Graound Level m	from RSL of the Building m
Hiyu Kecil	28.5	63.5	58.0	53.0	62.5	34.0	
Takong Kecil	16.0	62.5	57.0	47.0	61.5	45.5	
Batu Ampar	64.5	117.4	113.0	103.0	116.4	51.9	32.0
Tg. Berakit	31.5	98.5	92.0	82.0	97.5	66.0	

Note:  
 1: EL means elevation above sea level.  
 2: Elevation of radar scanner is approximate.  
 3: Elevation of parabolic antenna is indicated at center level.

The type of substructure for the towers depends on the ground conditions for each site. In the case of Hiyu Kecil and Takong Kecil, the substructure will comprise of shallow reinforced concrete foundation which will be placed directly on top of the prepared bed manually due to the difficulty in mobilizing heavy construction equipment to the remote islands. The radar tower for the VTS Center in Batu Ampar will be constructed on top of the RC roof slab of the VTS Center building which took into account the tower load and other conditions. The substructure in Tanjung Berakit will comprise of reinforced concrete to be placed directly on top of the prepared bed considering the soil conditions.

#### (2) Fuel Supply Facilities

The VTS Sensor Stations will be provided with generating sets for power supply due to the absence of commercial power supply. Some 2,000 liters of fuel supply per month is required for the operation of the generators. In the case of the existing lighthouses, fuel is supplied

once in 3 months by a vessel owned by DN. Based on information from DGST, the frequency of supply will not vary even with the completion of the Project. Therefore, based on this consideration, the capacity of the fuel storage tanks for the sites is set for 3 months of operation.

The existing fuel supply practice for the light houses in Hiyu Kecil and Takong Kecil is by drums which are hurled onto the sea from the DN vessel anchored offshore. The drums are towed by small boats to the shore and then rolled up manually to the sites. The same method will be adopted for these sites, however, Hiyu Kecil and Takong Kecil except for slight variations to be made due to the difference in elevations between the shore and inland, at 15m and 11m respectively. Movement of the drums manually from shore to inland would therefore pose extreme difficulty and for this reason, a 1-cubic meter storage tank will be erected in an appropriate location onshore which will be filled with fuel from drums hurled from the DN vessel, similar to the supply practice for the lighthouses. The fuel on the storage tank onshore will then be pumped up to the inland fuel storage depot of the generators.

For the protection of the environment, the fuel storage tanks will be provided with oil entrapments as safeguards against possible spillage.

### 2-2-2-6 Outline of the Equipment and Facilities to be Provided

The list of equipment and facilities for the proposed VTS System are summarized in Tables 2-2-9 and 2-2-10 below.

**Table 2-2-9 Summary of Equipment**

Equipment	Unit	Quantity	1	2	3	4
			Hiyu Kecil	Takong Kecil	Batu Ampar	Tanjung Berakit
Radar System	Set	4	1	1	1	1
VHF Marine Radio System	Set	3	1		1	1
AIS Base Station System (AIS System)	Set	3	1		1	1
CCTV Camera Equipment (CCTV System)	Set	1		1		
Meteorological Sensor Unit with Data Logger	Set	2	1			1
Tracking System	Set	1			1	
Multi-function Console with VHF Radio Communication Unit	Set	5			5	
Printer System (Monochrome and Color)	Set	1			1	
Data Base for Vessel Information	Set	1			1	
AIS Server System (AIS System)	Set	1			1	
CCTV Video Display Equipment (CCTV System)	Set	1			1	
Meteorological Monitor Console	Set	1			1	
Record and Playback System for Vessel Traffic	Set	1			1	
Resource Management System	Set	1			1	
Multiplex Radio Equipment (Data Communication System)	Set	6	1	2	2	1
Web Server System	Set				1	
Equipment Desk and Others	Set	4	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	6	2	2		2
Diesel Engine Generator	Set	3	1	1		1
	Unit		4	4		4

**Table2-2-10 Summary of Facilities**

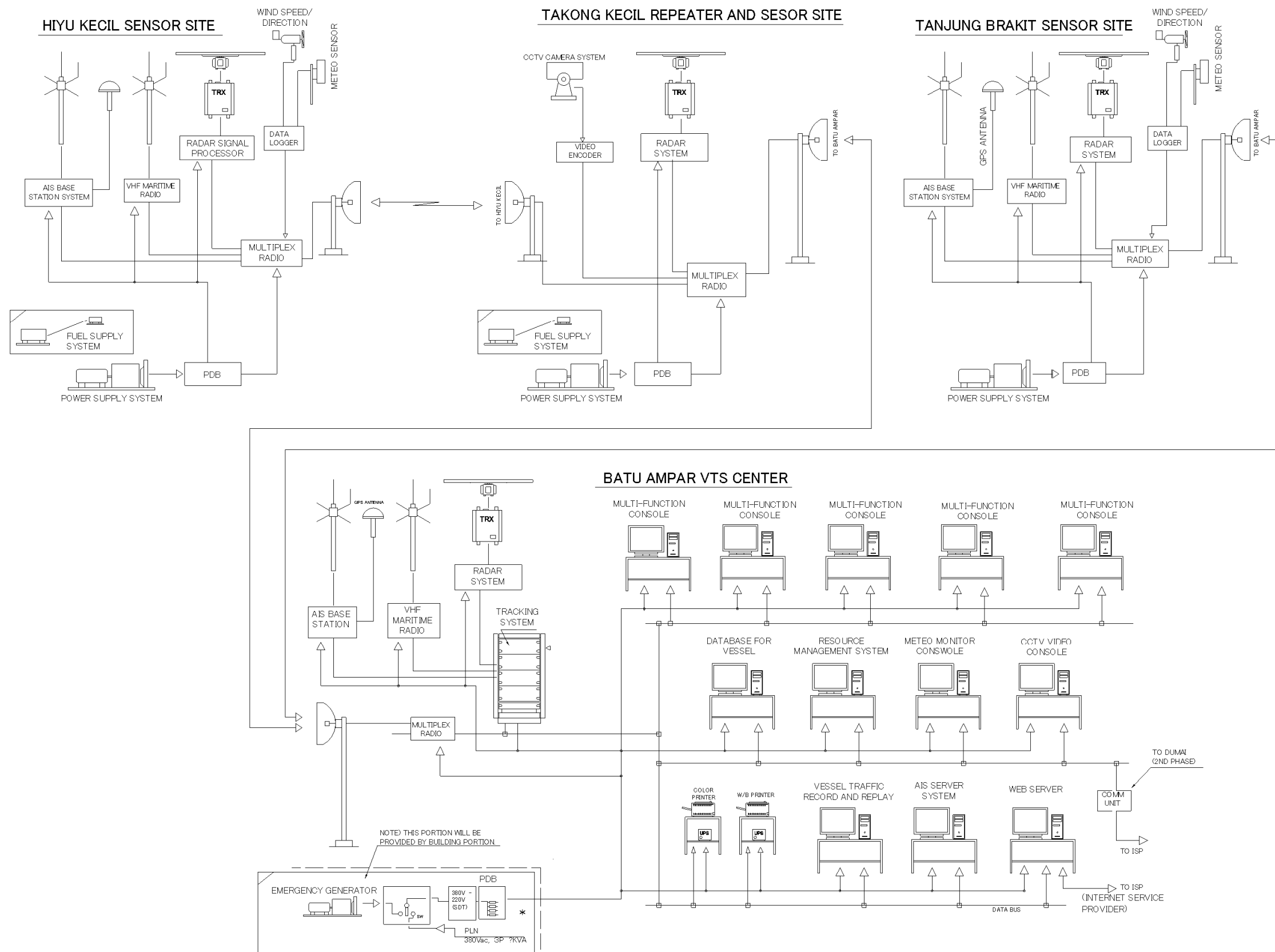
Facilities	Unit	Quantity	1	2	3	4
			Hiyu Kecil	Takong Kecil	Batu Ampar	Tanjung Berakit
VTS Center	Unit	1			1	
	m <sup>2</sup>	414			414.00	
Equipment Building	Unit	3	1	1		1
	m <sup>2</sup>	126.75	42.25	42.25		42.25
Generator Building	Unit	3	1	1		1
	m <sup>2</sup>	165	55.00	55.00		55.00
Air Conditioners (for VTS Center and Sub-Center)	Unit	1			1	
Diesel Engine Generator (Emergency Backup)	Unit	1			1	
	Kva, Units				60 KVA x 1	
Fuel Tank (Outdoor)	Unit	4	1	1	1	1
	m <sup>3</sup>		6.0	6.0	2.0	6.0
Fuel Supply System	Unit	2	1	1		
	m <sup>3</sup>		1.0	1.0		
Water Reservoir	Set	1			1	
	m <sup>3</sup>				1.5	
Septic Tank	Set	1			1	
	m <sup>3</sup>				8.0	
Steel Tower for Radar and Communications	Unit	4	1	1	1	1
	m		34.00	45.50	32.00	66.00



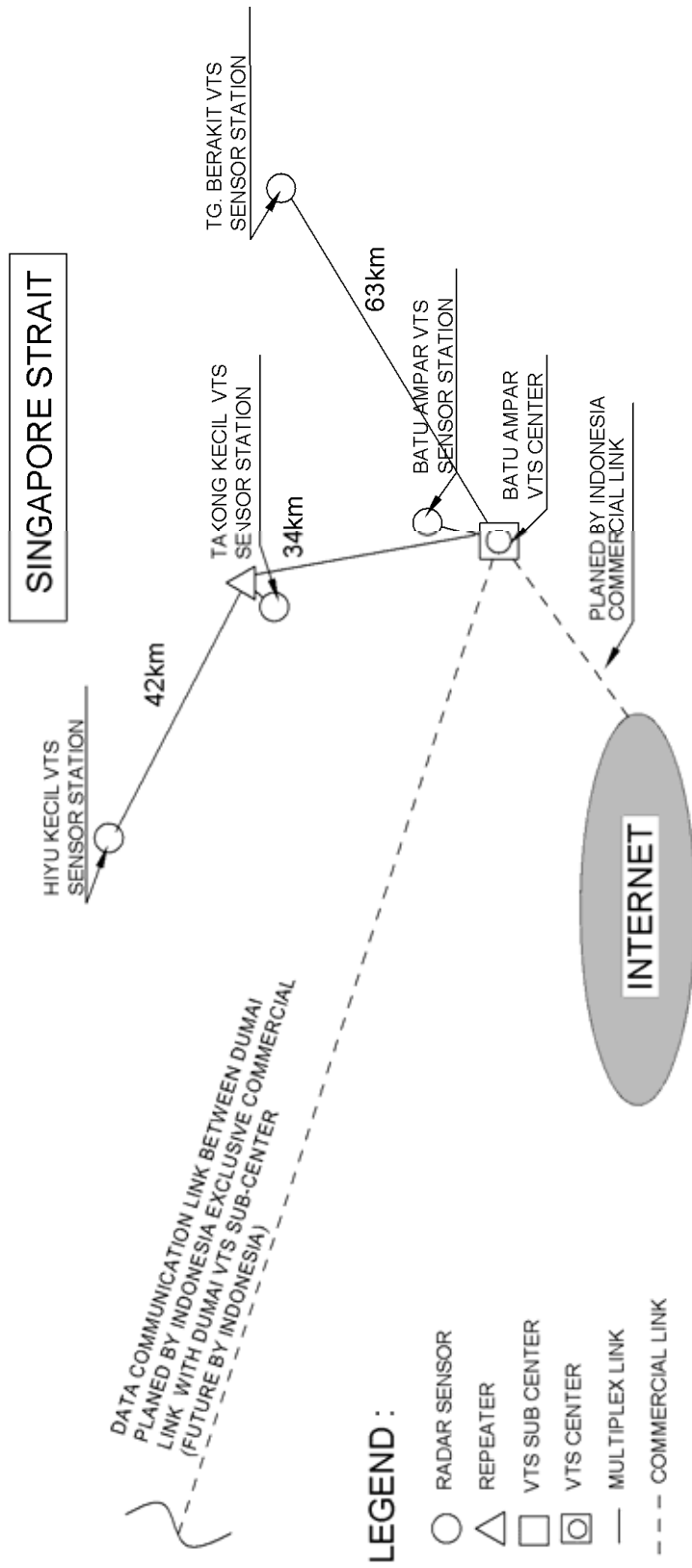
### **2-2-3 Basic Design Drawings**

The list of Basic Design Drawings is tabulated as follows:

Drawing 1	Block Diagram of VTS System
Drawing 2	VTS System Configuration
Drawing 3	Circuit Configurations
Drawing 4	Plot Plan of Facilities (1) Hiyu Kecil
Drawing 5	Plot Plan of Facilities (2) Takong Kecil
Drawing 6	Plot Plan of Facilities (3) Batu Ampar
Drawing 7	Plot Plan of Facilities (4) Tanjung Berakit
Drawing 8	Floor Plan of Batu Ampar VTS Center
Drawing 9	Elevation and Section of Batu Ampar VTS Center
Drawing 10	Plan, Elevation and Section of Equipment and Generator Building
Drawing 11	Steel Tower Elevations

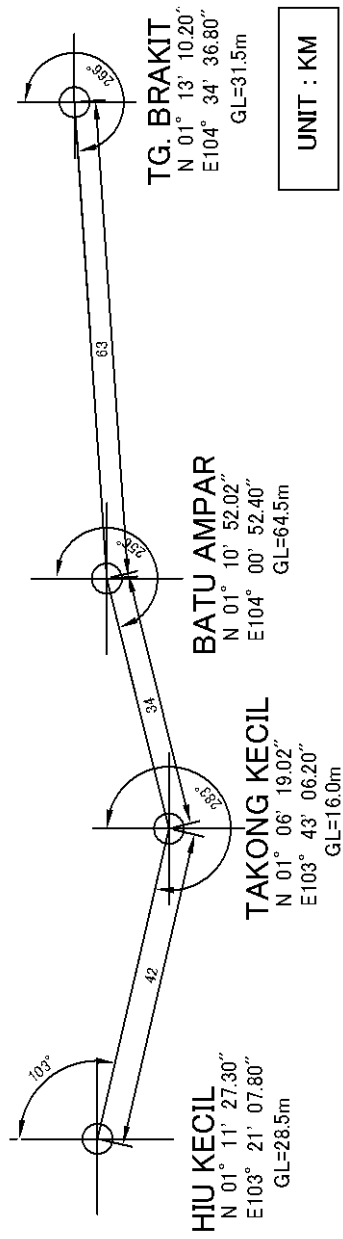


Drawing 1 Block Diagram of VTS System

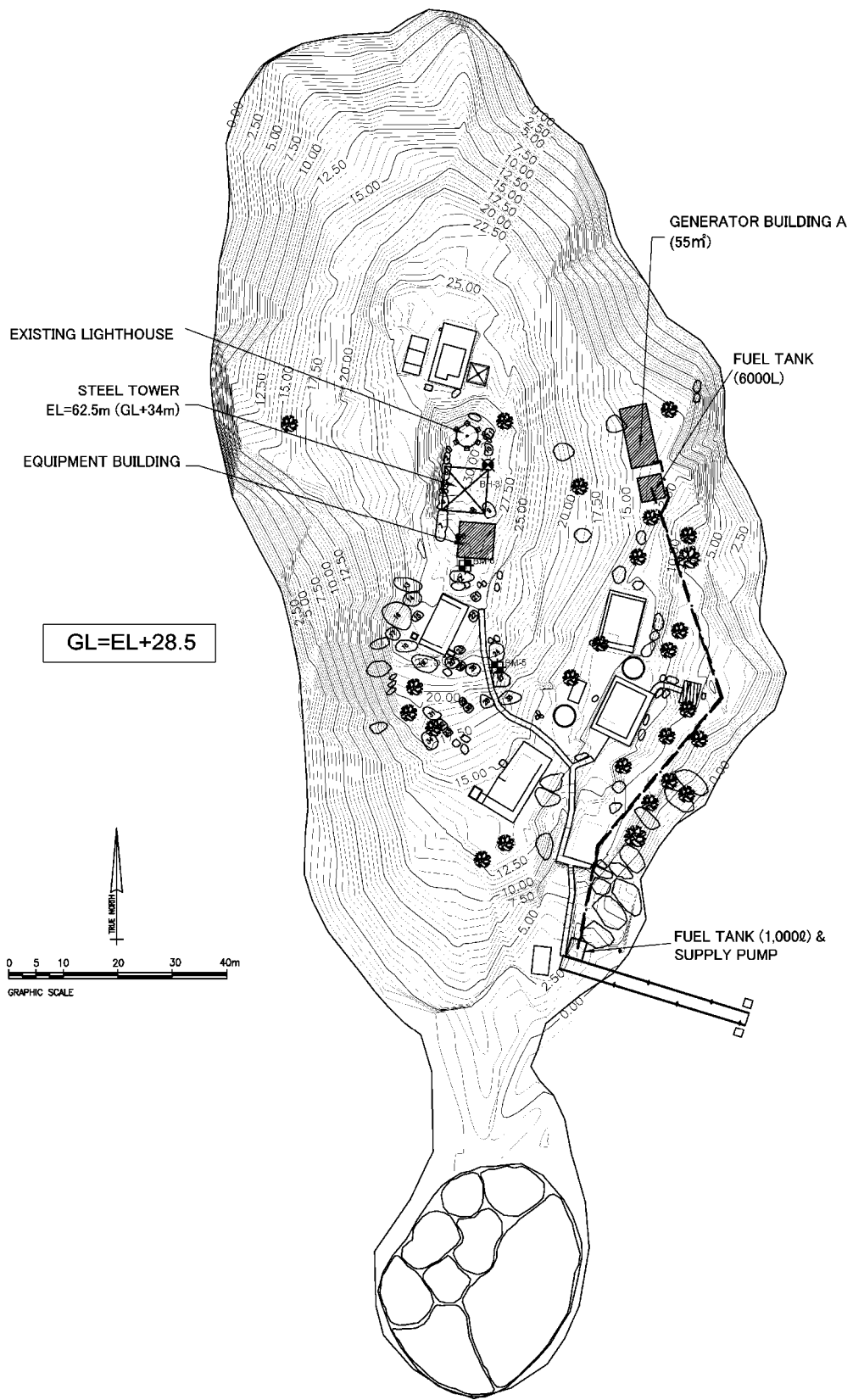


**Drawing 2 VTS System Configuration**

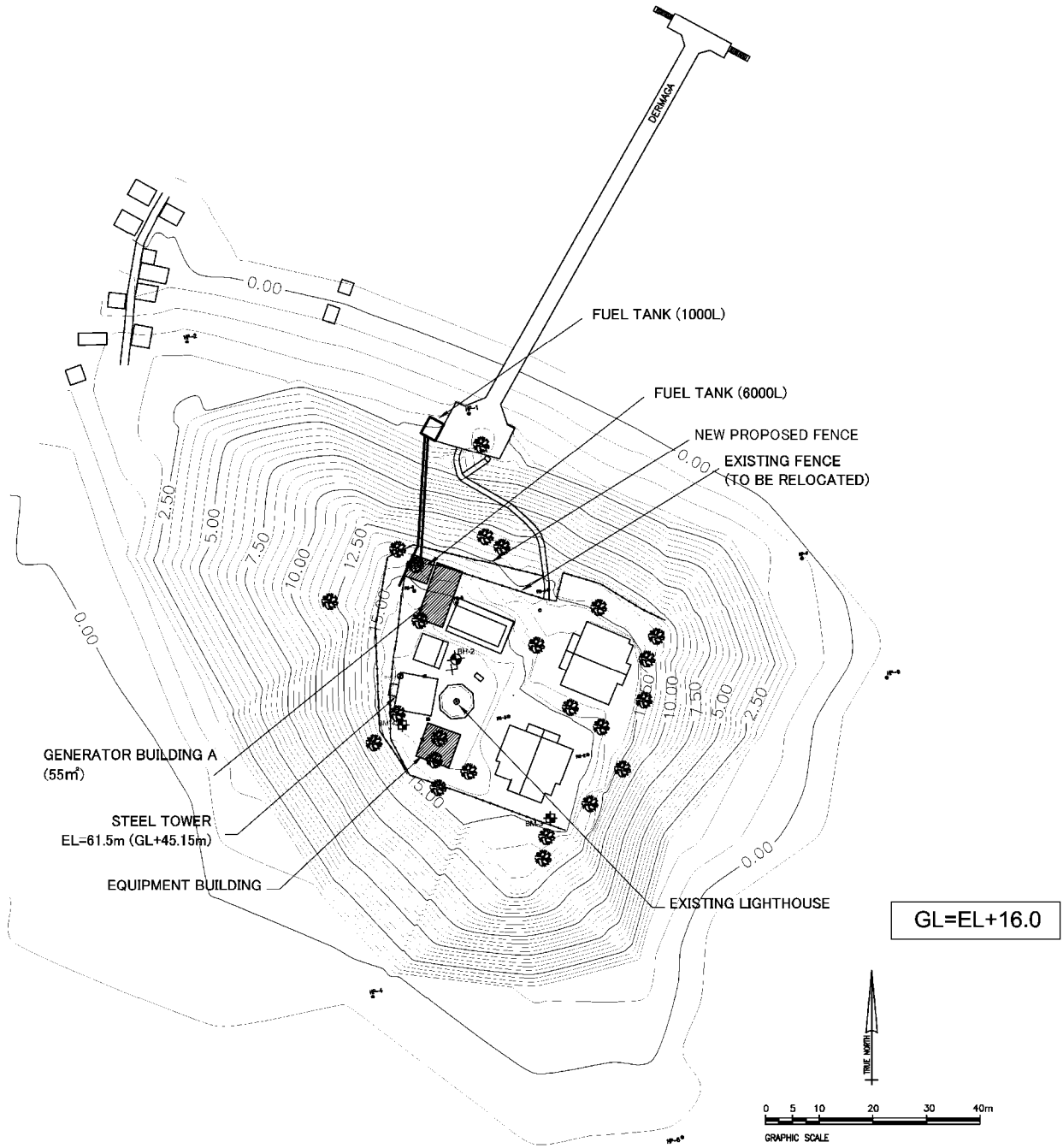
SINGAPORE STRAIT AREA



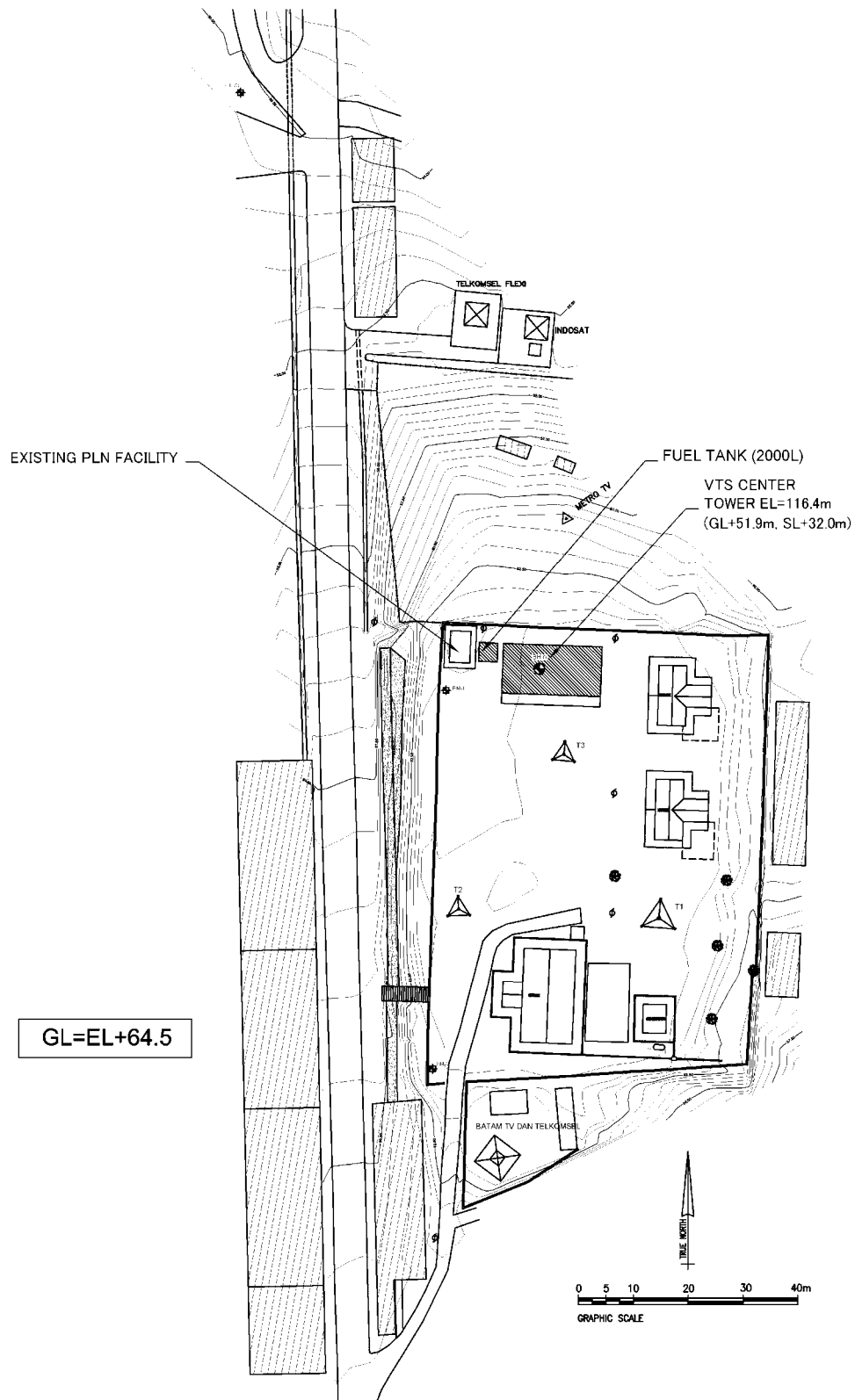
Drawing 3 Circuit Configurations



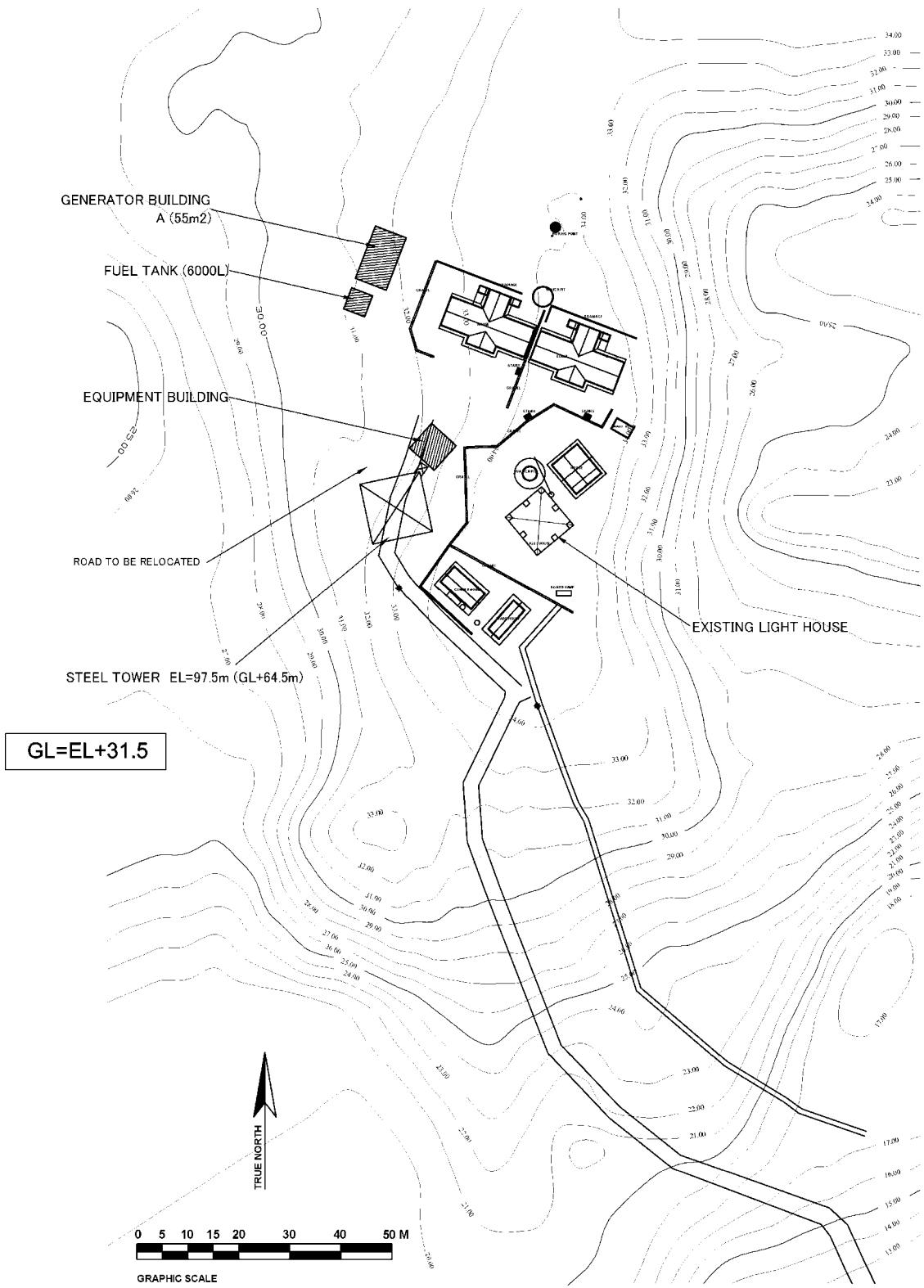
**Drawing 4 Plot Plan of Facilities (1) Hiyu Kecil**



**Drawing 5 Plot Plan of Facilities (2) Takong Kecil**

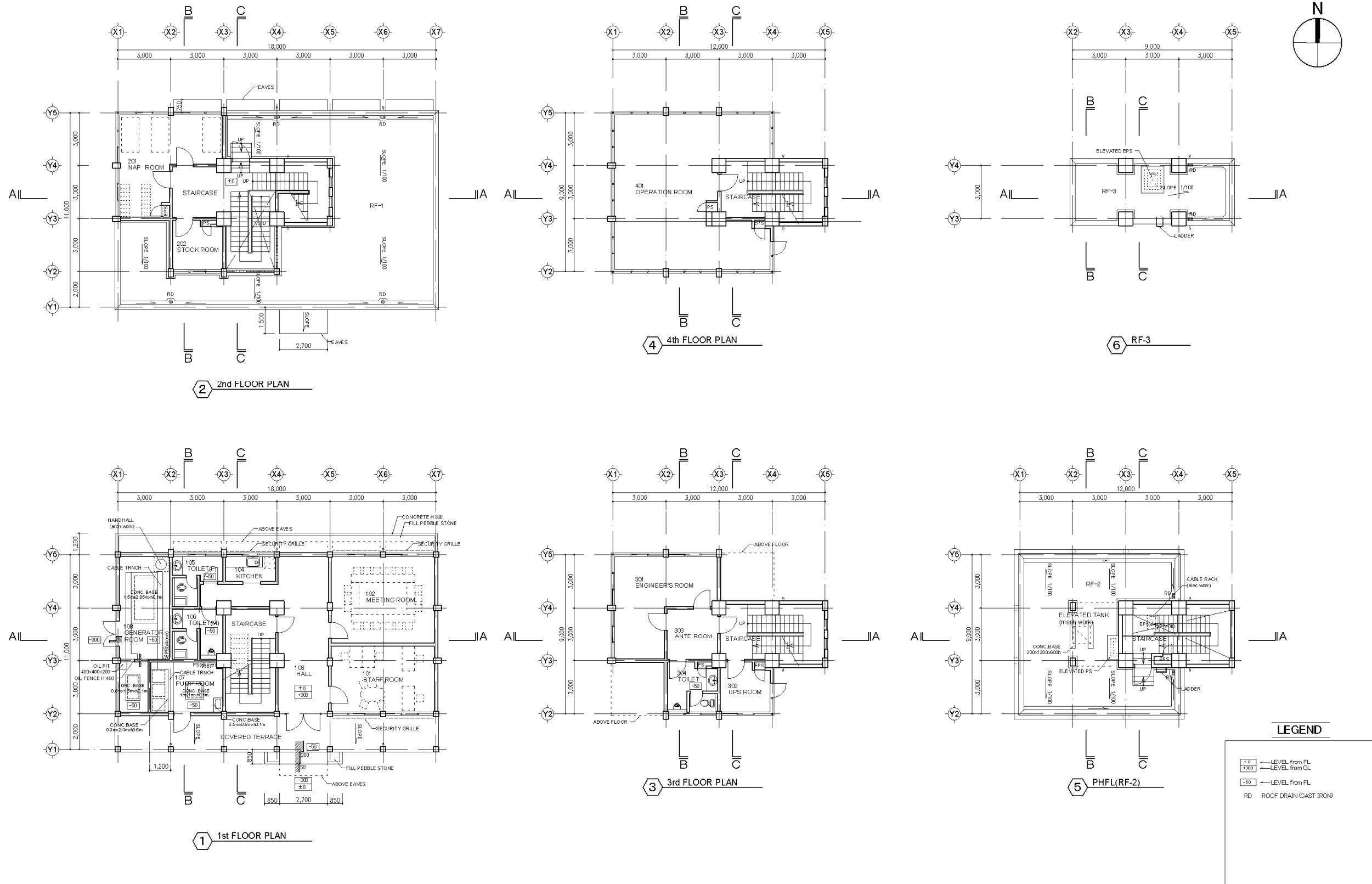


**Drawing 6 Plot Plan of Facilities (3) Batu Ampar**

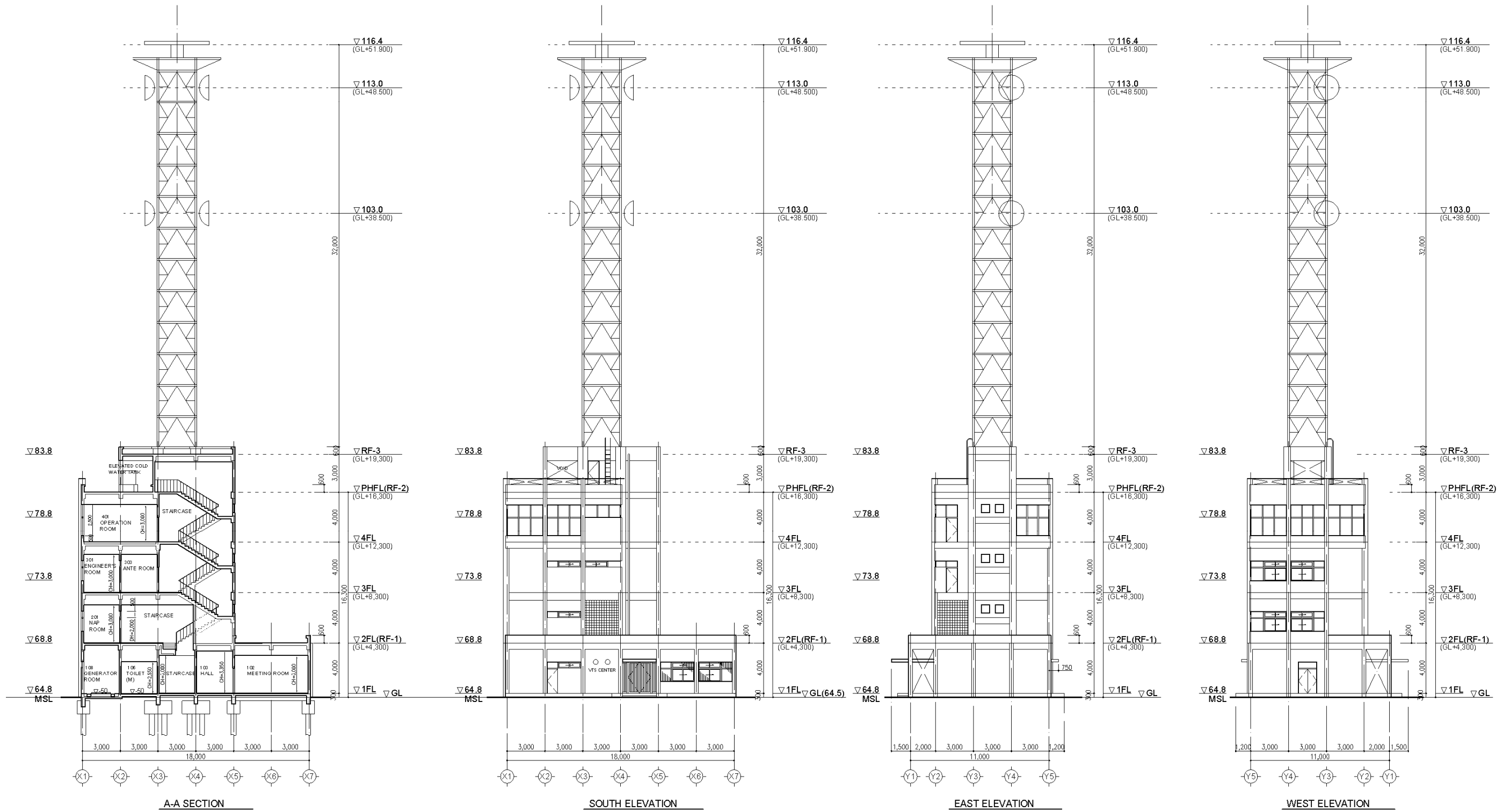


**Drawing 7 Plot Plan of Facilities (4) Tanjung Berakit**



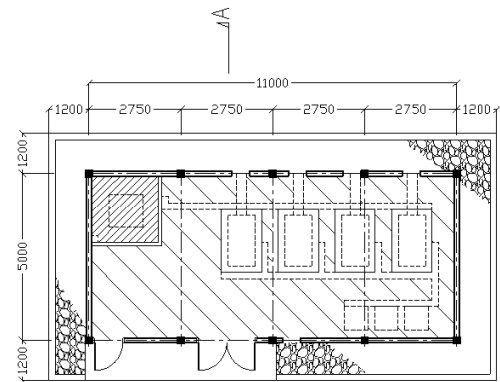


Drawing 8 Floor Plan of Batu Ampar VTS Center

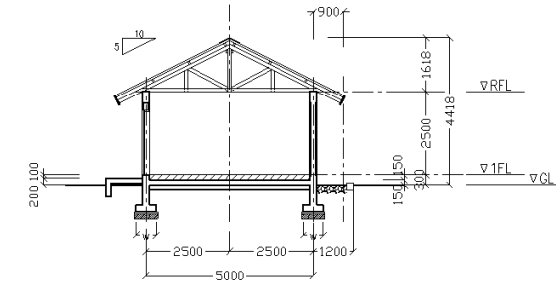


**Drawing 9 Elevation and Section of Batu Ampar VTS Center**

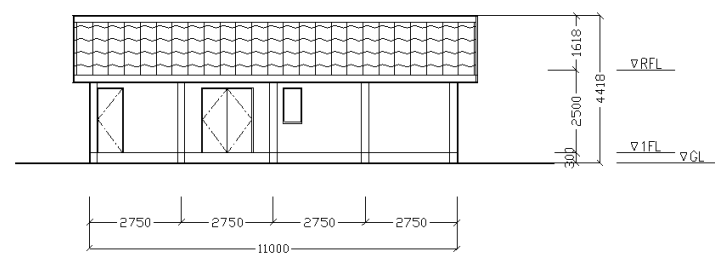
GENERATOR BUILDING (TYPE-A)



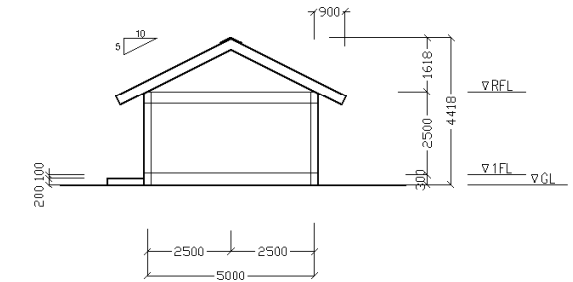
FLOOR PLAN



A-A SECTION



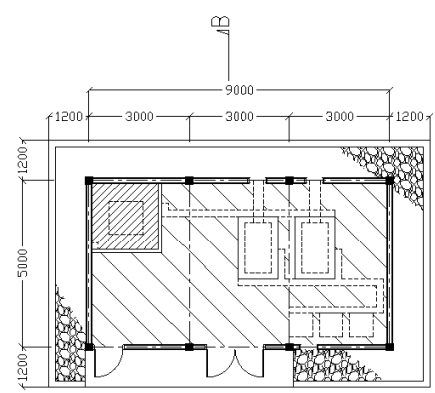
FRONT ELEVATION



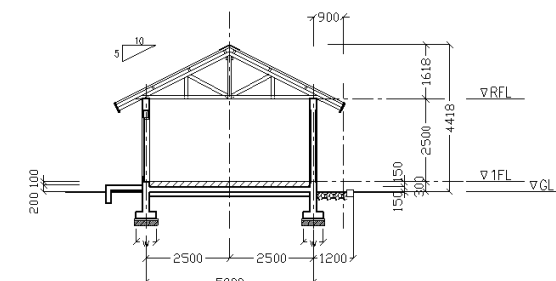
SIDE ELEVATION

NOTES:  
 W : WIDTH OF FOUNDATION FOOTING  
 W = 800 for TG. PARIT, BENGKALIS and DUMAI  
 W = 600 for HIYU KECIL, TAKONG KECIL, TG. BERAKIT and TG. MEDANG

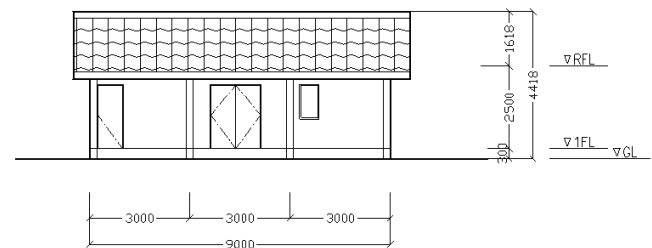
GENERATOR BUILDING (TYPE-B)



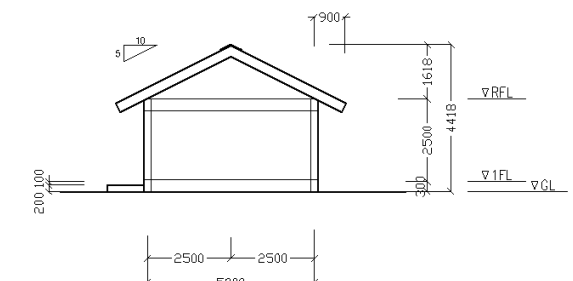
FLOOR PLAN



B-B SECTION

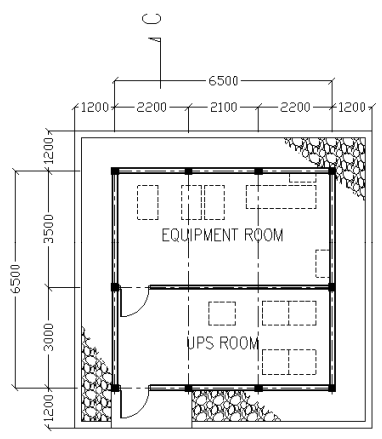


FRONT ELEVATION

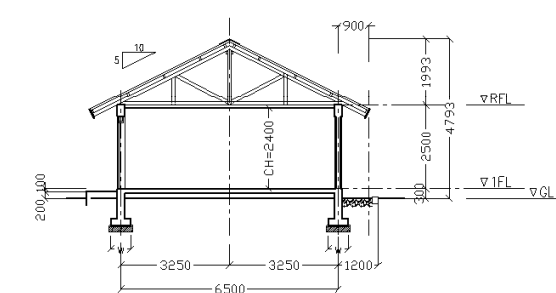


SIDE ELEVATION

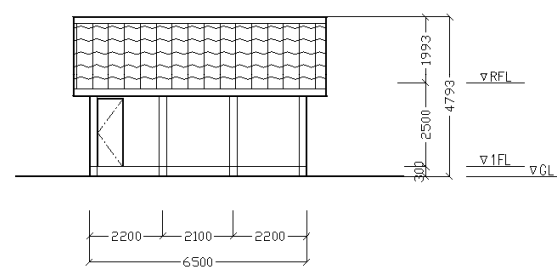
EQUIPMENT BUILDING



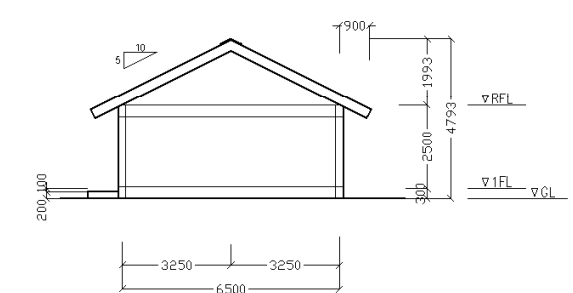
FLOOR PLAN



C-C SECTION

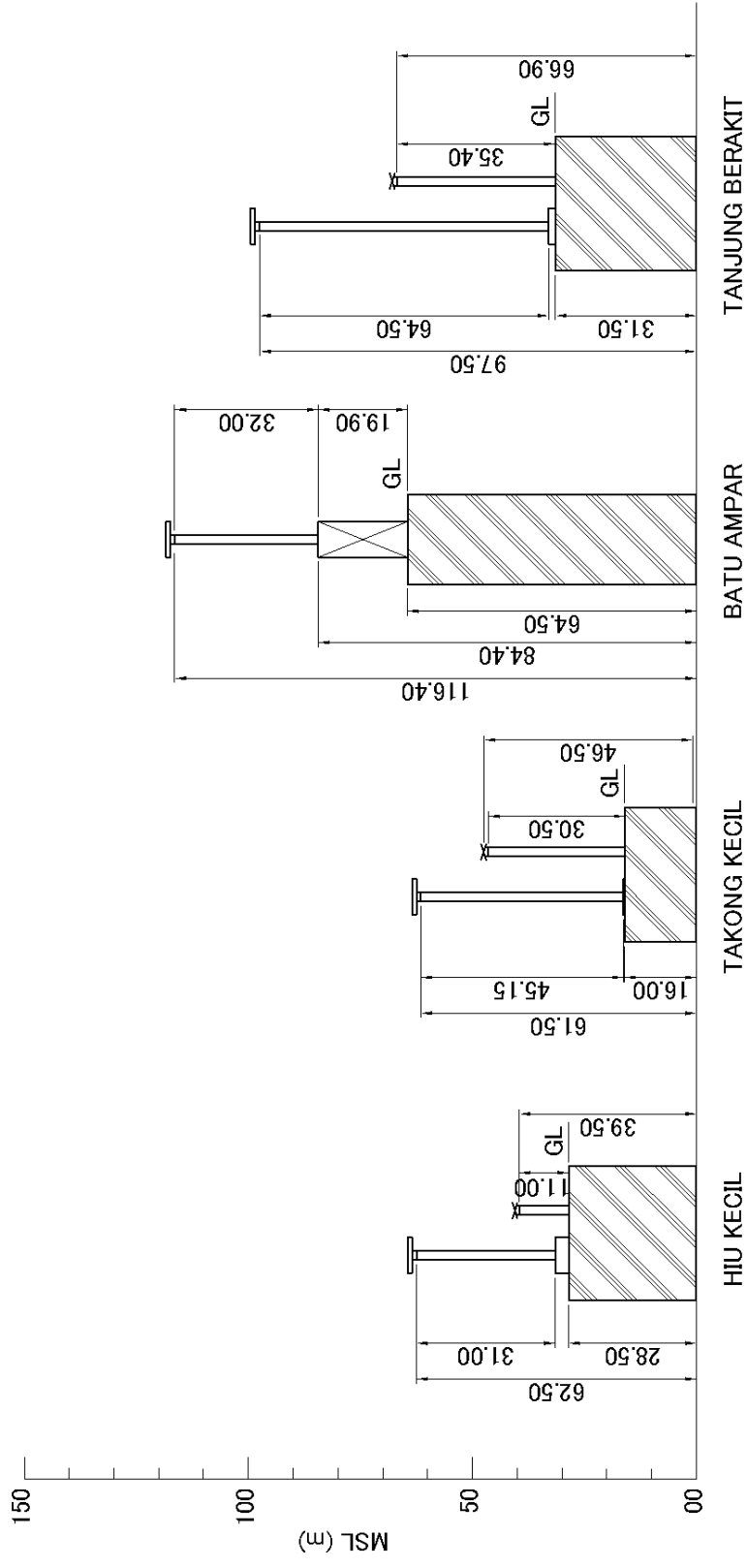


FRONT ELEVATION



SIDE ELEVATION

Drawing 10 Plan, Elevation and Section of Equipment and Generator Building



Phase I

Drawing 11 Steel Tower Elevations

## **2-2-4 Implementation Plan**

### **2-2-4-1 Implementation Policy**

Due to the absence of VTS equipment manufacturers in Indonesia, the facilities were initially conceived to be procured either in Japan, Europe or North America including Canada. The result of the quotations taken from manufacturers in Europe and America however, indicated that Japanese products are cheaper. To enhance competition, quotations were taken from more than three Japanese manufacturers. Based on the foregoing, a decision was made to procure the equipment in Japan. Selection of the most responsive bidder for the procurement of equipment will be based on the following: i) compliance with the specifications ii) ease of maintenance and iii) after sales service particularly on availability of technical support and spare parts.

The VTS System for the Project will composed of some custom-made equipment which requires specialty expertise by the manufacturers for the installation, setting up, tuning and test operation. Except however for the specialty works required to be carried out by the manufacturers, all works particularly for marine, civil, building works among others could be undertaken locally to the extent possible.

Construction materials such as cement, aggregates, steel bars, roof materials, window frames and doors among others which are available in Indonesia nationwide will be used to the extent practicable for the construction of civil and building works. The steel tower will be fabricated and erected locally due to the availability of materials and expertise.

### **2-2-4-2 Implementation Conditions**

Except for Batu Ampar, three among the four sites are located in remote areas or isolated islands. Special attention is therefore needed for hauling/delivery of materials and construction as described hereunder.

Hiyu Kecil and Takong Kecil which are located in isolated Islands are accessible only by sea and as such electricity and fresh water supply are not available. Stockpiling of materials and equipment in the Islands is not possible due to the extremely constricted space. Accordingly, construction will have to be carried out manually. The critical factor is on how to provide a yard for the stocking of materials and light equipment and the method of delivering and

replenishing materials at appropriate intervals to maintain continuous operation. One method will be the use of flat barge(s) with service/tug boats or reclamation near shore for stockpiling of materials and light equipment.

The whole island of Hiyu Kecil is resting on bedrock but the surface weathered rocks need to be removed manually and the bed prepared for the construction of the foundations/substructures of the steel tower and related building facilities.

As mentioned earlier, light emissions from the lantern of the existing lighthouse will be temporarily obstructed during the construction of the steel tower for Takong Kecil. While the steel tower will eventually be provided with a complementary lamp of the same flashing, discussions with the DGST are needed on how to remedy the temporary obstruction.

While it is possible to move on land in Tanjung Berakit, the access road is quite narrow. During the site inspection in October 2008 in the implementation review study, the supply of commercial power was available in the neighbourhood but the site was not supplied. The water supply system was not yet developed. Similar to Takong Kecil, remedial measures for the obstruction of light emissions from the existing lighthouse will have to be discussed with DGST.

#### **2-2-4-3 Scope of Works**

The following scope of works will be borne by the Indonesian Government.

- Tapping of commercial power supply for the VTS Center in Batu Ampar
- Demolition and removal of the existing fence in Takong Kecil
- Demolition and relocation of the road located in the yard of Tanjung Berakit

The Japanese side will provide the interface for data communication between Batu Ampar and Dumai while the Indonesian side will implement the interconnection link.

#### **2-2-4-4 Consultant Supervision**

- (1) Procurement Management Plan

Procurement management will be carried out by the experts for the i) radar and AIS System and

related equipment, ii) multi-function console and related software and iii) communication system. Consultancy services during manufacture of VTS components will comprise of production inspections, witnessing periodical tests, witnessing test on final completion, checking of individual equipment and system for compliance with the specifications and confirmation of console indicators as to function and compliance with the specifications.

Resident engineers will be deployed to the sites during the installation of equipments. The above-mentioned experts will also be deployed to conduct i) inspections of equipment during arrival at site and, ii) final inspection after the installation of the whole system has been completed.

## (2) Construction Management Plan

A Japanese resident engineer will be deployed from the start of construction up to final completion for the supervision of works and quality control of materials. Local engineers will assist in the construction supervision considering that constructions will be carried in four isolated sites simultaneously. In addition to the above, building, structural, steel tower, electrical and mechanical Japanese engineers will be deployed at the commencement of works for periodical inspections for quality work assurance and inspections on completion of works.

### **2-2-4-5 Quality Control Plan**

#### (1) Equipment

Following inspections are planned to be conducted during the manufacture of the equipment and installation:

##### 1) Factory Inspections

To check and monitor the factory progress of manufacturing, mid term and final inspections will be conducted upon completion. The scope of services for mid term inspections will include the following: i) to settle unclear and doubtful issues during manufacture, ii) to check the progress of fabrication and, iii) to check items which are required for effective final inspections. Final inspection will be conducted in Japan prior to delivery of products. This includes: i) compliance of individual equipment with the specifications, ii) compliance of the console indication and functions of each

equipment with the specifications. The inspection will be conducted both for the whole system and individual main equipment.

#### 2) Inspections Prior to Shipment

A third party will be engaged for the verification and quantity check of all the equipment prior to shipment.

#### 3) Field Inspections

When the individual equipment is installed and connected at site, it will be subjected to midterm field inspections in the presence of the Consultants. The scope of the mid term field inspections to be conducted by the manufacturer will comprise of verification for performance as to compliance with the specifications for the individual equipment and for the system as a whole.

Mid term inspections will be conducted when equipment installations have started at site and after minute adjustments and fine tunings have been completed.

#### 4) Turn Over of System to the Owner

The Owner will carry out a trial operation run of the system to verify system functions and performances compliance with the specifications. After the verification, all records of the mid term inspections for all sites will be compiled for concurrence by all parties concerned for acceptance of the Owner. Thereafter, the whole facilities/system will be turned over to the Indonesian Government for operation.

### (2) Facilities

The following tests will be carried out for materials to be incorporated for the works:

#### 1) Aggregate Test

Test will be carried out for specimens to determine the acceptability of the quarry prior to approval. Spot checking of delivered materials will be conducted and as necessary test will be undertaken on: i) specific gravity, ii) water absorption ratio, iii) Los Angeles test, iv) Alkali aggregate reaction, among others.



## 2) Tensile Strength Test/ Mill Certificates

Tensile strength test of reinforcing bars will be carried out in addition to submission of mill certificates prior to approval for use.

## 3) Slump Test

Slump test will be conducted prior to placing concrete per batches at all sites.

## 4) Concrete Compression Test

Concrete compression test will be conducted in the laboratory of the supplier for ready mixed concrete for Batu Ampar. Test of concrete specimens for the other sites will be conducted in Batu Ampar. Sampling is planned to be conducted at every 150m<sup>3</sup> concrete casting or at least one time per day. Three pieces of test specimens will be prepared each for 7 days and 28 days strength test. These test pieces will be transported to Batu Ampar before the date for compression test.

## 5) Tensile Strength Test for Angular Steel and Steel Plate for the Radar Tower

Tensile strength test of steel materials for the steel tower will be carried out prior to use of the material in the factory. Material quality will be controlled by the mill certificates submitted by the supplier.

### **2-2-4-6 Procurement Plan for Materials and Equipment**

#### (1) Spare Parts and Consumables

Japanese manufacturers normally have overseas branches and/or service agencies worldwide including Indonesia to facilitate immediate repairs in the unlikely event of breakdown. Spare parts which need to be regularly replaced will be provided as part of the Project. The spare parts to be included in the Project will be good for one year of operations as recommended by the manufacturer.

Stationeries including ink and papers are excluded from the scope of the Project.

## (2) Delivery of Materials and Equipment

Equipment procured from Japan will be delivered to the respective sites through Tg. Priok for customs clearance. The equipment will be transported to Batu Ampar Port from Tg. Priok. Transportation from Batu Ampar to the sites will depend on the mode of transport available at the time of transfer. Barges or LCTs will be used for equipment transport to Hiyu Kecil and Takong Kecil.

Construction materials including aggregates, cement, building materials among others will be procured in Batam. Steel materials for the tower will be procured from Jakarta using the transportation route as that for the equipment.

### **2-2-4-7 Operational Guidance Plan**

#### (1) Guidance for Operation

Guidance for operation and maintenance are indispensable for the efficient operation of the VTS System more so that the system is the first of its kind in Indonesia for the surveillance of the Straits.

The guidance for VTS operations will be prepared by the manufacturer under the supervision of the Consultants. All guidance materials will be provided by the manufacturer. Instructors will be Indonesian engineers who conducted the tuning and test operations. Table 2-2-11 hereunder shows the guidance program and the number of staffs to be trained.

**Table 2-2-11 Guidance for Operations Program and Staffing Schedule**

Location	VTS Center
Trainee (Expected)	16 personnel
Contents	
① Outline of the system	○
② Start and stop method of the console system	○
③ Operation of the radar console	○
④ Operation of AIS	○
⑤ Operation of VHF	○
⑥ Play back operation	○
⑦ Operation of vessel data base	○
⑧ Operation of resource management	○
⑨ System trouble measures	○

(2) Guidance for Maintenance

Table 2-2-12 hereunder shows the guidance program and staffs to be trained. The guidance will be conducted by Indonesian engineers of the manufacturer under the supervision of Japanese engineers who conducted the adjustment and fine tuning of the system.

**Table 2-2-12 Guidance for Maintenance Program and Staffing Schedule**

Location	VTS Center	Site
Trainee (Expected)	5	3 each
Contents		
① Outline of the system	○	○
② Start and stop method	○	○
③ Conditions of system operation	○	
④ Basic Operation of the VTS System	○	
⑤ Maintenance of power source	○	○
⑥ Measures during power breakdown	○	○
⑦ Maintenance for the micro wave transmission system	○	○
⑧ Maintenance for the radar transmitter and receiver	○	○
⑨ Maintenance for the VHF transmitter and receiver	○	○
⑩ Maintenance for the AIS base station	○	○
⑪ Maintenance for the CCTV camera	○	○
⑫ Server Maintenance	○	
⑬ Structure of the software system	○	
⑭ Maintenance for vessel data base	○	
⑮ Operation of the WEB system	○	

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

To achieve the objective of the project for the monitoring of the straits and to ensure and enhance traffic safety, the technical support should focus on training of Indonesian staffs for the operation and maintenance of the VTS System in addition to the guidance for operation and maintenance. As mentioned many times earlier, the system which is the first of its kind in Indonesia for the surveillance of the straits will require fully trained staffs for the efficient operation and maintenance of the VTS facilities.

Stage-1, the VTS System is under installation, therefore, the training for operations and maintenance as a soft component by using the system will be considered in Stage-2. Technical cooperation is also to be considered.

### 2-2-4-9 Implementation Schedule

The schedule for implementation is shown in Fig. 2-2-3.

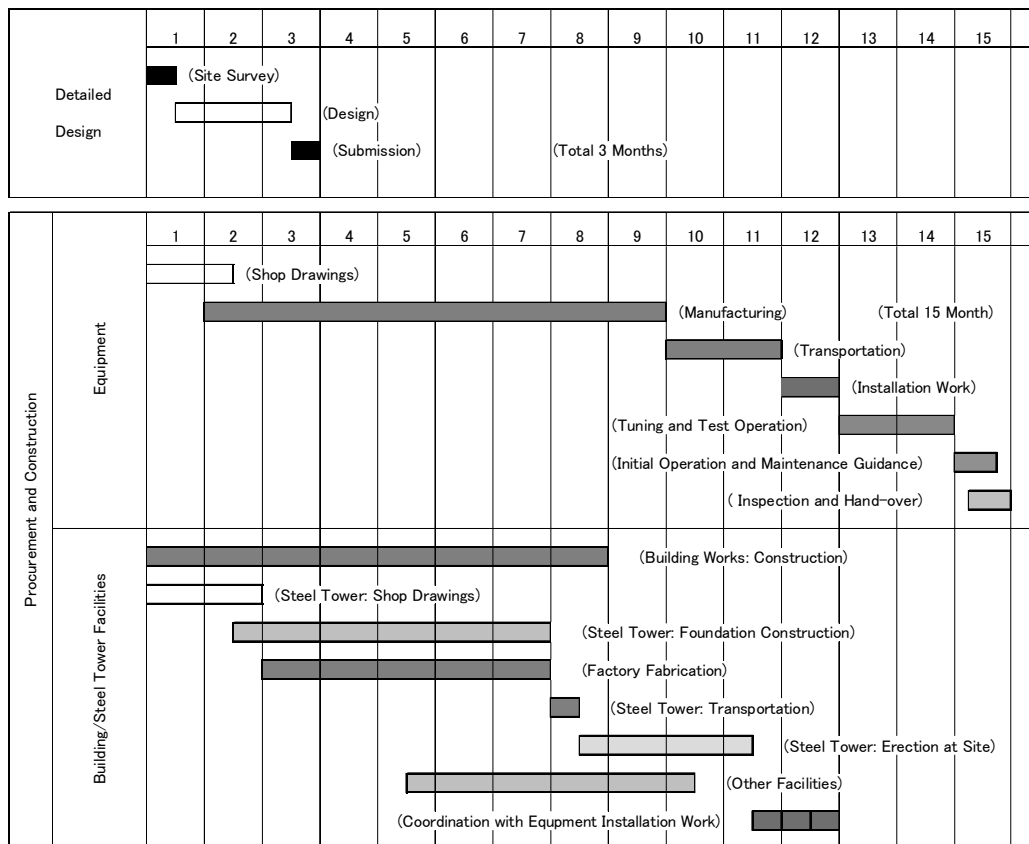


Fig. 2-2-3 Implementation Schedule for Stage-1

### **2-3 Obligations of Recipient Country**

The full cooperation of the Indonesian Government is being for the following tasks for the smooth implementation of this Grant Aid Project:

- Taxes and duties exemption
- Facilitation of project activities
- Provision of banking arrangement
- Authorization for Payments

Procurement and installation of the equipment and, construction of facilities will be conducted by the Japanese side, but the cooperation of the Indonesian side is needed for smooth implementation of the Project particularly on the following:

- Issuance of permits to enter the construction sites and construct
- Arrangement in obtaining the following licenses
  - wireless communication for radar image transmission
  - multiplex radio for data communication
  - VHF radio communication
- Issuance of permits to use the existing wharf in Hiyu Kecil and Takong Kecil for handling of construction materials, and to construct a temporary yard for stocking of construction materials
- Tapping of commercial power supply for the VTS Center in Batu Ampar
- Demolition and relocation of the existing fence in Takong Kecil
- Demolition and relocation of the road located in the yard of Tanjung Berakit
- Issuance of notices to related authorities regarding the provision of temporary navigation light aid during the construction of the radar steel tower due to the obstruction of light emissions from the existing lighthouse in Takong Kecil and Tanjung Berakit
- Notice to mariners and related international authorities, modification of sea charts as well as the Indonesian List of Lights according to the modified specifications of Takong Kecil lighthouse
- Procurement and installation of furniture inside of the buildings except racks for equipment installation

## **2-4 Project Operation Plan**

### **2-4-1 Maintenance Structure**

#### **(1) Area of Responsibility**

According to DN, the Navigation District Offices (Distrik Navigasi) will be tasked for the operation and management of the VTS System under the following arrangements:

##### **1) Tanjung Pinang Navigation District**

Batu Ampar, Takong Kecil and Tanjung Berakit will be under control of this office.

##### **2) Dumai Navigation District**

Hiyu Kecil will be under control of this office.

Operation-wise, information gathered in Hiyu Kecil, Takong Kecil, Batu Ampar and Tanjung Berakit will be transmitted to Batu Ampar VTS Center for intensive monitoring. For efficient operation, full cooperation/coordination between Dumai and Tanjung Pinang is required for the operation of Hiyu Kecil which needs to be simplified to avoid possible confusion. For this reason, it is desirable that Hiyu Kecil be under the control of Tanjung Pinang Navigation District instead of Dumai.

#### **(2) Staffing schedule**

Table 2-4-1 and Table 2-4-2 hereunder show the staffing schedule of DN for the VTS operations.

**Table 2-4-1 Staffing Schedule for the Operation  
(VTS Center/Sub-Center and Sensor Station)**

Position	VTS	
	Center	Site
Project Manager	1	-
Deputy Project Manager	1	-
Clerk	2	-
Computer Engineer	1	-
VTS Management	5	-
VTS Operator	10	-
Electrical Engineer	2	1
Technical Assistant	2	2
Total	24	3

**Table 2-4-2 Staffing Schedule by Sites**

Site	Number of Staff
Hiyu Kecil	3
Takong Kecil	3
Batu Ampar	24
Tanjung Berakit	3
Total	33

#### **2-4-2 Maintenance Method**

A basic understanding of the system is required for the staffs in charge with the preparation of the operation and maintenance manuals, systems and regulations. Taking this into account the support and concrete advices from experienced personnel is necessary for the operation of each site.

According to DN, fuel and other required consumables for the VTS operation will be supplied once in 3 months considering based on the operation frequency for the existing lighthouse. Continuous supply of fuel, consumer goods, spare parts, daily necessities and water for the staffs at the sites will be considered to ensure and maintain efficient VTS System operations. For this to be realized, the establishment of regulations and manuals for fuel and consumer goods supply operations must be prepared based on supply frequency and number of staffs to deployed for the operations.

## 2-5 Project Cost Estimation

### 2-5-1 Initial Cost Estimation

#### (1) Cost to be borne by the Recipient Country

The scope of cost to be borne by the Indonesian side is listed as follows:

- Demolition and removal of the existing fence in Takong Kecil
- Relocation of the road in the yard of Tanjung Berakit
- Furnitures in the Buildings and others
- Bank commissions

The cost for the above works is estimated at about Rp.225.3 million.

#### (2) Bases of the Cost Estimates

The bases of the cost estimates are listed in the tabulation hereunder.

1) Base date	November 2008
2) Exchange Rate	1 US Dollar = 106.75 Yen 1 Rp. = 0.0126 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.

### 2-5-2 Operation and Maintenance Cost

The maintenance cost for VTS System after completion of Stage-1 development comprising Hiyu Kecil, Takong Kecil, Batu Ampar and Tanjung Berakit, is estimated at Rp. 7.13 Billion (¥ 90 Million). The cost is exclusive of salaries of staffs for the operation of the VTS System. The annual budget of DN at Rp. 963.23 Billion (¥ 12.1 Billion) in 2008, for salaries of staff are reduced to Rp.781.37 Billion (¥ 9.8 Billion), and the estimated operation costs for Stage-1 will account about 0.9 % of the annual budget of Rp. 781/37 Billion exclusive of staff salaries. Maintenance of the steel tower by paint application at 10 year interval is estimated at Rp. 2.3 Billion (¥ 29 Million) for 4 the sites for Stage-1 development.



## **2-6 Other Relevant Issues**

### **(1) Formalities to be undertaken for Japanese Grant Aid Project Programs**

The proposed project through official grant aid of the Japanese Government is the first undertaking of DN. As part of the preparatory works for the implementation of the project, the cooperation from the Indonesian side is needed for the i) contract signing for the Consultant and the Supplier, ii) B/A (Banking Arrangement), iii) A/P (Authorization to Pay) among other formalities and others as required.

### **(2) Demarcation of AIS with MEH Project**

The AIS system for Hiyu Kecil and Tanjung Medang will be installed as part of the MEH project which planned the installations simultaneously. To ensure smooth implementation of the works, the Indonesian Government's cooperation is being sought for the coordination of the implementation between the two related projects. DN previously explained that the AIS to be provided for both sites is based on the present plan of initial simultaneous operations in of the following: i) the main purpose of the AIS to be implemented by MEH project is for the surveillance of VLCC in the TSS to enhance traffic safety for the protection of the environment in the Straits, ii) Procurement of the equipment is scheduled in 2008, iii) MEH project is connected with several government agencies including the Ministry of Environment, Batam Industrial Development Authority (BIDA), DGST, among others iv) MEH project is a demonstration project and therefore the function and final estimated cost have not yet been finalized.

The AIS system to be implemented by the MEH Project will be for two-year test operation for demonstration purposes only and for this reason, the conditions of use have not yet been finalized. Therefore, at present, to consider the joint use of the facility will be difficult. In addition, the MEH project is not progressed since April 2008 due to some discussions and coordination among the related authorities.

Since the AIS system under the JICA Project is a fundamental component of the VTS System, for smooth implementation of the project, installation of AIS for Hiyu Kecil in Stage-1 will be conducted as scheduled.

## **Chapter 3    Project Evaluation and Recommendations**

## Chapter 3 Project Evaluation and Recommendations

### 3-1 Project Effect

#### (1) Expected Benefits

The implementation of the Project is expected to generate the following benefits:

**Table 3-1-1 Project Benefits**

Current Problems	Countermeasure with the Project	Direct Effect and Extent of Improvement (Quantifiable Benefits)	Indirect Effect and Extent of Improvement
1. Monitoring of marine traffic in the Straits can not be conducted due to the absence of VTS System.	- Establishment of VTS System in Singapore Strait. (4 VTS Sensor Stns, and 1 VTS Center)	Traffic surveillance for objective area through VTS System is possible.  ( (i) Ship monitoring conditions through VTS operation, (ii) monitoring of aggregate traffic operation hours by VTS System)	The VTS System will contribute to the following:  - ship navigation safety in the Straits  - reducing the risks of marine accidents  - increasing the rescue rates of lives and assets  - decreasing illegal ships and activities in the Straits  - law enforcement against illegal ships and activities in the Straits  - improving of legal systems required for ship control and training of ship control operators
(i) Monitoring of ship movement in Malacca and Singapore Straits is not possible.	- Installation of Radar Scanners at Sensor Stns and Multi-function console at VTS Center in Singapore Strait.	Ship movement surveillance for monitoring area is possible through radar scanner and monitoring console.  (Monitoring of number of ships)	
(ii) Ship information can not be monitored due to the absence of AIS	- Installation of AIS Base Station at VTS Sensor Stns in Singapore Straits and installation of AIS Server System at VTS Center	Receipt of ship information and ship monitoring passing through the surveillance area by AIS is possible.  (Number of monitored ships received by AIS information)	
2. Service information particularly weather dissemination for safety of navigations is not possible.	- Installation of meteorological sensor at VTS Sensor Stns in Singapore Straits - Installation of VHF marine radio system and AIS system	Dissemination of service information including meteorological data collection from VTS Sensor Stations to the ships is possible in the surveillance area through VHF and AIS system.  (Number of information disseminated)	
3. Sufficient communication is not possible for ship positions and other necessary information for rescue operations during the occurrence of accident	- Establishment of VTS System in Singapore Straits (Installation of Radar, Multi-function Console, VHF marine radio system)	Provisions of service information to related guard and rescue organizations for joint rescue cooperation in times of accidents.  (Number of cooperation frequencies with the related guard and rescue organizations using VTS System)	

### **3-2 Recommendations**

The VTS System is envisioned to contribute to the safety of navigation in the Straits. To achieve the objective, the following is strongly recommended.

(1) Operation and Maintenance

- 1) Enhancing the basic understanding of operators and administrators for the operation of the VTS System,
- 2) Training of staffs for the efficient operation of the VTS System,
- 3) Training of staffs for inspection, trouble shooting and maintenance of the VTS System,
- 4) Establishment of operation and maintenance organization, preparation of operation and maintenance rules, manuals and, establishment of logistics system for fuel and consumer goods supply to each site for efficient VTS System operation,
- 5) Preparation of training program for operators and supervisors for the operation of the VTS System,
- 6) Establishment of pertinent laws for ship traffic in territorial waters of Indonesia,
- 7) Coordination with other related organization in Indonesia including BAKORKAMLA.

(2) Cooperation and coordination with the littoral States and International Organizations

Malacca and Singapore Straits are international straits and any duly foreign registered vessel can pass through the Straits. Therefore, VTS operations for the Straits are necessary to be supported with appropriate agreement and collaboration among the littoral states and International Organizations including the IMO. Until such time that an agreement has been reached, operations of the VTS System shall be limited only for the monitoring of the Straits at the Indonesian Side.

The main purpose of the VTS System to be provided by this Project is for the surveillance of small vessels crossing the TSS which are posing hazard to safety of traffic particularly for very

large vessels navigating along the TSS main routes. Under this concept, for the time being, the operations of the VTS System will be limited only for the monitoring of the Straits at the Indonesian Side. However, Indonesia may soon be jointing its colleagues (Malaysia and Singapore) which have already been operating their own VTS. Considering the limited space in the Straits, the individual operation of VTS System will most likely create possible confusion in the surveillance of the Straits if joint operation is not pursued. The MEH project is also currently coordinating with littoral states and IMO in enhancing the safety navigations and environmental protections in the Straits.

Measures to enhance traffic safety, protection of marine environment in support to the search and rescue missions and oil pollution protection programs are topics of discussions in Tripartite Technical Experts Group (TTEG) meeting by the littoral states. Indonesian Government's initiative to promote effective VTS System operations through appropriate tripartite discussions, coordination and cooperation are highly desirable for concurrence by International Organizations.

## **Appendices**

## Appendix-1: Member List of the Study Team

### (1) First Field Survey (February 12 to March 11)

Mr. Toshiyuki IWAMA	Team Leader	Director for Transportation and ICT Division 3 Economic Infrastructure Department Grant Aid Management Department Japan International Cooperation Agency
Mr. Masahiko KOSHIMIZU	Chief Consultant/ Maintenance, Operation and Management (MO&M) Specialist	Oriental Consultants Co., Ltd.
Mr. Mitsumasa NOGUCHI	Equipment Planning Specialist 1	Japan Aids to Navigation Association
Mr. Kazuma INOUE	Equipment Planning Specialist 2	Oriental Consultants Co., Ltd.
Mr. Jun YAMAUCHI	Transmission Facilities Specialist	Oriental Consultants Co., Ltd.
Mr. Takatsugu SHIMADA	Building Planning Specialist	Oriental Consultants Co., Ltd.
Mr. Sumio MORITA	Procurement and Estimation Engineer	Oriental Consultants Co., Ltd.

### (2) Second Field Survey (November 30 to December 24)

Mr. Toshiyuki IWAMA	Team Leader	Director for Transportation and ICT Division 3 Economic Infrastructure Department Grant Aid Management Department Japan International Cooperation Agency
Ms. Kyoko OKAMURA	Project Coordinator	Transportation and ICT Division 3 Economic Infrastructure Department Grant Aid Management Department Japan International Cooperation Agency
Mr. Masahiko KOSHIMIZU	Chief Consultant/ MO&M Specialist	Oriental Consultants Co., Ltd.
Mr. Jun YAMAUCHI	Transmission Facilities Specialist	Oriental Consultants Co., Ltd.
Mr. Takatsugu SHIMADA	Building Planning Specialist	Oriental Consultants Co., Ltd.
Mr. Sumio MORITA	Procurement and Estimation Engineer	Oriental Consultants Co., Ltd.
Mr. Keiji YAMAZAKI	Electrical Engineer	Oriental Consultants Co., Ltd.

## Appendix-2: Study Schedule

### (1) First Field Survey (February 12 to March 11)

No.	Date	Leader	Chief Consultant/ Maintenance, Operation and Management Specialist	Equipment Planning Specialist 1	Equipment Planning Specialist 2	Transmission Facilities Specialist	Procurement and Estimation Engineer	Building Planning Specialist
			Toshiyuki Iwama	Masahiko Koshimizu	Mitsumasa Noguchi	Kazuma Inoue	Jun Yamauchi	Sumio Morita
1	10/9	Thu.	Narita, Tokyo --> Jakarta					
2	10/10	Fri.	Courtesy Call to / Explanation to Embassy of Japan & JICA Jakarta Office, Discussions with DGST					
3	10/11	Sat.	Move to Bengkalis					
4	10/12	Sun.	Survey at Tanjung Parit, Move to Jakarta			Narita, Tokyo --> Jakarta		Narita --> Jakarta
5	10/13	Mon.	Discussion with DGST					Unit Price and Equipment Survey
6	10/14	Tue.	Signing of M/D, Report to EOJ, JICA office, Jakarta -->		Discussion with DGST			Ditto
7	10/15	Wed.	--> Narita, Tokyo	Discussion with DGST			Narita --> Jakarta	Ditto
8	10/16	Thu.	Preparation for Field Survey					Ditto
9	10/17	Fri.	Jakarta --> Dumai Visit to Dumai Coastal Radio	Jakarta --> Batam, Kijang, Tg. Pinang Coastal Radio Station	Jakarta --> Dumai Visit to Dumai Coastal Radio	Jakarta --> Batam, Kijang, Tg. Pinang Coastal Radio Station	Ditto	
10	10/18	Sat.	Site Survey of Tg. Medang, Morong	Site survey of Tg. Berakit	Site Survey of Tg. Medang, Morong	Site survey of Tg. Berakit	Ditto	
11	10/19	Sun.	Site survey of Silencing and proposed repeater	Site survey of Hiyu Kecil and Takong Kecil	Site survey of Silencing and proposed repeater	Site survey of Hiyu Kecil and Takong Kecil	Ditto	
12	10/20	Mon.	Site survey of Bengkalis, Tg. Parit	Move to Dumai, Survey of Silencing and Sepahat	Site survey of Bengkalis, Tg. Parit	Batu Ampar Coastal Radio Station, Batam -->	Ditto	
13	10/21	Tue.	Return to Jakarta	Dumai --> Jakarta	Return to Jakarta	Documentation	Ditto	
14	10/22	Wed.	Internal Discussion and Summarization of the Survey Results					Ditto
15	10/23	Thu.	Discussion with DGST				Sub-Contracting (Communication Link Survey)	Ditto
16	10/24	Fri.	Discussion with DGST		Discussion with DGST	Sub-Contracting (Communication Link Survey)	Discussion with DGST, Leave from Jakarta	
17	10/25	Sat.	Internal Meeting and Documentation					Arrival at Narita
18	10/26	Sun.	Internal Meeting	Internal Meeting, Leave from Jakarta		Internal Meeting		
19	10/27	Mon.	Report to EOJ, JICA, Leave from Jakarta	--> Narita			Report to EOJ, JICA, Leave from Jakarta	
20	10/28	Tue.	Arrival at Narita			Arrival at Narita		
21	10/29	Wed.						
22	10/30	Thu.						
23	10/31	Fri.						
24	11/1	Sat.						
25	11/2	Sun.						Narita --> Jakarta
26	11/3	Mon.						Discussion with DGST
27	11/4	Tue.						Data collection, preparation for site
28	11/5	Wed.						Jakarta --> Batam
29	11/6	Thu.						Survey of Tg. Berakit
30	11/7	Fri.						Survey of Batu Ampar
31	11/8	Sat.						Batam --> Jakarta
32	11/9	Sun.						Documentation
33	11/10	Mon.						Unit Price and Equipment Survey for Building
34	11/11	Tue.						Ditto
35	11/12	Wed.						Ditto, Leave from Jakarta
36	11/13	Thu.						Arrival at Narita



(2) Second Field Survey (November 30 to December 24)

No.	Date		Leader/ Project Coordinator	Chief Consultant/ Maintenance, Operation and Management Specialist	Transmission Facilities Specialist	Procurement and Estimation Engineer	Building Planning Specialist	Electrical Engineer
			Toshiyuki Iwama/ Kyoko Okamura	Masahiko Koshimizu	Jun Yamauchi	Sumio Morita	Takatsugu Shimada	Keiji Yamazaki
1	11/30	Sun.			Narita --> Jakarta			
2	12/1	Mon.			Discussion with DGST			
3	12/2	Tue.			Move to Dumai, Dumai Coastal Radio Station			
4	12/3	Wed.			Survey of Tg. Sair and Tg. Medang			
5	12/4	Thu.			Survey of Selincing and Sepahat			
6	12/5	Fri.			Survey of Tg. Sair			
7	12/6	Sat.			Survey of Tg. Parit and Bengkalis			
8	12/7	Sun.			Move to Jakarta			
9	12/8	Mon.		Narita --> Jakarta	Discussion with DGST	Narita --> Jakarta		
10	12/9	Tue.		Courtesy Call to EOJ JICA JKT Office, DGST	Courtesy Call to / Explanation to Embassy of Japan, JICA Jakarta Office & DGST, Internal Meeting			
11	12/10	Wed.		Discussion with DGST, GMDSS Consultants	Data Collection, Discussion with GMDSS Consultants, Preparation for Site Visit			
12	12/11	Thu.		Survey for Communication,	Discussion with DGST	Jakarta ---> Dumai, Visit to Dumai Coastal Radio Station		
13	12/12	Fri.		Ditto	Ditto, Leave from Jakarta	Survey of Tg. Medang and Tg. Sair		
14	12/13	Sat.		Documentation	Narita	Survey of Selincing and Sepahat		
15	12/14	Sun.		Documentation		Survey of Bengkalis and Tg. Parit		
16	12/15	Mon.		Discussion with DGST		Move to Jakarta, Internal Meeting		
17	12/16	Tue.		Ditto		Discussion with DGST, Data Collection for Cost Estimation		
18	12/17	Wed.		Ditto		Internal Discussions, Discussion for Design Conditions of Stage-2 Project		
19	12/18	Thu.		Discussion with DGST, Consultants of Microwave Communication Link Survey		Discussion with DGST, Data Collection for Cost Estimation	Arrival at Narita	
20	12/19	Fri.		Discussion with DGST		Ditto		
21	12/20	Sat.		Internal Meeting, Documentation		Internal Discussion, Documentation, Leave from Jakarta		
22	12/21	Sun.	Narita --> Jakarta	Documentation		Arrival at Narita		
23	12/22	Mon.	JICA Indonesia Office, M/M Sign, Move to Surabaya, Discussion with Mr. Alamsyah					
24	12/23	Tue.	Surabaya--Jakarta. EOJ, Leave from Jakarta	Surabaya--Jakarta. EOJ, Discussion with EOJ				
25	12/24	Wed.	Arrival at Narita	Discussion with DGST, Natural Cond. Survey Contract Sign, Leave from Narita				
26	12/25	Thu.		Arrival at Narita				

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

#### **Directorate General of Sea Transportation (DGST)**

Mr. Yuri Gunadi	Director of Navigation, Sub-Directorate of Marine Telecommunication
Mr. Alamsyah Sasmito, MM	Head of Section of Equipment and Maintenance, Sub-Directorate of Marine Telecommunication
Drs. Tofan Rindoyo	Head of Section Operation, Sub-Directorate of Marine Telecommunication
Mr. Laymond Ivan H.A.S.	Head of Equipment & Maintenance Section, Sub-Directorate of Aids to Navigation
Mr. Kardiawan S.	Staff of Sub-Directorate of Maritime Telecommunication
Mr. Tony Rafiq	Ditto
Mr. Ketut Aries	Ditto
Mr. Heri Supryadi	Ditto
Mr. Andi Aswad	Staff of Sub-Directorate of Aids Navigation
Mr. Leonard S.	Ditto
Mr. Rudi H. Irwansyah	Ditto
Ir. A. Tonny Budiono, MM	Head of Sub-Directorate of General Administration
Mr. Darmansyah	Staff of Sub-Directorate of General Administration
Mr. Eko Hadirumekso,	Sub-Division of Program, Div. of Planning
Mr. Kazuyuki Tanaka	JICA Expert on Safety Navigation, Preventing Marine Disaster and SAR

#### **Embassy of Japan**

Mr. Ichitaro Ehara	First Secretary
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#### **JICA Indonesia Office**

Mr. Kiichi Tomiya	Deputy Resident Representative (First Field Survey)
Mr. Hiroyuki Kawanishi	Senior Representative
Mr. Naoki Kakioka	Assistant Resident Representative
Ms. Sulisty Wardani	Program Officer for Infrastructure

## Appendix-4 Minutes of Discussions

Appendix 4-1 M/D on First Field Survey

### 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.

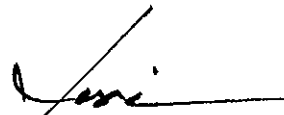
In the course of discussions, both sides confirmed the main items described in the attached sheet.

Jakarta, October 13th, 2008



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Toshiyuki IWAMA  
Leader  
Implementation Review Study Team  
Japan International Cooperation Agency



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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.

6 T.

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.

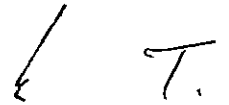
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Annex-1. Component of the Project at the Basic Design

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



## 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-function 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 Hiyu Kecil	2 Takong Kecil	3 Batu Ampar	4 Tanjung Berakit	5 Tanjung Medang	6 Tanjung Parit	7 Dumai
VTS Center	Unit	1			1				
	m <sup>2</sup>	414			414.00				
VTS Sub-Center	Unit	1						1	
	m <sup>2</sup>	207.4						207.36	
Equipment Building	Unit	5	1	1		1	1	1	
	m <sup>2</sup>	211.3	42.25	42.25		42.25	42.25	42.25	
Generator Building	Unit	6	1	1		1	1	1	
	m <sup>2</sup>	320	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	
	m <sup>3</sup>		6.0	6.0	2.0	6.0	6.0	2.0	
Fuel Supply System	Unit	2	1	1					
	m <sup>3</sup>		1.0	1.0					
Water Reservoir	Set	2			1			1	
	m <sup>3</sup>				1.5			1.0	
Septic Tank	Set	2			1			1	
	m <sup>3</sup>				8.0			4.0	
Steel Tower for Radar and Communications	Unit	7	1	1	1	1	1	1	
	m		38.00	49.00	30.00	73.00	106.00	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)

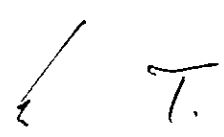
Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan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

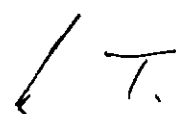
- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, 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.

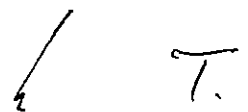
(8) Banking Arrangements (B/A)

- 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.

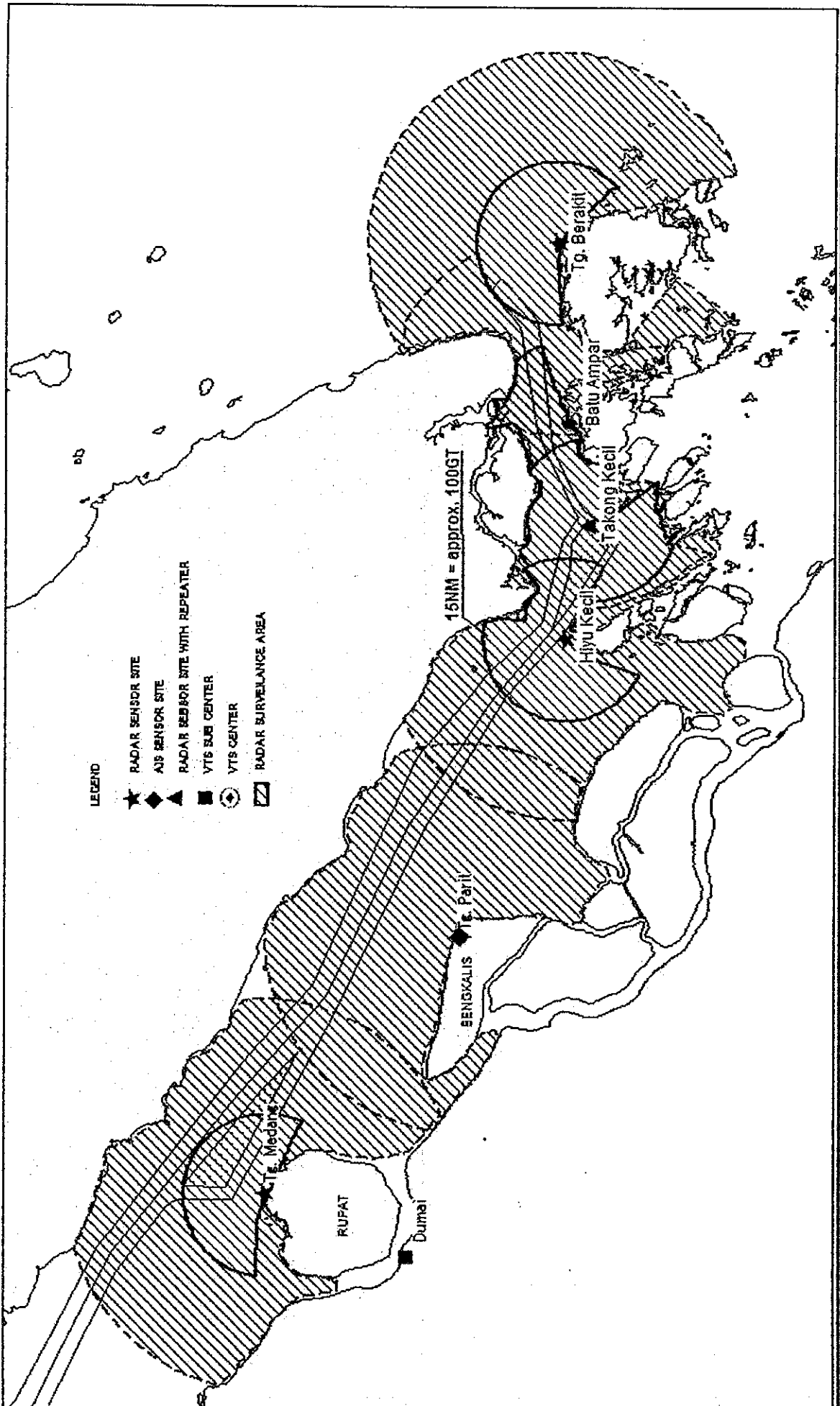
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## Major undertakings to be taken by each Government

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)



T.

**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



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Toshiyuki IWAMA  
Leader  
Implementation Review Study Team  
Japan International Cooperation Agency



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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.

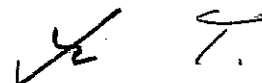
#### 2-2 Schedule of Stage-2

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.



END



**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 Stage-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. Satuan Kerja 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.

## 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 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

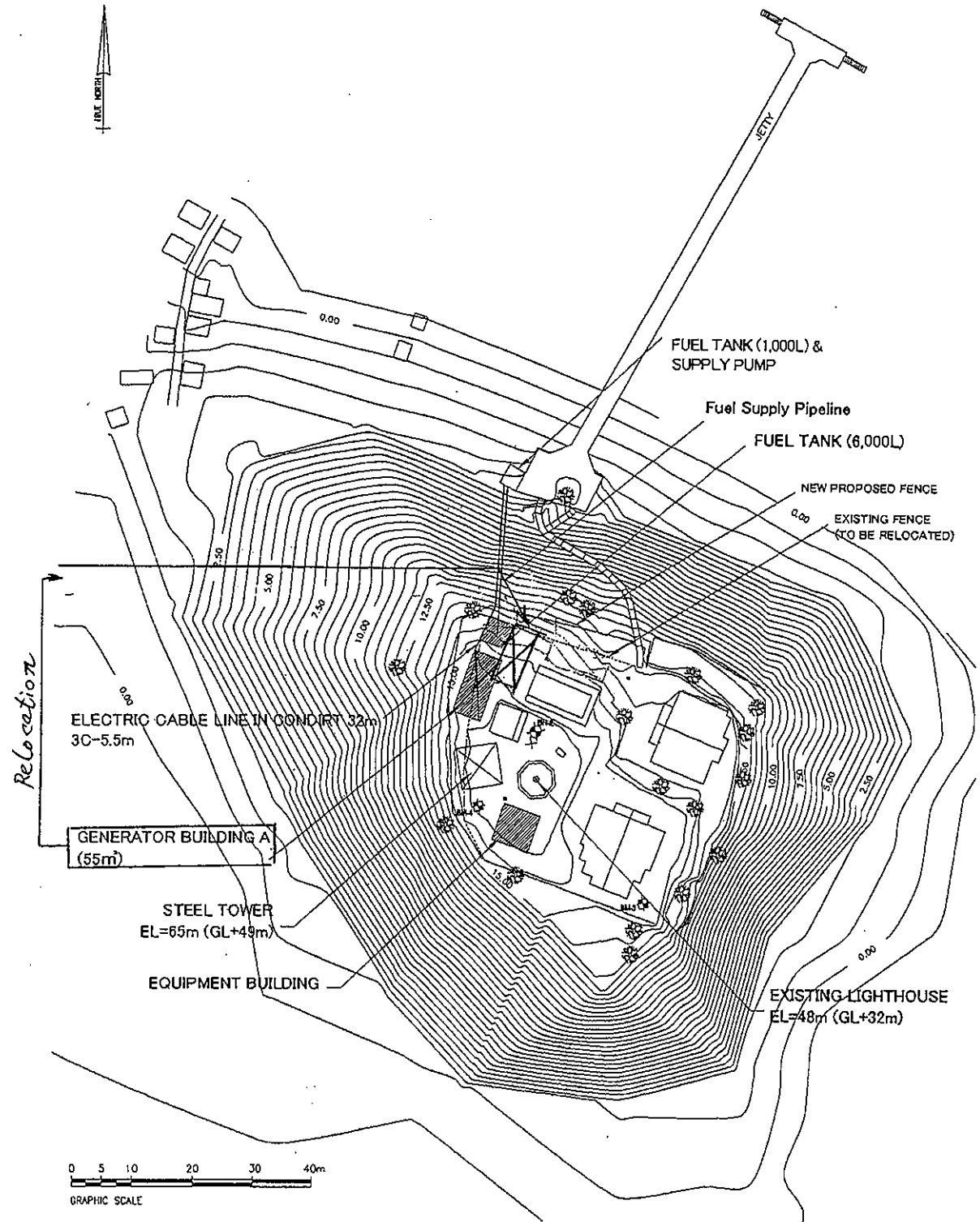
#### Directorate General of Transportation (DGST)

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

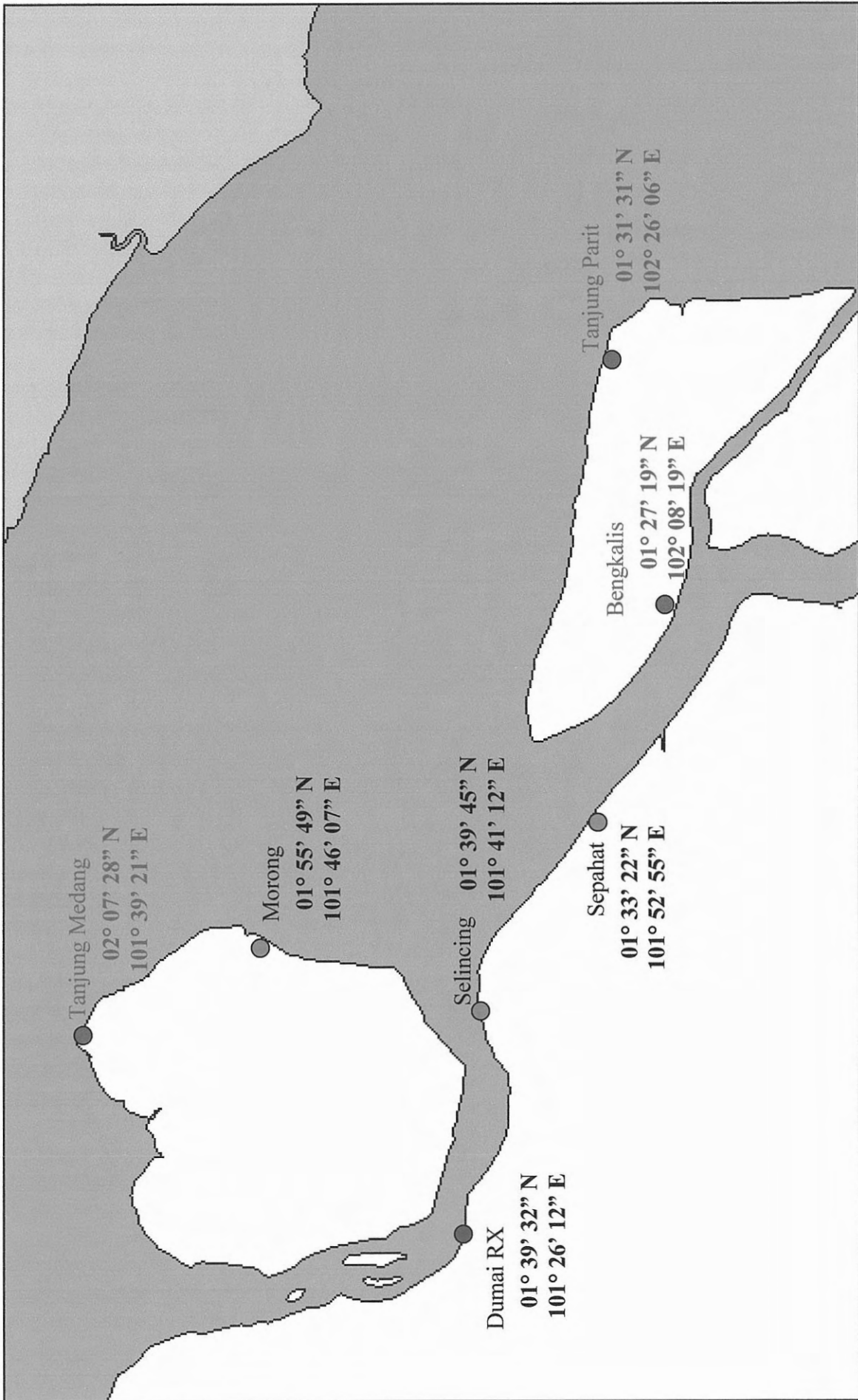
- Attachment-1 DGST request for generator building relocation at Takong Kecil
- Attachment-2 Locations of Proposed Repeater Station
- Attachment-3 Sketch Drawings of Site Conditions (Selincing, Sepahat and Morong)
- Attachment-4 Site Visit Schedule

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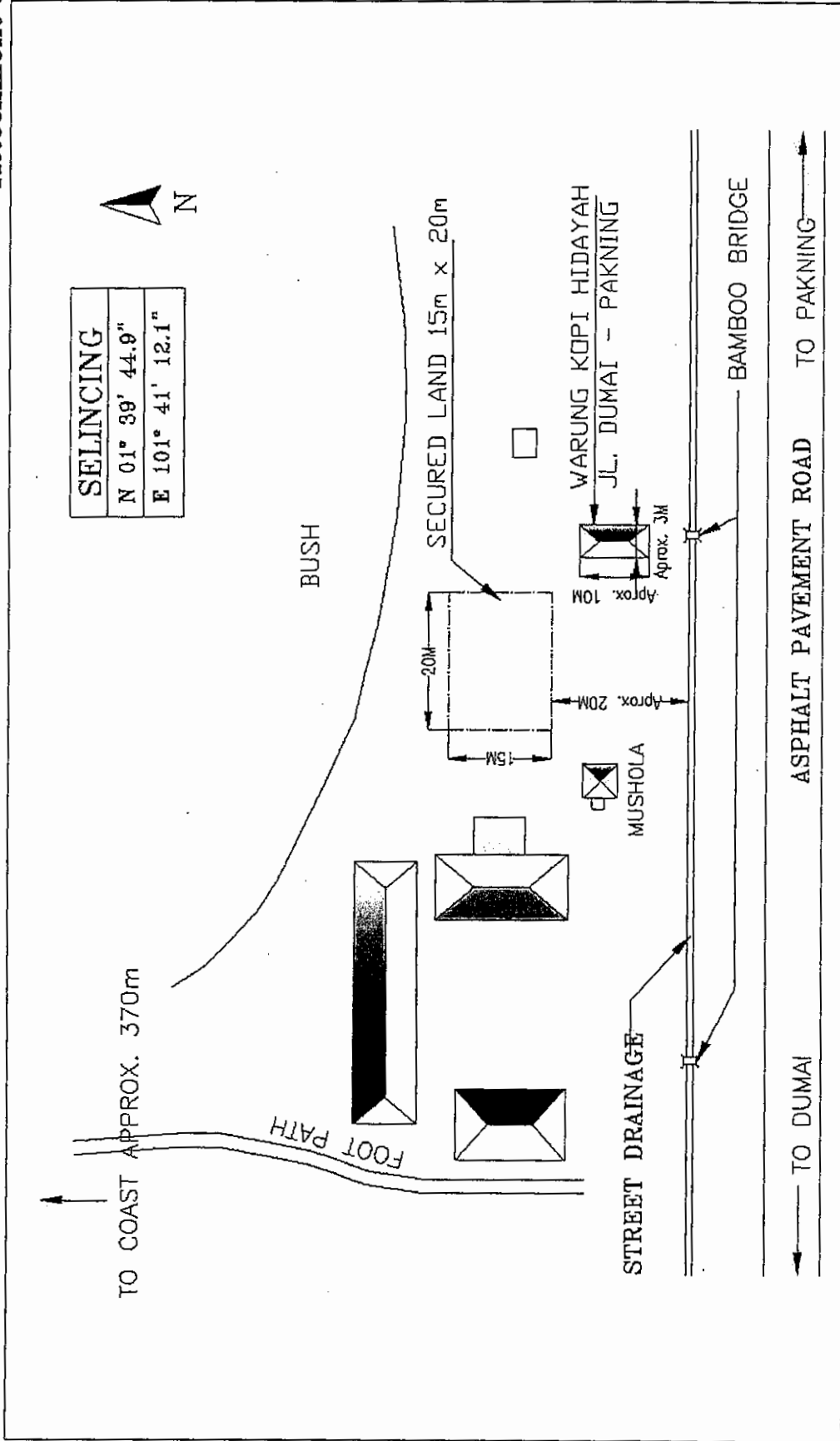
Drawing 7 Plot Plan of Facilities (2) Takong Kecil





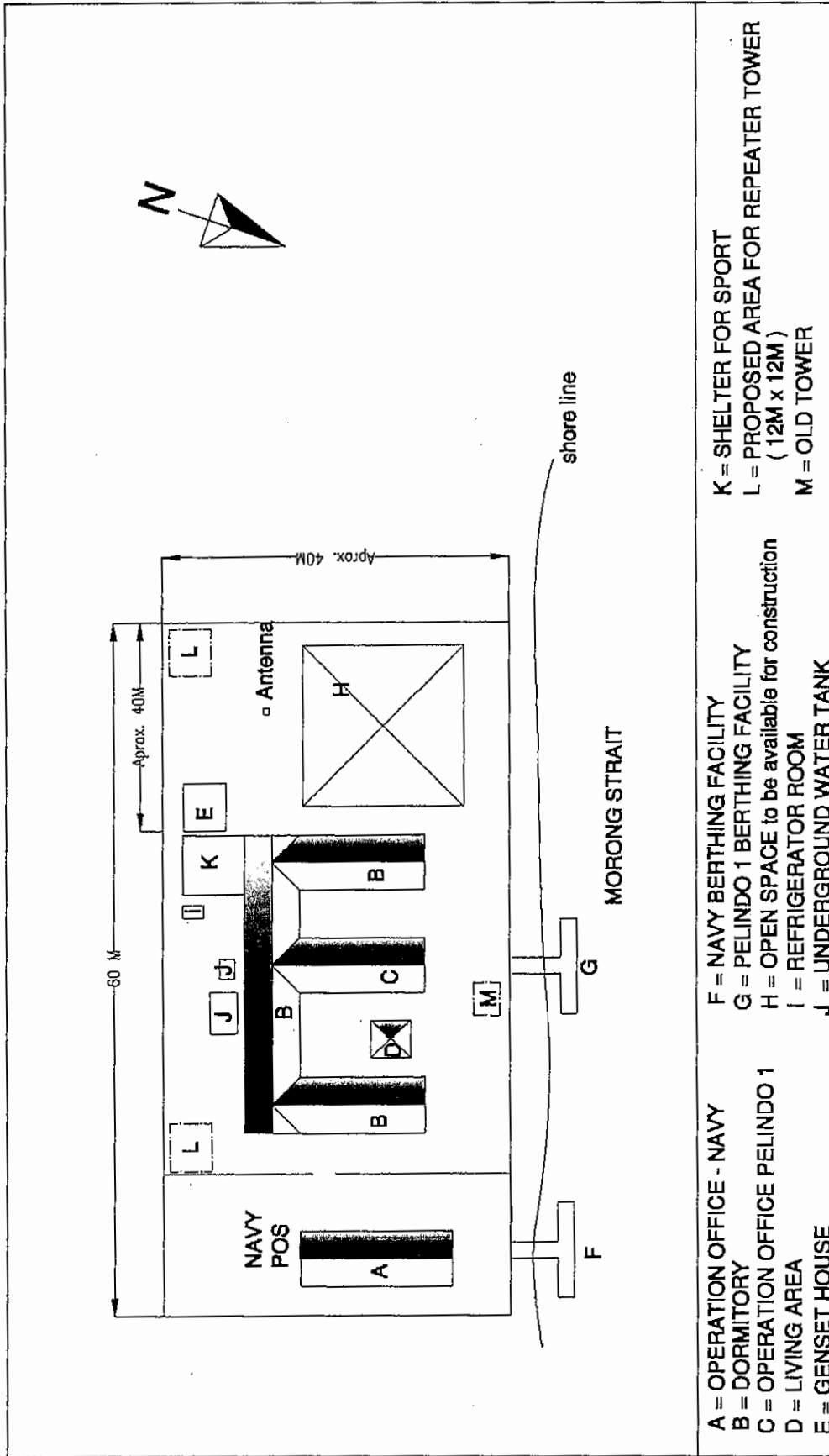
Locations of Proposed Repeater Stations





Site Conditions of Selincing





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)

<b>Date and time</b>	<b>Activities</b>	<b>Remarks</b>	<b>Sites</b>
Oct. 17, 2008	<b><u>Travel to Dumai</u></b>		
5:00	Leave from Hotel		
7:00	Travel from Jakarta to Pekanbaru by Air GA 170 (07:00 – 08:35)	Air Ticket	
	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)		District Navigation Office
	Stay at Dumai, Grand Zuri Dumai (0765-31999)		
Oct. 18, 2008	<b><u>Survey of Tg. Medang and Teluk Klecah (Morong) Pilot Station</u></b>		
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	<b><u>Survey of Seilincing and Sepahat Proposed Repeater Station and Dumai Coastal Radio Station</u></b>		
8:00	Move to Selincing by Car	Rental Car	
9:30	Site survey of proposed repeater station of Selincing		Seilincing (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
Oct. 20, 2008 7:00  9:30 11:00 12:30 14:00  15:30 16:00 17:00	<u><b>Visit to Survey of Bengkalis and Tg. Parit</b></u> Move from Dumai to Bengkalis by regular boat (arrival at Bengkalis at 8:50) Move from Bengkalis to Tg. Parit by Car Site Survey in Tg. Parit Move from Tg. Parit to Bengkalis by car Vist and Survey of Bengkalis Coastal Radio Station Lunch Move from Bengkalis to Sungai Pakning by regular boat (Arrival at S. Pakning 16:50) Move from Sungai Pakning to Pekanbaru by car (Arrival at Pekanbaru 21:30) Stay at Hotel Grand Zuri Pekanbaru (0761)860988	Regular Boat  Rental Car	Coastal Radio Station at Bengkalis  Tg. Parit Proposed VTS sensor station
Oct. 21, 2008  14:30	<u><b>Return Back to Jakarta</b></u> Move from hotel to Pekanbaru Travel from Pekanbaru to Jakarta by Air GA 175 14:30-16:00  Mr. Leonard travel Pekanbaru - Jakarta Mandala RI 073 16.45 – 18.20	Regular Boat  Air Ticket	

(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
<p>Oct. 17, 2008</p> <p>8:30</p> <p>11:05</p> <p>12:40</p> <p>13.00</p> <p>14.00-15.30</p> <p>15.30</p> <p>16:00</p>	<p><b><u>Travel to Batam and Visit Navigation District 1 Office Tanjung Pinang</u></b></p> <p>Leave from Hotel Jakarta to Batam by Air, GA 152 11:05 – 12:35 Mr. Andi Aswad Mandala airlines RI 140 - 9.30 – 11.00</p> <p>Move from Airport to Telaga Punggur</p> <p>Move from Telaga Punggur to Tg. Pinang by Regular Boat (1 hour). Informal meet with Mr. Benny T in the same boat</p> <p>Navigation District for meeting at Kijang (1.5 hour)</p> <p>Move from District Navigation Office to Tanjung pinang</p> <p>Stay at Tanjung Pinang Hotel Comfort (0771-41234)</p>	<p>Air Ticket</p> <p>Taxi</p>	<p>Navigation Distrikt at Kijang</p>
<p>Oct. 18, 2008</p> <p>8:00</p> <p>10.00</p> <p>12.00</p> <p>13.00</p> <p>16:30</p>	<p><b><u>Survey of Tg. Berakit</u></b></p> <p>Leave from Hotel Tanjung Pinang to Tg. Berakit by Car accompany by 1 staf of District Navigation 1- Kijang – Mr Sumbar Jati (2 hours)</p> <p>Site survey at Tg. Berakit (1-2 hours)</p> <p>Move from Tg Berakit to Tg Uban Move from Tg Uban to Telaga Punggur By Regular boat (1 hour)</p> <p>Move from Telaga Punggur to Hotel</p> <p>Stay at Batam (Hotel Novotel) (0778)425555 Preparation for site survey Hiyu Kecil and Takong Kecil (find rental boat)</p> <p>Contact Mr. Sudiantoro Head of Batu Ampar Coastal radio Station by phone and Refereed to Mr. Mulyanto</p>	<p>Rental Car</p>	

Date and time	Activities	Remarks	Sites
Oct. 19, 2008	<p><b><u>Survey of Takong Kecil &amp; Hiyu Kecil</u></b>  <b><u>(Mr. Noguchi, Mr. Yamauchi, Mr. Tanaka, Mr. Satrio, Mr Andi Aswad and Mr. Sumbar Jati)</u></b></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</p> <p>Rental Boat</p> <p>Rental Car</p> <p>Rental Boat</p>	<p>Takong Kecil</p> <p>Hiyu Kecil</p>
Oct. 20, 2008	<p><b><u>Mr. Yamauchi, Mr. Tanaka and Mr. Andi Aswad</u></b></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><b><u>Mr. Andi Aswad move from Batam to Jakarta</u></b>  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	<b><u>Mr. Noguchi and Mr. Satrio, Move to Dumai</u></b>	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.		Seilincing (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	<b><u>Return Back to Jakarta</u></b>		
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

### 3 Phone Number List

\*(1) Satellite Phone

0868-1103-4162 (for Team I, Rupert and Bengkalis)

0868-1103-4161 (for Team II, Batam, Bintang and Karimun)

(2) Mobile Phone Numbers

Masahiko Koshimizu: 0812-18386-812

Mitsumasa Noguchi: 0813-8971-3543

Kazuma Inoue: 0813-8935-0288

Jun Yamauchi: 0812-1808-7182

Irwan Wahiddin: 0813-8065-1228

Satrio Setyawan: 0815-940-1051

Piping Nurhandayani: 0812-9926-504

Simone: 0813-65590144

Mano (JKT Driver) 0813-8121-3202

**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) BENDAHRA (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

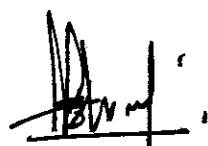
### (1) Obligations

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)

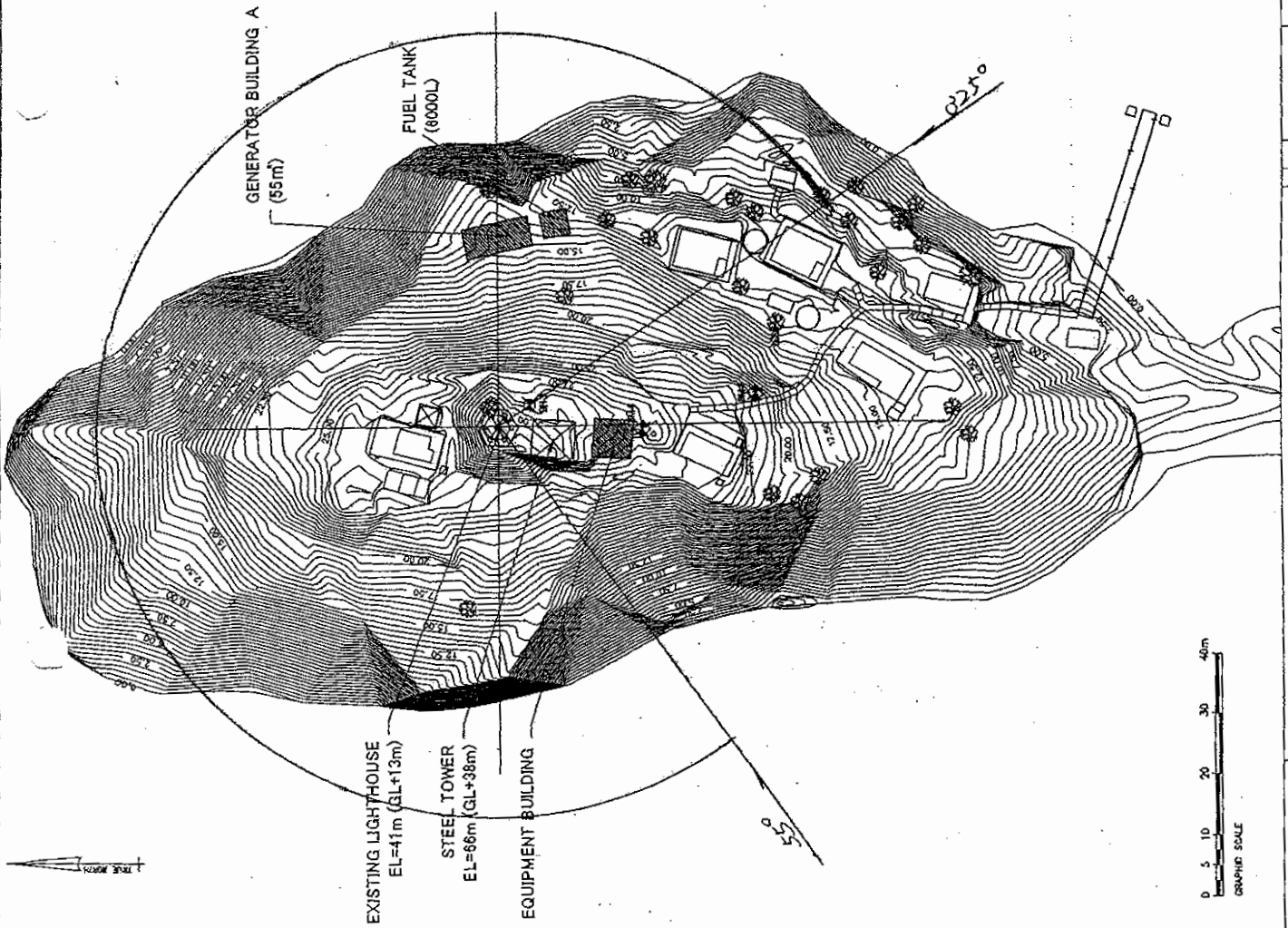
Ir. Alamsyah Sasmito,M.M	Head of Section Equipment and Maintenance Sub-Directorate of Maritime Telecommunication Directorate of Navigation
Drs. Tofan Rindoyo	Head of Section Operation Sub-Directorate of Maritime Telecommunication Directorate of Navigation
Mr. Raymond Ivan H.A.S	Head of Equipment & Maintenance 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

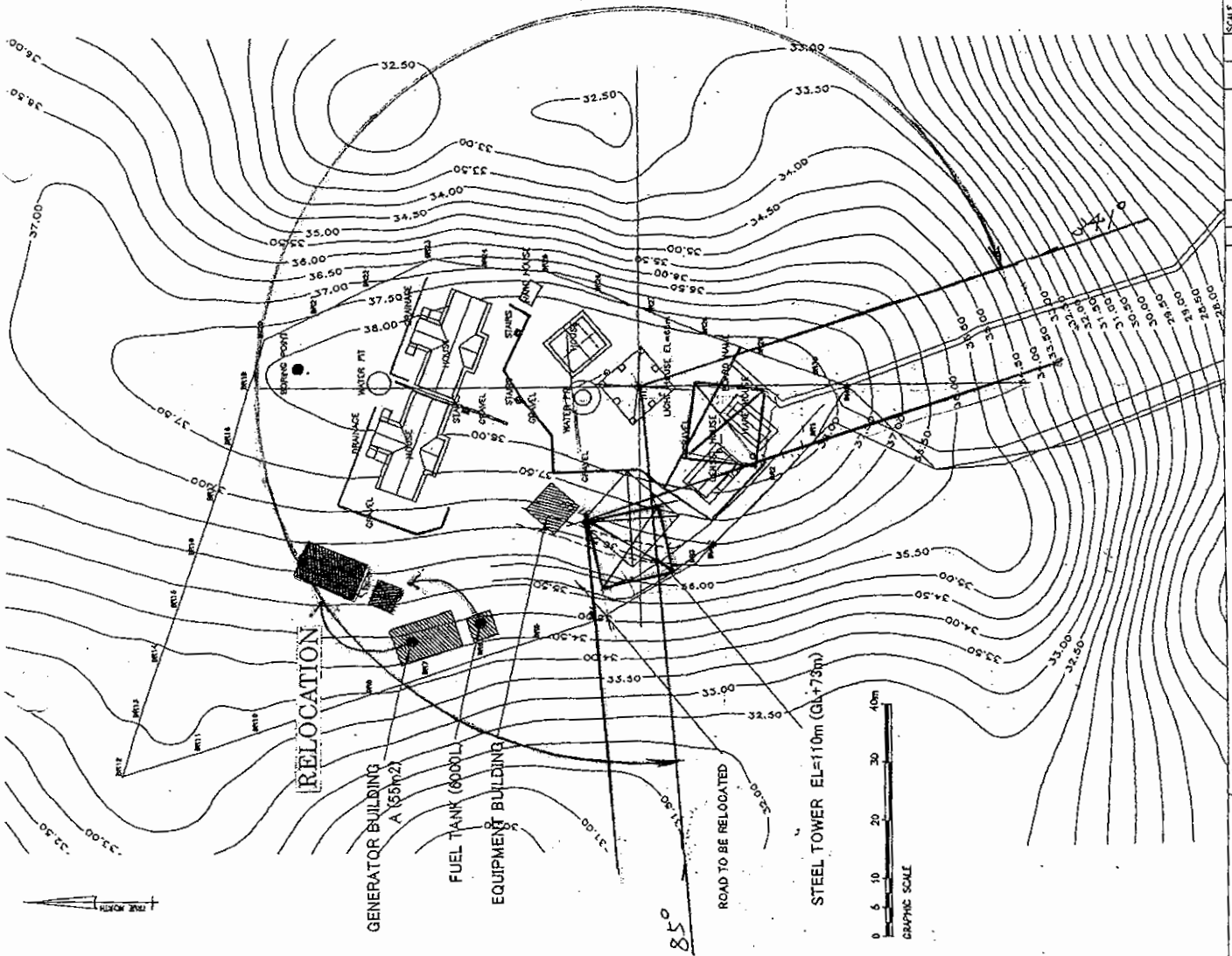


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SCALE	1/800	DWG TITLE	HIYU KECIL SITE PLAN
DATE	2008/7/1	DESIGNED BY	ORIENTAL CONSULTANTS CO., Ltd.
DRAWING BY		CHECKED BY	JAPAN AIDS TO NAVIGATION ASSOCIATION
INDUSTRY	NAVIGATION		
DWG NO	A-5		

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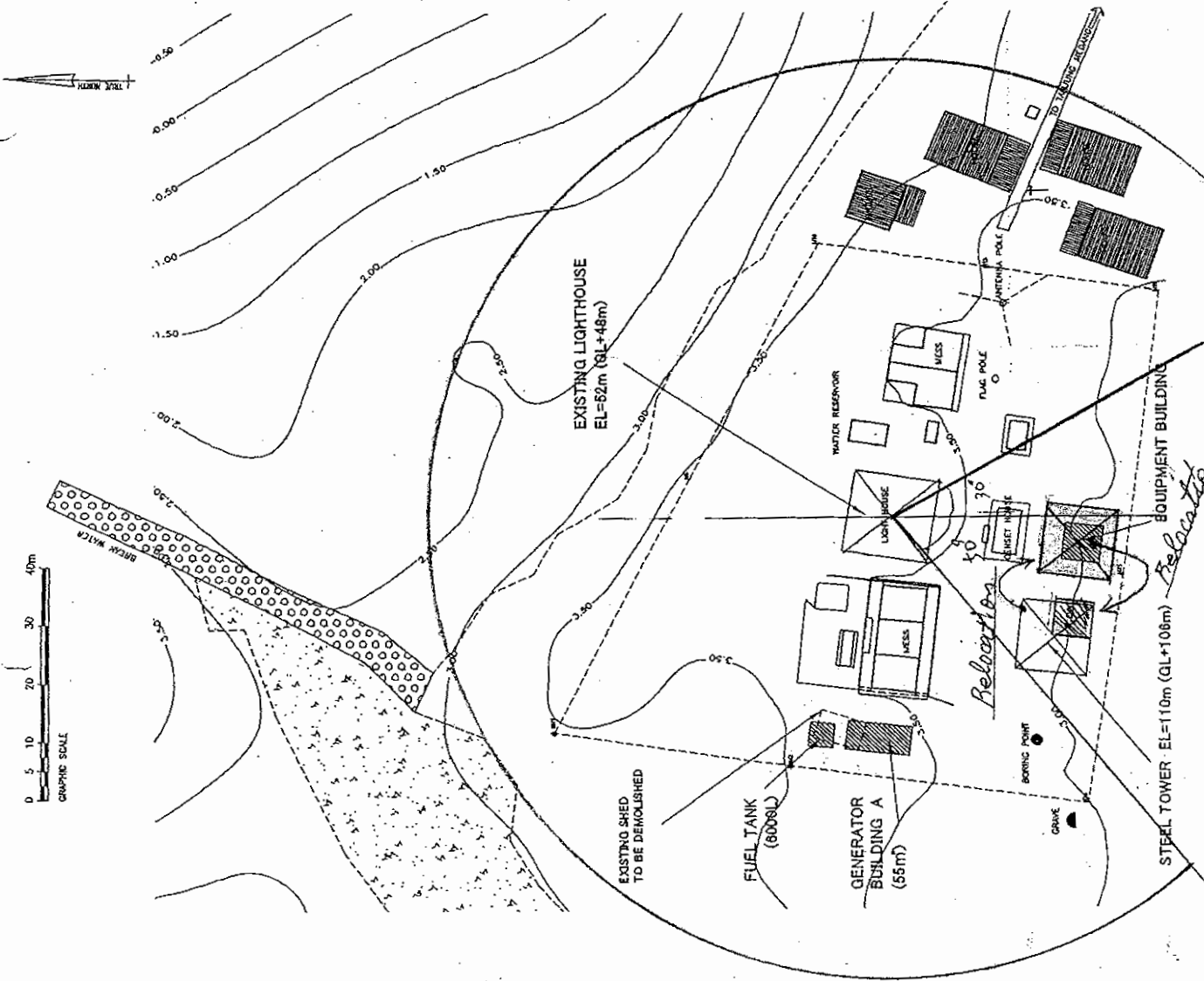






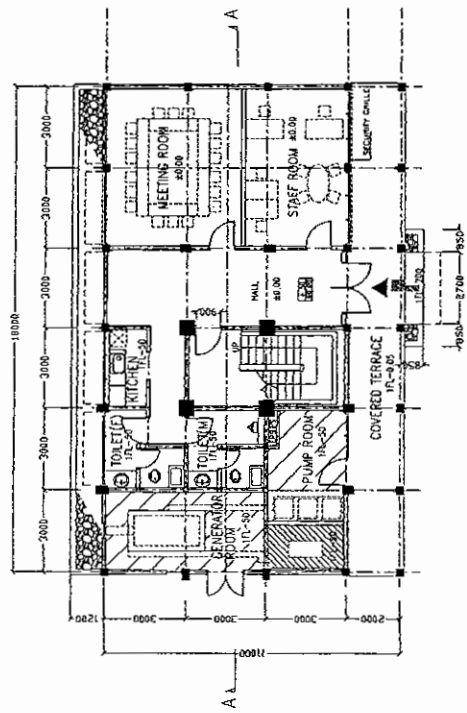
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GENERAL NOTE	
SCALE	1/2000
DATE	2009/11
DRAWING BY	
CHECKED BY	
DESIGNED BY	
DATE	
DWG TITLE	TANJUNG BRAKIT SITE PLAN
DWG NO	A-8
DESIGNED BY	ORIENTAL CONSULTANTS CO., LTD.
CHECKED BY	JAPAN AIDS TO NAVIGATION ASSOCIATION

ATTACHMENT - 4

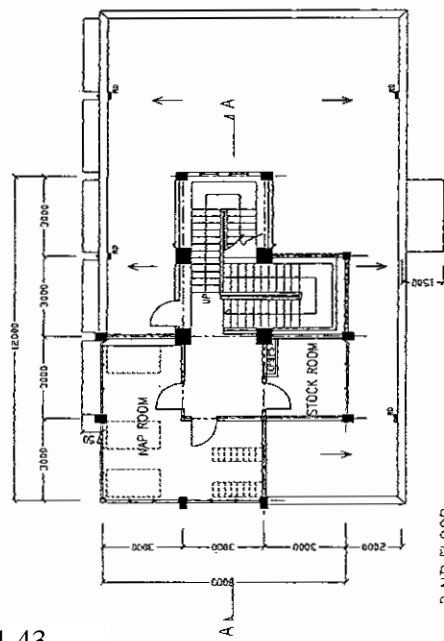


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DESIGNED BY	ORIENTAL CONSULTANTS CO. Ltd		
	JAPAN AIDS TO NAVIGATION ASSOCIATION		

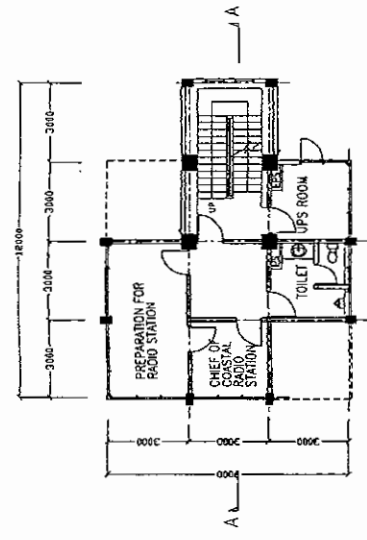
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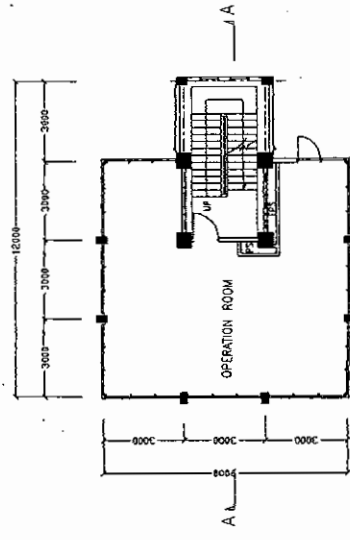
1 ST FLOOR



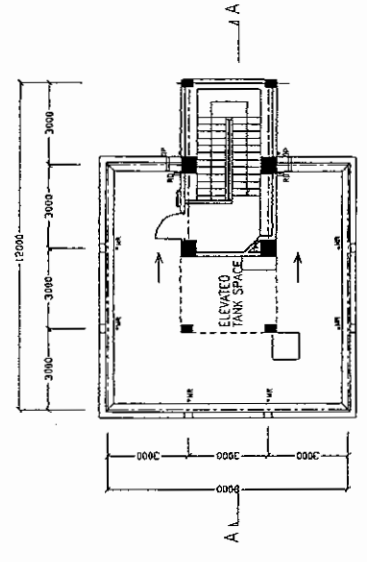
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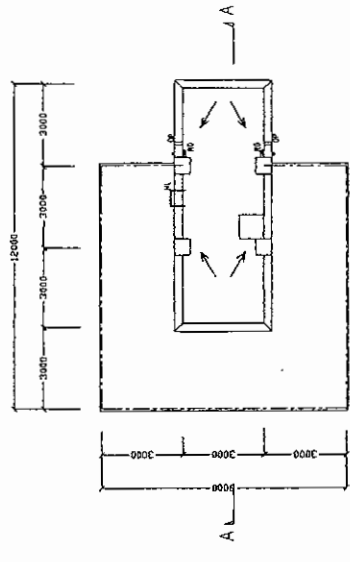
3 RD FLOOR



4 TH FLOOR



PENTHOUSE FLOOR



ROOF FLOOR

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

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

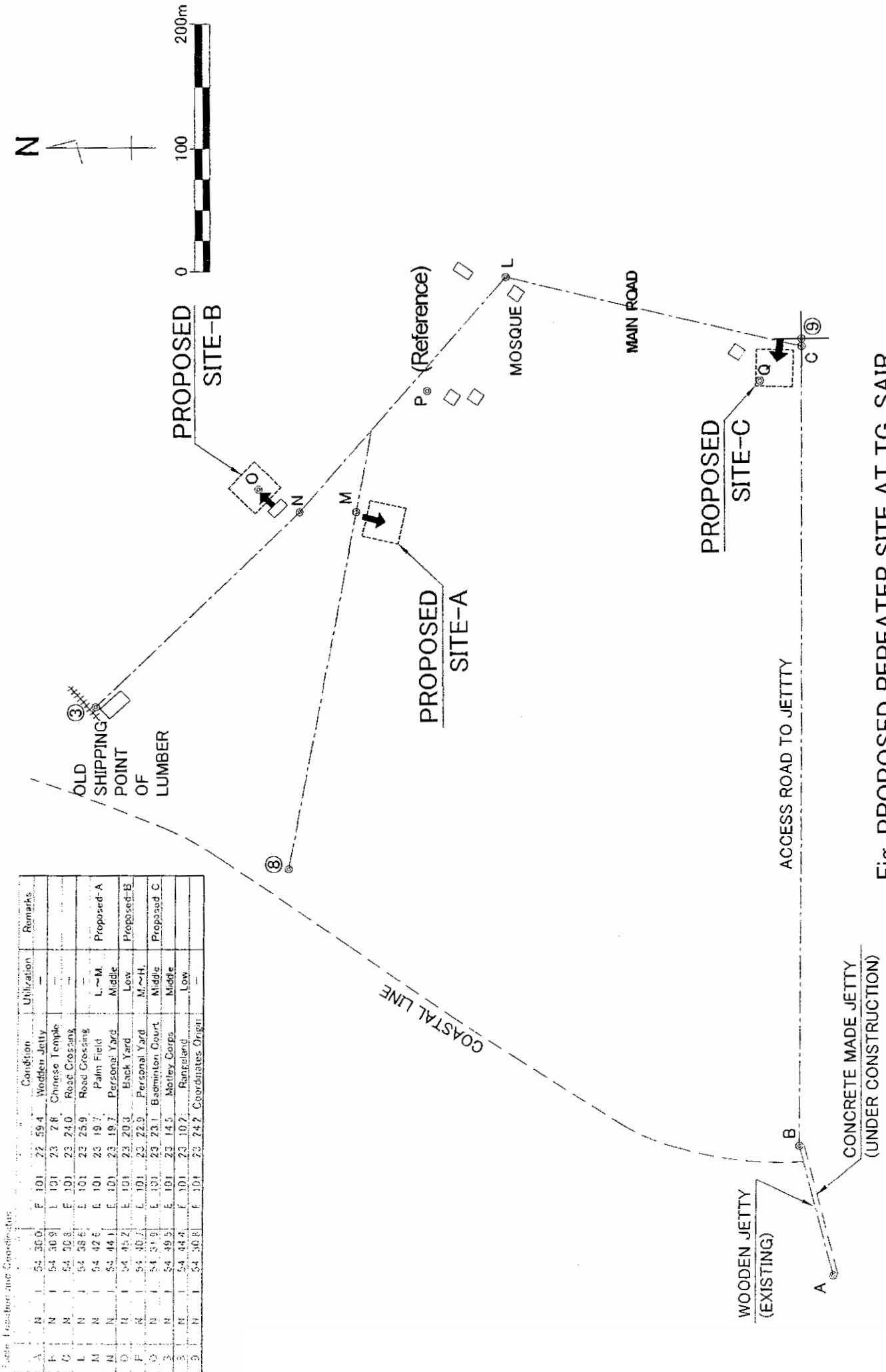
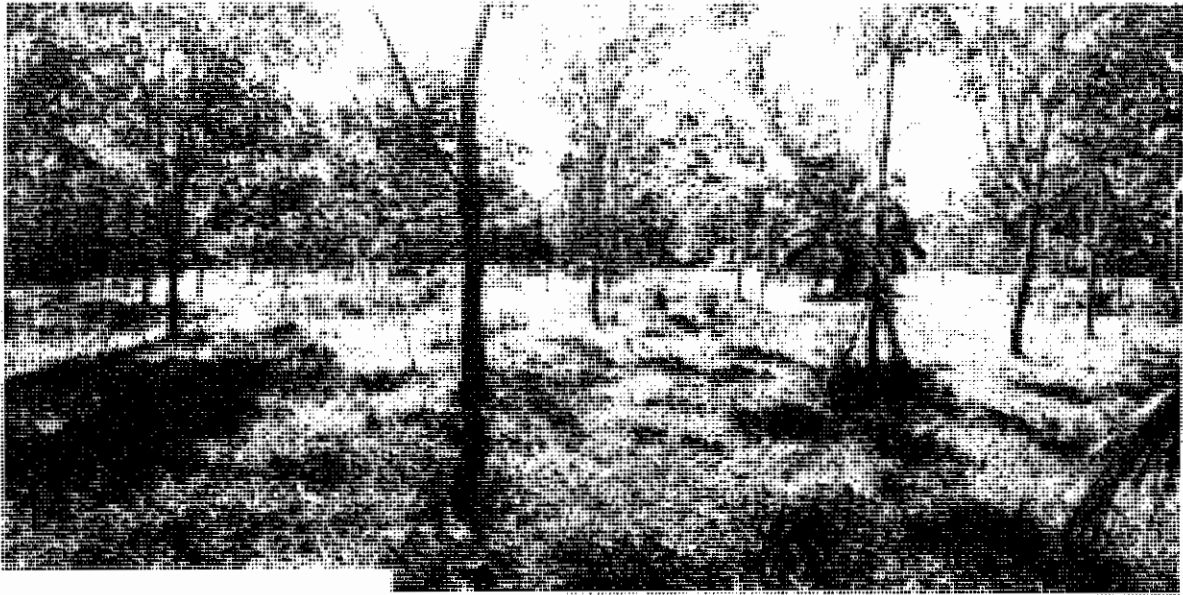


Fig. PROPOSED REPEATER SITE AT TG SAIR  
Scale = 1:4,000

*N/A*

Tg. Sair Site Photograph



M: SITE-A



N: SITE B (FRONT)

Handwritten signature or initials.



O: SITE-B (BACK)



Q: SITE-C

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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	<b><u>Travel to Dumai</u></b>		
5:00	<b><u>Mr. Jun Yamauchi, Mr. Kardiawan S &amp; Mr. Satrio S</u></b> 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	<b><u>Survey of Tg. Sair/Tg Medang</u></b>		
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. 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)		

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

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

**3 3.Phone Number List**

(1) Satellite Phone of JICA Study Team

0868-1103-4162

0868-1103-4161

(2) Mobile Phone Numbers

Masahiko Koshimizu: 0812-18386-812

Jun Yamauchi: 0812-18087-182

Satrio Setyawan: 0815-940-1051

(3) Others

1) Oriental Consultants Mid Plaza Office

021-573-5988

2) JICA Indonesia Office

021-5795-2112

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

**I Actual**

Date and time	Activities	Remarks	Sites
Dec. 11,2008	<u>Travel to Dumai</u>		
5:00	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)		
16:00	Stay at Dumai, Grand Zuri Dumai (0765-31999)	Rental Car	District Navigation Office
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 Tg. Sair
9:30	Move to 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><b><u>Survey of Selincing and Sepahat Proposed Repeater Station</u></b></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><b><u>Visit to Survey of Bengkalis and Tg. Parit</u></b></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><b><u>Return Back to Jakarta</u></b></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

**3 Phone Number List**

(1) Satellite Phone of JICA Study Team

0868-1103-4162

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(2) Mobile Phone Numbers

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Jun Yamauchi: 0812-18087-182

Mr. Takatsugu Shimada 0813-1164-9758

Mr. Sumio Morita 0813-1164-9757

Mr. Keij Yamasaki 0813-1164-9763

Satrio Setyawan: 0815-940-1051

Kardiawan Sukirno 0856-822-6282

(3) Others

1) Oriental Consultants Mid Plaza Office

021-573-5988

2) JICA Indonesia Office

021-5795-2112