

Record of Technical Discussions  
on the Basic Design Study  
on the Project for Improvement of Security Facilities and Equipment  
in Sihanoukville Port and Phnom Penh Port  
in the Kingdom of Cambodia

As described in the Minutes of Discussions of January 20, 2006, the team composed of consultants continued the site survey, collection of data and information, and technical discussions, all required for the study, until February 22, 2006, in line with the Inception Report and the Questionnaire.

The attachment is the record of such technical discussions. The record has been prepared for mutual understanding of the technical discussions, and is not intended to commit or imply realization of any part of the Project.

The Study has been and will be made under the guidelines of JICA according to Japan's grant aid scheme; therefore, any record that may conflict with the guidelines in any respect shall be deemed as invalid.

Should additional data and information or further technical discussions be required in the course of the studies in Japan, it shall be made between the undersigned by the means of a e-mail or facsimile.

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

Further discussion was conducted and some modification was added

Sihanoukville, 16 February, 2006

for 豊島 幸雄  
Mr. Fujio SAIGUSA  
Chief Consultant,  
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International Development System Inc.

H.E. LOU KIM CHHUN  
Chairman & CEO  
Sihanoukville Autonomous Port  
Ministry of Public Works and Transport

## Record of Technical Discussion

### 1. Field Survey Results

The Basic Design Study Team ("Team") has explained the field survey results to Cambodia side and they agreed the contents of results. The field survey results are shown below.

The contents of the requests by CED, PAS and PAP are categorized into 4 systems as below.

- (1) X-ray container inspection system: for **CED**
- (2) Surveillance system: for **PAS, PAP, ICD-PAS, ICD-PAP**
- (3) Vessel traffic management system: for **PAS**
- (4) Emergent aid system: for **PAS**

#### (1) X-ray container inspection system

X-ray container inspection system is the countermeasures to be taken for the detection of dangerous and suspicious goods directly. However, the system contributes largely to the increase of international trade and tourists by providing the security, so that it is effective to Cambodia economically.

Present condition of the existing  $\gamma$ -ray scanner is as follows.

- 1) Resolution
  - Resolution on the display by  $\gamma$ -ray scanner is very low, so that the distinction of the content in the container is largely depends on the experiences and intuition.
- 2) Inspected area
  - The existing radiation of  $\gamma$ -ray scanner is ran horizontally only, so that the probability of the detection is expected to be low.
  - Lower area than the floor of container is out of inspection.
- 3) Countermeasures for safety
  - Workers can access to the inspection entrance easily when alarmed. Any off limits signal is not signed.
  - Workers station is located within the inspection area, and is separated from the  $\gamma$ -ray scanner by usual aluminum sash. (This is not enough to shut down the radiation)
  - Path for driver faces to the equipment without closing the door. So, the drivers could be radiated.

4) X-ray scanner planning

- X-ray scanner should be used for both export and import containers.
- It is judged that the existing  $\gamma$ -ray scanner is insufficient for the export container scanning due to the low resolution. Therefore, requested X-ray scanner is assumed to be used for export container inspection.
- In 2008, the X-ray scanner will start its operation. At that time, inspection rate is planned as 50% by introducing the risk management. After 2008, the inspection rate could be reduced time-serially by referring the international trend. (see, **Table 1-1 tentative estimation**)
- Due to the problem of effectiveness of actual  $\gamma$ -ray installation, the import containers are equally to be inspected by the X-Ray in future. Specification of X-ray scanner should be determined appropriately to keep smooth operation of the system considering actual conditions of the container traffic inspection rate etc.
- Inspected trailer numbers per hour considering the peak hour condition are shown in **Table 1-1**.
- Parking lot for the trailers will be planned based on the waiting trailer numbers at peak hour.
- Appropriate scall of covered facility for the visual inspection should be provided as a part of X-ray scanner inspection system.
- Newly installed X-ray scanner will be located considering the traffic line of container in the port.

**Table 1-1 X-ray Inspection Planning-Tentative Estimation**

Item	2008	2009	2010	2011	2012	2013	2014	2015
Expo.Full Container (TEU)*	65,068	70,518	75,968	81,418	86,868	92,318	97,768	103,218
Trailer Nos*	43,379	47,012	50,645	54,279	57,912	61,545	65,178	68,812
Inspection Rate (%)**	25	25	25	25	25	25	20	15
Inspected Trailer NOs./year	10,845	11,753	12,661	13,570	14,478	15,386	13,036	10,322
Inspected Trailer NOs./hour	2	3	3	3	3	4	3	2
Inspected Trailer NOs./peak hou	13	14	15	16	17	18	15	12

\* Estimated

\*\* Assumed



(2) Surveillance system

Surveillance system consisting of CCTV system, ID pass system, and monitor room is planned to prevent the outsiders including terrorists from invading into the port area.

At the gate, visitors are identified by ID pass system. At present, both port domains are protected by concrete block wall and steel net fence. Although guard men patrol regularly within the port area, it is difficult to scrutinize all the area due to the long distance. Therefore, the surveillance system including the installation of CCTV is effective countermeasures against terrorists.

Furthermore, VTMS and the arrangement of patrol boat will make it possible to detect the suspicious ships earlier and will be effective to the surveillance system both from land side and sea side.

Inland container depot (ICD) of PAS is located at Phnom Penh far from the PAS, and it is utilized 70% empty and 30% full containers. Total throughput of containers at ICD is only around 3% of total container of port. Security system for this ICD is not considered urgently.

(3) Vessel traffic management system:

Described in Chapter 2

(4) Emergent aid system:

Oil import base is located at the 13km north from the HQ of PAS. All the import oil is produced oil consisting of gasoline, light oil and heavy oil. These oil tends to vapor quickly when spilled on the sea. These phenomena are different from the crude oil. The effect of spilled oil to the environment is less than the case of crude oil

Jointed private companies operate the oil terminal. (Sokimex and Marubeni JV Co., Shell Co., Caltex Co., and Tela Co.). Jointed companies are responsible to facility administration, security and countermeasures against the disasters. PAS administrates the navigation area only. At present, each companies have their own facility and equipment against the contamination caused by spilled oil.

## **2. Basic Design Policy and Concept for Port Security Equipment**

### **2.1 VTMS (Vessel Traffic Management System)**

2.1.1 JICA Team confirmed PAS's request of VTMS System consisting of following main components in order to perform surveillance during 24 hours to conform the ISPS code.

- (1) Radar (X-band)
- (2) AIS Receiver
- (3) VHF
- (4) CCTV Camera
- (5) Wind Direction/speed meter

2.1.2 JICA Team confirmed PAS's request that Monitoring equipment is installed in the operation room.

2.1.3 JICA team and PAS surveyed the best location of the tower for the radar antenna, VHF antenna, AIS receiver antenna and sensor for Wind direction/speed, and JICA Team and PAS confirmed that the most suitable location of tower is near to the horn beside the slipway.

JICA Team confirmed PAS's explanation that tower for VTMS sensors disturbs safety navigation of calling ships in the south navigation channel in order to find light-tower as a navigation target if new tower for VTMS sensors is constructed near the present light-tower.

JICA Team confirmed PAS's request that Japan side construct the tower for VTMS sensors at the same position of the present light-tower near to the horn beside the slipway.

JICA Team confirmed PAS's proposal that PAS shall demolish the present light-tower and PAS shall install the present light for navigation to the tower for VTMS sensors.

JICA Team explained that the height of tower for VTMS sensors shall be designed considering wide visibility by Radar and CCTV for navigation channel and restricted water area.

PAS revealed JICA Team the restricted water area for Port Facility Security.

PAS requested that electric chart of Sihanoukville water shall be installed on the Radar Display. JICA Team explained that electric chart of Sihanoukville water overlays the Radar Display.

2.1.4 The JICA Team requested that the location of wind power generation should be coordinated in relation to possible negative effects on VTMS function.

## **2.2 Patrol Boat**

2.2.1 The JICA Team confirmed PAS's explanation that PAS has no patrol boat and which is necessary to surveillance in order to conform the ISPS code.

### **2.2.2 Dimensions**

The JICA Team confirmed PAS's request that appropriate dimensions are designed based on required speed, engine horse power and space of crew.

The JICA Team confirmed that PAS requested the length (Loa) of 10-14m

### **2.2.3 Engine**

The JICA Team confirmed PAS's request that engine should be diesel engine, not gasoline engine.

### **2.2.4 Speed**

The JICA Team confirmed PAS's request that the speed of patrol boat is not less than 18 knots for patrolling in the restricted water.

### **2.2.5 Material of hull**

The JICA Team confirmed PAS's request that the material of hull construction is Aluminum because Aluminum can be repaired by PAS.

The JICA Team confirmed that PAS is not able to repair FRP boat at PAS repair dock (slipway).

### **2.2.6 Number of Crew**

The JICA confirmed PAS's explanation that the number of crew is max. 5 persons

## **2.3 Tugboat with fire fighting system**

### **2.3.1 Port Facility Security**

The JICA Team confirmed PAS's request of tugboat with fire fighting system which has been organized into PAS Security Plan to conform ISPS Code for the purpose of surveillance, disaster prevention and rescue.

The JICA Team confirmed PAS's explanation that at least one (1) tugboat is on duty for 24 hours for surveillance and only one (1) tugboat with fire fighting in Sihanoukville water area is not enough for surveillance, disaster prevention and rescue.

### **2.3.2 Fire fighting system**

The JICA Team confirmed PAS's request that fire fighting system is suitably designed with enough capacity for external fire fighting operation for calling large ships such as tanker, passenger ship and container ship in Sihanoukville water.

### 2.3.3 Dimensions

The JICA Team confirmed PAS's request that the dimensions is designed appropriately for considering good maneuverability and sufficient bollard pull for efficient assistance of calling ships with size of 10,000DWT container ship, 30,000DWT oil tanker and 180m passenger ship in the Sihanoukville water.

The JICA Team confirmed PAS's request that tugboat need 3 tiers-deck on upper deck and wheel house is located on Navigation Bridge Deck for safe and suitable operation.

### 2.3.4 Engine Horse Power

The JICA Team confirmed PAS's proposal that the engine horse power is 1500-1800PS.

The JICA Team explained that Engine Horse Power will be decided based on necessary bollard pull for assisting calling large ships.

### 2.3.5 Speed

The JICA Team confirmed PAS's request that tugboat speed is around 10 knots as a service speed.

## 2.4 Mooring facility for patrol boat, oil barges and tugboats

The JICA Team explained to PAS that the present mooring facility has enough space for mooring tugboats, pilot boat, mooring boat and speedboat.

The JICA Team confirmed that the nature of seabed in the basin is rock, and it will be costly facility.

The JICA Team confirmed that PAS understood the conditions.

## 2.5 Warehouse for oil fence and Garage for Oil Tanker Truck

The JICA Team explained to PAS that oil spill response equipment owned by oil companies is available by "Emergency Response Assistance Agreement 2002" for oil spillage response participated by concerned oil companies in case of oil spillage in the Sihanoukville water.

The JICA Team confirmed that PAS understood the cooperative utilization of the equipment..

### 3. CCTV Camera and Gate ID card entering System

#### 3.1 Basic design policies and concept

- The port(PAS) security will be strengthened by installing CCTV camera with digital HDD recorder at port perimeter and gates.
- It is necessary to install CCTV monitor display not only in security station but also in container yard operation room for better coordination with operation department for ensuring port security.
- ID pass entering system is utilize to just record date and time of the employee's gate-in and gate-out movements. For that purposes, it is recommended that the system consists of the following main components:
  - ID card
  - Control equipment(both gate in / gate out)
  - Personal computer(system soft-ware for control)
  - Printer, and
  - Other auxiliary equipment
- Camera should be so positioning in height the poles to maintain wide range of visibility of the area to be covered.
- Camera installation will be planned in consideration of coverage the port restricted areas and gates.

#### 3.2 Main futures of the equipment

- Camera max. visibility of 350 m will be adopt.
- Color camera night time visibility is obtained by 1.0 lux illumination.
- Power consumption of camera is 18 watts(approx.) per 1 no.
- Ambient operating temperature is plus 50 degree at continuous operation mode.
- Two types of camera will be employed.
  - Outdoor pan/tilt camera(for yard surveillance)
  - Outdoor fixed camera(for gate surveillance)
- Team explained to the PAS, installation plan for gate and yard surveillance CCTV cameras (see, Figure 3-1).

#### 3.3 Scope of works

- Electric power be required(220 V, 50 Hz, 1 ph.) to camera control and to operation of the X-Ray equipment/facilities(3 ph.,4 w, 380/220 V, 50 Hz, power demands approx. 40 – 50 kVA).
- Power connection point is provided by Cambodian and power cabling works from power connection point to security station is carried out by Japan(see, Figure 3-2).



## **4. Facility Plan**

### **4-1 X-Ray scanner (see, Figure 4-1)**

- Team studied the circulation plan for the import and export containers. Based upon the plan, Team discussed with the Cambodian side, and proposed a draft plan. The Cambodian side understood the plan.
- Cambodian side requested Team to study the container's circulation in detail in order to avoid traffic congestion.

### **4-2 Security Station (see, Figure 4-1)**

Team discussed with Cambodian side regarding the location of security station and components of the facility. Cambodian side requested to locate it on the side of the container gate. Team studied the appropriateness of the location, and proposed a facility plan. The plan was accepted by Cambodian side, and Team makes a draft final plan based on the study after return to Japan.

## **5. Others**

### **5-1 Soft Component**

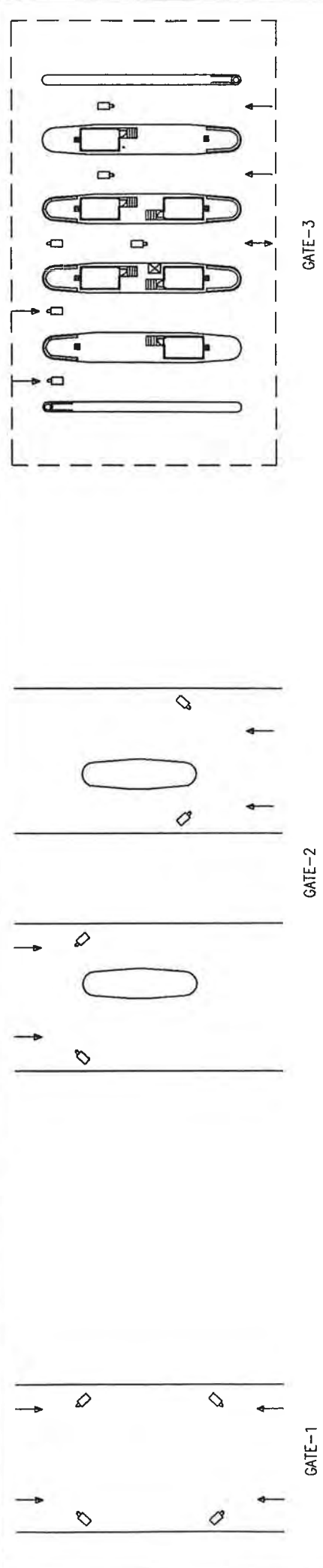
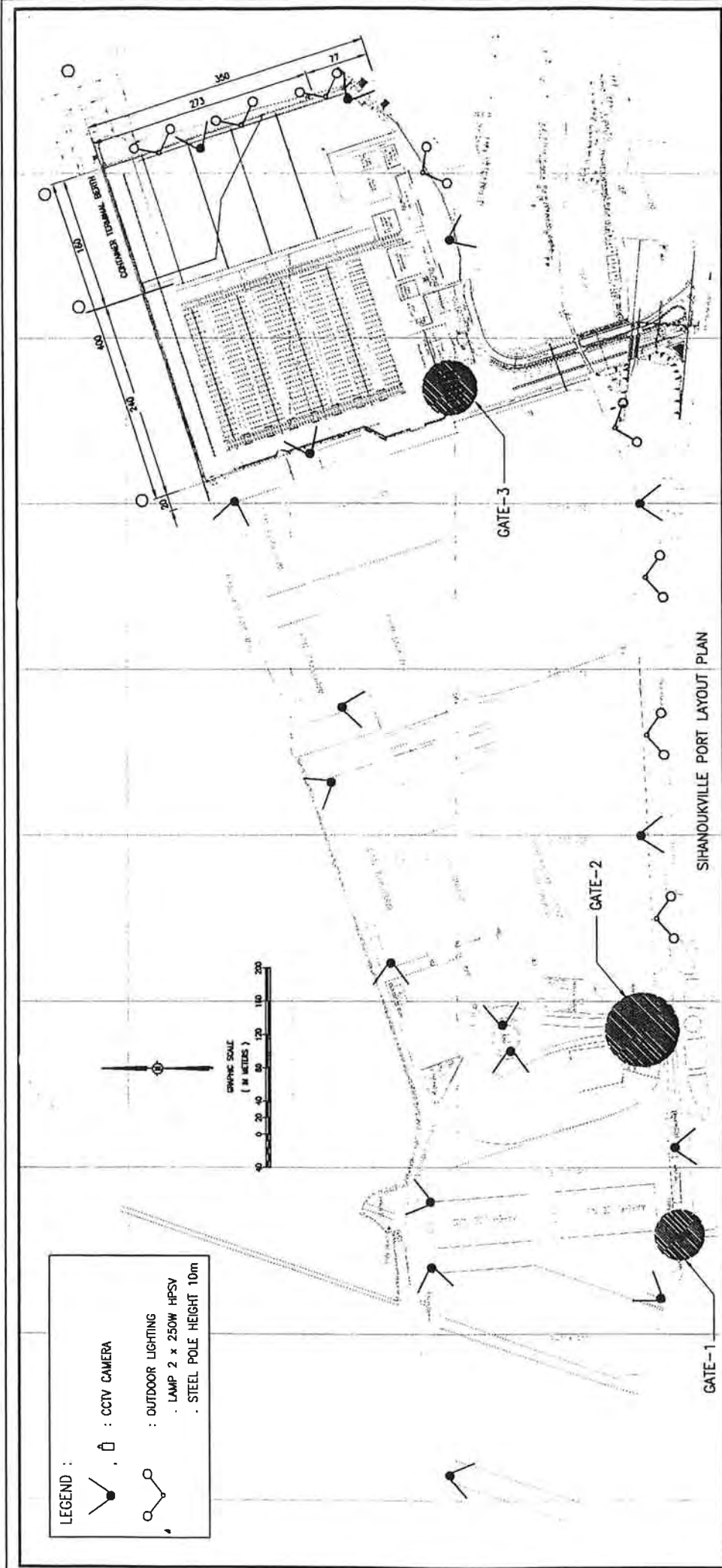
Japanese side and Cambodian side confirmed to discuss regarding the following soft component.

- VTMS
- CCTV
- Vessels

Training for the VTMS operation should be required to be done in Japan prior to in Cambodia.

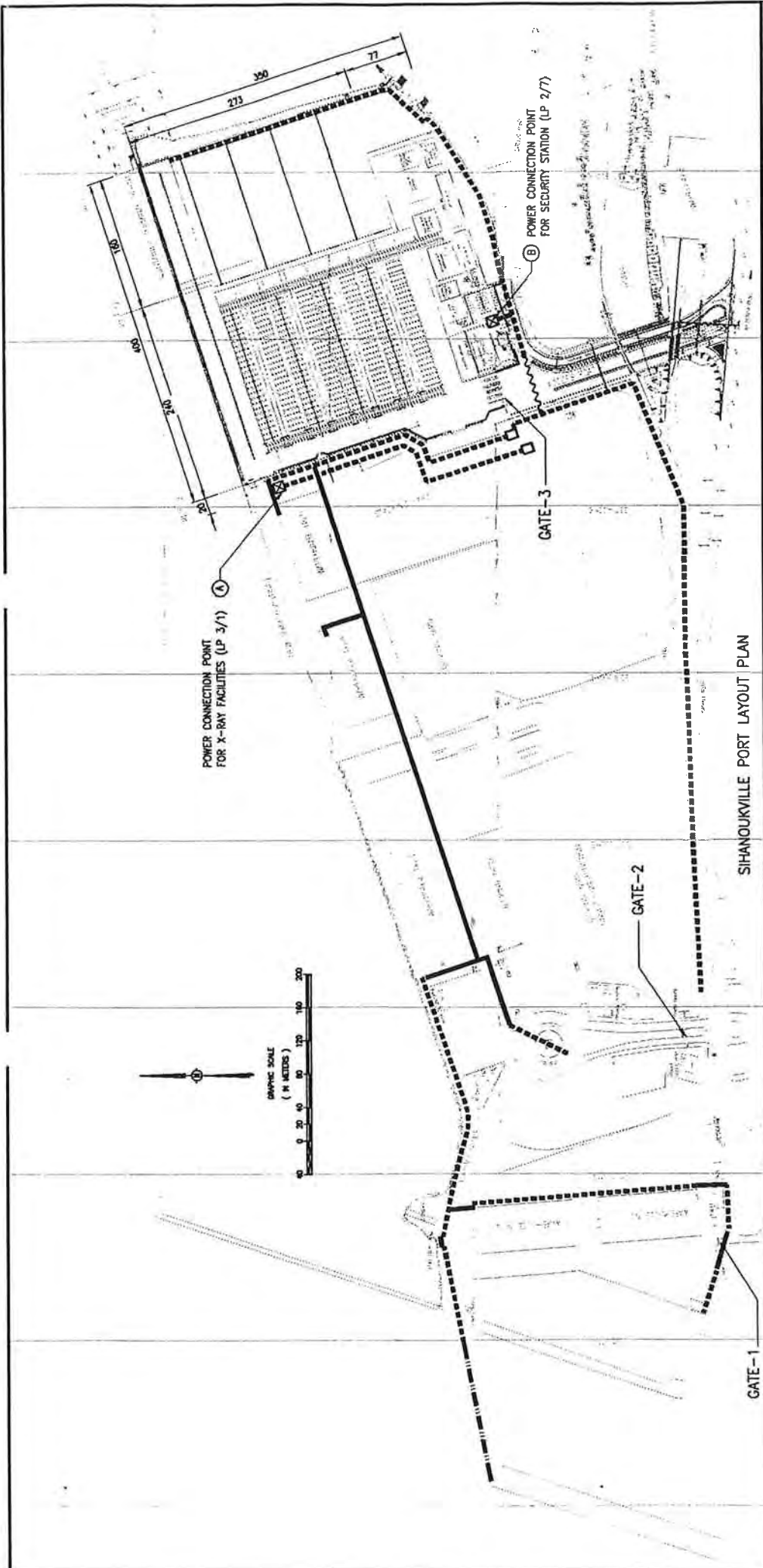
### **5-2 Demarcation (see, Figure 5-1)**

Team discussed with Cambodian side regarding demarcation of undertakings by Japanese side and Cambodian side. Cambodian side understood the principal of JICA Grant Aid system. Team confirmed that Cambodian side shall provide utility lines such as water-supply, drainage, electricity and telephone to the connection points for the facilities.



**CCTV CAMERA INSTALLATION PLAN FOR GATE AND YARD SURVEILLANCE**

Figure 3-1



SIHAUKVILLE PORT LAYOUT PLAN

LEGEND :

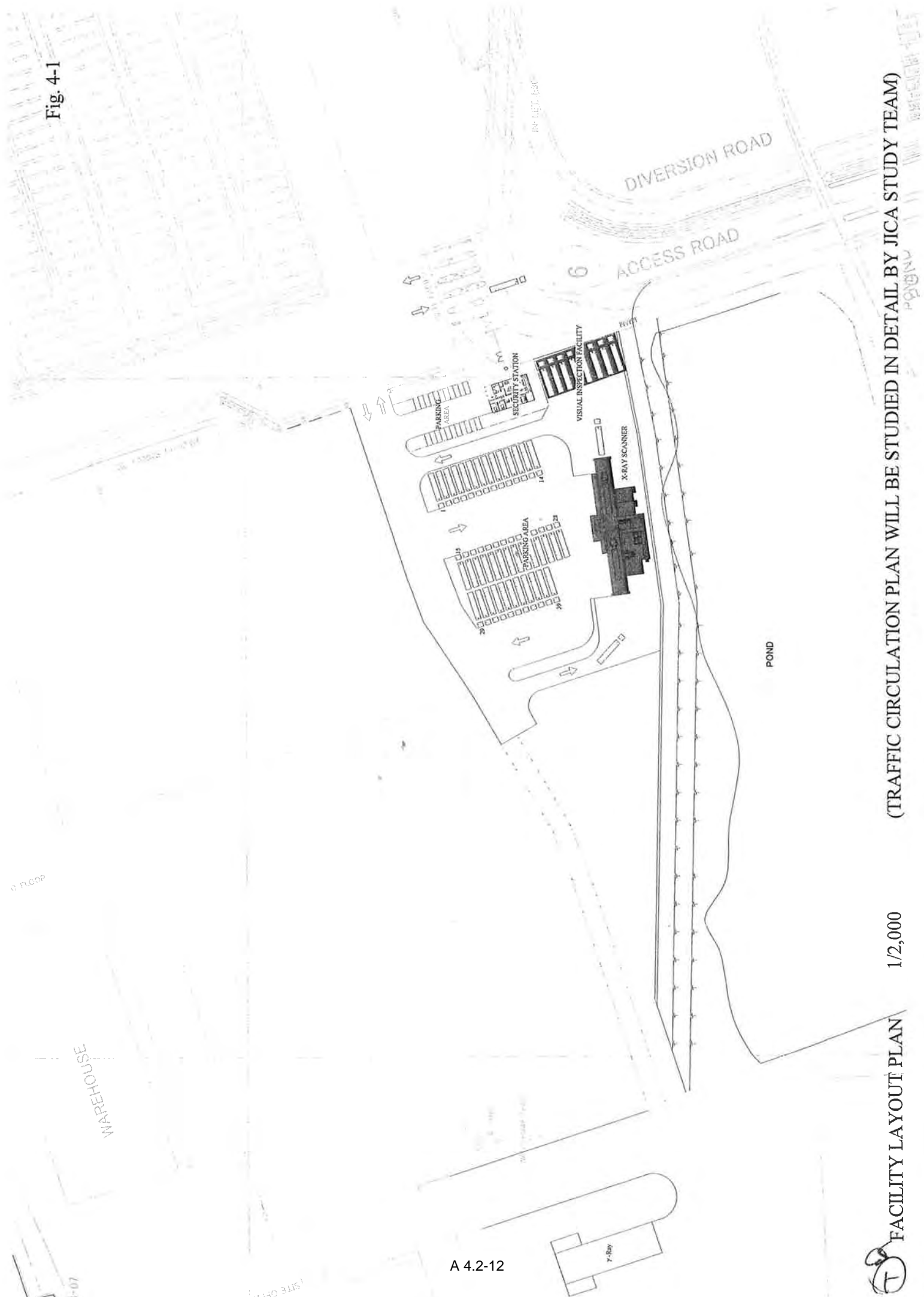
-----	: NON PAVED
————	: CONCRETE PAVEMENT
~~~~~	: EXISTING CABLE ROUTE
- . - . - .	: PIPED CABLE ALONG WITH APPROACH WAY TO EXTEND TO OLD JETTY

CABLE INSTALLATION ROUTE

Figure 3-2

⑦

Fig. 4-1



FACILITY LAYOUT PLAN 1/2,000 (TRAFFIC CIRCULATION PLAN WILL BE STUDIED IN DETAIL BY JICA STUDY TEAM)

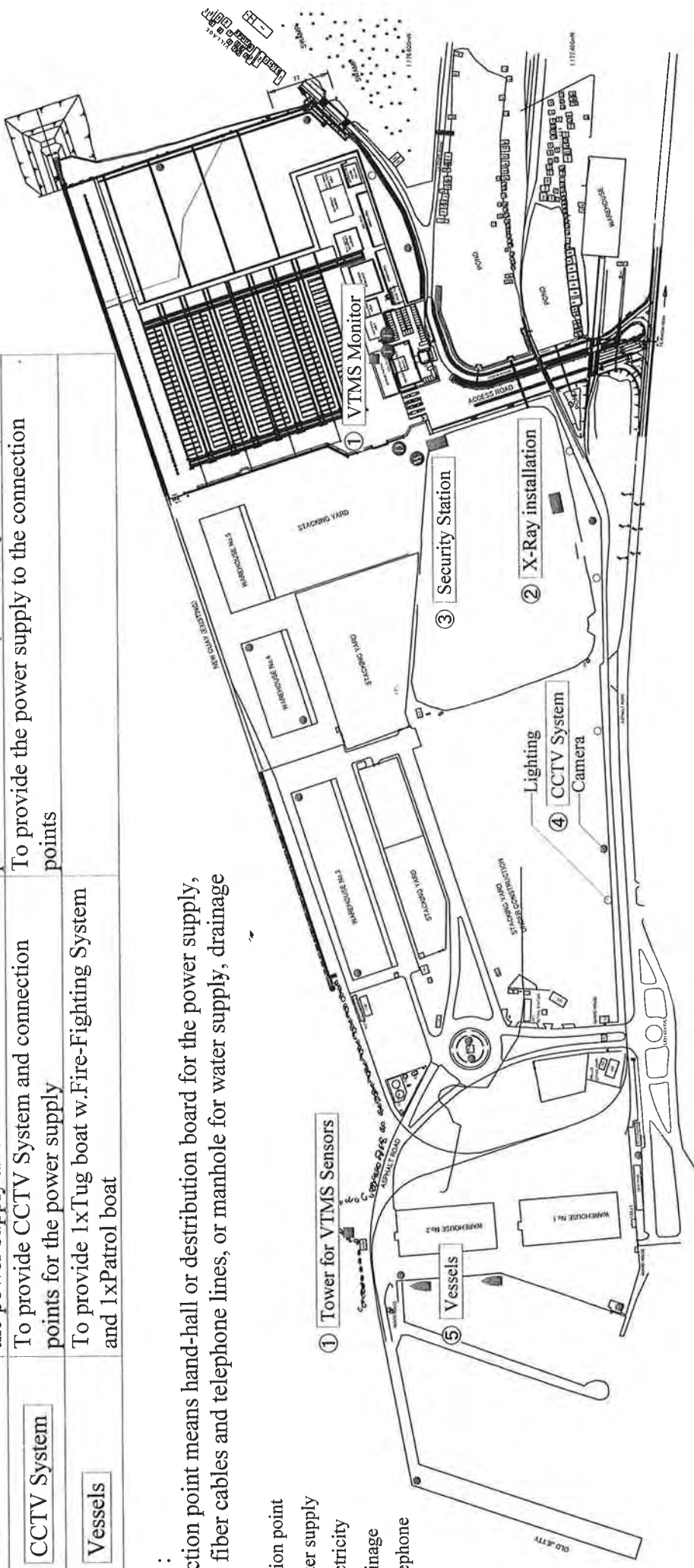
Fig.5-1

UNDERTAKING	Japanese Side	Cambodian Side
① VTMS	To introduce VTMS incl. tower construction and connection point for the power supply	To demolish existing tower and re-installation of Beacon light and power supply to connection point
② X-Ray installation	To introduce X-Ray inspection installation incl. incidental facility and connection point	To provide utilities to connection points
③ Security Station	To provide facility and connection point for the power supply and other utilities	To provide power supply to the connection point and other utilities(water,telephone,etc.)
④ CCTV System	To provide CCTV System and connection points for the power supply	To provide the power supply to the connection points
⑤ Vessels	To provide 1xTug boat w.Fire-Fighting System and 1xPatrol boat	

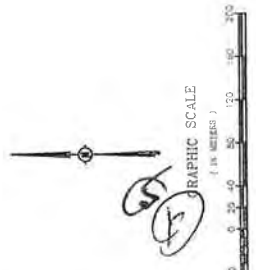
NOTE :

Connection point means hand-hall or distribution board for the power supply, optical fiber cables and telephone lines, or manhole for water supply, drainage

- Connection point
- Water supply
- Electricity
- Drainage
- Telephone



A 4.2-13



DEMARICATION OF UNDERTAKINGS by JAPANESE Side and Cambodian Side

Final demarcation of undertakings will be defined by JICA based on the result of analysis.

**Record of Technical Discussions**  
**on the Basic Design Study**  
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**in Sihanoukville Port and Phnom Penh Port**  
**in the Kingdom of Cambodia**

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

Phnom Penh, February 21, 2006 (A)



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for Mr. Fujio SAIGUSA  
Chief Consultant,  
JICA Basic Design Study Team  
International Development System Inc.



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H.E. PEN SIMAN  
Delegate of Royal Government of Cambodia  
in charge of Custom and Excise Department  
Ministry of Economy and Finance  
Kingdom of Cambodia

## Attachment

The Basic Design Study Team (the Team) has explained its field survey results on the current container inspection system and X-ray container inspection system planning in Sihanoukville Port.

The Cambodian side understood the Team's report on the subject.

### 1. Field Survey Results

1-1 Major findings on present conditions of the existing  $\gamma$ -ray scanner are as follows.

#### (1) Performance of $\gamma$ -ray scanner

- 1) While power of  $\gamma$ -ray scanner is relatively low, resolution by scanner is not clear enough to distinct the content in containers.
- 2) Space under the floor of container is out of inspection.

#### (2) Safety Issues

- 1) Workers can access to the inspection entrance easily even when alarmed.
- 2) Workers' station is separated from  $\gamma$ -ray scanner only by usual aluminum sash which is not enough to shut down the radiation.
- 3)  $\gamma$ -ray scanning is done without closing the door for the drivers. Operators and drivers do not seem to pay enough attention to safety.

#### (3) Operation of $\gamma$ -ray scanner

The existing  $\gamma$ -ray scanner inspects most of imported containers except PSI sealed containers, diplomatic and governmental import containers, Grant Aid containers, MEF approved containers, empty containers and detailed checking containers. Around 10% of the scanned containers are physically inspected, which indicates insufficient capability of the  $\gamma$ -ray scanner.

### 2. X-ray Container Inspection System Planning

#### 2-1 Significance and advantage of X-ray Container Inspection System

X-ray container inspection system is the countermeasures to be taken for the detection of dangerous and suspicious goods directly. In addition, the system contributes largely to facilitate international trade by improving security.

#### 2-2 Usage of X-Ray Container Inspection System

Considering the performance and operation of existing  $\gamma$ -ray scanner, it is advised that the

X-ray Container Scanner be used solely for both export and import container inspection after the completion of its installation. At that time, inspection rate expects to be reduced down to appropriate level by introducing risk management.

### 2-3 Location and ancillary facilities

- (1) Newly installed X-ray scanner should be located considering the traffic line of container in the Port (See Fig. Tentative Layout Plan).
- (2) Appropriate scale of covered facility for the physical inspection should be provided as a part of X-ray Container Inspection system for quick and efficient inspection activities.
- (3) Adequate backyard area for export/import container trailers for X-ray inspection should be provided.

### 2-4 Evaluation items

X-ray Container Scanner will be designed based on the following evaluation items;

- a. X-Ray energy (6 MeV)
- b. Penetration (Fe)
- c. Radiation direction for inspection
- d. Resolution;
  - IQI (Image Quality Index)
  - CI (Contrast Sensitivity)
  - In air
- e. Normal scanning speed
- f. Inspection speed
- g. Radiation projection
- h. Power requirement
- i. International safety standards (International Commission Radiological Protection )
- j. Others

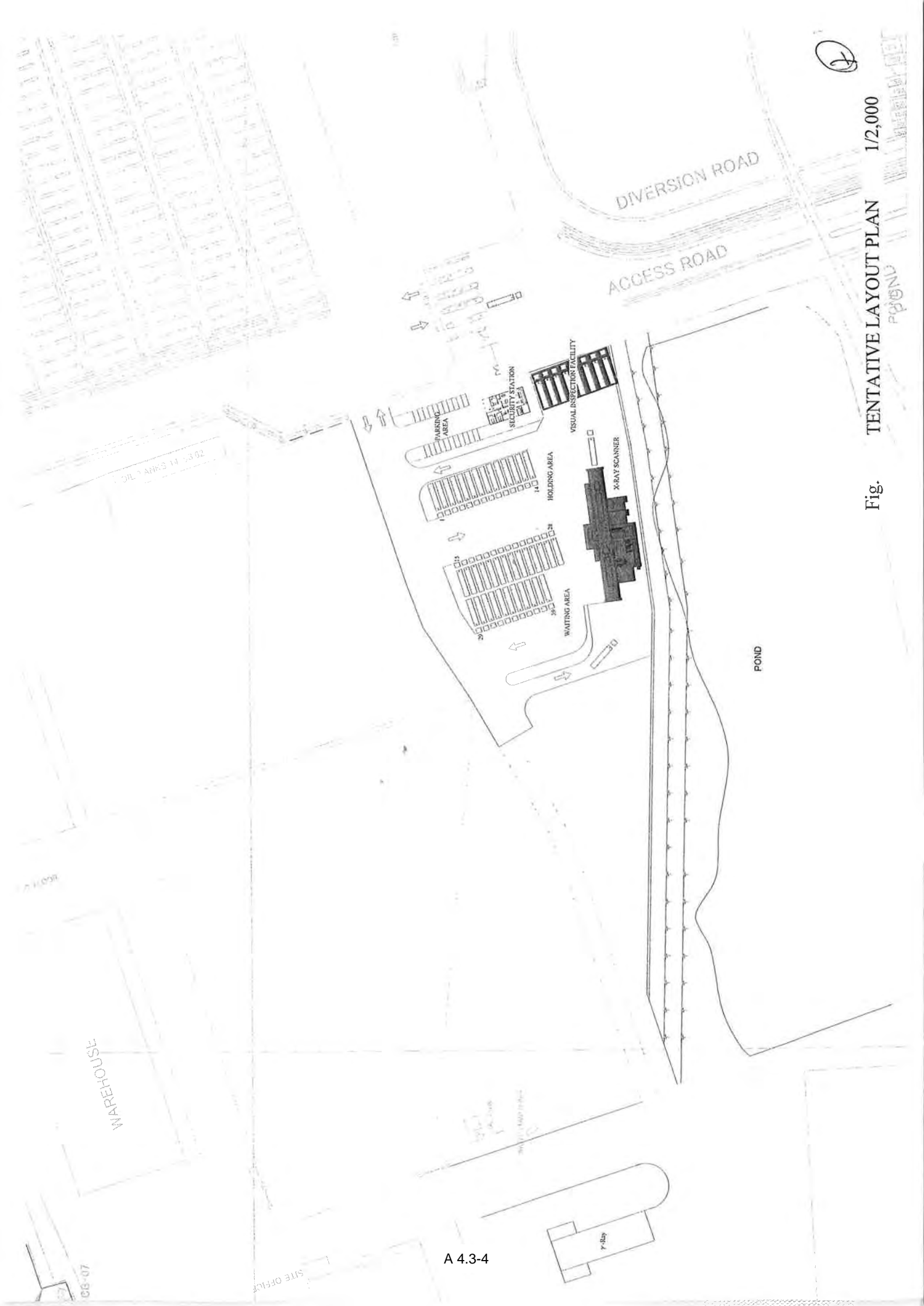
### 2-5 X-ray inspection charge

X-ray inspection charge needs to be decided on an appropriate level based on only operation and maintenance cost of the system.

### 2-6 Coordination on X-ray Container Inspection System Planning

X-ray Container Inspection System should be planned in collaboration with Sihanoukville Autonomous Port (PAS) under customs management.





1/2,000

TENTATIVE LAYOUT PLAN

Fig.

**Minutes of Discussions  
on the Basic Design Study  
on the Project for Improvement of Security Facilities and Equipment  
in Main International Ports in the Kingdom of Cambodia  
(Explanation on the Draft Report)**

In January to February, 2006, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Project for Improvement of Security Facilities and Equipment in Main International Ports (hereinafter referred to as "the Project") to the Royal Government of Cambodia and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the study.

In order to explain and consult the Government of Cambodia on the components of the draft report, JICA sent to Cambodia the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Hiroyuki Hayashi, Senior Program Administration Officer of the Transportation and Electric Power Team, the Grant Aid Management Department, JICA and is scheduled to stay in the country from June 4 to 12, 2006.

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

Phnom Penh, June 12, 2006



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Mr. HIROYUKI HAYASHI  
Leader  
Basic Design Study Team  
Japan International Cooperation Agency



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Delegate of Royal Government of Cambodia  
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Kingdom of Cambodia



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H.E. HEI BAVY  
Chairman & CEO  
Phnom Penh Autonomous Port  
Ministry of Public Works and Transport  
Kingdom of Cambodia

## ATTACHMENT

### 1. Components of the Draft Report

The Cambodian side agreed and accepted in principle the components of the Draft Report explained by the Team from the viewpoint of the objective of the Project, which is to enhance security level of Sihanoukville Port and Phnom Penh Port by providing security facilities and equipment in order to strengthen counter-terrorism/anti-terrorism measures and to facilitate international trade. The lists of components are shown in Annex-1.

### 2. Schedule of the Study

JICA will complete the Final Report in accordance with the confirmed items and send it to the Cambodian side around July 2006.

### 3. Other Relevant Issues

(1) Both sides confirmed that the title of the Project should be changed to as "The Project for Improvement of Security Facilities and Equipment in Main International Ports in the Kingdom of Cambodia".

(2) Both sides re-confirmed that the Cambodian side should allocate necessary budget for undertakings to be done on a timely manner, based on the provisional amount shown in the draft report in fiscal year 2006 to 2008. The lists of undertakings are shown in Annex-2.

(3) The Cambodian side confirmed that the responsible organizations / the implementing agencies for the Project will continue collaboration in taking procedures necessary for smooth implementation of the Project as below:

1) The Banking Arrangement (B/A) should be arranged and coordinated by the Ministry of Economy and Finance (MEF).

2) The Authorization to Pay (A/P) for the X-ray container screening system and related facilities/equipment will be coordinated by the Customs and Excise Department of MEF (CED).

3) The Authorization to Pay (A/P) for all facilities/equipment except the above-mentioned X-ray container screening system and related facilities/equipment will be arranged and coordinated by the Sihanoukville Autonomous Port (PAS). In addition, both PAS and the Phnom Penh Autonomous Port (PAP) should confirm detailed procedures, section(s)/person(s) in charge of issuance of A/P, customs clearance, budget allocation, and etc. by making the Memorandum of Understanding (MOU) before commencement of the Project.

(4) The Cambodian side explained to the Team that Patrol Boat, which is requested by the Cambodian side, should belong to PAS and should not be diverted to military use.

(5) The Cambodian side explained to the Team that the Port Facility Security Plan is not yet finalized and the Cambodian side will continue to ensure effective implementation of the Plan before the completion of the Project.

(6) The Team requested CED, and CED agreed to set the container fee at the lowest price considering mainly on operation and maintenance costs of the X-ray container screening system, and to inform the Government of Japan through JICA Cambodia Office of the above-mentioned scanning fee by the end of 2006.

(7) The Team requested PAS, and PAS agreed to grant free use of land for container inspection to CED, and to provide electricity to the X-ray container screening system at the cost of power generation in order to reduce operation costs of the system.

(8) The Team requested CED, and CED agreed to integrate the operation system of the container inspection into the Customs Processing System, which should be developed by CED, and to connect the Customs Processing System to PAS's port operation system to strengthen port security and trade facilitation.

(9) PAS requested the Team to include the following additional items, and the Team will study the appropriateness of the items and inform PAS of the results through JICA Cambodia Office;

1) 1 set of Card Reader for port staff entrance at the Gate 3 (total sets of the Card Reader for the Gate 3 should be changed from 2 sets to 3 sets)

2) 1 set of the echo-sounder equipped to the Patrol Boat

(10) The Team requested PAS, and PAS agreed not to install any obstacles, such as wind power generator(s) in the area shown in the Annex-3, which will be covered by radar of VTMS, in order to avoid any influence on VTMS.

(11) The Team requested PAP, and PAP agreed to obtain the necessary approval from the Phnom Penh Municipality on construction of the Security Station and inform the Team through JICA Cambodia Office by the end of June 2006.

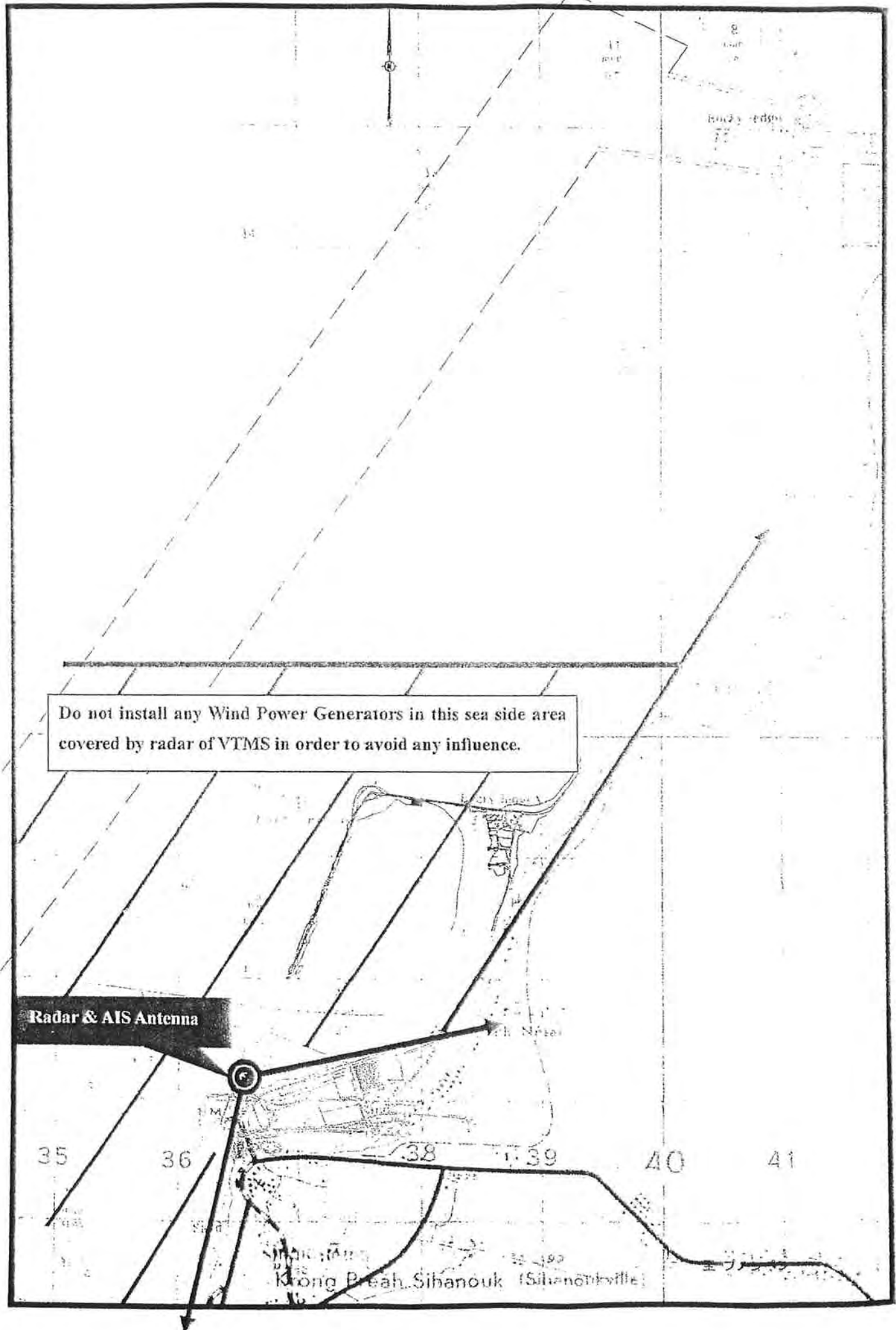
## List of Components for the Project

Components (Facilities/Equipment)	Outline technical specifications (Major technical aspect)
<b>For Sihanoukville Port</b>	
X-ray container screening system	X-ray container screening system: 1 set - X-ray energy: 6 MeV - Radiation direction: Single side view - Hourly throughput: 20 trucks or more
CCTV system	CCTV camera for Yard: 18 sets - Horizontal resolution: 480 lines or more - Optical zoom: more than or equal to 22 x CCTV camera for Gate: 14 sets - Horizontal resolution: 480 lines or more - Optical zoom: more than or equal to 8 x  with Public Address System (Amplifier: 360 W/Speaker: 30 W)
ID Pass Card System	ID pass card system: 1 set - Barcode Reader (5 sets) - Signal controller - PC for entry /gate management - Wireless LAN net work equipment - Card printer - Barcode cards for personal ID use to be supplied: 1,800 pcs
Security station	Flat office (total floor area: 230 m <sup>2</sup> ) consists of monitor room, officer room, rest room, toilet, storage and others
VTMS (Vessel Traffic Management System)	VTMS: 1 set - Radar : X-band, 25 kW Transmitting - AIS Receiver: 156.025 ~ 162.025 MHz - CCTV Camera: more than or equal to zoom 32 x - VHF: 25 W, 57 International Ch. - Anemometer: Wind Vane - Display: Color LCD, 17" or more
Patrol boat	Patrol boat: 1 ship - Material: Aluminum Alloy - Length: Approx. 14 meter - Speed: 18 knots - Main Engine: Approx. 200 PS x 2
Oil skimmer	Oil skimmer: 1 set - Floating type - 30 m <sup>3</sup> /hr x 10 kgf/cm <sup>2</sup> - Driven by hydraulic power pack - Oil collecting device: Outrigger with oil fence

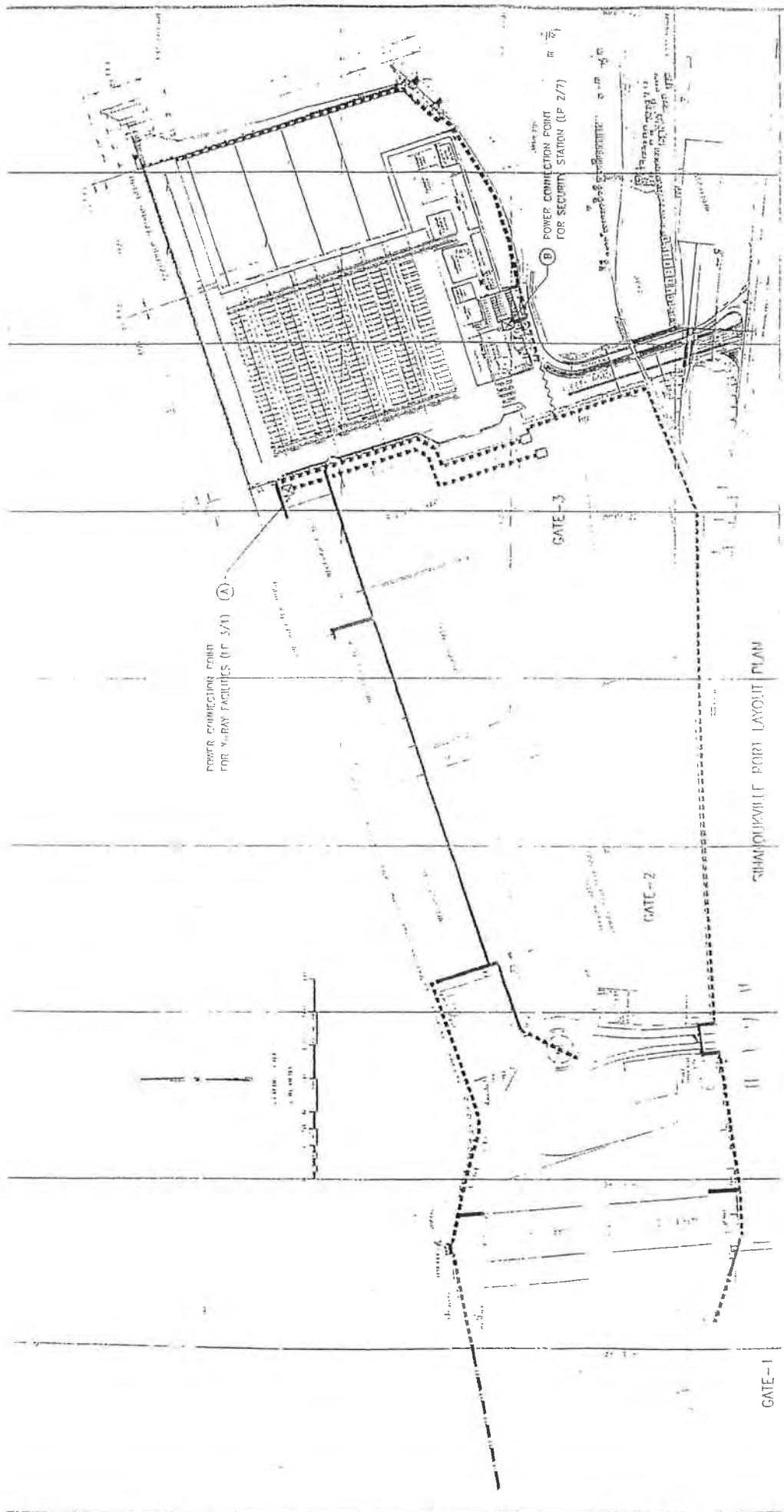
Oil fence	Oil Fence: 22 sets - Solid type (B-type) - 20 m/set x 22 sets, total length: 440 m
Oil barge	Oil barge: 1 set - Inflatable type - Capacity 25 m <sup>3</sup>
<b>For Phnom Penh Port</b>	
CCTV system	CCTV camera for Yard: 14 sets - Horizontal resolution: 480 lines or more - Optical zoom: more than or equal to 22 x CCTV camera for Gate: 2 sets - Horizontal resolution: 480 lines or more - Optical zoom: more than or equal to 8 x  with Public Address System (Amplifier: 360 W/Speaker: 30 W)
ID pass card system	ID pass card system: 1 set - Barcode Reader (2 sets) - Signal controller - PC for entry /gate management - Card printer - Barcode cards for personal ID use to be supplied: 900 pcs
Security station	2 story office (gate + station on 2 <sup>nd</sup> fl.) (total floor area: 207 m <sup>2</sup> ) consists of monitor room, officer room, meeting room, rest room, toilet, storage and others

## Major undertakings to be done by the Cambodian side

Components	Detailed undertakings	By	Completed before
<b>For Sihanoukville Port</b>			
X-ray container screening system	1. To secure site for parking area	CED	Feb. 2007
	2. To provide utility with enough capability (power, water, sewage, telecommunication and others) at the location specified in the design. Required power intensity: approx. 75 kVA, 380/220 V	CED	Aug. 2007
CCTV	1. To secure site for underground cabling route. (see Annex-4 for Cable Installation Route)	PAS	Aug. 2007
	2. To repair damaged fence and/or to install new one.	PAS	Aug. 2007
	3. To repair damaged existing yard lighting.	PAS	Aug. 2007
Security Station	To secure site for parking area.	PAS	Feb. 2007
VTMS	1. To remove present light beacon tower and to secure a space for tower and shelter for VTMS	PAS	Aug. 2007
	2. To secure site for cabling route between tower and operation & monitoring room in Administration Office. (see Annex-4 for Cable Installation Route)	PAS	Aug. 2007
	3. To secure a space at observation deck in administration office for operation & monitoring of VTMS	PAS	Aug. 2007
	4. To reinstall light beacons at VTMS tower.	PAS	Aug. 2007
Patrol Boat	To secure mooring berth.	PAS	Dec. 2007
Oil skimmer.	1. To secure a space for storage.	PAS	June.2007
Oil fence and Oil barge	2. To install fitting device at the existing tugboat for connection of outrigger for skimming.	PAS	June.2007
Temporary Construction Site	To secure a temporary construction site of 1.0Ha in Sihanoukville Port. (see Annex-5 for Temporary Construction Site in Sihanoukville Port)	PAS	Feb. 2007
All Components except X-ray screening system	To provide utility with enough capability (power, water, sewage, telecommunication and others) at the location specified in the design. Required power intensity: approx. 100 kVA, 380/220 V	PAS	Aug. 2007
<b>For Phnom Penh Port</b>			
CCTV	1. To secure site for underground cabling route (see Annex-6 for Cable Installation Route)	PAP	Aug. 2007
	2. To repair damaged fence, lighting and/or to install new fence and lighting.	PAP	Aug. 2007
ID pass card system	1. To secure site for underground cabling route	PAP	Aug. 2007
	2. To remove existing gate and to install a temporary gate	PAP	Feb. 2007
Temporary Construction Site	To secure a temporary construction site in Phnom Penh Port and/or nearby area to the port. (see Annex-7 for Temporary Construction Site in Phnom Penh Port)	PAP	Feb. 2007
All Components	To provide utility with enough capability (power, water, sewage, telecommunication and others) at the location specified in the design. Required power intensity: approx. 50 kVA, 380/220 V	PAP	Aug. 2007



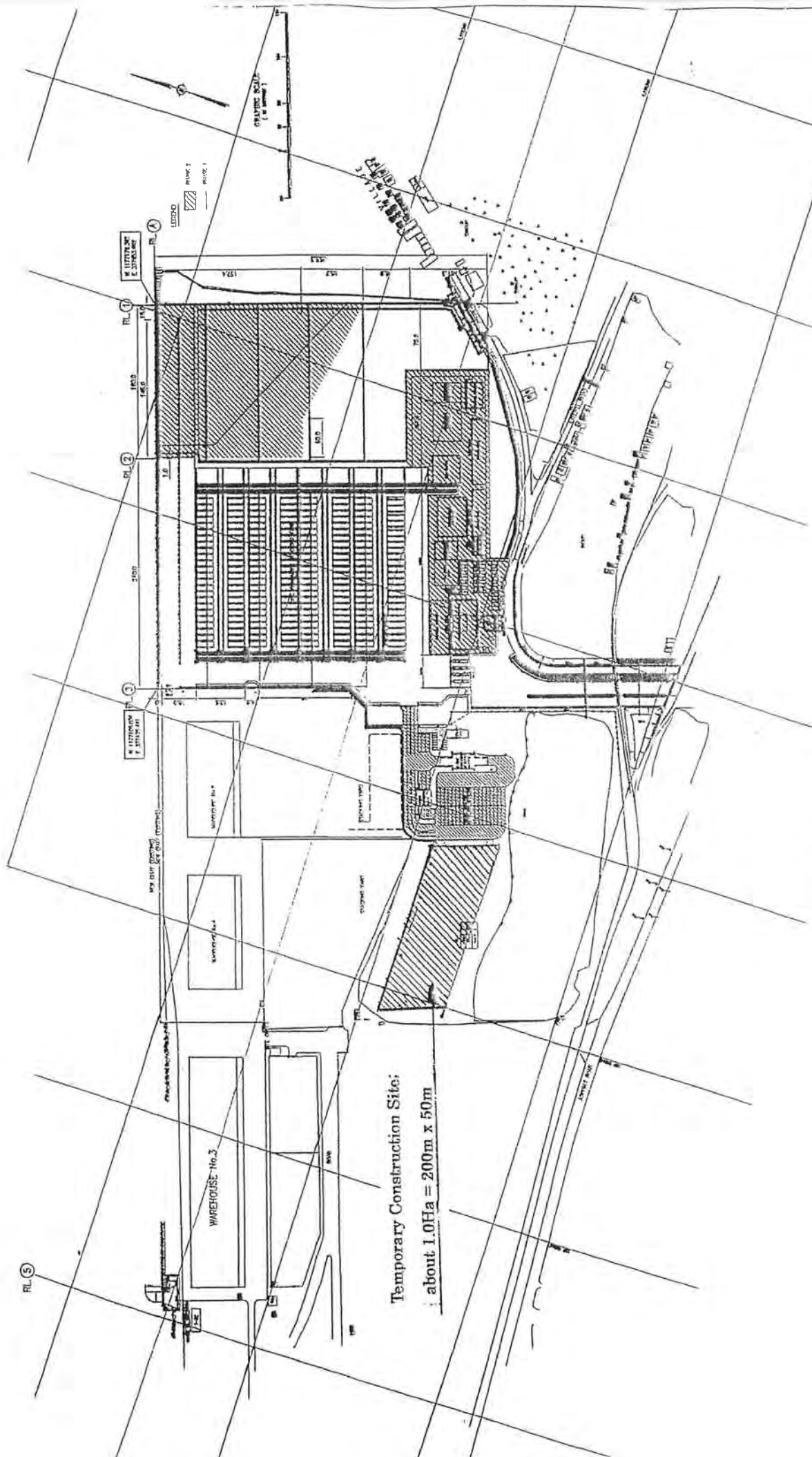




LEGEND

	NOT PAVED
	CONCRETE PAVEMENT
	EXISTING CABLE ROUTE
	PIPED CABLE ALONG WITH APPROACH WAY TO EXTEND TO OLD JETTY
	PIPED CABLE ALONG WITH GATE

Annex 4 CABLE INSTALLATION ROUTE

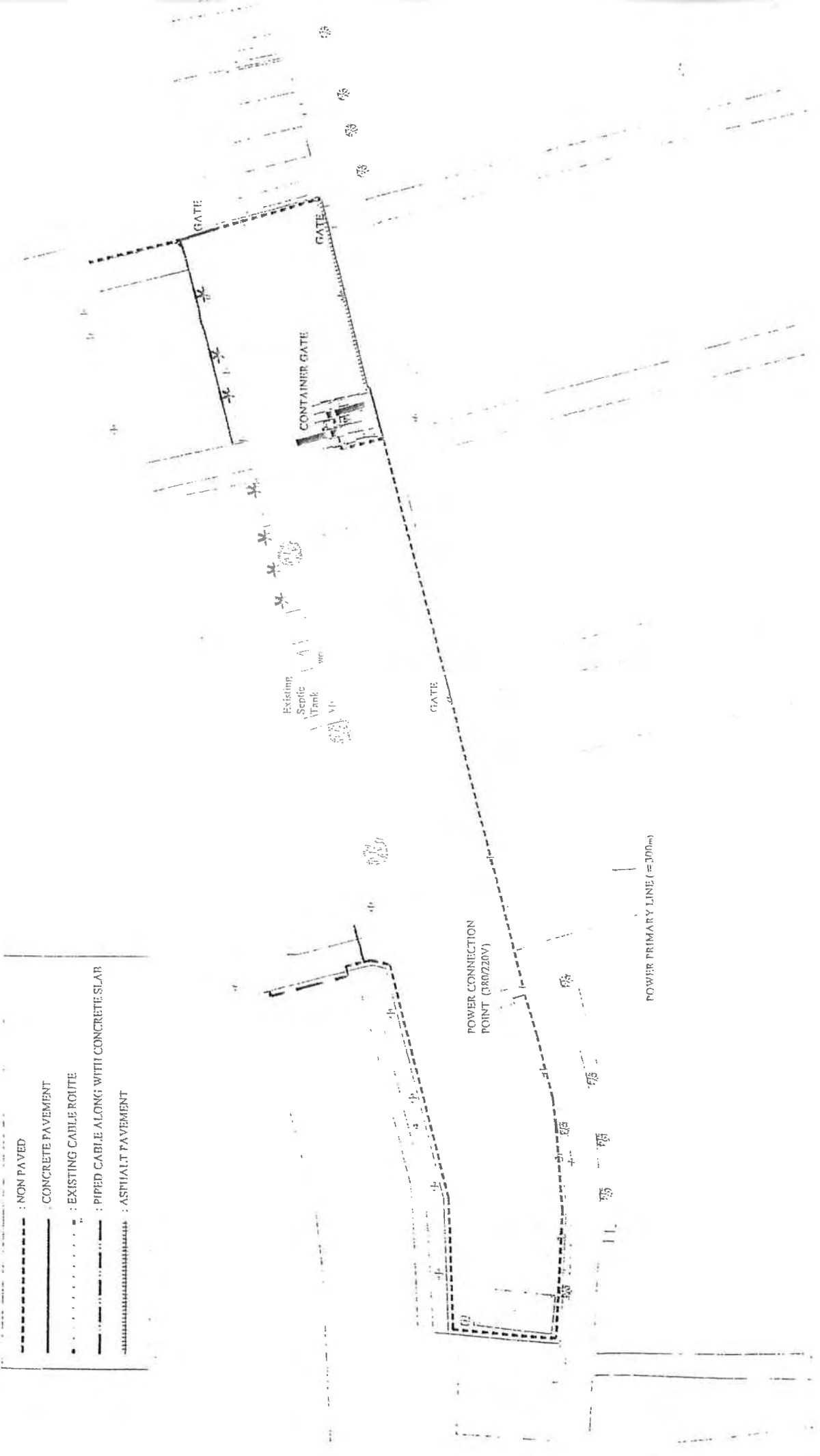


Temporary Construction Site:  
 about 1.0Ha = 200m x 50m

Annex 5 Temporary Construction Site

LEGEND :

- - - - - : NON PAVED
- : CONCRETE PAVEMENT
- · · · · : EXISTING CABLE ROUTE
- · — · — : PIPED CABLE ALONG WITH CONCRETE SLAB
- ||||| : ASPHALT PAVEMENT



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- - EXISTING LIGHTING POLE
- - PAN/TILT CAMERA
- - FIXED CAMERA

PROPOSED PLACES FOR TEMPORARY CONSTRUCTION SITE

Temporary Construction Site 1

Temporary Construction Site 2

Annex 7 Temporary Construction Site

