

**BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR
IMPROVEMENT OF EQUIPMENT
FOR DEMINING ACTIVITIES (PHASE IV)
IN
THE KINGDOM OF CAMBODIA**

October 2004

**JAPAN INTERNATIONAL COOPERATION AGENCY
PACIFIC CONSULTANTS INTERNATIONAL**

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PREFACE

In response to a request from the Government of the Kingdom of Cambodia, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Equipment for Demining Activities (Phase IV), and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Cambodia a basic study team from 31 March to 29 April 2004. The team held discussion with the officials concerned of the Government of Vietnam, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Cambodia in order to explain a draft basic design report, 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 Cambodia for their close cooperation extended to the teams.

October, 2004

Seiji KOJIMA
Vice President,
Japan International Cooperation Agency

October, 2004

LETTER OF TRANSMITTAL

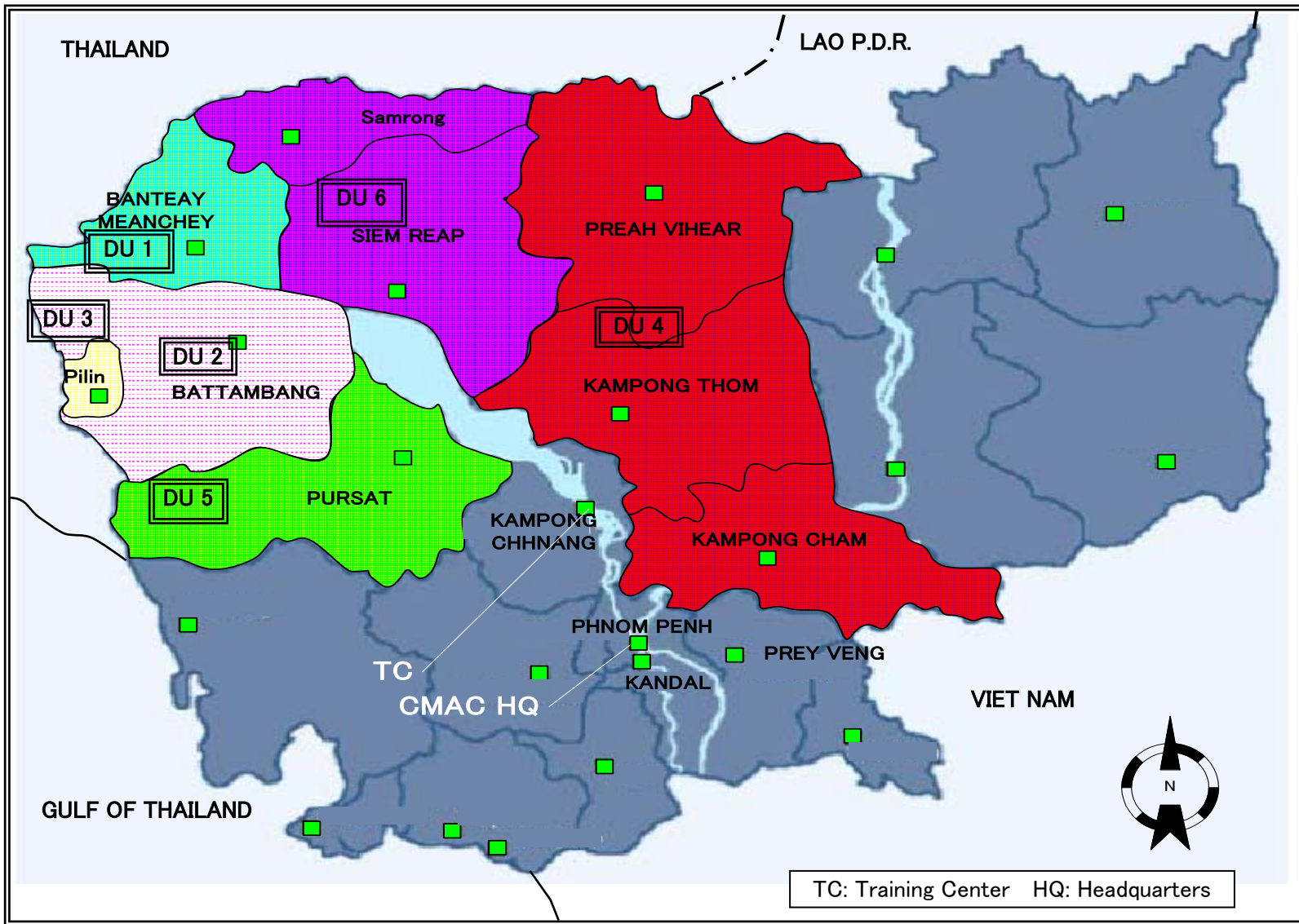
We are pleased to submit to you the basic design study report on the Project for Improvement of Equipment for Demining Activities (Phase IV) in the Kingdom of Cambodia.

This study was conducted by Pacific Consultants International under a contract to JICA, during the period from March, 2004 to October, 2004. In conducting the study, we have examined the feasibility and rational of the project with due consideration to the present situation of Cambodia 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,

Nobuo Monoe
Chief Consultant,
The Project for Improvement of Equipment for
Demining Activities (Phase IV)
Pacific Consultants International



Location Map

1. Brush Cutter



DU1 Mine Field M5363 HITACHI EX150LC



DU1 Mine Field 5259 KOMATSU P60-7B

2. Vehicles



DU5 Mine Field M4850C GMC Truck/Ambulance



Battambang Center Workshop

3. Mine Detector



DU3 Mine Field M5420A Minelab F1A4



DU6 Mine Field.M4726 Schibel AN-19/2

4. Logistic Computer



CMAC Headquarter Logistic Office



DU2 Logistic office

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Abbreviations

A/P	Authorization to Pay
B/A	Banking Arrangement
CBMRR	Community Based Mine Risk Reduction
CMAA	Cambodian Mine Action and Victim Assistance Authority
CMAC	Cambodian Mine Action Center
CMIS	Communications & Management Information System
CMT (CMMT)	Community Mine Marking Teams
DU	Dimining Unit
E/N	Exchange of Notes
EOD	Explosive Ordinance Disposal
EOJ	Embassy of Japan in Cambodia
4WD	Four Wheel Drive
GNP	Gross National Product
GPS	Global Positioning System
HaloTrust	Hazardous Area Life-support Organization Teust
ICRC	International Committee of the Red Cross
JAHDS	Japan Alliance for Humanitarian Demining Suppot
JMAS	Japan Mine Action Service
JICA	Japan International Cooperation Agency
LUPU	Land Use Planning Unit
MAG	Mine Advisory Group
M/D	Minutes of Discussion
NGO	Non-Governmental Organization
SOR	Standard of Regulation
UNDP	United Nations Development Programme
UNCEF	United Nations Children's Fund
UPS	Uninterruptible Power Supply
UXO	Unexploded Ordnance
VHF	Very High Frequency

SUMMARY

SUMMARY

More than ten years after the end of civil war in Cambodia, 4 to 6 million land mines are presumed to still exist in site. It is estimated that 100 years or more will be required for complete removal of these land mines. The removal of the land mines will contribute to the safety of citizens, promotion of repatriation, and growth of regional economy. It is recognized as an urgent national problem to be solved for social and economic development.

The Cambodia government developed the national demining activity strategy plan as one of the most important policies for the future development of Cambodia. In 1992, it established Cambodian Mine Action Centre (CMAC) under support of UNTAC. CMAC conducts mine awareness, investigation, demining and training as the pillars of its activities. From 1993 to May 2003, 106 km² of landmine and UXO clearance were performed, and 181,659 anti-personnel landmines, 3,514 anti-tank landmines, 750,887 UXO and 273,732,034 metal fragments were disposed of.

From 1998 to 2002, the Japanese Government carried out three projects regarding improvement of equipment for support CMAC's demining activities. CMAC has plans for demining 92 km² in its 5-year strategic plan (2003 to 2007).

However, basic equipment (such as brush cutters which are used to remove the brush in a mine field in advance of demining, mine detectors, etc.) is still insufficient and other related demining equipment is also required to achieve the goals of the 5-year strategic plan.

In order to improve the efficiency and safety of demining activities in Cambodia, the Cambodian government made a request for Japanese government Grant Aid.

In response to the request from the Cambodian government, the Japan International Cooperation Agency (JICA) dispatched the basic design team from March 31 to April 29, 2004. The basic design team discussed and checked the contents of the request with the Cambodian government, made comments on clearance methods, and collected necessary data.

The basic design report set out the type, size, quantity, and estimated cost of the equipment most appropriate for the Cambodian government needs. After discussion of the draft report in Cambodia from June 13 to 22, 2004, the amended final proposed equipment list was finalized as follows.

Final List of Equipment to be Procured

Equipment	Quantity	Use
Brush Cutter	14	To remove brush before clearance of mine.
Bulldozer	2	To construct approach roads to transport the brush cutter to mine field.
Truck trailer	2	To transport brush cutter and bulldozer to site.
Station Wagon	21	To transport mine dog, riper tools and injured persons, if any
Pickup Truck	45	To transport of staff and materials
Four-ton Truck	50	To transport of staff and materials
Motorbike	51	Emergency transportation and to contact remote places.
Mine Detector	600	Mine field detector for anti-personnel mines
UXO Detector	72	Mine filed detector for UXO
PPE Vest and Visor	1,120	To protect deminer during mine clearance activity
Workshop Building	1 set	For repairs of brush cutter and vehicles, storing parts, and technological training, etc.
Workshop Tools	1 set	Repair tools for brush cutter and vehicles
Demining Site Support Equipment	1 set	Generator, water pump, etc. to support demining site activities.
Operation Support equipment	1 set	Computer system and software to support demining operation activities.

The planned schedule of the procurement process will cover 9 months excluding time for Brush Cutter field test. The project cost is expected to be 1.717 billion Yen excluding Brush Cutter field test cost. This project cost is to be fully funded by Japanese Grant Aid.

The time and cost for brush cutting work, which occupied 70% of the demining work, will reduce by procurement of Brush Cutters. Procured vehicles will make transportation of staff and materials for demining works more efficient, and safety of deminer will improve by use of more protection and detection equipment.

The equipment will be maintained and repaired in the procured workshop building with procured tools and managed and supported using the procured computer system.

Improvement of CMAC equipment will expand the mine clearance area so more cleared land can be used for agriculture, permanent residences, roads and other infrastructure. Mine clearance is a very important activity to maintain national development in Cambodia, and this project is appropriate to be implemented under Japanese Grant-Aid.

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CHAPTER 1
BACKGROUND OF THE PROJECT

CHAPTER 1 BACKGROUND OF THE PROJECT

From 1998 to 2002, the Government of Japan executed three projects for “The project for Improvement of Equipment for Demining Activities”, and procured equipment which was necessary for demining activity and to support the demining activity of CMAC.

In its 5-year strategy plan (from 2003 to 2007), CMAC aims to reduce the number of landmine victims and improve social and economic development. Mine clearance area of 92 km² is planned in the 5-year strategy plan.

However, in order to attain the target of CMAC’s 5-year strategy plan, some equipment is still lacking and more is required for the demining activities. These include Brush Cutters (to cut the plants in a mine field in advance of mine detection), mine detectors, etc.

Consequently the Government of the Kingdom of Cambodia requested Grant Aid from the Government of Japan for the procurement of equipment for demining activities.

The Cambodian government request covers “improvement of equipment for demining activities phase-4 and -5” and study team conducted the basic design of this project based on this request in these phases.

CHAPTER 2
PROJECT CONTENTS

CHAPTER 2 PROJECT CONTENTS

2-1 Basic Concept of the Project

2-1-1 Overall Goal

More than ten years after the end of civil war in Cambodia, 4 to 6 million land mines are presumed to still exist in situ. It is estimated that 100 years or more is required for complete removal of the land mines. The removal of land mines will contribute to the safety of residents, promotion of repatriation and growth of regional economy. It is recognized an urgent national problem to be solved for social and economic development.

The total number of mine fields in Cambodia is about 3,037 and they cover an area of about 4,466 km². The 6 mine removal branches (Demining Units or DU) of CMAC are responsible for mine removal activity at 2,467 mine fields covering an area of 3,852 km², according to the mine clearance Level -1 survey in 2002.

In the past, CMAC received financial and technical support from donor countries and international organizations to operate its mine clearance activities. Between 1993 and March 2004, CMAC manually completed about 3% of the total mine clearance in an area of 112.8 km².

To promote mine removal activity, the Cambodian government created the national mine activity strategy plan (National Mine Action Strategic Plan), and the mine removal is one of its important activities. Under the organization of UNTAC, CMAC was established in 1992, and it has executed the strategy plan (2003-2007 years) for two years now.

2-1-2 Project Purpose

In this Project (Phase-4), CMAC demining equipment and tools will be purchased to obtain sufficient demining equipment for the land mine clearance activities. The project aims to stabilize the life of the Cambodian people by solving the problem of land mines in their living environment. Procurement in this project is necessary so that mine removal activity of CMAC can be executed more efficiently and more safely.

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

This grant aid project will supply the funds to procure sufficient demining equipment for the land mine removal activities and support at CMAC headquarters, as well as equipment for demining units in the field and for the training center to be able to train sufficient operators and support personnel.

This project was planned based on the following policies.

1) Basic policy

- To give selection priority to demining equipment used directly in the field and to tools used in maintenance of equipment for land mine clearance activities.
- To make it possible to maintain and manage the necessary equipment and amount, under control of CMAC budget.
- To select the equipment which can be used at the present technical level of CMAC.
- To purchase specialized equipment (mine detector, etc.) which has longer-term experience in demining.

2) Natural Conditions policy

- To consider suitability of equipment for use at high temperature and high humidity of the demining sites and the operator's working conditions.
- To select 4-wheel type vehicles that can operate smoothly in muddy road conditions.

3) Equipment Specification policy

- To base the specification of equipment on factors such as usage, natural conditions, geographic conditions, operation maintenance ability, after service, etc. Especially the Brush Cutter needs to have safety defense from explosion of anti-personnel mines.

4) Equipment Operation and Maintenance policy

- To select equipment type and size which the operators and mechanics are accustomed to use.
- To adopt the latest technology (such as electronic equipment) based on the operation and maintenance conditions in the sites.

2-2-2 Basic Plan (Equipment Plan)

(1) Confirmation of Equipment Number

To begin with, the following equipment was excluded from this plan:

Table 2-1 Exclusion of Equipment

Name of Equipment	Reason
Appropriate Equipment	Equipment such as projector, screen, television, videos and air conditioners are not appropriate for Grant Aid.
Mine Detection Dogs	It is necessary to demining activities to use mine detection dogs, but it is also necessary to select the dogs carefully, and not possible to procure the dogs though open bidding.
Physical Properties Laser Detector	The laser detectors been not completely developed or technically proven. Grant aid does not allow the procurement of equipment which is under development.
Ink Pens	Ink pens for plotters are excluded since they are judged as articles of consumption.
Telephone Switchboard	Telephone switchboard is office equipment, and it does not relate to the mine removal activities.

The amount of mine detection equipment was based on the priority in the CMAC headquarters detection field plan covering clearance area, clearance activity plan, situations of existing equipment, number of deminers and assistants, etc. The situation of existing demining equipment was evaluated for its possible contribution to the numbers as follows.

1) Brush Cutter

The brush cutter can cut as much as 20-30 men can do manually, but it requires 2-3 operators. By using brush cutters, work efficiency and speed will be increased and safety will be improved.

By using brush cutters, fuel and operation staff necessary for managing the brush cutter will increase, but labor cost will be greatly decreased. Also loss of life can be reduced.

The status of mine field area and area already cleared for each DU, and the number of brush cutters mobilized are shown in the table below.

Table 2-2 Status of Demining Activities and Brush Cutters

DU No.	Mine Field Area (km ²)	Cleared Area (km ²)	Completed (%)	No. of Platoons (Deminers)	Mobilization of Brush Cutter
DU1	429.4	30.73	7.16	9 (349)	3
DU2	1,180.5	23.58	2.00	9 (447)	3
DU3	254.8	24.40	9.57	10 (329)	2
DU4	497.4	11.71	2.35	6 (192)	1
DU5	537.8	6.13	1.14	7 (222)	2
DU6	952.4	16.26	1.17	6 (185)	1
Total	3,825.3	112.81	2.93	47 (1,724)	12

CMAC has planned demining activities for mine field area of 84.9 km² in the 5-year demining plan until 2007; however, it seems that it will not be able to achieve the target with the current equipment. Therefore, it is proposed to increase the brush cutter teams to 24 and increase the number of mine detection dogs.

At present, 12 brush cutters have been procured under Japanese Grant Aid Project (Phase-1) for CMAC, including two old Komatsu type (with backhoe) which are being used to construct approach roads, etc. In the procurement plan, the existing units are taken into consideration.

2) Anti-Personnel Mine Detector

The purchase of anti-personnel mine detectors will consider the model and number of existing detectors being used by CMAC. The existing status of Minelab F1A4 and SchibelAN-19/2 mine detectors is shown in the table below. Since CMAC was established in 1993 and up to the present, 1,788 units of Minelab F1A4 were procured in total. Of these, 600 units of Minelab F1A4 were purchased (200 in June 2000 and 400 in September 2003) under Japan Grant Aid. However, 738 units of Minelab F1A4 are out of service. Only 15 detectors are in use in the training center, and this is insufficient for training the required number of deminers.

Table 2-3 Operating Status of Detectors

DU	Total Minelab F1A4 units	Total Schiebel AN-19/2 units	Existing Status			Total no. of deminers	Allocation to deminer
			Possible to use	Need to repair	Out of service		
DU1	247		230	10	7	349	0.66
DU2	458	7	214 (7)	18	226	447	0.48
DU3	243		225	18	0	329	0.68
DU4	148	4	138 (4)	10	0	192	0.72
DU5	153		147	6	0	222	0.66
DU6	20 [MineX2FD: 2] [Vallon: 2]	110	18 (110)	1	1 (2) (2)	185	0.10
TC	519	656	15 (6)		504 (650)		
Total	1788	777	987 (127)	63 -	738 (650)	1,724	

Note: Numbers in parentheses are Schiebel AN-19/2 units

3) Vehicles

a. 15-ton Bulldozer

The approach roads to existing mine fields are not maintained. Construction of approach roads requires the rental of bulldozers, but there is not enough budget for this. Therefore, it was evaluated that there is high necessity for bulldozers in the Cambodian request. The request of bulldozers will be considered for 15-ton units in order to transport existing brush cutters using the requested trailer.

b. Cargo Truck

The existing U.S. military truck (GMC trucks from World War II) are superannuated, and the spare parts are very difficult to obtain; also operation and maintenance is very difficult. In addition, fuel consumption is about 1 liter for only 0.4 km, and so maintenance expense is high. The status of GMC trucks located in each DU is shown in the table below. Considering the cost of spare parts of the existing trucks, it will only be effective to secure spare parts to repair trucks which are operating now.

Table 2-4 Status of Cargo Trucks

DU	Possible to use	Need repair	Not possible to use	Persons in DU	Number of persons per truck
DU1	13			478	36.8
DU2	15			600	40.0
DU3	18			478	26.6
DU4	10			258	25.8
DU5	8			331	41.4
DU6	9			226	25.1
TC	3	1		72	24.0
Workshop	5	17	15	11	
HQ	5		8		
Total	86	18	23		

c. Station Wagon

A station wagon can be used for multi-purposes such as ambulance car, transport of mine detection dogs, carrying repair tools for small mobile workshop, etc. It is possible to use the station wagon similar to a pickup truck, but which is particularly good in rainy weather.

4) Workshop

The workshop is of high necessity for operation and maintenance of equipment. Use of prefab construction materials are deemed to be desirable to insure constant quality. Prefab materials from Japan can be part of the grant aid project.

CMAC is responsible to prepare the construction site, foundation of the workshop and perform the construction work. The responsibility of Japanese side is only procurement and assembly of prefab construction materials.

The following steps should be taken for construction:

- The construction site ground for the workshop should be compacted by CMAC.
- Both parties should confer about the workshop capacity and facilities.
- Cambodian side shall execute the foundation construction of the workshop before the Japanese side opens the tender for the prefab structure.
- Procurement and assembly of construction materials of the workshop shall be executed under the grant aid project.

- Cambodian side shall prepare electricity and water supply facilities.
- Cambodian side shall construct drainage, oil and water separation facilities, and car washing space.

5) Computers

CMAC now uses CMIS (Communications & Management Information Systems) and old fashioned computers which cause severe limitation for operation and financial management because CMAC needs timely data processing results for the mine clearance sites, feedback to the site on processing activity, and appropriate equipment management for such a large amount of mine detectors.

The old model computers are difficult to maintain and manage, and so CMAC has requested 120 new desktop computers which have greater processing power and speed. However, it is possible to still use some of the old model computers in office work, and so the project will take them into consideration in selecting new computers.

The status of requested and old fashioned computers are shown below for each DU.

Table 2-5 Status of Computers

DU	Requested number	Superannuated number	No. usable in office works
HQ	27	11	3
TC	17	9	1
DU1	10	3	1
DU2	23	14	2
DU3	13	4	1
DU4	16	6	2
DU5	5		
DU6	9	1	1
Total	120	48	11

2-2-3 Basic Design Drawing

The basic design drawings for the workshop building are shown below.

<Construction site map and workshop building layout plan>

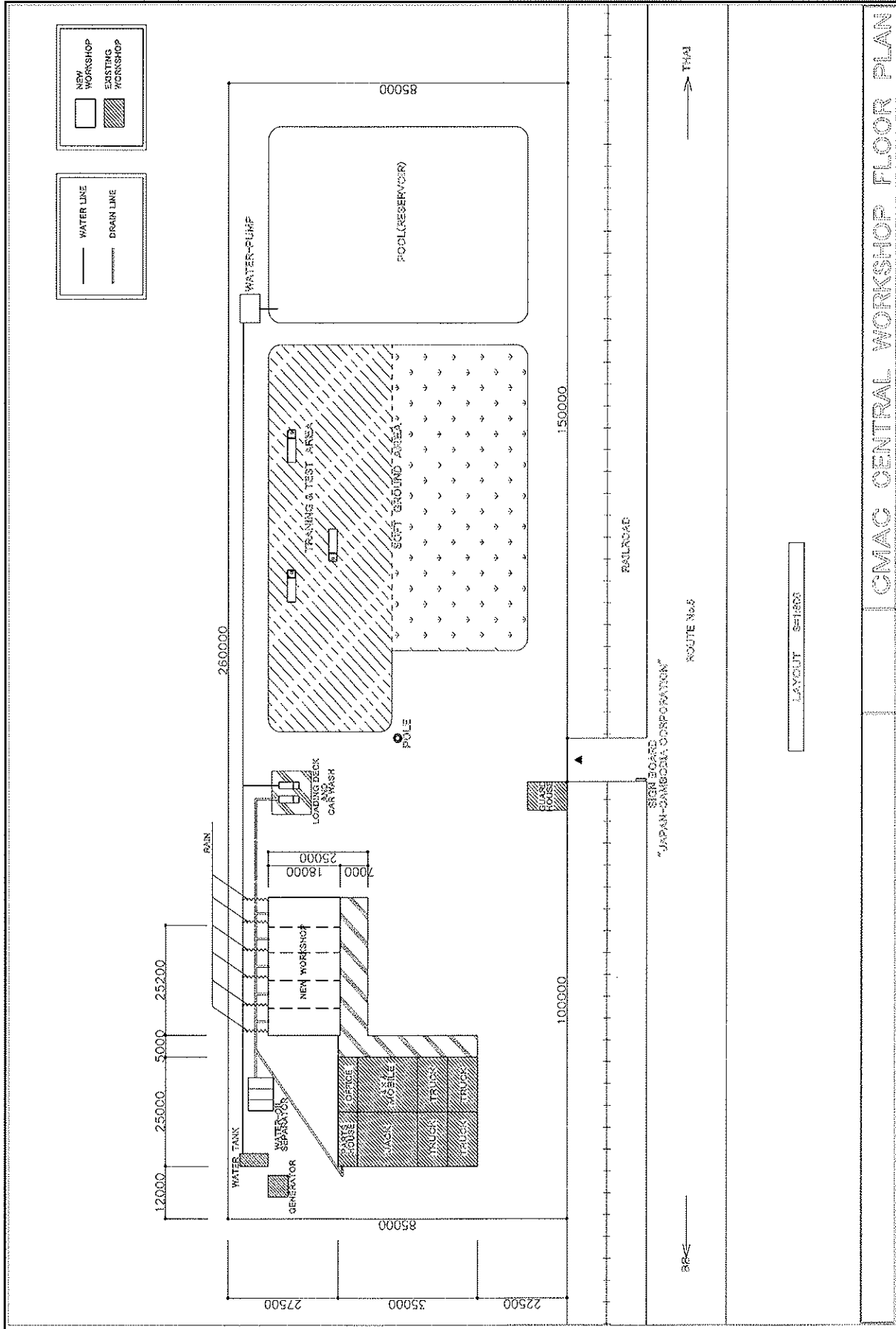
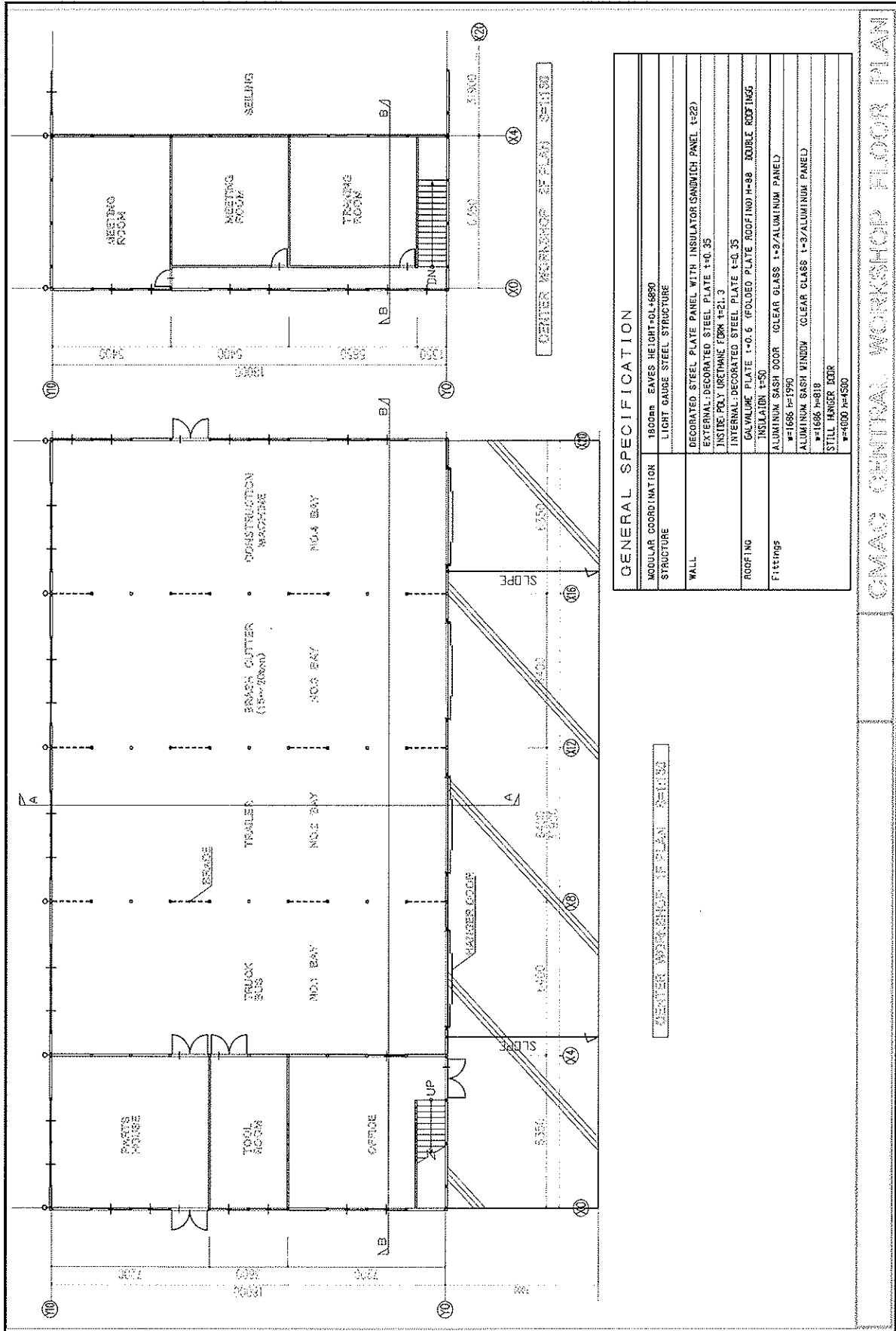


Figure 2-1 Workshop Land Plan



GENERAL SPECIFICATION

MODULAR COORDINATION	1800mm EAVES HEIGHT-SL-4890
STRUCTURE	LIGHT GAUGE STEEL STRUCTURE
WALL	DECORATED STEEL PLATE PANEL WITH INSULATOR SANDWICH PANEL 1-22) EXTERNAL: DECORATED STEEL PLATE 1-0.35 INSIDE POLY URETHANE (EPM 1-21.3 INTERNAL DECORATED STEEL PLATE 1-0.35
ROOFING	GLYPHOLITE PLATE 1-0.6 (FOLDED PLATE ROOFING) H-88 DOUBLE ROOFING INSULATION 1-50
Fittings	ALUMINUM SASH DOOR (CLEAR GLASS 1-3/4 ALUMINUM PANEL #1686 H-1990 ALUMINUM SASH WINDOW (CLEAR CLASS 1-3/4 ALUMINUM PANEL #1686 H-818 STILL HANGER DOOR #4000 H-1600

Figure 2-2 Workshop Floor Plan

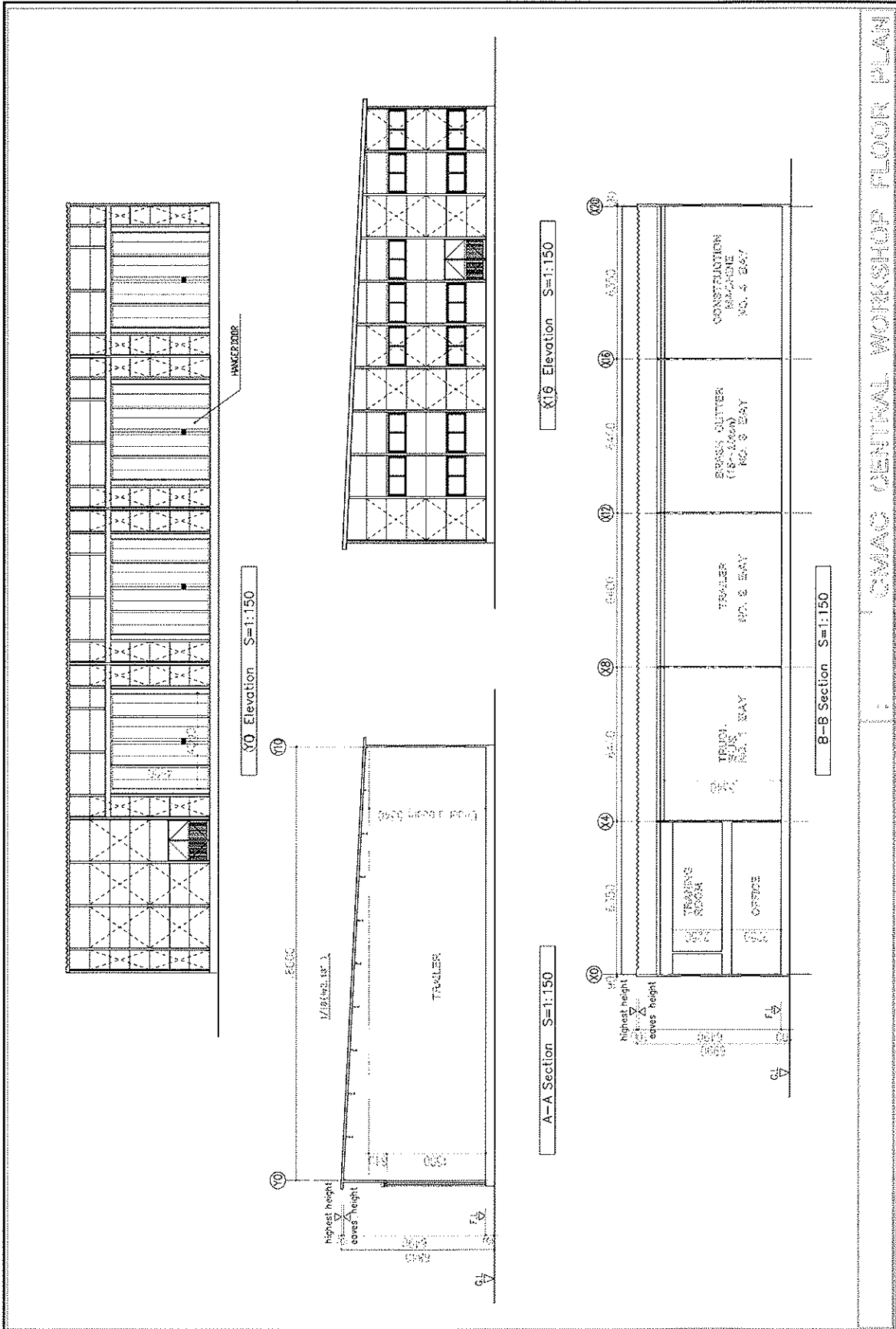


Figure 2-3 Workshop Elevation View

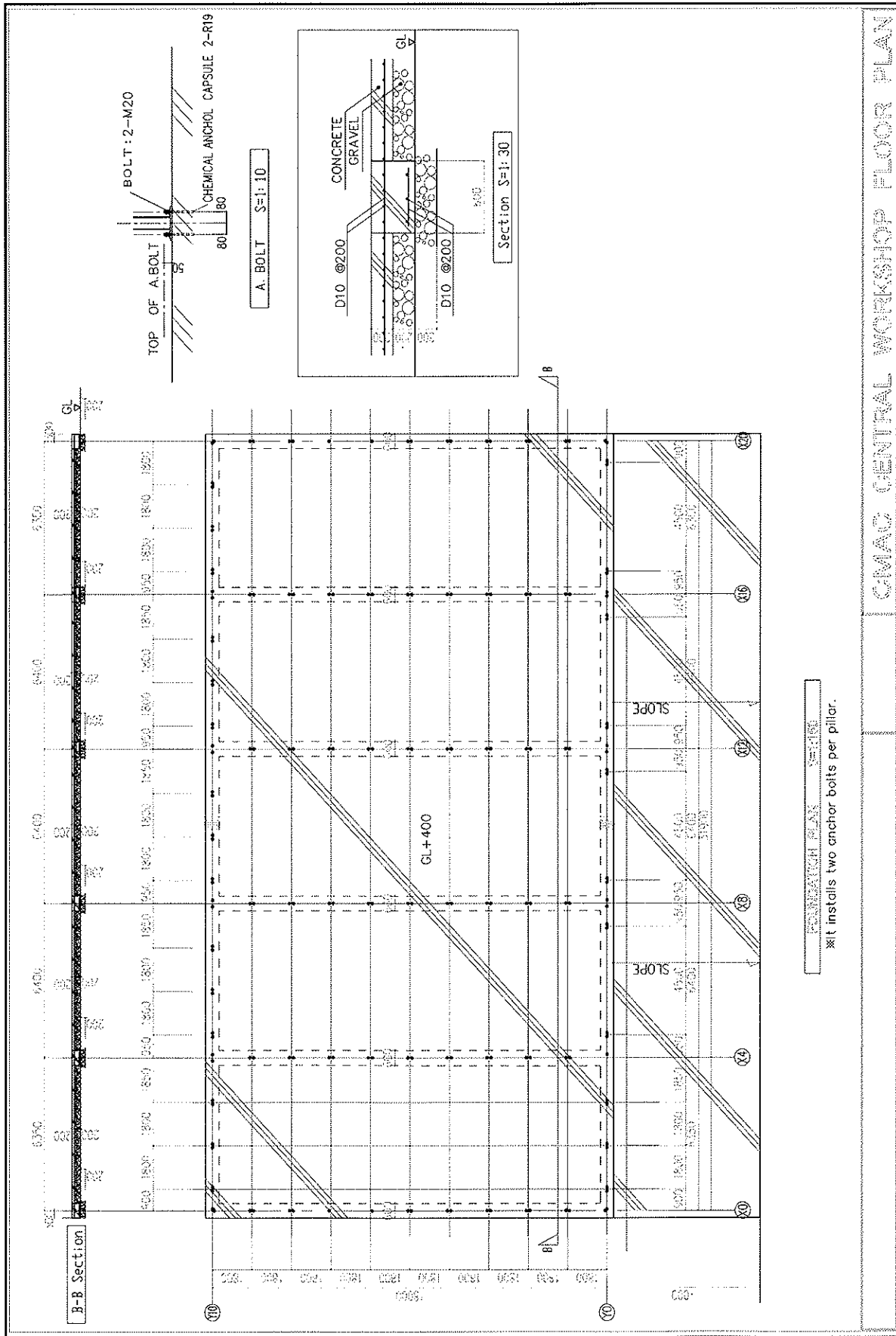


Figure 2-4 Workshop Basement

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

The counterpart organization on the Cambodian side is CMAC (Cambodian Mine Action Center). CMAC has responsibility for operation and maintenance of equipment, and its management. The transportation of the equipment from unloading port (Sihanoukville Port) to the specified site shall be borne by the grant aid project.

The final delivery point is Kampong Chhnang training center for the brush cutters, construction equipment, vehicles and detectors, etc. The prefab workshop and the repair tools equipment shall be delivered to Battambang, and the computers shall be delivered to the Phnom Penh headquarters. To provide training, a brush cutter operation training engineer shall be dispatched from Japan.

In consideration of the brush cutter being specialized equipment and anxieties of not performing up to the standard of CMAC, tests in Cambodia need to be executed before the equipment is delivered to the site. The execution method and details of the site test are discussed below.

(1) Contents of Brush Cutter Field Test

The field test for the brush cutter includes two types: performance test and safety test such as confirmation of safety defense from the anti-personnel mine explosion.

(2) Method of Field Test

- The brush cutting test shall be for 180 hours which is the CMAC standard.
- The brush cutting test shall be evaluated in four stages: at 50 hours, at 100 hours, at 150 hours, and at 180 hours.
- Safety shall be examined after the brush cutting performance test of 180 hours has ended.
- These tests shall be based on SOR#001002 which is the CMAC standard.
- The base machine can be a secondhand machine for the brush cutting test; however, defense and armor of the base machine shall be based on the actual specification in consideration of executing the safety test.

(3) Timing and Payment of the Test

There are several cases for handling the timing of the test and making payment to companies for the test. The merits and demerits are examined below for the following four cases:

Case-1 : The field test will be executed before the opening of the tender

Case-2 : The field test will be executed after the opening of the tender

Case-3 : The test cost is paid to all companies (failing companies are included)

Case-4 : The test cost is paid only to passing companies, and consultant does not pay failing companies.

Case-1: The field test will be executed before the opening of the tender

a. Basic Considerations

- The field test shall be executed as part of the technology test and only companies passing the field test can participate in the second stage tender (price opening tender).
- If about three companies are tenderers, plural machines can take the field test at the same time, and the delivery works must be completed in the term of the fiscal year.
- The price opening tender shall only be for the companies passing the field test.

b. Demerit

- Even if a company passes the field test, this shall not be concluded as a successful bid. If companies are not successful in bidding, the field test cost shall be borne by the company. Even if the field test cost shall be included in the Grant aid project, after the tenders are compared, the field test cost may be too large, and so criticism might be received.
- The number of companies that will take the field test is uncertain at the basic design stage, so the calculation of the total project cost including the field test expenses are extremely difficult to make.
- The field test cost will be paid to the testing company, not the successful company which has the lowest cost.
- Although the field test of plural companies can be executed at the same time, the capacity of CMAC is for about three companies. Therefore, having more than three companies will impact the work schedule.

Case-2: The field test will be executed after the opening of the tender

a. Basic Considerations

- If the opening of the tender and the technology of the brush cutter is tested at the same time, the field test as a detailed technology test will be executed after the first right of contract negotiation is fixed.
- The test cost can be reduced if testing is before opening the tender, and also project cost calculation will be easy. It is also reasonable to expect that the test cost will be included in the tender contract, if no test cost is paid to a failing company.
- It is only the company with first negotiation rights that can receive the field test and have the tender cost reduced.

b. Demerit

- The field test can be executed only for two companies from the work schedule.
- In case of failing both the first and the second negotiators, if the third negotiator is not one who passed already, the brush cutter cannot be procured.
- In case the first negotiator is failed because of a high price, criticism might be received on the test results because of its being a low priced brush cutter.

(4) Payment of test cost

Case-3: The test cost is paid to all companies (failing companies are included)

a. Basic Considerations

- In the third equipment improvement project (Phase-3), the test cost was paid to failing companies by "grass roots aid"; therefore, complaint can be expected as "it is more unfair than third phase".
- Only the tender bidder is able to participate in field tests.

b. Demerit

- The grass roots aid project was executed in Phase-3, so the project "Field test" was judged as a "brush cutter field test support plan". Therefore, there was rationality in the payment of the test cost to the companies which took the test regardless of passing or failing.

- On the other hand, this current grant aid project aims at "procurement of equipment". The tenderer with equipment which does not pass the test is equivalent to opening a tender which includes out-of-specification equipment.
- The test with poor results and low project cost calculation will be difficult to evaluate.
- If the tenderer bears the cost of preparation and procedure of the test, validity and the transparency of the contract are high. If the test cost is not paid to failing companies, the contract will probably include the equipment cost and the test expense.
- If the test cost is paid to failing companies, this has the possibility to impact the work schedule.

Case-4: The test cost is paid only to passing companies, and consultant does not pay failing companies

a. Basic Considerations

- Companies failing the test do not contribute to "procurement of equipment" which is the purpose of the grant aid project; therefore, the test cost is not paid to failing companies.
- The test by grass roots grant aid project in the phase -3 was only a test; however, for the test expense of brush cutting in the grant aid project is part of the procurement of equipment.
- The test becomes a deterrent to participation of bidders that have no confidence to pass it.
- If the test is executed after the tender opening, the cost calculation is easy to make, and it is also possible to expect the test cost to be included in the contract.

b. Demerit

- The complaint that "it is more unfair than phase-3" might come because the payment of the test cost in the test by "grass roots aid" executed in the phase-3 project was to failing companies.

Both field tests (brush cutter performance and safety) are to be executed for equipment which may not have passed before in Cambodia. The field tests are to be executed for the lowest price bidder in the first testing time, because there is a limit in the capacity of CMAC. The period which seems to be necessary for the field test is 5.0 months in total: equipment manufacture and transportation of 3.0 months and field test period of 2.0 months.

Therefore, the time from after the test and the tender contract to local delivery is 11.0 months, and so a total period of 15.0 months is needed from the exchange note conclusion to the equipment delivery to the site. The outline of the procurement schedule is shown below (assuming field test is excluded for the brush cutter).

Table 2-6 Brush Cutter Field Test and Procurement Schedule

Fisical Year		2004												2005												2006		
Year		2004												2005												2006		
Month		8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3							
E/N		▲																										
Tender Opening					▲																							
First Test	Preparation/Transportation for test machine																											
	Field Test																											
	Manufacturing/Transportation																											
Second Test	Preparation/Transportation for test machine																											
	Field Test																											
	Manufacturing/Transportation																											

2-2-4-2 Implementation Conditions

Local procurement is possible for items excluding brush cutters, construction equipment, vehicles, detectors, and workshop. Thus local procurement does not influence the execution of this project.

2-2-4-3 Scope of Works

As for this plan, foundation construction of the workshop building is a responsibility of the Cambodian side. The division of responsibility is shown in the figure below.

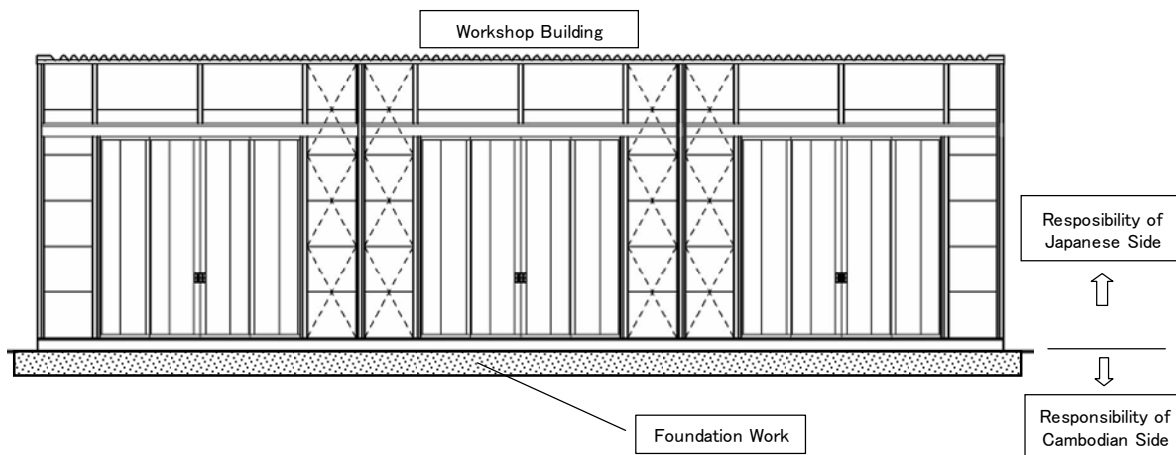


Figure 2-5 Division of Responsibility

2-2-4-4 Consultant Supervision

The manufacturer's engineers will execute the initial operation guidance, ripper guidance and maintenance guidance, etc. for two months for the brush cutter management.

The manufacturer's engineers will also execute the assembly and maintenance management guidance for two months at the site for the workshop.

2-2-4-5 Procurement Plan

This project will procure brush cutters, vehicles, construction equipment, and workshop, etc. from Japan, the detectors from the third country; other items and those related to the computers are for local procurement. For spare parts procurement, repair and maintenance works including vehicles, there is no problem to do purchasing in Cambodia. In consideration of the specialized nature of the brush cutter, it has the warranty period of 2 years or 3,000 hours.

CMAC has Minelab F1A4 mine detectors made in Australia and they account for 90% of all detectors. The mine detector is used in the front line of the mine clearance activity, and is an important element for safety considerations. In order for the operation and maintenance repairs and management to be efficient, the detector needs to have good brand specifications. For the same reason, the UXO detector of the Ebinger loop type made in Germany is assumed as the brand specification.

The procurement delivery and transport routes are as follows.

Table 2-7 The Third Country Procurement Delivery Route

Name of Detector	Transport Route	Final Destination
Minelab F1A4	Sydney ⇒ Phnom Penh (airlift)	Kampong Chhnang training center
Ebinger UPEX740M	Berlin ⇒ Phnom Penh (airlift)	Kampong Chhnang training center
Other Equipment	Singapore ⇒ Phnom Penh (sea freight)	Phnom Penh Head Office Kampong Chhnang training center

2-2-4-6 Implementation Schedule

Four (4.0) months are probably required for the procurement of the relevant equipment excluding the necessary field test for brush cutter. After manufacturing of the equipment, delivery will require 2.0 months for sea transportation, clearing customs, and inland transportation.

As for the procurement schedule, the following periods are required:

- After conclusion of the exchange of note to the tender contract: 4.0 months
- Final delivery period (from tender contract to site delivery): 6.0 months.
- Total: 10 months

Implementation schedule excluding the brush cutter field test is shown in Table 2-8.

Table 2-8 Implementation Schedule (Excluding Brush Cutter Field Test / Other Equipment)

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
D/D Stage	█ (E/N)																
		█ (Approve of Tender Documents)															
				█ (Tender Opening/Evaluation)													
		█ (Making of Tender Documents)															
			█ (Explanation of Tender Documents)														
(Total 4.0 months)																	
Procurement Stage																	
					█ (Preparation of Manufacturing)												
							█ (Manufacturing)										
								█ (Pre-shipment Examination)									
									█ (transportation)								
(Total 5.5 Months)																	
									█ (Site Examination/Hand Over)								

█ (Works in Japan) █ (Works in Cambodia)

Table 2-9 Implementation Schedule (One Brush Cutter Field Test)

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
D/D Stage	(E/N)																
				(Approve of Tender Documents)													
					(Tender Opening/Evaluation)												
				(Making of Tender Documents)													
			(Explanation of Tender Documents)														
<u>(Total 4.0 months)</u>																	
Procurement Stage																	
<u>(Total 12.5 Months)</u>																	



(Works in Japan)



(Works in Cambodia)

2-3 Obligations of Recipient Country

The following are the obligations of the Cambodian Government and implementing agency.

- 1) Regarding commissions for banking services: to bear the cost of advising commission of A/P, and payment commission.
- 2) To ensure prompt unloading and customs clearance upon delivery
- 3) Tax exemption of the imported goods
- 4) Internal transportation from the MOT depot to the work site
- 5) Exemption of Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed with respect to the supply of the products and services under the procurement contract
- 6) To maintain and use properly and effectively the facilities and equipment provided under the grant aid
- 7) To bear all expenses other than those covered by the grant aid that are necessary for the transportation, installation, operation and maintenance of the equipment.
- 8) The foundation construction necessary for installation of the workshop building.

2-4 Project Operation Plan

2-4-1 Equipment Procurement List

The equipment procurement list is as follows:

Table 2-10 Equipment Procurement List

Description	Quantity	Usage	Procured Country
Detector MinelabF1A4	600	Mine field detection for anti-personnel mine	Australia
UXO Detector Ebinger UPEX 740 M	48	Mine field detection for UXO	Germany
UXO Detector Minelab F1A4 UXO	24	Mine field detection for UXO and AP	Australia
GPS	44	Coordinates measurement in the mine field	
Station Wagon	21	Transport of mine dog, riper tools and injured persons	Japan
Pickup Truck	45	Transport of staff and materials	Japan
Four-ton Truck	50	Transport of staff and materials	Japan
Motorbike	51	Emergency transportation and contact to remote places.	Japan
Generator	50	Electric power supply for demining platoons in the mine field	Japan
Water Pump	40	Water for demining platoons in the mine field	Japan

Description	Quantity	Usage	Procured Country
Explosive Storage Box	50	For transportation risks such as for fuse and dynamite for mine blasting	Local procurement
Digital Camera	56	For use mine risk education, clearance report, activity record, and public information	
Megaphone	50	For use of well known to resident in the surrounding at mine or UXO explosion	
PPE Vest	1,120	For protect of mine clearance activity of deminer	Local procurement
PPR Visor	1,120	For protect of mine clearance activity of deminer	Local procurement
Insect/Mosquito Spraying Machine	63	The insecticide is scattered for the control of mosquitos near the mine clearance platoon in the mine field	
VHF Mobile	103	For use to contact between platoons.	
VHF Handheld	245	For use to contact between platoons.	
Desktop Computer	37	For management of equipment, clearance records, mine reports, etc.	
Laptop Computer	7	For presentation activity for each DU	
Groupware Server	2	To store operation/management reports and mine removal activities reports	
Network connected Storage	1	To store operation/management reports and mine removal activities reports	
Laser Printer	7	To make document copies in each DU	
Copy Machine (medium size)	7	To copy documents in each DU	
Copy Machine (large size)	4	To copy mine field information maps etc.	
Large Size Scanner	1	To scan mine field information maps etc.	
Flat Bed Scanner	2	To scan mine field information maps etc.	
Large Size Inkjet Plotter	1	To plot mine field information maps etc.	
Color Laser Printer	1	To make copies of mine field information maps, etc.	
UPS	7	To protect electric equipment at the platoons and training center with a stable power supply.	
Barcode Terminal	11	To help manage equipment for mine clearance activities	
Barcode Printer	1	To print barcodes for equipment for mine clearance activities.	
Dot Matrix Printer	1	To cheaply print a large amount of documents for mine risk education and public relations, etc.	
Tape Backup	1	To backup all data for safety.	
Mark Sheet Reader	1	The mark sheets are produced for use of mine clearance activities barcodes.	
24 Port Switch	10	LAN system to connect each DU and allow data exchange.	
Ethernet Switch	7	To connect from the main server to the hub.	
Router	7	Allows equipment management report of mine clearance activities are reported by e-mail.	
Security Appliance	1	To protect against viruses from outside	

Description	Quantity	Usage	Procured Country
Software	1	Necessary for computer equipment so Geogica information is efficiently operated.	
Brush Cutters	14	To remove brush before clearance of mines.	Japan
Bulldozer	2	To construct approach roads to carry the brush cutters to mine fields.	Japan
Truck trailer	2	To transport Brush cutters and bulldozers to site.	Japan
Workshop Building	1	To repair brush cutters and vehicles, store spare parts, and hold technological training, etc.	Japan
Workshop Tools	1	Repair tools for brush cutters and vehicles	Japan

The anti-personnel mine detector and UXO detector are assumed as third country procurement. At present, CMAC uses 90% or more of the same model mine detector as for this project (phase-4), and so there is little need for training and education of their use, but this will be handled by the manufacturers. The detector to be procured from the third country is the same as currently used in consideration of the operation/maintenance and safety of deminer. Brush cutters and vehicles were assumed to be procured from Japan in consideration of the quality and maintenance conditions locally.

2-4-2 Estimation of Project Cost and Field Test Expenses

1) Field Test Expenses

When field Test of Brush Cutter is excluded, the total of project cost is about 1.717 billion Yen in grant aid. The expenditure breakdown is estimated as shown in Table 2-12.

For the brush cutter procurement, the brush cutting test and safety test are to be executed at the site, and the design management expense (field test management expense) will require about 5.2 million Yen (Note: cutting ability test and safety test are to be performed at the same time). Also one more field test cost (procurement management expense) about 9.55 million Yen is separately required (Note: cutting ability test and safety test are to be performed at the same time).

These costs are assumed for 180 hours (60 days) test time according to CMAC standards. If there is less than 180 hours testing (due to disqualification) or in consideration of a fixed payment, calculation of the exact field test expense and consideration for payment will be required.

The contents of the field test expenses include the following payment items:

Table 2-11 Contents of field test expenses

1. Design Management Expense	Consultant Fee	Others Expenses
2. Test Expenses		
(1) Field Test Expenses	One Japanese Engineer Expenditure	Traveling expenses
		Daily allowance
		Accommodation expense
		Inland transportation (vehicle)
	Material transportation	Japan and Cambodia
	Site expenditure	Operator
		Chore helpers
		Vehicles
		Fuel expense
		Others (drinking water, communication, medical treatment, etc.)
(2) Evaluation Organization		

2) Japanese Side Cost

Japanese side cost of this project is estimated as shown in Table 2-12.

This cost estimate is provisional and will be further examined by the Government of Japan for approval of the Grant.

Table 2-12 Japanese Side Cost (Excluding field test of Brush Cutter)

Description	Amount (Million Yen)	Notes
Procurement site management and installation /construction expense, etc.	7.7	
Direct construction expense	0.7	
Common temporary expense	1.6	
Site expenditure	4.7	
Administrative expenses	0.7	
Equipment expense	1,691.2	
Equipment expense	1,559.3	
Transportation and packing expense	82.6	
Administrative expenses	49.3	
Design management expense	18.4	
Detailed design expense	14.5	
Procurement management expense	3.9	
Total	1,717.3	

2-4-3 Estimation Assumptions

- 1) Estimation is at June 2004
- 2) Exchange rate 1US\$=108.21 yen
- 3) The procurement schedule of the project shall be followed.
- 4) Additionally, this project will be executed at according to the system of the Japanese Grant Aid

CHAPTER 3
PROJECT EVALUATION AND
RECOMMENDATIONS

CHAPTER 3 PROJECT EVALUATION AND RECOMMENDATIONS

3-1 Project Effect

3-1-1 Direct Effect

(1) Efficiency of Mine Clearance Activities

Bush cutting is a very important activity since it occupies about 70% of the entire activity of demining, and is a bottleneck to increasing mine clearance. By reinforcing the activity with the brush cutters, demining time and cost is decreased. In addition, deminers can more efficiently execute mine clearance activities by increasing the number of mine detectors.

(2) Safety Improvement for Deminers

Due to the lack of the brush cutters, manual bush cutting is practiced at present. Bush cutting is done as initial work of demining and there is high risk in manual bush cutting since deminers are injured from mine explosions. The safety of the bush cutting work improves by using a reinforced brush cutter which has anti-personnel mine defenses. However, danger increases when there is aging and even the breakdown of the mine detector. Hence, mine detector, PPE Vest and Visor will be procured in this project to improve demining safety.

(3) Improvement of Maintenance Management Ability

The preventative maintenance and repair of equipment can be done in the workshop to be constructed, and with the equipment and repair tools that are to be procured by this project. By renewing the computer equipment which has become old, it will be possible to promptly process data necessary for the equipment operation and field management.

3-1-2 Indirect Effect

(1) Decrease in Mine Victims

By reinforcing mine clearance activities with new equipment, the range of the mine clearance activities will be extended, and mine injuries to the local residents in around the mine field reduced. The list of effects and improved conditions from the project are shown in the Table below.

Table 3-1 Effects of the Project and Improvements

Current situation and problems	Procurement plan of the project	Effect and improvement
1. Bush cutting is a bottleneck because it occupies about 70% of the demining activities in the mine field.	Procurement of Brush Cutter	The demining activities can be executed more efficiently by having more brush cutters and this will reduce demining time and cost.
2. Manual bush cutting is practiced, and deminers are injured by mine explosions in initial field works.	Procurement of Brush Cutter	The safety of works is increased for bush cutting by having more brush cutters armed with anti-personnel mine features.
3. The aging and breakdown of mine detectors and lack of the PPE vest/visor directly jeopardizes deminer.	Procurement of detector and PPE vest/visor	The safety is improved for deminers by procurement of detector and PPE vest/visor, etc., and clearance efficiency is also improved by having more detectors.
4. Lack of and aging of vehicles, and also lack of access roads to the mine field pose big obstacles for the transportation of deminers and material.	Procurement of pickup truck, cargo truck, bulldozer, etc.	Demining efficiencies are greatly improved by replacing the old GMC trucks of 1960's, and constructing access road by the new procurement of bulldozer. Access by vehicle becomes possible, and access time for deminers is reduced.
5. The repair of old equipment is subcontracted to private repair factories, and this squeezes the small budgets.	Procurement of workshop building and tools	The repair expenditures can be reduced, and workshop can be operated for maintenance/repair.
6. Due to lack of database, equipment management and past demining results cannot be arranged; also efficient demining plan cannot be planned.	Procurement of computer for mapping and software	By replacing the old computers, there can be prompt processing for work management and processing with necessary map data.

3-2 Recommendations

Since 95% of the budget of CMAC is financial support from donors, funding in the future is not stable. Thus, CMAC should make effort to increase its own budget in the future, which is also necessary as long as the budget from the Cambodian government is not fixed. Some possibilities for CMAC to secure its own revenue are listed below.

(1) Extended use of the central workshop

There is possibility that the workshop will have free time after old equipment is repaired and new equipment is procured by this project. Such free of time can be effectively used for contract work on private vehicle repairing, and additional revenue can be obtained.

(2) Charge-basis demining

Demining activities for other development projects in Cambodia (road, bridge maintenance, private housing lot development, and industrial estate development, etc.) can be executed on a charge-basis and revenue obtained.

(3) External dispatch of demining engineers or instructors

The mine clearance methods of CMAC are now up to the top class in the world.

Therefore, demining engineers or instructors from CMAC can be dispatched to other countries for demining activities on a charge-basis.

APPENDICES

**Member of the Basic Design Study
on the Project for Improvement of Equipment for Demining Activities**

1. Ms. Yumiko Asakuma, Leader
Japan International Cooperation Agency
Grant Aid Management Dept.
2. Mr. Nobuo Monoe, Chief Consultant
Pacific Consultants International
3. Mr. Eiji Takemori, Machinery Planning 2
Pacific Consultants International
4. Mr. Yukio Kohsaka, Machinery Planning 3
Pacific Consultants International
5. Mr. Akira Nakagome, Adviser
Pacific Consultants International

**Site Survey Schedule of Basic Design Study on the Project
for Improvement of Equipment for Demining Activities Phase IV**

Site Survey

Date			Ms. ASAKUMA (JICA)	Mr. MONOE (PCI)	Mr. KOHSAKA (PCI)	Mr. TAKEMORI (PCI)	Mr. NAKAGOME (PCI)	
1	31-Mar	wed	NR⇒BK⇒PNP (by air)					
2	1-Apr	thu	Courtesy call to JICA Cambodia Office and CMAC, PNP⇒BB (by car)					
3	2-Apr	fri	Site Survey at DU2					
4	3-Apr	sat	BB⇒SRA (by car)			Site Survey at DU2		
5	4-Apr	sun	SRA⇒PNP (by car)			Site Survey at DU3		
6	5-Apr	mon	Discussion with CMAC			Internal Meeting		
7	6-Apr	tue	Discussion with CMAC			Site Survey at DU5		
8	7-Apr	wed	Signing on the Minutes of Discussion			BB⇒BMC (by car)		
			Continue to another mission	Discussion with CMAC				
9	8-Apr	thu	Continue to another mission	Discussion with CMAC		Site Survey at DU1		
10	9-Apr	fri		Discussion with CMAC		Site Survey at DU1		
11	10-Apr	sat		Discussion with CMAC and other related authority		BMC⇒SRA (by car)		
12	11-Apr	sun		Internal Meeting		Site Survey at DU6	SRA⇒PNP (by air)	
13	12-Apr	mon		Discussion with CMAC and other related authority		Site Survey at DU6	PNP⇒BK (by air)	
14	13-Apr	tue		Discussion with CMAC		SRA⇒KT (by car)	BK⇒NRT (by air)	
15	14-Apr	wed		Discussion with CMAC		Site Survey at DU4		
16	15-Apr	thu		Discussion with CMAC		KPT⇒PNP (by car)		
17	16-Apr	fri		Discussion with CMAC				
18	17-Apr	sat		Discussion with CMAC		PNP⇒BK (by air)	Discussion with CMAC	
19	18-Apr	sun		Internal Meeting		BK⇒NRT (by air)	Internal Meeting	
20	19-Apr	mon		Discussion with CMAC		Continue to another mission	Discussion with CMAC	
21	20-Apr	tue		Discussion with CMAC			Discussion with CMAC	
22	21-Apr	wed		Discussion with CMAC			Discussion with CMAC	
23	22-Apr	thu		Discussion with CMAC			Discussion with CMAC	
24	23-Apr	fri		Market Survey in PNP			Market Survey in PNP	
25	24-Apr	sat		Market Survey in PNP			Market Survey in PNP	
26	25-Apr	sun	Market Survey in PNP		Market Survey in PNP			
27	26-Apr	mon	Site Survey		Site Survey			
28	27-Apr	tue	Discussion with CMAC		Discussion with CMAC			
29	28-Apr	wed	Report to JICA and EOJ		Report to JICA and EOJ			
30	29-Apr	thu	PNP⇒BK (by air)		PNP⇒BK (by air)			
			BK⇒NRT (by air)		BK⇒NRT (by air)			

BMC:Banteay Meanchey, BB:Battambang, PL:Pailin, PNP:PhnomPenh, BK:Bangkok, KPC:Kampong Chhnang, SRA:Siem Reap

Explanation of Draft Final Report

Date			Ms. ASAKUMA (JICA)	Mr. MONOE (PCI)	Mr. KOHSAKA (PCI)	Mr. TAKEMORI (PCI)
1	13-Jun	sun	NR⇒BK⇒PNP (by air)			
2	14-Jun	mon	Courtesy call to JICA Cambodia Office and Meeting withCMAC			
3	15-Jun	tue	Meeting with CMAC			
4	16-Jun	wed	Meeting with CMAC			
5	17-Jun	thu	Signing M/D			
6	18-Jun	fri	Meeting with CMAC			
7	19-Jun	sat	Continue to another mission	Meeting with CMAC		
8	20-Jun	sun	/	Internal Meeting		
9	21-Jun	mon		PNP⇒BK		
10	22-Jun	tue		BK⇒NRT (by air)		

BMC: Banteay Meanchey, BB: Battambang, PL: Pailin, PNP: PhnomPenh, BK: Bangkok, KPC: Kampong Chhnang, SRA: Siem Reap

List of Parties Concerned in the Recipient Country

- (1) Mr. Kazumi JIGAMI
Counselor
Chief, Economic Cooperation Section
Embassy of Japan

- (2) Mr. Juro CHIKARAISHI
Resident Representative
Japan International Cooperation Agency Cambodia Office

- Mr. Chikahiro MASUDA
Assistant Resident Representative
Japan International Cooperation Agency Cambodia Office

- (3) Concerned in the Cambodian Government

Name	Position	Authority/Firm
KHEM SOPHOAN	Director General	CMAC HQ
HENG RATANA	Deputy Director General	CMAC HQ
OUM PHUMRO	Director	CMAC HQ Support & Human Resources
LENG CHREANG	Soil and Water Eng.	CMAC HQ Dept. of Support/HR
VA DAVID	Manager	CMAC HQ Communications & Management Information Systems
SREY RITHISAK	Mechanical Mine Clearance Officer	CMAC HQ
NHEP SOUR	Office Manager	Battambang Workshop
SOM UIAEAR	DU Manager	DU 1
NOU SAROM	DU Manager	DU 2
HIM VANDY	DU Manager	DU 3
MEAN SARUM	DU Manager	DU 6
SOM SOTHA	Advisor to the Prime Minister and Secretary General	CMAA
MARU YAMAMOTO	Maintenance & Transportation Adviser	JICA Expert
MAKOTO FUJIMOTO	Senior Technical Advisor MIS	JICA Expert
YOSHITAKA YAMADA	Resident Representative	JMAS Cambodia Office

MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT
FOR IMPROVEMENT OF EQUIPMENT FOR DEMINING ACTIVITIES (PHASE IV)
IN THE KINGDOM OF CAMBODIA

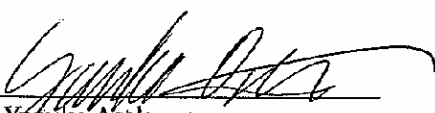
In response to a request from the Government of the Kingdom of Cambodia (hereinafter referred to as "Cambodia"), the Government of Japan decided to conduct a basic design study on the Project for Improvement of Equipment for Demining Activities (Phase IV) (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

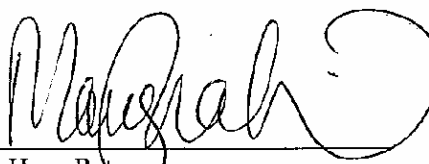
JICA sent to Cambodia the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Ms. Yumiko Asakuma, Grant Aid Management Department, Japan International Cooperation Agency, and is scheduled to stay in the country from March 31 to April 28, 2004.

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

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

Phnom Penh, 6 April, 2004


Ms. Yumiko Asakuma
Leader
Basic Design Study Team
Japan International Cooperation Agency
Japan


Mr. Heng Ratana
Deputy Director-General
Cambodian Mine Action Center
Kingdom of Cambodia

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve demining activities of Cambodian Mine Action Center (hereinafter referred to as "CMAC"), through procurement of necessary equipment.

2. Project Site

The project sites are Phnom Penh, Kampong Chhnang, Banteay Menchey, Battambang, Pailin, Kampong Thom, Pursat, and Siem Reap.

3. Responsible and Implementing Agency

The responsible and implementing agency is CMAC.

4. Items requested by the Government of Cambodia

After discussions with the Team, the items described in Annex-1 were finally requested by Cambodian side. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

5. Japan's Grant Aid Scheme

- 5-1 Cambodian side understands the Japan's Grant Aid Scheme explained by the Team, as described in Annex-2.
- 5-2 Cambodian side will take the necessary measures, as described in Annex-3, for smooth implementation of the Project, as a condition for the Japan's Grant Aid to be implemented.

6. Schedule of the Study

- 6-1 The consultants will proceed to conduct further studies in Cambodia until April 28, 2004.
- 6-2 JICA will prepare the draft report in English and dispatch a mission in order to explain its contents in June 2004.
- 6-3 In case that the contents of the report is accepted in principle by the Government of Cambodia, JICA will complete the final report and send it to the Government of Cambodia around October, 2004.

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7. Other relevant issues

7-1 Both sides agreed that equipment plan should be formulated based on the result of the basic design study according to the following factors.

- Priority items for demining activities
- Budget allocation for operation and maintenance
- Existing technology

7-2 Regarding procurement procedure of brush cutters, both sides agreed as follows:

- Procurement procedure for the Project (Phase IV) will be investigated through the basic design study and discussed at the draft final report explanation.
- In order to open the door for competitive manners, brush cutters will be opened for all brands.
- Necessity of cutting capability test and survivability test will be investigated through the study. Allotment of costs for these tests will be also discussed at the draft final report explanation.

Cambodian side expressed their desire that brush cutters procured for the Project should be useful for any kinds of field operational terrains including heavy vegetation, bamboo, and rocky.

7-3 Both sides agreed that the new type mine detector requested by Cambodian side should not be included because it is still under development.

7-4 Both sides confirmed that the building of the central workshop will be considered under the conditions as mentioned below.

- The building location will be shown in Annex-4
- Building size will be discussed by both sides.
- Cambodian side will conduct foundation work as shown in Annex-5 before the tender.
- Procurement and installation of materials will be conducted by the Grant Aid.
- Cambodian side will provide facilities for the distribution of electricity and water supply.
- Cambodian side will construct drainage and car wash facility.

Annex-1: List of Equipment

Annex-2: Japan's Grant Aid Scheme

Annex-3: Major Undertakings to be taken by Each Government

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Annex-3: Major Undertakings to be taken by Each Government

Annex-4: Workshop building location

Annex-5: Foundation Work to be conducted by Cambodian side

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List of Equipment

(List 1) 1/2

Sub-project:	Replacement and supplement of equipment and vehicles required	
Sites:	CMAC headquarters, Training Centre, and Demining Units	
Description	Quantity	Category
Mine Detectors (Mine Lab-F3)	600	A
UXO/Mine Detector (Ebinger)	80	A
GPS 12 XL	50	A
Station Wagons, 4x4 vehicles (Ambulance style)	30	A
Pick-up vehicles (4x4)	90	A
Mini truck 3-ton	20	A
Truck, 5-Ton (Canvas)	50	A
Motorbikes 125cc (4 Stroke)	60	A
Generator, 5 KVA (diesel)	40	A
Generator, 3 KVA (diesel)	10	A
Water Pumps	40	A
Explosive container	50	A
Digital cameras	80	C
Digital Video Camera	1	C
Megaphones	50	A
PPE, Vest	1,000	A
PPE, Visor	3,000	A
Insect/Mosquito Spraying Machine	62	A
VHF Mobile (including antenna)	170	A
VHF Handheld	300	A
Desktop Computer	120	C
Laptop Computer	7	C
Private Branch Telephone Exchange (PBX) System	5	C
LAN and Groupware Server	2	C
Backup and SunSystems Server	2	C
Storage Devices (NAS Appliances)	1	C
Printer Laser	7	C
Photocopy Machines, Medium size	7	C
Photocopy Machines, Large	4	C
Large Size Scanner (A0)	1	C
Flat Bed Scanner (A3)	2	C
Large Size Inkjet Plotter (A0)	1	C
Photo Grade Color Printer	1	C
Floor UPS	7	C
Graphtec/PHP34-INK Pen Plunger	100	C
Barcode Handy Terminal	11	C
Barcode Printer	1	C
Dot Matrix Printer	1	C
Tape Backup System (Autoloader)	1	C
Optical Mark Sheet Reader	1	C

(List 1) 2/2

Sub-project:	Replacement and supplement of equipment and vehicles required		
Sites:	CMAC headquarters, Training Centre, and Demining Units		
Description	Quantity	Category	
24-Port Gigabit Switch	10	C	
LAN Fast Ethernet Switch	7	C	
Router (Firewall/VPN)	7	C	
Server Rack Mount	1	C	
Internet Proxy-Cache Appliance	1	C	
Security Appliance	1	C	
Software and Licenses:			
Windows 2003 Server (standard)	1	C	
Windows 2003 Server (Client Access)	80	C	
Lotus Domino and Notes (80 Lics)	1	C	
Red.Hat Enterprise Linux ES	1	C	
Norton Anti-virus for Domino	1	C	
Backup Software	1	C	
ArcView	1	C	
AutoCAD	1	C	
ERDAS	1	C	

(List 2)

Sub-project:	Equipment Required for Improvement of Demining Technology		
Sites:	CMAC Demining Units		
Description	Quantity	Category	
Brush Cutter, Standard ZX 160 (15-21-ton)	15	A	
Bulldozer (15-ton)	2	A	
Truck and Trailer	2	A	

(List 3)

Sub-project:	Building and Facilities to Equip the Central Workshop		
Sites:	CMAC Central Workshop, Battambang Province		
Description	Quantity	Category	
Central Workshop Building	1	B	
Facilities to Equip the Central Workshop	1	B	

Category

A: essential equipment for demining activity

B: equipment for maintenance

C: necessary equipment for relevant activities

Japan's Grant Aid Program

1. Japan's Grant Aid Procedures

(1) The Japan's Grant Aid Program is executed by the following procedures.

Application (request made by a recipient country)

Study (Basic Design Study conducted by JICA)

Appraisal & Approval (appraisal by the Government of Japan and approval by the Cabinet of Japan)

Determination of Implementation (Exchange of Notes between both Governments)

Implementation (implementation of the Project)

(2) Firstly, an application or a request for a Grant Aid project submitted by the recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Japan's Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA 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 Program, based on the Basic Design Study Report prepared by JICA and the results are then submitted to the cabinet for approval.

Fourth, the project approved by the cabinet becomes official with the Exchange of Notes signed by the Government of Japan and the recipient country.

Finally, for the implementation of the Project, JICA assists the recipient country in preparing contracts and so on.

2. Contents of the Study

(1) Contents of the Study

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The purpose of the Basic Design Study conducted by JICA on a requested project is to provide a basic document necessary for appraisal of the project by the Japanese Government. The contents of the Study are as follows:

- a) confirmation of the background, objectives, benefits of the project and also institutional capacity of agencies concerned of the recipient country necessary for project implementation,
- b) evaluation of the appropriateness of the project for the Grant Aid Scheme from a technical, social and economical point of view,
- c) confirmation of items agreed on by the both parties concerning a basic concept of the project,
- d) preparation of a basic design of the project,
- e) estimation of cost 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 Japan's Grant Aid Scheme.

Final project components are subject to approval by the Government of Japan and therefore may differ from an original request. Implementing the project, the Government of Japan requests the recipient country to take necessary measures involved which are itemized on Exchange of Notes.

(2) Selection of Consultants

For smooth implementation of the study, JICA uses (a) registered consulting firm(s). JICA selects (a) firm(s) based on the proposals submitted by the 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 consulting firm(s) used for the study is (are) recommended by JICA to a recipient country after Exchange of Notes, in order to maintain technical consistency and also to avoid any undue delay in implementation should the selection process be repeated.

3. Japan's Grant Aid Scheme

(1) What is Grant Aid?

The Grant Aid Program provides a recipient country with non reimbursable funds to procure the equipment and services (engineering services and transportation of the

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products, etc.) for economic and social development of the country under principles in accordance with relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials or such.

(2) Exchange of Notes (E/N).

Both Governments concerned extend Japan's Grant Aid in accordance with the Exchange of Notes in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid etc., are confirmed.

(3) "The period of the Grant Aid" means one Japanese fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedure such as Exchange of Notes, concluding a contract with (a) consulting firm(s) and (a) contractor(s) and a final payment to them must be completed.

(4) Under the Grant, in principle, products and services of origins of Japan or the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant may be used for the purchase of products or services of a third country.

However the prime contractors, namely, consulting, contractor 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.)

(5) Necessity of the "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. The Government of Japan shall verify those contracts. The "Verification" is deemed necessary to secure accountability to Japanese tax payers.

(6) Undertakings Required to 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 prior to the installation work in case

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the project is providing equipment,

b) to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,

c) to secure buildings prior to the installation work in case the project is providing equipment,

d) to ensure all the expenses and prompt execution 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.

(7) Proper Use

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

(8) Re-export

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

(9) Banking Arrangement (B/A)

a) The Government of the recipient country or its designated authority shall open an account in the name of the Government of the recipient country in a bank in Japan. The Government of Japan will execute the Grant Aid by making payments in Japanese yen to

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cover the obligations incurred by 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 issued by the Government of the recipient country or its designated authority.

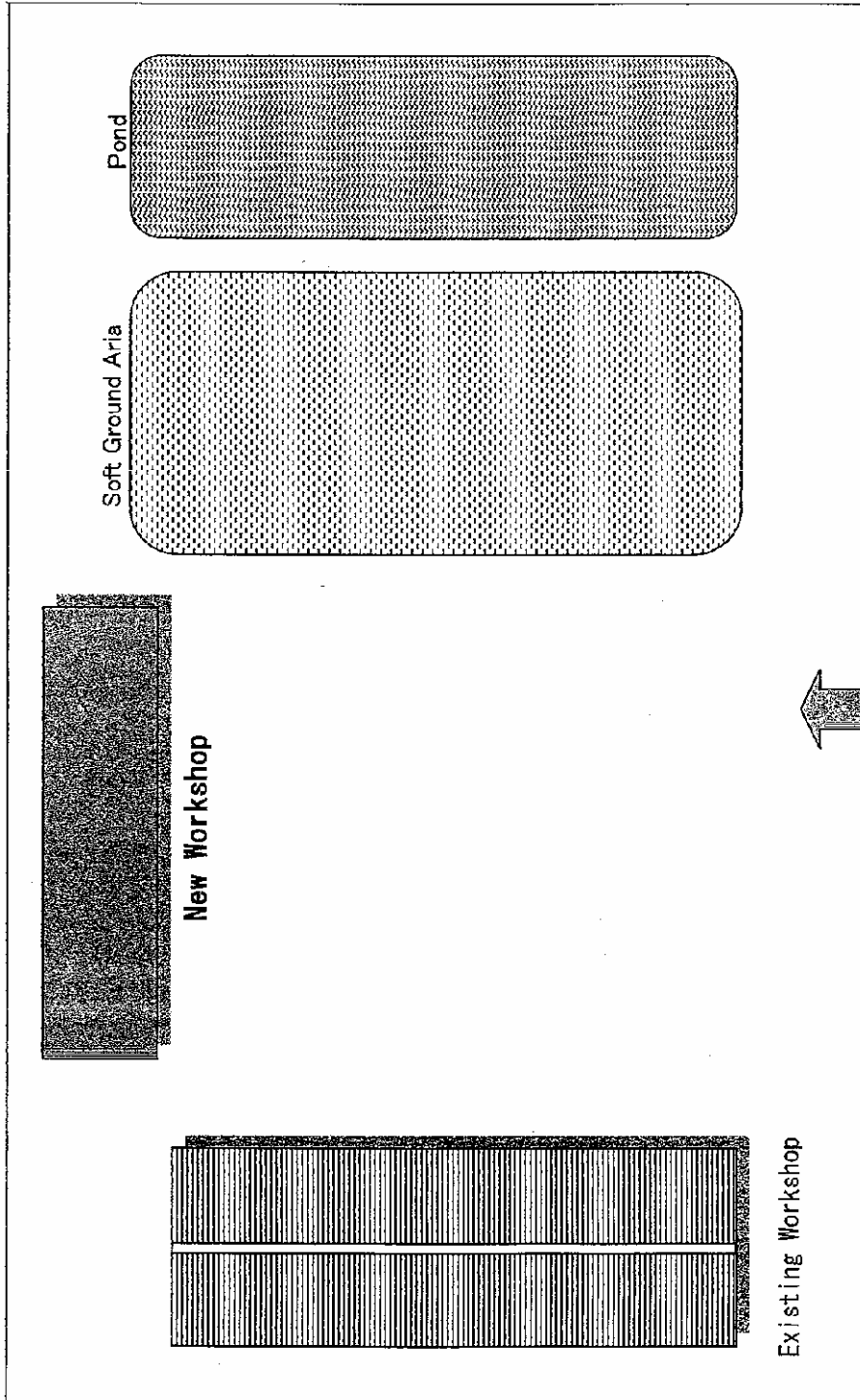
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Major Undertakings to be taken by Each Government

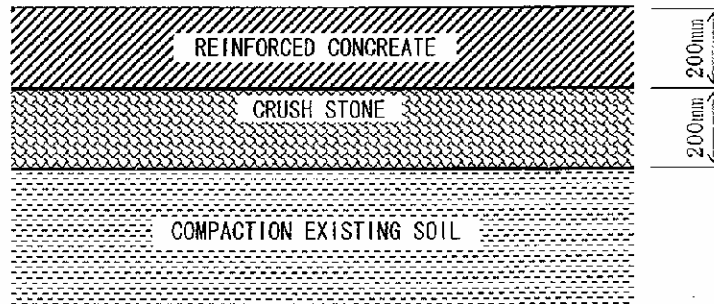
NO	Items	To be covered by Grant Aid	To be covered by Recipient side
1	To bear the following commissions to be a bank of Japan for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
2	To ensure prompt unloading and customs clearance at the port of disembarkation 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	(●)	(●)
3	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		●
4	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 contract		●
5	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid		●
6	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for the transportation and installation of the equipment		●

Workshop building location



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STRUCTURE OF BASEMENT



Aria is approximate 1,000m².

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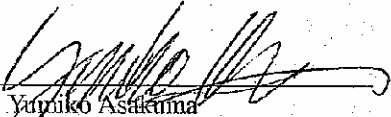
MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT
FOR IMPROVEMENT OF EQUIPMENT FOR DEMINING ACTIVITIES (PHASE IV)
IN THE KINGDOM OF CAMBODIA
(EXPLANATION ON DRAFT REPORT)

In April 2004, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Basic Design Study Team on the Project for Improvement of Equipment for Demining Activities (Phase IV) (hereinafter referred to as "the Project") to the Kingdom of Cambodia (hereinafter referred to as "Cambodia"), and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the Study.

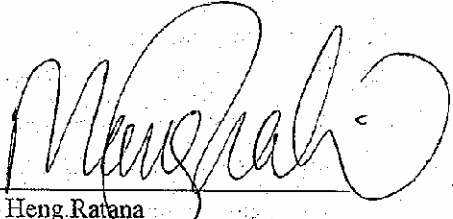
In order to explain to and consult with Cambodian side on components of the draft report, JICA sent to Cambodia the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Ms. Yumiko Asakuma, a project officer of the Project Management Group II, Grant Aid Management Department, JICA, from 13th to 20th of June, 2004.

As a result of discussions, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

Phnom Penh, 17 June, 2004



Ms. Yumiko Asakuma
Leader
Draft Final Explanation Team
Japan International Cooperation Agency
Japan



Mr. Heng Ratana
Deputy Director-General
Cambodian Mine Action Center
Kingdom of Cambodia

ATTACHMENT

1. Components of the Draft Report

The Government of Cambodia agreed and accepted in principle the components of the draft report explained by the Team.

The list of equipment is attached to Annex-1.

The final decision will be made by the Government of Japan based on the examination of the result of the Basic Design Study.

2. Japan's Grant Aid scheme

The Cambodian side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Cambodia as explained by the Team and described in Annex-2 and Annex-3 of the Minutes of Discussions signed by both parties on 6th of April, 2003.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the Government of Cambodia in September 2004.

4. Other relevant issues

4-1 Concerning the Central Workshop, both sides agreed as follows;

- The draft of the Central Workshop is shown in Annex-2.
- The construction place of the Central Workshop is shown in Annex-3.
- Procurement, transportation of materials to the site, and setting up will be covered by the Grant Aid.
- The foundation work shown in Annex-4 shall be completed by Cambodian side by the end of November, 2004, before the tender opening.
- Equipment of electricity and water supply will be prepared by the Cambodian side soon after the setting up.
- Drainage, oily water separator and car wash should be constructed by the Cambodian side.

4-2 Procured equipment other than the workshop materials will be transported to the headquarters or the Training Center by the Grant Aid. Internal transportation from

the Training Center to the work site will be conducted by Cambodian side.

- 4-3 The computers procured under the Grant Aid will have been properly used for more than four years.
- 4-4 The equipment procured by the Grant Aid should be used properly and effectively for a reasonable period of time. When it becomes unusable for operations after that, Cambodian side is required to consult with the Embassy of Japan before it is disposed, transferred, or used for other purposes.
- 4-5 Cambodian side expressed concern that the manufacturers which are not seriously interested in selling brush cutters for the Project but just want to put their materials on the test for future markets would join the tender and the Project would be delayed or would not be completed before the end of the period consequently. The Team will convey the concern to the Japanese parties concerned.
- 4-6 Cambodian side agreed to install locally-made back seats for the 4-ton trucks in Cambodia.

Annex-1: List of Equipment

Annex-2: Draft of the Central Workshop

Annex-3: Construction place of the Central Workshop

Annex-4: Foundation work of the Central Workshop

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Annex-1: List of Equipment

No.	Items	Specifications	Quantity
1	Mine Detector	Minelab F1A4	600
2	UXO Detector	Ebinger UPEX740M	48
3	UXO Detector	F1A4 UXO	24
4	GPS		44
5	Station Wagon	4WD (ambulance style)	21
6	Pickup Truck	4WD	45
7	4 T Truck	unites to 4 WD 4 Ton with Hood	50
8	Motorbike	125cc 4 Stroke	51
9	Generator	5KVA Diesel	40
10	Generator	3KVA Diesel	10
11	Water Pump	2HP, 1000 /min. discharge	40
12	Explosive Box		50
13	Digital camera		56
14	Megaphone		50
15	PPE Vest		1,120
16	PPE Visor	with Helmet, 1 visor for spear per each	1,120
17	Spraying Machine	Engine type	63
18	VHF Mobil	with Antenna	103
19	VHF Handheld		245
20	Desktop Computer		37
21	Laptop Computer		7
22	Groupware Server		2
23	Storage Devices		1
24	Laser Printer		7
25	Photocopy Machine	Medium size	7
26	Photocopy Machine	Large size	4
27	Large Size Scanner	A0 size	1

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No.	Items	Specifications	Quantity
28	Flat Bed Scanner		2
29	Large Size Inkjet Plotter	A0 size	1
30	Color Laser Printer		1
31	Floor UPS		7
32	Barcode Terminal	Portable type	11
33	Barcode Printer		1
34	Dot Matrix Printer		1
35	Tape Backup	Auto loader	1
36	Mark Sheet Reader		1
37	24 Port Switch		10
38	Ethernet Switch		7
39	Router	Firewall	7
40	Security Appliance		1
41	Software	Set	1
42	Brush Cutter	15-21 Ton	14
43	Bulldozer	15 Ton	2
44	Truck Trailer	25 Ton class	2
45	Workshop Building	Prefab building include installation	1
46	Workshop Tools	Set	1

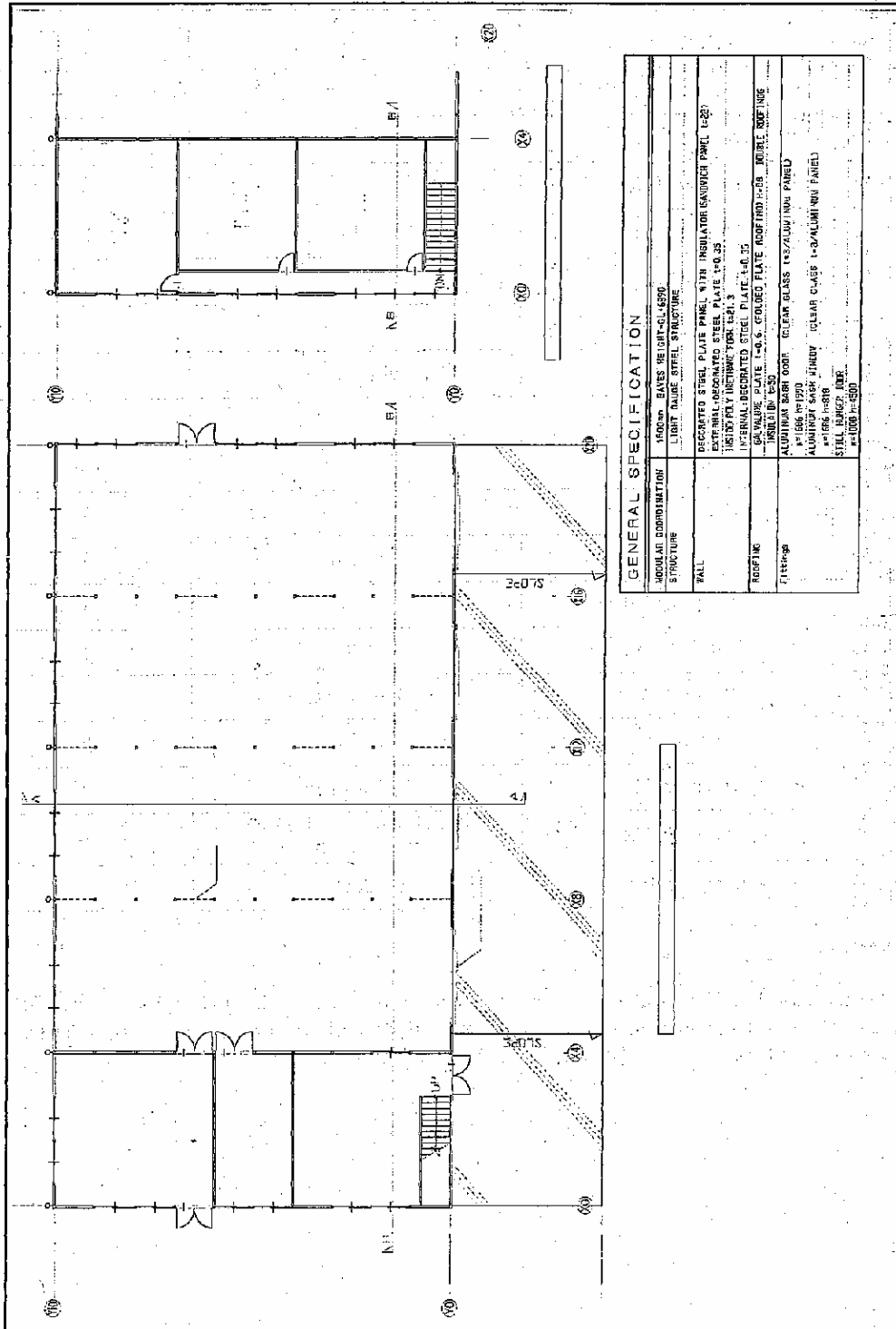
Remarks:

Software is included of the 1 windows 2003 Server (standard), 80 windows 2003 Server (Client Access), 1 Lotus Domino and Notes, 1 Red Hat Enterprise Linux, 1 Norton Anti-virus for Domino, 1 Backup Software, 1 Arc View, 1 AutoCAD and 1 ERDAS

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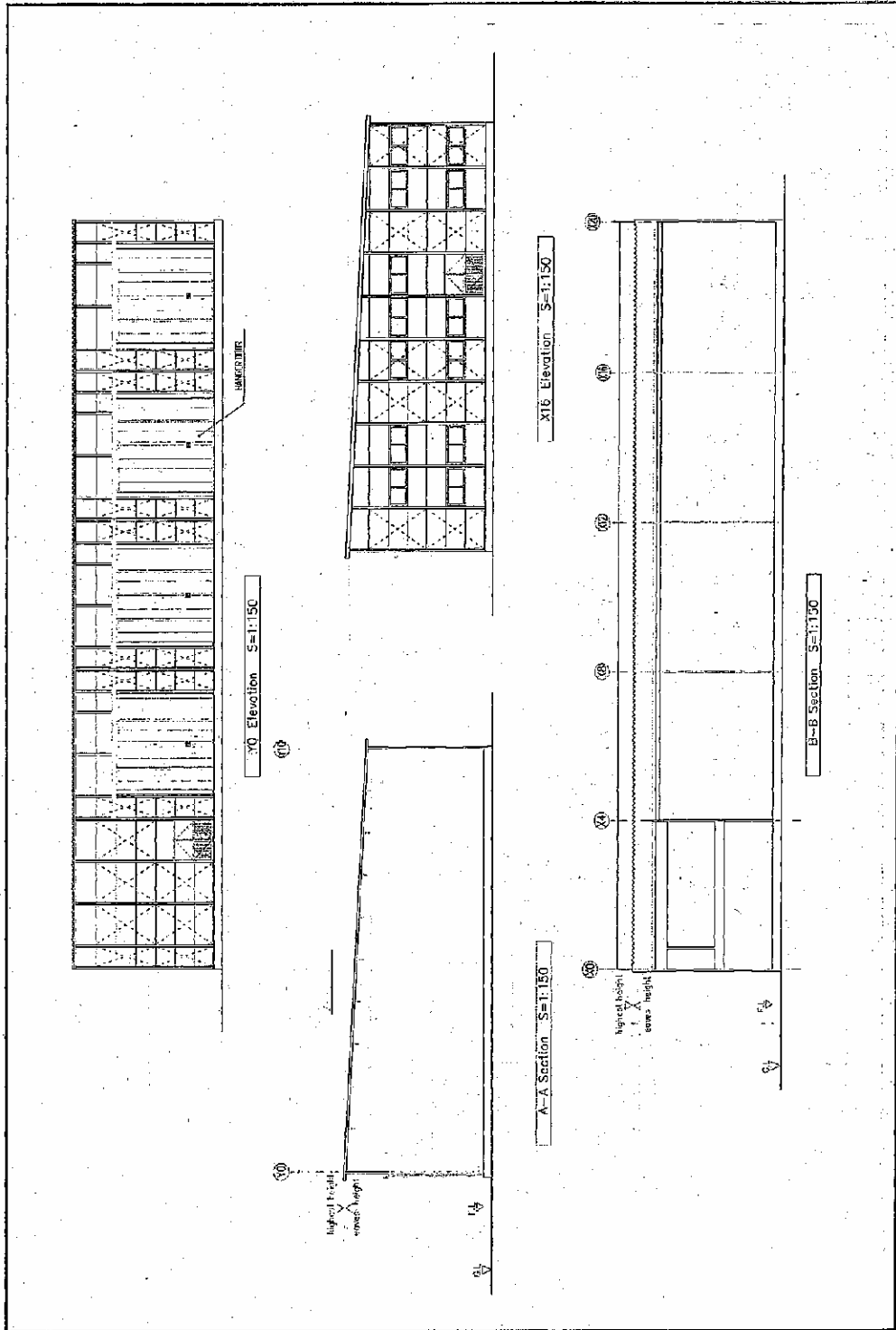
Annex-2: Draft of the Central Workshop



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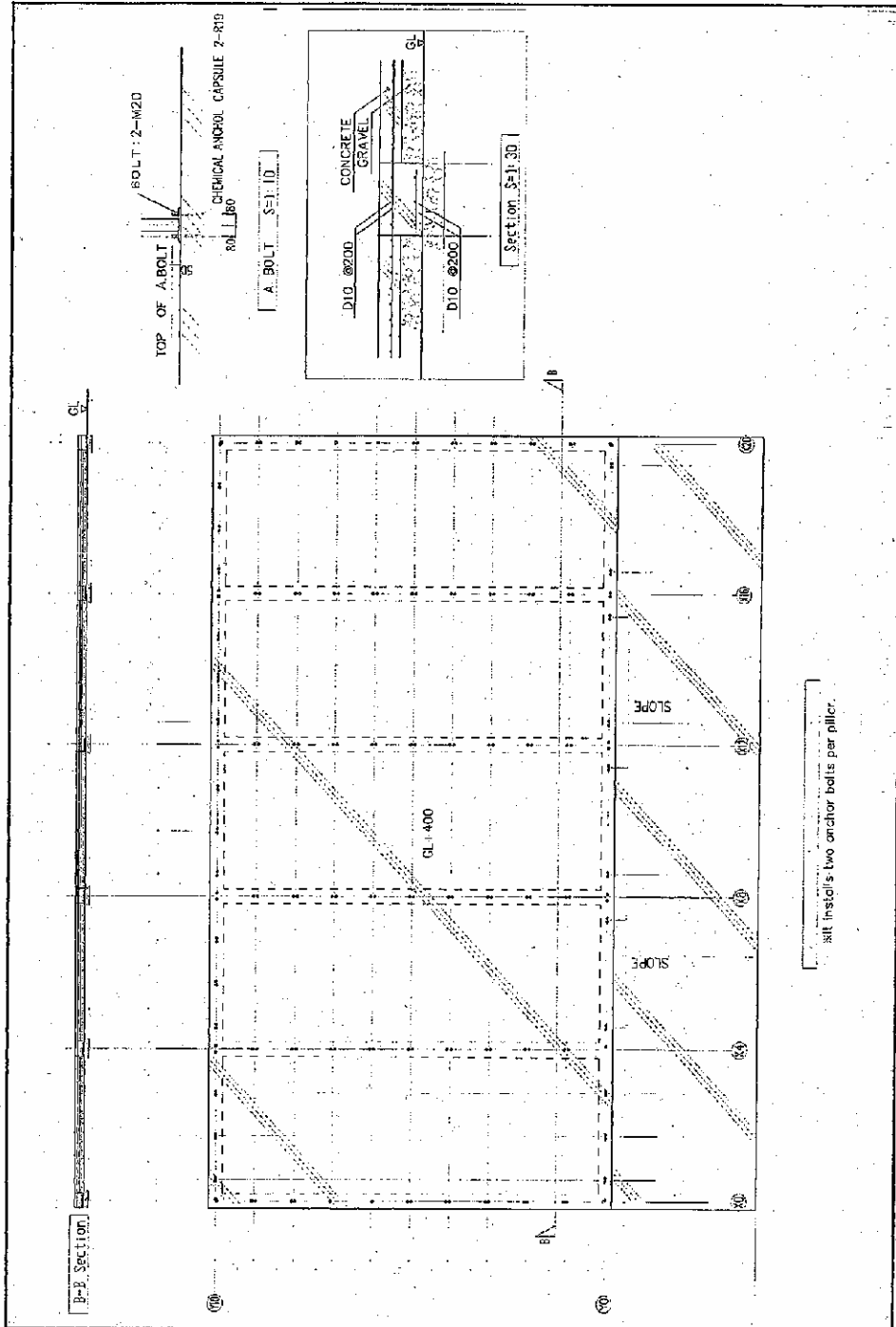
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Annex-4: Foundation work of Central Workshop



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COLLECTED ITEM

- ① CMAC Integrated Work Plan 2004
- ② CMAC Integrated Work Plan 2003
- ③ CMAC Six-Month Progress Report January-June 2003
- ④ CMAC Annual Report 2002
- ⑤ CMAC Annual Report 2003
- ⑥ National Assessment of Mine/UXO Contamination, Atlas of the National Mine Action Database of Cambodia
- ⑦ CMAC Five-Year Strategic Plan (2003-2004)