No.

Agricultural Mechanization Sector
Ministry of Agriculture and Land Reclamation
The Arab Republic of Egypt

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR MODERNIZATION OF AGRICULTURAL MECHANIZATION CENTR IN DAMANHOUR
IN
THE ARAB REPUBLIC OF EGYPT

October 2006

JAPAN INTERNATIONAL COOPERATION AGENCY

SANYU CONSULTATNS INC.

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PREFACE

In response to a request from the Government of the Arab Republic of Egypt, the Government of Japan decided to conduct a basic design study on The Project for Modernization of Agricultural Mechanization Center in Damanhour and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Egypt a study team from March 2 to March 26, 2006.

The team held discussions with the officials concerned of the Government of Egypt, 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 Egypt in order to discuss a draft basic design, and as this result, the present report was finalized.

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

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

October, 2006

Masafumi KUROKI
Vice-President
Japan International Cooperation Agency

October, 2006

LETTER OF TRANSMITTAL

We are pleased to submit to you the basic design study report on “The Project for Modernization of Agricultural Mechanization Center in Damanhour” in The Arab Republic of Egypt.

This study was conducted by Sanyu Consultants Inc., under a contract to JICA, during the period from February to October, 2006. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Egypt 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,

Toshinori KUDO
Project manager,
Basic design study team on
The Project for Modernization of
Agricultural Mechanization Center
in Damanhour
Sanyu Consultants Inc.

Summary

The Arab Republic of Egypt (hereinafter referred to as Egypt) is located at the northeast end of Africa, facing the Mediterranean Sea on the north and the Red Sea on the east, with a population of 72.6 million (year 2004) and a land area of 995,000 km^2. While 96% of the country's total land area is desert regions, habitable zones and cultivable lands accounting for only 4% are concentrated in the Nile Valley and the Nile Delta. The River Nile is running through the country from south to north, structuring fluvial terrace and riparian alluvial plains. There stretches out vast deserts on either side of the terrace.

Egyptian economy has been temporarily down due to the decrease in tourist income after the 9-11 terrorism attack in 2001 but effects of the reformation toward macroeconomic stability started in 2000s are gradually becoming visible. Furthermore, in the late 2004, there was a recovery of tourist income, increase in traffic on the Suez Canal, and commencement of the natural gas export to European countries, which led to an increase in foreign currency earnings, avoiding a long-feared decrease in Egyptian pound. Meanwhile, there are still many issues to be tackled such as the high unemployment rate, underlying poverty, low ratio of food self-sufficiency, undeveloped export industry, and visible trade deficit, etc.

Despite the limited farmland area, the agricultural sector accounted for 13.9% in the total GDP in 2005, and this is the third largest sector following that of service and industry. Furthermore, since about 30% of the employed population is engaged in the agricultural sector, it is characterized as one of the most important sector in Egypt. Nevertheless, Egypt is a world's leading importer of food, with 18.1% share of agricultural product (year 2003) in whole import. For improvement of the nation's self-sufficiency in food products, employment creation and poverty alleviation, Egypt has placed the expansion of agricultural areas (horizontal expansion) and increase in agricultural productivity (vertical expansion) as the central issues.

In Egypt, thanks to the supply of irrigation water from the River Nile, double and/or triple cropping is available through a year and they repeat cultivation without any fallow period to increase agricultural production. Therefore, it is necessary to start cultivation immediately after harvesting and this requires farmers to introduce agricultural machinery for making the operation sequence more efficient and shortening their working time. However, the majority of the farmers actually use "agricultural machinery hiring service", because agricultural machines are not only expensive but also need technical capabilities for operation and maintenance (O/M) such as routine checkup and repair.

Under these circumstances, Agricultural Mechanization Sector (AMS) of Ministry of Agriculture and Land Reclamation (MALR) in Egypt started agricultural machinery hiring service in 1980s and planned establishment of 150 agricultural mechanization stations (the Station) in whole country. To date, 126 stations have been established. The Station is a facility holding

agricultural machinery and operators as well as providing agricultural machinery hiring service. In addition to these functions, the Station equipped with the functions for regularly repairing and maintaining machinery, for training operators and mechanics to improve their technical levels, and for storing/delivering spare parts are called “agricultural mechanization center (AMC)”. Such AMC are located in 6 places all over the country at present, working as a base for promotion of agricultural mechanization in each area. Of them, Sinbellawein AMC in the east delta is the one established in 1987 through Japan’s Grant Aid, which has been well operated and maintained, contributing to the promotion of agricultural mechanization in the area. AMS has been continuing their works aiming to cover 10% of the whole farmland with its agricultural machinery hiring service.

The Project site is Damanhour Agricultural Mechanization Station now existing in Damanhour, capital of Beheira Governorate, about 160km northwest of Cairo, and the target area of the Project is that Governorate in the west delta. The Governorate holds a population of 4.6 million (year 2004) and more than half employed population is engaged in agriculture. Whereas some of large-scale farmers (10 feddans and above) accounting for 10% of the total farmers own agricultural machinery, small-scale farmers (less than 2 feddans) accounting for more than half cannot own. Recently in the western side of the desert in the target area, as the regional development has been expanding, farmers’ needs of hiring service are increasing for their farmland leveling and cultivation/harvesting for double/triple cropping.

However, since there is no agricultural mechanization center with any repair facility or training facility in the target area, they are forced to depend on the Sinbellawein or Sakha AMC in east delta, causing disparities among regions. Accordingly, in the target area, it takes a long time for repairing, the number of machinery on the waiting list is increasing, and that of workable machinery for hiring service is decreasing. Another problem is insufficiency of technical capacities of operators and mechanics, and because of this, existing machinery is not efficiently utilized. As a result, the hiring service cannot rapidly respond to the farmers’ demand, leading to the delay of harvesting and cultivating period and to decreasing in productivity, and some farmers are even forced to abandon cultivation.

Considering these circumstances, aiming at the promotion of agricultural mechanization in Beheira Governorate, the Government of Egypt requested the Government of Japan a grant aid for the Project for Modernization of Agricultural Mechanization Center in Damanhour (hereinafter called the Project) organized by AMS as the implementing and executing agency.

In response to a request from the Government of Egypt, JICA sent a Preliminary Study Team to Egypt in September 2005 and the Basic Design Study Team in March 2006 to confer with government officials concerned in Egypt and to survey DAMC and similar centers. After subsequent domestic works in Japan, the Draft Report Explanation Team was sent in September 2006 for building a consensus with the Egyptian side on the Basic Design and the components of the Project.

The Project aims to establish a supporting system for the promotion of agricultural mechanization in the target area, by constructing facilities and procuring equipment necessary for training and repair. The major components of the Grant Aid are as follows:

Facility/Equipment	Major Components	Contents
1) Construction of Facilities	Workshop building	Steel Structure, 2-story of a part (1,534.50m^2)
	Training building	Reinforced Concrete Structure, 2-story (960.00m^2)
	Staff building	Reinforced Concrete Structure, 2-story (864.00m^2)
	Tractor shelter	Steel Structure, 1-story (1,325.80m^2)
	Adjunct facilities	Reinforced Concrete Structure, Steel Structure (202.48m^2)
2) Procurement of Equipment	Equipment for workshop	For washing & cleaning, chassis repair, electric/hydraulic repair, machine shop, metal works, welding, engine/driving repair, fuel injection pump test, adjusting/lubricating, handling, mobile workshop
	Equipment for training	Cutaway model, OHP, slide projector

For implementing the Project under the Japan's Grant Aid, it will take 5 months for detailed design study and 12 months for construction. The overall project cost is estimated as 886 million Japanese yen (840 million Japanese yen by the Japanese side and 46 million Japanese yen by the Egyptian side).

The target area to be benefited through the Project is 578,000ha of farmland and the number of target farm families is 255,400. Expected effects under the implementation of the Project are as follows:

Direct Effect

- Total number of the AMS staff to receive training will reach 400 per year.
- Total numbers of farmers to receive training will reach 200 per year.
- Time for repairing one machine will be reduced from the present level of 90 days to that of 36 days (60% reduction).
- Rate of workable machines will be raised from the present level of 85.8% to that of 94.4% (approx. 10% increase).
- Farmers will receive stable agricultural machinery hiring service after repair time is shortened and rate of workable machines is raised as above.

In-Direct Effect

- Newly-established training facility will provide training fitting with regional peculiarity, strengthen the trainees' motivation for agricultural mechanization, and contribute to promotion of agricultural mechanization.
- Stable agricultural machinery hiring service will enable efficient land use and increase productivity.
- Agricultural productivity and farm incomes in the target area will increase.

AMS will continuously be responsible for management and O/M of the facilities after implementing the Project. There is no technical problem since such facilities and equipment do not

require any high O/M technology in particular and they are the same as those used in similar centers (AMC in Sinbellawein or Sakha). O/M experiences of staff are deemed sufficient, seeing that the existing staff to remain in the center will account for 70% and many of new comer will be recruited from the other AMCs and the Stations. Since the O/M costs of this Center (331 thousand LE) is equivalent to only 0.82% of the whole O/M cost of AMS (40,281 thousand LE in year 2004/05 excluding personnel cost) and his financing is kept balanced in black every year, AMS would be able to cover all O/M costs by himself.

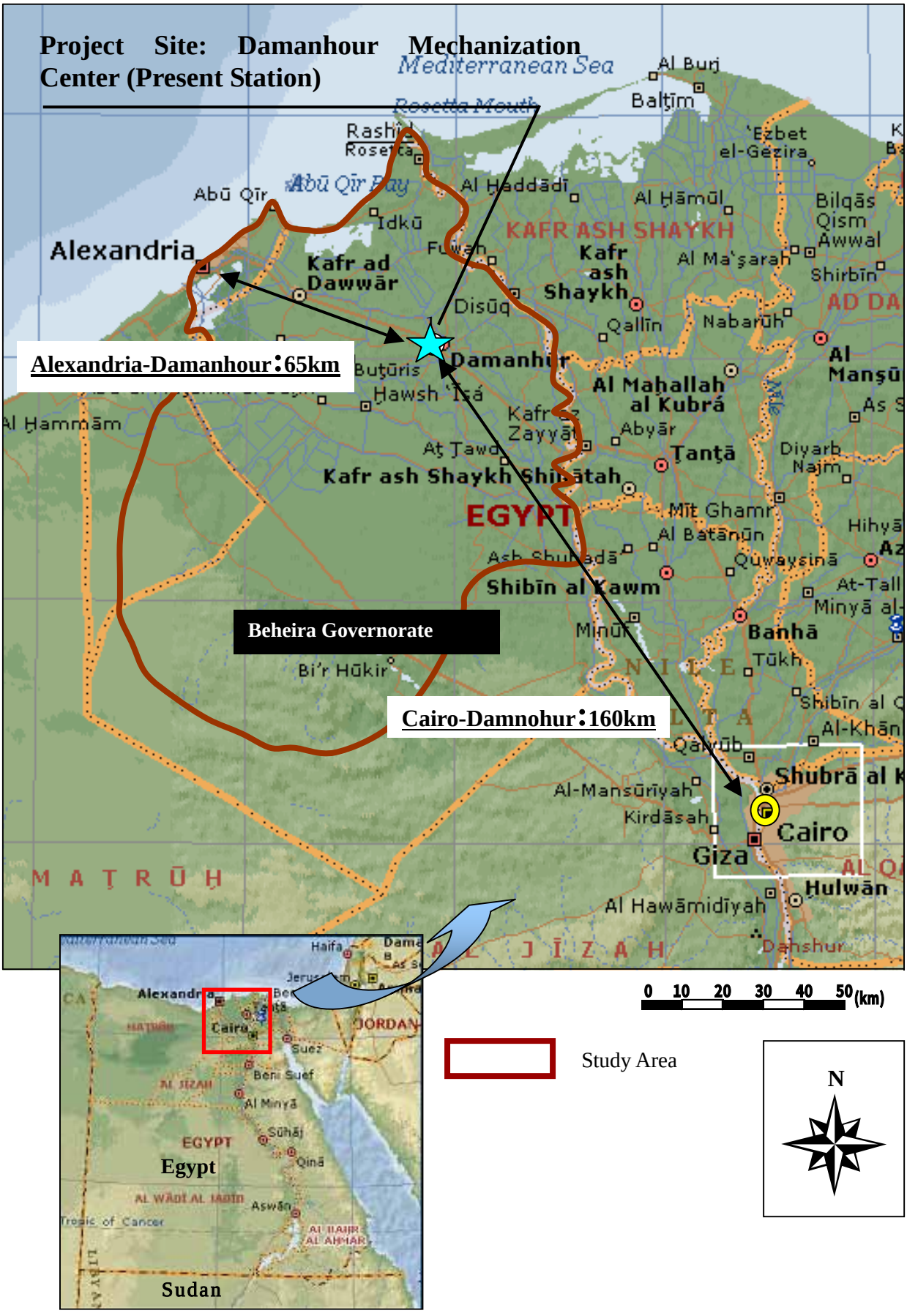
From these viewpoints, and considering that the Project will greatly contribute to improving basic human needs of the residents, it is judged that implementation of the Project under Japan's Grant Aid will have high validity.

Finally, a must for implementing this Project is that works to be borne by the Egyptian side will be completed on schedule.

Contents

[Appendices]

Location Map of the Study Area



Perspective
Damanhour Agricultural Mechanization Center

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Abbreviations

Abbreviations:

AMC	Agricultural Mechanization Center
AMS	Agricultural Mechanization Sector
CA	Central Administration
CAPMAS	Central Agency for Public Mobilization and Statistics
DAMC	Damanhour Agricultural Mechanization Center
FAO	Food and Agricultural Organization
FMTC	Farm Machinery Training Center in Maamoura
GA	General Administration
GDP	Gross Domestic Product
GNI	Gross National Income
GNP	Gross National Product
HS	Hiring Station
ID	Irrigation Department
MALR	Ministry of Agriculture and Land Reclamation
MoFA	Ministry of Foreign Affairs
MoMP	Ministry of Military Production
MWRI	Ministry of Water Resources and Irrigation
WB	World Bank

Unit:

cm	centimeter	℃	degree centigrade
fed.	feddan (=0.42 ha)	ha	hectare (=2.38 fed.)
km	kilometer	kg	kilogram
m	meter	km^2	square kilometer
mm	millimeter	lit.	liter
V	volt	C0	Standard sharing coefficient
kVA	kilovolt ampere		

Currency:

LE	Egyptian Pound
Pt	Egyptian Piaster (Pt) (1LE=100Pt)
J¥	Japanese Yen (Yen or J¥)
US$	US Dollar (USD or US$)

Exchange rate（March, 2006）

LE	= J¥20.400
US$	= J¥117.10

Chapter 1 Background of the Project

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(1) Background and Outline of the Project

In Egypt, thanks to the supply of irrigation water from the River Nile, double and/or triple cropping is available through a year and they repeat cultivation without any fallow period to increase agricultural production. Therefore, it is necessary to start cultivation immediately after harvesting and this requires farmers to introduce agricultural machinery for making the operation sequence more efficient and shortening their working time. However, the majority of the farmers actually use “agricultural machinery hiring service” because agricultural machines are not only expensive but also need technical capabilities for operation and maintenance (O/M) such as routine checkup and repair.

Under these circumstances, Agricultural Mechanization Sector (AMS) of Ministry of Agriculture and Land Reclamation (MALR) in Egypt started agricultural machinery hiring service in 1980s and planned establishment of 150 agricultural mechanization stations (the Station) in whole country. To date, 126 stations have been established. The Station is a facility holding agricultural machinery and operators as well as providing agricultural machinery hiring service. In addition to these functions, the Station equipped with the functions for regularly repairing and maintaining machinery, for training operators and mechanics to improve their technical levels, and for storing/delivering spare parts are called “agricultural mechanization center (AMC)”. Such AMC are located in 6 places all over the country at present, working as a base for promotion of agricultural mechanization in each area. Of them, Sinbellawein AMC in the east delta is the one established in 1987 through Japan’s Grant Aid, which has been well operated and maintained, contributing to the promotion of agricultural mechanization in the area. AMS has been continuing their works aiming to cover 10% of the whole farmland with his agricultural machinery hiring service.

However, since there is no agricultural mechanization center with any repair facility or training facility in the target area, they cannot help but depend on the Sinbellawein or Sakha AMC in the east delta, causing disparities among regions. Accordingly, in the Target area, it takes a long time for repairing, the number of machinery on the waiting list is increasing, and that of workable machinery for hiring service is decreasing. Another problem is insufficiency of technical capacities of operators or mechanics, and because of this, existing machinery is not efficiently utilized. As a result, the hiring service cannot rapidly respond to the farmers’ demands, leading to the late of harvesting and cultivating period and to decreasing in productivity, and some farmers are even forced to abandon cultivation.

Considering these circumstances, aiming at the promotion of agricultural mechanization in Beheira Governorate, the Government of Egypt requested the Government of Japan a grant aid for the Project for Modernization of Agricultural Mechanization Center in Damanhour (hereinafter called the Project) organized by AMS as implementing and executing agency.

(2) Outline of the Request

Contents of the request are as follows:

- Construction of workshop facilities and procurement of equipment (such as for the engine overhauling, maintenance of the transmission, metal works, welding, and forklift (1 set), electric tools, panel beating tools, carpentry tools and mobile workshop (2 units))
- Construction of training facilities (audio & visual room, lecture room, accommodation), demonstration farm for practical training, and procurement of equipment for training (such as cutaway models, audio & visual apparatus, microbus, training software materials, etc.,)
- Construction of tractor shelter, fuel station, car wash and procurement of tractors (110ps x 20 units, 82ps x 20 units), implements (disc-hallow 20” x 36, 10units; 20” x 32, 10units), combine 20units
- Construction of administration building and elevated tower tank, and procurement of equipment for administration (office appliances, vehicles)

Chapter 2 Contents of the Project

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

2-1-1 Overall Goal and Project Target

(1) Overall Goal

AMS has been targeting to cover 10% of the agricultural land in Egypt by agricultural machinery hiring service. However, the agricultural machinery hiring service covers, on average, only 7.3% of the target area in the west delta, which is far from 10% of target value. Correction of regional disparities caused between the east and the west delta has become another issue. For making a contribution to those, “Agricultural mechanization will be promoted in the target area.” is set as the overall goal.

(2) Project Target

The supporting system in the target area has not been well developed, due to not only the lack of agricultural machinery for hiring service but also nonexistence of training and repair facilities which are essential to provide a stable hiring service. To cope with this, “A supporting system to promote agricultural mechanization in the target area will be established” is set as the Project target.

2-1-2 Outline of the Project

To achieve the above targets, the Project aims to provide for “Damanhour Agricultural Mechanization Center”, human and financial resources needed for the agricultural machinery hiring service, training and repairing (three major functions), and facilities/equipment necessary for management of those functions. Implementation of the above is expected to enable to conduct training in the target area, to shorten time for repairing damaged machinery, to increase the number of workable machines, and to provide farmers with a stable hiring service. Agricultural mechanization will be consequently promoted. After being analyzed and evaluated the Project validity in Japan, major components of the Japanese Grant Aid were clarified as Table 2-1.

Aiming at smooth implementation of Japan’s Grant Aid and contributing to monitoring and evaluation, PDMo as the Project outline is summarized in Table 2-2.

Table 2-1 Major Components of Japan's Grant Aid

Function	Major Components of Japan's Grant Aid	Notable Remarks
Maintenance Repairing function (newly established)	・ Workshop building (steel-frame building, partly two-story, 1,534.05m^2) ・ Construction of car-wash facility	・ As to the requested fuel station, the existing one can be used as it still functions well.
	・ Equipment for workshop: categorical use; For Washing & Cleaning, Chassis Service, Electric, Metal Works, Welding, Fuel Injection Pump Test, Lubrication	・ The requested carpentering tools are excluded from the Project Components, because they are not directly related to the promotion of agricultural mechanization. ・ Forklifts and mobile workshops listed in support equipment are classified as this repairing equipment.
Training function (newly established)	・ Training building (reinforced concrete building, two-story, 960.00m^2)	・ Since some plots belonging to MALR or private land would be used as substitute for it, the requested demonstration field is excluded from the Project Components.
	・ Equipment for training: cutaway models, OHP sets, slide projector	・ Training equipment only for making use of the existing teaching materials is included in the Project Components.
Hiring service function (strengthened)	・ Tractor shelter (2 steel-frame buildings, one-story, 1,325.8m^2)	・ Since the Project target is to put in place the supporting system of promoting agricultural mechanization, requested agricultural machinery is excluded from the Project Components,
Others	・ Staff building (reinforced concrete building, two-story, 864.000m^2) ・ Construction of adjunct facilities (reinforced concrete and/or steel-frame building, one-story, 202.48m^2)	・ Requested elevated tower tank is excluded from the Project Components, because it is possible that a pipeline would directly be connected from the public water supply system with sufficient water pressure. ・ The requested office apparatus and vehicles are excluded from the Project Components by the reason that they are universally appropriated and no guarantee can be made to strictly confine to the exclusive use for the pledged purpose.

Remarks: Details are referred to the Appendix 5-7 "Comparison of the Request and the Project"

Table 2-2 PDMo of the Project

Name of the project: The Project for Modernization of Agricultural Mechanization Center in Damanhour
Target area: Service area of Damanhour Agricultural Mechanization Center in Beheira Governorate
Target group: User farmers of hiring service (255,400 farm families), annual number of trainees (600 persons/year)
Project period: 2006 - 2008 (planned)

Summary of the Project	Objectively verifiable indicator	Means of verification	Important assumptions
1. Overall Goal Agricultural mechanization is promoted in the target area of the Project	① Usage rate of agricultural machinery will be increased ② Distribution rate of agricultural machinery is increased..	・ Machinery usage rate of farm family (by monitoring) ・ Distribution rate of agricultural machinery (by monitoring)	・ Security in the target area is not aggravated
2. Project Target The supporting system of promoting agricultural mechanization is established in the Project area	① Acceptance of trainees' number reaches at 600 per year. ②Average duration of repair of farm machinery (mean: 90 days) is saved by 60%.	・ Records of acceptance of the trainees' number (training contents or trainees' number). ・ Performance records of actual maintenance / repairing	・ No change is made on the current agricultural policies of the Egyptian Government (i.e. promotion of agricultural mechanization),
3. Outputs The agricultural machinery hiring service is stably provided. 1) Training is conducted in Damanhour 2) Time for repairing damaged agricultural machinery is shortened in Damanhour 3) The number of workable agricultural machines in Beheira is increased	1) - ① Number of trainees of the staff of AMS reaches 400 per year. 1) - ② Number of farmer trainees reaches 200 per year. 2) - Average duration of repair of agricultural machinery (mean: 90 days) is saved by 36 days (60% reduction) 3) – Machinery-operating ratio is increased from 85.8% to 94.4% (approx. 10%)	・ Number of staff trainees ・ Number of farmer trainees ・ Performance records of actual maintenance / repairing ・ Documents of application for maintenance/repairing, records ・ Records of utilizing hiring service	・ Economic conditions are not deeply recessed. ・ Oil price is not sharply increased.
4. Activities	Input Plan		Preconditions
1) Facilities and equipment required for the operation of the training center are arranged, 2) Facilities and equipment required for the central workshop are arranged. 3) Facilities required for hiring services of agricultural machinery are arranged.	[Japanese side] 1) Construction of training building and Procurement of training equipment (OHP, cut-model etc.) 2) Construction of a central workshop and a car wash facility, procurement of maintenance / repairing equipment (lathe, electric working tools, metal work tools, welding tools, painting tools etc.) 3) Construction of tractor shelters 4) Construction of staff building	[Egyptian side] 1) Acquisition of construction area and land leveling 2) Removal of the existing facilities 3) Installment of various fire extinguishers for the facilities 4) Procurement of required recurrent budget and staff 5) Management and O&M of the center	・ Preliminary preparatory works borne by the Egyptian side (removal of the existing facilities, etc.) are implemented on schedule.

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

2-2-1-1 Basic Policy

(1) Overall Basic Policy

The basic policies of designing are as follows.

1) The Project aims at establishing the supporting system to promote agricultural mechanization. The Project components include necessary facilities and equipment for maintenance/repair function and training function in addition to the existing hiring service function. However, since the existing facilities are old and heavily damaged, they will be newly constructed under the Project.
2) The existing fuel station and parts of owned equipment can be continuously used according to the preliminary check, and will be exempted from the Project components.
3) As for demonstration farm, it is excluded from the Project components, because area for construction is limited in the Project site and plots belonging to the private farm near the site could be used for the space of field demonstration.
4) The requested elevated tower tank is excluded from this Project because public water supply having sufficient water pressure can be directly connected, and
5) The existing staff will be adopted as the base of persons in planned facilities to determine the scale thereof. Exceptionally, newly recruited and transferred staff to be accommodated in newly established functions (that of training, repair and technical assistance) will be included in the base (refer for details to Appendix 5-9 “Number of persons included in the target”).

(2) Design Policy according to Function

1) Training Function

① From a viewpoint of promoting agricultural mechanization, the targets of training will be staff in charge of agricultural mechanization and farmers in the target site.

② The contents of training will be provided to meet the needs of staff in charge of agricultural mechanization and farmers.

③ Maximization of training function will be envisaged by optimizing the method of providing training courses (number of target trainees, number and frequency of required training).

<**Results of Training Plans**>

- Training will not be undertaken during busy farming seasons for harvest and combine inspections.
- Training for AMS staff will be undertaken 20 times a year (3rd year or later).
- Training for farmers will be undertaken 10 times a year.
- The maximum number of trainees will be 20 per class.

Table 2-3 shows contents of the training courses and Table 2-4 estimated trainee numbers.

(see appendix 5-8 “Examination of training plan” for more information)

Table 2-3 Training Courses and Their Contents

Group and Course	Contents	Type	Training time (annual)		
			1st year	2nd year	3rd year or later
Training A：Agricultural mechanization course: for machinery operators					
Tractor training（6 courses）	Operation of tractors and implements, maintenance check, etc. Basic: 2 courses, Applied: 4 courses	Basic	2	2	2
		Applied	1	3	7
		Sub-total	3	5	9
Combine training（5 courses）	Operation of combines and maintenance check, repair, and O/M, etc. Basic: 2 courses, Applied: 3 courses	Basic	2	2	2
		Applied	1	2	3
		Sub-total	3	4	5
Training A：Workshop skill course: for mechanics					
Maintenance course（6 courses）	Inspection/maintenance and running repairs of hydraulic pressure drive systems, electric systems or engines Basic: 2 courses, Applied: 3 courses	Basic	2	2	2
		Applied	2	3	4
		Sub-total	4	5	6
Sub-total (once/1week)			10	14	20
Training B：Agricultural mechanization course: for farmers					
Farmer training（5 courses） (once/2 days)	Type, specification and management of irrigation facilities and attached operating machine		10	10	10

Table 2-4 Estimated Trainee Numbers

Category	1st year	2nd year	3rd year	4th year	5th year
1)Training- A	200	280	400	400	400
2)Training- B	200	200	200	200	200
Annual total	400	480	600	600	600
Accumulation	400	880	1,480	2,080	2,680

2) Maintenance/Repairing Function

① The contents and scale of the facilities and equipment for workshop are complied with the items and quantities of farm machinery owned by the Agricultural Mechanization Stations

of the target area.

② Repairing the heavy damage such as chassis repair, overhaul of engine, etc., which are difficult to be repaired at the hiring station as well as manufacturing small spare parts are included in the Project. Equipment for periodical maintenance and light damages are excluded from the Project components because that they can be maintained at each hiring station.

③ The requested carpentering tools are excluded from the Project components, because they are not directly related to the Project target of the promotion of agricultural mechanization.

3) Function of Hiring Service of Farm Machinery

① To continue the existing hiring service, tractor shelters and car wash facility of size meeting the present number of machines are included in the Project.

② The requested agricultural machinery (tractors, combines and implements), which is practically used, is excluded from the Project components, considering the maximum usage of existing machines and the Project target is to establish the supporting system for promoting agricultural mechanization in the Project area.

2-2-1-2 Policy on Natural Conditions

(1) Policy on the Results of Geological Survey

Basic form of the building can have number of stories sustainable with spread foundation considering that load bearing capacity of 8t / m^2 in the site.

(2) Policy against Earthquakes in Egypt

Damanhour area belongs to a higher graded area with the seismic grade 3 and this is equivalent to Japanese earthquake strength standard: C0 (standard sharing coefficient) = 0.1. Accordingly, earthquake strength standard is adopted at the same value in the Project, thus structural planning will be provided for the planned building based on the Japanese structural calculation standard. Since currently effective seismic standard is under review in the Egyptian authority, the state of review will be taken into consideration in Detailed Design Study, and wherever necessity arises recalculation is considered based on the newly authorized value for seismic standard.

(3) Policy on the Elevation of Foundation within the Site

The ground in the site is about 1.2 m lower than the road in front of the site. Considering that there is no effect of rainwater and no drainage facility is employed, earth filling will not be done and any drainage facility will not be laid down within the site.

(4) Policy on Climatic Conditions in Egypt

Because daytime temperature during summer reaches 35°C, temperature on the outer wall directly exposed to sunshine exceedingly rises up. To cope with high temperature, air-conditioning equipment will be installed for regulating room temperature for habitable environment except training building's staying dormitory. Also, eaves will be installed at the windows and louvers are employed at the windows of habitable environment facing to the west in order to shade from direct sunshine. Surface of roofs will be coated with heat insulating materials to save energy. Outer wall and roofs of workshop building will be treated with heat insulating material, while no air conditioning equipment will be installed for repair bay with higher ceiling where a well-ventilated structure will be applied.

2-2-1-3 Policy on Socio-Economic Conditions

Egypt is an Islamic country where the majority of people pray 5 times a day. Since prayers should clean their hands, feet, necks and heads before praying, a washing basin for feet will be installed in the water closet in this Project. However, water closet installed with shower booths can substitute it and dispense new installation of a washing basin for feet. A mosque to be removed is found in the site, and no mosque will be included in the Project.

2-2-1-4 Policy on Situations of Construction and Procurement

(1) Equipment and Materials for Construction Works

1) General Construction Materials

Cement, reinforcing bars, timber, light steel products, building tools, ventilation/ illumination equipment etc. are available for the domestic procurement in Egypt, and will be procured in Cairo City or in Alexandria City to deliver to the site.

2) Materials for Finishing Works

As regards specification of major equipment / materials for finishing works exterior and interior completion materials are available at local markets, local procurement is planned for these items.

3) Construction Machinery

Almost all generally-used construction machinery can be obtained in Egypt. Because in and around Damanhour, machinery maintenance is limited, it is planned to procure in Cairo City or in Alexandria City to deliver to the site. As for concrete plants, no rental plant is found though some construction firms and ready-mixed concrete companies hold some plants. Hence, local lease of concrete mixers is sought in the Project.

(2) Procurement of Equipment

Equipment and materials to be procured in the Project are divided into those that are available at local suppliers and those preferably procured in Japan or in a third country such as European countries depending on their prices, post-purchasing maintenance services or contents of specifications. Maintenance equipment to be used in the workshop has not been manufactured nor assembled in Egypt. Either, it is difficult to procure it in third countries because they constitute a vast range. Further, it is not judged favorable to purchase through local agents in the light of specifications and maintenance services. Thus, most of the equipments are planned to procure in Japan. However, some equipment, that are popular in Egypt, are not necessarily purchased abroad.

2-2-1-5 Policy on Use of Local Contractors

Local contractors basically have techniques required for construction works, civil engineering works and equipment installing works. As the construction of the facilities through the Project does not contain any specific engineering skills nor special construction methods, it is designed to make full use of local contractors and local construction workers to reduce cost.

2-2-1-6 Policy on Operation and Maintenance

AMS of MARL, the implementing agency, itself will carry out management and O/M of the Project. AMS is an organization covering the whole country, with enough experiences, appropriate arrangement of personnel, favourable financial condition and high technological levels of the staff. Hence, management and O/M of the facilities in this Project will be properly and smoothly performed without difficulty. Provided that procured workshop equipment is various and requires consistency of repair works, guidance is to be done on initial operation and frequently used equipment.

2-2-1-7 Policy on Grading Facilities and Equipment

Taking into account, the well operated and maintained similar centers, characteristics of target area, and operation and maintenance of the Center to be established, it is designed that the Center is envisaged giving priority to functions and its facilities and equipment have a minimum required quality of materials, grade, specifications and designs.

2-2-1-8 Policy on the Methods of Construction/Procurement and Construction Period

(1) Methods of Construction/Procurement

In principle, designing will meet the architectural standard in Egypt (Egyptian code: Ministry of Housing, Utilities and Urban Communities). For approval of construction, AMS submits an application, and subsequently City Damanhour and its Fire Department examine it. For material procurement, transportation by track will be adopted considering that a well-maintained national highway and bypasses run from Cairo and the Port of Alexandria to the project site.

(2) Construction Period

The project constitutes a compound type with building construction and equipment procurement where a few buildings are to be constructed within a limited space. Since A-type national bond will be appropriated owing to a long construction period, leading to separate Exchange of Note (E/N) into that of Detailed Design Study (D/D) and that of construction works. During D/D it is essential that works borne by Egypt including transfer of current activities, withdrawal of the existing facilities and land leveling of the Project site, should be finished. The construction works will start after completion of the works borne by Egypt.

2-2-2 Basic Design

2-2-2-1 Design of Ground and Layout of Facilities

(1) Design on the Composition of Required Facilities

Plan-1: Treatment of the Existing Facilities

Most of the existing buildings in the Project site are becoming too old and their flow lines are complicatedly crossed, making the proper activity plan of Damanhour Agricultural Mechanization Center (DAMC) difficult. To solve this inconvenience, it is necessary to remove all facilities in the site except for fuel station that can be used as it is. The works of removal of such existing facilities and clearing and leveling of the ground of the site are responsible for the Egyptian side.

Plan-2: Composition on Lay-out of the Site Ground

Judging from the limitation of available areas of the site for the planned facilities and from the irregular shape thereof, it is planned that the southern side where a square area can be secured will be used for the area allotted to farm machinery (function of hiring service + that of maintenance/repair), while the northern side where only limited areas and shape of ground is available will be used for the area allotted to personnel (function of training + hiring service + others). Two parts of entrance/exit will be provided in the front of staff area and farm machinery area for preventing accidents. Thereby it is secured the smooth flow lines trailed by personnel and farm machinery with the common functions (see Fig. 2-1).

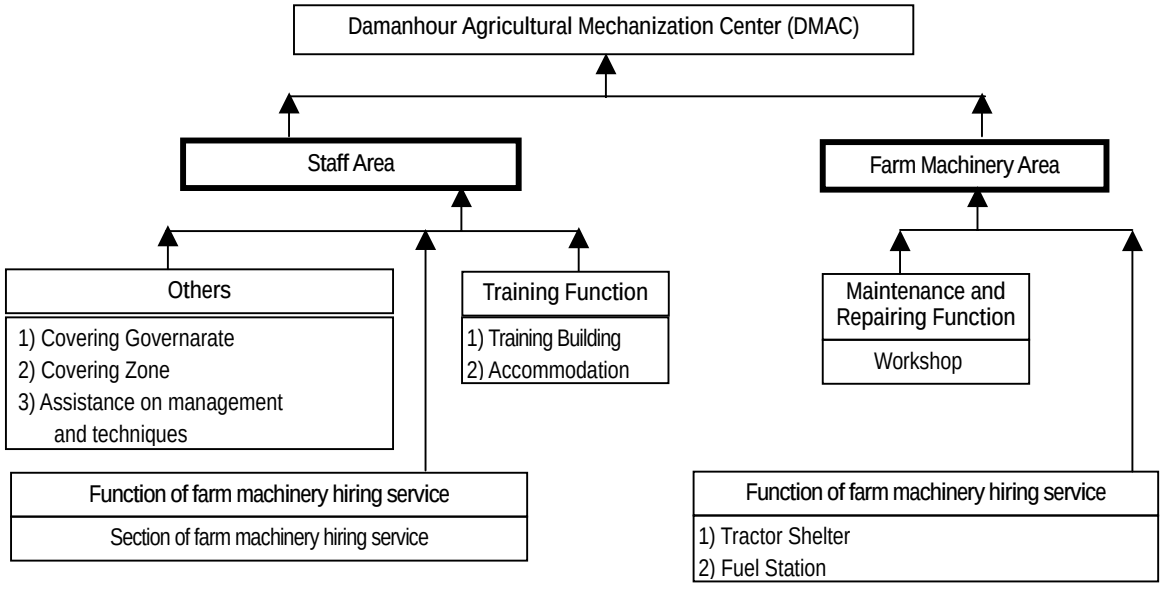


Fig. 2-1 Composition on Layout of the Site of DAMC

Plan-3: Foundation of Architectural Facilities

The buildings will be two-story ones constructed with spread foundation based on the site condition with the load bearing capacity of 8t / m^2. Form of buildings will be simple and standard one.

(2) Major Components of the Required Facilities

It is examined that the parts of facilities will be able to commonly used depending on functions and activities, based on the Basic Policy and plan-1 to plan-3 (page 2-4). Major components of the facilities are determined and shown in Table 2-5.

Table 2-5 Major Components of the Facilities

Major Components	Usage / principal equipment etc.
Workshop Building (Farm Machinery Area)	
Farm machinery repairing bay	・ To be used as the area for repairing and maintenance of farm machinery held jointly by central workshop (Cwo) and farm machinery hiring service sector (HS) ・ As equipment, repairing space for accommodating 8 tractors and machine shop/ processing and welding area are provided. One overhead crane covers the entire area
Farm machinery repairing room	・ To be used as rooms needed for particular repairing, fuel injection pump test room, engine repairing room and repainting room are provided ・ A warehouse for storing parts and tools for maintaining farm machinery owned by this center under the control of (HS), and that for storing parts of farm machinery is provided for medium-extent repairing in 10 HS controlled by (GA)
Workshop management room	・ (Cwo): To be used for farm machinery repairing sector of 19 stations in 3 Counties ・ Providing space of office works of (Cwo) and locker room for mechanic engineers
	・ (HS): To be used for maintenance of farm machinery owned by this center ・ Providing space of office works of (HS) and locker room for mechanic engineers
Training Building (Staff Area)	
Lecture room	・ To be served as lecture room, audio-visual room and meeting hall for trainees ・ Layout for the type of teaching room and round table type desk arrangement is based on meter standard adopted by Egypt ・ Carrying in and out of equipment, desks etc. are required owing to alteration of usage. Audio-visual equipment, training equipment, furniture etc. are stored in warehouse for audio-visual equipment and go-down for linen and utensils
Group discussion room	・ Group discussion room used in parallel with training courses is laid adjacent to lecture room and also used as meeting room. ・ 3 groups are anticipated in the discussions in this room ・ Mobile compartment screens are provided to cope with variable usages as grouping of discussions and also as meeting purpose
Staying dormitory	・ To be used as accommodating 20 trainees and 5 instructors for overnight staying ・ As staying room for instructors, 2 rooms, one accommodating 2 instructors and another 3 are provided ・ As dormitory for trainees, 2 rooms for accommodating 4 trainees and 2 others for accommodating 6 trainees are provided, thus coping with difference of the class-level of trainees ・ From crime and disaster preventing point of view, it'll be accustomed to lock the gate separating dormitory area from training area at night though procuring two ways of emergency evacuation by emergency unlocking etc.
Dining hall and kitchen	・ Dining hall and kitchen are used for lodging of training instructors and trainees, the former also used as chatting corners
Training center staff room	・ To be served for use of staff of training center (TC) and for preparation of training
Staff Building (Staff Area)	
Staff room	・ To be provided for the space of activities by the staff of (CA) in charge of technical assistance in 3 counties ・ An office room for the director of county directly belonging to AMS
	・ To be provided for the space of activities by the staff of (GA) in charge of technical assistance in 10 HS in Beheire Governorate
	・ To be provided for the space of activities by the staff of (HS) in this station
Tractor Shelter (Farm Machinery Area)	
Tractor shelter	・ To be used as storing space for rental hiring farm machinery, tractors combines and implements
Adjunct Facility (Farm Machinery Area / Staff Area)	
Guard house, fuel station, electricity distributor's room, connecting corridor etc.	・ To be provided as an appurtenant facility of this center controlled by (HS), consisting of Guard house, fueling space for car-wash, fuel station and maintenance works of farm machinery, electricity control room for servicing and distributing electricity and a connecting corridor connecting technical staff building with training building. In this regard, existing fuel tank and eaves (measuring gauges) are utilized as they are.

Note: CA: Central Administration, GA: General Administration, TC: Training Center, HS: Hiring Service, Cwo: Central Workshop.

2-2-2-2 Building Plan

(1) The Site Plan/Floor Plan

Plan-1: Determination of the Size of Each Facility and Scale of the Rooms

The size of each facility and scale of the rooms will be relevantly determined in due consideration of the contents of activities in the center of the Project, the norm with regard to the architectural standards in Egypt (Egyptian code, Ministry of Housing, Utilities and Urban Communities), basic modules related to fittings / fixtures, customs, required surface areas and a required width of passages, number of users, types of utilization, especially spaces for human activities and flow-lines, space for maintenance and storage of farm machinery, layout of furniture and equipment.

Plan-2: Determination of the Scale of the Workshop Building

Layouts of space for repairing farm machinery and spare parts storage in the workshop building, will be designed, considering space for working on stored equipment and flow lines there. Here standards on facilities and installation of equipment in Japan (maintenance standard for farm machinery, public vocational training facilities) will be referred to. Main parts of the workshop consist of repairing bay, machinery shop, room for repairing and tests as well as warehouse, for which suitable surface areas are calculated and summed up. These areas are estimated at 630 m^2 of repairing bay + machinery-shop, 300m^2 of room for repairing and tests + 150m^2 of storage = 1,080m^2 (Details in Appendix 5-10 “Determination of the Scale of Workshop Building”).

Plan-3: Determination of the Scale of the Training Building

Training building consists of a lecture room, group discussion rooms, a store of audio-visual equipment and habitable space including a lodging facility and a dining hall. Based on the design policy by function, in this Project, the scale of the building is determined so as to accommodate 20 trainees, 5 instructors and 20 staff belonging to the training center. The scale of lodging facility will be determined in comparison with the use of other existing training centers and the room number will commensurate with that of trainees. Results are shown in Table 2-6 “Scale of the lodging facility” and Table 2-7 “Scale of rooms in lodging facility”, respectively.

Table 2-6 Size of Lodging Facilities (comparison with other centers)

Item / Size		Sinbellawein AMC*	Sakha AMC	Maamoura AMC	The scale adopted for this Plan
1. Year of Establishment		1987	1963	1965	-
2. Building		* Made of RC, built as 2F building, part of management floor * Converted from a meeting room: 13 beds, Converted from a meeting room: 10 beds * Controlled by AMS	* Made of RC, built as 3F building * Lodging facility taken over from MALR * Controlled by AMS	* Made of RC, built as 3F building * Accommodation of 150 trainees per day is possible * Controlled by MALR	* Made of RC, built as 2F building
3. Size of rooms					
(1) Large room	10-13 persons, joint use for T/S	5.3 m^2 / lodging person, no shower	none	None	Not adopted.
(2) Middle room	6 persons/room, joint use for T/S	None	none	None	5.0 m^2 / lodging person
	4 persons/room, joint use for T/S	None	none	None	6.0 m^2 / lodging person
(3) Small room	3 persons, with toilet and shower	None	8.35 m^2 / lodging person	8.85 m^2 / lodging person	8.0 m^2 / person (for instructors)
	3 persons, joint use for T/S	None	6.67 m^2 / lodging person	none(equivalent to 7.08 m^2 / person)	Not adopted.
	2 persons, with toilet and shower	None	none	11.0 m^2 / lodging person	10.0 m^2 / person (for instructors)
	2 persons, joint use for T/S	None	none	none (equivalent to 9.27 m^2 / person)	Not adopted.
	1 person, with toilet and shower	None	none	21.0 m^2 ~ 30.40 m^2 / lodging person	Not adopted.
	1 person, joint use for T/S	None	none	15.65 m^2 - 25.15 m^2 / lodging person	Not adopted.
4. Current situation		1. Talking voices and snoring are heard around here and there. Claim arising for failure of agreeable sleeping at night. 2. No place is available for washing cloths. 3. Too few toilets (only 2). Conventional shower is available, but numbers limited. 4. No measures taken for trainees' grades.	1. Though the facility has become too old, no complaint has been heard. 2. Room numbers are enough to adopt treatment of trainees by their grade. 3. Toilets and showers are fully equipped.	1. Though the facility is old, many rooms exist, so no complaint has been heard. 2. Many single rooms are equipped, and used for accommodating instructors. 3. Room numbers are enough to adopt treatment of trainees by their grades.	Reasons for adopting: 1. Large rooms cannot cope with trainees' grades, complaints from trainees are feared as experienced in other centers. 2. However, smaller rooms are not cost effective for trainees. 3. Hence, small rooms are used for instructors, while middle ones provided for trainees. 4. Adopting each room the minimum space.

Note: AMC=Agricultural Mechanization Center, T/S= toilet and shower booth

Remarks: At existing training center, staff grade is determined based on his/her experience. Usually, room is allocated corresponding to the staff grade.

Table 2-7 Comparison of Room Sizes for Lodging Facility Building

Item		Sub-item	First alternative		Second alternative		Third alternative (adopted for this Plan)	
			Small room (room-layout in the reference of the third basic principle conference		Large room		Middle room and small one	
I. Standard								
1	Target trainees		20 trainees and 5 instructors		20 trainees and 5 instructors		20 trainees and 5 instructors	
2		Number of rooms	1F: 1 room for 2-person, 1 room for 3-person (instructors) 2F: 1 room for 2-person x 4 rooms, 1 rooms for 3-person x 4 rooms (trainees)		1F: 1 room for 2-person, 1 room for 3-person (instructors) 2fF: 1 room for 20, maximum 1~2 large rooms (trainees)		1F: 1 room for 2-person, 1 room for 3-person (instructors) 2F: 1 room for 4-persons, x 2 rooms, 1 room for 6-person x 2 rooms (trainees)	
3		Toilet / shower booth	* Install each 3-person rooms (total 5rooms) * For 2-person's rooms (total 5rooms) install in 1 booth; for other 4 rooms 1 booth is jointly used by 2 rooms.		Toilet / shower booth is not equipped in each room, but jointly utilized.		Toilet / shower booth is not equipped in each room, but jointly utilized.	
II. Comparison								
	Item		Contents of examination		Contents of examination		Contents of examination	
1	Target trainees	Egyptian society / custom Occupation levels are graded according to experienced years and based on this rule boarding rooms are determined & allotted.	* The planned size can correspond to the grade levels of instructors and trainees	◎	* Room for instructors can be provided. * This cannot cope with the proper treatment for occupation grades.	△	* By employing rooms accommodating 4-6 persons, treatment for grades to a certain extent be met.	○
2	Environ-ment	Comfort	* Comfort can be kept with rooms for fewer persons. * Problems inducing complaints in other centers such as talking voices and snoring at night will be mitigated. * Electing a room master will help keeping good living environment that also helps lodgers follow discipline and rules.	◎	* Problems would likely arise as other center from talking voice and snoring at night. * Due to many persons in a room, rules are difficult to be observed. * Agreeability can hardly meet living environment for concentrated training.	△	* By adopting middle sized rooms, considerable comfort can be maintained.. * Such complaints as heard in other centers may be alleviated. * It will be easier to keep rules by electing a room master.	○
3	Difference between architecture / equipment		(1) Building (only lodging is concerned): small rooms with 2-3 persons, taking as a base of comparing price. (2) Equipment (ditto): toilet / shower attached to small rooms, 7 in total, taken as a base of comparing price.		(1) Building (only lodging is concerned): 1 or 2 large room; cost lowered than the first alternative. (2) Equipment (ditto): toilet / shower are jointly served; cost lowered than the first alternative		(1) Building (only lodging is concerned): 4-6 middle sized room; cost lowered than the first alternative (2) Equipment (ditto): toilet / shower are jointly served; cost lowered than the first alternative	
4	Construction cost		Price comparison: taken as a base comparison	△	Price comparison: a little bit cheaper than the third alternative	○	Price comparison: cost lowered than the first alternative	○
5	Operation and Maintenance		Owing to too many rooms, O&M cost is high.	×	O&M cost is comparatively lower	○	No substantial difference with the 2nd alternative	○
Result of Comparison			△		△		○	

Plan-4: Determination of the Scale of the Office Rooms

As regards the scale of office rooms common to each facility, unit space per person is designed considering contents of office works and a staffing plan derived from the Project plan. Unit size per person to be adopted is based on the standard unit space as summarized in Table 2-8 according to the contents described in Plan-1 (page 2-12).

Table 2-8 Standard Area of Office Rooms

Officer's grade (number of staff)	**Standard scale to be adopted**		**Reference value by a reference[1]**	**Reference value by RI of JAA[2]**	**Estimation Standard of office space of M G A[3] (incl. correction value)[4]**
General staff class (73 staff)	6m^2 / person	The space is provided to allow to align desk and chair to the same direction	8.5m^2/person - 11.5 m^2 / person	6.1m^2/person (layout area at the same direction)	7.5m^2 / person
Section-chief class (4 staff)	8m^2/ person	They are accommodated in the same room as for general staff	10.5m^2 / person - 12.5 m^2 / person	8m^2 / person - 15 m^2 / person	12m^2 / person
Director, general director class (5)	20m^2/ person	They are accommodated in the same room as for general staff, but procures space to meet and talk with the visitors	22m^2 / person - 29 m^2 / person	20m^2 /person - 33 m^2 / person	25.5m^2/ person
Governorate director class (1)	30m^2/ person	The space is reserved for the purpose of meeting and talking with the directors of each sector and visitors during office works	34m^2 / person – 54 m^2 / person	30m^2/person - 60 m^2 / person	43.5m^2/ person
General staff class in charge of itinerant guidance (39 staff)	4m^2/ person	For the staff who have out-of–office duty or works outside the building, the rate of stay is set at 50% (6m^2 / person), procuring storage space for privately held documents, fixtures etc.	5.7m^2 / person - 7.0 m^2 / person		
Operators and maintenance staff (82 staff)	1m^2/ person	Including tractor operators and maintenance staff for farm machinery, reserving space of 1 compartment per person to lockers to be installed			

Note: [1]; Shin-Kenchikugaku-Taikei (new architectural encyclopedia), [2]; Reference Inventory of Nihon Kenchikugakkai Shiryou Shuusei (Japan Architectonics Assembly), [3]; Ministry of General Administration, Government of Japan.

Note: [4]; A correction value of 3 m^2/staff (the difference between the standard correction value of 7 m^2/staff and the area of adjunct facilities such as a conference room and water sections which are already included in the design contents) was added to 4.5 m^2/staff.

Plan-5: Comparison of Structural Compositions for Training and Staff Building

About the training and staff building in the Staff Area, considering that the area is rectangular and limited, load bearing capacity of the site and cost reduction for the Project, comparison alternative of structural compositions for training and staff building was made. Separate building with 2-story is finally determined as the most suitable type for the design plan and cost reduction. These comparison contents are referred to the following Table 2-9.

Table 2-9 Comparison of Structural Compositions for Training and Staff Buildings

Item of alternatives		Single building								Two buildings (Adopted for this Plan)	
		2-story: straight alignment		2-story: square alignment		2-story: 3-faced alignment		3 - 4-story building		2-story: separate buildings	
Outline		The facility is linearly laid out, placing the main entrance at the center so that building function can be divided into two parts.		In compliance with Egyptian construction standard, placing a yard in order to securing lighting and ventilation of the rooms.		In compliance with Egyptian construction standard, placing a yard in order to securing lighting and ventilation of the rooms.		3 or 4-story building is designed to place training function and technical assistance function.		2 buildings are laid in parallel to make users' movement easier, where group discussion room and lecture room can be used as meeting room staff building, functionally the same as a single building.	
1	Design plan 1) Path of flow	Much limitation is resulted from the necessity of needing linear-shaped space, leading to crossing of path of flow within the site	×	Facility can be made compact and flow-lines of farm machinery and users can be separated	○	Facility can be made compact and flow-lines of farm machinery and users can be separated	○	Facility can be made compact and flow-lines of farm machinery and users can be separated	○	Facility can be made compact and flow-lines of farm machinery and users can be separated	○
	2) Fuel station	Since space area is limited, it's necessary to shift current station.	×	The existing fuel station can be used as it is.	○	The existing fuel station can be used as it is.	○	The existing fuel station can be used as it is.	○	The existing fuel station can be used as it is.	○
	3) Load bearing capacity etc.	The building can be constructed with direct foundation.	○	The building can be constructed with direct foundation.	○	The building can be constructed with direct foundation.	○	Needing sheet-pile footing due to low load bearing capacity and insufficient supplying water pressure arises need to provide tower of cistern.	×	The building can be constructed with direct foundation.	○
2	O/M, management	・ Both training and technical assistance functions with different service time sequence can be planned by block and O/M like electric source control is easier. ・ Facility lies in long space leading to longer time to user's shift.	△	・ Since the corridor is connected in a closed type, technical assistance function cannot be separated from training function thus O/M like electric source control becomes inconvenient.	×	・ Both training and technical assistance functions with different service time sequence can be planned by block and O/M like electric source control is easier.	△	・ Since the corridor is connected in a closed type, technical assistance function cannot be separated from training function thus O/M like electric source control becomes inconvenient.	×	・ Both training and technical assistance functions with different service time sequence can be planned by block and O/M like electric source control is easier.	○
3	O/M cost	・ Lodging rooms tends to be laid at the western side with intense sunshine, resulting in higher running cost of air conditioning.	×	・ Because the building is laid on the South-North direction of the yard, sunshine from the western to the eastern side of the building can be interrupted, reducing running cost of air conditioning.	○	・ Because the building is laid on the South-North direction of the yard, sunshine from the west to the eastern side of the building can be insulated, reducing running cost of air conditioning.	○	・ Lodging rooms tends to be laid at the western side with intense sunshine, resulting in higher running cost of air conditioning..	×	・ Because the building is laid on the South-North direction of the yard, sunshine from the western to the eastern side of the building can be insulated, reducing running cost of air conditioning.	○
4	Major factor of construction cost	・ Facility area: decreasing ・ Exterior wall area: decreasing ・ Shifting fuel station: increasing	×	・ Facility area: increasing ・ Exterior wall area: increasing	△	・ Facility area: increasing ・ Exterior wall area: increasing	△	・ Facility area: decreasing ・ Exterior wall area: decreasing ・ Footing works#: increasing ・ Over-roof sealing: decreasing ・ Tower water tank: increasing	×	・ Base alternative for comparison (Footing type is direct footing)	○
	Estimated rough construction cost *	Construction works**: increasing Equipment works: increasing Total: increasing		Construction works**: increasing Equipment works: decreasing Total: increasing		Construction works**: increasing Equipment works: decreasing Total: increasing		Construction works**: increasing Equipment works: increasing Total: increasing		Construction works**: standard Equipment works: standard Total: standard	
Integral Evaluation		×		△		△		×		○	

Note: * = Increase or decrease in the case of taking alternative of two building as standard; **= Including cost of replacing fuel station; # = sheet-pile footing

Plan-6: Determination of the Scale of Tractor Shelter

The tractor shelter is designed with column-less roofed space by both sides cantilever where the optimum shelter layout shall be examined by size and by type of farm machinery without adhering to division of span, and the scale will be calculated from the total width required for each type of farm machinery. The designed total width is calculated as below at 187m. The length of one side of the shelter roof will be 7 m and total 14m (7 m×2). The total width is so long that it will be divided into two procuring flow-lines and in consideration with the shape of available space for construction.

The total of each width is calculated based on the average width of each of the existing machinery + 0.6m, as well on the quantity of machinery:

- For tractors: 2.67 m / machinery × 17 machinery = 45.4m
- For combines 2.57m / machinery × 11 machinery = 28.3m
- For implement 1.99m/machinery × 57 machinery = 113.4m

in total: 187.1m

From the above calculation, the width of the shelter is determined as 187m (38.5m x 2 + 55m x 2). As well, the length thereof is determined at 7m since the length of farm machinery is about 6m at maximum. Length of both sides cantilever is total 14m.

Plan-7: Room, Staff and Standard Floor Area for Person

Based on the staff number determining the scale of the facilities (Basic Policy) and Plan-1 to Plan-6, standard areas of the main facilities and floor areas of each building were determined as Table 2-10.

Table 2-10 Room, Staff and Standard Floor Area per Person

Workshop Building (floor area: 1,505 m^2) Floor area is roughly estimated. Exclude attached facilities.

Name of room	Number of staff and others	Standard area (m^2)
Farm Machinery Service Division, O/M section		
Room of maintenance section	1 section chief, 4 general staff	32
Locker room	11 machinery maintenance staff	11
Store for tools and parts (for farm machinery hiring service division)	Equivalent to existing part store of farm machinery hiring service division and storage space for tools	60
Central Workshop (Cwo), Farm machinery repair bay is commonly used by GA and by HS		
Room of central workshop	1 division chief, 11 general staff	86
Locker room	36 machinery maintenance staff	36
Repair bay	Flow-lines and layout based on the design standard of farm machinery maintenance workshops	810
Fuel injection testing room		32
Engine repair room		50
Painting room		30
Store for parts (for other 9 stations: (GA)	Equivalent to the total area for store of Cwo as dispersed over the existing 3 locations	90

Training Building (floor area: 960 m^2)

Training Center		
Room for training center	1 division chief, 19 general staff	134
Preparation room	Resting room for external instructors & provision of lecturing material / data	28
1 lodging room (3 persons/room)	Room for instructors with toilet/shower	10
1 lodging room (2 persons/room)	Room for instructors with toilet /shower	24
2 lodging rooms (4 persons/room)	Rooms for trainees	20
2 lodging rooms (6 persons/room	Rooms for trainees	32
Dining hall	For 25 persons including trainees and instructors	56
Kitchen	Equivalent to 50% of the area of dining hall	25
Storeroom for food	Equivalent to 20% of the area of dining hall	12
Lecture room	Lecture room for 20 seated trainees	80
Group discussion rooms (1)	Used for discussions and meetings	24
Group discussion rooms (2)	Used for discussions and meetings	24
Group discussion rooms (3)	Used for discussions and meetings	24
Store of audio-visual equipment	Storage space for audio-visual equipment	16
Bed room (3 persons) × 6	For accommodation of 3 trainees, with toilet/shower	24/rooms
Bed room (3 persons) × 6	For accommodation of trainees and instructors, with a set of toilet/shower per 2 rooms	16/rooms
Store for linen and utensils	Go-down for linen but also for furniture storage when layout is altered for lecture room and group discussion rooms	32

Staff Building (floor area: 864 m^2)

Farm Machinery Hiring Service Division (HS)		
Room for farm machinery hiring service	1 division chief, 3 section chiefs, 21 general staff and 14 general staff (in charge of follow-up)	226
Locker room for operators	35 operators	35
Central Administration (CA)		
Central Administration director's room	1 CA director	30
Central Administration division's room	1 superintendent division chief, 6 general staff, and 5 general staff (in charge of itinerant circuit instruction)	76
General Administration (GA)		
General Administration division's room	1 superintendent division chief, 12 general staff, and 20 general staff (in charge of itinerant circuit instruction)	172

Tractor Shelter (floor area: 1,326 m^2)

Tractor Shelter	Storage space for tractors, combines, implements etc.	1,310

(2) Section Plan

1) Training building and Staff building: The story height of habitable rooms is designed to keep 2,700mm under the beam, giving a well-ventilated section.
2) Workshop building: The story height of repairing bay must keep the lifting height of the overhead crane, 5,000mm, making the inner space column-less. While the management sector that does not need higher story height is designed as 2-story.
3) Tractor shelter: By creating column-less space for tractors with straightly aligned independent row of columns, both sides of which are supported with cantilevers with braces, a space is provided where farm machinery is efficiently sheltered. 4,000mm height is kept from joint part between braces and columns to enable to shelter large-scale farm machinery.

(3) Structure Plan

1) Dead load: Actual load of structure materials and finishing materials will be counted.
2) Live load: Live loads by usage by Japanese law of architectural standard are adopted as the basis. As regards loads for the secondary materials, though a part of the load values listed in Egyptian code is adopted, Japanese values are employed for load of suspended structure and load against earthquakes.
3) Wind load: Referring to the wind load in Damanhour area by Egyptian code, 0.8 kN/m^2 is adopted.
4) Seismic load: C0 = 0.1 is adopted according to Japanese calculation standard for building structure.

(4) Facilities Plan

1) Electricity

   A power receiving room will be established inside the site. Stand-by generator for emergency use will not be installed. Illumination, switches and other equipment, circuit codes and electric storage type water boiler will be procured at local markets. The primary side electricity servicing works and the cost of transformer should be borne by the Egyptian side.

2) Water supply facility

   Water is supplied from the municipal water pipe running along the front road of the site through branching into the site by direct pressure. Equipment for water supply such as water taps and distribution pipes is procured at local markets

3) Rainwater drainage facility

   As the existing state, rainwater is drained by natural percolation within the site.

4) Drainage of sewage

   Living drainage and sewage from the facilities will be conveyed with a pipe drainage system by separating the origins into the terminal drainage tanks inside the site. Then, sewage can be evacuated out of the site by dipping it up as practiced by the existing facilities. Connection of the

system with the sewage line to be newly laid down in the future is also considered. During Detailed Design Study, the plan will be confirmed and if it has not been sealed yet till then, only dip-up-evacuation method will be deployed.

5) Hygiene facility

The same water flushing type of the toilet is employed as the existing ones, where kits for rinsing the private part after using toilet will be also installed as a religious consideration, too.

6) Air conditioning facility

Since air-conditioning is necessary during summer, air-conditioning equipment will be installed in the required rooms by procuring at local suppliers. Mechanical ventilation will be installed in dining hall.

7) Fire extinguishing facility

Fire extinguishing facility will be installed under the Egyptian standard of firefighting. Facilities to be employed is outside fire hydrants and fire alarm boxes, inside fire hydrants in the buildings of the Staff Area as well as self-actuated fire extinguishers in the power receiving room, various types of fire extinguishers and escape route signs in every facility, if required. The Egyptian side will bear the cost and works for self-actuated fire extinguishers, fire extinguishers, and escape route signs.

(7) Plan of Construction Materials

After reviewing the use in the similar existing centers, climatic conditions in the Project site, state of material procurement in Egypt, major finishing materials to be used are determined as shown in Table 2-11 and Table 2-12. They can be procured locally in principle.

Table 2-11 Major Exterior Finishing

Building	Roof	Exterior wall	Fittings
Training building, Technical staff building	Asphalt water-proof	Concrete mortar smoothing iron, Concrete block, mortar smoothing iron, spray painting, partly brick printed tile	steel-made fittings, aluminum fittings, transparent glass
Workshop building	Heat-insulated material sandwiched panel	Heat-insulation material sandwiched panel	Steel-made fittings, aluminum fittings, transparent glass
Tractor shelter	Steel-made roof		

Table 2-12 Major Interior Finishing

Building	Floor	Baseboard	Interior wall	Ceiling	Fittings
Technical staff building, Training building	Terrazzo tile	Terrazzo tile	Mortar smoothing iron, Mortar smoothing iron painted	Mortar smoothing iron, Mortar smoothing iron painted with paint	Wooden fittings, aluminum fittings
Workshop building	Concrete smoothing iron, terrazzo tile	Mortar smoothing iron, Mortar smoothing iron painted	Exterior wall material exposed, iron part is painted, Plaster board painted	Roofing material exposed, iron part is painted, Plaster board painted	Steel fittings, aluminum fittings, Wooden fittings, aluminum fittings

2-2-2-3 Equipment Plan

(1) Overall Equipment Plan

Equipment to be procured in the Project is the prerequisite one for AMC equipped with three major functions (training, repair and hiring services of farm machinery). Based on the design policy (page 2-3), the Project components are limited to the equipment for the Project target of establishment of promoting agricultural mechanization. Considering the activities of similar centers, characteristics of target area, and management and O&M of the Center to be established, the plans are as follows:

<Equipment for Training>

Plan-1. For training of maintenance practices, equipment for the workshop will be used and workshop equipment for specialized training is excluded from the Grant Aid element.

Plan-2. Cutaway-model including those of the engine is included in the Grant Aid element because it is necessary for quick understanding of the mechanical structures with its visual effect.

Plan-3. Whereas software for educational purpose is excluded from the Grant Aid element because the existing textbooks are available in AMS, only the minimum required training equipment is included therein.

<Equipment for Workshop>

Plan-1. Items and quantities are determined not to interfere a flow of works in the workshop. Procurement of general hand tools, conventional measuring tools, work desks, store-cabinets etc. are to be excluded from the Grant Aid element and borne by the Egyptian side.

Plan-2. Equipment for exclusively regenerating engines is excluded from the Grant Aid since the frequency of use is low.

Plan-3. As for the maintenance related to fuel injection pump, equipment for test / adjustment (including testing stand of fuel injection pumps and its attachment, nozzle tester etc.) is included in the Grant Aid element.

Plan-4. Milling machines are included in the Grant Aid considering the purpose of coping with manufacturing parts to be fit to the ready-made parts.

Plan-5. As for forklifts, the minimum out of the required numbers are included in the Grant Aid element considering that they are used in the central workshop and outdoor as well.

Plan-6. Mobile workshops are included in the Grant Aid element because the target area is vast and high frequency of troubles of farm machinery takes place amidst farmers' plots.

<Other Equipment>

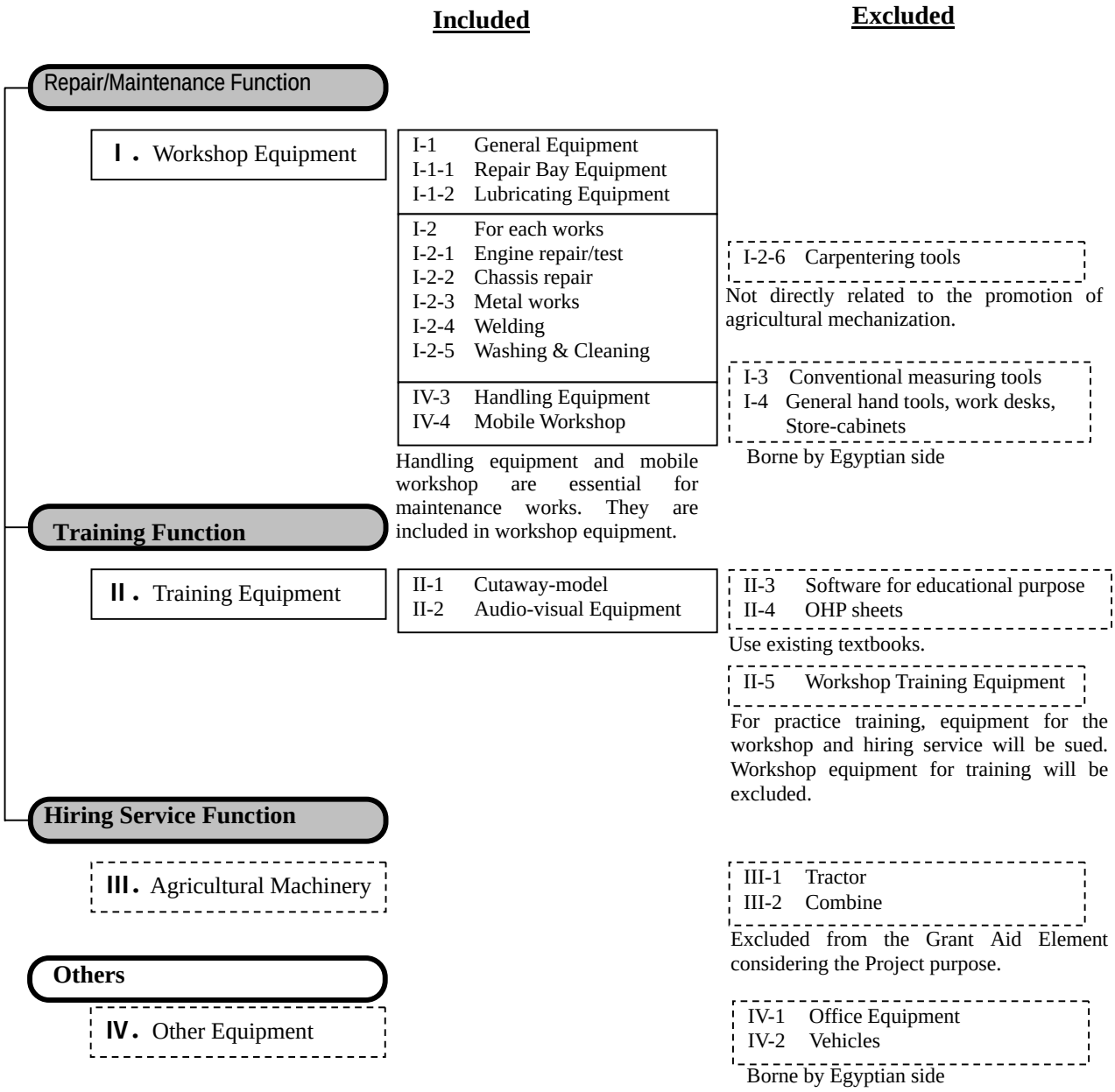
Plan-1. Office appliances are to be borne by the Egyptian side in the light of current status of the existing similar centers where external orders are commonly utilized.

Plan-2. Station wagons and pick-up tracks for itinerant circuit around hiring stations are excluded and borne by the Egyptian side, considering their generality that may not fulfill the original purpose. Microbuses for training will be excluded from the Grant Aid element because alternative transportation such as rental vehicles or use of public traffic systems is available.

(2) Equipment Plan

1) Examination on the Composition of Equipment Items

The requested equipment list consists of various types of equipment ranging multidisciplinary fields, in addition duplication is observed among the fields. After carefully examining the original purposes of their use by function, the equipment was categorized as shown in Fig. 2-2, based on the above mentioned overall equipment plan (page 2-21).



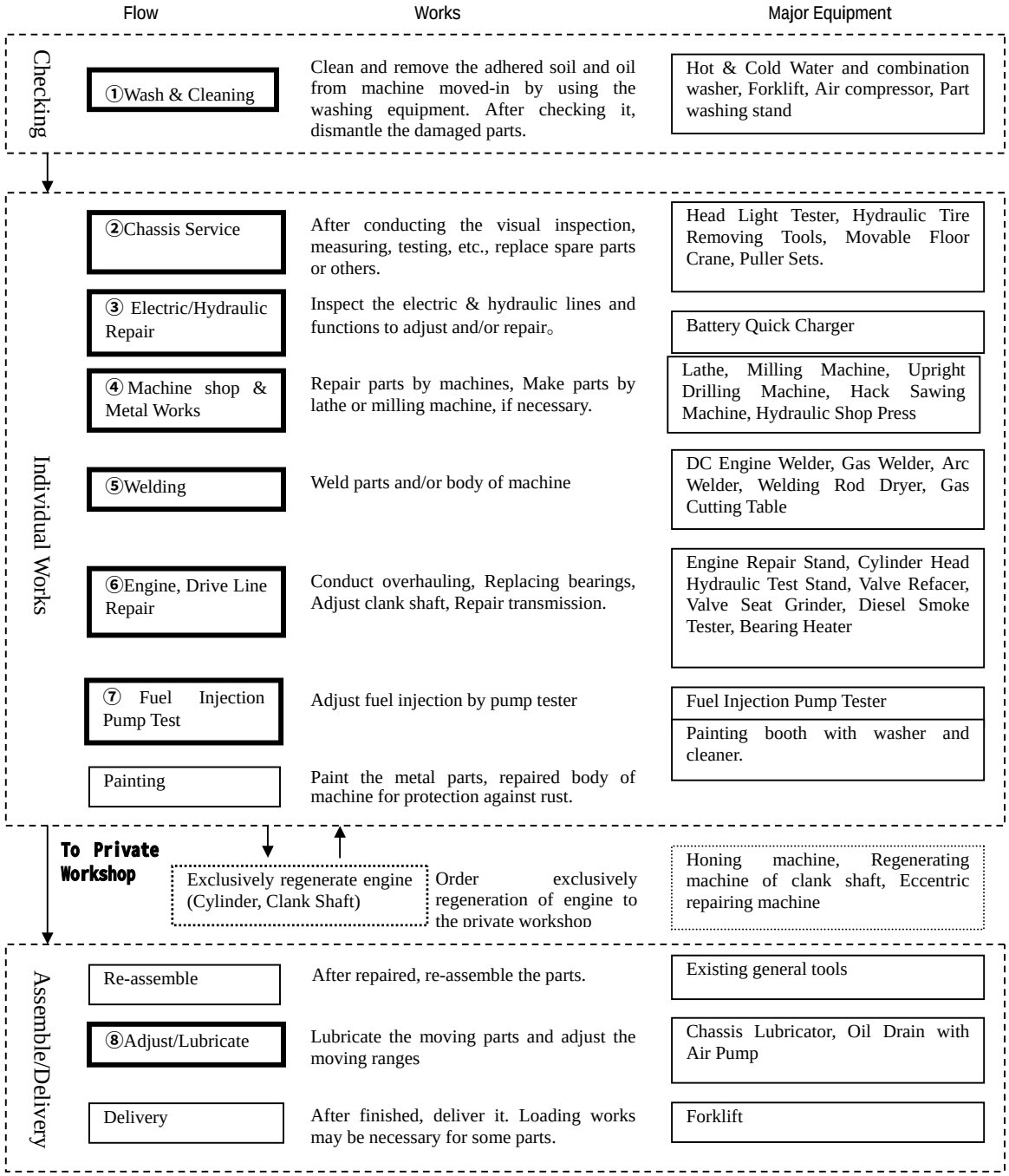
Note: Numbers in Figure are as the same ones as of the requested equipment list, not correspond to ones of Equipment List for the Project.

Figure 2-2 Equipment by Category

2) Equipment Plan for the Workshop

① Flow of the Works in the Workshop

As to equipment for the workshop, its work contents are closely linked with items and types of equipment. As shown in Fig.2-3, examination was made on the contents of works by item, major equipment items to be used, composition of technical staff in charge of the workshop etc. including those ordered to private maintenance workshops.



Note: Numbers in the flow column is correspond to those of Table 2-14 “Outline of Major Equipment”

Figure 2-3 Flow of Workshop Works

② Classification by Equipment Type

To determine the number of equipment or the workshop, requirements were firstly identified and then demand in units of equipment (as a guide) was examined (Table 2-13).

Table 2-13 Classification by Equipment Type

Requirement	Demand in units	Major equipment	Remarks
Equipment of the workshop to be planned minimum extent of quantities by joint use:	1	lathe, milling machine, electric hack-saw, upright drilling machine	jointly utilized among workshop and other sector
Equipment quantity of which should be minimized mainly by cost-saving reason, including machine tools	1	DC engine welder	The same as above, also used in mobile workshop.
Equipment of the workshop essential for inspecting maintenance and repair: Test machines and measuring kits etc. used for large scale repair and overhauling at the central workshop, mobile workshop, forklift	1	Test fuel injection pump, valve abrasive equipment, valve testing & repairing equipment, toe-in adjustment equipment	Though these are essential equipment, they are not necessarily used regularly. Therefore, only one set is considered enough to meet the requirement
	1 2	Forklift Mobile workshop	1 vehicle is to cover overall purposes except for mobile workshop
Teaching material for training: Cutaway-models for display	1 for each	Cutaway-model for training (diesel engine), Slide Projector, OHP /screen	As a rule only one set to be procured for training (such as OHP etc.)
Equipment with higher frequency of use: Equipment of which much quantities are required because more than one mechanical engineers simultaneously use them for such works as the occasion of working site and working procedure in the workshop, or of disassembling and inspecting woks for farm machinery at the start of off-season of farming	Certain	Jacks, fixed racks, parts cleaner, air compressors, drilling machine, welder, gas welding set, electric charger, thickness gauges, pitch gauges, compressing tester	The quantity will be determined considering the process of each work and number of staff (accounting also of utilization of the existing / available equipment)
Other supplemental equipment and accessories dependent on the above listed quantities	Certain	Sling kits, tools and bits, air compressor hoses	The quantity will be determined regarding equipment related and process of each work

3) Equipment Required for Other Functions

There are training and hiring service of farm machinery as separated functions. Only equipment used in a lecture room for the training function will be selected as the equipment for the Project.

4) Outline of Major Equipment Items Included in the Grant Aid Element

From the results of the above examination, the following factors were reflected: activities, utilities/equipment of other similar facilities, conditions of existing equipment (extent of obsolescence, specifications, capacity); actual status, work contents, ability, and multi-purpose usage of neighboring private workshops, and the general descriptions of equipment are designed for the Project. Planned outline and quantities of the major equipment are listed in Table 2-14.

Table 2-14 Outline of Major Equipment

No. of work flow	Equipment (Equip't list No.)	General description	Multi-purpose usage	Other Centers	Quantity
① Accepting for repairing & Cleaning	Hot & Cold Water and Steam Combination Washer (108)	Hot & cold water and steam combination washing before repairing. Remove oil and dust. 1) Specifications: Hot/cold water pressure 140kgf/ cm2 Discharge 890 lit/hr Steam temp.: approx. 135℃ 2) Place：Repair bay; 1unit、Car wash area; 1unit	none	Sinbellawein：4 units	2 units
	Air compressor (1, 50, 65, 111)	Supply compressed air for using repair tools and painting tools. 1) Specifications 1: High pressure14kgf/ cm^2 730 lit/min Specifications 2: Medium pressure 9.5kgf/ cm^2、600 lit/min Specifications 3: Low pressure 7kgf/ cm^2 440 lit/min 2) Place : Repair bay; high 1unit、medium 1unit, Engine repair room; low 1unit, Painting room; low 1unit	None	Sinbellawein: 4 units (2 units supplied by Japanese Grant Aid) Sakha: 5 units	3 kinds 4 units
	Parts Washing Stand (109)	Remove oil, grease, dust and other immature from parts. 1) Specifications: 20 lit/min, Tank capa.: 90 lit. 2) Place: Repair bay and machine shop 1unit, Engine repair room 1unit	None	Sinbellawein: 1 unit (under repair)	2 units
②Chasse, Body Repairing	Head Light Tester (54)	Tester for candela and light angle. 1) Specifications: 1,000～120,000 candela 2) Place: Repair bay	none	Sinbellawein: 1 unit (supplied by Japanese Grant Aid)	1 unit
	Hydraulic Tire Removing Tools (58)	Using for removing tire from rim. 1) Specifications: Applicable rim size; 20 – 26inches, 25 – 49inches Output power: 10 ton 2) Place: Repair bay	None	Sinbellawein: 1 unit (supplied by Japanese Grant Aid)	2 kinds 2 units
	Mobile Floor Crane (2)	Support and move engine for repairing. 1) Specifications: Capa.; 1 ton 2) Place: Repair bay	none	Sinbellawein: 2 units (supplied by Japanese Grant Aid)	1 unit
	Puller set (69, 70, 71)	Pulling out bearings, gears and shaft from body. 1) Specifications: for small, medium and large machines 2) Place: Repair bay	none	Simbellawein: Using. Sakha：Using.	3 kinds 3 units
③Electric, Hydraulic Repairing	Battery Quick Charger (61)	Charging the battery. 1) Specifications: DC 6～12V; 50A, 18～24V; 35A Quick charge: 24～60AH Normal charge: 24～120AH 2) Owned at present: 1 unit 3) Place: Repair bay 2 units, (existing one to be used by HS)	none	Sinbellawein: 2 units (supplied by Japanese Grant Aid) Sakha: 2 units	2 units

No. of work flow	Equipment (Equip't list No.)	General description	Multi-purpose usage	Other Centers	Quantity
④ Machine shop, Metal working & Welding	Lathe (95)	Make the part of agricultural equipment to machine the thread, surface cleaning, cutting and other works for parts. 1) Specifications: Distance between center 1500mm Mass: 2600kg 2) Place: Machine shop	none	Sinbellawein: 1 unit (supplied by Japanese Grant Aid) Sakha: 1 unit Tuokh: 1 unit	1 unit
	Universal Milling Machine (78)	Machining parts of agricultural machinery. Able to make the surface repairing, grooves of pins, gear, etc. 1) Specifications: table size 1,350mm x 320 mm ・Travel: 800 mm x 400 mm x 400 mm ・Mass: Approx. 3500kg 2) Place: Machine shop	none	Toukh： 1 unit	1 unit
	Upright Drilling Machine (77)	Make holes and threads on the parts. 1) Specifications: Hole for steel sheet φ32mm Thread: M16 2) Place: Metal processing area	none	Sinbellawein: 1 unit (supplied by Japanese Grant Aid) Sakha: 1 unit	1 unit
	Hack Sawing Machine (79)	Cut off the steel materials for manufacturing chases, trailers, etc. 1) Specifications: Capa. Bar; φ210 mm, Angle: 190mm x 190 mm、Mass: 320kg 2) Place: Metal processing area	none	Sinbellawein: 1 unit (supplied by Japanese Grant Aid) Sakha: 1 unit	1 unit
	Hydraulic Shop Press (81)	Press materials to bent, remove bearings and bush, etc. 1) Specifications: Capa. 35 ton 2) Place: Machine shop	none	Sinbellawein: 1 unit (supplied by Japanese Grant Aid)	1 unit
⑤ Welding	DC Engine Welder (106)	Weld hard steel materials operating with engine. 1) Specifications: Capa. 28.0V、Current 200A 2) Place: Welding area	none	Sinbellawein: 3 units (supplied by Japanese Grant Aid)	1 unit
	Gas Welder Set (103)	Weld or cut off steel materials using oxygen and acetylene. 1) Specifications: consist of oxygen tank, acetylene tank, regulators, torch, etc. 2) Owned at present: 2 units 3) Place: Welding area 2 sets, Repair bay 1 unit	none	Sinbellawein: 5 sets Sakha： Few sets	3 sets
	AC Arc Welding Machine (101)	Weld the steel materials to repair and make a part of machine. 1) Specifications: Unload voltage 70V, Nominal current 250A 2) Owned at present: 1 unit 3) Place: Welding area; 2 units, Repair bay; 1 unit	none	Sinbellawein: 7 units Sakha： 5 units	3units
	Welding Rod Dryer (102)	Dry welding rod by electric heater. 1) Specifications: Capa. 20kg 2) Place: Welding area	none	Sinbellawein: using Sakha： using	1 unit
	Gas Cutting Table (105)	Use for welding and protect the firing bits from spreading around. 1) Specifications: Dimensions 900 x 600 x 500mm 2) Place: Welding area	none	Sinbellawein, Sakha: Only table used	2 units

No. of work flow	Equipment (Equip't list No.)	General description	Multi-purpose usage	Other Centers	Quantity
⑥ Engine & Driving system repair	Engine Repair Stand (28)	Hold and support engine for repair and inspection to protect it from falling down. 1) Specifications: Supporting power 1,000kg 2) Place: Engine repair room	none	Sinbellawein: 2 units (supplied by Japanese Grant Aid)	2 units
	Cylinder Head Hydraulic Test Stand (29)	Test lubrication and cooling of engine during the repair. 1) Specifications: Consist of hydraulic pump, board and test stand 2) Place: Engine repair room	none	Sinbellawein: 1 unit (supplied by Japanese Grant Aid)	1 unit
	Valve Refacer (31)	Machine and reface the valve surface to keep good contact to the engine. 1) Specifications: Chuck capa.; dia. 4.0 - 14.3 mm machine angle: 0 - 75 ° 2) Place: Engine repair room	none	Sinbellawein: 1 unit (supplied by Japanese Grant Aid)	1 unit
	Eccentric Valve Seat Grinder (32)	Grind the valve seat after removing carbon or cleaning to keep the original power of engine. 1) Specifications: applicable valve size φ28 mm - φ65mm grinding angle: 0 ° - 75 ° 2) Place: Engine repair room	none	Sinbellawein: 1 unit (supplied by Japanese Grant Aid)	1 unit
	Diesel Smoke Tester (46)	Measure the contamination of the exhaust smoke of diesel engine. 1) Specifications: Filter reflection type, accuracy ±3% 2) Place: Engine repair room	none	Sinbellawein: 1 unit (supplied by Japanese Grant Aid)	1 unit
	Bearing Heater (49)	Heat the bearing to enlarge it before placing to the shaft. 1) Specifications: Dry type 0 - 300℃ 2) Place: Engine repair room	none	Sinbellawein: 1 unit (supplied by Japanese Grant Aid)	1 unit
⑦ Fuel injection pump test	Fuel Injection Pump Test Set (48)	Test and regulate the fuel injection pump for obtaining the best timing of injection and fuel supply for maximum output. 1) Specifications: for 8 plungers, 80-4,200rpm/min 2) Place: Fuel injection pump test room	none	Sinbellawein: 1 unit (supplied by Japanese Grant Aid)	1 unit
⑧ Adjust & Lubrica-tion	Chassis Lubricator (14)	Apply lubrication such as grease or oil for engine and chassis by pressure. 1) Specifications: Movable grease type and oil type Output pressure: 230 kgf/ cm^2 Output volume: 350 g/min 2) Required number: Grease type 2 units, oil type 1 unit 3) Place: Repair bay	none	Sinbellawein: 3 units (supplied by Japanese Grant Aid)	2 kinds 3 units
	Oil Drain with Air Pump (15)	Remove oil and grease from engine, chassis and transmission by air pressure. 1) Specifications: Tank capa. 75 lit, Output capa.; 12 lit/min 2) Place: Repair bay	none	None: (usually add grease or oil with a little bit remaining old one.)	1 unit
Cargo -handling equipment	Forklift (112)	Lift and transport the materials or parts to anywhere in the site. 1) Specifications: Diesel engine type, Capac; 2-ton 2) Place: Central workshop	none	Sinbellawein: 2 units (supplied by Japanese Grant Aid)	1 unit

No. of work flow	Equipment (Equip't list No.)	General description	Multi-purpose usage	Other Centers	Quantity
Mobile workshop	Mobile workshop (113)	Move to anywhere outside the site for repairing machines against light of medium damages. 1) Specifications: * 4WD pick-up truck type, * Body: with room made of corrugated aluminum L2,300 mmxW1,700 mmxH1,200 mm 2) Place: Central workshop	none	Sinbellawein: 3 units (supplied by Japanese Grant Aid) Sakha: Using 2 units	2 units
Training Equipment	Cut Model (Water-cooled diesel engine) (114)	Use it for training to teach engine structure and function of the parts. 1) Specifications: Water-cooled diesel engine, cut model 2) Place: AV & Furniture Room in Training building	none	Sinbellawein: 1 unit (supplied by Japanese Grant Aid)	1 unit
	OHP, Screen, Slide Projector (115, 116)	Use them for training with existing teaching materials. 1) Specifications: * OHP; projection distance 1.3 - 3.6m、sizeA4 * Screen: portable, size; 1800x1800mm * Slide projector: Rotary type, 80 slides 2) Place: AV & Furniture Room in Training building	yes (use for projec-tion of objects in the room)	Sinbellawein: using Sakha: using	1 set

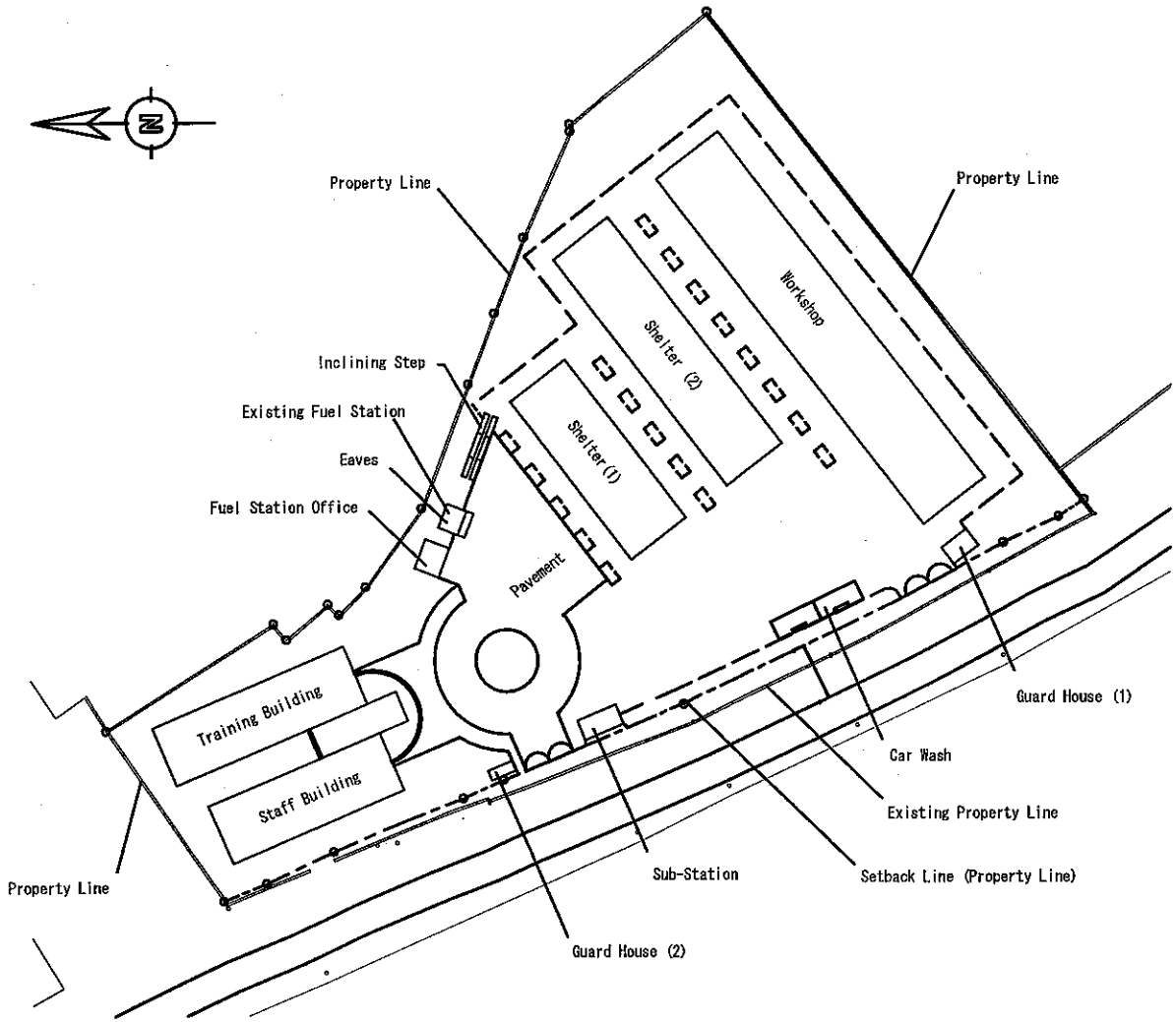
5) Layout of Installing Equipment for the Workshop

Farm machinery will be repaired in the workshop according to the workflow. Because the workshop has limited area, disposition is planned in such a manner that repairing equipment is placed on path of flow so that the works can be smoothly made (Details are referred to the Appendix 5-13 “Equipment Layout Plan”).

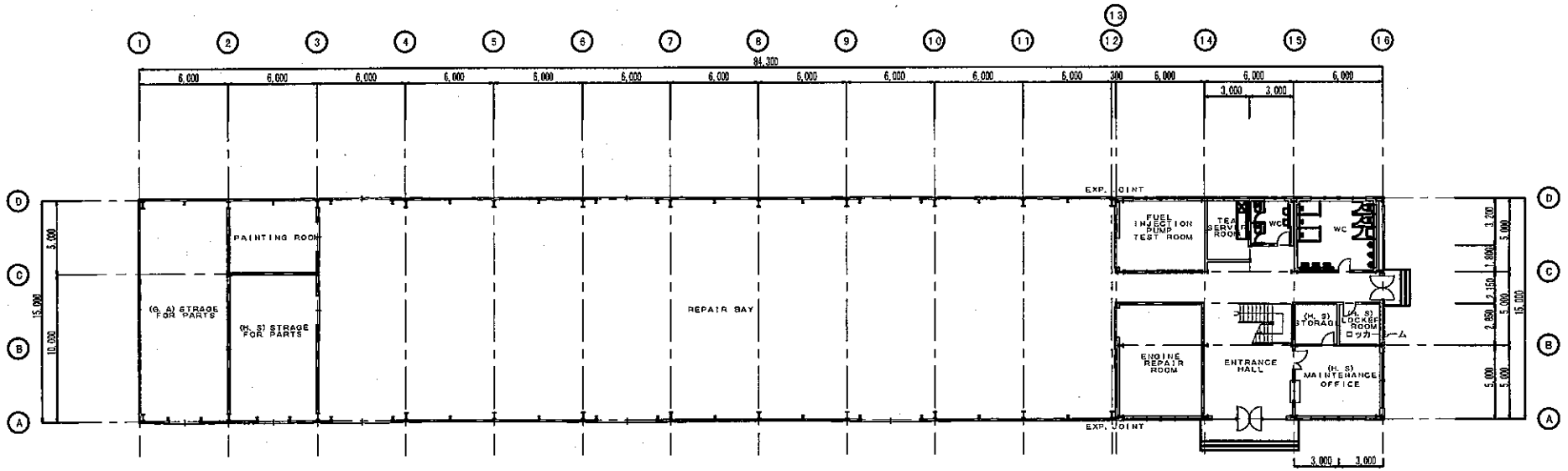
2-2-3 Basic Design Drawings

Table 2-15 List of Drawings

Drawing Number	Name of Drawings
D-1	Site Plan
D-2	Workshop Building, Ground Floor Plan
D-3	Workshop Building, First Floor Plan
D-4	Workshop Building, Elevation
D-5	Workshop Building, Section
D-6	Training Building, Ground Floor Plan
D-7	Training Building, First Floor Plan
D-8	Training Building, Elevation
D-9	Training Building, Section
D-10	Staff Building, Ground Floor Plan
D-11	Staff Building, First Floor Plan
D-12	Staff Building, Elevation
D-13	Staff Building, Section
D-14	Shelter (1) Ground Floor Plan
D-15	Shelter (1) Elevation
D-16	Shelter (2) Ground Floor Plan
D-17	Shelter (2) Elevation
D-18	Adjunct Facilities, Floor Plan / Elevation (1)
D-19	Adjunct Facilities, Floor Plan / Elevation (2)
D-20	Car Wash, Inclining Step, Floor Plan / Elevation


N
Property Line
Property Line
Workshop
Shelter (2)
Shelter (1)
Inclining Step
Existing Fuel Station
Eaves
Fuel Station Office
Pavement
Training Building
Staff Building
Guard House (1)
Car Wash
Existing Property Line
Setback Line (Property Line)
Sub-Station
Property Line
Guard House (2)
0
25
50 (m)

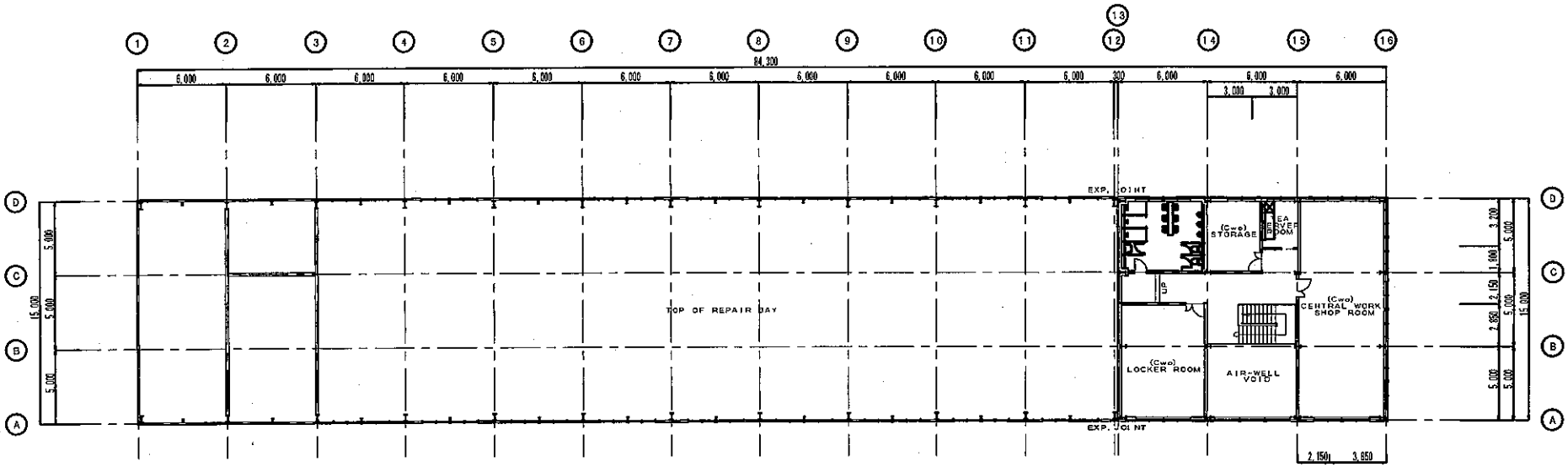
D-1 Site Plan



WORK SHOP GROUND FLOOR PLAN

0 5 10 (m)

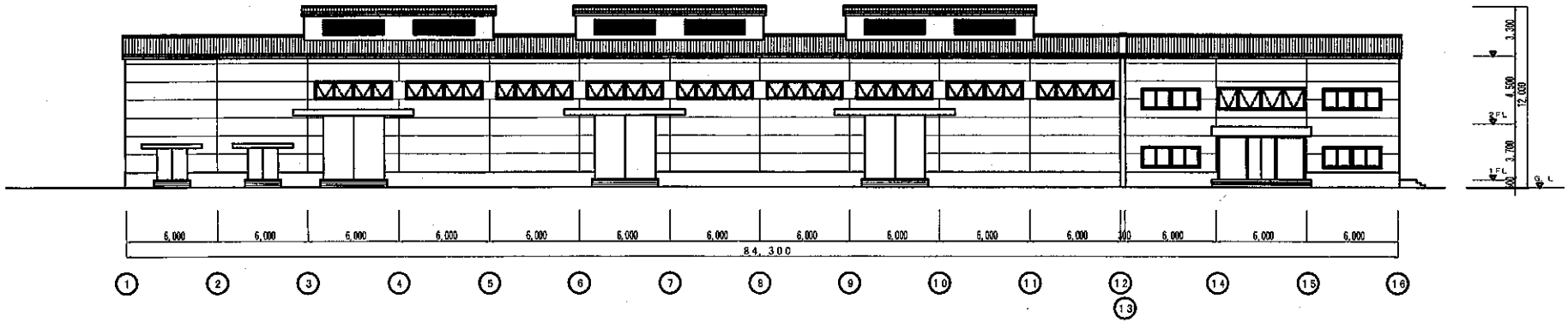
D-2 Workshop Building, Ground Floor Plan



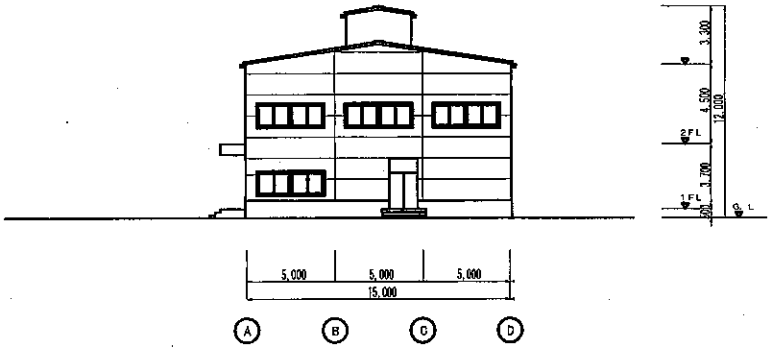
WORK SHOP 1ST FLOOR PLAN

0 5 10 (m)

D-3 Workshop Building, First Floor Plan



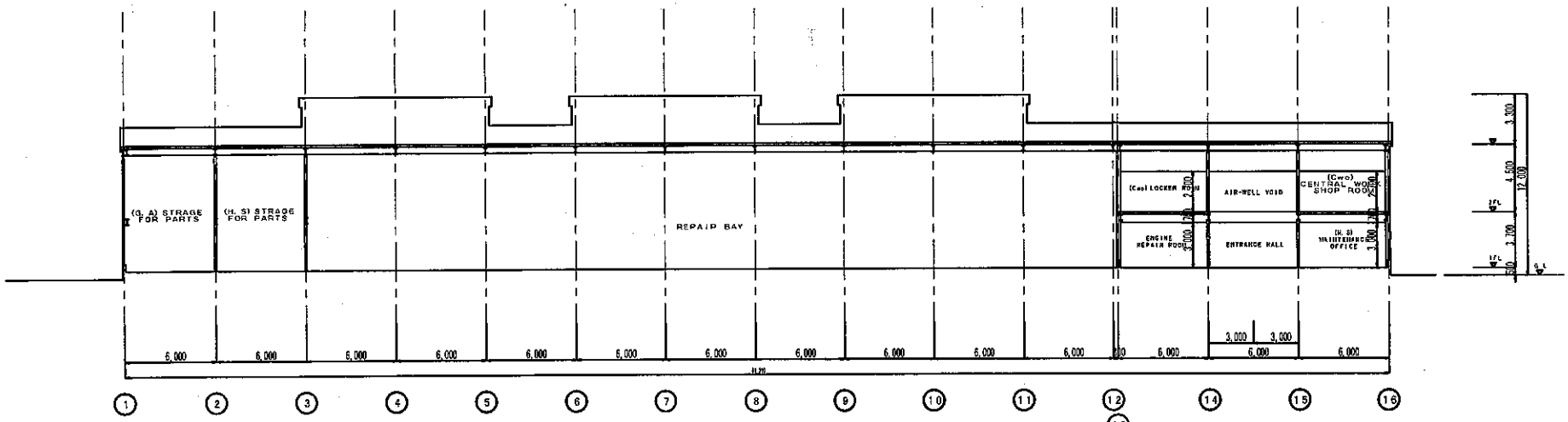
WORK SHOP ELEVATION



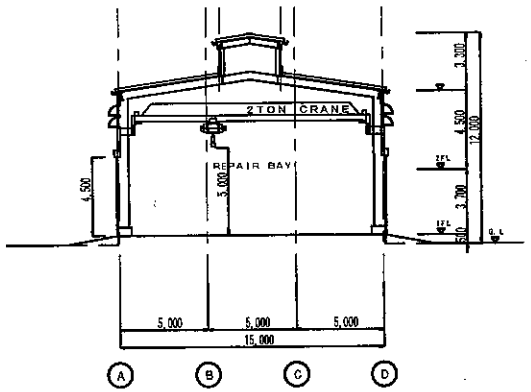
WORK SHOP ELEVATION

0 5 10 (m)

D-4 Workshop Building, Elevation



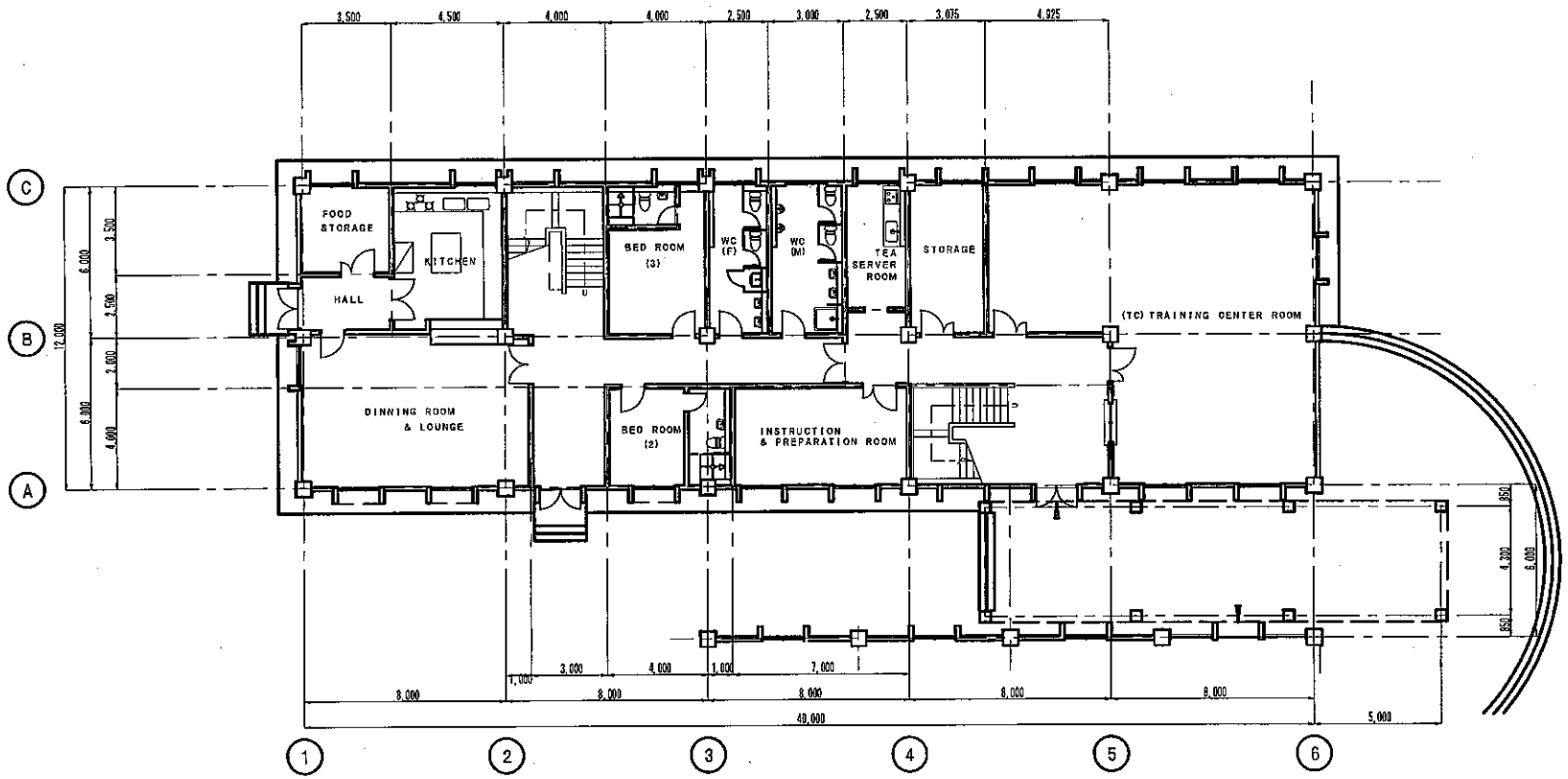
WORK SHOP SECTION



WORK SHOP SECTION

0 5 10 (m)

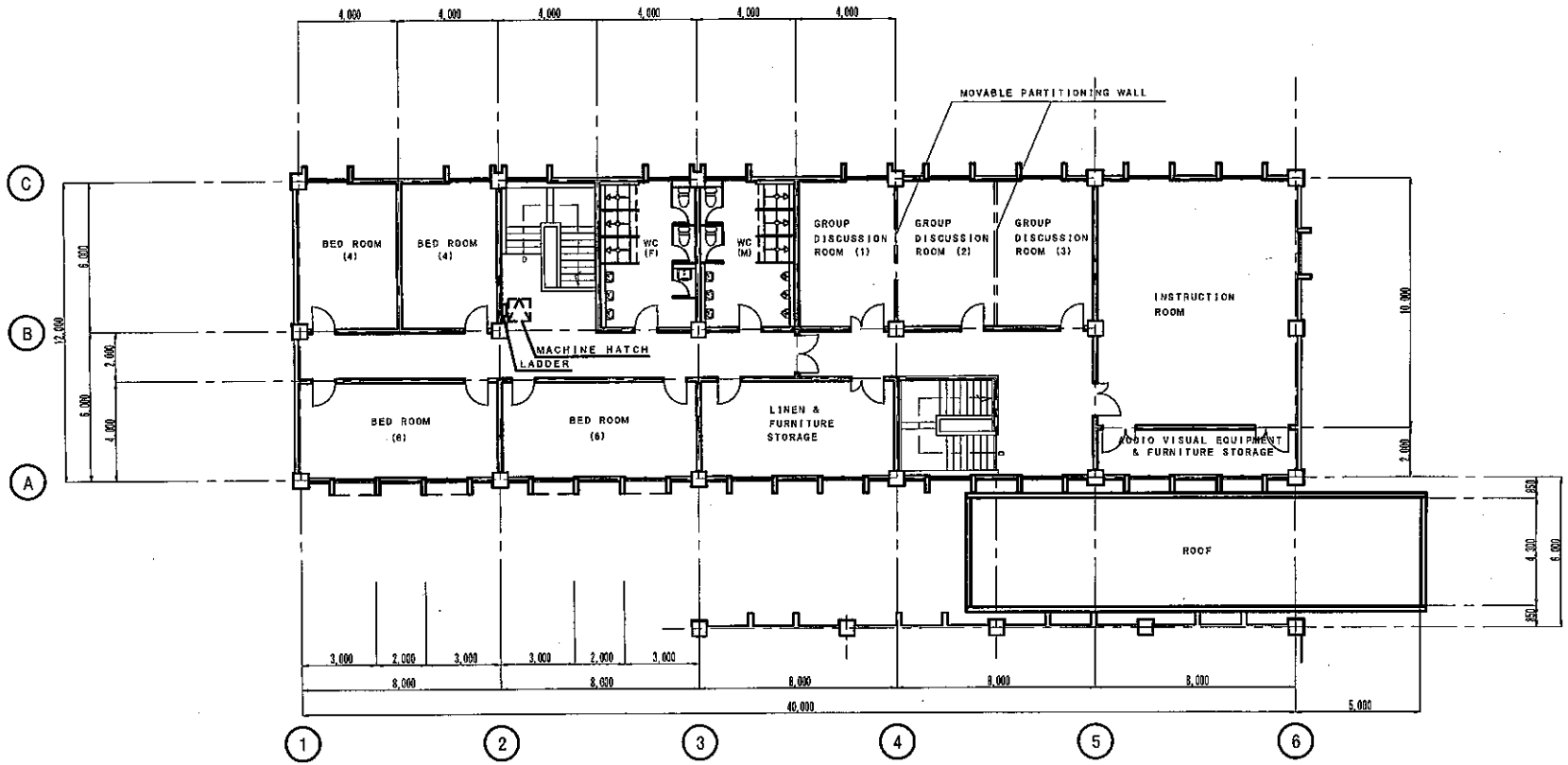
D-5 Workshop Building, Section



TRAINING BUILDING GROUND FLOOR PLAN

0 5 10 (m)

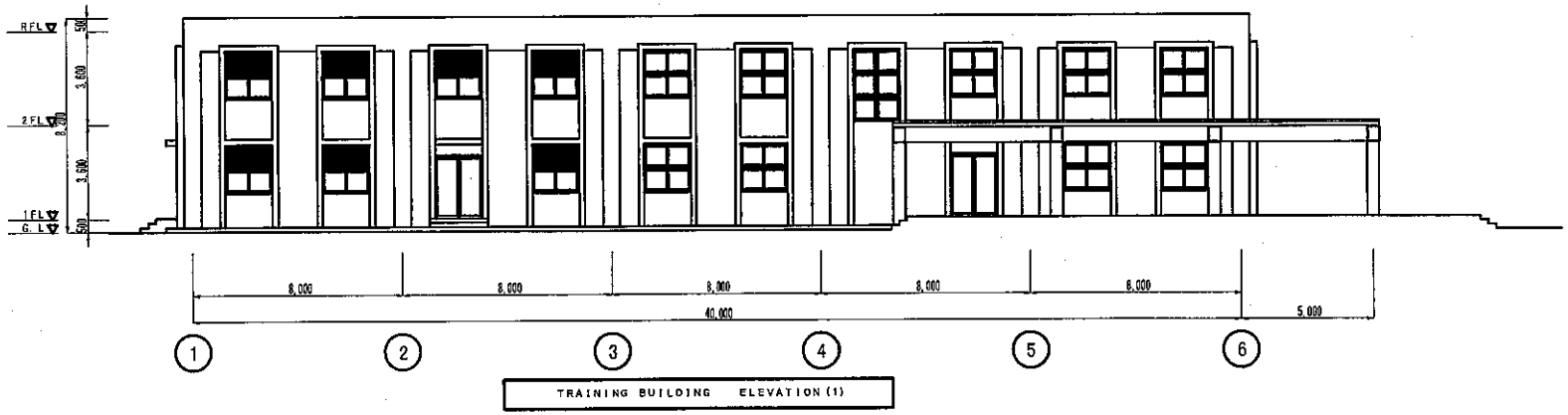
D-6 Training Building, Ground Floor Plan



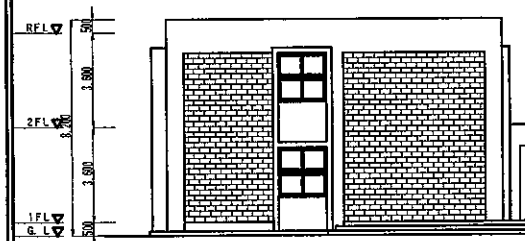
TRAINING BUILDING 1ST FLOOR PLAN

0 5 10 (m)

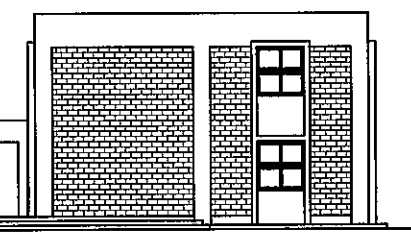
D-7 Training Building, First Floor Plan



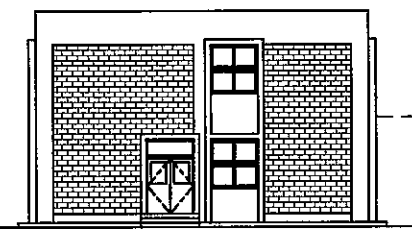
TRAINING BUILDING ELEVATION (1)



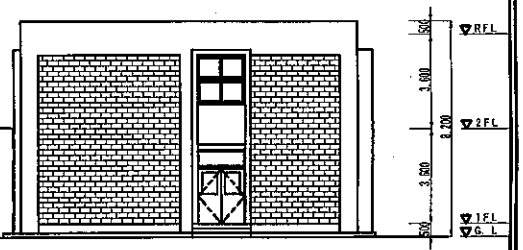
STAFF BUILDING ELEVATION (2)



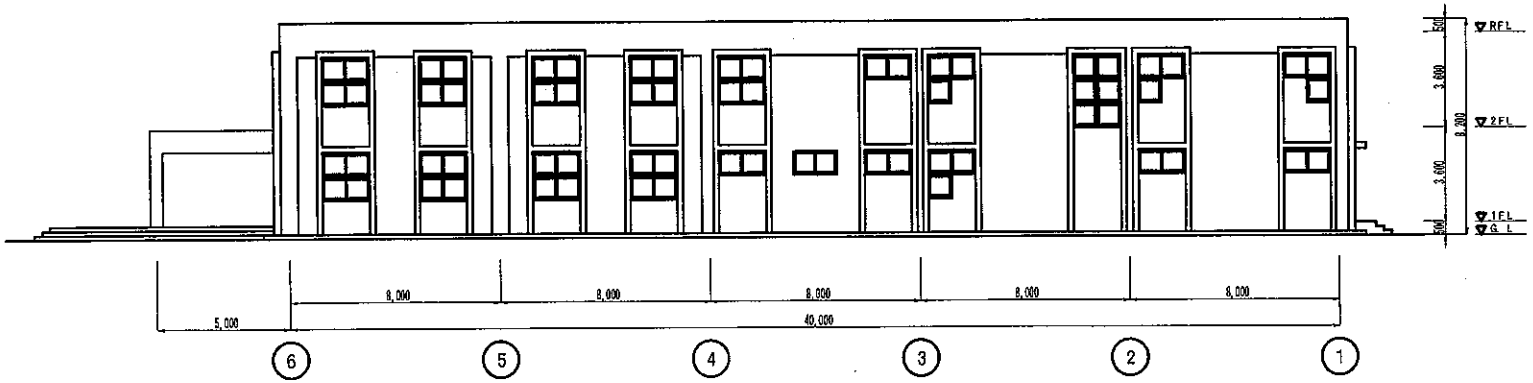
TRAINING BUILDING ELEVATION (2)



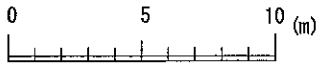
TRAINING BUILDING ELEVATION (4)



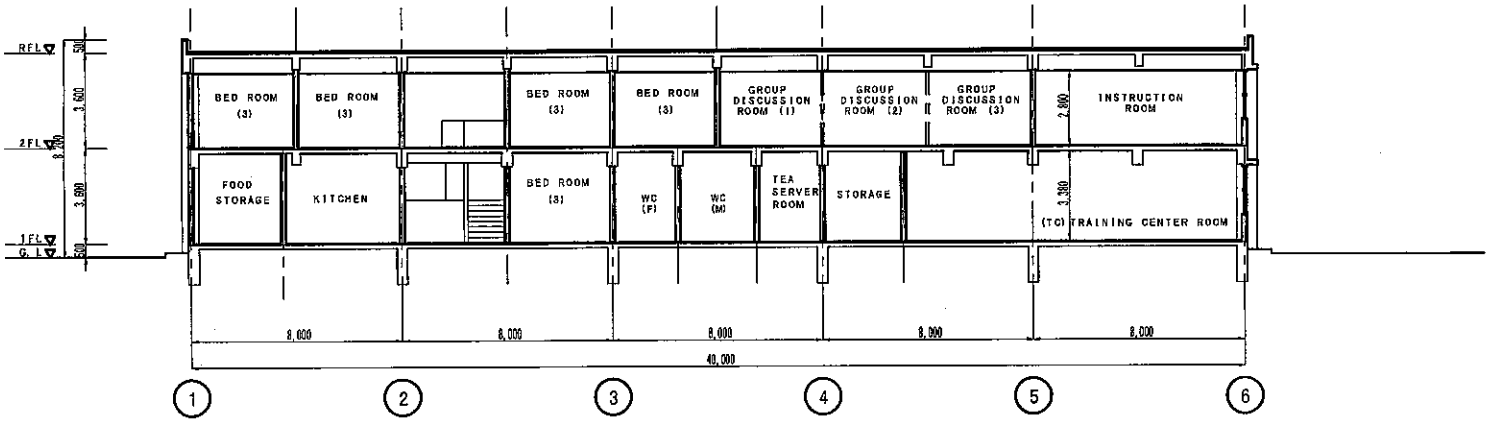
STAFF BUILDING ELEVATION (4)



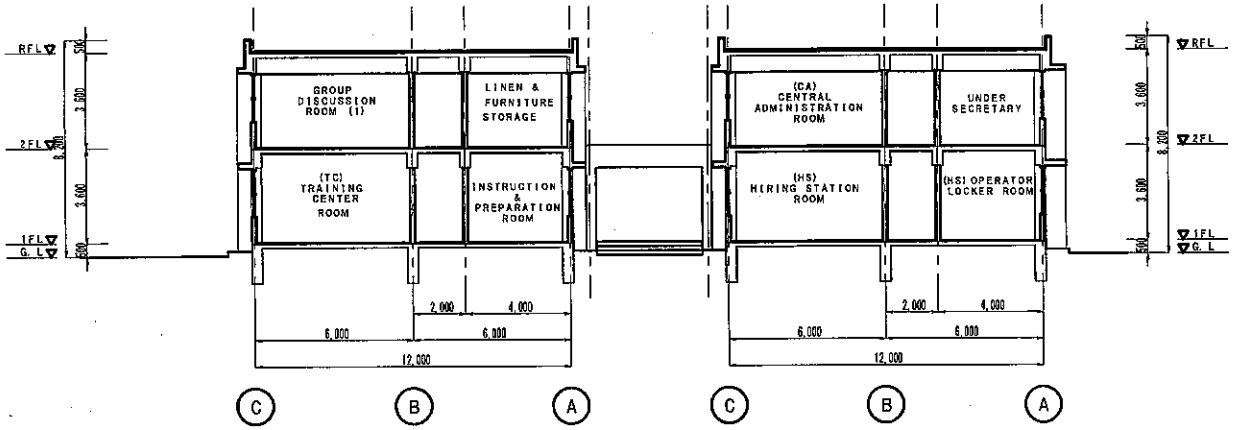
TRAINING BUILDING ELEVATION (3)



D-8 Training Building, Elevation



TRAINING BUILDING SECTION (1)

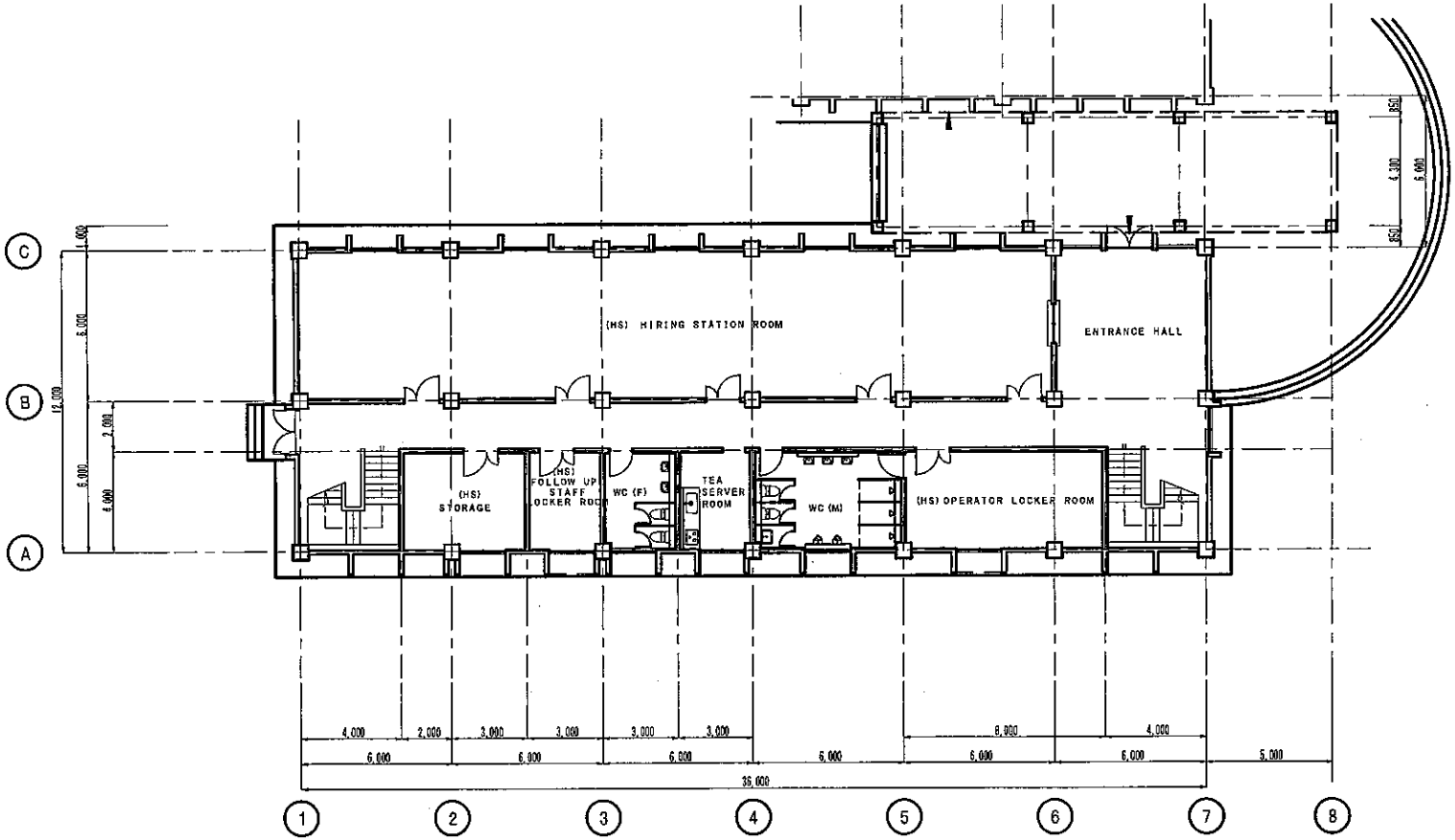


TRAINING BUILDING SECTION (2)

STAFF BUILDING SECTION (2)

0 5 10 (m)

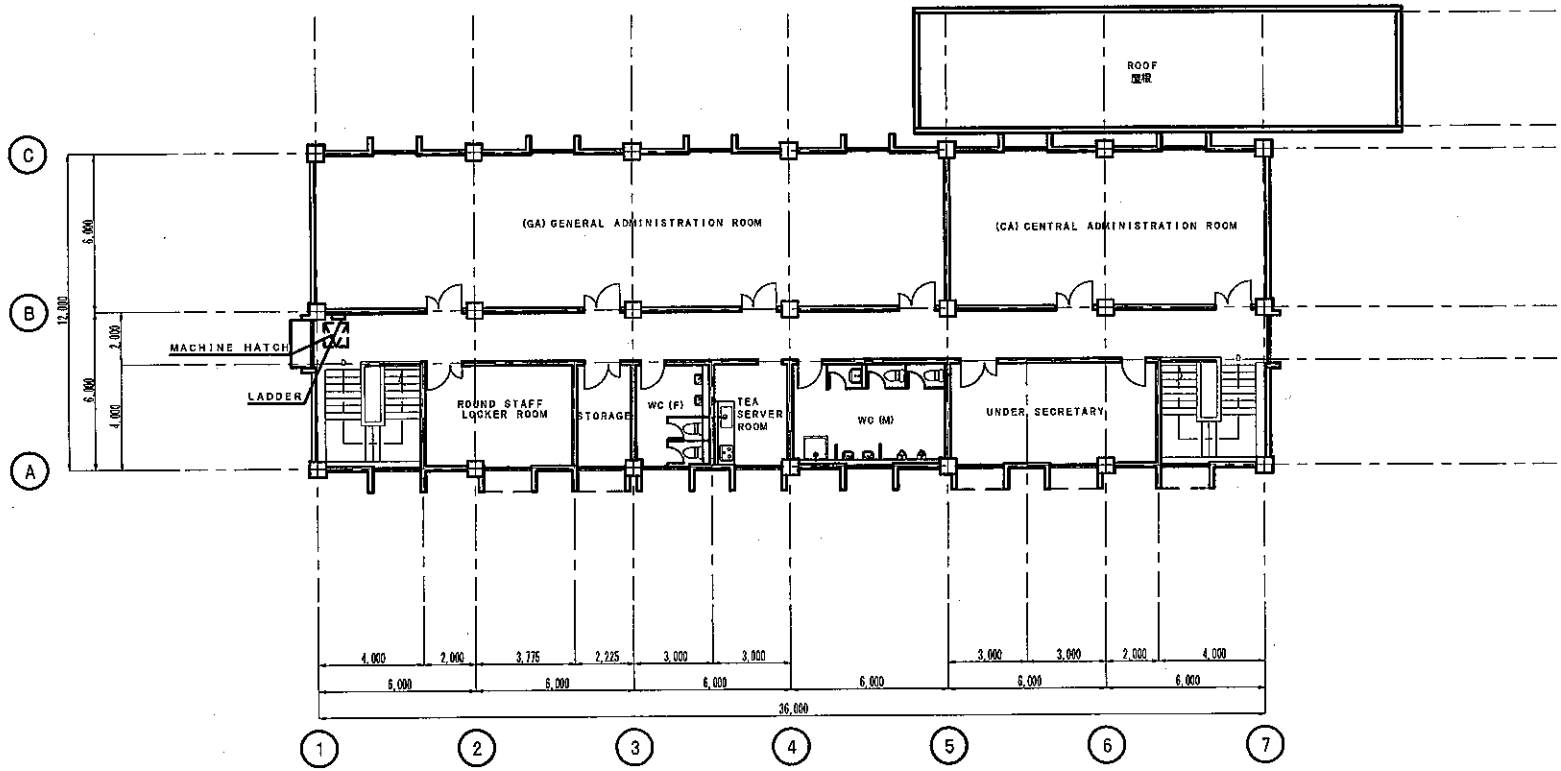
D-9 Training Building, Section



STAFF BUILDING GROUND FLOOR PLAN

0 5 10 (m)

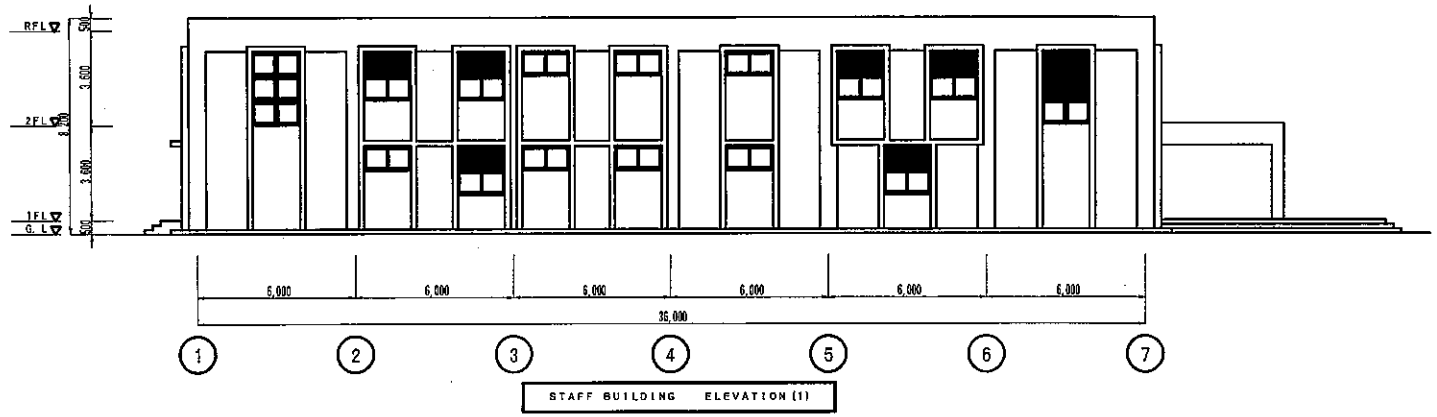
D-10 Staff Building, Ground Floor Plan



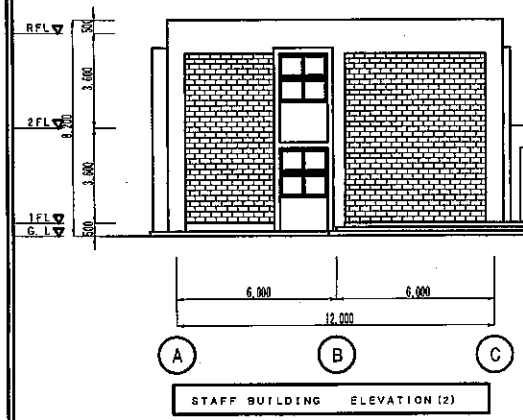
STAFF BUILDING 1ST FLOOR PLAN

0 5 10 (m)

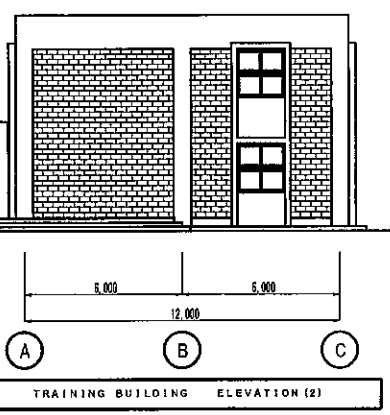
D-11 Staff Building, First Floor Plan



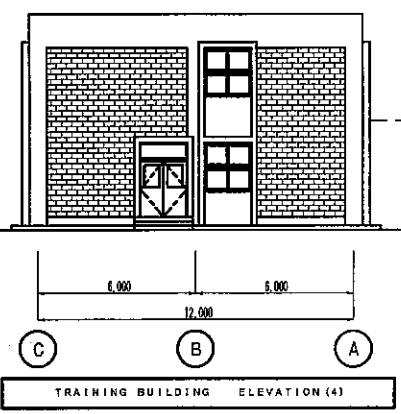
STAFF BUILDING ELEVATION (1)



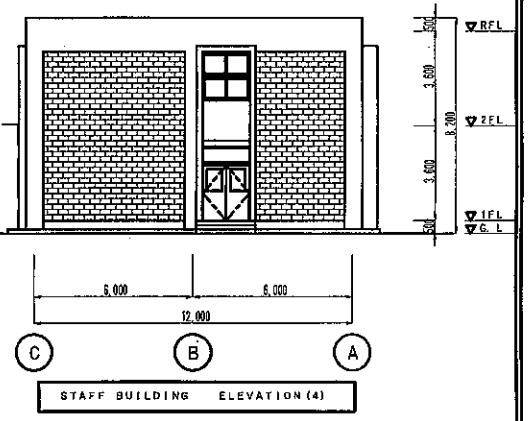
STAFF BUILDING ELEVATION (2)



TRAINING BUILDING ELEVATION (2)



TRAINING BUILDING ELEVATION (4)

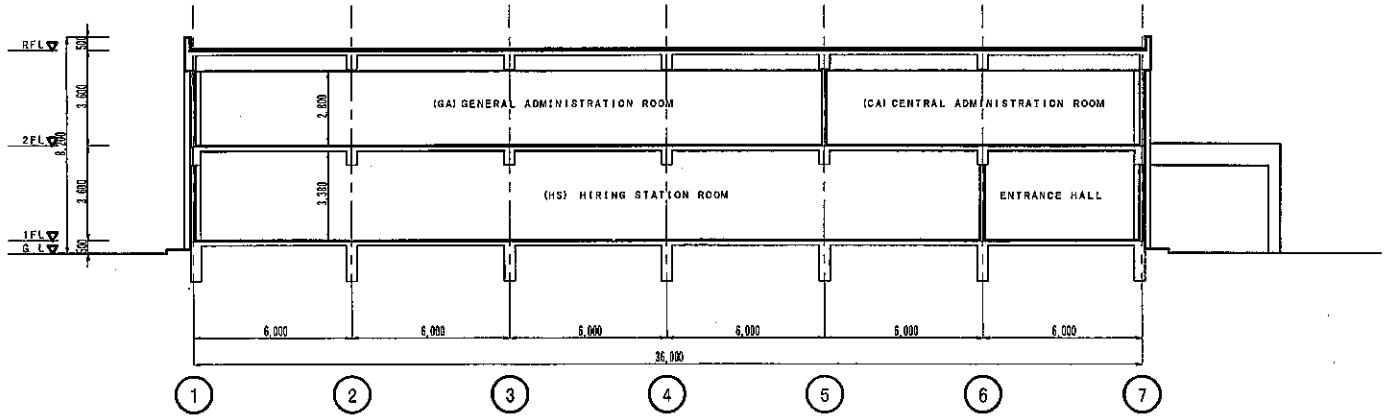


STAFF BUILDING ELEVATION (4)

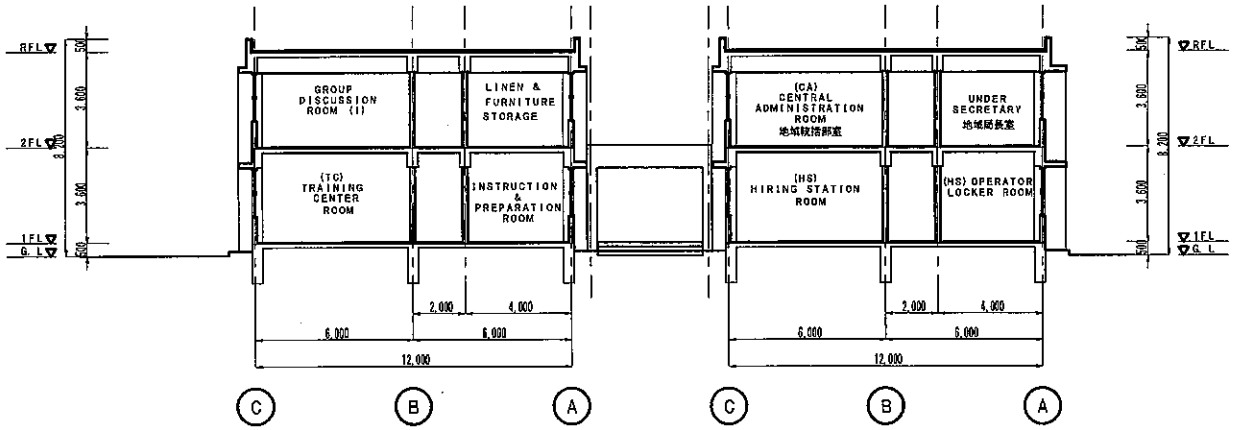
STAFF BUILDING ELEVATION (3)

0 5 10 (m)

D-12 Staff Building, Elevation

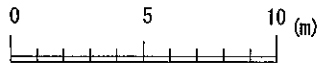


STAFF BUILDING SECTION (1)

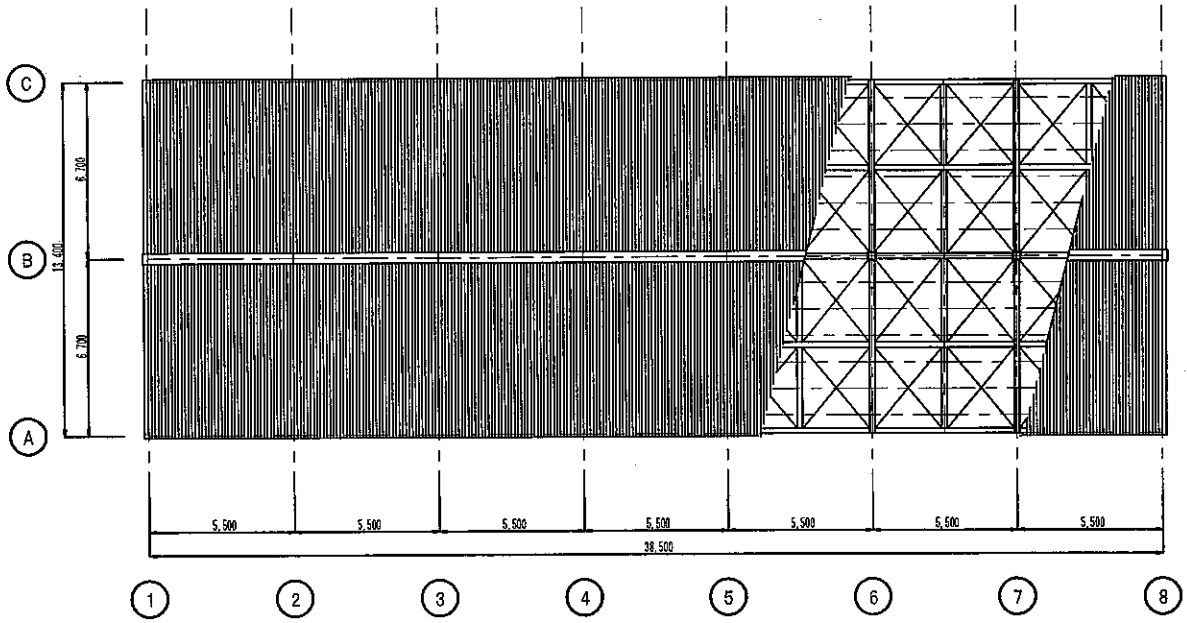


TRAINING BUILDING SECTION (2)

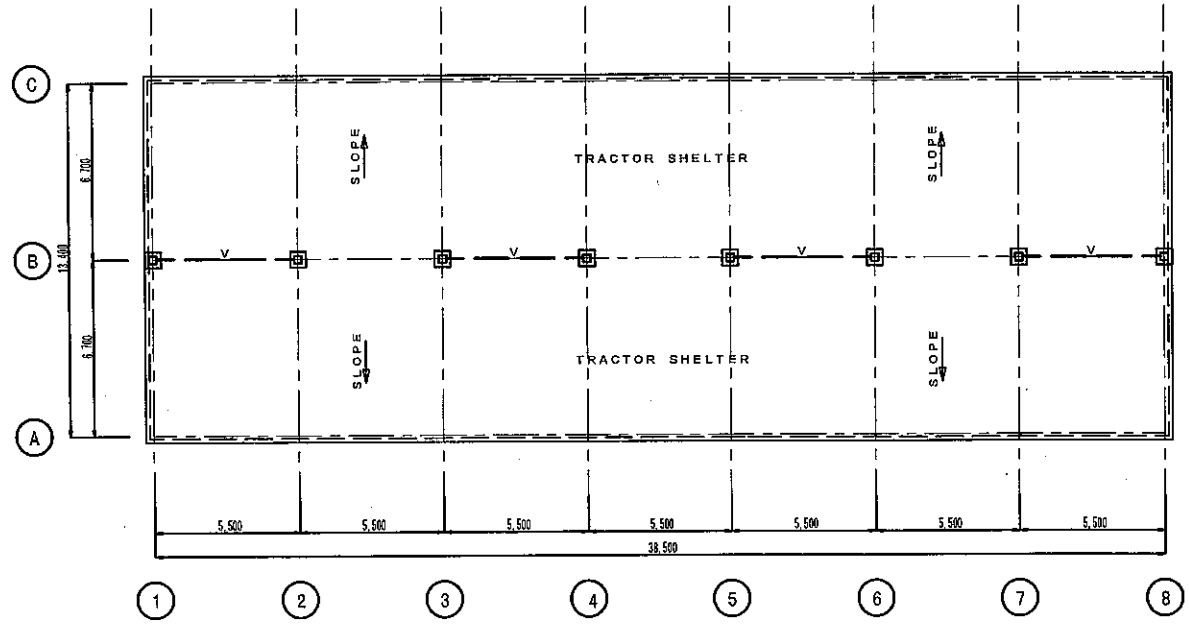
STAFF BUILDING SECTION (2)



D-13 Staff Building, Section



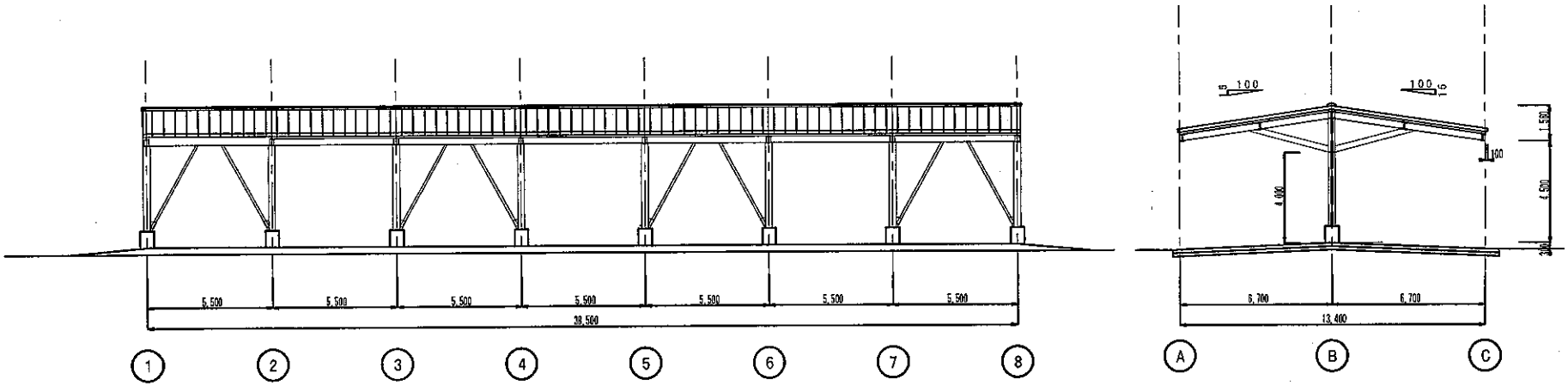
TRACTOR SHELTER (1) ROOF PLAN



TRACTOR SHELTER (1) GROUND FLOOR PLAN

0 5 10 (m)

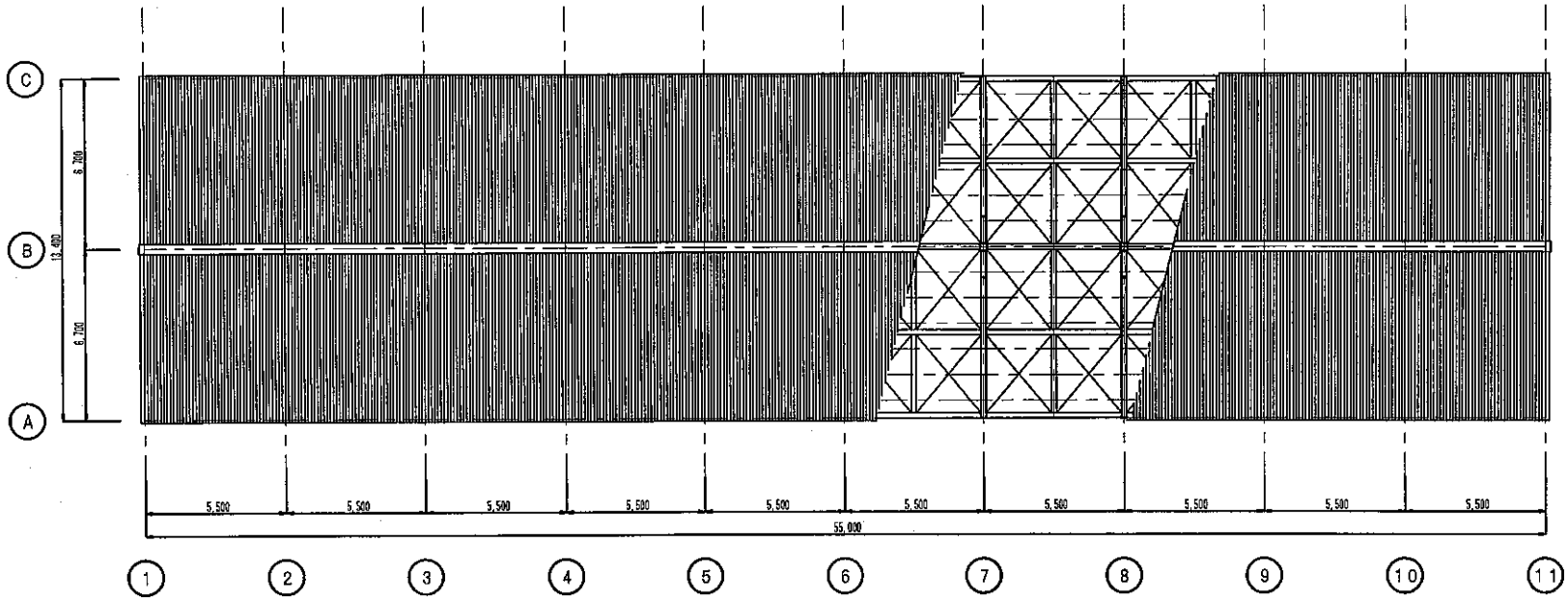
D-14 Shelter (1), Ground Floor Plan



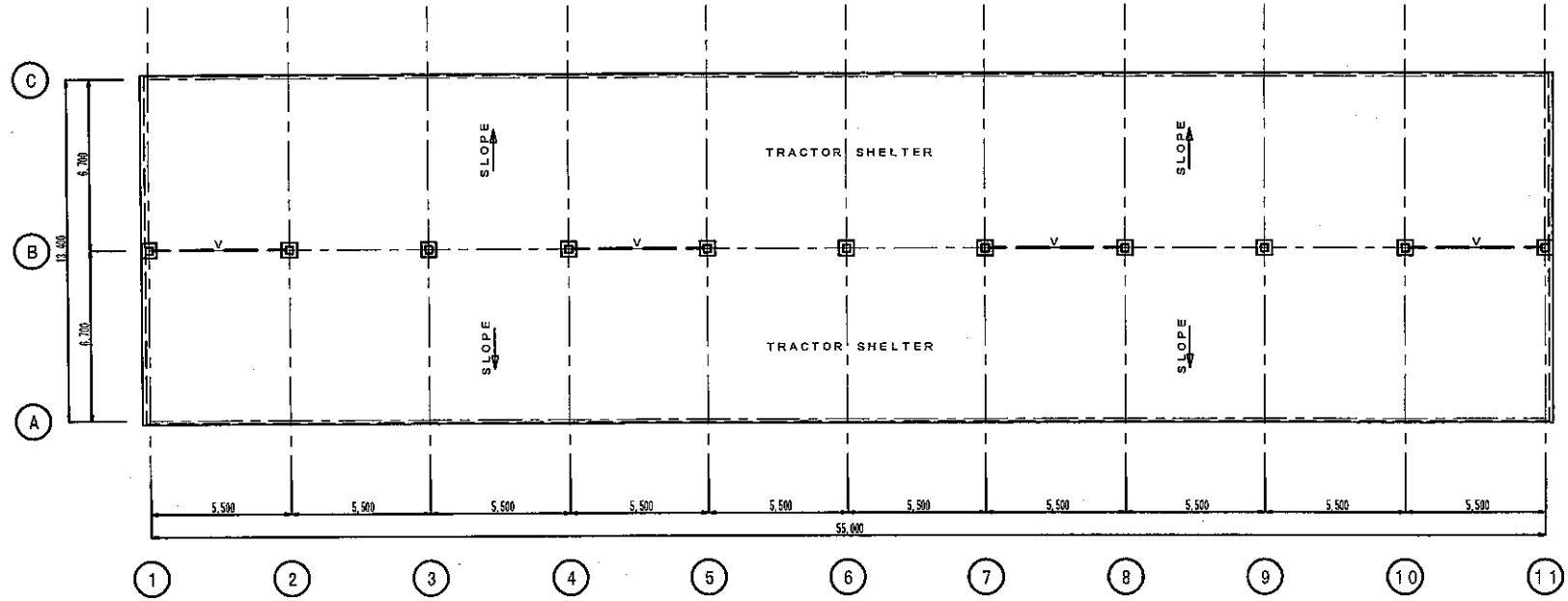
TRACTOR SHELTER (1) ELEVATION

0 5 10 (m)

D-15 Shelter (1), Elevation



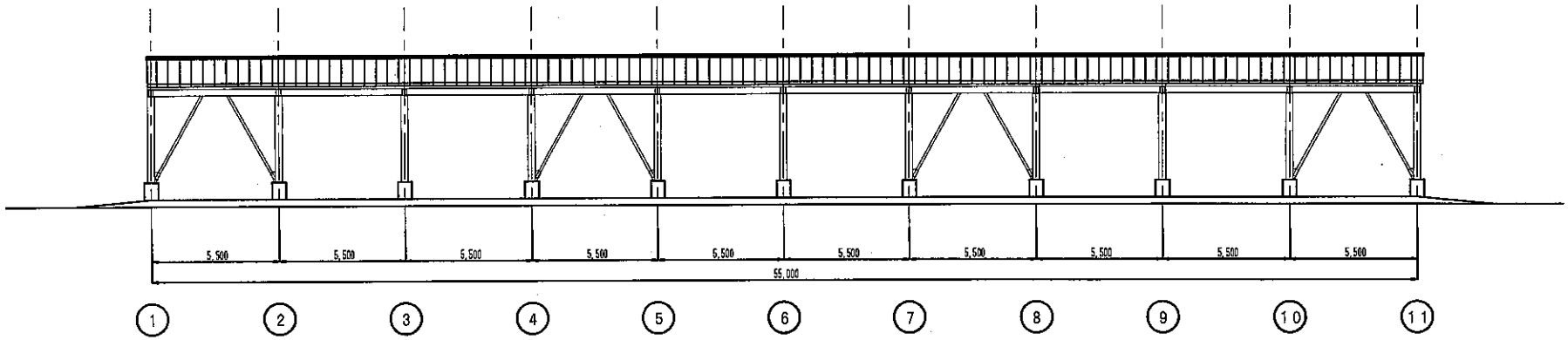
TRACTOR SHELTER(2) ROOF PLAN



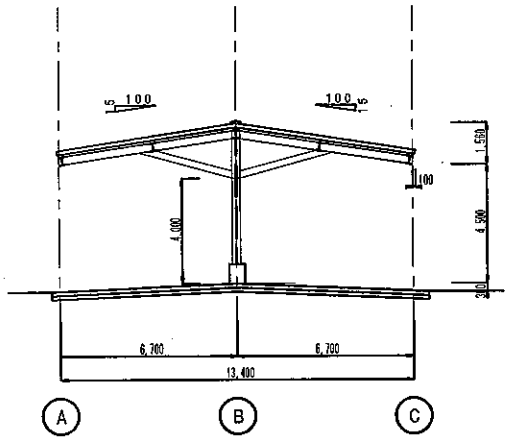
0 5 10 (m)

TRACTOR SHELTER(2) GROUND FLOOR PLAN

D-16 Shelter (2), Ground Floor Plan



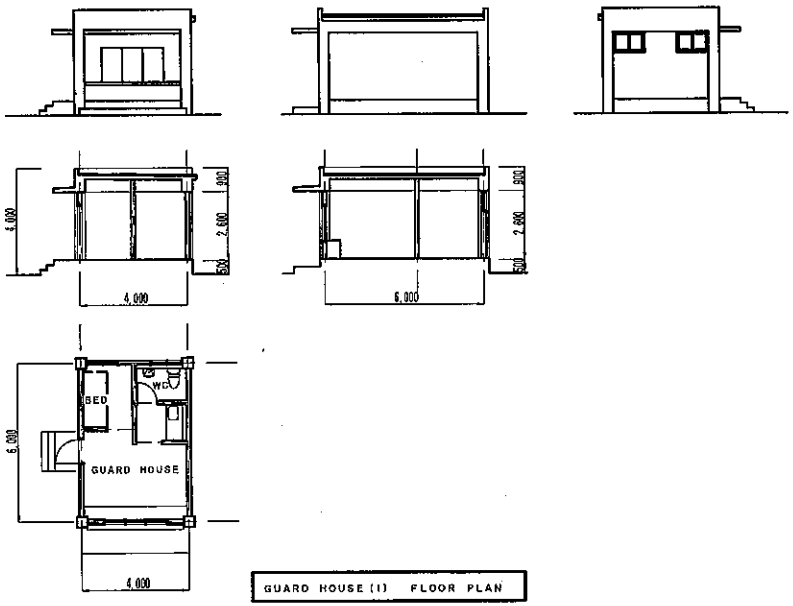
TRACTOR SHELTER(2) ELEVATION



TRACTOR SHELTER(2) ELEVATION

0 5 10 (m)

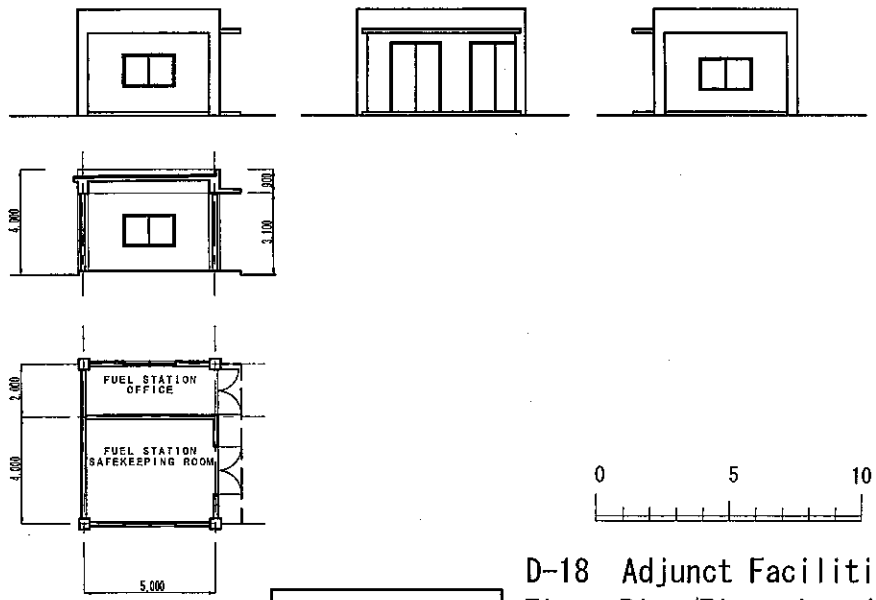
D-17 Shelter (2), Elevation



GUARD HOUSE (1) FLOOR PLAN

GUARD HOUSE (2) FLOOR PLAN

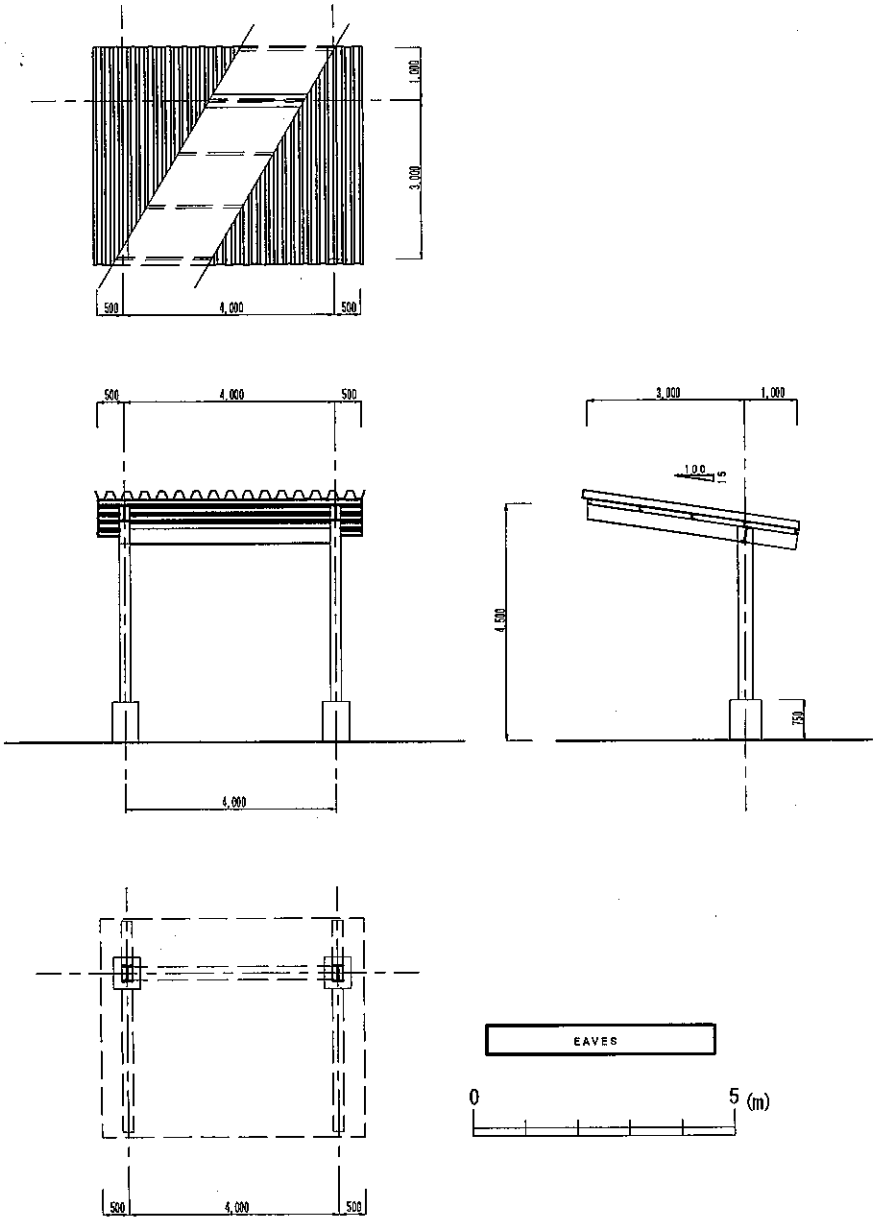
SUB-STATION FLOOR PLAN

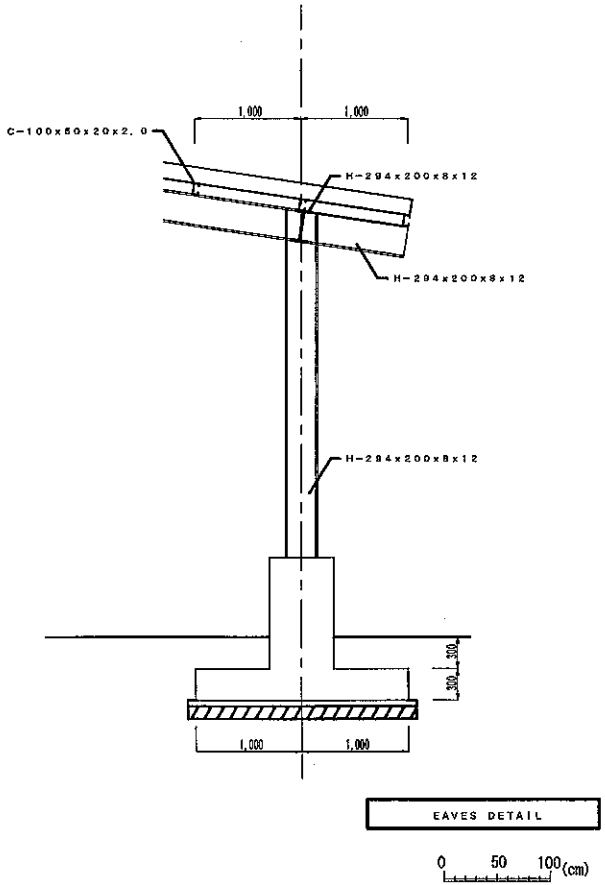


FUEL STATION OFFICE

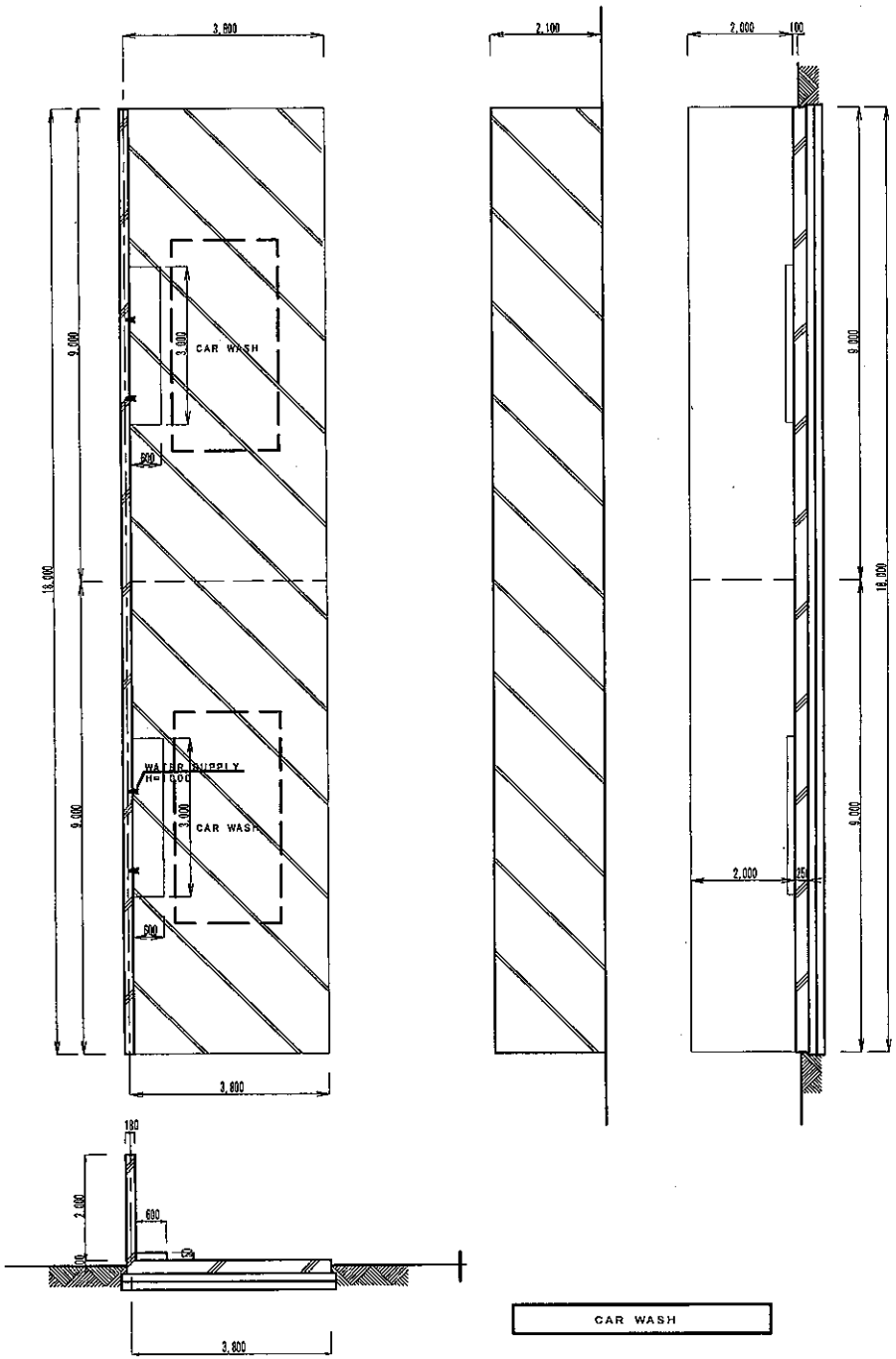
0 5 10 (m)

D-18 Adjunct Facilities Floor Plan/Elevation (1)

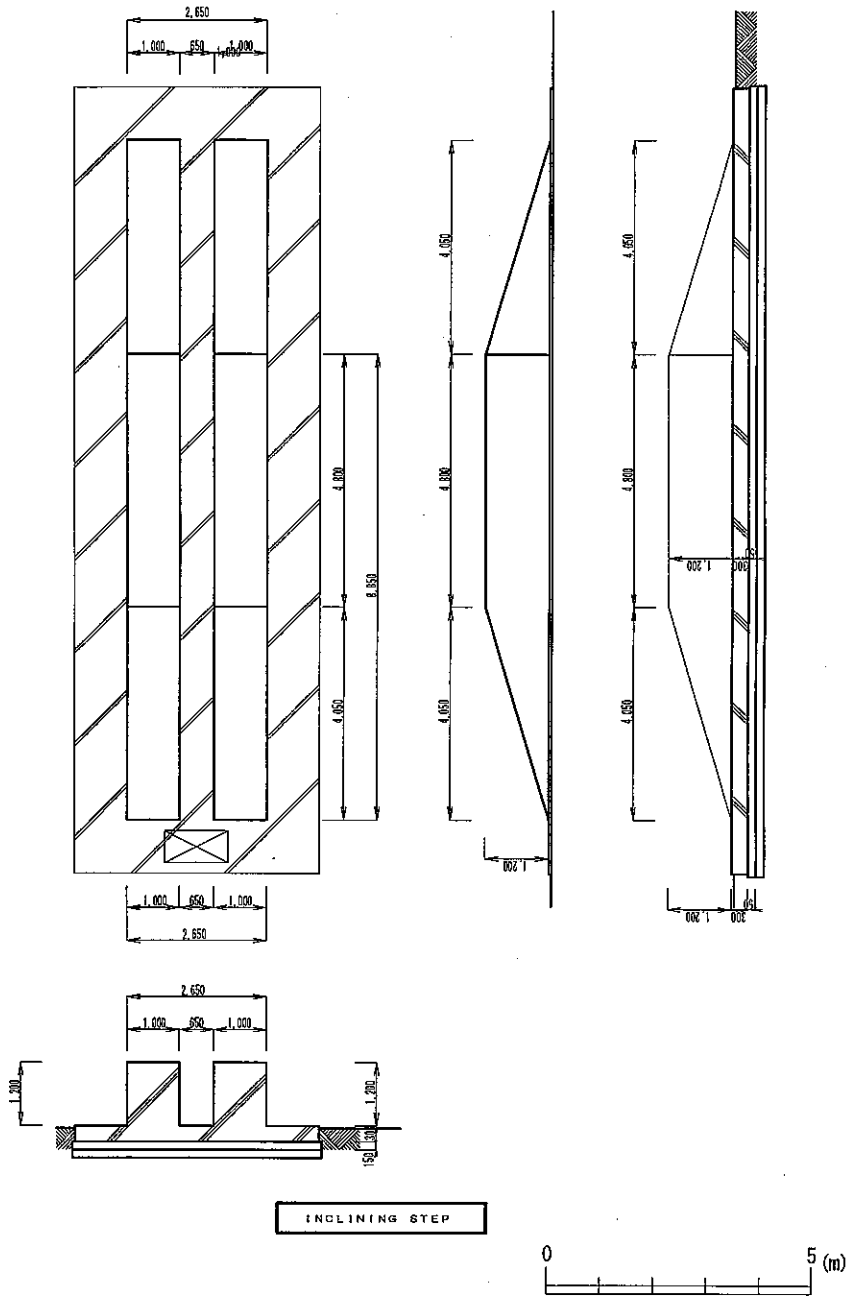




D-19 Adjunct Facilities, Floor Plan/Elevation (2)



CAR WASH



INCLINING STEP

0 5 (m)

D-20 Car Wash, Inclining Step, Floor Plan/Elevation

2-2-4 Implementation Plan / Procurement Plan

2-2-4-1 Implementation / Procurement Policy

(1) Policy of Implementation

1) Project Implementing Agency

The responsible and implementing agency of the Project in the Egyptian side is AMS (Agricultural Mechanization Sector) under MARL. With a view to smoothly implementing the Project, AMS should have close contact and have consultations with concerned agencies in Egypt and the Japanese consultant as well as select and appoint a responsible person who takes charge for the Project. The implementation agency AMS has obligations of performing duties without delay borne by the Egyptian side including temporal translocation of the functions of the existing station, demolishment and land leveling of the existing facilities from the Project site, consolidation of infrastructure, provision of land for temporary works for the Contractor and application of a permit for construction to Damanhour municipal authority concerned, etc.

2) Consultant

In order to implement constructing the facilities and procuring equipment, a Japanese consultant concludes contracts with AMS on the services of design and supervision of the Project works, based on which it carries out Detailed Design and supervising services for the implementation of the Project. For tender, the consultant provides tender documents and takes charge of tendering services in place of AMS.

3) Contractors Undertaking the Construction Works and Suppliers Undertaking Procurement of Equipment

In compliance with the framework of Japan's Grant Aid, a Japanese corporate contractor and supplier selected in an open bidding will undertake the works such as construction of the facilities and procurement of equipment for the Project.

As regards the selection of the contractor undertaking the construction works and the supplier undertaking the procurement of equipment, they will have the obligation of follow-up services even after the completing the construction including supplemental repairs of the facilities and required actions on the occasion of repairs, etc. Therefore, they will be selected in full consideration of contact and coordination after handing over of the completed facilities concerned.

4) Necessity of Dispatching Engineers

Construction of the facilities in the Project consists of procurement of equipment and materials, inland transportation, the site implementation, etc., will take 12 months. Therefore, well-coordinated management among the stakeholders is essential for proper implementation. It is necessary to manage work schedule, quality of the works, confirmation of the work performances

and safety in a consistent and sustainable manner. In order to make full use of local contractors and labor forces, engineering and architectural adjustment and secure supervision of work schedule are essential. Therefore, dispatch of Japanese engineers to the Project site is planned.

5) Principle of Facility Construction

Smooth implementation will be pursued by means of making effective and efficient use of available local materials and construction methods as possible.

(2) Policy of Procurement

As equipment for the Project is of great variety, it will be procured in Japan, Egypt and third countries considering the easy O&M and initial cost reduction. About the transportation, the most suitable method is planned after examined the ocean freight, airway and inland and/or river transportation as well as by truck, container and/or railway depending on the eligible country sources.

2-2-4-2 Implementation Conditions

(1) Undertaking in Construction Works

1) Situations on Construction

In the Project, not only the construction of the facilities extends over the entire site, but also the construction periods of these facilities are overlapped. To cope with this situation, procurement of land other than the original construction site is required. As a plan, planned road situated at the northern border of the site can be rented to this end, where a temporary office for the Project management and supervision, the plants of processing forms and reinforcing bars, and store of materials and equipment will be placed. AMS will be requested to bear a cost for temporal land acquisition for the Project. There is no concrete mixing plant in Damanhour City, while the plant in Alexandria is located at a distance of approximately two hour by vehicle to reach, and this is too far to employ for the construction in the Project. For this reason, a small-scale concrete plant will be installed in the site to carry out through quality control.

2) Utilization of Available Local Materials

The followings are current situations on major construction materials to be used, which are available at local markets.

-Aggregates and stones: Those with acceptable quality are limitedly available throughout Egypt. For the works of the Project, only the aggregates and stones obtained from Suez located at the east of Cairo will be utilized. Many of fine aggregate and stone materials are so saline that salinity tests cannot be neglected before employing them into construction works.

-Forms: Wood of pine with a section 4 inch× 6 inch is commonly used for making forms. Because cut-out raw timber is used, sufficient management and nurture are necessary.

-Steel frame and reinforcing bars: They are marketed and for the latter, mill-sheets are available. Steel bars are also not abundantly marketed in Egypt, price levels of which are rising. Elaborated preparation is needed prior to their procurement.

-Brick and concrete block: They have been abundantly distributed in the market. However, quality is highly variable and due to this defect careful selection is required to eliminate cracked cakes or those with broken corners at the fabricate plants f or the procurement before delivery to construction site. Especially, as to brick tiles used for finish materials, it is essential to choose high quality materials.

-Fittings: Available aluminum, wooden and steel fittings do not have high quality but no specific usage requiring high air-tightness will be included in the works. Since no trouble has been so far found in utilizing these fittings in similar centers, they can be procured at local markets.

3) Safety Measures

Attention must be paid to secure safety for the workers in the construction site. Dangerous works at high places will be included in the construction works of the Project such as those for roofing, where accidents of rolling / falling down cannot be overlooked. In particular, because those at the building made of steel frame include works of tightening bolts, safety net will be placed under the roofs to prevent accident of rolling or falling down. For the workers, such safety measures will be taken as guide and educate safety works, too. At the same time, it will be necessary to staff guards who are regularly stationed even at night in consideration for measures of preventing crimes, such as measures against theft etc.

(2) Undertaking in Procurement

The application procedures for tax exemption and incurred cost are borne by the Egyptian side. Inland transportation is borne by the Japanese side that includes transport by trucks from Alexandria, the port of cargo collection to the Project site in Damanhour City. The distance of transportation is measured at around 65 km, with favorable road conditions.

2-2-4-3 Scope of Works

(1) Sharing Division of Implementation

Sharing division of implementation between the Egyptian and Japanese sides are shown below (Table 2-16).

Table 2-16 Sharing Division of Implementation

Item of Implementation	Japan	Egypt	Remarks
1. Procurement of the site ground			
(1) Procurement of the site ground for construction		○	Demolishing the existing facilities including hazard objects or buried ones in the ground, and land clearing / leveling
(2) Provision of the space for temporary utility/facility for Works		○	Land for planned access road adjacent to the site
(3) Infrastructure consolidation		○	Electricity: application license to draw extension cables and transformer including the primary-line drawing with installation of transformer, Telephone: application license to draw extension lines, primary drawing and distribution of codes in the site, installation of phones, Water supply: application license for municipal water & primary drawing Drainage: application for connecting to main sewerage drain and connection works
2. Facilities			
(1) Construction of facilities as described in the report of the D/D study	○		Attached facilities to the main facilities including electricity, air-conditioning, hygiene facilities etc, infrastructure improvement such as electricity supply and water supply / drainage
(2) Existing fuel supplying facility		○	Existing fuel tank & measuring gauge can be still used
(3) Temporary fencing and temporary gate	○		
(4) Pavement within the site	○		
(5) Planting works		○	Exterior works including plantings and garden designing
(6) Improvement wall fence etc.		○	Repair and renewal of exterior facilities like wall fence, door-gate
3. Procurement and installation			
(1) Furniture and fittings / fixtures		○	Furniture, curtains, fixtures etc. necessary for O/M, management
(2) Equipment to be procurement in the Project	○		Including installation works
(3) Equipment, tools etc. required other than (2) above		○	Including shift of the existing equipment and reinstallation works
4. Services for clearing procedures, cost bearing etc.			
(1) Various procedures related to construction		○	
(2) Custom clearance procedures		○	
(3) Measures related to inland transportation	○		
(4) Procedures for the exemption of taxes / duties		○	Including cost
(5) Expenses other than those borne by the Japanese side		○	
(6) Banking Arrangement (B/A), issuance of authorization to pay (A/P)		○	Including cost
(7) Provision of conveniences needed for disembarkation and sojourn of Japanese nationals who enter and stay in Egypt for the purpose of performing tasks of the Project		○	Including cost bearing

Note: ○ indicates the divided share of implementation of the Project.

(2) Sharing Division of Procurement and Installation

Since the Project includes building construction and equipment procurement as well as equipment to be procured is required the works of installation, test run and operation guidance, therefore, such works including inland transportation will be borne by Japanese side.

2-2-4-4 Consultant Supervision

(1) Contents of Services for Detailed Design Study

The consultant will organize a consistent Project team with the services of providing Detailed Design Study (D/D) and supervision of implementation to envisage smooth implementation of the Project in compliance with the contents of Basic Design Study (B/D). The services of the consultant in D/D are the followings:

1) Site study works required for D/D and provision of D/D,
2) Review of the cost estimation performed during Basic Design Study (B/D), and
3) Provision of detailed drawings and tender documents

Here, the staffing of chief manager (1 person), principal engineer in charge of construction (1 person), construction engineer (1 person), engineer in charge of structure (1 person), engineer in charge of electric equipment (1 person), engineer in charge of water supply / drainage, engineer in charge of tender document (1 person), engineer in charge of cost estimation (1 person) for construction as well as equipment planning (1 person) and cost estimation (1 person) for equipment are planned to staff for the Project.

(2) Supervision Plan on Construction/Procurement

The consultant shall take charge of tender, evaluating tender, witnessing at contract negotiations, consulting with the implementing agency. The consultant shall closely sustain coordination with the implementing agency in the Egyptian side, the responsible agencies in the Japanese side, contractors and suppliers undertaking construction and equipment procurement in its supervision of implementation so as to sustain control on working schedule, quality of the works, control of performance and safety.

1) Consulting Engineers to be Dispatched

For the supervision of site construction, qualified person with the experiences on the construction works of the project under Japan’s Grant Aid Scheme in the field of overseas services, also with intelligence and experiences on law of Building Standards Act and other related regulations for construction is appointed to take charge of supervising services. It also plans to adequately dispatch supervising staff to the site consisting of consultant engineers as in Table 2-17. Further, as local staff, it shall employ local engineer for supervising construction, driver, and worker for miscellaneous labor works.

Table 2-17 Consulting Engineers to be Dispatched

Role of engineer	Number	Content of services	Period of dispatch
Regularly stationing supervisor	1	Overall supervision of the Project, negotiations and consultations with stakeholders/ related agencies	Throughout the construction period
Engineers of each disciplinary	as required	Point supervision on construction works, structure works, electricity works, water supply and drainage works, etc.	For adequate period during the construction period
Equipment Supervisor	1	Overall supervision of the equipment procurement, installation, testing and primary operation, operation teaching	For adequate period during the construction period

2) Implementation Supervision

Implementation supervision comprises a wide and diversified range of works including procurement of equipment and materials, temporary works, foundation works, structural works, facility works, interior works and exterior works. To cope with such diversity, the consultant shall supervise construction works including the following items in coordination and cooperation with the implementing agency in the Egyptian side:

- Supervision on the work schedule
- Progress reporting, taking measures against the problems and leading to the solution
- Quality control
- Supervision on the safety
- External negotiations and consultations, and
- Supervision on the payment of construction costs

3) Control on the Work Schedule

In order for the contractors to observe the deadline specified in the contract, the consultant shall make weekly or monthly comparison between the planned work schedule at the period of contract and actual progress thereof. Wherever delay of the schedule is previewed, it shall prompt and foster the attention to the contractor(s). At the same time, it demands the contractor(s) to submit and execute the countermeasures, thereby instructing so that the contractor(s) can complete the delivery of the completed works or of the procured equipment and materials.

The contents of comparison between the planned schedule and actual progress shall mainly cover the following items:

- Confirmation of the actual performance of planned construction (state of procuring construction equipment and materials and state of progress on the construction works)
- Confirmation of the actual delivery of equipment and materials (for construction equipment and materials and fixtures)

・ Confirmation of the progress of temporary works and the preparation of construction machines (as need arises)

4) Supervision Plan on Procurement

Contents of supervision on procurement are as follows:

・ Confirmation and collation of equipment and shop drawings: the shop drawings provided by the contractor(s) are confirmed based on the contract documents,
・ Inspection prior to delivery: After the completion of manufacturing the equipment, documents of factory inspection are checked whether the actual specifications of the products match with those described in the specifications and the delivered quantities will be checked,
・ Collative inspection of the equipment prior to shipment: Before the procured equipment is shipped, inspection shall be made through the third inspecting organization on the visual appearance and quantities (items and numbers) to confirm whether the specifications thereof meet with what is required in the contract documents. Then approval of shipping will be given to them, and
・ Supervision services during the installation period: As the supervision services during the period of installation, ① works of installation and adjustment, ② instruction on test running, initial operation and operation guidance and ③ inspection / handover of the equipment are confirmed.

2-2-4-5 Quality Control Plan

(1) Quality Control

The supervision shall be made based on the following items to check whether the actually manufactured and delivered construction equipment and materials as well as constructed buildings / facilities satisfy with the required finished work quality and specifications of those mentioned in contract documents:

・ Collation of drawings of construction works and specifications of equipment and materials for these works,
・ Collation of manufacturing drawings of fixtures and fittings and their specifications,
・ Witness / inspection at the site of manufacture / production sites or collation of the results of inspection,
・ Collation of installation drawings for equipment and instructions of installation, and
・ Confirmation and supervision on specified finished work quality / state of completion.

(2) Safety Control

Supervision shall be exercised to prevent labor accidents at the site and harm and accidents towards the third persons during the construction period in consultation and collaboration with the responsible personnel for safety control at the side of the contractor(s) undertaking the Project works. The following are the items to be regarded on the safety control at the site:

- Formulation of safety control regulations and selection / appointment of safety manager,
- Prevention of accidents through the regular check of construction machines,
- Fixation of operating routes of construction vehicles, carrying machines and thorough reinforcement of safety driving, and
- Installation of safety facilities and their regular inspection.

(3) Construction Management Plan of Contractors

Careful management is necessary for realizing designed quality of buildings amidst the construction within the limited site area, with plural buildings that have to be built during overlapping construction periods. To this end, it is planned that Japanese engineers will be dispatched so that, the chief engineer, architectural engineer, construction manager (facilities) and administrative manager for each will be regularly stationing at the site. As for other required technical staff, local staffs will be employed at the site.

Throughout the construction period, technical transfer to local technical staff is made as to construction management. In this connection, it is necessary to procure / employ local engineers, skilled laborers covering many kind of works and construction materials. Hence, an administrative manager will be staffed to cope with anticipated enormous volume of office / clerical works related to orders / communication for local employment and with hired local staff and general managing works.

2-2-4-6 Equipment and Materials Procurement Plan

(1) Equipment and Materials for Construction Works

1) General Construction Materials

Although cement, reinforcing bars, timber, light-steel manufactures, fittings, facility for ventilation and illumination can be domestically procured, almost all equipment and materials are to be procured in Cairo City or Alexandria City and carried to the site. Multitude of wholesalers and retailers dealing with construction equipment and materials exists where sands, various sorts of aggregates and crushed stone, cement (four major brands: Amirya, Suez, Assuit, Egyptian), reinforcing bars, gypsum, brick, tile, marbles are readily obtained though these local produce are limitedly available. As to procurement of large amount of cement and reinforcing bars, they will be directly transported from factories located at outskirts of Cairo City or Alexandria City. Table 2-18

shows division of procurement.

Table 2-18 Procurement Division of General Construction Materials

Classification	Name of materials	Eligible Source Country			Remarks
		Egypt	Japan	Third country	
Construction Materials	H-shaped steel	○			Available at local markets
	C-shaped steel	○			Ditto
	Barbed wire	○			Ditto
	Deformed reinforcing bar	○			Ditto
	Cement	○			Ditto
	Fine aggregates	○			Ditto
	Crude aggregate	○			Ditto
	Mixed neutralizing agent	○			Ditto
	Stone materials	○			Ditto
	Timber	○			Ditto
	Veneer / plywood board	○			Ditto
	Beatty	○			Wooden scaffold is common, rental one not available
	Pipe/ board for scaffold	○			Available at local markets
	Form assembling materials	○			Ditto
	Asphalt	○			Ditto
	Painting materials	○			Ditto
	Brick	○			Ditto
	Grating	○			Ditto
	Glass	○			Ditto
	Tile	○			Ditto
	Wooden / steel doors	○			Ditto
	Aluminum sash	○			Ditto
	Interior materials	○			Ditto
	Roofing water seal materials	○			Ditto
Facility materials	Overhead crane		○		Not available at local markets
	Painting baffle booth		○		Ditto
	Cable	○	○		Some parts from Japan
	Socket	○			Available at local markets
	Tap/drain water pipe materials	○			Ditto
	Ventilation fan	○			Ditto
	Air conditioner	○			Ditto
	Water supply / hygiene facility	○	○		Ditto
	Incoming switch-board	○	○		Some parts from Japan
	Illumination implement	○			Available at local markets
	Electric cable pipe	○	○		Some parts from Japan

2) Construction Machines

Though most commonly used construction machines are available including bulldozers, backhoes, and cranes etc., it is difficult to procure all of them in and around Damanhour. They are therefore planned to be procured in Cairo City or Alexandria City on a rental basis and transported to the site. For methods of renting and cost coverage, it is planned that equipment to be procured is divided into two categories, i.e., machines for a short term use during a particular construction period and those commonly used for various types of works within the site for a long term. Division of procurement is indicated in Table 2-19.

Table 2-19 Procurement Division for Construction Machines

Classifica-Tion	Name of materials	Eligible Source Country			Remarks
		Egypt	Japan	Third country	
Construction machines	Bulldozer	○			
	Backhoe	○			
	Crane	○			
	Vibration Roller	○			
	Rammer	○			
	Concrete Mixer	○			

(2) Procurement of Equipment

1) Equipment will be procured with the following plan:

- As to audio-visual equipment to be used for training, the local made equipment will be procured because it is commonly distributed in local market,
- As to forklift, that produced in Japan as the third country brand or Japanese brand and it can be purchased through local agents with systematic servicing networks, taking into consideration O/M after purchase,
- As to equipment for repair, made-in-Japan products with stable quality and high reliance will be procured since it includes greatly diversified items, and
- In the procurement, it includes installation, adjustment / test running and instructions on operation and application at the site.

2) The range of spare parts and expendables shall be based on the following interpretations.

- The spare parts of the equipment for repair and training equipment are not included in the Grant Aid element of the Project because they include very few parts to be regularly changed,
- Although spare parts of the items including blades, refilling of gas, tools, etc. are required for a part of electricity-driven tools, gas welder and metal work machines are to be borne by the Egyptian side because they are available at local markets, and
- As to spare parts of mobile workshop, they are borne by the Egyptian side because they are readily obtained in local markets.

Table 3-20 indicates Procurement Division for Equipment.

Table 2-20 Procurement Division for Equipment

Classifi-cation	Name of Equipment	Number on Equipment list	Eligible Source Country			Remarks
			Egypt	Japan	Third country	
Repair bay, Lubrication	Air Compressor	1, 50, 65, 111		○		Made-in-Japan products have advantage in credibility
	Mobile Floor Crane	2		○		Ditto
	Oil Drain with Air Pump	11		○		Ditto
	Chassis Lubricator	14		○		Ditto
Engine repair works	Engine Repair Stand	28		○		Ditto
	Cylinder Head Hydraulic Test Stand	29		○		Ditto
	Valve Refacer	31		○		Ditto
	Eccentric Valve Seat Grinder	32		○		Ditto
	Diesel Smoke Tester	46		○		Ditto
	Fuel Injection Pump Test Stand	48		○		Ditto
	Bearing Heater	49		○		Ditto
Chassis, service	Head Light Tester	54		○		Ditto
	Hydraulic Tire Removing Tools	58		○		Ditto
	Battery Quick Charger	61		○		Ditto
	Puller set	69, 70, 71		○		Ditto
Metal works	Upright Drilling Machine	77		○		Ditto
	Universal Milling Machine	78		○		Ditto
	Hack Sawing Machine	79		○		Ditto
	Hydraulic Shop Press	81		○		Ditto
	Lathe	95		○		Ditto
Welding	AC Arc Welding Machine	101		○		Ditto
	Welding Rod Dryer	102		○		Ditto
	Gas Welder	103		○		Ditto
	Gas Cutting Table	105		○		Ditto
	DC Engine Welder	106		○		Ditto
Washing and painting	Hot & Cold Water and Steam Combination Washer	108		○		Not available in the local markets, difficult to obtain in the third countries
	Parts Washing Stand	109		○		Made-in-Japan products have advantage in credibility
Handling Equipment	Forklift, 2-ton	112	△	○		Made-in-Japan products with European Brand
Mobile Workshop	Mobile workshop	113		○	△	Some are made in third country with Japan Brand
Training equipment	Cut Model (Water-cooled diesel engine)	114		○		Made-in-Japan products have advantage in credibility
	OHP	115	○			The local has advantage for price & services
	Screen	115	○			Ditto
	Slide Projector	116	○			Ditto

2-2-4-7 Operational Guidance Plan

Considering a wide variety of the equipment for the workshop and necessity of consistent work flow on repair and maintenance works, initial operational guidance mainly on electric tools and testing apparatus including applied operational works on some major items, which will be frequently used, are to be done. In order to carry out the guidance to the technical staff of AMS efficiently in limited time period, simultaneous guidance in 2 groups will be carried out by mechanical engineers dispatched by the contractor who are in charge of 2 categories: one for repair/testing/adjustment of agricultural machinery and the other for metal works respectively. Considering the level of operational skills and past experiences of the staff, concentrated short-term guidance will be done. To cope with future job transfer and/or absence in emergency cases, plural staff (at leaset 2 persons) has to be targeted at each guidance subject. Operational manual and other teaching materials will be used for securing the quality of guidance. Generally, costs of necessary utilities such as electricity, fuel, water, etc, which will be consumed during the guidance period, will be borne by AMS.

2-2-4-8 Soft Component Plan

AMS has sufficient experiences consisting of more than 20-year history and countrywide activities, and thus other existing centers are well operated and maintained, too. Facilities to be constructed and equipments to be procured under the Project are similar to those of such existing centers. Since any excessively advanced technology is not required to the operation and maintenance for those, suitable operation and maintenance would be carried out under past experiences. Therefore, it is justified that there is no necessity of technical assistance in this Project.

2-2-4-9 Implementation Schedule

Twelve months are previewed for the construction of the buildings for the Project. Since it will take eight months for the preparatory work borne by the Egyptian side (from the shift and withdrawal of existing activities to dismantling and demolishment of the existing facilities), more than eight months will be taken from signing of E/N to commencement of the construction works. Since there is little rain throughout a year in the project site, effects of raining will not be considered during the construction period. Detailed Design Study and Construction/procurement supervision under the A-type national bond are shown below: Implementation schedule is summarized in the following bar chart (Table 2-21)

(1) Detailed Design Study (D/D)

1) Site study	0.5 month
2) D/D・Provision of tender document	4.0 months
3) Approval of tender document	0.5 month
Total	5.0 months

(2) Construction / procurement supervision

1) Tendering

・ Publication, drawing distribution, site explanation	0.5 months
・ Tendering	1.5 months
・ Tender evaluation, contract with contractor	1.0 months
Total	2.5 months

2) Construction

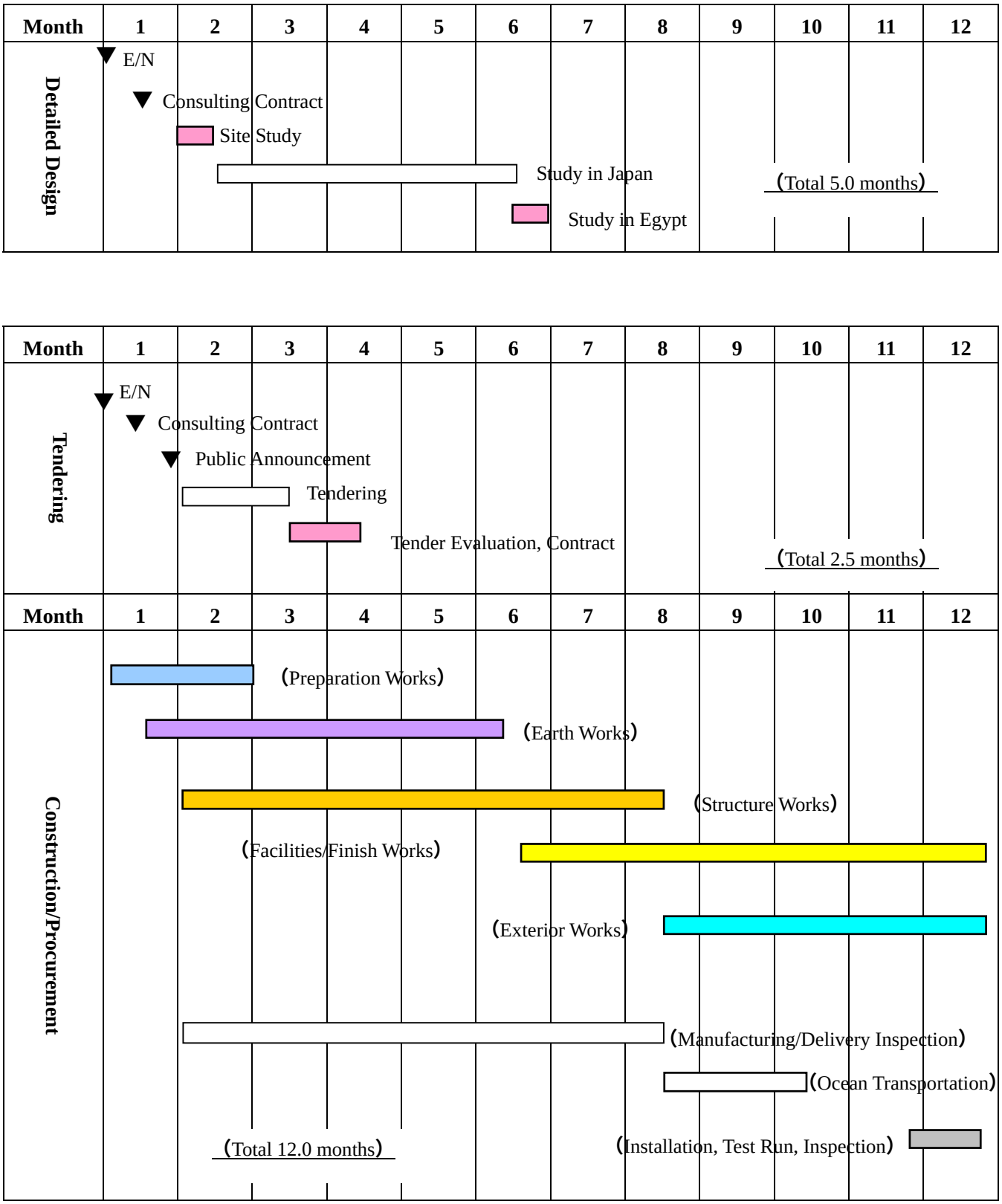
・ Preparation / temporary works	2.5 months
・ Earth works	5.0 months
・ Structural works	6.5 months
・ Facilities/Finish works	6.5 months
・ Exterior works	4.5 months
Total	12.0 months

3) Procurement of Equipment

・ Preparation of Installation Drawings ・ Manufacturing、Inspection at Factory	6.5 months
・ Inspection before delivery, Inspection before shipment	
・ Acceptance before shipment, Agreement (0.5months included in the above)	
・ Shipping, Ocean transportation	2.0 months
・ Unpacking, distribution, installation ・ Adjust, test run, initial operation	1.3 months
・ Application operation, inspection, handover	
Total	10.0 months

(or 12.0 months for combined works of construction/procurement)

Table 3-21 Implementation Schedule



2-3 Obligations of the Government of Egypt

2-3-1 General Obligations

(1) To provide necessary data and information for detailed design conducted by the Japanese consultant after the approval of this basic design,

(2) To secure land necessary for the Project and to clear, level and reclaim the land prior to commencement of the construction and the installation of equipment and materials,

(3) To provide facilities of electricity, water supply and drainage and others necessary for the Project in and around the sites,

(4) To bear advising commission of an authorization to pay and payment commissions to the bank,

(5) To ensure all the expenses and prompt execution for unloading and customs clearance at the port of disembarkation and tax exemption of the equipment and materials for the Project,

(6) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Egypt with respect to the supply of the products and services under the Verified Contracts,

(7) 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 Egypt and stay therein for the performance of their works,

(8) To maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to inform the conditions of the facilities constructed and equipment procured by the Grant Aid to Japanese side as requested. The products purchased under the Grant Aid should not be re-exported from the recipient country, and

(9) To bear all the expenses necessary for the execution of the Project other than those to be borne by the Grant Aid

2-3-2 Works to be Borne by the Egyptian Side

Works to be borne by the Egyptian side for the Project are indicated below:

(1) Shift of General Administration (GA) and the farm machinery hiring service (HS) (during the construction period): shift of staff and fixtures, disassembling and transfer of the shelter, continuation of the hiring service,

(2) Application for disassembling of the existing facilities within the site and the perimeter fence, tender for disassembling works, and disassembling/ demolishment works,

(3) Submission of application for licensing construction works and acquisition of permission,

(4) Works of drawing the primary electric source into the site: including a transformer with 500kVA and its attachment facilities (as to definite amount of kVA, it will be informed from Japan after completing the Detailed Design Study),

(5) Introduction of water source into the site,

(6) Installation of necessary furniture, and

(7) Procurement and installation of self-actuated fire extinguishers, various types of fire extinguishers and escape route signs.

The AMS has decided to cover their total obligation fees by his own budget and considered periodical budgeting. Their works to be finished before the Project Implementation are “Shift of GA and HS activities”, “Disassembling and demolishment of the existing facilities” and “Acquisition of the permission”. Costs of those are decided to clear up in AMS.

2-4 Project Operation Plan

2-4-1 System of Management and Operation & Maintenance (O/M)

(1) Alteration of Present O/M System

Accompanying with the up-grade of the present Damanhour Hiring Station (HS) to the Damanhour Agricultural Mechanization Center (DAMC) through the implementation of the Project, related functions, organizational system and staffing will be altered. As DAMC is established, the new organization of Central Administration (CA) will control three General Administration (GA) (Beheira, El Aradi El Gededa and Wadi El Natron) and Hiring Stations. This CA assists three major functions of the Center with its staff, itinerant visit (monitoring) to each Hiring Station in cooperation with GA for technical instructions. Fig. 2-4 shows an organizational system controlling the AMC.

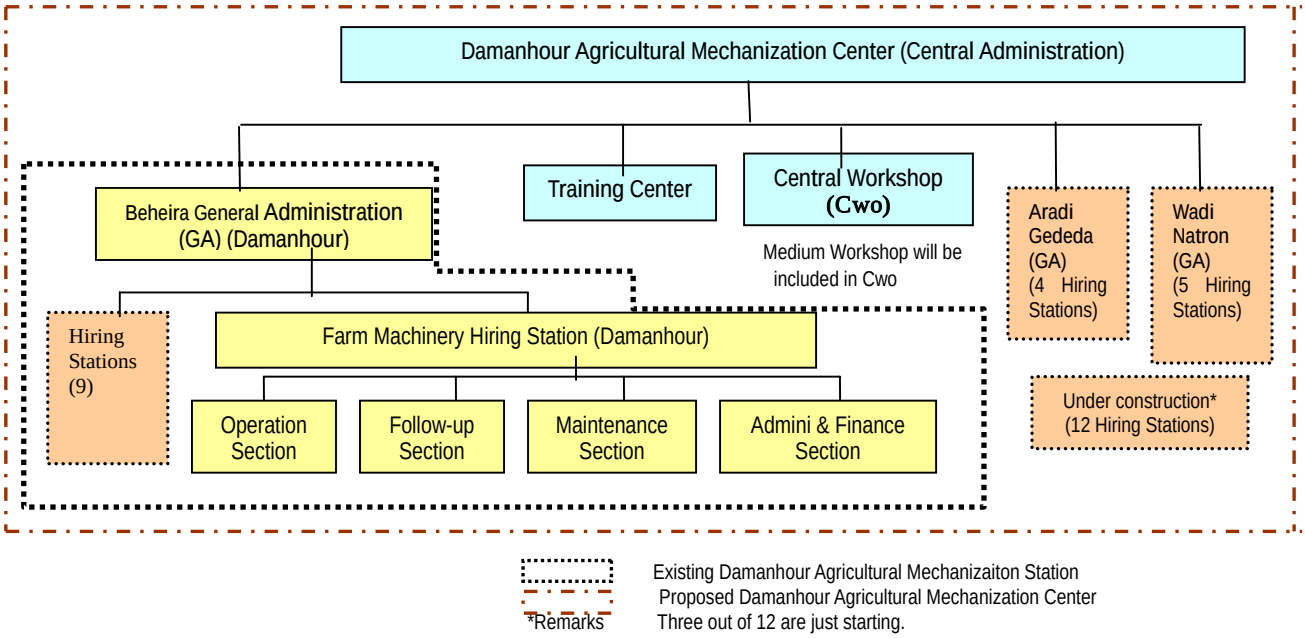


Fig. 2-4 Organization of Proposed DAMC

(2) Staffing

In addition to the existing staff of DAMC, which constitutes the majority of all, personnel will be additionally increased for the functions of the training center and the central workshop to be newly established and others. Deficiency in required staff of DAMC will be basically coped with shifting of experienced staff from similar centers and GAs and/or HSs in the target site, but partly supplemented with public recruitment from surrounding areas. The total staff planned DAMC will be 234, adding reshuffled 47 and publicly recruited 32 (9 carpentry staff are excluded) to the existing 155. In this regard, as the target personnel in this Grant Aid element, the target staff

comprises the existing staff and that of newly recruited who are definitely engaged in the newly established functions, based on basic policy thereon. Table 2-22 shows staffing and staff recruit methods.

Table 2-22 Staff Recruit Methods of Each Related Office

Post	Present (person)	Plan (person)	Target (person)	Recruit Methods
Repair/Maintenance Function				
Central Workshop (Cwo)	20	52	52	・ 20 mechanic & technicians are existing. 16 mechanic & technicians will be recruited among experienced persons in private workshops in and around Damahour. ・ Other 16 will be shifted from GA and HS in Beheira. ・ 9 carpenters are not included in the Project. Because carpentry is not directly connected with the concept of the Project.
Training Function				
Training Center (TC)	0	20	20	・4 instructors will be transferred from technician of AMS in Beheira. ・9 staff will be transferred from administration staff of AMS in Beheira ・7 staff will be recruited from experienced persons in Damanhour area.
Hiring Service Function				
Hiring Station (HS)	102	112	102	
Chief of the center	0	1	0	・Not included in the Project
Division Chief	1	1	1	・Existing
Management Section	47	56	47	・47 staff are existing ・9 additional persons in the future are not included in the Project.
Follow-up Section	17	17	17	・Existing
Management and Accounting Section	21	21	21	・Existing
O/M Section	16	16	16	・Existing
Others				
Undersecretary	0	1	1	・Transfer from Sakha Center.
Central Administration Sector (CA: Central Administration)	0	14	12	・Transfer from Sakha Center ・2 additional persons in the future are not included in the Project.
General Administration Sector (GA: General Administration)	33	35	33	・Existing ・2 additional persons in the future are not included in the Project.
Total	155	234	220	・79 increased (47 transferred, 32 recruited)

Remarks: Column of “Target (person) means the persons for base number of the Project design.

2-4-2 Contents of Management and O/M

DAMC will be responsible for management and O/M of the facilities to be constructed and equipment to be procured in the Project. There is no technical problem since such facilities and equipment do not require any high O/M technology in particular and the contents of O/M are the same as those used in similar centers (AMC in Sinbellawein or Sakha). Experiences of staff in O/M are deemed sufficient, seeing that the existing staff to be remained in the Center will account for 70% and many of new staff will be recruited from the other centers and hiring stations.

System needed for O/M, including protection and repair, is conducted by function. The costs for management and O/M are also categorized by function, and annual balance for the Center is calculated by CA. The system is that Central Workshop (Cwo) asks CA for spare parts and expendables for its facility, Training Center (TC) does for its energy costs and communication costs and Hiring Station (HS) requests for its energy costs and communication costs to meet their requirements. This system follows those of the other centers. Hiring Station also manages and maintains the other facilities of the Center, and conducts the security of the Center by deploying staff at two guardhouses.

2-5 Project Cost

2-5-1 Initial Cost Estimation of the Project

The estimated initial project cost for implementing this Project is estimated 886 million Japanese yen in total. According to the implementation between the Egyptian and Japanese sides aforementioned, costs borne by both sides are shown as bellow: This cost estimation is provisional and would be further examined by the Government of Japan for the approval of the Grant.

(1) The cost borne by the Japanese side:

"The Project for Modernization of Agricultural Mechanization Center in Damanhour in Egypt"

Approximate Project Cost Approx. 839.8 million yen

Table 3-23 Cost Borne by the Japanese Side

4 buildings in Beheira State (and 7 adjunct facilities) (Total floor area: 4,856.78m^2)

Items		Approximate Project Cost (Million yen)	
Facilities	Workshop building, Training building, Staff building, Tractor shelters Adjunct facilities (Guard houses, Sub-station, Fuel station office, Eaves, Car wash, Inclining step)	637.8	741.0
Equipment	Equipment for Washing & Cleaning, Chassis & body repair, Electric & hydraulic repair, Metal works, Welding, Engine & driving repair, Fuel injection pump test, Adjusting & Lubricating, and Handling, Mobile workshop, Cutaway model, OHP, Slide projector	103.2	
Detailed Design, Implementation／Procurement Supervision, Guidance			98.8

(2) Cost to be Borne by the Egyptian Side: Approx. 46.06 million yen

Table 2-24 Cost borne by the Egyptian Side

Contents of construction works borne by Egypt	Period	Estimated cost (LE)	Remarks
1. Transfer the GA & HS to the temporary site: (1) Transfer staff, equipment and furniture/fixtures (2) Demolish/transfer of shelters (3) Continue the farm machinery hiring service	1 month	50,000	Start after E/N signed
2. Demolish the buildings within the site: (1) Obtain the demolishing license (2) Bidding for construction and a contract (3) Demolish the buildings	6 months	80,000	Start after E/N signed
3. Demolish and construct fence (east & south): (1) Obtain the demolishing license (2) Bidding for demolishing works (3) Demolish the buildings (4) Construct fence	8 months	435,000	Start after E/N signed
4. Construct AMC: (1) Obtain the construction license from the Damanhour city council	2 months	100,000	Receive Detailed Drawings from Japanese side, Start 2 months after demolished.
Sub-total (Cost needed during the preparation)	8 months	665,000	
5. Construct distribution electricity line to the site: (1) Including transformer 500kVA according to the proposed loads from the Japanese side	6 months	250,000	During the Construction of Center
6. Construct water supply to the site	2 months	100,000	During the Construction of Center
Sub-total (Cost needed during the preparation)		350,000	
7. Install and procure self-actuated fire extinguishers, various fire extinguishers and escape route signs.	1 month	48,000	Just prior to completing the Construction of Center
8. Procure furniture and accessories	1 month	600,000	During the Construction of Center
9. Demolish and construct fence (west & north): (1) Obtain the demolishing license (2) Bidding for demolishing works (3) Demolish the buildings (4) Construct fence	8 months	359,000	During the Construction of Center After the construction by Japanese side.
Sub-total (Cost needed after the Construction)		1,007,000	
Total Cost (Construction cost to be borne by the Egyptian side)		2,022,000	
Other costs: Land acquisition for temporary works (approx. 5,000m^2)		180,000	
Banking Arrangement, Authorization to Pay		16,000	
Customs Clearance		40,000	
Sub-total (Other costs)		236,000	
Grand Total		2,258,000	

(3) Conditions of Cost Estimation

1) Time of estimation: March 2006 (at the completion of Basic Design Study)
2) Currency exchange rate: 1US$ = 117.10 yen
   1 LE = 20.40 yen
3) Currency exchange rate: Construction period is given in the work schedule.
4) Others: The project is to be carried out in compliance with the Japan's Grant Aid Scheme.

2-5-2 Management and O/M Cost

(1) Management and O/M Cost

For implementing the Project, the annual cost of energy and communications, expendables for equipment, etc. incurred for O/M of DAMC of the Project are estimated as in Table 2-25. Costs for utility and expendable purchase are shown in Table 2-26.

Table 2-25 Cost for Management and O/M of DAMC

Item	Cost ('000' LE)
Personnel	914
Electricity	65
Fuel	26
Component purchase	215
Expendable purchase	25
Total	1,245

Table 2-26 Costs for Utility and Expendables

Item	Cost (LE)	Basis of calculation	Quantity
(1) Utility cost			
Electricity	51,320	Annual amount of electricity used in facilities	256,600 kWh
Water	2,385	Amount of water used in facilities	5,300 m^3
Gas	5,800	Amount of gas used in facilities	5,800 kg
Phone	5,500	Future increases are estimated from past record of similar facilities	
Sub-total	65,000		
(2) Expendable purchase			
Welding rod	5,000		100kg
Acetylene・Oxygen gas	5,000		10 tanks
Replacement blade of tool	10,000	Lathe, miller, drill, grinder, and others	
Others	5,000		
Sub-total	25,000		

While only the farm machinery hiring station belongs to the profitable section, GA, HS, central workshop and training center are non-profitable sections. A budget for the management and O/M cost of the DAMC is prepared, and the headquarters AMS will be responsible to manage it. The amount of the budget is 331,000 LE (personnel cost subtracted: 1,245,000 LE – 914,000 LE) is

equivalent to only 0.82% of the total management and O/M costs of the headquarters 40,281,000 LE (the difference between the headquarters' budget and the MALR contributions & personnel cost: 62,384,000 LE - 22,103,000 LE (2004/2005)) and his financing is kept balanced in black every year, AMS would be able to cover all O/M costs by himself.

(2) Points of Concern in Management and O/M

Since the equipment will eventually get older and will require replacement, AMS has to take into account the following points.

1) In Egypt, farm machinery is used for about two times longer than their normal lives (tractor: 8 years, combine: 5 years) and some for longer than 20 years. This often makes it wholly damaged and requires users to be very careful with its maintenance and checkup. Use of genuine parts as often as possible is preferable.

2) As preventive maintenance, it is necessary to keep doing daily and/or routine checkup. When needed, damaged parts must be replaced right away.

3) Some components would be discontinued manufacturing in the future and making substitute parts will be indispensable. Therefore, it is essential that universal machines, electric tools, and manual tools would be sufficiently maintained and utilized.

4) Except for small electric tools, equipment for repair and maintenance has long lives and can be used for longer than 20 years for general purposes. While daily maintenance and checkup are required, it is also necessary to make plans for renewal.

2-6 Points of Concern in Implementation of the Project

The following points should be concerned in the Project for smooth and efficient implementation.

(1) Timely accomplishments of equipment procurement and coordination among stakeholders

This project includes construction of buildings and procurement of equipment as a combined project, and thus synchronous delivery of the equipment according to the construction schedule is required. In order to timely accomplish, workshop equipment should be procured and installed after some parts (floor pavement, overhead mobile crane works such as installation, trial run and final inspection, electric wirings, air piping works, drainage, etc.) of workshop building have been constructed. Therefore, all stakeholders have to coordinate and adjust all relevant issues beforehand.

(2) Obligations of the Government of Egypt

1) It is necessary for the Egyptian side to take fast-track and planned management system to avoid

any delay because of considerable amount of required cost and long construction period in a span of 8 months before commencement of construction. Close communication and coordination among the stakeholders will be required.

2) Securing of land required for temporary works for contractor is another undertaking. At this stage, future road construction site bordered on north of the Project site is supposed to be utilized for this purpose. Though the land is possessed by Damanhour city, Egyptian side shall secure this absolutely before commencement of construction. In case that the land is not large enough, other additional site shall be arranged in neighboring areas.

3) Establishment of A/P (Authorization to Pay) and Customs Clearance are also undertakings of Egyptian side. Proper coordination and execution among authorities concerned are required without any delay.

Chapter 3 Project Evaluation and Recommendations

Chapter 3 Project Evaluation and Recommendations

3-1 Project Effect

Effects of this Project are shown in Table 3-1. The direct effects are as follows: establishment of the training facilities will contribute to enhancing both knowledge and technical levels of farmers as well as those of operators and mechanics; by establishing a central workshop, average maintenance and repair period can be shorten, resulting in longer operational time of agricultural machineries for hiring service.

As further in-direct effects, supporting system of promoting agricultural mechanization will be established, agricultural mechanization will be promoted in the target area, contributing to increase in productivity, quantity of agricultural outputs, and farm incomes.

Table 3-1 Project Effects

<table>
<tr><th>Current Status and Problems</th><th>Project Input Plan</th><th>Direct Effect</th><th>In-Direct Effect</th></tr>
<tr><td>＜Training Facility＞
- Lack of training facilities causes insufficient knowledge and/or skills of operators and mechanics. It leads to inefficient O/M as well as shortening of operating hours.
- Insufficient knowledge of farmers is as an obstacle to further agricultural mechanization.</td><td>- Construction of training building
- Procurement of training equipment</td><td rowspan="3">- Total number of staff trainees will reach 400 per year.
- Total number of farmer trainees will reach 200 per year.</td><td rowspan="3">- Newly-established training facility will provide training fitting with regional peculiarity, strengthen the trainees' motivation for agricultural mechanization, and contribute to promotion of agricultural mechanization.</td></tr>
<tr><td>＜ Repair/Maintenance Facility＞
- Lack of central workshop causes late response to heavily damaged breakdowns and/or frequent field failures of the agricultural machinery. This reduces operating period of machines.</td><td>- Construction of workshop building, staff building, and adjunct facilities
- Procurement of workshop equipment</td></tr>
<tr><td>＜ Farm Machinery Hiring Facility＞
- Agricultural machines are mostly obsolescent, resulting in many cases of field failures and shortage of workable machines for hiring service</td><td>- Construction of tractor shelter</td></tr>
<tr><td colspan="2">- Time for repairing one machine will be reduced from the present level of 90 days to 36 days (60% reduction).
- Rate of workable machines will be raised from the present level of 85.8% to 94.4% (approx. 10% increase).</td><td>- Stable hiring service of agricultural machinery will enable efficient land use and increase productivity.
- Agricultural productivity and farm incomes will increase in the Target area.</td></tr>
</table>

3-2 Recommendations

3-2-1 Issues to be Required to the Egyptian Side

To achieve more efficient effects from the Project and sound sustainable operation and maintenance (O&M), the Egyptian side is required to respond to the following issues:

(1) Technical Transfer from the Existing Similar Centers

AMS has already established and maintained central workshops and training centers in several districts and attained definite effects for promoting agricultural mechanization. After establishing this Center, technical transfer from the existing similar centers is expected for more prompt and efficient O&M of this Center.

(2) Personal Exchanges among Authorities concerned

There is a training center for agricultural machines, Farm Machinery Training Center (FMTC) in Maamoura under the jurisdiction of MALR. FMTC is, as an education school, training technicians of agricultural field with 33 training courses and methods of training would be excellent. Personal exchange between it should be considered to attain more effective O&M of this Center. And another personal exchange between the Ministry of Military Production (MoMP), that has manufacturing lines of agricultural machinery would expectedly lead to the further effectiveness.

(3) Sustainable Management by Egypt

AMS has procured equipment with donors' funds. And, with collateral funds of the procurement, proceeds from the activities and investment budget from MALR, it has established the facilities of Central Administration in 6 sites, General Administration in 20 sites and Hiring Stations of agricultural machinery in 126 sites, and have conducted management and O/M of those. In the near future, it is expected to achieve its initial goal on agricultural mechanization plan: "Establishment of Agricultural Machinery Hiring Stations in 150 sites". Moreover, AMS is equipped with facilities for training, repairing/maintaining, and storing/delivering of spare parts essential for its activities, which has enabled financially and technologically sound O/M and has increased its technological level accompanied with its ample experiences. For these reasons, Egypt is strongly recommended to plan and implement sustainable management and O/M by their own, including renovation of aging agricultural machinery.

3-2-2 Technical Cooperation and Collaboration with Other Donors

Facilities to be constructed and equipment to be procured for the Project do not require very sophisticated O/M techniques and there will be neither technical problem nor necessity of particular technical assistance. However, along with technology development from year to year, agricultural machinery is becoming more and more sophisticated. When procuring such machinery,

it is required to regularly catch up with new technologies under consideration of technology transfer from its suppliers or donors. Therefore, in the future, the Government of Egypt is highly expected to have technical cooperation with suppliers and other donors, and collaboration with them for sustainable O/M of the Center, taking into account the renovation of aging agricultural machinery by own budget.

3-3 Project Evaluation

The target area of this Project is one of the main food-producing places in Egypt, and here small-scale farmers holding less than 2 feddans of farmland account for 54% of the total. The hiring service of agricultural machinery will be offered for many residents 225 thousand households in the target area. After implementing this Project, a supporting system of promoting agricultural mechanization will be established to extensively contribute to improving their standards of living.

For staffing in the Center, the existing one to remain in the center will account for 70% and many of new one will be recruited from the other centers and hiring stations. Therefore, experiences of staff in O/M are deemed sufficient. While activities of training and workshops in the planned Center will not generate any profits, only profitable section is a hiring service of agricultural machinery. It is a charge for service levied on farmers, which is minimal amount for smooth management and O/M of the facilities or equipment of the Center. From these viewpoints, it is judged that necessity and validity of Japan's Grant Aid in this Project are quite high.

Finally, implementation of the Project will bring little environmental burden.

3-4 Conclusion

This Project is expected to produce many effects as above and greatly contribute to improving basic human needs of the residents. These ensure high validity of implementing a part of the Project under Japan's Grant Aid. As the Egyptian side is able to prepare sufficient human and financial resources for management and O/M of the Project by themselves, it is judged that the Project will be implemented without any troubles.

[Appendices]

1. **Member List of the Study Team**
2. **Study Schedule**
3. **List of Parties Concerned in the Recipient Country**
4. **Minutes of Discussions**
5. **Other Relevant Data**
6. **Reference**

Appendix-1 Member List of the Study Team

1-1 Basic Design Study

Name	Responsibility	Position
Mr. WADA Yasuhiko	Team Leader	Deputy Resident Representative JICA Cairo Office
Mr. OYA Takeyuki	Project Coordinator	Rural Development Team Project Management Group III Grant Aid Management Department JICA
A. Mr. KUDO Toshinori	Chief Consultant / Facility Planning	Sanyu Consultants Inc. (SCI)
B. Mr. KITAMURA Riichiro	Construction Designing	Zen-Noh Architects & Engineers Inc. (JAEI)
C. Mr. MATSUMOTO Yuichi	Equipment Planning / Procurement / Cost Estimation	SCI
D. Mr. TAMURA Sakae	Implementation Planning / Cost Estimation	SCI
E. Mr. OTA Kazuhisa	Coordinator / Equipment Planning B /	SCI

1-2 Explanation of Draft Final Report

Name	Responsibility	Position
Mr. OKAMOTO Shigeru	Team Leader	Resident Representative JICA Cairo Office
Mr. OYA Takeyuki	Project Coordinator	Rural Development Team Project Management Group III Grant Aid Management Department JICA
A. Mr. KUDO Toshinori	Chief Consultant / Facility Planning	Sanyu Consultants Inc. (SCI)
B. Mr. KITAMURA Riichiro	Construction Designing	Zen-Noh Architects & Engineers Inc. (JAEI)

Appendix-2 Study Schedule

2-1 Basic Design Study

JICA: JICA Members
Consultant A: Chief Consultant /Facility Planning
Consultant B: Construction Designing
Consultant C: Equipment Planning /Procurement /Cost Estimation
Consultant D: Implementation Planning /Cost Estimation
Consultant E: Coordinator /Equipment Planning B

	Date	Day	Movement	Accommo-dation	Activities	Note
1	Mar. 01	(We)	Move to Singapore	In Air	• Leave Japan	A, B, C, D, E
2	Mar. 02	(Th)	Move to Cairo	Cairo	• After arriving at Cairo, meeting at JICA office and Courtesy call to EOJ, MOIC, Meeting with AMS	JICA A, B, C, D, E
3	Mar. 03	(Fr)		Cairo	• Preparation of study	A, B, C, D, E
4	Mar. 04	(Sa)		Cairo	• Site Survey to Damanhour, Sakha, Sinbellawein	JICA A, B, C, D, E
5	Mar.. 05	(Su)		Cairo	• Discussion with AMS on Inception report • Discussion of the results of Preliminary Study	JICA A, B
				Cairo	• Request quotation of equipment and materials to firms • Evaluation and contract for topo. & geological survey to local firm	C, D, E
6	Mar.. 06	(Mo)		Cairo	• Discussion with AMS • Signing of M/M	JICA A, B
				Cairo	• Survey of local contractors and distributors	C, D
				Cairo	• Preparation of baselines survey	E
7	Mar. 07	(Tu)	Move to Japan		• Reporting to MOIC, JICA & EOJ • Back to Japan	JICA A, B
				Cairo	• Discussion with AMS on questionnaire • Nego and contract for topo. & geological survey	C, D, E A, B, E
8	Mar. 08	(We)	Move to Simbelawein	El Mansura	• Survey existing organization, facilities, equipment and O&M	A, B C,
			Move to Simbelawein Back to Cairo	Cairo	• Survey of farming system, marketing, distribution system • Data collection (labor code, etc.)	D, E
9	Mar. 09	(Th)	Back to Cairo	Cairo	• Survey existing organization, facilities, equipment and O&M	A, B, C
				Cairo	• Data collection (building, labor code, etc.)	D, E
10	Mar.. 10	(Fri)		Cairo	• Internal meeting • Documentation	A, B, C, D, E
11	Mar. 11	(Sa)	Move to Sakha	Tanta	• Survey existing organization, facilities, equipment and O&M	A, B, C
			Move to Damanhour	Alexandria	• Survey local contractors and distributors • Supervising baseline survey • Survey farming system, marketing system	D, E

	Date	Day	Movement	Accommo-dation	Activities	Note
12	Mar. 12	(Su)	Move to Damanhour	Alexandria	• Survey existing organization, facilities, equipment and O&M	A, C
				Alexandria	• Supervising topo. And geological survey	B
				Alexandria	• Surveying marketing & distribution system • Supervising baseline survey	D, E
13	Mar. 13	(Mo)		Alexandria	• Discussion about the future plan	A, B, C, D
				Alexandria	• Supervising baseline survey	E
14	Mar. 14	(Tu)		Alexandria	• Survey existing organization, facilities, equipment and O&M at Ghanaklees, etc.	A, B, C, D
				Alexandria	• Supervising baseline survey	E
15	Mar. 15	(We)		Alexandria	• Survey existing organization, facilities, equipment and O&M at AMS in Beheira area	A, B, C
				Alexandria	• Surveying construction firms and distributors • Data collection about weather conditions, etc. at Damanhour	D, E
16	Mar. 16	(Th)	Back to Cairo	Cairo	• Survey existing organization, facilities, equipment and O&M at AMS in Behera zone	A, B, C
			Back to Cairo	Cairo	• Surveying marketing & distribution system	D, E
17	Mar. 17	(Fr)			• Internal meeting • Documentation	A, B, C, D, E
18	Mar. 18	(Sa)	Site survey El Aradi El Gededa zone	Cairo	• Survey existing organization, facilities, equipment and O&M at AMS in El Aradi El Gededa zone	A
				Cairo	• Surveying equipment firms • Data collection of transportation route • Checking the preparation of quotations from equipment and materials firms • Supervising baseline survey	B, D E
19	Mar. 19	(Su)	Site survey Aradi El Gededa	Cairo	• Survey existing organization, facilities, equipment and O&M at AMS in El Aradi El Gededa zone	A,
				Cairo	• Discussion with AMS • Surveying equipment firms Data collection of construction laws and regulations • Checking baseline survey data	B C, D E
20	Mar. 20	(Mo)		Cairo	• Survey Maaroura Farm Machinery Training Center	A, B
				Cairo	• Surveying equipment firms • Data collection of construction laws and regulations • Checking the preparation of quotations from equipment and materials firms	C, D E

	Date	Day	Movement	Accommo-dation	Activities	Note
21	Mar. 21	(Tu)	Site Survey Wadi El Natron	Cairo	• Survey existing organization, facilities, equipment and O&M at AMS in Wadi El Natron zone	A
				Cairo	• Checking baseline survey data • Collection of quotation from local firms • Collection of Baseline survey results	B C, D E
22	Mar. 22	(We)		Cairo	• Discussion with AMS about components, whole plan, necessity of technical assistant, etc.	A, B, C, D
				Cairo	• Documents collection, exchange rate	E
23	Mar. 23	(Th)		Cairo	• Discussion with AMS about basic plan, implementation plan, O&M plan, budget allocation, works by Egyptian side, etc.	A, B, C, D
				Cairo	• Collection of topo & geological survey results	E
24	Mar. 24	(Fr)		Cairo	• Internal meeting • Documentation	A, B, C, D, E
25	Mar. 25	(Sa)		Cairo	• Documentation.	A, B, C, D, E
26	Mar. 26	(Su)	Mover to Japan	In air	• Report to JICA and EOJ • Leave for Japan	A, B, C, D, E
27	Mar. 27	(Mo)	Move to Japan	Japan	• Arrive at Haneda	A, B, C, D, E

2-2 Explanation of Draft Final Report

	Date	Day	Activities	Stay
1	Sep. 8	Fri	Move (Narita 18:30 → Nagoya 19:45 (JL053)) (Nagoya 23:00 → Dubai 05:00 (JL5097))	In air
2	Sep. 9	Sat	Move (Dubai 15:10 → Cairo 18:00 (EK923))	Cairo
3	Sep. 10	Sun	Visit site (Site, Beheira Agricultural Office, and Damahour City Fire Dep.*)	Cairo
.4	Sep. 11	Mon	Visit JICA, for explanation and discussion about Draft Basic Design (DBD) Visit Embassy of Japan (EOJ) for explanation of DBD	Cairo
5	Sep. 12	Tue	Visit MOIC for explanation of DBD, Explanation about DBD to Agricultural Mechanization Sector (AMS) Facility procurement conditions survey	Cairo
6	Sep. 13	Wed	Discussion about DBD with AMS, Preparation and Signing of Minutes of Discussion (M/D) Discussion about fire fighting system about Damanhour City Fire Dep.	Cairo
7	Sep. 14	Thu	Report to EOJ Facility procurement conditions survey	Cairo
8	Sep. 15	Fri	Facility procurement conditions survey Move (Cairo 19:15 → Dubai 23:50 (EK924))	In air
9	Sep. 16	Sat	Move (Dubai 02:50 → Osaka 17:20 (JL5090)) (Osaka 18:45 → Haneda 19:55 (JL1316))	-

Remarks: * = Damanhour City Fire & Civil Defense Department Control

Appendix-3 List of Parties Concerned in the recipient Country

Agriculture Mechanization Sector（Ministry of Agriculture And Land Reclamation） Headquarter	
1	Dr. Osama Mohamed Kamel: First Undersecretary
2	Eng. Mohamed Salah Eldin: Manager, Machines Department, Agricultural Engineering Unit
3	Eng. Hassan Abdullatif Afmed: General Director, Agricultural Engineering Unit
4	Eng. Magdy Hossiny: Consultant Engineer – Architect
5	Eng. Abdelrazr Mohamed: Architect Engineer
6	Eng. Khaled Abd EL Ghang: Supervision Engineer
7	Eng. Sherif Abd Elazizaly: Electric Engineer
Ministry of International Cooperation	
1	Mr. Nobil Abdel-Hamid Hassan: Chairman
2	Mrs. Samiha Barakat: Director of Japanese Dept.
Central Administration of Middle Delta (Sakha Agricultural Mechanization Center)	
1	Mr. El-said Basiony Amer: Undersecretry
2	Mr. Ibrahim El Minshawy Abo Ahmed: General Director of G.A.
3	Mrs. Sonia Abdel Aleem: General Director of Training Center
4	Mr. Abdo Hammad: Director of Central Warehouse
5	Mr. Hala Adly Mostafa Rageh:
6.	Mr. Othman Ahmed Aly Kouka: Manager, Central Workshop
7	Mr. Aboelftouh A Hemayed: Training officer
Central Administration of North Delta (Sinbellawein Agricultural Mechanization Center)	
1	Mr. El-Said El-Said Harraz: Undersecretary
1	Mr.Mahmoud Medkur: Dept. Manager
2	Mr. Aly Aly Mahmoud Halima: General Director of G.A.
3	Mr. Mohamad Monstaser: Director of Training Center
4	Mr. Basher Abed el Maged Shaer: Manager, Accountant
5	Mr. Mohamed el Mashed: Head of Station of Senbellawain
6	Mr. Mohamed el Montser: Head of Training center
7	Mr. Refat Abed el Kaarrem Mohamed: Manager, Central Workshop
Agricultural Directorate of Kafr-el-Shake	
1	Mr. Fawzy El Shazly: General Director
2	Mr. Mahmaud Mohamed Fikry: Supervisor of Agricultural Affaire
Maamoura Farm Machinery Training Center	
1	Mr. Mohamad Yossry El-gohary: Director of Mamoura Training Center
Damanhour Agricultural Mechanization Station	

1	Mr. Ahmed Abd El Mohsen: General Director of G.A.
2	Mr. Aly El Kharashy: Training Officer
3	Mr. Ahmed El Feky: Director of Medium Workshop
4	Mr. Mohamed Shbl: Damanhour Hiring Station
Agricultural Directorate in Behera	
1	Eng. Mostafa El Menyawy: Under Secretary
2	Mr. Osama Hilal: General Director, Agricultural Extension Directorate
Kafr El Dawaar Hiring Station	
1	Mr. Sabry Basuni Mohamed: Director of Kafr El Dawaar Hiring Station
Etai El Baroud Hiring Station	
1	Mr. Abs Fawzi Mohamad Elamrey: Director of Etai El Baroud Hiring Station
El Mahmodia Hiring Station	
1	Mr. Hassan Mohamed Kharashi: Director of El Mahmodia Hiring Station
Abu El Matameer Hiring Station	
1	Mr. Abs Mhamoud Mohamed Yosaef El Kelali: Director of Abu El Matameer Hiring Station
El Delengat Hiring Station	
1	Mr. Dafe Mohamad Mohamad: Director of El Delengat Hiring Station
Abis Hiring Station	
1	Mrs. Hala Mohamed Shawki: Director of El Abis Hiring Station
Shubrakheet Hiring Station	
1	Mr. Magdy Basyuny Mohamed: Director of Shubrakheet Hiring Station
2	Mr. Mohammed Ahamed Ahamed Woruas: Staff of El Shubrakheet Station
El Sawaaf Hiring Station	
1	Mr. Hosny Saas El Maghraby: Director of El Sawaaf Hiring Station
2	Mr. Alla Ahmed Abdlgl Koder: Staff of El Sawaaf Station
Kom Hamada Hiring Station	
1	Mr. Ahmed Abd El Malak: Director of Kom Hamada Hiring Station
2	Mr. Sameh Mohammed Elaskary: Staff of El Kom Hamada Station
Ganaklees Agricultural Mechanization Station	
1	Mr. Samer Zaki: General Director of Ganaklees Hiring Station
2	Mr. Atia Mahmod Sliman: Director of Ganaklees Hiring Station
Ahmed Shawki Hiring Station	
1	Mr. Ibrahim Elsaid Hassan: Director of Ahmed Shawki Hiring Station
2	Mr. Ibrahim Shaban Mohammed: Staff of El Sawaaf Station
Naguib Mahfouz Hiring Station	
1	Mr. Hamdy Ratip Nagi: Director of Naguib Mahfouz Hiring Station
El Salam Hiring Station	
1	Mr. Medhat Zain Elabdine: Director of El Salam Hiring Station

2	Mr. Mahay Arb Alzzol Malcof: Staff of El Sawaaf Station
Wadi El Natron Agricultural Mechanization Station	
1	Mr. Mohamed Abd Elhalim Shams Eldin: Director of Wadi El Natron Hiring Station
Maryot Hiring Station	
1	Mr. Abudul Sadek Ali: Director of Mariot Hiring Station
2	Mr. Aidel Mohamad Moktour: Workshop Mechanic of Mariot Hiring Station
3	Mr. Meheil Ibrahim Zaki: Workshop Mechanic of Mariot Hiring Station
Bangar El Sokkar Hiring Station	
1	Mr. Salah El Said: Director of El Sokkar Hiring Station
2	Mr. Hussin Al Sudkirn: Staff of El Sokkar Hiring Station
Abd El Rakeeb Hiring Station	
1	Mr. Mohamed Abdalla Mohamed Ayub: Director of Abd El Rakeeb Hiring Station
El Zohour Hiring Station	
1	Mr. Mohammad Abdel Kader: Director of El Zohour Hiring Station
Damanhour City Council, Road Department	
1	Mr. Mohamed Mahroos: Chief of Road Department, Engineer Mohamed Abo Ziethar of Road Department
Branch of Beheira Electric Distribution Company	
1	Eng. Ihab EL Kabany: Chief of Techinecal Sector
Beheira Beverage & Drainage Company	
1	Mr. Mahmoud Mansour: Chairman of Beheira Beverage & Drainage Company
Pump Station Shoubro Damanhour City	
1	Mr. Hussan EL Fishowy: Responsible for Sewage in Damanhour City ,followed by City Council Chief
Damanhour City Fire & Civil Defense Department	
1	Mr. Alaa Abou Ghazala
2	Mr. Colonel Nader

4. Minutes of Discussions

4-1 Basic Design Study

4-2 Explanation of Draft Final Report

Appendix 4-1 Basic Design Study

MINUTES OF DISCUSSIONS
ON
BASIC DESIGN STUDY
ON
THE PROJECT FOR MODERNIZATION OF AGRICUTURAL MECHANIZATION CENTER IN DAMANHOUR
IN
THE ARAB REPUBLIC OF EGYPT

Based on the results of the Preliminary Study, the Government of Japan decided to conduct a Basic Design Study on Project for the Modernization of Agricultural Mechanization Center in Damanhour (hereinafter referred to as "the Project") and entrusted the study to Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Arab Republic of Egypt (hereinafter referred to as "Egypt") the Basic Design Study Team (hereinafter referred to as "the Team"), which was headed by Mr. Yasuhiko WADA, Deputy Resident Representative, Egypt Office, JICA and was scheduled to stay in the country from 2nd to 26th March, 2006.

The Team held a series of discussion with the officials concerned of the Government of Egypt and both parties confirmed the main items described in the attached sheets.

Cairo, March 6th, 2006

Mr. Yasuhiko Wada
Leader
Basic Design Study Team
Japan International Cooperation Agency
(JICA)

Dr. Osama Mohamed Kamel
First Undersecretary
Chairman
Agricultural Mechanization Sector
Ministry of Agriculture and Land Reclamation
Arab Republic of Egypt

Mrs. Samiha Barakat
General Director
General Department of JAPAN
Central Department for Asia
Ministry of International Cooperation
Arab Republic of Egypt

ATTACHMENT

1 Objective of the Project

The objective of the Project is to promote the existing Agricultural Mechanization Station in Damanhour to Agricultural Mechanization Center (hereinafter referred to as "AMC") by establishing Training Center and Central Workshop in addition to the existing Hiring Service through the provision and construction of necessary equipments and facilities.

2 Project site

The Project site is at AMC in Damanhour and its location and commanded area is the same as Annex - I of the Minutes of the Preliminary Study signed on 5th October, 2005 (hereinafter referred to as "the Previous Minutes").

3 Responsible and Implementing Agency

3.1 The responsible and implementing agency is Agricultural Mechanization Sector (hereinafter referred to as "AMS") of Ministry of Agriculture and Land Reclamation (hereinafter referred to as "MoALR").

3.2 The organizational chart of MoALR and AMS are the same as Annex - II and III of the Previous Minutes.

4 Items requested by the Government of Egypt.

After discussion with the Team, the components with priorities described in Annex – I are finally requested by the Government of Egypt. JICA will assess the appropriateness of the request and will summarize it into the draft basic design report.

5 Japan's Grant Aid Scheme

The Egyptian side understood Japan's Grant Aid Scheme and would take necessary measures described in Annex – V of the Previous Minutes for smooth implementation of the Project, as a condition for the Japan's Grant Aid to be implemented.

6 Further schedule of the study

6.1 The consultant members will continue their study until 26th March, 2006.

6.2 JICA will prepare a draft final report in English and dispatch a mission in order to explain its content around July 2006.

6.3 In case the content of the draft final report is accepted in principle by the Government of Egypt, JICA will complete a final report and send it to the Government of Egypt by the end of August 2006.

7 Other relevant issues

7.1 Proposed Action Plan of AMC in Damanhour

The proposed plan of AMC in Damanhour was handed over to the Japanese side in October 2005 and the revised version in February 2006. However, the Japanese side expressed that it is difficult to find the validity, reality and sustainability of the plan and requested the Egyptian side to revise it again. Both sides confirmed that the revised action plan will be handed over to the Japanese side by 16th March, 2006. The Japanese side will examine the appropriateness and sustainability of the revised plan and will reflect the result into the draft final report.

7.2 Appropriateness of the Training Plan

The Team expressed that in order to identify the appropriateness and sustainability of the

training plan, the Egyptian side should review the actual training result in the other training center, such as AMC in Sakha and Shimbellawein, and the farming situation in New Land, and reflect the result into the revised action plan mentioned in 7.1. The Team also explained that the validity, reality and sustainability of the training plan and curriculum should be confirmed by both sides, as a condition for further consideration.

Moreover, the Egyptian side explained that the actual result / records of the trainings in other centers would be handed over to the Japanese side by 16th March, 2006, together with the revised action plan.

7.3 Number of agricultural mechanization stations under AMC in Damanhour

At the Preliminary Study stage, it was confirmed that AMC in Damanhour would have been in charge of twenty (20) existing and three (3) newly establishing hiring stations. However, the Egyptian side actually established twelve (12) new hiring stations in the area and excluded Matrooh from the commanding area. Thus, the total number of hiring stations under AMC in Damanhour is thirty one (31) now.

7.4 List of the requested equipments with priorities

Both sides confirmed that the practical training related to repair and maintenance would be taken place in Central Workshop, and thus some of the equipments for Central Workshop would be utilized as for Training Center and vice versa. In this aspect, the requested items should be reviewed and narrowed to the minimum requirement for the operation of the Center.

In addition, both sides confirmed that the detailed priorities for each requested equipments would be determined by the Egyptian side and the consultant members by the end of the field survey. The priorities shall be discussed based on the main factors including the proposed action plan, performance in the other centers, the result of the Preliminary Study, and available personnel / budget etc. The Japanese side will assess the appropriateness of the priorities and reflect the result into the draft final report. The Team expressed that it was difficult to provide the equipments such as vehicles, administrative equipments, racks, and simple tools under the Japan's Grant Aid. However, the Egyptian side expressed that these items are very necessary for future fruitful activities of the proposed plan, and it must be taken into consideration.

7.5 Comparison with AMC in Sakha and Shimbellawein

Both sides confirmed that due to the limited space, it is not realistic for AMC in Damanhour to have the same scale and function as Sakha or Shimbellawein. In this aspect, the requested components should be focused on the high prior and most necessary ones, and therefore, the scale and function would be compact, but effective enough.

In addition, as there is big warehouse already exist in Ganaklees, Beheira, both sides agreed that Central Warehouse would not be necessary for AMC in Damanhour, but the existing warehouse should be replaced in the new facilities.

7.6 Operation and maintenance

The Team explained that if the Project was to be implemented, the Egyptian side would be fully responsible for the proper operation and maintenance of the provided equipments and facilities.

7.7 Items to be taken by the Egyptian side

If the Project is to be implemented, hiring service will not be possible to operate in Damanhour during the construction work. The Egyptian side explained that they would take necessary measures, such as utilizing the other hiring stations, to minimize the risk of stopping the hiring service.

7.8 Support to the further study

The consultant members will continue their study until 26th March, 2006 and the Egyptian side explained that they would take necessary measures to support the smooth implementation of the study and the security of persons concerned of the study.

END

Components Requested Egypt Side

Level of Priority as follows;
A
B: Less than "A"
C: Less than B"
D: Lowest Priority

* underline means the change at the Basic Design Stage.

Application Form for Grant Aid		Preliminary Study Stage			Basic Desing Study	Remarks
Components	Qty	Components	Purpose of Use	Priority	Priority	
Training activities						
1. Facility						
(1) Audio-visual room		(1) Audio-visual room	Conducting training courses	A		
(2) Training classes		(2) Training classes		A		
(3) Others		(3) Dormitory and dining room	Accommodation for trainees	A		
		(4) Practice room	Conducting practical training	A		
(5) Operator's training yard		(5) Operator's training yard	Conducting practical training	D		
2. Equipment						
(1) Cutaway model (engines, fuel injection pump)	3 items	(1) Cutaway model (engines, fuel injection pump)	Teaching aids of agricultural machinery and Implements	A		
(2) Audio-visual equipment (projector, TV, camera, PC, etc)	10 items	(2) Audio-visual equipment (projector, TV, camera, PC, etc)		B		
(3) Educational software (CD) (centrifugal com., hydraulics)	6 items	(3) Educational software (CD) (centrifugal com., hydraulics)		A		
(4) Animated overhead transparencies	10 items	(4) Animated overhead transparencies		A		
(5) Engine repair and test	67 items	(5) Engine repair and test	Conducting practical training / Central Workshop	B	A	Genereal and small tools should be borne by the Egyptian side and further survey shall be done to determine priorities for each equipments.
(6) Chassis service	45 items	(6) Chassis service			A	
(7) Tools for common use	34 items	(7) Tools for common use			C	
(8) Metal works	44 items	(8) Metal works			A	
(9) Welding (arc, gas)	15 items	(9) Welding (arc, gas)			A	
(10) Washing and painting	9 items	(10) Washing and painting			B	
(11) Wood works	19 items	(11) Wood works			C	
(12) Micro bus	1 unit	(12) Micro bus	transportation service for trainees to & from the field	B		Further survey shall be done based on the completed training plan.

Application Form for Grant Aid		Preliminary Study Stage			Basic Desing Study	Remarks
Components	Qty	Components	Purpose of Use	Priority	Priority	
Central workshop activity						
1. Facility						
(1) Engine overhauling		(1) Engine overhauling	Repair of AMSs machineries and production of farm implements	A		
(2) Transmission repairing		(2) Transmission repairing		A		
(3) Electricity and electronics		(3) Electricity and electronics		C		
(4) Metal working		(4) Metal working		A		
(5) Hydraulic and pneumatic circuits		(5) Hydraulic and pneumatic circuits		C		
(6) Painting cabin		(6) Painting cabin		C		
(7) Welding		(7) Welding		A		
(8) Wood working		(8) Wood working		B		
2. Equipment						
(1) General equipment	54 items	(1) General equipment	Repair of AMSs machineries and production of farm implements	B		General & small tools should be borne by the Egyptian side and futher survey shall be done to determine priorities for each equipments.
(2) Lubrication equipment	9 items	(2) Lubrication equipment				
(3) Measuring tools	59 items	(3) Measuring tools				
(4) General tools	88 items	(4) General tools				
(5) Mobile workshop (pickup based service truck)	2 unit	(5) Mobile workshop (pickup based service truck)	Repair and maintenance of farm machinery as emergency repair in fields	B		Further survey shall be done to examine the necessity and Specification
(6) Forklift, 2t	1 unit	(6) Forklift, 2t	Transportation of machinery parts	A		
(7) Reach forklift, 1t	2 units	(7) Reach forklift, 1t	mobilization of spareparts within warehouse	D		

Annex - I

Application Form for Grant Aid		Preliminary Study Stage			Basic Desing Study	Remarks
Components	Qty	Components	Purpose of Use	Priority	Priority	
Hiring service activity						
1. Facility						
(1) Machinery shelter		(1) Machinery shade	Machinery parking	A		
(2) Fuel supply and car washing		(2) Fuel supply and car washing	Washing of machinery Supplying fuel for machinery	A		
2. Equipment						
(1) Tractor 110hp, 4WD w/ Cabin	20 units	(1) Tractor 110hp, 4WD w/ Cabin	Hiring service machineries for 20 stations	A		Appropriateness of the distribution plan will be examined carefully.
(2) Tractor 82hp, 4WS w/ ROP/Canopy	20 units	(2) Tractor 82hp, 4WS w/ ROP/Canopy				
(3) Disk harrow 20"x36, Tandem	10 units	(3) Disk harrow 20"x36, Tandem				
(4) Disk harrow 20"x32, Tandem	10units	(4) Disk harrow 20"x32, Tandem				
(5) Combine harvester 28hp, head-feeding	20 units	(5) Combine harvester 4-Row, head-feeding				
Administration activity						
1. Facility						
(1) Administration office		(1) Administration office	Operational management for the training, workshop and hiring service activities	A		
(2) Staff office		(2) Staff office				
(3) Customer office		(3) Customer office				
(4) Account office		(4) Account office				
(5) Office equipment		(5)				
(6) Others						
2. Equipment						
(1) Photocopy machine	1 unit	(1) Photocopy machine	Operational management for the training, workshop and hiring service activities	C		
(2) PC desk top	10 units	(2) PC desk top				
(3) PC portable	6 units	(3) PC portable				
(4) Printer ink jet type	4 units	(4) Printer ink jet type	Making and preparation of training test books for trainees			
(5) Lecture amplifier set	3 sets	(5) Lecture amplifier set				
(6) Transistor megaphone set	3 sets	(6) Transistor megaphone set				
(7) wagon (4WD)	1 unit	(7) wagon (4WD)	Transportation for the staff to supervise other stations	C		
(8) Pickup track (4WD)	2 units	(8) Pickup track (4WD)	Transportation for the staff to supervise other stations	B		

A4-7

Appendix 4-2 Explanation of Draft Final Report

MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY
ON
THE PROJECT FOR MODERNIZATION OF AGRICULTURAL MECHANIZATION CENTER IN DAMANHOUR IN THE ARAB REPUBLIC OF EGYPT
(EXPLANATION OF DRAFT FINAL REPORT)

In March 2006, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Project for Modernization of Agricultural Mechanization Center in Damanhour (hereinafter referred to as "the Project") to the Arab Republic of Egypt (hereinafter referred to as "Egypt"), and through discussion, field survey, and technical examination in Japan, JICA prepared a draft final report of the study.

In order to explain and to consult with officials concerned of the Government of Egypt on the components of the draft final report, JICA sent to Egypt the Draft Report Explanation Team (hereinafter referred to as "the Team"), which was headed by Mr. Shigeru OKAMOTO, Resident Representative, JICA Egypt Office and was scheduled to stay in the country from 9th to 15th September, 2006.

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

Cairo, September 13, 2006

Mr. Shigeru Okamoto
Resident Representative
Japan International Cooperation Agency
Egypt Office

O. Kamel

Dr. Osama Mohamed Kamel
First Undersecretary
Chairman
Agricultural Mechanization Sector
Ministry of Agriculture and Land Reclamation
Arab Republic of Egypt

Witness

Samiha Barakat

Mrs. Samiha Barakat
General Director
General Department of JAPAN
Central Department for Asia
Ministry of International Cooperation
Arab Republic of Egypt

ATTACHMENT

1. Explanation of the Draft Final Report

The Government of Egypt agreed and accepted in principle the contents of the draft final report explained by the Team.

2. Japan's Grant Aid Scheme

The Egyptian side understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Egypt as explained by the Preliminary Study Team and described in Annex-V of the Minutes of Discussions signed by both parties on 3rd October, 2005.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to Ministry of Agriculture and Land Reclamation representing the Government of Egypt by the end of November, 2006.

4. Other Relevant Issues

4-1. Undertakings by the Egyptian side

(1) Both sides confirmed that, for the smooth implementation of the Project, it should be indispensable for the Egyptian side to implement its undertakings described below.

- disassembling and demolishment of the existing facilities
- submission of application for licensing construction works and acquisition of the construction permission
- drawing the primary electric source into the site
- introduction of water source into the site

Above undertakings and their related measures should be implemented, according to the tentative schedule shown in Annex- I .The rough estimation of the cost undertaken by the Egyptian side described as Annex- II . The Egyptian side explained that Agricultural Mechanization Sector would be responsible for funding this expense, in case the Japanese

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Government would finally decide to implement this Project.

(2) During the implementation of the Project, it is impossible to continue operating hiring service at the Project site in Damanhour. Therefore, both sides confirmed that Agricultural Mechanization Sector secured the temporary site for the hiring service activities, at the northeast of the Project Site. The existing agricultural machineries and staffs would be temporarily transferred to the site, so that the hiring service would continuously be in operation during the actual implementation of the Project.

(3) The Egyptian side explained that as soon as the construction is completed, the staff of Central Administration would be transferred from Sakha Agricultural Mechanization Center to Damanhour as planned.

(4) Both sides confirmed that the Egyptian side would report the progress and completion of its undertakings every three months to the Japanese side (the consultant and JICA Egypt Office) according to the schedule indicated in Annex- I in case the Japanese Government would finally decide to implement the Project. The Egyptian side agreed to provide the reason of delay and future action plan if the undertakings would not progress nor been completed according to the schedule.

(5) Both sides confirmed that Agricultural Mechanization Sector would bear overall responsibility for the coordination and implementation of all the undertakings by the Egyptian side in case the Japanese Government would finally decide to implement the Project.

(6) Both sides confirmed that, in order to ensure the benefit to the end users over a long period by utilizing the facilities and equipments to be constructed and procured under the Project, it should be indispensable for the Egyptian side to implement proper operation and continuous maintenance works, and secure adequate budget for these purposes.

(7) Both sides confirmed that the temporary construction site next to the Project site may not be large enough to store the construction materials. Therefore, it may be necessary to use farmland as the storage for the construction materials. The Egyptian side explained that in

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case it is required to secure farmland as the storage, they will take necessary measures including acquisition of permission, and compensation for farmers, if necessary.

END

Annex - I Tentative Implementation Schedule

Annex - II Cost Estimation borne by the Egyptian side

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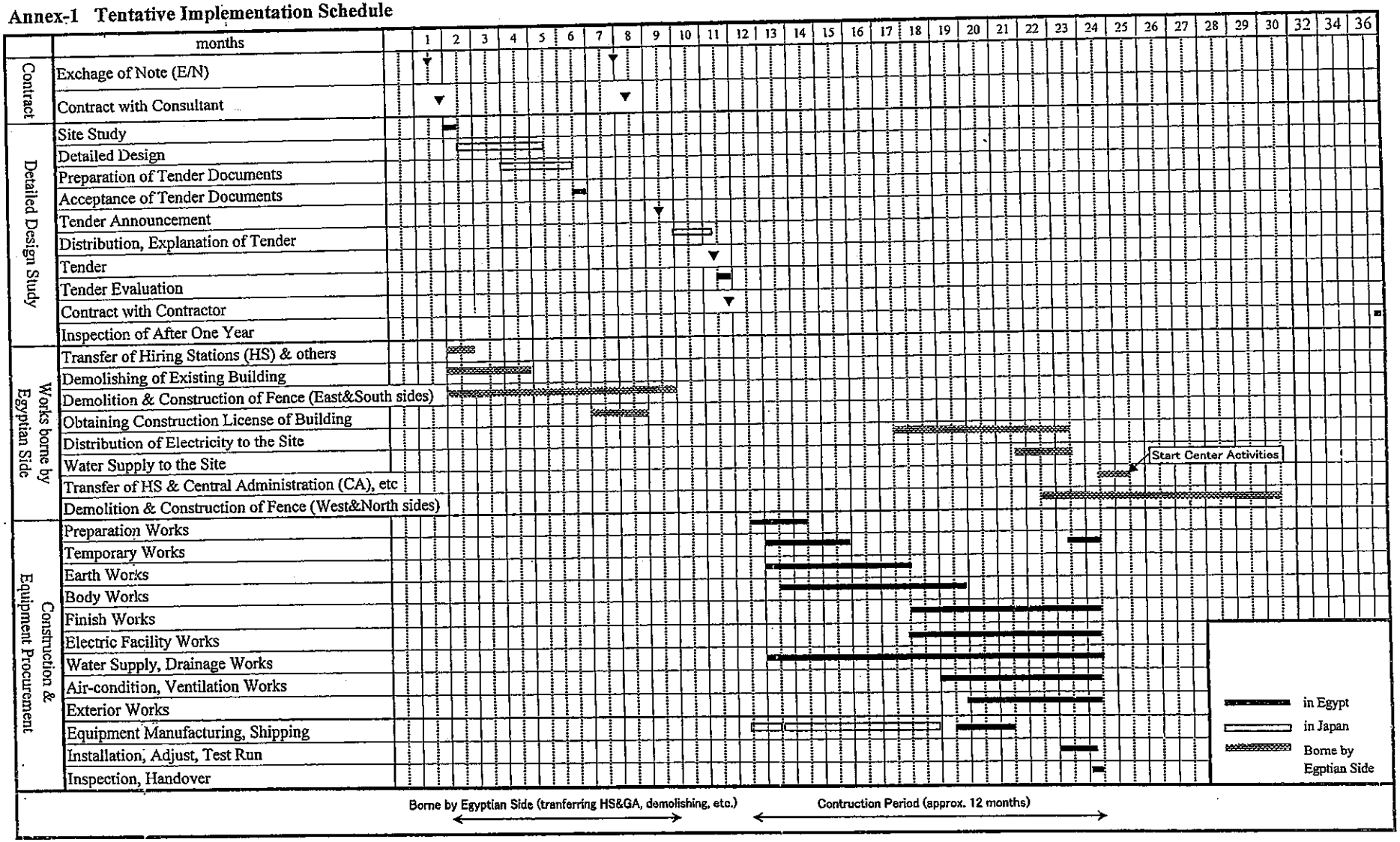
Annex-1 Tentative Implementation Schedule



Annex-2 Cost Estimation borne by Egyptian Side

Item	Time needed (month)	Cost LE.	Remarks
First stage : Transfer the Hiring Station & the Demolishing Works			
A-Transfer the HS to the temporary site :- 1- Transfer the tractors, combines, implements, workshop equipment, and warehouse stock. 2- transfer the employee of GA& HS and their office equipments 3- Disassemble the shelter 4- Transport shelter to the temporary site. 5- Material for repairing & painting and their cost. 6-assembling cost of shelter	1	50,000	Start after E/N signed.
B-Demolition of Building within the center :- 1-Issuing demolishing license from the city council. 2- Bidding period. 3-demolishing works period.	1	80,000	Start at the same time of the above.
C-Demolition & Construction of the fence (East & South sides):- 1- Issuing demolishing license. 2- Bidding period. 3- Demolishing works period 4-Issuing construction license. 5-Bidding period. 6-Construction work period	8	435,000	Start at the same time of the above After demolition of Building.
D-Construction Building within the site :- 1-Issuing construction license.	2	100,000	*receiving working drawing from Japanese side
Sub-total	8	665,000	

Item	Time needed (month)	Cost LE.	Remarks
Second Stage : During Construction Works **A- Distribution electricity to the site :-** including transformer 500KVA according to the proposed loads from the Japanese side	6	250,000	During the construction by Japanese side.
B-Water supply to the site from line 800 mm :-	2	100,000	
Sub-total	6	350,000	
Third Stage : After Construction Works **A- Furniture and accessories :-** 1- Furniture and accessories 2- Transfer of Hiring Station 3- Transfer of CA & Staff	1	600,000	Just after the construction by Japanese
B- Demolition & Construction of the fence (West & North sides) :- 1- Issuing demolishing license 2- Bidding period 3- Demolish works period 4- Issuing construction license 5- Bidding period 6- Construction works period	2+6	359,000	Before completion of construction by Japanese After completion Demolish & construct
Sub-total	8	959,000	
Total Cost		1,974,000	

Connecting to the sewage network		30,000	When sewage network is constructed

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5. Other Relevant Data

5-1 Staff Number of 19 Hiring Stations and GA
5-2 Number of Equipment Owned by Each HS
5-3 Conditions and Usage of Equipment in Each HS
5-4 Commanding Farm Area and Income and Expenditure of Each HS
5-5 Topographic and Geological Survey
5-6 Baseline Survey
5-7 Comparison between the Request and the Project
5-8 Examination of Training Plan
5-9 Number of Persons included in the Target
5-10 Determination of the Scale of Workshop Facility
5-11 Rate of Available Farm Machinery between Present and Plan
5-12 Equipment List for the Project
5-13 Equipment Layout Plan

Staff Number of 19 Hiring Stations & GA

Zone	No.	Name of Hiring Stagtion	Estalished Year	Central Administration	General Administration		Hiring Station					Total	
					Admin & Finance	Medium Workshop	Operation Section	Maintenance Section	Follow-up Section	Admini & Finance	Sub-total HS	Total	(Female)
Beheira Zone	1	Damanhour	1985		33	20	49	16	17	21	103	156	10
	2	Kafr El Dawaar	1995				19	15	4	14	52	52	2
	3	Etay El Baroud	1988				48	9	12	22	91	91	3
	4	El Mahomoudiah	1986				47	4	4	20	75	75	9
	5	Abu El Matameer	1987				21	20	13	20	74	74	5
	6	El Delengat	1991				30	9	13	14	66	66	
	7	Abis	1990				19	5	8	11	43	43	6
	8	Shubrakheet	1991				34	13	(incl. Operatio	21	68	68	4
	9	El Sawaaf	1998				24	10	4	10	48	48	0
	10	Kom Hamada	1991				67	3	8	27	105	105	0
	Sub-total				33	20	344	104	83	179	725	763	39
	Average				33	20	36	10	9	18	73	78	4
El Aradi El Gededa Zone	11	Gana Klees	1987		32	14	23	5	12	12	52	98	8
	12	Ahmed Shawki	1989				36	7	10	12	65	65	1
	13	Naguib Mahfouz	1988				28	5	8	5	46	46	0
	14	El Salam	1989				28	3	2	10	43	43	1
	15										0	0	
	Sub-total				32	14	115	20	32	39	206	252	10
	Average				32	14	29	5	8	10	41	50	3
Wadi El Natron Zone	16	Wadi El Natron	1996		16	15	32	0	9	10	51	82	2
	17	Mariyot	1999				29	8	(incl. Operatio	8	45	45	0
	18	Banger El Sokar	1989				12	0	(incl. admi)	16	28	28	1
	19	Abd El Rakeep	1989				25	4	(incl. Operatio	10	39	39	2
	20	El Zohour	1990				16	2	(incl. Operatio	8	26	26	1
	Sub-total				16	15	114	14	9	52	189	220	6
	Average				16	15	23	3	2	10	38	44	1
Total					81	49	573	138	124	270	1,105	1,235	55
Average				15	30	17	30	7	7	14	58	65	5
Estimation of 12 station increased (31 stations)													
	Average						17	5	4	10	39	39	2
	Increased 12 stations						201	58	52	114	467	473	23
	Total (31 stations)			15	81	49	774	196	176	384	1,572	1,708	78
	Estimation (training required)						970						

Source: AMS each station
Estimation by Study Team

Appendix 5-2 Number of Equipment Owned by Each HS

Number of Equipment owned by Each HS

No.	Item	G.A of El Beheira											G.A. of El Aradi El Gededa						G.A. of Wadi El Natron						Total	Others		
		1	2	3	4	5	6	7	8	9	10	sub-total	11	12	13	14	15	sub-total	16	17	18	19	20	sub-total		22	23
1	**Tractor**	17	12	14	13	19	14	16	11	10	18	144	15	24	18	18		75	21	19	16	18	13	87	306	40	31
1	More than 200hp											0	1	3		1		5	1			2		3	8		
2	150<200hp	1				2	1				1	5	4	5	3	5		17	4	6	1	1	2	14	36		4
3	100<150hp	3		1	1	3	1	2		1	4	16	1	5	5	2		13	7	7	6	8	1	29	58	1	2
4	50<100hp	12	11	12	11	9	10	13	9	8	9	104	8	7	10	10		35	9	6	6	7	9	37	176	22	21
5	Less than 50hp	1	1	1	1	5	2	1	2	1	4	19	1	4				5			3		1	4	28	17	4
2	**Conbine**	11	7	12	9	12	11	8	7	4	6	87	2	5	2	8		17	5	6	2	2	1	16	120	22	18
1	Head feed type	10	7	9	9	8	10	8	7	4	6	78						0						0	78	22	11
2	Conventional type	1		3		4	1					9	2	5	2	8		17	5	6	2	2	1	16	42		7
3	**Excavator**	2	1	1	1		1	1	1			8				1		1						0	9	3	
4	**Buldozer**											0						0	5			1		6	6		
5	**Corn Harvester**											0		3				3						0	3		
6	**Implements**	57	41	40	40	53	45	36	25	36	53	426	50	90	49	69		258	70	57	44	19	42	232	916	107	78
1	Chisel plow	9	7	9	8	12	9	12	5	7	9	87	8	12	7	11		38	7	8	7	6	7	35	160	23	22
2	Moldboard plow	5	2	2		2	3	1		2	4	21	4	10	8	4		26	5	3	4		2	14	61	3	4
3	Moldboard plow (revversible)	1	2		1			1		2		7	3	4	1	1		9	4	1				5	21		
4	Disc plow					1	1			2	1	5		1	4	1		6	1	4	4		2	11	22		
5	Subsoiler										1	1						0	1	2				3	4		1
6	Disc harrow	1				6	2			1	1	11	7	10	4	9		30	10	6	4		4	24	65	1	2
7	Rotary plow										1	1	1	3		2		6						0	7		
8	Scraper, mount type											0						0	2					2	2	1	
9	Scraper, hydralic type	13	8	7	10	8	7	5	4	5	8	75	8	13	8	14		43	14	13	6	2	12	47	165	12	14
10	Lazer trasmit & unit	3	3	3	3	5	4	3	6	3	3	36	2	11	3	6		22	6	9	6		6	27	85	3	7
11	Inter-low cultivator											0		2	1			3	1					1	4		3
12	Ridger		1		1	3	1	1	1	3	1	12	2	1				3			1		3	4	19	2	3
13	Planter for potato									2	1	3	1	2	1	2		6	1					1	10		
14	Planter (pneumatic)											0		2		1		3	1	1	1			3	6	1	
15	Sdde drill	11	7	8	7	8	6	3	3	5	8	66	6	7	5	6		24	5	3	8	4	3	23	113	23	11
16	Sprayer (mount type)											0						0						0	0		
17	Sprayer (trailer type)				1			1	1			3						0	1	1		4		6	9	1	1
18	Boom sprayer											0	1	1	1			3	1					1	4		
19	Thresher for wheat	2	4	3	4	2	4	1	1	2	2	25	1					1	3			3		6	32	3	
20	Thresher for bean											0						0						0	0	1	
21	Thresher for corn											0						0					1	1	1		
22	Posthole digger	1		1			2					4	2	2	3	2		9	3	2	2		1	8	21		
23	Digger (potato, peanut)											0	1		1			2						0	2		
24	Baler (press type)	3	1	2	1	3	1	2	1	1	3	18	3	6	2	5		16	2	2	1			5	39	11	5
25	Chopper	2	2	2		1	1	3	2	1	4	18		2		4		6					1	1	25	1	4
26	Mower	4	4	3	4	2	4	3	1		6	31		1		1		2	2	2				4	37	21	1
27	Excavator, mount type	2		1			1			1	1																

Source : each HA

1 Damanhour
2 Kafr El Dawaar
3 Etai El Baroud
4 El Mahmoudiah
5 Abu El Matameer
6 El Delengat
7 Abis
8 Shubrakheet
9 El Sawaaf
10 Kom Hamada
11 Ganaklees
12 Ahmed Shawki
13 Naguib Mahfouz
14 El Salam
16 Wadi El Natron
17 Mariyot
18 Bangal El Sokar
19 Abd El Rakeep
20 El Zohour
22 Sinbellawein
23 Sakha

Appendix 5-2 Number of Equipment Owned by Each HS

Number of Equipment owned by Each HS

No.	Item	G.A of El Beheira											G.A. of El Aradi El Gededa						G.A. of Wadi El Natron						Total	Others		
		1	2	3	4	5	6	7	8	9	10	sub-total	11	12	13	14	15	sub-total	16	17	18	19	20	sub-total		22	23
1	**Tractor**	17	12	14	13	19	14	16	11	10	18	144	15	24	18	18		75	21	19	16	18	13	87	306	40	31
1	More than 200hp											0	1	3		1		5	1			2		3	8		
2	150<200hp	1				2	1				1	5	4	5	3	5		17	4	6	1	1	2	14	36		4
3	100<150hp	3		1	1	3	1	2		1	4	16	1	5	5	2		13	7	7	6	8	1	29	58	1	2
4	50<100hp	12	11	12	11	9	10	13	9	8	9	104	8	7	10	10		35	9	6	6	7	9	37	176	22	21
5	Less than 50hp	1	1	1	1	5	2	1	2	1	4	19	1	4				5			3		1	4	28	17	4
2	**Conbine**	11	7	12	9	12	11	8	7	4	6	87	2	5	2	8		17	5	6	2	2	1	16	120	22	18
1	Head feed type	10	7	9	9	8	10	8	7	4	6	78						0						0	78	22	11
2	Conventional type	1		3		4	1					9	2	5	2	8		17	5	6	2	2	1	16	42		7
3	**Excavator**	2	1	1	1		1	1	1			8				1		1						0	9	3	
4	**Buldozer**											0						0	5			1		6	6		
5	**Corn Harvester**											0		3				3						0	3		
6	**Implements**	57	41	40	40	53	45	36	25	36	53	426	50	90	49	69		258	70	57	44	19	42	232	916	107	78
1	Chisel plow	9	7	9	8	12	9	12	5	7	9	87	8	12	7	11		38	7	8	7	6	7	35	160	23	22
2	Moldboard plow	5	2	2		2	3	1		2	4	21	4	10	8	4		26	5	3	4		2	14	61	3	4
3	Moldboard plow (revversible)	1	2		1			1		2		7	3	4	1	1		9	4	1				5	21		
4	Disc plow					1	1			2	1	5		1	4	1		6	1	4	4		2	11	22		
5	Subsoiler										1	1						0	1	2				3	4		1
6	Disc harrow	1				6	2			1	1	11	7	10	4	9		30	10	6	4		4	24	65	1	2
7	Rotary plow										1	1	1	3		2		6						0	7		
8	Scraper, mount type											0						0	2					2	2	1	
9	Scraper, hydralic type	13	8	7	10	8	7	5	4	5	8	75	8	13	8	14		43	14	13	6	2	12	47	165	12	14
10	Lazer trasmit & unit	3	3	3	3	5	4	3	6	3	3	36	2	11	3	6		22	6	9	6		6	27	85	3	7
11	Inter-low cultivator											0		2	1			3	1					1	4		3
12	Ridger		1		1	3	1	1	1	3	1	12	2	1				3			1		3	4	19	2	3
13	Planter for potato									2	1	3	1	2	1	2		6	1					1	10		
14	Planter (pneumatic)											0		2		1		3	1	1	1			3	6	1	
15	Sdde drill	11	7	8	7	8	6	3	3	5	8	66	6	7	5	6		24	5	3	8	4	3	23	113	23	11
16	Sprayer (mount type)											0						0						0	0		
17	Sprayer (trailer type)				1			1	1			3						0	1	1		4		6	9	1	1
18	Boom sprayer											0	1	1	1			3	1					1	4		
19	Thresher for wheat	2	4	3	4	2	4	1	1	2	2	25	1					1	3			3		6	32	3	
20	Thresher for bean											0						0						0	0	1	
21	Thresher for corn											0						0					1	1	1		
22	Posthole digger	1		1			2					4	2	2	3	2		9	3	2	2		1	8	21		
23	Digger (potato, peanut)											0	1		1			2						0	2		
24	Baler (press type)	3	1	2	1	3	1	2	1	1	3	18	3	6	2	5		16	2	2	1			5	39	11	5
25	Chopper	2	2	2		1	1	3	2	1	4	18		2		4		6					1	1	25	1	4
26	Mower	4	4	3	4	2	4	3	1		6	31		1		1		2	2	2				4	37	21	1
27	Excavator, mount type	2		1			1			1	1																

Source : each HA

1 Damanhour
2 Kafr El Dawaar
3 Etai El Baroud
4 El Mahmoudiah
5 Abu El Matameer
6 El Delengat
7 Abis
8 Shubrakheet
9 El Sawaaf
10 Kom Hamada
11 Ganaklees
12 Ahmed Shawki
13 Naguib Mahfouz
14 El Salam
16 Wadi El Natron
17 Mariyot
18 Bangal El Sokar
19 Abd El Rakeep
20 El Zohour
22 Sinbellawein
23 Sakha

Appendix 5-3 Conditions and Usage of Equipment in Each HS

Conditions and Usage of Equipment

		Name of Hiring Station	Establsihed year	Tractor Farmer's Field Area (feddan)	Tractor expected Covered Area 2004/05 (feddan)	Tractor Covered Area 2004/05 (feddan)	Tractor Covered %	Tractor covered (fed/ unit)	Combine Farmer's Field Area (feddan)	Combine expected Covered Area 2004/05 (feddan)	Combine Covered Area 2004/05 (feddan)	Combine Covered %	Combine covered (fed/ unit)	Conditions											
														Tractor						Combine					
														Total number	Operable	Workable	Under repair	Break down	Year made	Total number	Operable	Workable	Under repair	Break down	Year made
El Beheira Zone	1	Damanhour	1985	92,000	7,077	5,250	5.7	404	40,250	3,659	1,966	4.9	179	17	16	13	3	1	1986-2003	11	8	11	0	3	1996-2003
	2	Kafr El Dawaar	1995	69,980	7,776	5,360	7.7	596	26,000	4,333	1,577	6.1	263	12	12	9	3	0	1989-2004	7	7	6	1	0	2000
	3	Etay El Baroud	1988	86,380	7,853	5,200	6.0	473	25,335	3,167	1,941	7.7	243	14	12	11	1	2	1988-2004	12	9	8	1	3	1996-2003
	4	El Mahomoudiah	1986	28,750	2,212	1,300	4.5	100	35,000	4,375	1,869	5.3	234	13	13	13	0	0	1986-2004	9	8	8	0	1	1997-2004
	5	Abu El Matamee	1987	87,890	5,859	6,400	7.3	427	27,000	3,375	1,646	6.1	206	19	18	15	3	1	1981-2003	12	8	8	0	4	1997-2004
	6	El Delengat	1991	86,100	6,623	5,300	6.2	408	40,000	5,714	2,367	5.9	338	14	14	13	1	0	1985-2003	11	7	7	0	4	1997-2004
	7	Abis	1990	47,000	3,615	3,000	6.4	231	28,050	4,675	1,654	5.9	276	16	15	13	2	1	1992-2003	8	8	6	2	0	1996-2003
	8	Shubrakheet	1991	53,600	5,360	4,500	8.4	450	23,175	3,311	1,622	7.0	232	11	10	10	0	1	1986-2004	7	7	7	0	0	1997-2004
	9	El Sawaaf	1998	47,050	4,705	3,900	8.3	390	15,210	3,803	890	5.9	223	10	10	10	0	0	1980-2004	4	4	4	0	0	1999-2002
	10	Kom Hamada	1991	114,000	8,769	9,000	7.9	692	18,120	3,624	1,230	6.8	246	18	18	13	5	0	1980-2002	6	6	5	1	0	1998-2002
	Sub-total			712,750	5,940	49,210			278,140	3,973	16,762			144	138	120	18	6		87	72	70	5	15	
	Average			71,275	5,940	4,921	6.9	410	27,814	3,973	1,676	6.2	239	14	14	12	2	1		9	7	7	1	2	
El Aradi El Gededa Zone	11	Gana Klees	1987	58,180	4,475	4,250	7.3	327						15	15	13	2	0	1985-2000	2	2	2	0	0	1996-2000
	12	Ahmed Shawki	1989	54,150	2,461	3,900	7.2	177						24	24	22	2	0	1991-2005	5	5	5	0	0	1995-2005
	13	Naguib Mahfouz	1988	51,000	2,833	3,500	6.9	194						18	18	18	0	0	1994-2005	2	2	2	0	0	1998-2003
	14	El Salam	1989	69,910	4,112	5,400	7.7	318						18	18	17	1	0	1989-2005	8	8	8	0	0	1994-2002
	15																								
	Sub-total			233,240	3,332	17,050								75	75	70	5	0		17	17	17	0	0	
	Average			58,310	3,332	4,263	7.3	244						19	19	18	1	0		4	4	4	0	0	
Wadi El Natron Zone	16	Wadi El Natron	1996	100,000	8,333	8,300	8.3	692						21	14	12	2	7	1985-2004	5	5	5	0	0	1991-2002
	17	Mariyot	1999	125,000	8,929	10,920	8.7	780						19	19	14	5	0	1992-2004	6	6	6	0	0	1992-2001
	18	Banger El Sokar	1989	100,000	8,333	8,300	8.3	692						16	13	12	1	3	1986-2003	2	2	2	0	0	1995
	19	Abd El Rakeep	1989	61,000	3,813	4,500	7.4	281						18	17	16	1	1	1994-2002	2	2	2	0	0	1995-1999
	20	El Zohour	1990	45,000	3,462	2,900	6.4	223						13	13	13	0	0	1997-2003	1	1	1	0	0	2002
	Sub-total			431,000	6,433	34,920								87	76	67	9	11		16	16	16	0	0	
	Average			86,200	6,433	6,984	8.1	521						17	15	13	2	2		3	3	3	0	0	
	Total			1,376,990	5,358	101,180			*410,283	3,973	*24,617			306	289	257	32	17		###	105	###	5	15	
	Average			72,473	5,358	5,325	7.3	394	27,814	3,973	1,676	6.2	239	16	15	14	2	1		6	6	5	0	1	

Source: Each HS

Note: * marks = estimation of all 19 stations

Appendix 5-4 Commanding Farm Area and Income and Expenditure of Each HS

Commanding Farm Area and Income & Expenditure by Each HS

Zone	No.	Name of Hiring Staiton	Established Year	Commanding Farm Area					Income			Expenditure			Balance		
				Commanding Farm Area (feddan)	Number of Village	Farm Household (H.H.)	Farm Are per H.H. (feddan /H.H)	Population	2002/03	2003/04	2004/05	2002/03	2003/04	2004/05	2002/03	2003/04	2004/05
El Beheira Zone	1	Damanhour	1985	92,000		12,000	0.6	80,000	617,850	658,345	762,840	414,926	485,503	535,369	202,924	172,842	227,471
	2	Kafr El Dawaar	1995	69,980		18,000	0.6	121,000	523,622	508,680	508,460	292,529	308,594	348,463	231,093	200,086	159,997
	3	Etay El Baroud	1988	86,380	64	12,000	5.3	85,000	565,780	479,782	724,394	465,870	455,980	555,179	99,910	23,802	169,215
	4	El Mahomoudiah	1986	28,750	20	8,500	2.0	57,000	554,008	491,798	629,424	405,672	429,220	445,531	148,336	62,578	183,893
	5	Abu El Matameer	1978	87,890		6,000	1.2	40,000	745,244	701,121	799,565	431,171	443,692	489,632	314,073	257,429	309,933
	6	El Delengat	1991	86,100	36	15,000	4.4	100,000	735,651	664,740	803,184	432,576	439,540	640,000	303,075	225,200	163,184
	7	Abis	1990	47,000	25	8,000	0.4	6,000	780,830	664,995	729,798	322,718	361,961	346,757	458,112	303,034	383,041
	8	Shubrakheet	1991	53,600	40	2,000	2.5	13,000	430,203	311,294	496,106	171,253	191,154	256,749	258,950	120,140	239,357
	9	El Sawaaf	1998	47,050	20	10,000	5.0	67,000	340,337	342,060	349,404	220,810	261,377	278,633	119,527	80,683	70,771
	10	Kom Hamada	1991	114,000	70	30,000	3.8	70,000	585,945	536,177	557,198	425,845	459,378	711,114	160,100	76,799	(153,916)
	Sub-total			712,750	275	121,500		639,000	5,879,470	5,358,992	6,360,373	3,583,370	3,836,399	4,607,427	2,296,100	1,522,593	1,752,946
	Average			71,275	39	12,150	2.6	63,900	587,947	535,899	636,037	358,337	383,640	460,743	229,610	152,259	175,295
El Aradi El Gededa Zone	11	Gana Klees	1987	58,180	13	3,900	14.9	60,000	747,363	659,886	719,563	438,863	512,614	463,438	308,500	147,272	256,125
	12	Ahmed Shawki	1989	54,150	20	9,000	6.0	50,000	1,481,100	1,535,209	1,530,125	559,910	548,745	901,764	921,190	986,464	628,361
	13	Naguib Mahfouz	1988	51,000	40	12,000	4.3	40,000	711,224	671,119	835,129	26,723	397,856	460,120	684,501	273,263	375,009
	14	El Salam	1989	69,910	20	6,000	11.7	40,000	1,287,849	1,270,646	1,847,124	484,092	662,014	897,451	803,757	608,632	949,673
	15		2005														
	Sub-total			233,240	93	30,900		190,000	4,227,536	4,136,860	4,931,941	1,509,588	2,121,229	2,722,773	2,717,948	2,015,631	2,209,168
	Average			58,310	23	7,725	7.5	47,500	1,056,884	1,034,215	1,232,985	377,397	530,307	680,693	679,487	503,908	552,292
Wadi El Natron Zone	16	Wadi El Natron	1996	100,000	10	8,000	5.0	54,000	639,981	716,165	874,551	27,440	481,116	605,813	612,541	235,049	268,738
	17	Mariyot	1999	125,000	40	20,000	6.3	134,000	724,549	786,966	1,058,600	366,328	482,733	498,787	358,221	304,233	559,813
	18	Banger El Sokar	1989	100,000	40	40,000	2.5	268,000	610,864	514,587	560,715	239,567	301,636	330,956	371,297	212,951	229,759
	19	Abd El Rakeep	1989	61,000	10	25,000	2.4	170,000	596,742	802,701	1,247,751	401,158	507,756	528,998	195,584	294,945	718,753
	20	El Zohour	1990	45,000	20	10,000	4.5	67,000	478,480	427,269	497,438	225,190	305,288	262,881	253,290	121,981	234,557
	Sub-total			431,000	120	103,000		693,000	3,050,616	3,247,688	4,239,055	1,259,683	2,078,529	2,227,435	1,790,933	1,169,159	2,011,620
	Average			86,200	24	20,600	4.2	138,600	610,123	649,538	847,811	251,937	415,706	445,487	358,187	233,832	402,324
	Total			#######	488	255,400		1,522,000	13,157,622	12,743,540	15,531,369	6,352,641	8,036,157	9,557,635	6,804,981	4,707,383	5,973,734
	Average			72,473	26	13,442	5.4	80,105	692,506	670,713	817,440	334,350	422,956	503,033	358,157	247,757	314,407

Source: Each HS

Appendix 5-5 Topographic & Geological Survey

As a survey of natural conditions, topographic & geological survey were conducted by sub-contract base at the Project Site of Agricultural Mechanization Center in Damanhour.

＜Outline of Survey＞

This survey is aimed at determining the most suitable scale and deployment of facilities as well as securing the accuracy of basic design. Works of survey are as follows:

Works of Survey

＜Topographic Survey＞ Outline:	①Plain Survey ・Area: Whole site with road at front of site ・Objects: Road, Buildings, Trees（H=3m and over） Other fixed facilities on the ground （If there is infrastructure such as electricity, water supply, sewers and gas pipelines, they should be plotted on the drawings.） ②Ground Level Survey ・After set the boarder line between road and site or near around point as the fixed point BM±０, conduct the level survey at the crossed points of 20m mesh within the area. ・Survey the levels of road center in front of the site at each 20m.
Output:	Three copies of survey reports including the following: ・Plane drawings, Perspectives, Field notes, Daily Report, Photograph of the site
＜Geological Survey＞ Outline:	①Boring Test ・Depth: 30m（7 points） ・Standard Penetration Test（1m interval） ②Soil Sampling Test ・One Dimensional Consolidation Test and Unconfined Compression Test（15 points） ③CBR Test（4 points）
Output:	Three copies of survey reports including the following: ・Site map of boring test, Sectional Drawing of Soil Characteristics (2 phases)(based on BM±0) ・Data sheets of soil test, daily reports, Photograph of the site.

＜Outline of Survey Results＞

Outline of survey results are shown in the followings:

5-5-1 Topographic Survey

5-5-2 Boring Test

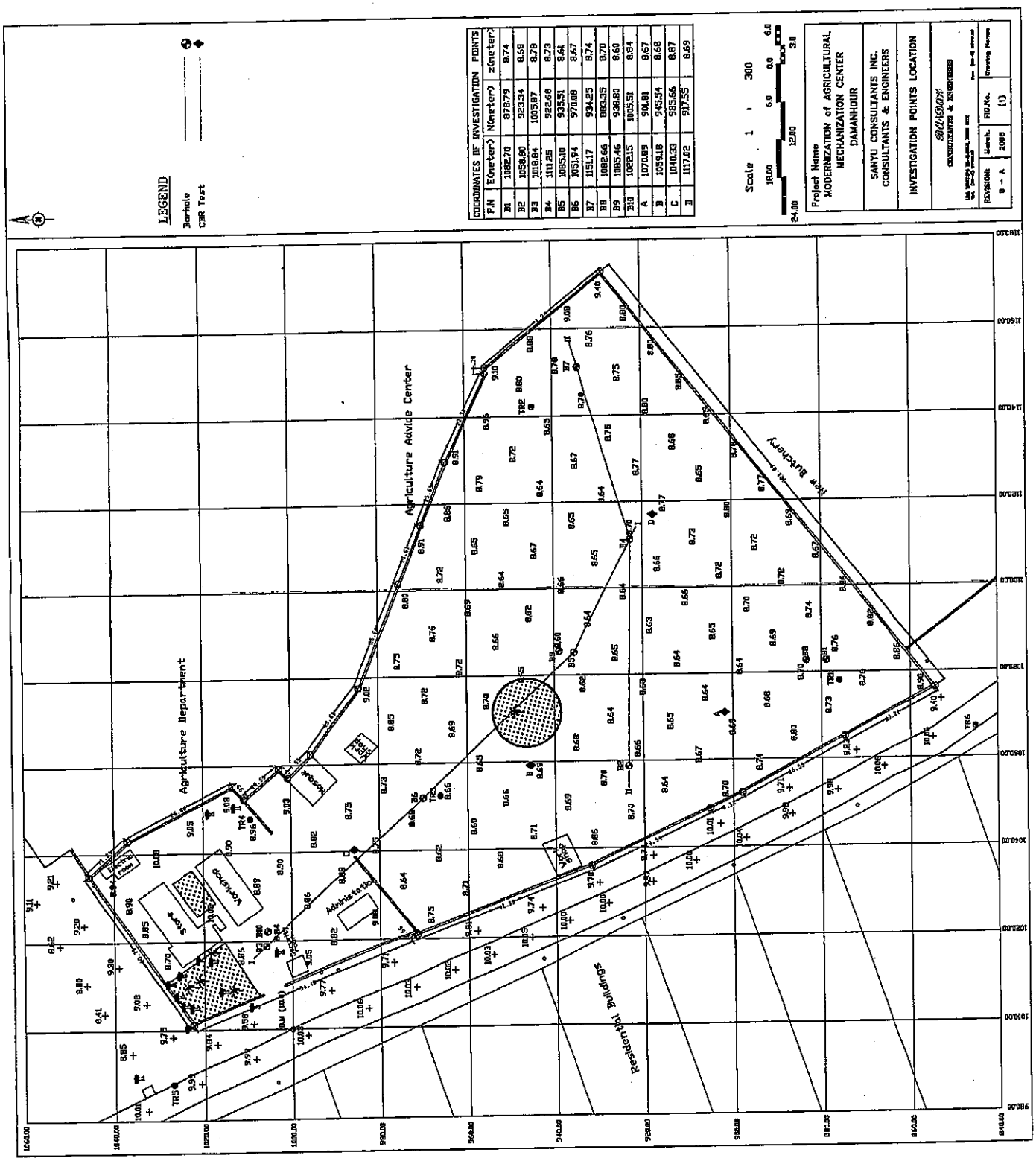
5-5-3 Unconfined Compression Test

5-5-4 One Dimensional Consolidation Test

5-5-5 CBRTest

Appendix 5-5 Topographic & Geological Survey

5-5-1 Topographic Survey

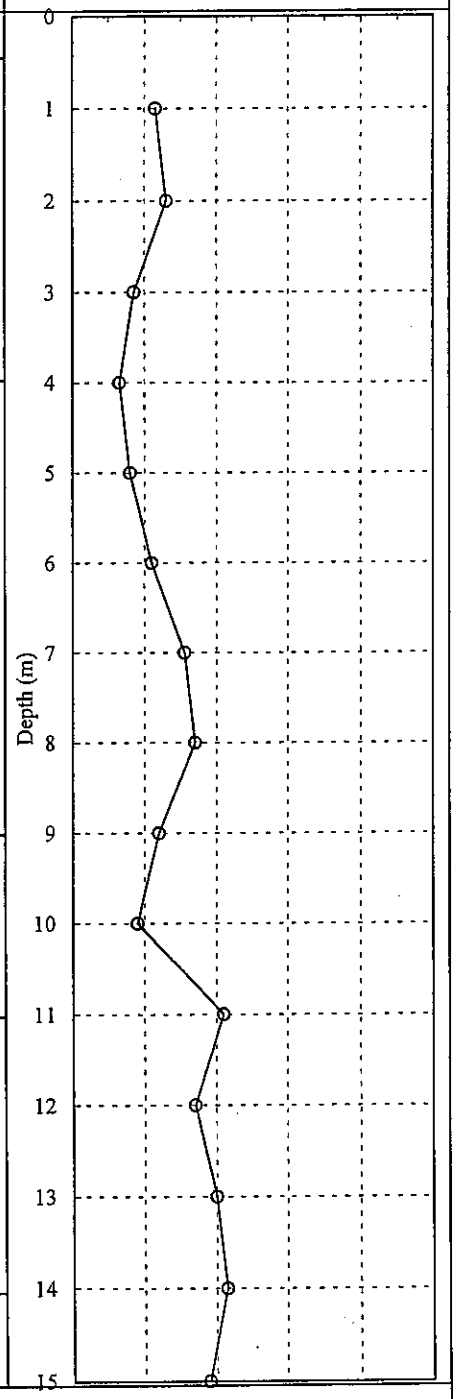


COORDINATES OF INVESTIGATION POINTS			
P.N	E(meter)	N(meter)	Z(meter)
B1	1082.70	878.79	8.74
B2	1058.60	923.34	8.68
B3	1016.84	1005.87	8.78
B4	1111.25	922.68	8.73
B5	1065.10	935.51	8.61
B6	1051.94	970.08	8.67
B7	1151.17	934.25	8.74
B8	1082.66	893.35	8.70
B9	1065.46	936.80	8.60
B10	1022.15	1005.51	8.84
A	1070.89	901.81	8.67
B	1059.18	943.54	8.68
C	1040.33	985.66	8.87
D	1117.62	917.55	8.69

5-5-2 Boring Test

Project : Modernization of Agricultural Mechanization Center	Borehole No. : (7)		Sheet No. : (1 / 2)
	Rig Type : Mechanical		G.L. : 8.74
Location : Damanhour	Driller : Shaheen Company		I.G.W.L. :
Client : Sanyu Consultants Inc.	Date : 19 / 3 / 2006		F.G.W.L : 1.70

Depth (m)	N blows/15cm 1st	2nd	3rd	Borehole log	Soil Classification
					FILL
1	6	9	14		CLAYEY SILT, BROWN TO DARK BROWN
2	5	10	16		
3	5	7	10		
4	4	6	7		
5	5	7	9		SILTY CLAY, DARK GREY
6	4	8	14		
7	8	13	18		
8	11	15	19		
9	7	9	15		
10	6	8	10		PEAT
11	11	17	25		
12	11	15	19		SILTY CLAY, DARK GREY
13	10	15	25		
14	16	16	27		
15	13	17	21		MEDIUM TO FINE SAND, SOME SILT, YELLOWISH GREY



Remarks : CONTINUE

Co-ordinates : E : 1151.17

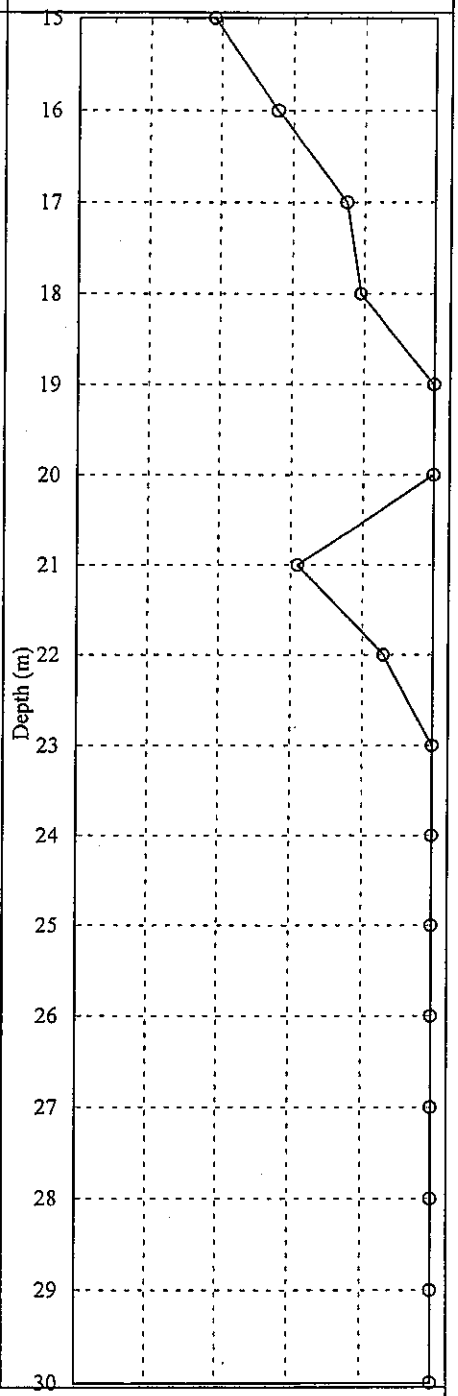
N : 934.25

BANDOK

Fig. (14)

Project : Modernization of Agricultural Mechanization Center	Borehole No. : (7)	Sheet No. : (2 / 2)
	Rig Type : Mechanical	G.L. : 8.74
Location : Damanhour	Driller : Shaheen Company	I.G.W.L. :
Client : Sanyu Consultants Inc.	Date : 19 / 3 / 2006	F.G.W.L : 1.70

Depth (m)	N blows/15cm 1st	2nd	3rd	Borehole log	Soil Classification
16	21	23	33	X	POOR GRADED SAND, TRACES OF SILT,
				X	YELLOWISH GREY
17	16	30	45		
18	17	29	50	X	
19	20	36	13cm	X	
20	36	50	12cm	X	
21	19	26	36	X	
22	28	36	50	X	
23	42	10cm	7cm	X	
24	36	50	5cm	X	
25	10cm	6cm	5cm	X	
26	49	10cm	5cm	X	
27	50	9cm	5cm	X	
28	50	5cm	4cm	X	
29	10cm	5cm	4cm	X	
30	12cm	7cm	4cm	X	



Remarks : END OF BORING 30 m Depth

Co-ordinates : E : 1151.17

N : 934.25

BANDOK

Fig. (15)

5-5-3 Unconfined Compression Test

UNCONFINED COMPRESSION TEST

Project : Modernization of Agricultural Mechanization Center
Location : Damanhour
Client : Sanyu Consultants Inc.

Borehole no. : 8
Sample diameter : 70 mm
Sample height : 139 mm

Depth : 3 m
Bulk unit weight : 1.80 t/m^3
Water content : 34.1%

Strain (%)	Stress (kg/cm^2)
0.00	0.00
0.36	0.09
0.72	0.17
1.08	0.26
1.44	0.31
1.80	0.36
2.16	0.40
2.52	0.49
2.88	0.54
3.24	0.59
3.60	0.66
4.32	0.75
5.04	0.81
5.76	0.87
6.47	0.94
7.19	0.98
7.91	1.03
8.63	1.05
9.35	1.08
10.07	1.10
10.79	1.11
11.51	1.10
12.23	1.09

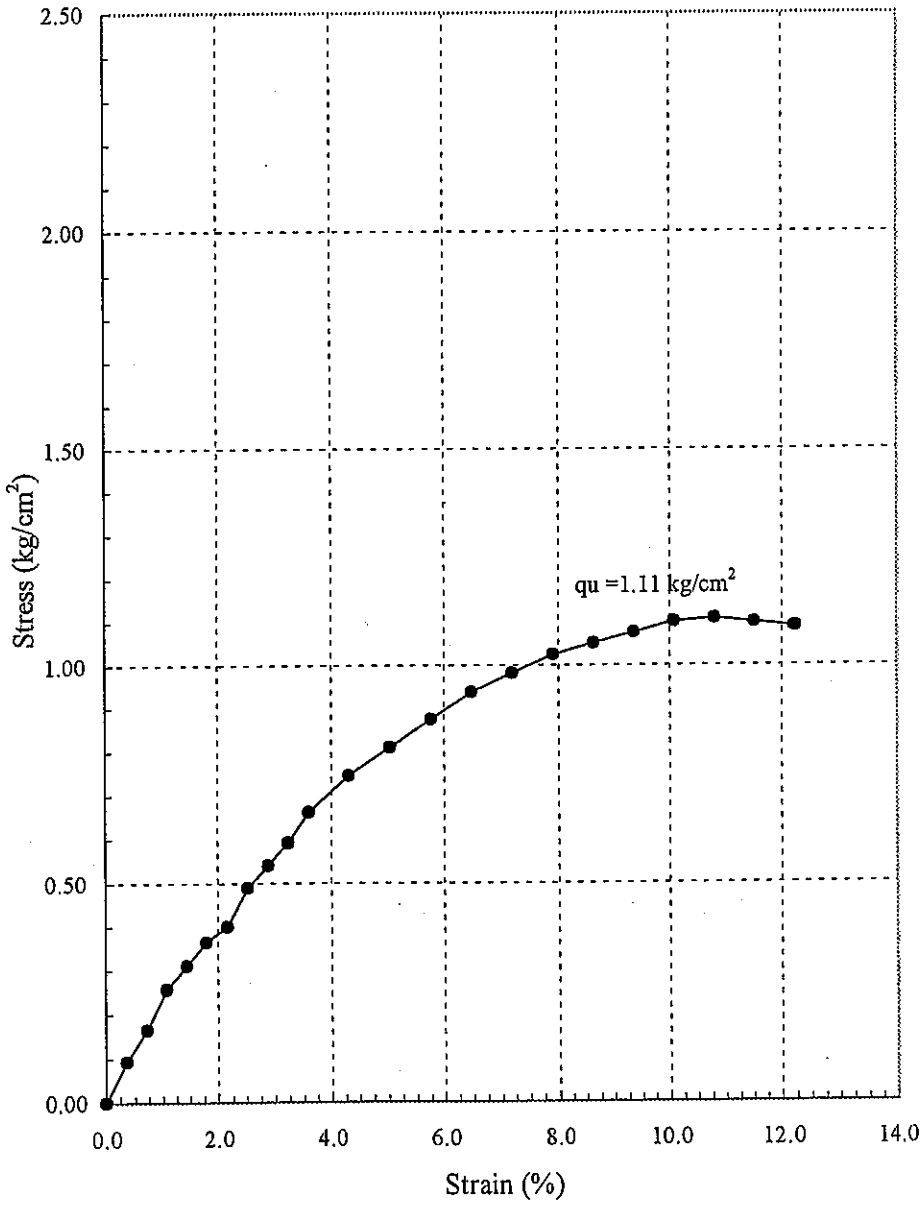


Fig. (49) Stress - Strain curve

Tested By : A.B.
Checked By : A.R.

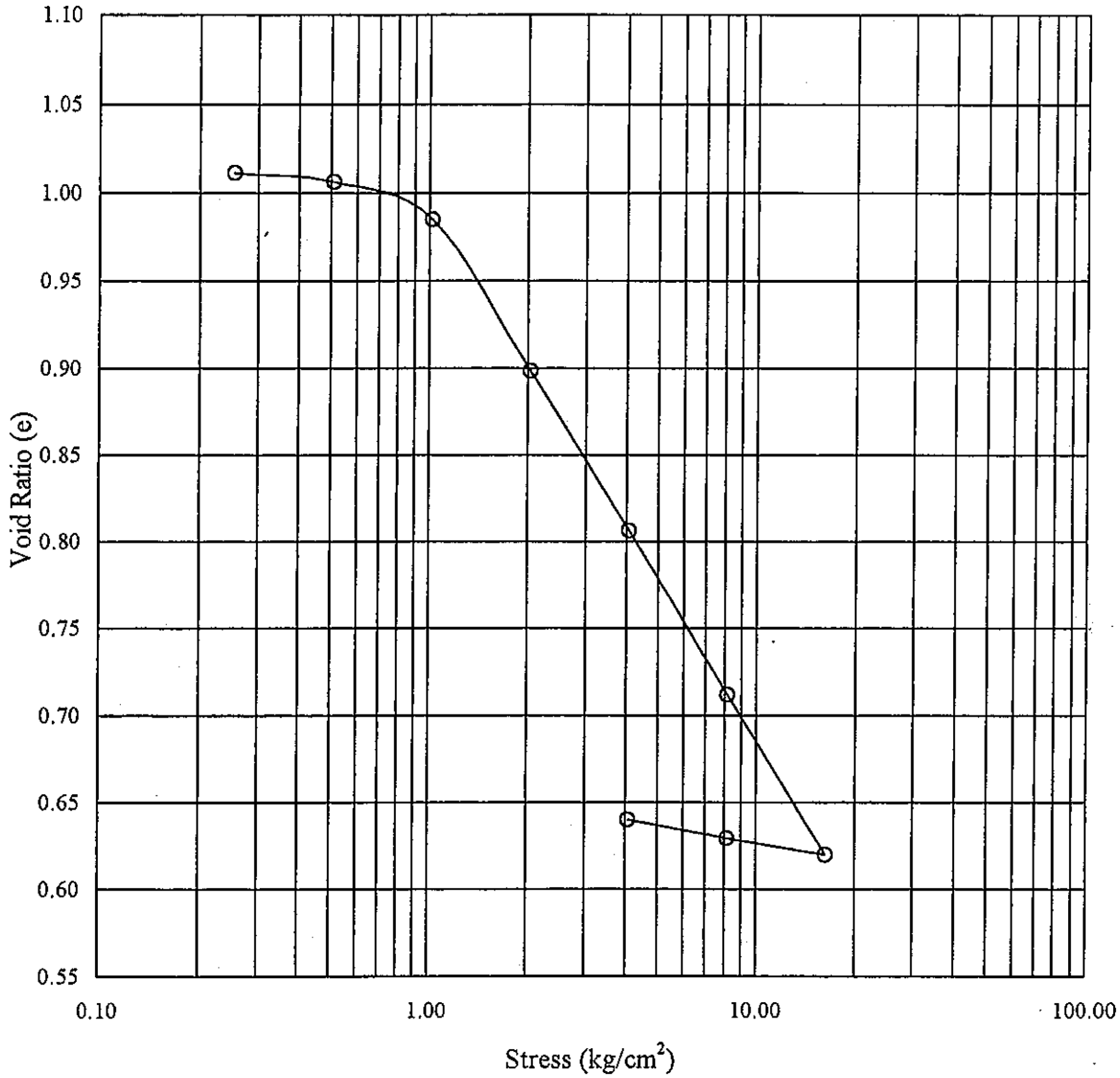
BANDOH

5-5-4 One Dimensional Consolidation Test

ONE DIMENSIONAL CONSOLIDATION TEST

Project : Modernization of Agricultural Mechanization Center
Location : Damanhour
Client : Sanyu Consultants Inc.

BH : (8)
Depth : 3 m



Water content	=	34.1	Overburden pressure	=	5.40 t/m²
Bulk unit weight	=	1.80 t/m³	Compression index	=	0.310
Specific gravity	=	2.70 (assigned)	Recompression index	=	0.032
Initial void ratio	=	1.012	Preconsolidation pressure	=	9.5 t/m²

Fig. (64) Void ratio - Vertical stress curve

BANDAI

5-5-5 Field CBR Test

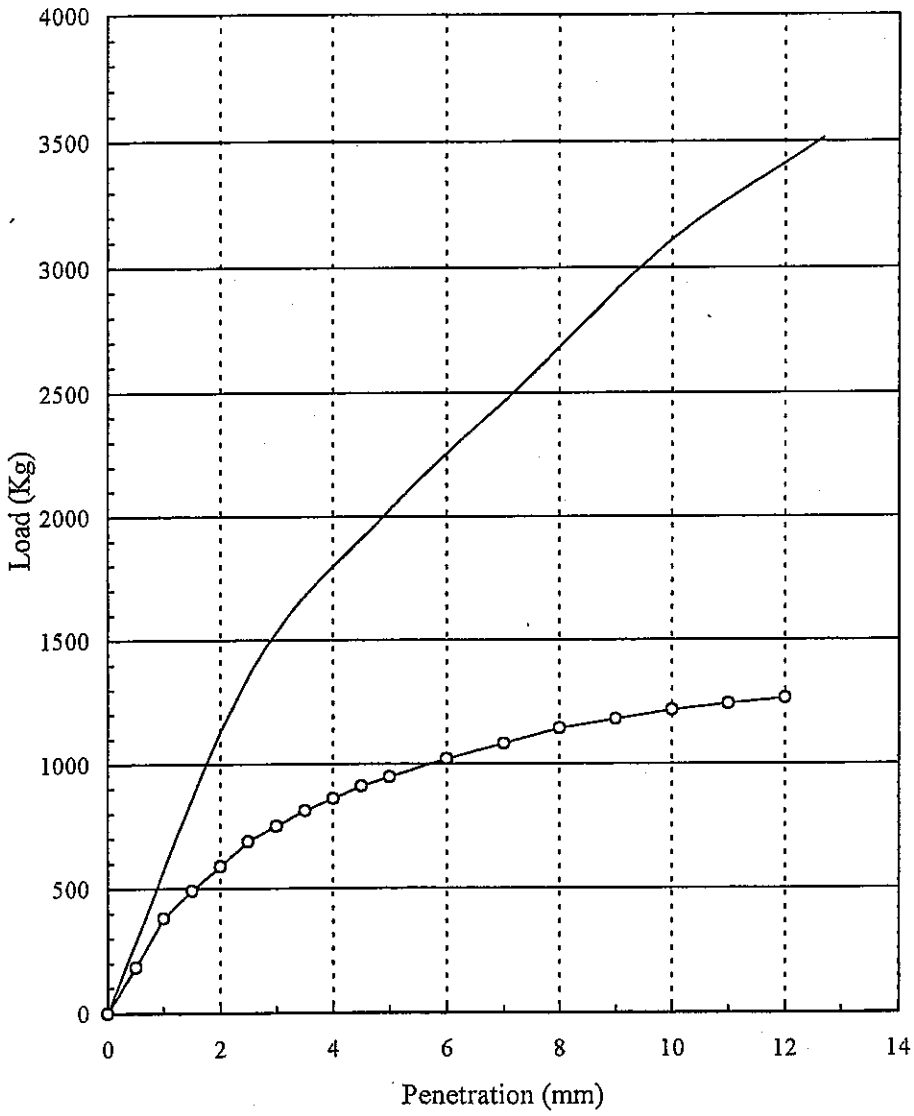
FIELD CBR TEST (CALIFORNIA BEARING RATIO)

Project : Modernization of Agricultural Mechanization Center
Location : Damanhour
Client : Sanyu Consultants Inc.

Test Location : Point (A)
Depth : Existing ground surface
Surcharge load : 9.03 kg
Load diameter : 214 mm
Rate of penetration = 1 mm / minute

Test Results	
Penetration (mm)	Load (Kg)
0	0.00
0.5	184.28
1	380.84
1.5	491.40
2	589.68
2.5	687.96
3	749.39
3.5	810.81
4	859.95
4.5	909.09
5	945.95
6	1019.66
7	1081.08
8	1142.51
9	1179.36
10	1216.22
11	1240.79
12	1265.36

Standard Soil	
Penetration (mm)	Load (Kg)
0.000	0.000
2.500	1352
5.000	2028
7.500	2569
10.000	3110
12.700	3515



CBR Value at 2.5 mm = 50.88 %
CBR Value at 5.0 mm = 46.64 %

Co-ordinates : E : 1070.89 N : 901.81
G.L. : 8.67

Fig. (81) Load - Penetration curve
Test No. A

BANDOK

Appendix 5-6 Baseline Survey

The baseline survey was conducted to aiming at the collection of data and information which are various indicators using for project evaluation and effectiveness in future from the farmers who are direct beneficiaries by the Project and living in the Beheira zone (Old land) and Aradi El Gededa zone and Wadi El Natron zone (New land) in the Project area.

＜Outline of Survey＞

There are 19 Hiring Stations in the Project Area (31 Hiring Stations in future establishing 12 stations). Baseline survey was carried out after selected the villages and farmers by zone. Since the baseline survey of 15 out of 19 Hiring Stations was finished during the period of the Preliminary Study, remaining 4 Hiring Stations was conducted during the period of this Basic Design Study and the all of data and information were analyzed together.

Four (4) Hiring Stations are Abis in New land and Maryot, Bangar El Sakkar and El Zohour in New land. Two villages by Hiring Station and 10 farmers by village were selected and interviewed (4 zones x 2 villages x 10 farmers = 80 farmers). In addition, farmers were chosen by category such as ① less than 2 feddan, ② 2 to 5 feddan and ③ 5 feddan and over of their farm land holding. In Old land, 6 farmers belong to ① and 2 farmers belong to ② and ③, respectively. On the other hand, in New land as there are no ①, farmers were randomly chosen.

Therefore, total data is from 380 farmers (300 farmers by Preliminary Study + 80 farmers by Basic Design Study) consisting of 10 farmers by village, 2 villages by Hiring Station and 9 Hiring stations in Beheira zone, 4 Hiring Stations in Aradi El Gededa zone and 5 Hiring Stations in Wadi El Natron zone.

No.	Zone	Station (AMS)	Village	
1	Behera Zone	Damanhour	El Shoukah	El Safasif
2		El Mahmoudia	Kafrel Rahmania	Ezbet Allam
3		Kafr El Dawar	Abis El Mostagaddah	King Osman
4		Shobrakheet	Shobra-Ris	Mostaanad
5		Etai El Barod	Kafr El Haggak	Kafr Mosaed
6		El Delengat	Al Masin	Abu-Seafah
7		Abu El Matameer	Abu-Ghararah	Kom El Faraq
8		El Sawaf	El Sawaf	El Maghneyyin
9		Kam Hamada	Balin	Malihah
10		Abis	Abis Two	Khorshed
11	El Aradi El Gededa Zone	Ganaklees	Ganaklees	El Lohoum
12		El Salam	El Salam	El Thawrah
13		Naguib Mahfouz	El Shaarawy	Naguib Mahfouz
14		Ahmed Shawky	Ahmed Shawky	El Hussein
15	Wadi El Natron Zone	Mohamed Abdel Raquib	Abdel Raquib	El Shagaah
16		Wadi El Natron	Belal	Single Farms
17		Maryot	El Eman	El Khalid
18		Bangar El Sakkar	El Almereya	El Sakkar
19		El Zohour	El Zohour	Bong El Arab

：Conducted in Basic Design Study

＜**Results**＞

Results of survey are shown in the followings: such as income, farm land holding, agricultural product and their problems concerning their livelihood, agricultural equipment and hiring conditions about the usage of agricultural equipment as well as their problems and/or request to the agricultural mechanization. Data were analyzed by zone (Beheira zone, Aradi El Gededa zone and Wadi El Natron zone) in order to finding the zonal agricultural conditions and characteristics as clearly as possible.

1) Farming Area and Rate of the Intensive

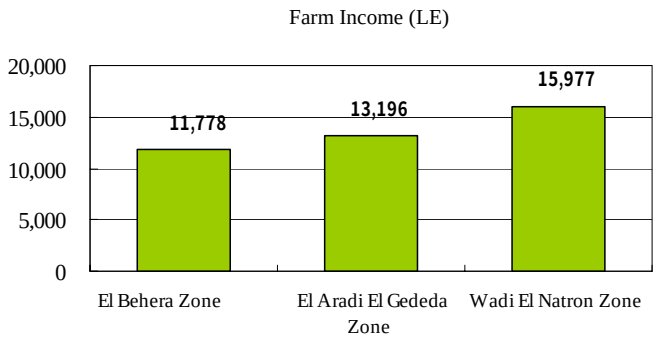
Major Crops	Wheat		Maize		Cotton		Rice	
Zone	Area (feddan)	Rate (%)	Area (feddan)	Rate (%)	Area (feddan)	Rate (%)	Area (feddan)	Rate (%)
El Behera Zone	2.27	87.5	1.91	61.0	3.38	49.0	3.47	54.5
El Aradi El Gededa Zone	6.15	72.5	2.30	62.5	1.58	3.75	3.00	11.25
Wadi El Natron Zone	4.22	72.5	2.69	53.0	3.08	3.0	1.00	1.00

Major crops in the Study area Beheira Governarate are wheat, maize, cotton and rice. Wheat is produced in three zones and planted by more than 70% farmers. Farming areas of it are 6.15 feddan in Aradi El Gededa zone and as smaller as 2.27 feddan in Beheira zone. Maize is planted more than 50% of all zones and 1.91 feddan in Beheria zone, 2.30 feddan in Aradi El Gededa and 2.69 feddan in Wadi El Natron. Cotton and rice is around 50% in Beheira zone, but rare in New land (Aradi El Gededa zone and Wadi El Natron), which has a problem of irrigation water shortage.

When being conducted evaluation of agricultural mechanization promotion, comparison between the data of this baseline survey in 2006 and newly conducted survey in future will be able to in order to analyzing the change of farming area of major crops and rate of their intensive in the Project area. However, data should be analyzed and evaluated by zone because the farming conditions are varied by zone.

2) Farm Income

Farm income is almost by agriculture in the area. Farm income in Wadi El Natron is the highest 15,977 LE and in Beheira the lowest 11,778 LE. It seems that the progress of agricultural mechanization and size of farm land holdings. Promotion of agricultural mechanization leads to the increment of agricultural productivity and increasing the farm area and conducting the other jobs using the spare time being obtained by mechanization



promise the increment of farm and/or other income in the household. Therefore, by comparing the values from this survey data and from the monitoring survey in future, effects of agricultural mechanization promotion will be able to be estimated.

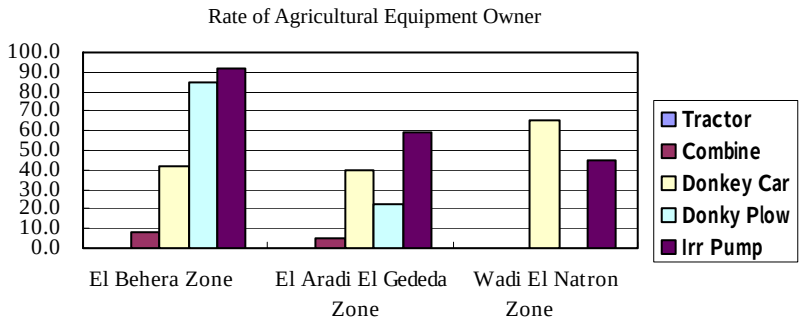
3) Usage Rate of Agricultural Equipment

In the conditions of usage of hiring agricultural equipment, usage rate of hiring tractor is the highest 85% in Beheira, 78% in Aradi El Gededa and 50% in Wadi El Natron. Next is combine, around 40% in Beheira and in Aradi el Gededa, on the other hand, hiring rate of thresher and sprayer is more than 20% in Wadi El Natron. About tractor usage, which is the highest among others, shortage of tractor number and higher farmers' demands seem to cause the limited and lower usage rate (average of three zones: 78.3%). The more available tractor number by establishing the Center is expected the increment of usage rate.

Equipment Name	Tractor	Combine	Thresher	Sprayer	Laser Level	Seed Drill	Thresher (Rice)
Zone	(%)	(%)	(%)	(%)	(%)	(%)	(%)
El Beheira Zone	85.0	39.4	23.3	5.0	12.8	5.0	7.8
El Aradi El Gededa Zone	77.5	45.0	13.8	7.5	5.0	1.3	0.0
Wadi El Natron Zone	50.0	10.0	25.0	30.0	0.0	0.0	0.0

4) Rate of Agricultural Equipment Owners

According to the baseline survey, agricultural equipment owners are not many. About the high cost equipment such as tractor and combine, small-scale farmers don't have and large-scale farmers have a limited number. On the other hand, it is found that the farmers use for farming the hiring equipment as well as donkey reducing the manpower job. After established the Center of this project and operated well in order to providing the services to the farmers, farmers intentions to the Center are expected to become higher. At the results of the farmers' usage and understanding of agricultural equipment effectiveness, usage rage of agricultural equipment and Rate of Owners are expected to become higher.



Unit : %

Zone	Tractor	Combine	Donkey Car	Animal Plow	Pump
Beheira Zone	0.0	7.8	42.4	84.4	92.2
El Aradi El Gededa Zone	0.0	5.0	40.0	22.5	58.8
Wadi El Natron Zone	0.0	0.0	65.0	0.0	45.0

＜Output and Indicators＞

Output and indicators for three major functions of the Center will be the followings:

Output 1) Training function is installed in the existing Damanhour Agricultural Mechanization Station.

Indicators: ① Number of trainees of the staff of Agricultural Mechanization Sector reach 400 in the third year or later.

② Number of farmers' trainees reach 200 per annum.

③ Training for more than 23 weeks per year is performed.

Where, ① and ② are analyzed by trainee records and ③ by training records.

Output 2) The Existing maintenance/repairing function is fortified in the said station.

Indicators: ① Possible capacity of maintenance/repairing of tractors/combines (currently light repairing 40 numbers per year) is raised by 108% (83 numbers per year).

② Average duration of repair of farm machinery (mean: 90%) is saved by 60% (35 days).

Where, ① is analyzed by repairing performances and ② by application forms of repairing and repairing records.

Output 3) The existing hiring service are ameliorated.

Indicators: ① Available number of farm machinery for rent (average 374 feddan per unit per year) increases by 10%

Where, ① is analyzed by working records of machinery.

Project target "The technical supporting system of promoting agricultural mechanization is created in the Project Area" is analyzed by achievements of newly established training and repairing functions.

Overall goal "Agricultural mechanization is promoted in the target area of the Project" is estimated as effectiveness by comparing data and information between from this baseline survey and from the monitoring survey in future.

Comparison between the Request and the Project

Function	Contents of the Request	Major Components of the Project	Notable Remarks
Repairing/ Maintenance function (newly established)	・ Construction of workshop building ・ Construction of fuel station and car-wash facility	・ The same (steel-frame building, partly two-story, 1,534.50m^2) ・ Construction of car-wash facility	・ As to requested fuel station, the existing one can be used as it is since it still functions well.
	・ Procurement of equipment: for Engine overhauling equipment, Transmission repair equipment, Metal Processing (lathe, etc), electric tools, sheet-metal work tools, welding tools, painting tools, wood works equipment	・ Procurement of equipment: The same (Categories: Washing & Cleaning, Chassis Service, Electric& hydraulic, Metal Works, Welding, Engine & driving repair, Fuel Injection Pump, Test & lubrication)	・ Requested carpentering tools are excluded from this Project because they are not directly related to the promotion of agricultural mechanization ・ Forklifts and mobile workshops listed in support equipment are classified as this repairing equipment
Training function (newly established)	・ Construction of training building (including audio-visual room, lecture rooms, dormitory)	・ The same (including audio-visual room, lecture rooms, dormitory) (reinforced concrete building, two-story) (960.00 m^2)	-
	・ Training yard (demonstration field)	・ Excluded	・ Since some plots belonging to the MALR or private land would be used as substitute for it, the requested demonstration field is excluded from the Project Components.
	・ Equipment: OHP sets, cut-models, TV, video, computer, AV equipment, training materials, etc.	・ Equipment: OHP sets, cut-models, Slide Projector	・ Training equipment only for making use of the existing teaching materials is included in the Project Components.
Hiring service function of farm machinery (strengthened)	・ Construction of tractor shelter	・ The same (2 steel-framed buildings, 1,325.80 m^2)	-
	・ Procurement of equipment: Tractors (110HP; 20 units, 82 HP; 20 units, Disc harrow; 20 units, Combine 20 units.	・ Excluded	・ Since the Project target is to put in place the supporting system of promoting agricultural mechanization, requested agricultural machinery is excluded from the Project Components.
Others	・ Construction of staff building ・ Construction of adjunct facilities	・ The same (reinforce concrete building, two-story, 864.00 m^2) ・ The same (reinforced concrete and/or steel-frame building, one-story, 202.48 m^2)	-
	・ Construction of elevated water tank	・ Excluded	・ The requested elevated tower tank is excluded from this Project because public water supply has enough feed water pressure.
	・ Procurement of equipment: Office apparatus, vehicles, forklifts, mobile workshops, etc.	・ Equipment: Forklift, mobile repairing vehicle is classified into repairing function, others are excluded from this Project.	・ The requested office apparatus and vehicles are excluded from the Project Components by the reason that they are universally appropriated and no guarantee can be made to strictly be confined to the exclusive use for the pledged purpose.

Appendix 5-8 Examination of Training Plan

1. Objectives of training

(1) Training by the Project aims at allowing operators and mechanics of farm machinery who are the staff of AMS in the target area to learn and master operation and repair / maintenance techniques through basic subjects and applied ones. The former subjects include handling and O/M, inspection / maintenance and trouble-shooting diagnosis of farm machinery, wile the latter do safety operation, efficient use thereof, driving / operation skills and repair techniques.

(2) It also has another objective of guiding farmers in the target area outline of farm machinery and its operations, kinds of machinery by farming operations, efficiency of agricultural mechanization as an enlightening education on the necessity of effects and promotion of agricultural mechanization.

2. Training program by the Government of Egypt

<The training courses and contents by the Government of Egypt >

The training courses are shown in the table 2-1. It includes training A for the target trainees of staff operators and mechanics and training B for farmers. Though training C to be provided by MALR is also included as a component, it is excluded from the table because AMS is not responsible for this training.

Table E-1 The training courses and contents

Training A：Agricultural mechanization course: targeted at operators		Contents	Level	Frequency of training (year)		
Training of tractors				1st year	2nd year	after 3 years
1	Tractor operation with different implements	driving operation using / dealing implements	Basic	1	1	2
2	Tractor: Maintenance	Inspection / maintenance and simple repair	Basic		1	2
3	Laser leveling	Individual application: treatment of implements	applied	1	1	1
4	Seed drill: adjustment / calibration	ditto	applied	1	1	1
5	Planter: adjustment / calibration	ditto	applied		1	1
6	Bailer operation and maintenance	Individual application: treatment of implements	applied	1	1	2
Training of Combine						
7	Head feeding combine: O/M	Handling operation & inspection / maintenance	Basic	1	1	2
8	Head feeding combine: Hydraulic / electricity	Inspection / maintenance and simple repair	Basic		1	2
9	Conventional: operation O / M	Large-sized combine operation and O / M	applied	1	1	2
Training A：Workshop technique course: for mechanics						
1	Engine: overhauling and repair	Engine repair, basic overhauling	Basic	1	1	1
2	Transmission: overhauling and repair	Energy transmitting driving system basal repair	Basic	1	1	1
3	Sheet-metal works	Basic works of sheet metal	applied	1	1	1
4	Hydraulic system	Implements hydraulic driving system adjustment and repair	applied		1	1
5	Electric circuit of farm machinery	Foundation of electric system repair	applied	1	1	1
	Subtotal (once/a week)	(3rd year and later, 20times a year, 20 weeks)		10	14	20
Training B：Agricultural mechanization course: for farmers						
1	Modern irrigation facilities (drip, sprinkler)	Kinds of irrigation facilities and specifications and their treatment	-	2	2	2
2	Forage machinery: operation O / M	Operation implements attached to tractors	-	2	2	2
3	Potato harvester: operation O / M	Operation implements attached to tractors	-	2	2	2
4	Groundnut harvester: operation O / M	Operation implements attached to tractors	-	2	2	2
5	Hay bailer: operation O / M	Operation implements attached to tractors	-	2	2	2
	Subtotal (once in 2 days)	(10 times a year, 20days)		10	10	10

Note：(1) contents and level stem from review / evaluation by the Study Team

Annual schedule by the Egyptian side is given below, planned avoiding peak farming season (April ~ May and mid August ~ mid October) and shifting period of fiscal year (June ~ July), though there observed some overlapping between training period and peak season in the initial part.

Table E-2 Annual training calendar

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Restricted Period		Combine inspection period		wheat harvest		fiscal year		paddy harvesting period					
1st year													
Training A: operators			8	9						4	1, 3	6	6
Training A: Maintenance		5								1	2	3	4
Sub-total TrainingA)		1	1	1						2	3	2	10
Training B		1,1,3,3						2,2,4, 4,5,5,					10
Total		5	1	1				6		2	3	2	20
2nd year													
Training A: operators	2,7	5	8	9						4	1, 3	6	9
Training A: Maintenance		5								1	2	3, 4	5
Sub-total TrainingA)	2	2	1	1						2	3	3	14
Training B		1,1,3,3						2,2,4, 4,5,5,					10
Total	2	6	1	1				6		2	3	3	24
3rd year and later													
Training A: operators	2,2,7,7	5	8, 8	9, 9						4	1, 2,3	6, 6	15
Training A: Maintenance		5								1	2	3, 4	5
Sub-total TrainingA)	4	2	2	2						2	4	4	20
Training B		1,1,3,3						2,2,4, 4,5,5,					10
Total	4	6	2	2				6		2	4	4	30

Note: (1) Numbers in the table indicate course number
(2) Sub-total and figures in total columns indicate number of training batches.

<Medium-term training program by the Government of Egypt>

According to training program by the Government of Egypt, target trainees of the training are staff of AMS in Training A, farmers in Training B and post-graduates in Training C provided by MALR. According to its medium-term program, an introductive period is set for the initial 3 years in Training A. In this Training A, it is planned to annually train 500 staff in the third year, where 25 trainees trained in a course are envisaged.

Table E-3 Medium-term training program by the Government of Egypt

Category	1st year	2nd year	3rd year	4th year	5th year
1) Training A	250	350	500	500	500
2) Training B	200	200	200	200	200
3) Training C	400	400	400	400	400
Total	850	950	1,100	1,100	1,100
Cumulative total	850	1,800	2,900	4,000	5,100

3. The training program revised by the Egyptian side (as of August at the confirmation)

The revised training course is shown below. It contains a training course for the staff operators and mechanics and the other for farmers. The training courses for the staff are further

divided into 3 courses for tractor, for combine and for workshop techniques for each of which different course has been selected.

<Kinds and contents of training courses revised by the Egyptian side>

Table E-4 The training courses and contents

Training A：Agricultural mechanization course: targeted at operators		**Contents**	**Level**	**Frequency of training (year)**		
Training of tractors				1st year	2nd year	after 3 years
1	Tractor operation with different implements	Driving operation using / dealing implements	Basic	1	1	1
2	Tractor: maintenance	Inspection / maintenance and simple repair	Basic	1	1	1
3	Laser leveling	Individual application: treatment of implements	applied	1	1	2
4	Seed drill: adjustment / calibration	ditto	applied	0	1	2
5	Planter: adjustment / calibration	ditto	applied	0	1	1
6	Bailer operation and maintenance	Individual application: treatment of implements	applied	0	0	2
	Subtotal			3	5	9
Training of Combine harvester						
1	Head feeding combine: operation	Handling operation & inspection / maintenance	Basic	1	1	1
2	Head feeding combine: O / M	Inspection / maintenance and simple repair	Basic	1	1	1
3	Head feeding combine: Hydraulic / electricity	Inspection / maintenance and simple repair	applied	1	1	1
4	Conventional: operation	Large-sized combine: operation			1	1
5	Conventional: operation: maintenance	Large-sized combine: O / M				1
	Subtotal			3	4	5
Training A：Workshop technique course: for mechanics						
1	Tractor: operation with different implements	Driving operation & implement handling skills	Basic	1	1	1
2	Tractor: maintenance	Energy transmitting driving system basal repair	Basic	1	1	1
3	Hydraulic systems	Implements hydraulic driving system adjustment and repair	applied	1	1	1
4	Electric circuit of farm machinery	Basic skills for repairing electric circuit system		1	1	1
5	Engine: overhauling and repair	Basic skills for repairing engines	applied	0	1	1
6	Transmission: overhauling and repair	Basic skills for repairing power transmission	applied	0	0	1
	Subtotal			4	5	6
	Subtotal	(3rd year and later, 20times a year, 20 weeks)		10	14	20
Training B：Agricultural mechanization course: for farmers						
1	Modern irrigation facilities (drip, sprinkler)	Kinds of irrigation facilities and specifications and their treatment	-	2	2	2
2	Forage machinery: operation O / M	Operation implements attached to tractors	-	2	2	2
3	Potato harvester: operation O / M	Operation implements attached to tractors	-	2	2	2
4	Groundnut harvester: operation O / M	Operation implements attached to tractors	-	2	2	2
5	Hay bailer: operation O / M	Operation implements attached to tractors	-	2	2	2
Subtotal (once in 2 days)		(10 times a year, 20days)		10	10	10

The annual training schedule by the Egyptian side has been reviewed as follows where the schedule is planned avoiding peak farming season (April ~ May and mid August ~ mid October) and year-end period of fiscal year (June ~ July), though there observed some overlapping between training period and peak season in the initial part at the BD survey period in March.

Table E-5 The result of reviewing annual training calendar

Conditions	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	Combine maintenance			Wheat		Annual		Rice					
First year													
Training A: Tractor											1, 2,3		3
Training A: Combine								3				1,2	3
Training A: Maintenance	2	4										1,3	4
Sub-total (Traiing A)	1	1						1			3	4	10
Training B						1,1,2,3, 4	2,3,4,5, 5						10
Total (first year)	1	1				5	5	1			3	4	20
Second year													
Training A: Tractor		5								4	1, 2,3		9
Training A: Combine		4						3				1,2	9
Training A: Maintenance	2	4								5		1,3	5
Sub-total (Traiing A)	1	3						1		2	3	4	14
Training B						1,1,2,3, 4	2,3,4,5, 5						10
Total (Second year)	1	3				5	5	1		2	3	4	24
After 3 years													
Training A: Tractor	3,4,6	5						6		4	1, 2,3		9
Training A: Combine		4,5						3				1,2	5
Training A: Maintenance	2	4								5	6	1,3	6
Sub-total (Traiing A)	4	4						2		2	4	4	20
Training B						1,1,2,3, 4	2,3,4,5, 5						10
Total	4	4				5	5	2		2	4	4	30

Remarks: (1) Numbers in the table show course number.
(2) Total and subtotal show numbers of implmenting training courses.

4. Examination of training program

Policy-1

In order to contribute to the promotion of agricultural mechanization, staffs of agricultural mechanization sector and farmers in Beheira Governorate are targeted in the training program under the Project. Though the Government training program includes a plan of training held by MALR (Training C), it is excluded from the plan of the Project because no confirmation is so far made on its actual implementation.

Policy-2

The contents of the training are planned to meet real needs of the targeted staff of AMS and the farmer trainees.

Policy-3

Maximization of training opportunities is pursued through the optimization of implementing method of training courses (target trainees, numbers and frequencies of necessary attendance to the training courses).

<Target trainees>

Training A:

The training is targeted at the operators belonging to management division in 19 stations

under control and mechanics belonging to maintenance division in these stations. In the Project, the trainees include currently servicing staff and newly employed ones (newly employed as mechanics accompanying with the grading up of the AMC of the Project and personnel who offset the decrease by the retired staff). The number of staff is given in the table below.

Table E-6 Training A, Number of target trainees

Target staff	Currently servicing	New staff (at the occasion of grading-up)	Subtotal	New staff (every year) (supplement of retired staff)
Operator (staff)	573	0	573	32
Mechanics (staff)	187	28	215	12
Total	760	28	788	44

Note: (1) Supplement of retired indicates the offsetting of number of retired staff. It's equivalent to 5.5% of current number of staff.
(2) Because 12 stations will be added from the third year and later, 201 operators and 58 mechanics will be augmented who are assumed to become the target of trainees.

Training-B:

Since the number of trainees who can be accommodated in the training B is based on training A, in other words the same number as planned in training A is accepted in this training. They will be publicly recruited from farmers in Beheire Governorate (255,400) who desire training, among those who live in the area where AMS provides the service activities (target value set at 10%). Applying the result of the Baseline Survey, the number of farmers who desire training is equivalent to 53.8%. Assuming that a farmer represents a farm household, the number of target trainees is tentatively estimated as 13,741.

<**Annual training schedule: Training Calendar**>

During the peak season of farming, the staffs of AMS are extremely busy with their works, even working at night. Accordingly, training is only programmed during off-season and by this limitation a batch 20 weeks (equivalent to 20 times / off-season) are the possible periods for training. The training program planned by the Egyptian side has also a schedule of avoiding peak season for farming and the busy end of the fiscal year as far as possible, and in this concern, assumptions as listed below are given to examine the output and the results are shown in the following table.

(1) Providing a training program that completely avoids the peak season for farming. For Training A, the scheduled period also avoids 2 months of fiscal year-end.
(2) Giving one month for the period of inspection of combine harvesters to meet the actual practice, then training for 20 weeks / year is possible.
(3) Each course in Training A includes curriculum for 1 week. This allows training 20 times per year.
(4) It is judged possible to hold farmer's training during the end of fiscal year that continues 2

months. Assuming 2 days for training period / course, and also 1 day each before and after the schedule are added to this program, 16 training courses can be held per year. Regarding the procedure of public recruitment of trainees among the target farmers and the restriction on the budget provision, the Egyptian side envisages only 10 times of farmers training a year, this idea is respected regardless of the maximum mentioned above.

(5) As regards Training C, it is excluded from the training activities under this Project, however, there would be no problem arising from the plan of MALR that gives training C during the vacant period for training A or B under an agreement between AMS and MALR.

Table E-7 Examination result of annual training calendar

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Limiting Period		Combine period	inspecting	Wheat period	harvesting	Fiscal year-end period			Paddy harvesting				
Available period for training A	4weeks	4weeks	not av.	not av.	not av.	not av.	not av.	2weeks	not av.	2weeks	4weeks	4weeks	20 weeks
Available period for training B	not av.	not av.	not av.	not av.	not av.	4weeks	4weeks	not av.	not av.	not av.	not av.	not av.	8 weeks

Note: not av: the period not available for training

<**Precondition principles of training**>

Training A:

(1) Since the training center included in the Project is the first one established in Beheire Governorate, an introduction phase is to be placed considering the period for preparation and consolidation of the training system, during which step-wise increase of training is planned, namely, 10 batches of training for the 1st year, 14 in the 2nd and 20 in the 3rd year or later. This training program is in line with what has been planned by the Egyptian side. Despite, if the system of training is ready for giving full training services in the 1st and 2nd year, no objection would result from giving full 20 times training a year even during introduction phase.

(2) Because many of the present staffs already have practical experiences, opportunities are provided for the sake of staff trainees, once in three years courses for applied subjects. This plan is proposed paying respect to the performances achieved in the similar centers provided by the Egyptian curriculum. In this connection, the Egyptian side planned in the medium-term plan the frequency of training at once in 2.5 years for all the target trainees. Similar training centers have so far experienced the frequency at once in three years during the earlier period from just after the construction up to around 10 years thereafter, but since then, more than 20 years have passed since these centers had been built. Because the technical capacity of currently working staff has been much improved during this period,

contents of the training have also been enriched to be able to cover such courses for the managerial staff as workshop management, middle-class personnel management, safety control etc.

(3) It is required to rapidly nurture newcomer operators and mechanics. Literally as a proverb goes "strike while iron is hot", priority of training chance should be given to the newly recruited staff. Basic subject training is provided for newly recruited staff at the 1st year (one week course), then after they assist the senior staff to have experiences for handling farm machinery, an additional course of applied subject is given (one week course). In the following year they attend a basic subject course (for one week) reaching almost the same technical level as that of their seniors through these 3 training services. Then, they are included in the ordinary staff to whom the training at the frequency of once in three years will be given. From the viewpoint of newly employed staff, it is basically desirable to attend the whole 3 subjects within the 1st year for their rapid nurturing /capacity development, but availability of the courses are limited on one hand and in-service training would be effective for them to fairly rapidly build their capacity on the other. Thus, the Egyptian side decided to adopt this system from their past lessons and experiences.

(4) For the forms of training, lectures, practices and group discussions are adopted in a mixed way.

Training B:

(1) Training B is focused on enlightenment education.

(2) Trainees are publicly recruited among the target farmer population for training. Number of trainees per batch or training course should be at the maximum equal to that determined in Training A, 20 trainees.

(3) One batch training takes 2 days.

(4) The forms of training include lectures, study visits to workshop and to the operation sites and group discussions.

<**Review of number of trainees**>

Based on the principles and preconditions of the training, the optimization and maximization of the training is examined in the following way.

Training A:

(1) Number of trainees

Table E-8 Training A: Number of staff trainees and targets

Target staff	Existing personnel	Newly recruited staff
Target	Receiving training once in about 3 years (the plan in respect of experiences in similar centers of the Egyptian Government)	Receiving training 3 times in 2 years (the plan in respect of experiences in similar centers of the Egyptian Government)
Operators	573	32
(of which, tractor)	(382)	(20)
(of which, combine)	(191)	(12)
Mechanics	215	12
Total	788	44

(2) Calculation of the size of classes at the stationary phase（in the 3rd year or later）

This training program basically assumes constant number of the existing staff, and the training aims at their technical improvement. Although replaced staff can be counted in the target trainees, however, any increment in personnel are not considered as eligible trainees under this Project. Therefore, the scale of training is decided assuming the number of trainees in the training class at its equilibrium state. No additional or supplementary consideration is to be made for fewer frequencies in the 1st year and 2nd year. The following shows how to calculate the number of trainee in the class.

For all the target trainees, equal opportunity of attending training is given so that all of them can get their training chance of once in three years, thus deciding the optimum number of trainees in the class. In this estimation, number of trainees in the class is taken as the independent variable, then the number of years required is chosen as dependent one, and different values are put as independent variables (number of trainees) and if a value is found that gives nearest value of 3 as the value of dependent variable, then it can be considered as the optimum number. For the operators and the mechanics, assuming the number of trainees at 18, 19, 20, 21, 22 and 23, simulation was made for these 6 cases and the results were summarized in the following table E-9.

Suppose number of trainees is given as “r”, then (number of trainees) ÷ r = (No. of trainees / class)

1) Required class number for new staff: (number of new staff) ÷ r = (number. of classes),

(Here, since real number of staff is used, it shows vacancy is found in the class of basic subject)

2) Yearly required number of classes for the newly recruited staff: (No. of trainees / classes) ×{(1st year 2 times)+(2nd year 1 time of occupancy rate)} = (number of classes per year) =

(X),

("1 time in the 2nd year" indicates the occupancy rate is allotted for the class of applied subject, and the vacancy is allotted to the training for the existing regular staff.)

3) Required years for training the existing staff: {(existing regular staff) - (new staff in the previous year)}÷ r ÷{(possible batch of class per year) – (X)} = (Y),
4) Here, comparing this value with the targeted year requirement (Z = 3) to see the difference: (α), (α)= (Z) – (Y), then the optimum number is obtained as the nearest approximation (α) 0 gives the optimum number of trainees / class.

For instance, assuming 18 trainees composing a class in the case of training for tractor operators,

① Since (number of new staff) ÷ r = (number. of classes), 20 ÷ 18 = 1.1 2

② Applying (No. of trainees / classes) ×{(1st year 2 times)+(2nd year 1 time of occupancy rate)} = (number of classes per year) = (X), 2 × (2 + 0.1) = 4.2

③ Then, adopting the formula; {(existing regular staff) - (new staff in the previous year)}÷ r ÷{(possible batch of class per year) – (X)} = (Y), (573 – 32) ÷ 18 ÷ (9 – 4.2) = 4.2

④ Comparing this value with the targeted year requirement (Z = 3) to see the difference: (α): (α)= (Z) – (Y) = 3 – 4.2 = -1.2

Table E-9 Required years for Training targeted by number of trainee in a class

Number of trainees /class	18/class	19/class	20/class	21/class	22/class	23/class
For Agricultural Mechanization Courses for Operators of Tractor (9 classes / year)						
① Required class for new recruit	2	2	1	1	1	1
② Required times for new recruit	4.2	4.1	3	2.95	2.9	2.87
③ Years necessary for regular staff training	4.2	3.9	3.0	2.85	2.7	2.57
④ Target years	3	3	3	3	3	3
Difference (α) =	-1.2	- 0.9	0	0.15	0.3	0.43
For Agricultural Mechanization Courses for Operators of Combine Harvester (5 classes / year)						
① Required class for new recruit	1	1	1	1	1	1
② Yearly required class for new recruit	2.7	2.6	2.6	2.6	2.5	2.5
③ Years necessary for regular staff training	4.3	3.98	3.7	3.5	3.3	3.1
④ Target years	3	3	3	3	3	3
Difference (α) =	-1.3	-0.98	-0.7	-0.5	-0.3	-0.1
For Workshop Skill Courses for Maintenance Staff (6 classes / year)						
① Required class for new recruit	1	1	1	1	1	1
② Yearly required class for new recruit	2.7	2.6	2.6	2.57	2.5	2.5
③ Years necessary for regular staff training	3.4	3.2	2.99	2.82	2.7	2.5
④ Target years	3	3	3	3	3	2
Difference (α) =	-0.4	-0.2	-0.01	0.18	0.3	0.5

From the above table E-9, the optimum number of trainees in a class is 20 by which the planned training can be completed within the targeted 3 years as the minimum required scale for training.

The planned training in this context means that the target of 3 subjects in two years for newly recruited staff as against 1 subject in 3 years for the in-service operators and mechanics is fulfilled.

In this case of a class accommodating 20 trainees, currently in-service tractor operators can achieve the target of covering one training subject in 3 years, while it takes 3.7 years for currently in-service operators of combine harvesters to complete one training subject. It means that an additional training course for the application of combine harvesters must be provided once in two years to fill this gap. Alternatively, the in-service operators of combine harvesters can attend the course for basic subject that have still capacity of accommodating trainees although the contents of the training do not exactly meet the training purpose. This alternative is considered informative and useful in improving technical skill and this application allows all the existing regular staff to attend training courses at the frequency of once in 3 years.

Training-B:

(1) Given two days per 1 batch of training course and 10 batches are planned in a year, the number of trainees comes annually to 200.

(2) As the raining aims at enlightenment education and trainees are publicly recruited, the contents of this training course should meet the needs of trainee farmers. In this connection, according to the program planned by the Egyptian side training courses reflecting regional features and farming characters have been selected.

<Conclusion>

Concluding from the examination of the above discussed training program, short ~ medium term of training program, annual training schedule, contents of courses and curriculum planned by the Egyptian side are considered relevant because they consider regional features and farming character prevailing in Beheira Governorate and their contents aim at improving levels of staff's skill or envisage enlightenment education for farmers.

20 trainees per batch is calculated optimum for least necessary scale of training courses, with which envisaged accomplishment of training will be brought about as annually 400 trainees for Training A, annually 200 trainees for Training B, totaling annually at 600 trainees. The following shows the predicted fruit of training.

Table E-10 Predicted achievement in number of training planned under the Project

Category	1st year	2nd year	3rd year	4th year	5th year
1) Training A	200	280	400	400	400
2) Training B	200	200	200	200	200
Total	400	480	600	600	600
Cumulative total	400	880	1,480	2,080	2,680

In this regard, when the training program proceeds to the medium period reaching a stationary phase, it'll be possible for mechanics to receive training chance with less time span

than the reviewed (3.4 years) provided that review is made on the frequency of training for operators and mechanics. As to annual training schedule, effect of training can be raised up if it is reviewed and improved through regular feedback of the result of evaluation on the training effects into the annual schedule.

5. Future plan of training

In this training plan, the target of training is sustained in short ~ medium term at the rate of once in 3 years for in-service operators and mechanics, of 3 times in 2 years for newly recruited staff, and later, after 10 years elapse, technical capacity building for their services in charge will roughly be accomplished through these courses of training. On a long term basis, as observed in similar training centers, contents of training courses in management and maintenance sectors, such as O/M, operational management control, inventory management etc. will be added while training courses for operators and mechanics will be curtailed. It should be noted that expansion of reclamation in West Delta is planned. Under such development trend, training is still likely continued provided that the planned 12 farm machinery hiring stations are additionally opened in near future that bring about new staffing of operators and mechanics and of course demand for training arises for the staff.

The following table shows the performances recorded in similar centers.

Similar training centers located in East Delta have long performances reaching 20 years. The training achieved in 2004/05 is tabulated below where not only staff training for promoting agricultural mechanization but the training courses matched with farmers' demands are also included. Besides, there are training courses provided by MALR, thus diversification of training is proceeding on.

Table E-11 Implemented Training Records of Other Centers

Performance of training in Sibellawein (2004 / 05)	Training course	No. of annual trainees
1) Training A (Targeted to the staff of AGS)	Leveling with laser beam, adjustment / correction of seed drill, maintenance of hydraulic and electric system of combine harvesters, inventory management, O/M etc.	325
2) Training B (Target: Private farmers or operators)	Introduction / briefing of farm machinery course, Farm crop production	200
3) Training C (Targeted to the post graduates)	Computer management, manufacturing milk products	489
Total		1,009
Performance of training in Sakha (2004 / 05)	Training period	No. of annual trainees
1) Training A (Targeted to the staff of AGS))	Operation and O/M of tractors, Leveling with laser beam, adjustment / correction of seed drill, management of electric circuit of tractors, control and managerial works, middle-class management, symposium on safety as well on O/M	420
2)Training B (Target: Private farmers or operators)	Usage and maintenance of seeder / transplanter of sugar beet, overhauling of tractor, storage of maize grains, farm crop production including wheat and broad-bean cropping (by researcher trainers)	594
3) Training C (Targeted to the post graduates)	Computer management, manufacturing milk and poultry products,	114
Total		1,128

Appendix 5-9 Number of Persons included in the Target

Number of Persons included in the Target of Calculating the Scales of Facilities

Basically, the existing staff is adopted as the base of persons in planned facilities to determine the scale thereof. Exceptionally, newly recruited and transferred staff to be accommodated in newly established functions (that of training, repair and technical assistance) will be included in the base.

Table C-1 Number of Persons for the Scales of Facilities

Sections	Number of Persons					Remarks
	Existing	Transferred	Newly recruited	Plan	The Project	
Workshop function						
Central Workshop	20	16	16	52	52	For achieving the target, 32 increased persons will be necessary. They should be included for the Project.
Training function						
Training Center	0	13	7	20	20	For achieving the target, 20 increased persons will be necessary. They should be included for the Project.
Hiring Service function						
Hiring station	102	1	9	112	102	10 persons will not be fixed. They would be excluded for the Project.
Technical assistance function						
Central Administration		13 +2	0	15	13	13 persons will surely be transferred. 2 persons are not sure, they would be excluded for the Project.
General Administration	33	2	0	35	33	2 persons are not sure, they would be excluded for the Project.
Total	155	47	32	234	220	

Remarks: Column “the Project” means base number of persons calculating the Scales of Facilities for the Project.

1) Treatment of the Newly Employed Staff

As to the number of personnel that is important in estimating standard space for office floor in technical assistance building, only the number of the staff who have already been employed is counted in the Project out of the personnel plan in Egypt, and those who will be employed as new employees (13 persons) are not included because of uncertainty on employment confirmation.

2) Treatment of the Staff with Out-of–the Office Duty

With a view to increasing space utility efficiency of the office, it is planned as

accommodating space of floor for the sector where those who are engaged in monitoring of the hiring service of farm machinery or those who have much outside office duty belong to, to provide a free-address type office room. In estimating standard floor area of the room for the sector staffed by those who have outside duty, the rate of their outside duty is assumed at 50%, in other words ½ is adopted for the standard space per staff according to the above cited policy. In this connection, since these staff cannot be equipped with their own desks, space for storing their private document, fixtures is procured at the rate of $1m^2$ per staff (39 persons are categorized into this type of staff).

3) Treatment of the Staff other than Formal Employment

The working staff (6 persons) who are not confirmed as regular services, such as workers who are out of formally employed personnel, are not included in the target persons for the calculation of standard scale of office floor. Likewise, the staffs belonging to the attached facility where functional element is dominant in calculating the scale of facility (10 persons) are not included either as the basis of area requirement.

4) Number of Trainees as Target of Estimation

As to the number of trainees to be accommodated in the training building, as a result of verifying needs of training (contents, number of trainees in training courses and frequency of holding trainings) for the targeted persons in the light of current activity and future plan, 20 trainees per training are assumed as the basis of calculating the scale of lecture room etc. Besides, in determining scale of necessary space for lodging rooms and dining hall, the number of target persons is counted at 25 by adding 5 instructors. (Details are referred to “Training Program” in Appendix-E.)

Appendix 5-10 Determination of the Scale of Workshop Facility

The area of workshop facility is calculated at 1,080 m^2, consisting of 630 m^2 occupied by repair bay + 300 m^2 accounted for machine shop, repair / test room etc. + 150 m^2 provided for warehouse.

The following shows the basis of this calculation.

(1) Quantity and area of farm machinery repair bay: 630 m^2

① Demand for overhauling of farm machinery held by Hiring Stations in Beheira Governorate

From the interval of overhauling tractors, every 6-8 years per machinery, it is estimated that 38 tractors / year (= total numbers held 306 ÷ 8-year) are estimated as the target of overhauling. Because the period required for overhauling per machinery is 20 days (this period has been estimated taking account of both the capacity of the staff of workshop and hitherto performances in the workshop, also from the number of maintenance equipment to be procured in this Project), the total number of annually overhauled machinery is calculated at

38 / year × 20 days = <u>760 machinery-day / year</u>.

In this concern, combines are considered as out of the target of overhauling because they have short life (though the stations hold 120 combines).

② Demand for heavy repair of farm machinery held by Hiring Stations in Beheira Governorate

As regards tractors and combine harvesters, overall current rate of troubled machinery indicates 4.4% per month (performance), of which about 20% has heavy troubles needing repair at the central workshop. Using total number of tractors and combines, 426, and from these background data,

Annual number of heavy repair requirement: 426 × 4.4 % / month × 20% × 12 month = <u>44.8 /year</u>

Assuming that slightly more than a half of the average performance, 50 days are required as number of days for repair in this case (this period, 90 days/year have been estimated taking account of both the capacity of the staff of workshop and hitherto performances in the workshop), then the total days required for repair of machinery throughout the year is calculated at

<u>45 machinery</u>/ year × 50 days = 2,250 machinery-day / year

From the above calculations ① and ②, the total number of machinery requiring overhauling and maintenance is totaled at <u>83 machinery / year</u>, and total days annually required for overhauling and maintenance comes to (760 + 2,250 =) 3,010 machinery-day / year. Based on these figures, average days required for overhauling and maintenance and mean number of machinery kept in bay are calibrated in the following:

Average days required for overhauling and maintenance: 3,010 machinery-day ÷ 83 = 36.2 days; slightly more than a month,

Mean number of machinery kept in bay: 3,010 machinery-day ÷ 365 = 8.2 (holidays are included in the calculation because of long term the repair takes)

The space of repair bay is henceforth calculated at 8 machinery, as a regular base. Applying 80 m^2 for the space of repair works *and passage per repairing machinery, 80 m^2 × 8 = 640 m^2 (area of repair bay is planned at 630 m^2)

* Note: basis for 80 m^2 per machinery
Assuming that average size of a tractor (110 hp class) occupies 4,400mm × 2,200mm, additional maintenance space of each 1,800mm for both sides is necessary, leading to the space requirement per machinery estimated at 8,000mm × 5,800mm. Further, adding both side 2,100mm each for the space of vehicle passage, it finally comes to 8,000mm × 10,000mm = 80 m^2

Reference value: The area of indoor repair works in the Japanese licensed workshops for specified parts (for the vehicles defined as large sized and used for specific utility, engine-mounted) is stipulated as 112 m^2.

Note) Space for repairing machinery held in hiring stations and its implements
Routine inspection and maintenance of machinery held in Hiring Stations and repair of the implements attached thereto are to be carried out open space within the shelter. In other cases, any space will not specially be procured because space of repair bay is jointly utilized as necessary arises.

(2) Area of machine shop, working area, specified tests, repair room: 300 m^2

Except for the special works requiring the independent room such as engine repair room and fuel injection pump testing room, overall procurement of space consistent with workability will be pursued through the rational design of joint use of idle space matched with layout of equipment and path of flow by allotting a part of open space in the workshop to ordinary works. The workshop designed in this Project has become thereby enough compact comparing with the facility / equipment standard of similar workshops in Japan (farm machinery maintenance plants and public vocational training facilities) or with the central workshop of Sinbellawein AMC.

(3) Area of warehouse and storage depot: 150 m^2

Designed as equivalent to the area of existing warehouse for parts, this warehouse is jointly utilized as the storage space for precision measurement tools and testing equipment (equivalent to 36 m^2) by the device on the way of storage.

Reference: Total area of the existing warehouse of parts 117 m^2, storage area of precision measurement tools and testing equipment (the volume of which is totaled at about 30 m^2) 36 m^2

Rate of Available Farm Machinery between Present and Plan

Items	Present	Plan	Remarks
Heavy Damages	Frequency: 426 units x 4.4%/month x 0.2 x 12months = 45unit/year Period of repair ： 45units/month x 90days = 4090units.day/year	Frequency: 426units x 4.4%/month x 0.2 x 12months = 45units/year Period of repair: 45units/months x 50days = 2250unit.day/year	Heavy repairing and OH are conducted in the Central Workshop. Average repairing period: (2250+760)unit/day ÷(45+35)units = 36days
Overhaul Works (OH)	At present, machinery is carried to Other Central Workshops or private repair shops to conduct OH, but not periodically. Number of Tractor 306units÷8years = 38units/year Period of OH：38units/year x 90days = 3420unit.day/year （It is required for the same days as heavy damage repairing because of poor facilities and tools.）	Repairing number per year: as the same of left column Period of OH: 38unit/year x 20days = 760unit.day/year （Periodical repairing will be able to be done with appropriate facilities and tools.: 20days/unit）	Life time (more than 8 years of official durability) of farm machinery will become longer in order to be conducted periodical OH. Practically, systematical repairing during the off-season will be able to be minimized the affect of works.
Medium Damages	Frequency：426units x 4.4%/month x 0.4 x 12month = 90 unit/year Period of repair (in case there is no mobile workshop): 90 units/year x 10 days = 900unit.day/year	In case of using two mobile workshops, Period of repair: 90units/year x 3days = 270units.day/year	
Amount (day)	4050+3420+900 = 8370units.day/year	2250+760+270 = 3280units.day/year	
Rate of Available Machinery per Year	Total period: 426units x 138day/year = 58788units.day/year （Season 6months x 23days/month=138day/year: usually, on season are each two months in spring and autumn, but tractors are used before and after the season. Therefore, season is set for 6 months. Days per month is set as 23 including overtime works for one day. Rate of Available Number = (58788 – 8370) ÷ 58788unit/year = 85.8%…①	Rae of Available Number = (58788 – 3280)÷58788unit/year = 94.4%….②	Increase of rate: 10.02% (②／①) （10.02% is equivalent for 37.3units of farm machinery）

Appendix 5-12 Equipment List for the Project

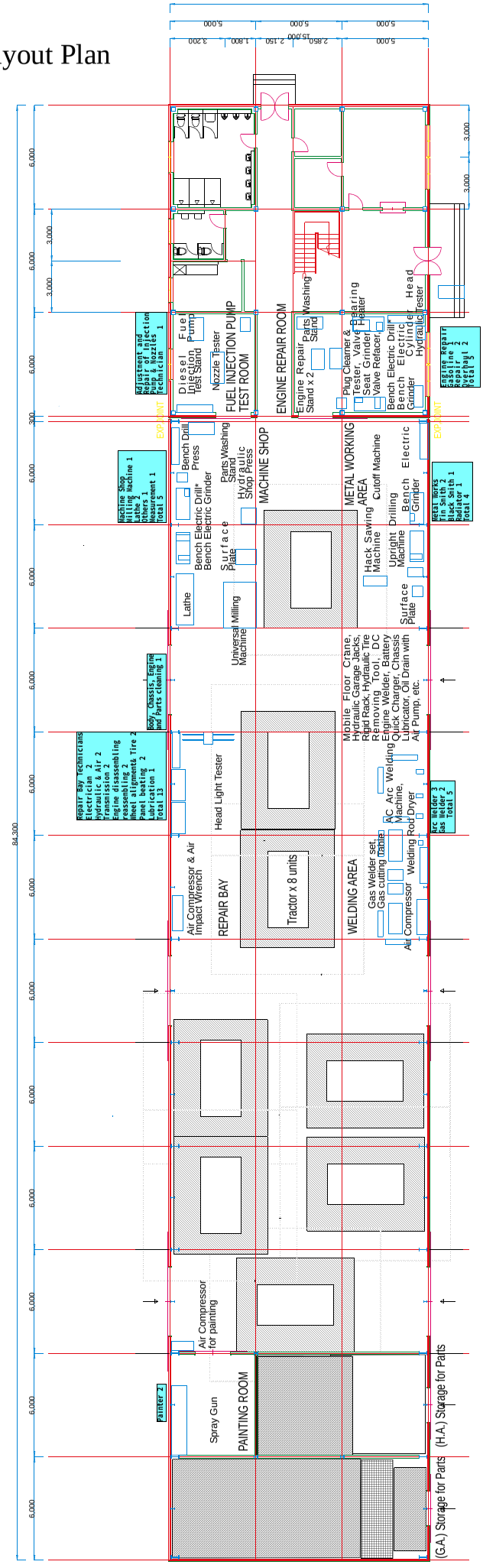
No.	Description	Specification	Q'ty
I. Workshop Equipment			
1. Repqir Bay Equipment			
1	Air Compressor	Two-stage, 1.4MPa, 730 lit./min., AC380V, 7.5kW	1 unit
2	Mobile Floor Crane	1-ton, manual operation, Arm length 1,500mm	1 unit
3	Garage Jack	Hydraulic, 1.5-5.0ton, Max saddle height 460-610mm	1 set
4	Transmission Jack	Capa 1500kg, Lift stroke 550mm, Tilt 30°	1 unit
5	Sling Kit	Capa: 1,250kg, Width 50mm, L 4.0m Capa: 1,250-2,000kg , L 1.5-2.0m, 4 kinds, 8 pcs 2ton, Adjustable Length 760mm-1,150mm	1 set
6	Bench Electric Grinder, Single phase	205mm, 650W, Single-phase, AC220V	1 unit
7	Bench Electric Grinder, Triple phase	205mm, 600W, Three-phase, AC380V	2 units
8	Portable Electric Drill	Capa: 6.5-13mm, AC220V, 300-600W	4 sets
9	Electric Disc Grinder	100mm, 180mm wheel, AC220V, 650W-1200W	4 sets
10	Bench Electric Drill	Capa: 13mm, AC200V, 200W	2 units
2. Lubrication Equipment			
11	Oil Bucket Pump	40cc/stroke, 25 lit.	2 units
12	High Pressure Grease Pump	25MPa, 16ℓ	1 unit
13	Grease Gun	200cc, 300cc, 25Mpa, handy type Capa. 1/8"x28	1 set
14	Chassis Lubricator	Discharge pressure 23MPa , pail can, Weight approx. 14kg for oil, output pressure1.2 MPa, 7 lit/min, Tank capa. 20ℓ	1 set
15	Oil Drain with Air Pump	75 Liter, Discharge volume 12 lit/min.	1 unit
16	Drum Pump	24 lit./min, Overall length 1300mm, Rotary vacuum	4 units
17	Drum Can Carrier	Capa: 250kg, wheel dia. 250mm	1 unit
3. Engine Repiar Works and Test			
18	Compression Gauge	For Diesel Engine, 7MPa, For Gasoline Engine, 2.5MPa	2 sets
19	Connecting Rod Aligner	Dia. 30-75mm, Length 65-300mm	1 set
20	Automobile Thermometer	-20 - 0 - 200 ℃, with protector	5 pcs
21	Piston Ring Tool	Capa. 51-85mm, Capa. 83-135mm Capa. 50-125mm, Capa. 75-175mm	3 sets
22	Valve Lifter & Compressor	Operating range 15-180mm	3 pcs
23	Air Valve Lapper	Capa. 6kgf/㎠ or more	3 sets
24	Torque Multiplier	1:4, Capa. 500 - 1500 Nm	3 pcs
25	Oil Pressure Gauge for Transmission & Engine	0-2MPa, with Adaptor & Hose	2 pcs
26	Micro Hone	51 to 118mm dia., Grit No.180, 8kinds/set Chuck Capacity : 13mm , AC220V, 620W	1 set
27	Engine Cleaning Gun	Overall length 450mm, with 1-m hose	2 sets
28	Engine (Repair) Stand	Capa: 1000kg, Horizontal, Adjustable angle 360°	2 units
29	Cylinder Head Hydraulic Test Stand	5-10kgf/㎠, Hydraulic pump, Test stand, Sealing plate	1 set
30	Valve Spring Tester	Capa 120kg, grad.: min 1kg	1 unit
31	Valve Refacer	Chuck capa: 5.0-14.3mm, Angle: 0-75°、AC200V	1 unit
32	Eccentric Valve Seat Grinder	Valve sear: 28-65mm, AC200V, 250W	1 unit
33	Standard Thickness Gauge	Size 75x12.5mm, 0.03-1.00mm, 19 leaves	5 pcs
34	Thickness Gauge	Size 75x12.7mm, 0.03-1.00mm 25 leaves、Size 75x12.7mm, Inch size 9 leaves	1 set
35	Screw Pitch Gauge	0.2-6.0mm pitch (ISO), 60°x23 leaves, 3-80teeth/inch (SAE), 60°x34 leaves	5 sets
36	Piston Feeler Gauge	0.03-0.3mm, 8-leaves	3 sets
37	Cylinder Gauge	35-160mm, 1/100mm, Depth 200-300mm	3 sets
38	Oil Pressure Gauge for Engine	For Engine, Graduation: 0.68MPa, hose 1.5-m	1 unit
39	Vacuum Tester	for Diesel Engine, 1000mmAq. Min.20mmAq, Hose 1-m, for Gasoline engine, 0-76cmHg, Hose 1-m	1 set
40	Plug Cleaner and Tester	Discharge 10,000V, 0.9MPa, fitting 12mm, AC220V	1 unit
41	Cam-angle & Tacho Tester	2-8 cylinders, 0-7,500rpm, 2 ranges	1 set
42	Hand Tachometer	Non-contact, 6-20,000rpm	1 set

No.	Description	Specification	Q'ty
43	Diesel Timing Tachometer	120-9990rpm	1 set
44	Wrench set for Engine Maintenance	Belt tightening type; 10, 12, 14 mm Ratchet handle, Extension bar 75, 250mm; 10x12, 12x14, 17x19mm, each 2pcs.	1 set
45	Radiator Cap & Cooling System Tester	0-0.2 Mpa, graduation: 0.01Mpa, length 260mm Gravity 1.10 ~ 1.30, Graduation: 0.01	1 set
46	Diesel Smoke Tester	LED, 0－100%, Accuracy: ±3%, AC220V	1 unit
47	Nozzle Tester	0-40MPa, Graduation: 1 Mpa. Tank capa. 600cc	2 sets
48	Diesel Fuel Injection Pump Test Stand	7.5kW, 8-plungers, with Test Attachment, AC380V	1 set
49	Bearing Heater (Dry type)	Rack Travel Gauge Kit, AC220V, 3kW	1 unit
50	Air Compressor	0.7MPa, Tank capa 120 lit, AC380V, 3.7kW	1 set
51	Die Grinder	Speed 22,000rpm, Chuck dia. 6mm, Air consumption 0.45m^3/min	1 unit
52	Torque Wrench	30-180Nm, Graduation 5-Nm; 100-550Nm, Graduation 10-Nm	3 sets
4. Chassis Service			
53	Steering Adjustment Gauge	100-2100mm, Graduation 0.1mm, Overall length 960mm Camber +5 - 0 - -5degree, caster +11 - 0 - -3degree Wheel mass 5ton, dia. 350mm, L520xW470mm	1 set
54	Head Light Tester	0-120,000 candela, Height range 500-1300mm, Battery type	1 unit
55	Tire Pressure Gauge	Capa 0.1 -1.0 MPa,	5 sets
56	Air Chuck	270mm, Capa 0.1 - 1.0 Mpa	2 sets
57	Tire Service Tool Set	Rim Wrench, Tire Gauge, Tire Levers, etc.,	2 sets
58	Hydraulic Tire Removing Tool	for Rim dia. 20-25"; for Rim dia. 25-49"	1 set
59	Volt Ampere Regulator Tester	0- +/-25/50/100/250/500V, 0- +/-25/50/100/250/500A	3 sets
60	Solder-less Terminal Kit	Plug & Sockets, Terminal Pliers, etc.,	1 set
61	Battery Quick Charger	DC Output : Max. 6-12V: 50A, 18-24V: 35A 6 & 12V, For 6-150AH battery Capa 100A, cable size 8mm^2	2 sets
62	Battery Hydrometer Set	Hydrometer, Thermometer, Syringe	3 sets
63	Portable Hydraulic Tester with Adaptor & Hoses	Flow rate: 15-350 lit/min.	1 unit
64	Oil Filter Wrench	Chain type, 80mm - 115mm; Length 280mm, Universal type	2 sets
65	Air Compressor	0.93MPa, Tank Capa 170 lit, AC380V, 5.5kW	1 set
66	Torque Wrench	50-280 N.m, 30-180 N.m	1 set
67	Chassis Maintenance Tools	for Medium and Heavy trucks for Medium and Heavy trucks 8-21mm, 10pcs.	1 set
68	Body & Fender Tool Set	4-pad, 2-spoon, 1-flange tool, 4-hammer	1 set
69	Puller Board Set for Small Tractor	Gear puller, Wheel puller, etc.,	1 set
70	Puller Board Set for Medium to Large Tractor	Gear puller, Wheel puller, etc., Heavy duty	1 set
71	Mechanical Tool Kit (Puller & Others)	Special Tools(Puller, etc.,) for Large Vehicle	1 set
72	Mechanic Tool Set for Agricultural Machinery	Mechanic Tool set for Large Vehicle	6 sets
73	Handy Tool Set (JIS)	Mechanic Tool set (JIS)	5 sets
74	Mechanic Tool set (ISO)	Mechanic Tool set (ISO)	10 sets
75	Air Impact Wrench	Square drive 3/4"sq., Capa. 20mm, Air consumption 0.45m^3/min.; 1/2"sq.; 1"sq., 36mm	2 sets
76	Hydraulic Test Gauge Set	Pressure gauge: 2.5, 6, 40, 60MPa	2 sets
5. Metal Works			
77	Upright Drilling Machine	32mm, Tapping M16, Swing 500mm, AC380V, 1.5kW	1 set
78	Universal Milling Machine	Max. travel : 800x400x400mm , AC380V, 7.0kW End Mill, Mulling Cutter, Gear Cutter, etc.,	1 set
79	Hack Sawing Machine	Blade size : 350x32x2.0mm, Hydraulic type, AC380V, 1.4kW	1 unit
80	Cut-Off Machine	Grind dia. 305mm, Cutting capa:angle 100mm, AC380V, 2.2kW	1unit
81	Hydraulic Shop Press	35ton, Ram stroke 140mm, Required air 6-9.9kgf/cm^2	1 unit
82	Screw Pitch Gauge	0.2-6.0mm pitch (ISO), 60°x23 leaves 3-80teeth/inch (SAE), 60°x34 leaves	5 sets

No.	Description	Specification	Q'ty
83	Steel Compass	Range 0 - 200mm	5 pcs
84	Firm Joint Caliper, Small & Large	Measuring range: Inside 0-150mm, 0-300mm Measuring range: Outside 0-150mm, 0-300mm	5 sets
85	Firm-Joint Caliper, Medium	Measuring range: Outside 0-200mm: Inside 0-200mm	1 set
86	Surface Plate, Small	Dimensions: 600x600x100mm, accuracy: 0.066mm	2 pcs
87	Surface Plate, Large	Dimensions: 900x1200x125mm, accuracy: 0.110mm	1 pc
88	Inspection tool kit	B type, 100x40x70mm; A type, 200x70x110mm Overall length 150mm, 600mm Overall length 300mm, 400mm	3 sets
89	Vernier Height Gages	0 - 500mm, Resolution 0.02mm	1 unit
90	Machinist's Vise	Jaw width 125mm	11 pcs
91	Cast Iron Swage Block, Large	Mass 55kg, Dimensions: 300x300x98mm	2 pcs
92	Cast Iron Swage Block, Small	Mass 40kg, Dimensions: 260x260x95mm	1 pc
93	Cast Iron Anvil, Large	Cast iron, 100kg,	2 pcs
94	Cast Iron Anvil, Small	Cast iron, 30kg,	1 pc
95	Lathe	Swing: 460mm, Distance between center 1,500mm, AC380V, Slant Tool, Knife Tool, Boring Tool, Threading Tool, etc.,	1 set
96	Bench Drill Press	Capa: 23mm, Swing 430mm, Stroke 125mm, AC220V, 400W	1 unit
97	Screw Clamp	C-type, Opening 100mm, Depth 60mm	4 pcs
98	Screw Plate	M3 to M20, NF1/4 & PT1/8", 28 taps, 26 dies Spiral type, 6.5-19mm, with case Size 0.75-3.00mm, 8 kinds	1 set
99	Adjustable Reamer Set	12.00-38.00mm, 11pcs	1 set
100	Stud Bolt Remover Set	6, 8, 10, 12mm, 4pcs/set	1 set
6. Welding			
101	AC Arc Welding Machine	Output 250A, Input AC220V, 19.5A	3 units
102	Welding Rod Dryer	Capa: 20kg, 300°C, AC220V, 1.2kW	1 unit
103	Gas Welder Set	Regulators, Welding Torch, Cutting Torch, etc., Oxygen Gas Cylinder 47 liters & Acetylene Gas Cylinder 41	3 sets
104	Cylinder Carrier	Loading capa: 250kg, wheel dia. 250mm	3 units
105	Gas Cutting Table	Steel made, Dimensions: 900x600x500mm, with copper screen	2 units
106	DC Engine Welder	DC output 50-200A, AC output 5.0kVA, Diesel engine 9kW	1 unit
107	Dye Penetrant Metal Crack Detector Set	Penetrant, Detergent, Developer ; 3 kinds, 450cc cans	1 set
7. Washing and Painting			
108	Hot & Cold Water and Steam Combination Washer	Hot/cold water 14MPa, 890 lit./hr, AC380V, 3.7kW, Diesel fuel tank 42 lit.	2 units
109	Parts Washing Stand	Pouring type, Discharge 20lit/min x 2, Dimensions:	2 units
110	Spray Gun	Suction type, 1.0mm dia., Output 85 mℓ/min. Suction type 1.3mm dia., Output 150 mℓ/min.	2 sets
111	Air Compressor	Pressure 0.7MPa, Tank capa 130 lit., AC380V, 3.7kW	1 set
8. Handling Equipment			
112	Forklift	Capa. 2 ton, Engine output : approx. 35kW, Diesel	1 unit
9. Mobile Workshop			
113	Mobile Workshop	3 seats, Pick-up truck, 4WD with Mechanic, Electric Tools	2 sets
II. Training Equipment			
1. Cutaway Model			
114	Water Cooled Diesel Engine	Water Cooled, Single Cylinder Diesel Engine	1 unit
2. Audio-visual Equipment			
115	OHP, Overhead Projector	Projection distance : 1.3-3.6m, AC220V, 300W	1 set
116	Slide Projector	Rotary type, more than 80 slides	1 unit

Appendix 5-13

Equipment Layout Plan



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No.	Name	Style	Original/ Photocopy	Issued	Year
1	The Statistical Year Book 2004	booklet	Original	C.A.P.M.A.S.	2005
2	Labour Law	booklet	Original	The Middle East Library	2006
3	Tax Law	booklet	Original	The Middle East Library	2005
4	The Law and the Executive Regulations of the Law on Environment	booklet	Original	The Middle East Library	2006
5	The Executive Decrees of the Labour Law	booklet	Original	The Middle East Library	2005
6	Insurance of Contractors, Quarries and Salines Workers	booklet	Original	The Middle East Library	2004
7	The General Sales Tax Law	booklet	Original	The Middle East Library	2006
8	Egyptian Federation of Construction and Building Contractors	booklet	Original	The Middle East Library	2003
9	Cars Industry in Egypt	booklet	Original	The Middle East Library	2005
10	Increase & Increments in Wages & Salaries	booklet	Original	The Middle East Library	2005
11	The Executive Statutes of the General Sales Tax Law	booklet	Original	The Middle East Library	2005
12	Customs Tariff	booklet	Original	The Middle East Library	2005
13	Dictionary of expressions of soil, mechanics and faundation engineering	booklet	Original	(Building Reserch Instittute)	-
14	Foundations of design and conditions of implementing building works, 1994	booklet	Photocopy	Ministry of Housing	2004
15	Foundations of design and conditions of implementing electric conduction for building	booklet	Photocopy	Ministry of Housing	1994, 2004
16	Foundations + D17 of design and conditions of implementation for protecting construction from firing (part1)	booklet	Photocopy	Ministry of Housing	1998
17	Alarm and detecting systems of fire (part3)	booklet	Photocopy	Ministry of Housing	1999
18	Detail index for constructions and drawing	booklet	Photocopy	Ministry of Housing	2001
19	Lab testing index for concrete material	booklet	Photocopy	Ministry of Housing	2001
20	Foundation of design and conditions of implementation of healthy structures engineering in the building (part1)	booklet	Photocopy	Ministry of Housing	2002
21	F+D17 Foundation of design and condition of implemention of water pumping (drainage) (volume 2)	booklet	Photocopy	Ministry of Housing	1997
22	Fpoundation of design and conditions of implementing treatment works (drainage) (volume 2)	booklet	Photocopy	Ministry of Housing	1997
23	Characteristics of alumetal works	booklet	Photocopy	Ministry of Housing	1994

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No.	Name	Style	Original/ Photocopy	Issued	Year
24	Characteristics moisture and water isolation works	booklet	Photocopy	Ministry of Housing	1995
25	Characteristics of concrete and rainforced concrete work	booklet	Photocopy	Ministry of Housing	1995
26	Characteristics of cutting and fill works	booklet	Photocopy	Ministry of Housing	1995
27	Characteristics of general expenditures and financial necessities	booklet	Photocopy	Ministry of Housing	1995
28	Characteristics of archectural iron shaping works	booklet	Photocopy	Ministry of Housing	1997
29	Characteristics of thermat isolation works	booklet	Photocopy	Ministry of Housing	1998
30	Contract of engineering consultory services for implementation supervision	booklet	Original	Ministry of Housing	1994
31	General conditions for contracting works	booklet	Original	Ministry of Housing	1994
32	Stuff Number of Damanhour Mechanization Station	-	Print	AMS	2006
33	Stuff Number of GA (Damanhour, Ganaklees, Wadi Natron, Senbelawain, Sakha)	-	Print	AMS、each stations	2006
34	Agricultural Machinery and Implements owned by AMS	-	Print	AMS、each stations	2006
35	Stuff Number of Hiring Station	-	Print	AMS、each stations	2006
36	Level of Operator & Technician of Hiring Station	-	Print	AMS、each stations	2006
37	Map of Damanhour City (1/25,000)	Map	Original		-
38	Map of Administration Boundary of Behera	Map	Original	Behera water and Drainage	-
39	Location Map of Water Pipe in Damanhour (1/1,000)	Map	Original	BWADC	2006
40	Damanhour City Map (main buildings)	Map	Original	BWADC	2006