2．ミニッツ関係

Minutes － 1	基本設計調査時	(1984年4月1日署名)
Minutes － 2	基本設計確認調査時	(1984年6月27日署名)
参　考	技術協力実施協議覚書	(1984年3月26日署名)

ミニッツ

Minutes of Discussion

on

The Construction Project for
The Construction Machinery Training Centre
In the Islamic Republic of Pakistan

In response to the request made by the Government of the Islamic Republic of Pakistan for the Construction Project of the Construction Machinery Training Centre(hereinafter referred to as"the Project"), the Government of Japan has sent, through the Japan International Cooperation Agency (hereinafter referred to as "JICA"), a team headed by Mr. Yoshifusa SHIKAMA, Basic Design Division of Grant Aid Department, JICA, to condust a basic design study from March 23rd to April 1st,1984. The team has carried out a field survey, held a series of discussions and exchanged views with the authorities concern of the Project.

As the result of the study and discussions, both parties have agreed to recommend to their respective Governments to examine the results of the survey attached herewith towards the realization of the Project.

April 1st,1984

Yoshifusa Shikama

Mr. Yoshifusa SHIKAMA
Team Leader
Basic Design Study Team
JICA

S. G. Ahmed

Syed Ghulam Ahmed
Joint Secretary
Technical Assistance &
International Economic
Relation,
Economic Affairs Division
Government of Pakistan.

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ATTACHMENT

1. The objective of the Construction Machinery Training Centre Project is to provide skilled mechanics and operators with necessary knowledge, techniques and practice to the agencies concerned to preserve construction machineries in good condition, and thus contributing to the development of social infra-structure and man-power development of Pakistan.

2. The purpose of the Construction Project is to provide necessary building, facilities and equipment for the Construction Machinery Training Centre (hereinafter referred to as"the Center").

3. The proposed site of the Project is located at Sangjani the land acquired by Pakistan side(hereinafter referred to as "the Project Site"). The Project Site location is shown in Annex I.

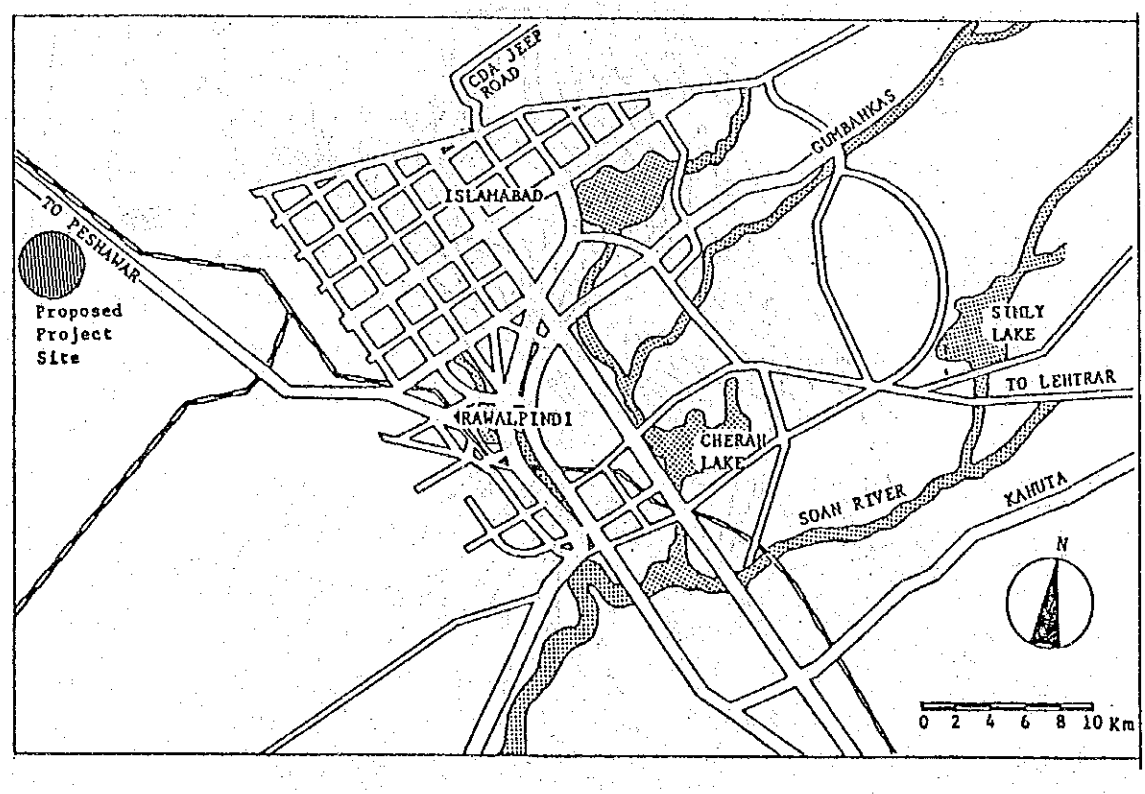
4. The Japanese Survey Team will convey to the Government of Japan the desire of Pakistan side that the former takes necessary measures to co-operate in implementing the Project and provides the building and other items listed in Annex II within the scope of Japanese economic cooperation programme in grant form.

5. The Government of Pakistan has understood Japan's grant aid system explained by the Team which includes a principle of use of a Japanese Consultant Firm and a Japanese General Contractor for implementation of the Project.

6. The Government of Pakistan will take necessary measures listed in Annex III on condition that the grant assistance by the Government of Japan is extended to the Project.

ANNEX I - A

Location Map



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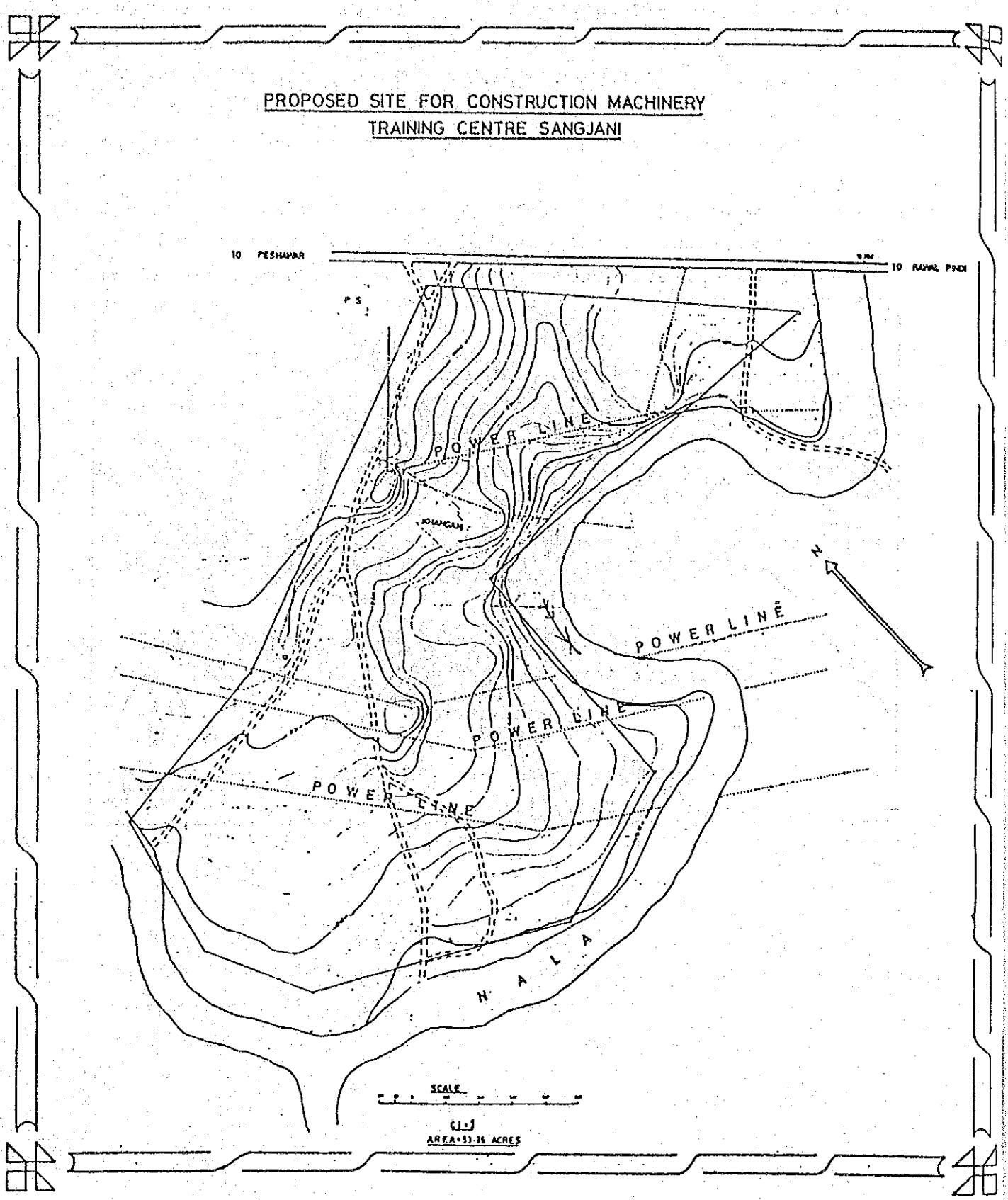
ANNEX I - B

Project Site Map



ANNEX II

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Items requested for the Construction Project by the Government of Pakistan.

1. Facilities

1) Administrative Section

- Administrative Room
- Director Office
- Senior Staff Room
- Teacher's Room
- Conference Room
- Locker Room
- Shower Room
- Reception Room

2) Educational Section

- Classroom
- Lecture Hall
- Library
- Audio Visual Room

3) Training Workshop Section

- Instructors and Sub Instructors Room
- Classis Shop
- Welding, Fabrication & Undercarriage Shop
- Machine Shop
- Power-line & Hydraulic Shop
- Engine Shop
- Parts Warehouse
- Fuel Injection Pump Room
- Engine Test Room
- Electrical Room
- Hydraulic Test Room
- Tool Room
- Shop Classroom
- Waterpool for Engine - dynamo
- Generator Room

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4) *Welfare Facility*

- *Canteen*
- *Kitchen*
- *Storage*
- *Recreation Room*

5) *Outdoor Facility*

- *Garrage for Construction Equipment*
- *Washing Area (concrete floor)*
- *Fuel Station with Tank*
- *Parking Lot*
- *Practice Field for Operators Course*
- *Guard House*
- *Gate and Fence*

6) *Accommodative Facility*

- *Hostel for Trainees (Max capacity 100 persons)*
- *Residential House for Pakistani Instructors*

Note 1: With the regards to the residential accomodation for Pakistani Instructor and staff, the Government of Pakistan strongly recommends and requests the Government of Japan that this accomodation should be also constructed under the Grant Aid Scheme.

2. With the regard to the provision of furniture in the Center, the Government of Pakistan strongly recommends and requests the Government of Japan to consider furnishing of Pakistani Instructiors office and residential accomodation.

2 Equipment

ミニッツ

1) Description	Specification (Approx)	Qty for Ope.	Qty for Mech.	Total
Bull Dozer	320 ps	1		1
	220 ps	1		1
	160 ps	1		1
	140 ps	1	1	2
Dozer Shovel	160 ps	1		1
	110 ps	1	1	2
Wheel Loader	200 ps	1		1
	100 ps	1	1	2
Motor Grader	145 ps	1		1
	110 ps	1	1	2
Dump Truck	18 t (off highway)	1		1
	10 t (highway)	1	1	2
Road Stabilizer	360 ps	1		1
Truck Crane	10 t	1		1
Hydraulic Excavator	1.2 m^3	1		1
	0.9 m^3	1		1
	0.5 m^3		1	1
Motor Scraper	23 m^3	1		1
	16 m^3	1		1
Vibratory Roller	8 t	2		2
Pneumatic Roller	15 t	1		1
Compressor W/ Attachment	2.5 m^3/min	1	1	2
Diesel Generator	9.5. Kw	1	1	2
Asphalt Distributor		1		1

2. Service Workshop Equipment

3. Cutway Model

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Note 1 : Additional equipment are requested by Pakistan side as follows.

Priority	Description	Specification (Approx)	Qty for Ope.	Qty for Mech.	Total Qty.
1.	Asphalt Finisher		1		1
2.	Concrete Paver		1		1
3.	Pavement Cutter		1		1
4.	Milling Machine		1		1
5.	Slurry Seal Machine		1		1
6.	Jumbo Drill		1		1
7.	Dump Truck	18 t	1		1
		10 t	1		1
8.	Truck Crane	10 t	1		1
9.	Motor Scraper	16 m^3		1	1

Note 2 : Pakistan side requested to include spare parts for the Center at least for 2 years.

ANNEX III

ミニッツ

Following arrangements are required to be taken by the Government of Pakistan.

1. To secure a lot of land necessary for the construction of facilities and to clear, fill and level the site as needed before the start of the construction.

2. To provide necessary data and information for basis design.

3. To provide facilities for distribution of electricity, telephone, water supply, gas and other incidental facilities to the proposed Project Site.

4. To ensure prompt unloading, tax exemption, customs clearance at ports of disembarkation in Pakistan, and prompt internaltransportation therein of the products purchased under the grant.

5. To maintain and use properly and effectively that the facilities constructed and equipment purchased under the grant.

6. To undertake incidental civil works such as gardening, fencing, gates and exterior lighting, if needed.

ミニッツ

MINUTES OF DISCUSSION
ON
THE DRAFT REPORT OF BASIC DESIGN STUDY
ON
THE CONSTRUCTION OF
THE CONSTRUCTION MACHINERY TRAINING CENTRE
IN
THE ISLAMIC REPUBLIC OF PAKISTAN

With the view to assist the Government of the Islamic Republic of Pakistan with the grant aid project for the Construction of the Construction Machinery Training Centre (hereinafter referred to as "the Project"), the Government of Japan dispatched a Mission to carry out the Basic Design Study (hereinafter referred to as "the Study") on the Construction of the Project through Japan International Cooperation Agency (JICA) from March 23rd to April 11th, 1984.

The Mission carried out a field survey and had a series of discussions with the authorities concerned of the Government of Pakistan.

As a result of these survey and discussions, JICA prepared and submitted a Draft Final Report on the Study and dispatched a Mission to explain and discuss on this Report starting from June 22rd to July 1st, 1984.

Both parties had a series of discussions on the Report and have agreed to recommend to their respective Governments that the major points of understanding reached between them, attached herewith, should be examined toward the realization of the Project.

June 27, 1984

福田晴耕

Mr. Seikou Fukuda
Team Leader
Draft Report of Basic Design Study Team
JICA

Mr. F. I. Malik
Joint Secretary to the
Government of Pakistan
Economic Affairs Division
ISLAMABAD

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MAJOR POINTS OF UNDERSTANDING

BASIC DESIGN

1. The Pakistani side has principally agreed to the basic design proposed in the Draft Final Report.

2. The Final Report (10 copies is English) on the Project will be submitted to the Pakistani side by the end of August, 1984.

3. The Pakistani side understood the system of Japan's Grant Aid Programme and the major undertakings to be taken by both Governments for realization of the Project as shown in ANNEX I & II.

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ANNEX 1

Major undertakings to be done by both Governments.

		Japanese side	Pakistani side
1.	To secure a lot of land		●
2.	To clear, level and reclaim the site		●
3.	To construct the gate and fence in and around the site		●
4.	To construct the parking lot of the Area-J	●	
	Develop the landscape in the site		●
5.	To construct the road		
	1). Within the Area-J	●	
	2). Outside of the Area-J		●
6.	To construct the building within the Area-J	●	
7.	To provide facilities for distribution on electricity, drainage and other incidental facilities		
	1). Electricity		
	a. Distributing line		●
	b. Internal wiring after Tranformer	●	
	2). Drilling tubewell and water supply	●	
	3). Drainage		
	a. Storm water drainage outside of the Area-J		●
	b. Drainage system (for toilet sewer, ordinary waster, storm drainage and others) and soak pits within the Area-J	●	
	4). Telephone System		
	a. Telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. MDF and the extension after the frame/panel	●	
	5) Furniture and Equipment		
	a. General furniture		●
	b. Training equipment for the Project	●	

ANNEX - 2

GRAND TRUNK ROAD
PESHAWAR
ISLAMABAD
Mosque
AREA-J LINE
184.0 M
154.0 M
GUARD
R.H.
EXISTING ROAD
POWER LINE
POWER LINE
POWER LINE
PRACTICE FIELD FOR OPE. COURSE
NALA
0
50
100
150M
MASTER PLAN
LEGEND
PROPOSE SITE BOUNDARY LINE
AREA-J LINE

ミニッツ

Minutes of the Meeting

The Japanese Implementation Survey Team for the Construction Machinery Training Centre Project in Rawalpindi (hereinafter referred to C.M.T.C.) which is organised by Japan International Cooperation Agency and headed by Mr. Yoshichika HONDA, had a series of discussion on the Technical Cooperation Scheme with the Pakistan Steering Committee from March 18,1984 to March 26,1984.

As a result of the discussion, the Japanese Implementation Survey Team (hereinafter referred to as the Team) and Pakistani Authority concerned has reached at the agreement mentioned in the Annex, to recommend their respective government for the Implementation of C.M.T.C. Project.

March 27,1984

Yoshichika HONDA
The Leader of Japanese
Implementation Survey
Team, JICA

Syed Ghulam Ahmed
Joint Secretary
Technical Assistance &
International Economic
Relation,
Economic Affairs Division
Government of Pakistan

Annex

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(Contents of the Annex)

Master Plan of the C.M.T.C. Project

I. Goal and purpose of the CMTC Project

II. Scope of Training

III. Measures undertaken by the Government of Pakistan.

IV. Measures undertaken by the Japanese Government.

V. Administrative Organizations.

VI. Further details concerning to the CMTC's Implementation.

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Annex

Master Plan of the C.M.T.C. Project

I. Goal and purpose of the C.M.T.C. Project.

In accordance with the 6th Five Year Economic Development Plan ('83-88), The Government of Pakistan has placed emphasis on the development of social infra-structure such as road net-work, dam, irrigation system and land recalamation and also on man-power development of un-skilled labour.

The Government of Pakistan is now introducing a large number of construction machinery in order to execute these various public works effectively and smoothly.

In this context, the purpose of the C.M.T.C Project is to provide skilled mechanics and operators with necessary knowledge, technique and practice to the agencies concerned to preserve construction machinery in good condition, and thus contributing to the development of social infra-structure and man-power development of Pakistan.

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II. Scope of Training

This training is carried out so as to train the trainees to be skilled operators, Mechanic I, Mechanic II at the completion of each course. Accordingly, the three courses are prepared as follows:

1. Training Courses
   1) Operator course
   2) Mechanic I course
   3) Mechanic II course

2. Training period

Operator course	----	3 months
Mechanic I course	----	3 months
Mechanic II course (Engine	----	5 months
(Chassis	----	5 months

3. Entry of qualification of trainee.

1) Operator course
   Experience is not necessary.
   Minimum graduation : Secondary School or equivalent
   Minimum age : 18 years old, should understand written English.

2) Mechanic I course
   Experience is not necessary
   Minimum graduation : Secondary School or equivalent
   Minimum age : 18 years old, should understa written English.

3) Mechanic II course
   Minimum graduation & experience : Secondary school & practical experience for 3 years as an assistant mechanic, or Intermediate College & practical experience for one year as an assistant mechanic.
   Minimum age : ~~18~~ 20 years old, should understand written English.

4. Numbers of trainees
   1) Operator course : 40 enrolments
   2) Mechanic I course : 20 enrolments
   3) Mechanic II course
      Engine : 20 enrolments
      Chassis : 20 enrolments

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5. Total number of trainees to be trained in one year.

I.	Operator course	------Max 100
II.	Mechanic I course	------Max 60
III.	Mechanic II course	
	Engine	------Max 40
	Chassis	------Max 40
		300

6. Major items of each course

Referred in "TRAINING CURICULUM"

7. Major Training Equipments and Materials listed below will be required and provided by the Govt. of Japan and used for each training course, however, the list of equipments and materials will be designated by the Basic Design Team (Grant Aid Scheme) at an appropriate state of its study.

1. Equipments

- Buldozer
- Motor scraper
- Motor garder
- Compactor
- Hydraulic excavator
- Dump truck
- Dozer shovel
- Wheel laoder
- Road stebilizer
- Asphalt distributor
- Truck crand
- Compressor
- Generator etc.

2. Materials

- Text book
- Slide film
- Wall chart
- Transparencies
- Cutway models
- Mini plastic models
- etc.

Note:- The Govt. of Pakistan has strongly recommended the inclusion of following equipment which would be required at CMTC in addition to the equipment listed above.

a. Asphalt Paver b. Pavement cutter c. Milling Machine
d. Slurry seal Machine e. Concrete Paver f. Jambo drill

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8. Training Programme

1) Outline of training programme

A. Operator course

a. Objectives

It intends to train the trainees to have enough theoretical machine knowledge, and operation and maintenance knowledge. As a result they can build roads, dam irrigation and reclamation without any difficulties.

b. Outline of programme

i) This programme has training subjects, time to be spent and training materials and equipment used when lecturing.
An instructor will give brief explanation of tools, measuring devices and structure and function of machines. As a result, the trainees can carry out machine operation, drive machines, maintenance.

ii) This programme will be broken down as follows:

1) Explanation of common tools, lifting tools and measuring tools.

ii) Introduction of construction machines

a) Crawler type(Bulldozer, Dozer shovel & power shovel).

b) Wheel type(Dump truck, Motor grader Motor scraper, etc).

iii) Explanation of engineering components

iv) Operation practice in training centre

v) Construction procedure

vi) Importance of maintenance

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B. Mechanic I Course

a. Objectives

It intends to train the trainees to have enough theoretical machine knowledge required for maintenance disassembly and assembly of components. As a result, they can assembly and disassemble components, and undertake minor repairs.

b. Outline of programme

i) Contents of programme.

This programme has training subjects, time to be spent and training materials and equipment used when lecturing and practicing.

An instructor will give full explanation of tools, Measuring devices and structure and function of machines.

As a result, the trainees can carry out minor repairs.

ii) This programme will be broken down as follows:

- Full explanation of common tools lifting tools and measuring tools.
- Introduction of construction machines
- General information for practice.
- Maintenance of bulldozer, dump truck.
- Maintenance of Motor grader, loader and power shovel.
- Shop practice programme of engine.
- Shop practice programme of each system of machine.

C. Mechanic II course

a. Objectives

It intends to train the trainees to have enough theoretical machine knowledge required for disassembly and assembly of components.

As a result, they can assemble and disassemble components, carry out major repairs, solve major trouble and confirm the rebuilt units.

b. Outline of programme

i) Contents of programme

This programme has training subjects, time to be spent and training materials and equipment used when lecturing and practicing.

An instructor will give full explanation of tools, measuring devices and structure and function of machines.

As a result, the trainees can carry out major repairs, overhauling, trouble shooting and test.

ii) This programme will be broken down as follows:

- Full explanation of common tools, lifting tools and measuring tools.
- Full explanation of engineering components
- Shop practice programme of each course
  1. Engine
  2. Chassis
     (Power train, hydraulic brake, tyre and undercarriage, etc).
- Testing of each system.
- Major trouble shooting
- Machining and welding techniques.

9. TRAINING CURRICULM(Tentative)

			Total Personnel to be trained
1) Operator Course	3 months training	A 20 Persons) x 4 times B 20 Persons)	160 persons/year

Curriculm

1st month — Lecture (Introduction of construction machines Function of components, Importance of preventive maintenance, operation procedures. Construction procedure, Explanation of common tools). — A & B Groups

2nd month	3rd month		
A Group	B Group	Operation practice	
		1st week — Bulldozer	4 groups
		2nd week — Motor scraper & Bulldozer	4 groups
		3rd week — Motor grader & Compactor	4 groups
		4th week — Hydraulic Excavator & Dump truck.	4 groups
B Group	A Group	Operation Practice	
		1st week — Dozer shovel & Wheel loader	4 groups
		2nd week — Road stabilizer & Asphalt distributor	2 groups
		3rd week — Truck crane, Compressor & Generator.	4 groups
		4th week — Review and test	

				Total persons to be trai
2) Mechanic I Course	3 months	20 persons x 3 times		60 persons/year
1st month	Lecture	(Explanation of tools and equipment, Introduction of construction machine, General of engine, Bulldozer, Power shovel, wheel loader, elector circuit and Hydraulic circuit).		
2nd month	Lecture & Practice	(Importance of preventive maintenance, General information for practice, minor disassembly and assembly of components).		
3rd month	Practice on engine, valve clearance, Injector adjustment Basic trouble shooting Basic gas cutting and welding technic.			
3) Mechanic II Course	5 months training			
	(Engine)	20 persons x 2 times = 40		80 persons/year
	5 months training			
	(Chassis)	20 persons x 2 times = 40		

Total persons to be traine

ENGINE		
1st Month	Lecture	(Explanation of tools and Equipment. General of engine, electric circuit & Fuel system, Kinds of engine, Function of engine components).
2nd Month	Lecture & Practice	(Procedure of engine overhauling, General information of practice, Engine disassembling, cleaning measuring and assembling, parts reconditioning).
3rd Month	Practice	(another engine overhauling, Electric component repair and test).
4th Month	Practice	(Fuel injection pump and injection nozzle repair and test, Turbocharger disassembling and assembling).
5th Month	Practice	(Engine dynamometer test, adjustment, trouble shooting).
CHASSIS		
1st Month	Lecture	(Explanation of tools and Equipment, General of construction machine, Function of each component such as clutch, Targue convertor, transmission).
2nd Month	Lecture & Practice	(Steering system, final drive, differential gear, Brake system).
3rd Month	Lecture & Practice	(Hydraulic component such as pump, motor control valve, Cylinder, Plunger type pump and motor).
4th Month	Test of Hydraulic Component	
	Lecture	(Under-carriage component and repair).
	Practice	(Under-carriage rebuilding).
	Lecture	(Tyre)
	Practice	(Tyre disassembling and assembling)
5th Month		Trouble shooting of component
	Practice	(Machining, gas cutting and welding).

10. Table on Training Programme

Description	Period of training	Numbers of trainees	Times of training to be held per year	Total numbers to trainees per year	Numbers of counter parts to be required	
					Chief	Sub
Course						
1). Operator course Crawler type (Bulldozer, dozer shovel, power shovel Wheel type Dump truck, Motor grader, roller etc).	3 months	A 20 B 20	4	160	1	3+4
2). Mechanic I course						
Maintenance and repair	3 months	20	3	60	1	3
3). Mechanic II course						
Engine	5 months	20	2	40	1	3
Chassis	5 months	20	2	40	1	3
			Total	300	4	16

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III. Measures undertaken by the Government of Pakistan.

1. Staffing

Pakistani Authority concerned will assign the Director of CMTC and Head of Training and Administrative Wings, and other necessary staffs shown in the table below, at latest before six (6) months of the opening of training courses:

(Table)

Description		Number	Qualifications
Training Wing			
1) Operator Course	(Chief Instructor)	1	B.Sc Engineering and one year experience or equivalent.
	(Sub Instructor)	7	Graduated from Intermediate College and three years practical experience or Diploma plus one year experience or equivalent.
2) Mechanic I Course	Chief	1	B.Sc Engineering and one year experience or equivalent.
	Sub	3	Graduated from Intermediate College and three years practical experience or Diploma plus one year experience or equivalent.
3) Mechanic II Course			
Engine	Chief	1	B.Sc Engineering and one year experience or equivalent.
	Sub	3	Graduated from Intermediate College and three years practical experience or Diploma plus one year experience or equivalent
Chassis	Chief	1	B.Sc Engineering and one year experience or equivalent.
	Sub	3	Graduated from Intermediate College and three years practical experience or Diploma plus one year experience or equivalent.
(Administrative Wing)			
Director			
Accountants			
Chauffers			
Steno Typists			
Clerk etc.			

2. Budget ミニッツ

As a running expenses for C.M.T.C. Project, following items operating the project shall be budgeted by Pakistani Authority concerned.

A. Personnel expenses according to staffing plan mentioned above.

B. Expenses for electricity, water supply, fuel, oil.

C. Expenses for supply of training materials, maintenance charges of facility and equipment.

D. Expenses for Custom Clearance and domestic transportation of training equipment.

3. Training Facility and Accommodation.

For the implementation of CMTC Project, following accommodation facilities listed below shall be required.

Accommodation Facilities

1). Office & Teaching Room

a. Director room
b. Senior Staff room
c. Teacher's Room (for Japanese Experts)
d. Conference room
e. Administration room
f. Library
g. Class room
h. Audio Visual room
j. Locker room
k. Canteen
l. Kitchen
m. Toilet
n. Storage
o. Reception room

2). Workshop

a. Instructors and Sub Instructors room
b. Chassis shop
c. Welding, fabrication & undercarriage shop
d. Machine shop
e. Power line & Hydraulic shop

ミニッツ

Accomodation Facilities (Continued)

f. Engine shop
g. Parts ware house
h. Fuel Injection pump room
j. Engine test room
k. Electrical room
l. Hydraulic test room
m. Tool room
n. Shop Class room
o. Toilet
p. Water pool for engine dynamo
q. Generator

3) Garrage for construction equipments
4) Washing area (concrete floor)
5) Fuel station with tank
6) Hostel for trainees (Max.capacity 100 persons)
7) Recreation room
8) Residential houses for Pakistani Instructors
9) Parking lot for experts, instructors and guests
10) Guard house
11) Gate and fence
12) Practice Field for operator course

Note: Regarding to the residential accomodation (item 8) for Pakistani Instructer and staff, the Government of Pakistan strongly recommends and requests the Government of Japan that this accomodation should be also constructed under the Grant Aid Scheme.

13

IV Measures undertaken by the Japanese Government.

The team will recommend the Japanese Government to undertake following measures for the implementation of CMTC Project, in terms of despatch of experts, receiving trainees and provision of equipments as technical cooperation.

The Japanese Government will take necessary action after accepting the formal request of Pakistani Government, in the procedure of Japanese Technical Cooperation Scheme.

1. Despatch of Japanese Experts.
In order to provide the Pakistani Instructors with necessary advice, competent three or four (4) Japanese experts including Chief Technical Adviser will be assigned to CMTC Project by the expense of Japanese Government.

2. Training of Pakistani Instructors in Japan.
For the purpose of providing Pakistani Instructors with up-dated knowledge and technique concerning to construction machinery, several Pakistani Instructors, as counterparts of experts in CMTC will be trained in the suitable training facility in Japan for certain period.

3. Provision of supplementary training equipments.
The main training equipments will be provided by the Japanese Grant Aid Scheme, limited supplementary training equipments will be provided after the mutual consultation between the Japanese experts and Pakistani Authority concerned. All of the training equipments and machinery shall be used only for training purpose of CMTC.

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V. Administrative Organizations.

The CMTC shall be operated under the supervision of the following related organizations, as a result of the Minutes signed by Japanese Contact Mission and E.A.D on November 24, 1983.

1. Responsible Agency in Pakistani Government
Ministry of Communications.

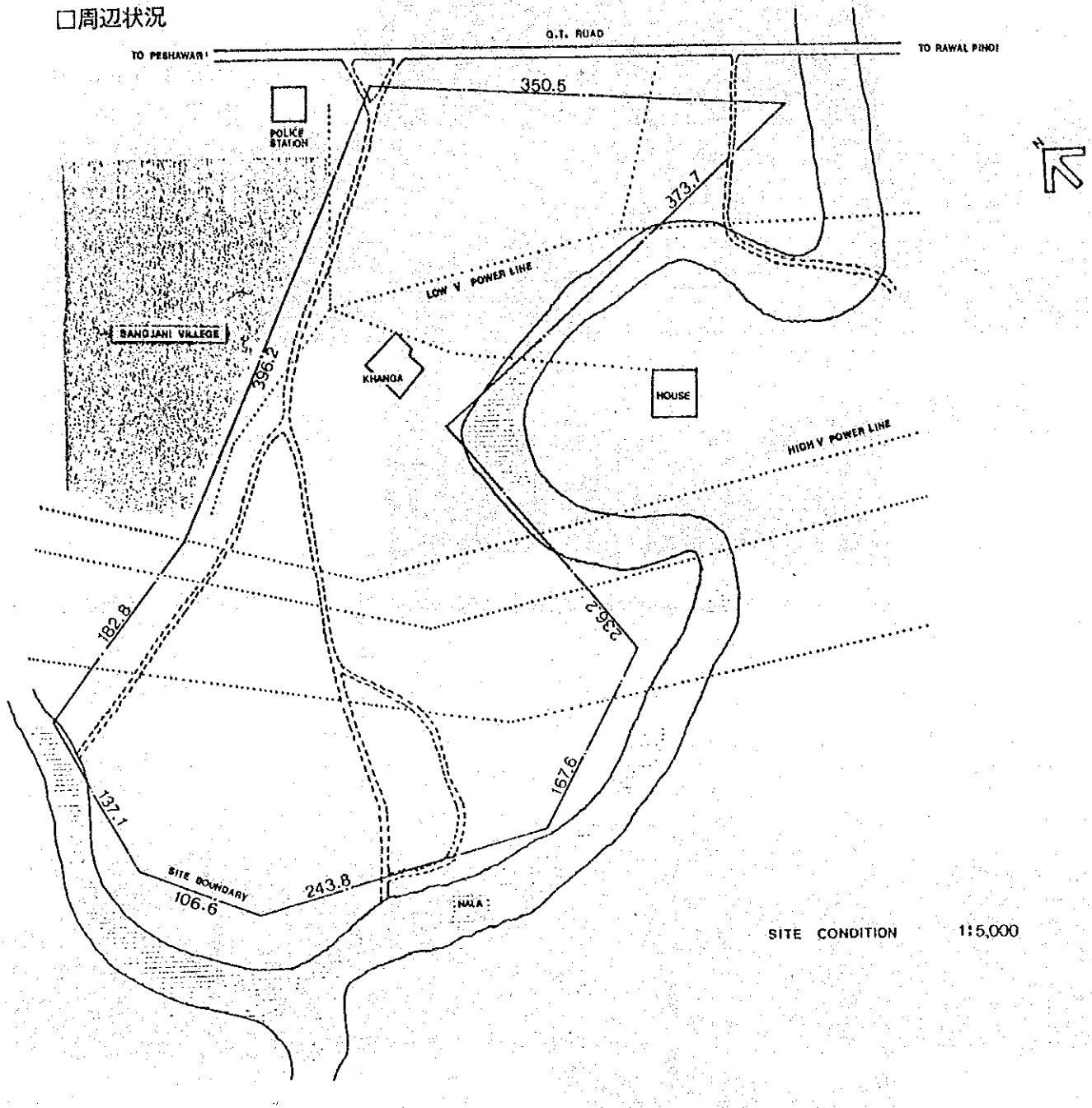
2. " The Managing Board of the CMTC".
Headed by Secretary of MOC (Ministry of Communications),
The Managing Board of the CMTC has responsibility for supervising the activities and basic policy of the CMTC.
The board is supreme body of decision making in Pakistani side, and consists of Secretary of MOC (Chairman). Joint Secretary of MOC, Director General of FWO, Director General of NHB, Chief (Transport & Communications) Ministry of Planning & Development,
Chief Engineer of NLC, Japanese experts, and representatives of Japanese Embassy and JICA Islamabad office as observers.

3. " The Steering Committee of the CMTC".
Under the supervision of the Managing Board, the steering committee has responsibility for technical matters in the CMTC.
The Committee consists of Japanese experts, engineers and representatives from FWO, NLC, CDA, WAPDA and other related organizations.

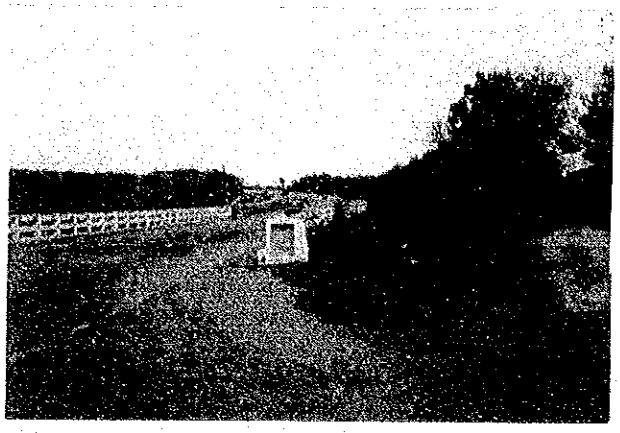
VI. Further details concerning to the CMTC's Implementation.
The team will recommend JICA to despatch a consultation team for finalizing the technical cooperation scheme, in close coordination with the grant aid scheme.

3．建設予定地の周辺状況（1984 年 3 月）

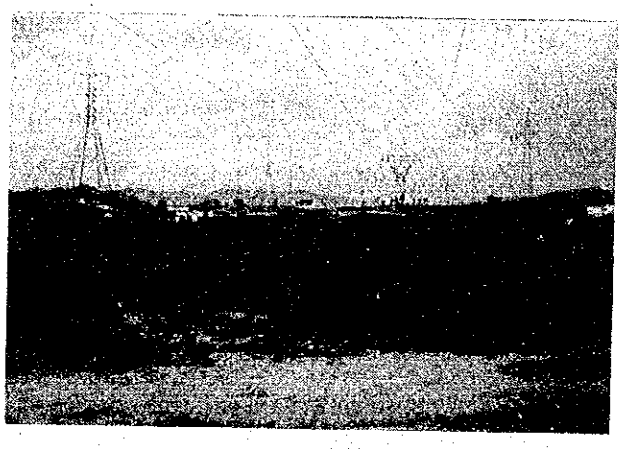
□周辺状況



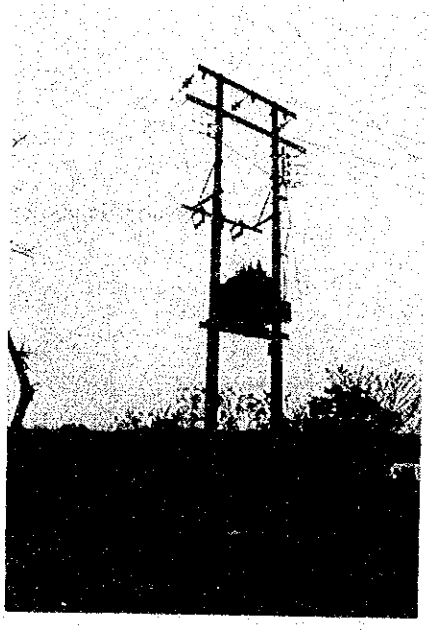
建設予定地の周辺状況



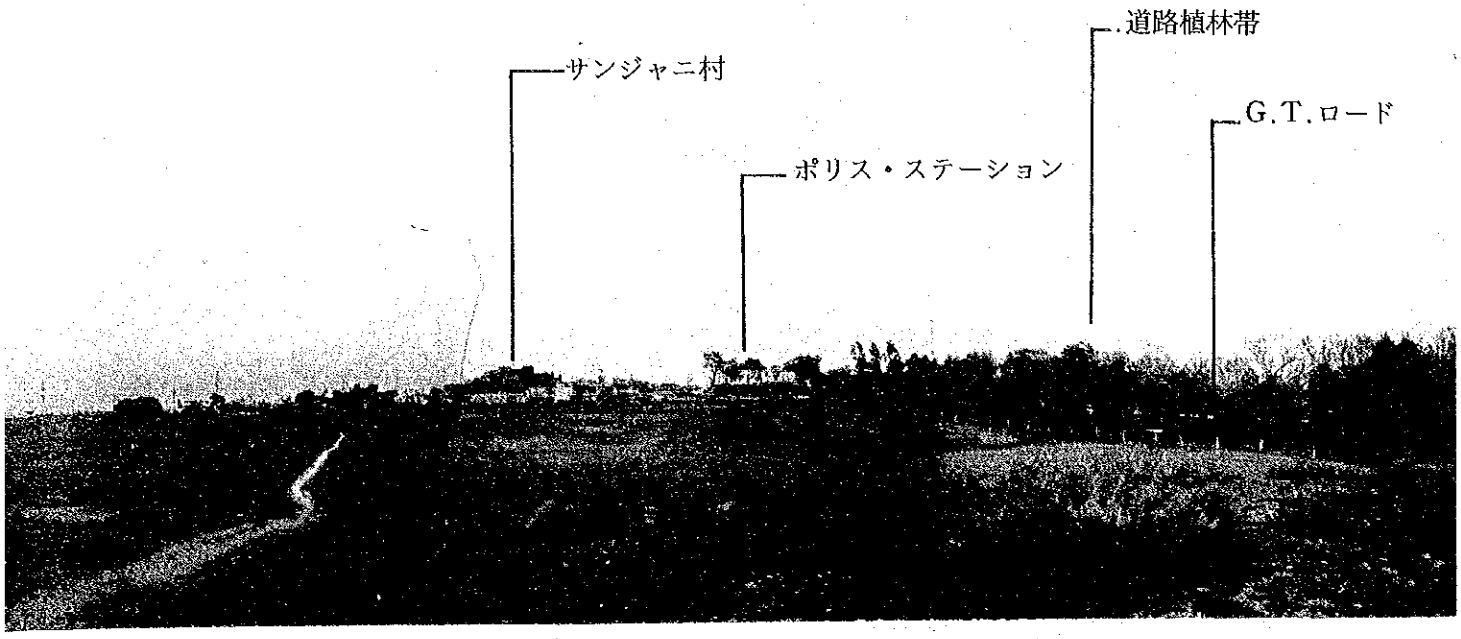
GRAND TRUNK ROAD
(G.T.ロード)



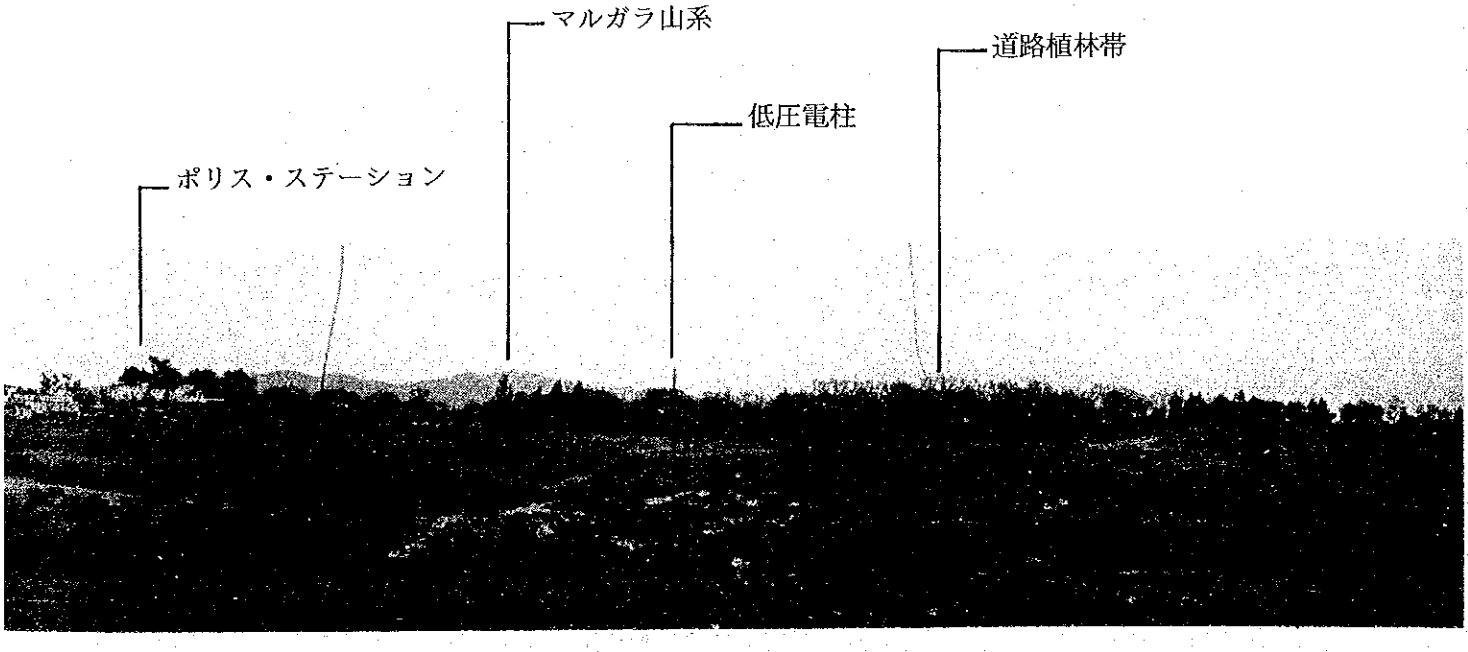
敷地を横断する高圧線（3本）



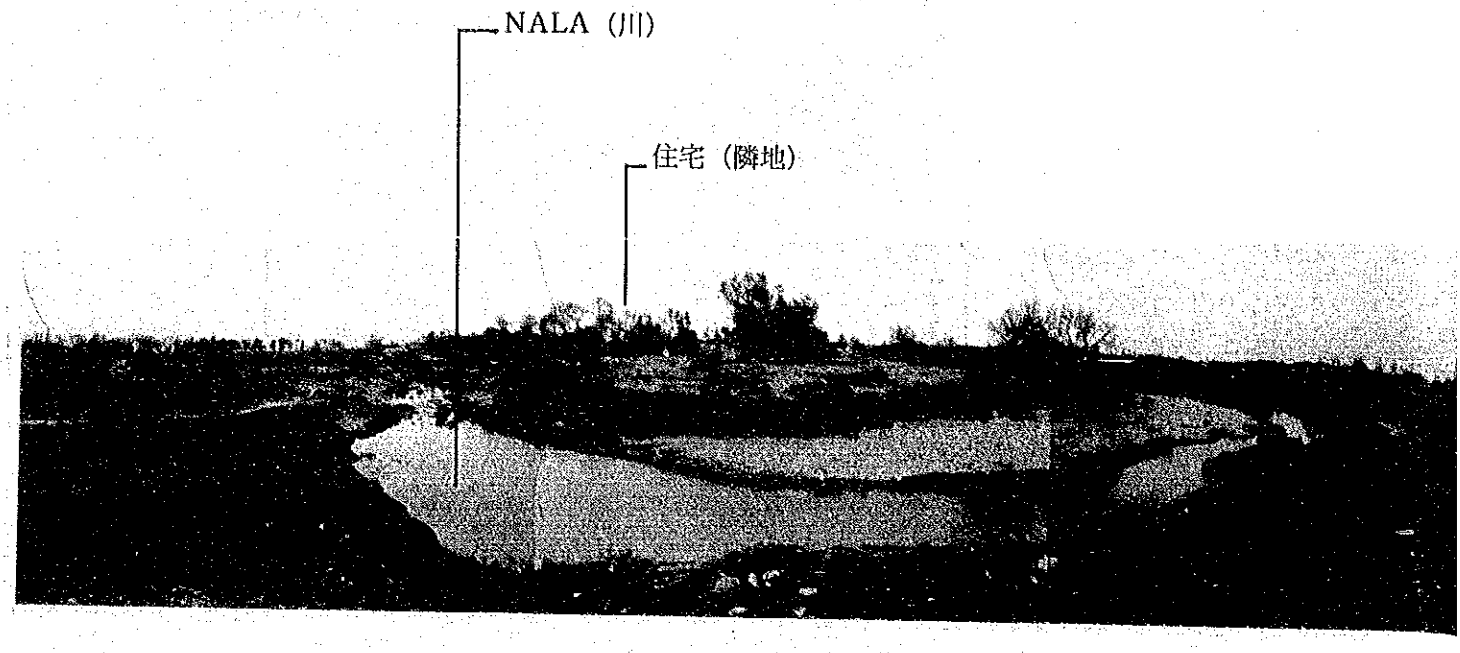
サンジャニ村へ電力供給する変圧器



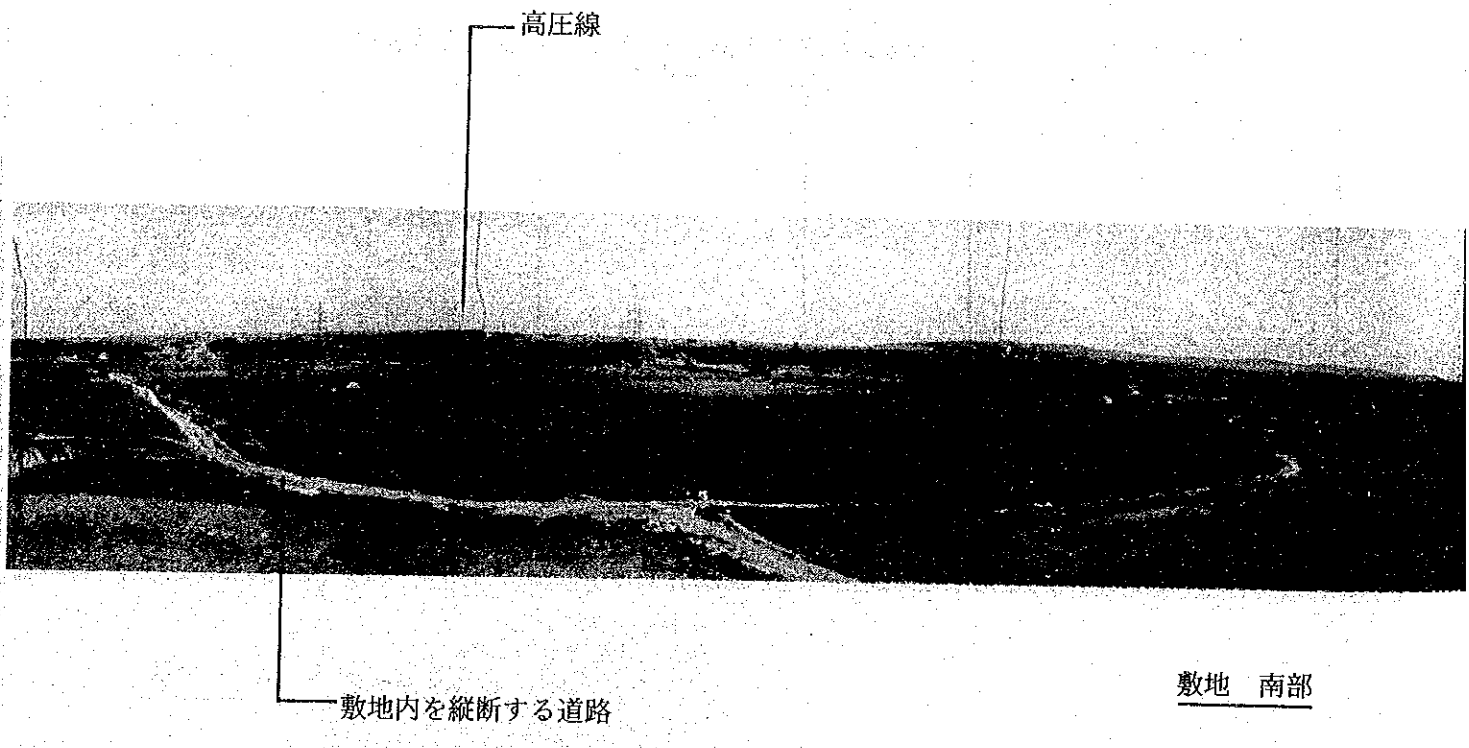
敷地　東北部



敷地　北部



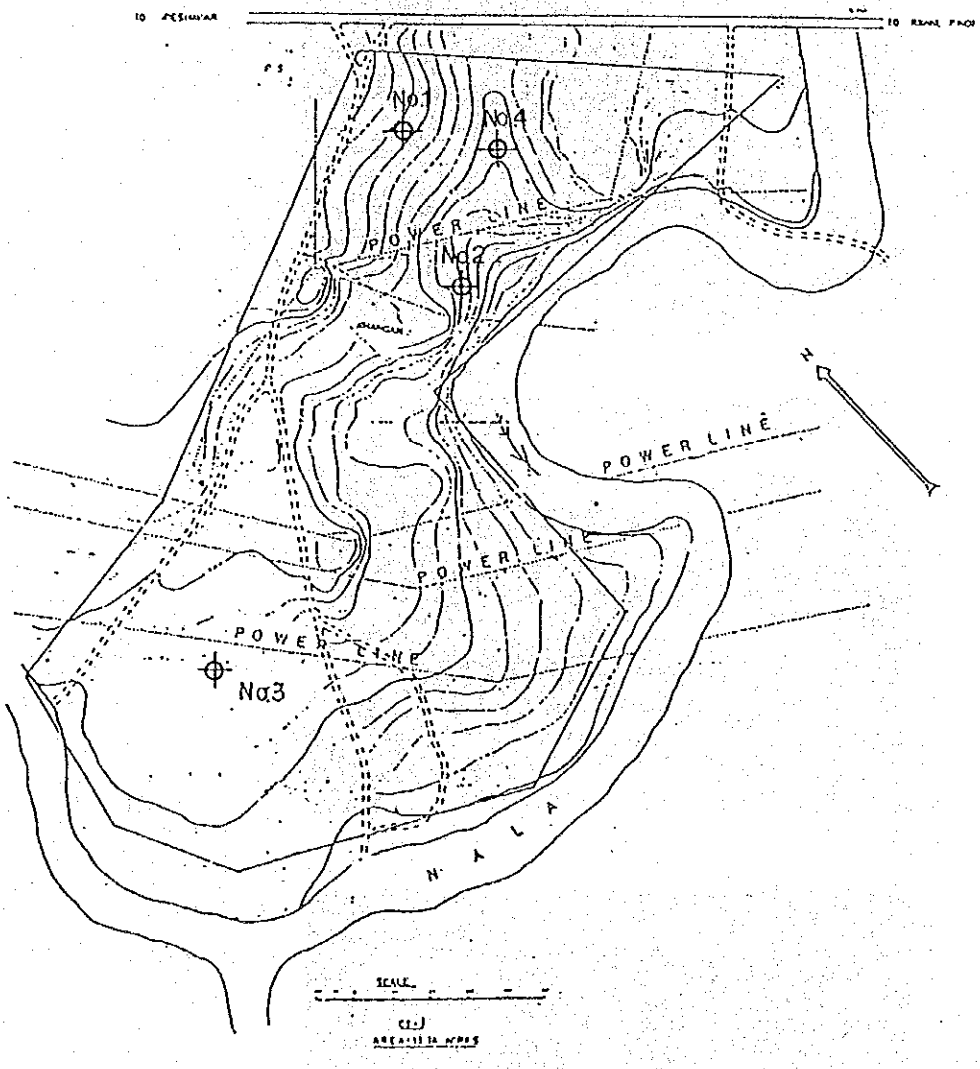
NALA（川）周辺



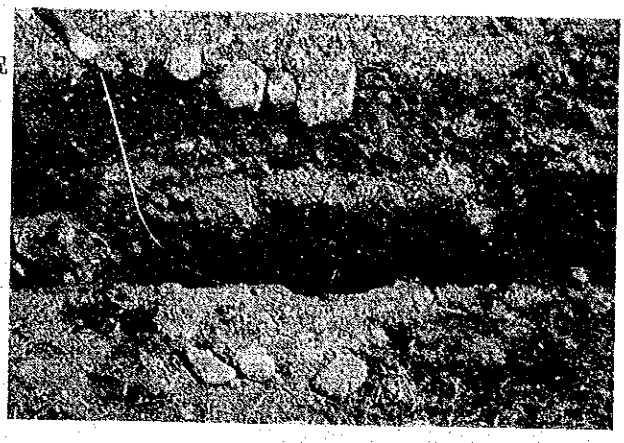
敷地　南部

□試掘試験

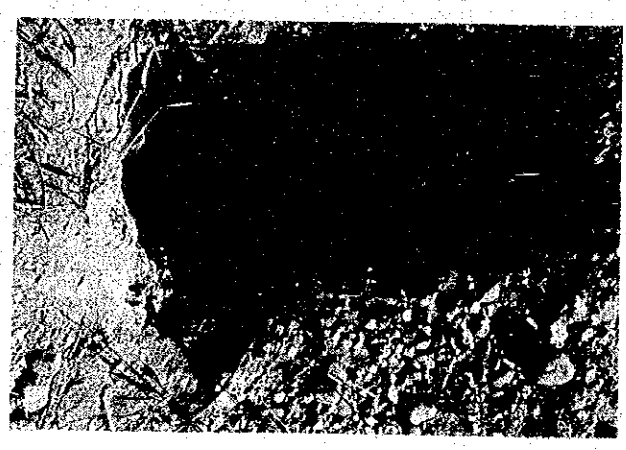
PROPOSED SITE FOR CONSTRUCTION MACHINERY
TRAINING CENTRE SANGJANI



建設予定地の周辺状況



テスト・ピット　No. 1



テスト・ピット　No. 2

テスト・ピット　No. 3

テスト・ピット　No. 4

□土質試験結果

SOIL TESTING RESULTS								1
Title of Job : CMTC Project in PAKISTAN								
Bore Hole No.								
Sample No.				1	2	3		
Depth of Sample (m)				0~1.0	0~1.0	0~1.0		
Grain-Size Analysis	Gravel-Size Fraction (2000μ<)		%	3	70			
	Sand-Size Fraction (74~2000μ)		%	17	11	35		
	Silt-Size Fraction (5~74μ)		%	51	6	37		
	Clay-Size Fraction (5μ>)		%	29	13	28		
	Max. Grain Size		mm	9.52	38.10	4.76		
	Uniformity Coefficient	U_c		—	14375.0	—		
	Coefficient of Curvature	U'_c		—	88.0	—		
Consistency	Liquid Limit	w_L	%	31.3	34.1	28.5		
	Plastic Limit	w_p	%	14.8	13.9	15.7		
	Plasticity Index	I_p		16.5	20.2	12.8		
classification				(CL)g	(GC)	(ML)		
				F	GF	F		
Specific Gravity of Soil Particle		G_s	g/cm³	2.683	2.697	2.709		
Natural	Natural Moisture Content	w	%	15.2	13.0	5.7		
	Bulk Density	γ_t	g/cm³					
	Natural Void Ratio	e_o						
	Degree of Saturation	S_r	%	35	20	35		
Unconfined Compression Test	Uncon. Comp. Strength	q_u	kg/cm²					
	Sensitivity Ratio	S_t						
	Modulus of Elasticity	E_{50}	kg/cm²					
Triaxial Compressen Test	※ Testing Method							
	Cohesion	c	kg/cm²					
	Angle of Internal Friction	ϕ	deg.					
Direct Sheat Test	※ Testing Method							
	Cohesion	c	kg/cm²					
	Angle of Internal Friction	ϕ	deg.					
Consolidation Test	Precompression Intensity	p_y	kg/cm²					
	Compression Index	C_c						
	Coefficient of Consolidation	C_v	cm²/min					
	Coefficient of Permeability	k	cm/min					

※ Unconsolidation – Undrained Shear Test UU
Consolidation – Undrained Shear Test CU, $\overline{CU}$
Consolidation – Drained Shear Test CD

GRAIN SIZE ANALYSIS

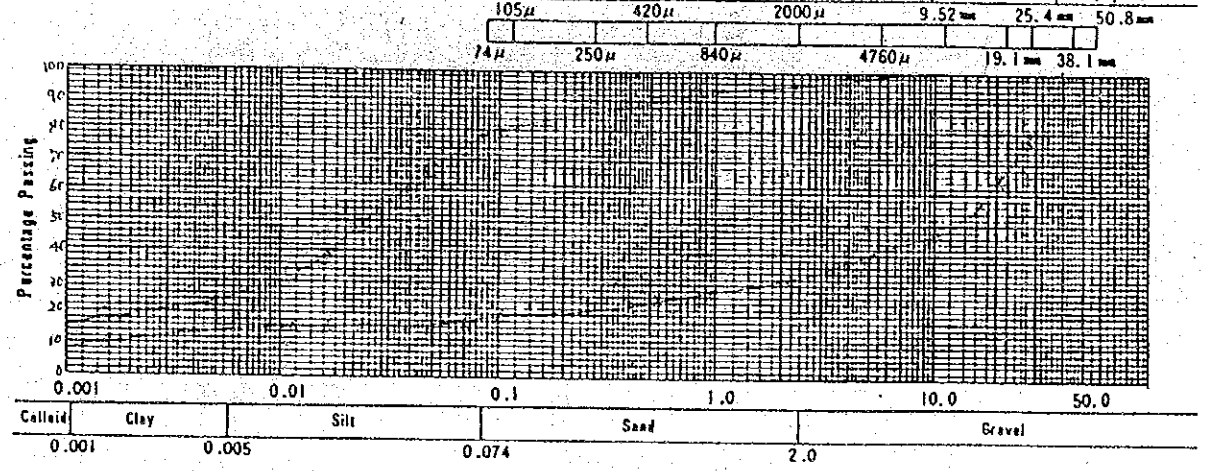
2

Title of Job CMTC Project in PAKISTAN

Bore Hole No.

Sample No. & Depth (0 m ~ 1.5 m)

No	Gravel %	Sand %	Silt %	Clay %	Colloid %	Max. Grain Size mm	60% Grain Dia. Size mm	Effective Dia. Grain Size mm	Uniformity Coefficient Uc
1	3	17	51	46		9.52	0.029		—
2	70	11	6	22		38.10	23.0		14375.0

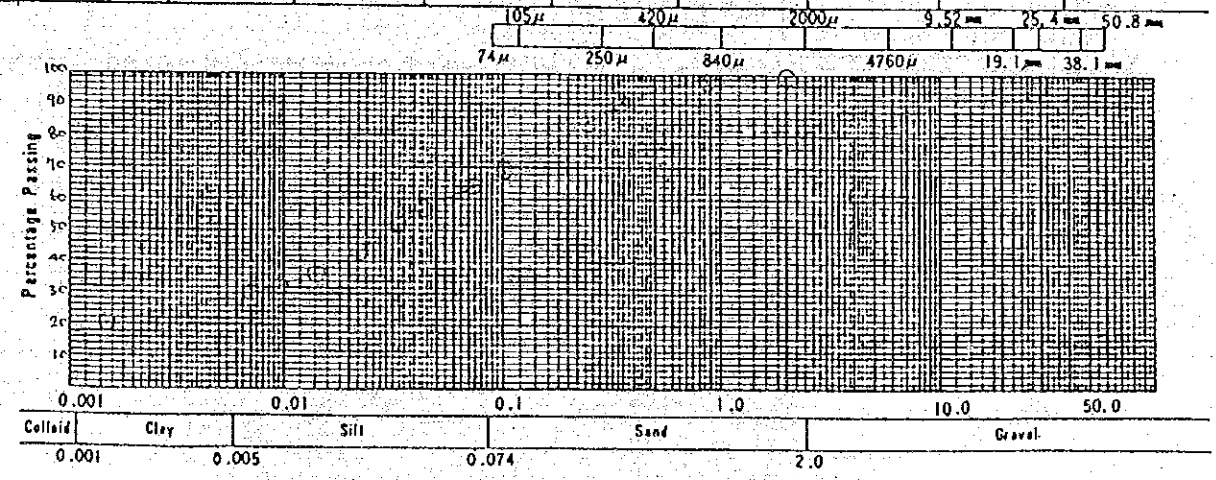


Title of Job

Bore Hole No.

Sample No. & Depth (m ~ m)

No	Gravel %	Sand %	Silt %	Clay %	Colloid %	Max. Grain Size mm	60% Grain Dia. Size mm	Effective Dia. Grain Size mm	Uniformity Coefficient Uc
3		35	37	44		4.76	0.054		



LIQUID LIMIT AND PLASTIC LIMIT

3

Title of Job CMTC Project in PAKISTAN

Bore Hole No.

Sample No. & Depth No. 1 (0 m ~ 1.0 m)

Liquid Limit Test			Plastic Limit Test	
No.	Number of Blows	Moistur Contents %	No.	Moistur Contents %
1	49	29.6	1	15.4
2	37	30.1	2	13.9
3	30	30.7	3	15.0
4	21	31.7		
5	13	33.2		
6	7	35.2	Average	

Liquid Limit w_L	Plastic Limit w_P	Plasticity Index I_P
31.3 %	14.8 %	16.5

Sample No. & Depth No. 2 (m ~ m)

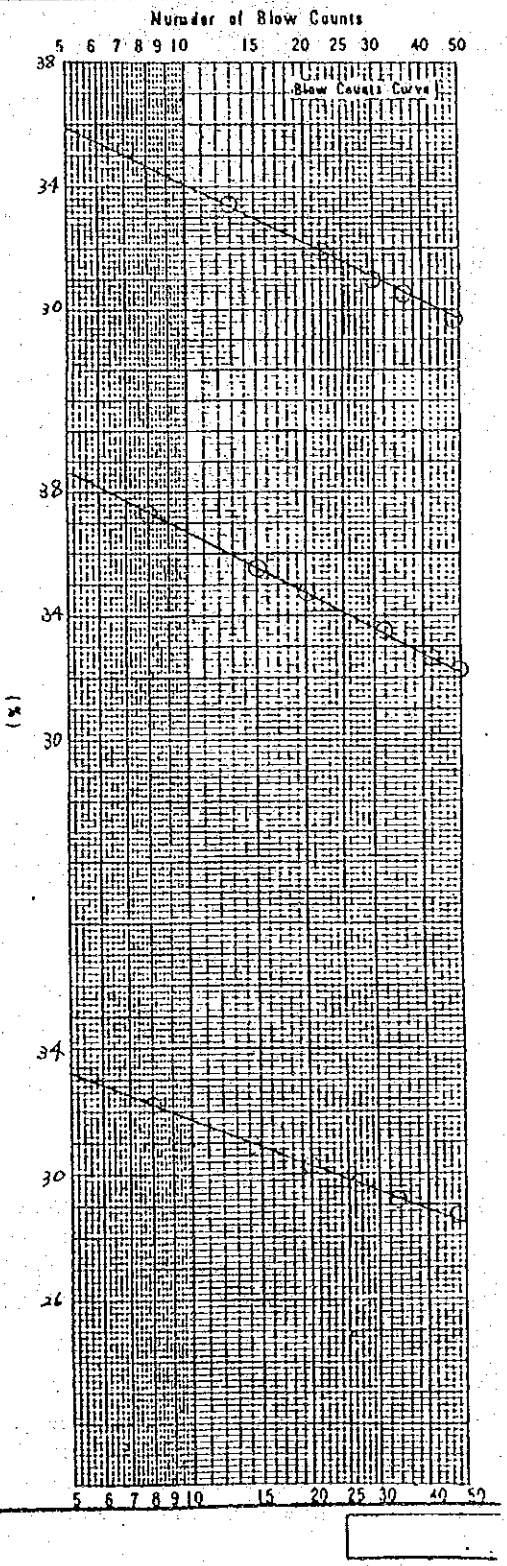
Liquid Limit Test			Plastic Limit Test	
No.	Number of Blows	Moistur Contents %	No.	Moistur Contents %
1	49	32.2	1	13.3
2	42	32.6	2	13.8
3	32	33.6	3	14.5
4	20	34.9		
5	16	35.4		
6	8	37.5	Average	

Liquid Limit w_L	Plastic Limit w_P	Plasticity Index I_P
34.1 %	13.9 %	20.2

Sample No. & Depth No. 3 (m ~ m)

Liquid Limit Test			Plastic Limit Test	
No.	Number of Blows	Moistur Contents %	No.	Moistur Contents %
1	48	26.9	1	15.9
2	34	27.4	2	16.6
3	26	28.4	3	14.7
4	20	29.1		
5	14	30.1		
6	8	31.8	Average	

Liquid Limit w_L	Plastic Limit w_P	Plasticity Index I_P
28.5 %	15.7 %	12.8



4. 訓練機材リスト

E-1 ACTUAL MACHINES

A. ACTUAL MACHINE FOR OPERATOR COURSE

Item	Description	Q'ty
A-1	BULLDOZER With Straight Tilt Dozer, Multi-Shank Ripper, Pusher Plate and Canvas Canopy Max. Horse Power: Approx.320 PS Drive System: Torque Convertor Drive Dozer Size: Approx 4.0 x 1.6 M	1
A-2	BULLDOZER With Straight Tilt Dozer, Fixed Drawbar & Canvas Canopy Max. Horse Power: Approx. 220 PS Drive System: Torque Convertor Drive Dozer Size: Approx. 3.7 x 1.3 M	1
A-3	BULLDOZER With Straight Tilt Dozer, Fixed Drawbar & Canvas Canopy Max. Horse Power: Approx. 160 PS Drive System: Torque Convertor Drive Dozer Size: Approx. 4.0 x 1.0 M	1
A-4	BULLDOZER With Angle Dozer, Fixed Drawbar & Canvas Canopy Max.Horse Power: Approx. 110 PS Drive System: Direct Drive Dozer Size: Approx. 3.7 x 0.9M	1
A-5	DOZER SHOVEL With Standard Bucket & Canvas Canopy Max. Horse Power: Approx. 165 PS Drive System: Torque Convertor Drive Bucket Size: Approx. 1.8 M^3	1
A-6	DOZER SHOVEL With Standard Bucket & Canvas Canopy Max. Horse Power: Approx. 110 PS Drive System: Direct Drive Bucket Size: Approx. 1.4 M^3	1
A-7	WHEEL LOADER With Standard Bucket & Canvas Canopy Max. Horse Power: Approx. 235 PS Drive System; Torque Convertor Drive Bucket Size: Approx. 3.5 M^3	1

Item	Description	Q'ty
A-8	WHEEL LOADER With Standard Bucket & Canvas Canopy Max. Horse Power: Approx. 107 PS Drive System: Torque Convertor Drive Bucket Size: Approx. 1.7 M^3	1
A-9	MOTOR GRADER With Scarifier, Rear Mounted Ripper & Canvas Canopy Max. Horse Power: Approx. 145 PS Drive System: Hydraulic Transmission Blade Size: Approx. 3.7 x 0.5 M	1
A-10	MOTOR GRADER With Scarifier & Canvas Canopy Max. Horse Power: Approx. 115 PS Drive System: Hydraulic Transmission Blade Size: Approx. 3.1 x 0.5 M	1
A-11	DUMP TRUCK Max. Horse Power: Approx. 280 PS Drive System: Torque Convertor Drive Max. Carrying Capacity: 20,000 Kg	1
A-12	DUMP TRUCK Max. Horse Power: Approx. 300 PS Drive System; Direct Drive Max. Carrying Capacity: Approx. 10,000 Kg	1
A-13	ROAD STABILIZER Max. Horse Power: Approx. 360 PS Drive System: Max. Mixing Capacity: Approx. 2.0 x 0.37 M	1
A-14	TRACK CRANE Max. Horse Power: Approx. 260 PS Drive System: Direct Drive Max. Crane Capacity 10,000 Kg Boom: 3 Stages Boom Max. Length: Approx. 10.0 M	1
A-15	EXCAVATOR Max. Horse Power: Approx. 108 PS Drive System: Hydraulic Drive Bucket Capacity: Approx. 0.7 M^3	1

Item		Q'ty
A-16	EXCAVATOR Max. Horse Power: Approx. 90 PS Drive System: Hydraulic Drive Bucket Capacity: Approx. 0.5 M^3	1
A-17	MOTOR SCRAPER With Rops Canopy Single Engine Max. Horse Power: Approx. 364 PS Drive System: Torque Convertor Drive Capacity (Heaped): Approx. 16 M^3	2
A-18	VIBRATORY ROLLER Max. Horse Power: Approx. 86 PS Vibrating Force: 6.0 - 10 TONS Vibrating Speed: Approx. 2,500 - 3,000 rpm	2
A-19	PNEUMATIC ROLLER Max. Horse Power: Approx. 100 PS Type: Mechanical Compacting Width: Approx.2 M	1
A-20	AIR COMPRESSOR Max. Horse Power: Approx. 2.5 PS Capacity: 215 M^3/ MIN Pressure: 7.0 Kg/cm^2	1
A-21	ATTACHMENTS (Concrete Breaker)	3
A-22	GENERATOR Max. Horse Power: Approx. 17 PS Capacity: Approx. 9.5 KW	1
A-23	ASPHALT DISTRIBUTOR Max. Horse Power: Approx. 26 PS Tank Capacity: Approx. 3,000 S.T.D. Spreading Width: Approx. 2.0 M	1

B. ACTUAL MACHINE FOR MECHANIC COURSE

Item	Description	Q'ty
B-1	BULLDOZER With Straight Tilt Dozer, Fixed Drawbar & Canvas Canopy Max. Horse Power: Approx. 160 PS Drive System: Torque Convertor Drive Dozer Size: Approx. 4.0 x 1.0 M	1
B-2	DOZER SHOVEL With Standard Bucket & Canvas Canopy Max. Horse Power: Approx. 110 PS Drive System: Direct Drive Bucket Size: Approx. 1.4 M^3	1
B-3	WHEEL LOADER With Standard Bucket & Canvas Canopy Max. Horse Power: Approx. 107 PS Drive System: Torque Convertor Drive Bucket Size: Approx. 1.7 M^3	1
B-4	MOTOR GRADER With Scarifier & Canvas Canopy Max. Horse Power: Approx. 115 PS Drive System: Hydraulic Transmission Blade Size: Approx. 3.1 x 0.5 M	1
B-5	DUMP TRUCK Max. Horse Power: Approx. 300 PS Drive System: Direct Drive Max. Carrying Capacity: Approx. 10,000 Kg	1
B-6	EXCAVATOR Max. Horse Power: Approx. 90 PS Drive System: Hydraulic Drive Bucket Capacity Approx. 0.5 M^3	1
B-7	AIR COMPRESSOR Max. Horse Power: Approx. 25 PS Capacity: 2.5 M^3/MIN Pressure: 7.0 Kg/cm^2	1
B-8	GENERATOR Max. Horse Power: Approx. 17 PS Capacity: Approx. 9.5 KW	1

E-1-C. COMPONENT

Item	Description	Q'ty
	1. Engine	
1.	Engine assembly	2
2.	Engine assembly with turbo and main clutch	4
3.	Gasoline engine assembly	2
	2. Torque Converter and Transmission	
1.	Torque converter assembly	4
2.	Torqflow transmission	4
3.	Transmission for loader	2
4.	Transmission	4
	3. Fuel Pump	
1.	Fuel injection pump assembly for small engine	5
2.	Fuel injection pump assembly for big engine	5
3.	Fuel pump	10
	4. Hydraulic	
1.	Hydraulic pump assembly	10
2.	Pump assembly for transmission	4
3.	Hydraulic control valve	4
4.	Steering control valve ass'y	4
5.	Hydraulic pump and regulator for excavator	2
6.	Hydraulic motor for excavator	2
7.	Hydraulic cylinder assembly	6

Item	Description	Q'ty
	5. System Board	
1.	Electric system board for bulldozer	1
2.	Electric system board for truck	1
3.	Hydraulic system board	1
4.	Brake system	1
	6. Differential	
1.	Differential ass'y with banjyo housing	4
2.	Dump transmission	2
	7. Electrical	
1.	Starter motor	4
2.	Alternator	4
3.	Generator	4
4.	Regulator	10

E-2. SPARE PARTS

A.	SPARE PARTS FOR OPERATOR COURSE	1 SET
B.	SPARE PARTS FOR MECHANIC COURSE	1 SET

E-3. SERVICE WORKSHOP FACILITIES

A. EQUIPMENT & TOOLS

Item	Description	Q'ty
A-1	CHASSIS BAY	1 SET
A-2	ENGINE REPAIR SHOP	1 SET
A-3	ENGINE DYNAMOMETER ROOM	1 SET
A-4	HYDRAULIC COMPONENT TEST ROOM	1 SET
A-5	FUEL INJECTION PUMP, ELECTRICAL COMPONENT & BATTERY ROOM	
A-5-1	FUEL INJECTION PUMP ROOM	1 SET
A-5-2	ELECTRICAL COMPONENT ROOM	1 SET
A-5-3	BATTERY ROOM	1 SET
A-6	POWER LINE HYDRAULIC & TIRE SERVICE REPAIR SHOP	1 SET
A-6-1	POWER LINE REPAIR BAY	1 SET
A-6-2	TIRE SERVICE BAY	1 SET
A-7	MACHINE SHOP	1 SET
A-8	WELDING & UNDERCARRIAGE REBUILDING SHOP	
A-8-1	WELDING & FABRICATION BAY	1 SET
A-8-2	UNDERCARRIAGE SHOP	1 SET
A-9	COMPRESSOR ROOM	1 SET
A-10	CLEANING & PAINTING EQUIPMENT	1 SET
A-11	PARTS WAREHOUSE	1 SET
A-12	TOOL ROOM	1 SET

MAJOR SHOP EQUIPMENT ARE AS FOLLOWS:

A-1 Chassis Bay

Item	Description	Q'ty
A-1-1	Overhead Crane, Double Beam Type with Direction Board Rail less travel wheel Capacity : 5 ton	1
A-1-2	Mobile Work Bench (Wood Cover) With Vise	1 set
A-1-3	Parts Rack	1 set
A-1-4	Parts Wagon with casters and 4 shelves	1 set
A-1-5	Mechanic Tool Set For Construction Equipment	4
A-1-6	Tool Cabinet	4
A-1-7	Parts Cleaner Tank : 100 lit.	1
A-1-8	Hydraulic Garrage Jack Capacity : 10 ton	2
A-1-9	Transmission Jack Capacity : 1,800 kg	1
A-1-10	Fork Lift, 2.5 ton Capacity	1

訓練機材リスト

A-2 Engine Repair Shop

Item	Description	Q'ty
A-2-1	Over Head Crane Double Beam Type with Direction Board Rail less travel wheel Capacity : 3 ton	1
A-2-2	JIB Crane, Wall Type with Chain Block, 4 Button Type Capacity : 1 ton	2
A-2-3	Mobile Floor Crane Capacity : Max. 2 ton	1
A-2-4	Hydraulic Press Capacity : 35 ton	1
A-2-5	Work Bench with Cabinet and Locker	1 set
A-2-6	Bench Electric Grinder	1
A-2-7	Bench Drill Press Capacity : 13 mm	1
A-2-8	Engine Stand Service cap. : 3,000 kg	4
A-2-9	Parts Rack	1 set
A-2-10	Parts Wagon with casters and 4 shelves	1 set
A-2-11	Cylinder Head Work Bench	1
A-2-12	Parts Cleaner	1
A-2-13	Valve Refacer	1
A-2-14	Valve Spring Tester	1
A-2-15	Piston Heater (Bearing Heater)	1
A-2-16	Connecting Rod Aligner	1
A-2-17	Tool Cabinet	4
A-2-18	Mechanic Tool Set for Construction Equipment	4
A-2-19	Cylinder Head Hydraulic Stand	1
A-2-20	Steam Cleaner	1
A-2-21	Mobile Work Bench (Lift Type)	1 set
A-2-22	Tool Locker	1 set

Item	Description	Q'ty
A-2-23	Parts Cleaner with One Busket	1
A-2-24	Connecting Rod Boring Machine	1
A-2-25	Surface Grinder	1
A-2-26	Cylinder Boring Machine	1
A-2-27	Main Line Boring Machine	1
A-2-28	Honing Machine	1
A-2-29	Crankshaft Grinder	1
A-2-30	Crankshaft Rebuilding Machine	1
A-2-31	Valve Seat Grinder	1
A-2-32	Machinists Vise	1

A-3 Engine Dynamometer Room

Item	Description	Q'ty
A-3-1	Engine Dynamometer with Panel Stand	1
A-3-2	Engine Stand & Bed	1
A-3-3	Fuel Tank with Stand	1
A-3-4	Cooling Water Tank For Engine with Stand	1
A-3-5	Water Supply Pump	2
A-3-6	Fuel Consumption Meter	1
A-3-7	Work Bench with Cabinet and Locker	1
A-3-8	Parts Rack	1
A-3-9	Tool Locker & Cabinet	1

A-4 Hydraulic Componet Test Room

Item	Description	Q'ty
A-4-1	Hydraulic Component Universal Tester	1
A-4-2	Parts Rack	1 se
A-4-3	Mechanic Tool Set	6
A-4-4	Electric Chain Block with Gear Trolly	1
A-4-5	Mobile Work Bench	1

A-5 Fuel Injection Pump Room

Item	Description	Q'ty
A-5-1	Diesel Fuel Injection Pump	1
A-5-2	Pump Test Stand	1
A-5-3	injector Flow Comparator	1
A-5-4	Nozzle Tester	1
A-5-5	Work Bench	6
A-5-6	Engineers Vise	10
A-5-7	Mechanic Tool Set with English Size Tool	10
A-5-8	Tool Cabinet	2
A-5-9	Parts Cleaner	1
A-5-10	Parts Rack	1 set
	Electric Component Room	
A-5-11	Starter Generator Test Bench	1
A-5-12	Motor Puller Set	1
A-5-13	Work Bench	1
A-5-14	Engineers Vise	1
A-5-15	Tool Cabinet	1
	Battery Room	
A-5-16	Silicon Quick Charger with Normal Charge	1
A-5-17	Parts Rack	1 set
A-5-18	Water Purifier	1

A-6 Power Line Hydraulic repair Bay

Item	Description	Q'ty
A-6-1	Unit Repair Stand	4
A-6-2	Mechanic Tool Set For Construction Equipment	4
A-6-3	Tool Cabinet	4
A-6-4	Mobile Work Bench (Lift Type) with Vise	1 set
A-6-5	Parts Rack	1 set
A-6-6	Parts Wagon with Caster and 4 Shelves	1 set
A-6-7	Hydraulic Cylinder Service Stand	1
A-6-8	Jib Crane, Wall type	1
	Tire Service Bay	
A-6-9	Hydraulic Tire Removing Tool Tire size:OR tire 12.00-26.00 Ram Capacity: 10 ton	1
A-6-10	Tire Spotter Set	1
A-6-11	Work Bench with 1 Drawer and Shelves	1
A-6-12	Tool Cabinet	1

A-7 Machine Shop

Item	Description	Q'ty
A-7-1	Precision Lathe Swing over bed: not less than 500 mm Distance between center: 1,500 mm	3
A-7-2	Upright Drilling Machine Drilling capacity: not less than 50 mm dia.	1
A-7-3	Bench Drill Press Capacity: notless than 23 mm	1
A-7-4	Universal Milling Machine	1
A-7-5	Shaping Machine with Standard Accessories	1
A-7-6	Hack Sawing machine	1
A-7-7	Bench Electric Grinder	1
A-7-8	Work Bench with 1 Drawer and 1 Shelf	2
A-7-9	Parts Locker	1 set
A-7-10	Parts Rack	1 set
A-7-11	Mobile Floor Crane	1
A-7-12	Bar Rack	1
A-7-13	Tool Locker and Cabinet	1 set

A-8 Welding & Fabrication Bay

Item	Description	Q'ty
A-8-1	A. C Arc Welder	2
A-8-2	Electrode Drier	2
A-8-3	CO_2-Gas Shield Arc Welder	1
A-8-4	Gas Welder Set	4
A-8-5	Iron Anvil, Cast Iron, 70 kg	1
A-8-6	Cast Iron Swage Block	1
A-8-7	High-speed Abrasive Cut-Off Machine	1
A-8-8	Partition for Welding	1 set
A-8-9	Hand Lever Shear	1
	Undercarriage Shop	
A-8-10	Roller Idler Press	1
A-8-11	Conveyor Stand for Roller Line	1
A-8-12	Track Press with Hydraulic Winch	1
A-8-13	Shoe Bolt Impact Wrench	1
A-8-14	4 Conveyors and Shoot	1
A-8-15	Track Link Rebuilding Machine Kit	1
A-8-16	Track Link Welding Bed	1
A-8-17	Roller Idler Attachment	1
A-8-18	Electric Grinder with Stand & Glass	1
A-8-19	Parts Wagon with Casters and 4 Shelves	1 set
A-8-20	Track Link Hanger	1
A-8-21	Tool Cabinet	1
A-8-22	Hydraulic Press (100 ton)	1

A-9 Compressor Room

Item	Description	Q'ty
A-9-1	Air Compressor 1,600 l/min.	1

A-10 Cleaning & Painting Equipment

Item	Description	Q'ty
A-10-1	Hot Water High Pressure Washer	1
A-10-2	Steam Cleaner	1
A-10-3	Air Compressor with Water Separator Approx. 350 liter/min.	1

A-11 Parts Warehouse

Item	Description	Q'ty
A-11-1	Parts Racks	1 set
A-11-2	Parts Truck	1 set
A-11-3	Power Lifter Max. Capacity: 600 kg	1

A-12 Tool Room

	Torque Multipler Torque Wrench General Tools	1 set

E-3-B. Special Tool

Item	Description	Q'ty
B-1	Special tools for engine	1 set
B-2	Special tools for bulldozer, dozer shovel, wheel loader, dump truck, motor grader	1 set

E-3-D-1. CUTAWAY MODELS

Item	Description	Q'ty
	1. Cutaway Models	
	a. Engine	
1.	Engine assembly	1
2.	Fuel injection pump	1
3.	Fuel pump	1
4.	Injector	1
5.	Water pump	1
6.	Full flow oil filter	1
7.	Turbocharger	1
	b. Torqflow system	
1.	Torque converter	1
2.	Torqflow transmission	1
3.	Transmission control valve	1
	C. Steering clutch	
1.	Steering clutch	1
	d. Undercarriage	
1.	Track roller	1
2.	Track link	1
	e. Electrical system	
1.	Starting motor	1
2.	Alternator	
	f. Hydraulic system	
1.	Hydraulic pump	1
2.	Hydraulic control valve	1

Item	Description	Q'ty
	g. Brake system	
1.	Brake booster	1

E-3-D-2. Plastic Model

Item	Description	Q'ty
1.	Mini-Plastic model of planetary gears	1
2.	Plastic model of torque converter	1
3.	Plastic model of planetary gears	1
4.	Automobile chassis model	1
5.	2 cycle engine principal	1
6.	4 cycle engine principal	1
7.	Transmission model	1
8.	Differential model	1
9.	Front alignment model	1
10.	Turning radius model	1
11.	Wheel balance model	1

E-4-B. SLIDES

a.	General	1 set
b.	Operation and Maintenance	1 set
c.	Structure and Function	1 set
d.	Disassembly and Assembly	1 set

E-4-C. OVERHEAD TRANSPARENCIES

a.	General	1 set
b.	Diesel Engine	1 set
c.	Torque Convertor	1 set
d.	Electrical System	1 set
e.	Hydraulic System	1 set
f.	Others	1 set

E-5. OTHERS

A.	SERVICE VAN With Service Tools Drive: 4 x 4	1 UNIT
B.	MICRO BUS FOR FIELD TRAINING 29 PASSENGERS	1 UNIT
C.	FUEL DIESEL STATION & 2 - 9.6 KL TANK	1 SET

□ Final Draft of Actual Machine for the CMTC Project

Description	Specification	Q'ty for Ope.	Q'ty for Mech.	Total	Remark
Bull Dozer	320 ps	1		1	Ripper working on hard-soil/rocks and maching with the Scraper 16m^3 as a pushing dozer
	220 ps	1		1	
	160 ps → 150 ps	1		1	
	▼140 ps → 110 ps	1	1	2	Much popular type in Pakistan
Dozer Shovel	160 ps	1		1	
	110 ps	1	1	2	
Wheel Loader	△200 ps → 230 ps	1		1	Maching with the Dump-truck 20 ton
	100 ps	1	1	2	
Motor Grader	145 ps	1		1	
	110 ps	1	1	2	Articulate-type for Operator course
Dumpt Truck	△18 t → 20 t (off-high)	1		1	Torque-Control type
	10 t (highway)	1	1	2	
Road Stabilizer	360 ps	1		1	
Truck Crane	10 t	1		1	
Hydraulic Excavator	▼1.2 m^3	1 → 0		1 → 0	Quite big compared with other Machinery
	0.9 m^3 → 0.7 m^3	1		1	Much popular type in Pakistan
	△0.5 m^3	0 → 1	1	1 → 2	Adjastment of total number
Motor Scraper	▼23 m^3	1 → 0		1 → 0	Quite big compared with other Machinery and necessary of a pushing Bulldozer 410 ps
	△16 m^3	1 → 2		1 → 2	Adjastment of total number
Vibratory Roller	8 t	2		2	
Pneumatic Roller	15 t	1		1	
Compressor W/ Attachment	2.5 m^3/min.	1	1	2	
Diesel Generator	9.5 kw	1	1	2	
Asphalt Distributor		1		1	

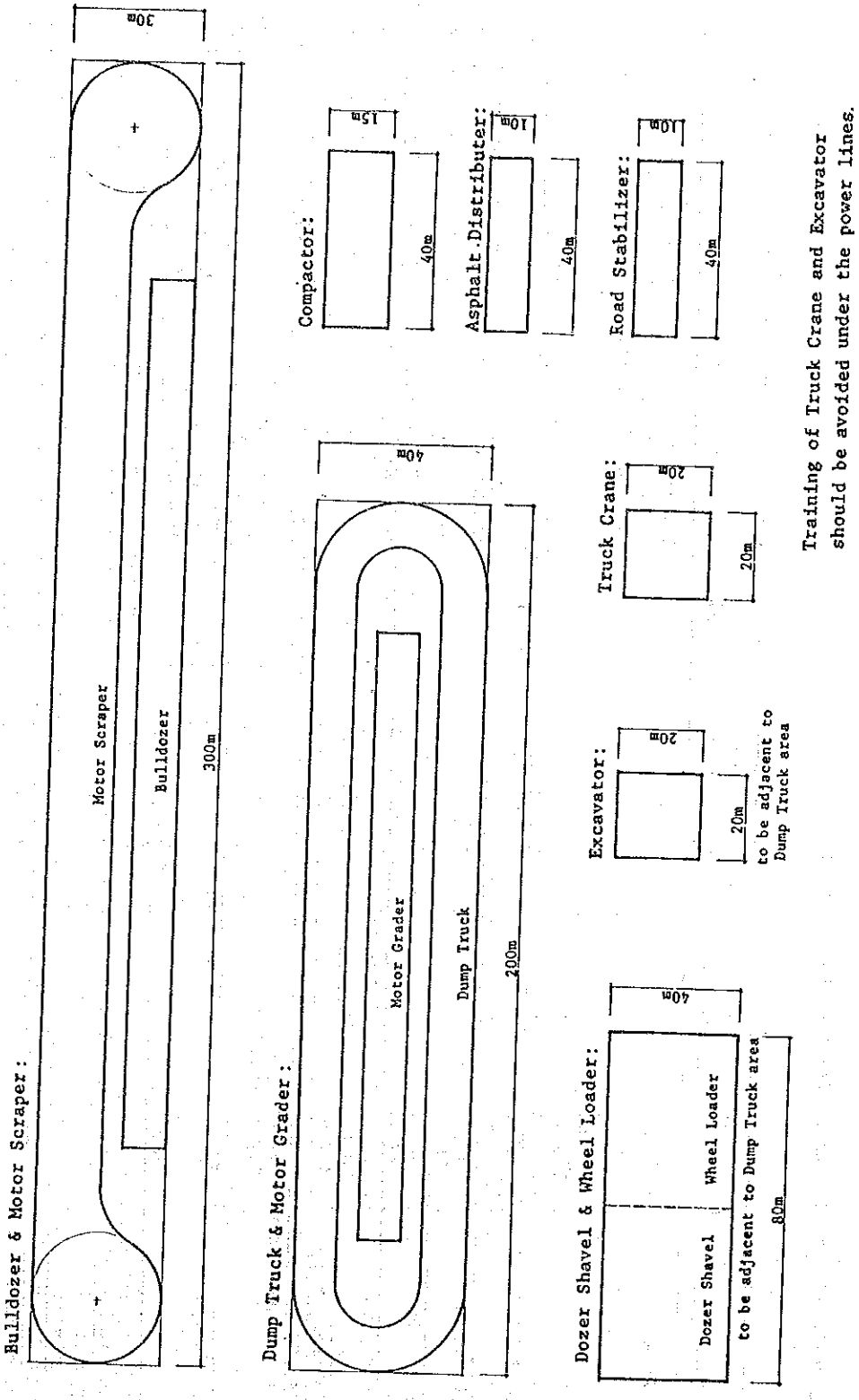
↓
Middle grade second-hand machinery, 3 years old or 3,000 hours-run.

▼ Grade down

△ Grade up

□オペレーター訓練の必要面積

■ Basic Area for Operator Training



■ Operator Training and Construction Equipment

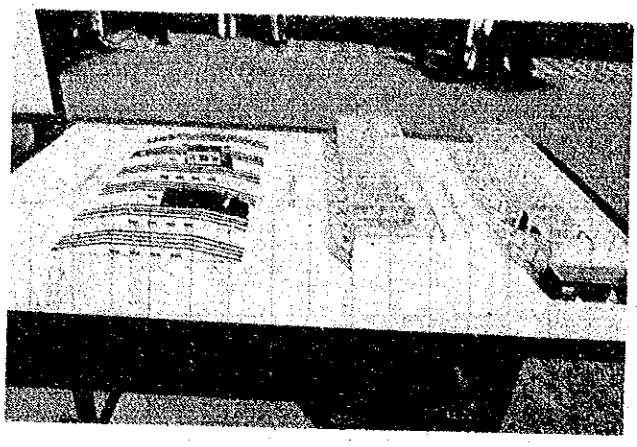
	BULLDOZER				DOZER SHOVEL		WHEEL LOADER		MOTOR GRADER		DUMP TRUCK		STABI	HYDRAULIC EXCAVATOR		SCRAPER	ROLLER VIB. VIG.		GENERA-TOR	AIR-COMPRESSOR	
	320 PS	220 PS	150	110 PS	160 PS	110 PS	280 PS	100	145 PS	110 PS	20 TON	(18 TON	360 PS	0.9 CU.M	0.5 CU.M	16 CU.M	10 TON	10 - 29	9.5 KW	2.5 CU.M/MIN	OTHERS
DOZE AND DIG WORK	●	●	●	●																	
RIPPING WORK	●								●												
SLOPE CUT WORK	●	●	●	●					●	●						●					
EMBANKMENT & REFILL	●	●	●	●												●					
LEVELLING (ROUGH)	●	●	●	●																	
DITCH EXCAVATION				●					●	●				●	●						
GROUND EXCAVATION														●	●						
LOADING (AND DIG)					●	●	●	●						●	●						
LOAD AND CARRY							●	●													
SPREAD AND GRADING									●	●											
SOIL COMPACTION																	●	●			
ASPHALT COMPACTION																	●	●			
OPERATION																			●	●	
HAULING											●	●				●					
ROAD PAVEMENT													●				●	●			FINISHER
GRAVEL ROAD MAINTE									●	●							●				
ROAD REHABILITE									●	●							●	●			CUTTER
MOTOR SCRAPER WORK	●																				

* mainly use for lighting or small electric tools.

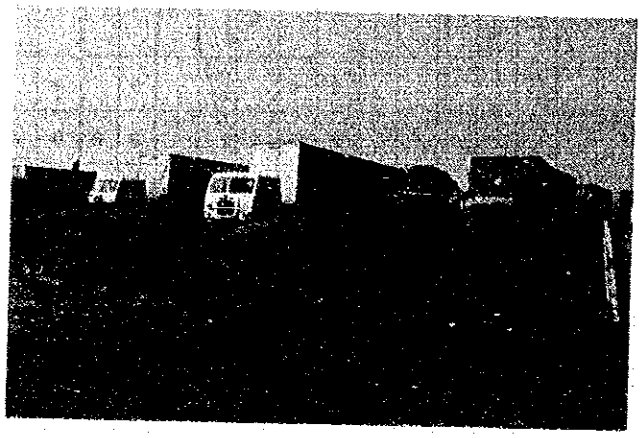
** mainly use for concrete breaker or painting

類似施設の現況

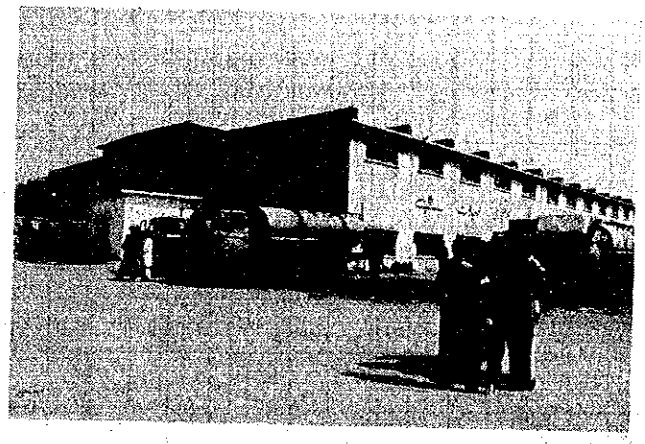
NCL
KALACHI
MAINTEMNCE
SHOP



整備部門の模型



洗車場



修理工場外観

修理工場内部

6．類似施設の現況

1）NATIONAL LOGISTIC CELL（NLC）

概要：生産省（MINISTRY OF PRODUCTS）の管轄下にある輸送補給局で約1,500台の車輌を保有し、カラチ・ラホール・ペシャワール間の物質輸送を行う。民間に大規模な運送会社のないこの国では唯一の輸送機関であり、民間物質の輸送も行う。
カラチとラホール近郊のグジュランワラに修理工場をもつほか、路線上の要所には簡単な修理の出来るDepotを配備している。カラチの修理工場はトラック・トレーラーが主であるが、グジュランワラでは建設機械の修理も着手しはじめた処であった。これはグジュランワラが前線基地としての性格を持ち、道路建設や補修なども実施する為と思われる。また、ともに運転・修理の技術者養成の為の訓練所を設けているが、カラチでは、本格的に実施されているのに比べ、グジュランワラの方ではまだこれに至っていない状況であった。

□ NLC KARACHI MAINTENANCE SHOP

このセンターでは、トラック・トレーラー等の車輌の運輸管理と修理業務を行っており運輸管理部門では、各メーカー、車種別の月間コスト分析、修理業務では、車輌の整備をライン化して効率の向上に努めるなど、レベルが高い。

整備工場：

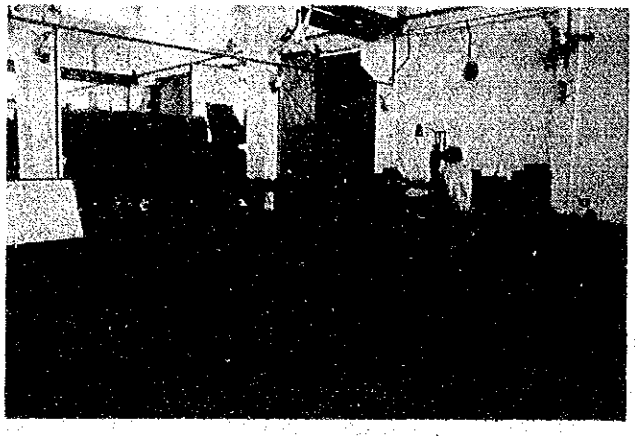
- 整備効率を向上させる為に、洗車・整備・点検修理のラインが確立されておりトラック等の輸送車輌の整備工場としては、非常に良く管理されている。

- 職員構成はENGINEER 13名、FORMAN 13名、TECHNICIAN 128名、CIVIL 46名その他雑用等約400名と非常に大規模である。

- 整備・修理機械としては、シャフト研磨機、シリンダー・ボーリング機、旋盤板金加工機、燃料ポンプ試験機、エンジン性能試験機、洗浄施設など充分に整備されており、トルク・レンチ、ダイアル・ゲージの使用等、修理の技術レベルも高い。

類似施設の現況

機械工場内観



クランク・シャフト研磨機

燃料ポンプ試験機

スペアー・パーツ管理部門

・整備・修理能力は、次の様である。

サービス	70～ 80 台／日
リペアー	80～100 台／日
オーバー・ホール	3～4 台／週

実績としてはベンツ・トラック 500台のうち65台はすでに300,000 kmを走行し目標としては全車輌を500,000 kmまで走行できるよう整備したいとの事であった。

メカニック養成所：

・1978年設立で定員75名（現在は45名）修業年限 18ヶ月（現在は24ヶ月）
設立以来 600人が卒業した。

・訓練はWORK SHOPで6ヶ月間、SERVICE STATIONで9ヶ月間行われる。

	SERVICE ST.	3ヶ月	洗車・オイル交換・マイナーリペアー
WORK SHOP	ENGINE SHOP	1.5ヶ月	分解組立・修理
	WORK SHOP	1.5ヶ月	車輌全般

SERVICE STATION	ENGINE	9ヶ月
	CHASSIS	9ヶ月

・テキストは各車輌のサービス・マニュアルを使用し、特別の教材は使っていない。

・指導員は40人につき3人、12～20年の実務経験者を採用し、外国人専門家やメーカー技術者も短期間参加している。

・入所資格はMATRIC FISC（セカンダリー卒業）で18～25才の者

・訓練方法

1）Basic Lecture	75名（現在45名）－	6ヶ月
2）Maintenance, Light Repair	25名（15名）	4ヶ月
3）Heavy Repair	25名（15名）	〃
4）Basic O.H.	25名（15名）	〃

■ NLC BASIC ENGINEERING COURSE-1

WEEKLY TRAINING PROGRAMME - 4TH WEEK 07-12, APR, 1984

Periods / Date	1st 8:30 - 9:10	2nd 9:10 - 9:50	3rd 9:55 - 10:35	4th 10:40 - 11:20		5th 11:40 - 12:20	6th 12:20 - 13:00	7th 13:05 - 13:45	8th 13:50 - 14:20
SAT 07, APR	Motivation		Maintenance Problems	Manpower Planning Control		Communication Process	Theory of Leadership	Aggregate Screening	
SUN 08, APR	Formal & Informal Leadership	Human Resource Planning	Principles of Training	Determining Effectiveness of Trg.		Visit 153 Par Bn/Operation of Road Const Machinery			
MON 09, APR	Corrosion Computerisation	Universal Religion	Salinity	Traffic Problem	TIME	Soil Mechanics	Robots	Uswa -&- Hasna	Traffic Studies
TUE 10, APR	Lecture by Trainee Engeers Details given on notice board		Visit KSSEW 10:00 - 13:00 hrs		BREAK	Visit KSSEW		Visit Pakistan Steel Mills 13:00 - 15:30 hrs	
WED 11, APR	Paper Writing		Visit TDC			Visit TDC		Visit KPT	
THU 12, APR	Muslim Nationalism	Course Critique	Course Adm	Spare		Commandants closing Address			

SUBJECT	PERIODS
Managerial Skills	8
Engineers Equipment	8
Visits	24
Miscellaneous	5
Total	45

注)・座学ではエンジンの作動・種類・構造・冷却系・ブレーキ系・シャーシー系等すべてのシステムについての理論を教える。

・2班に分け講義と工場実習を午前・午後の交代で6ヶ月行う。

・6ヶ月後は2)・3)・4)の3班に分け工場の各セクションで実習し、順次交代しながら、18ヶ月で修了する。

・4)ではエンジンとシャーシーに分け専門的訓練を行う。

・訓練生は新聞にて一般公募し、3ヶ月毎に75名ずつ入校させる。6ヶ月のOJTのあと、2年後の卒業式の際に教育者認定の卒業証を発行する。グレードはA～Eの5段階で特点は次の配分にて決定する。

実技・実習	50％
ペーパーテスト	30％
レポート	10％
卒業面接	10％

・トラック運転手は日本制シュミレーターを20台導入して訓練している。

・訓練コースは基本的に4つあるが、常時開設してはいない。

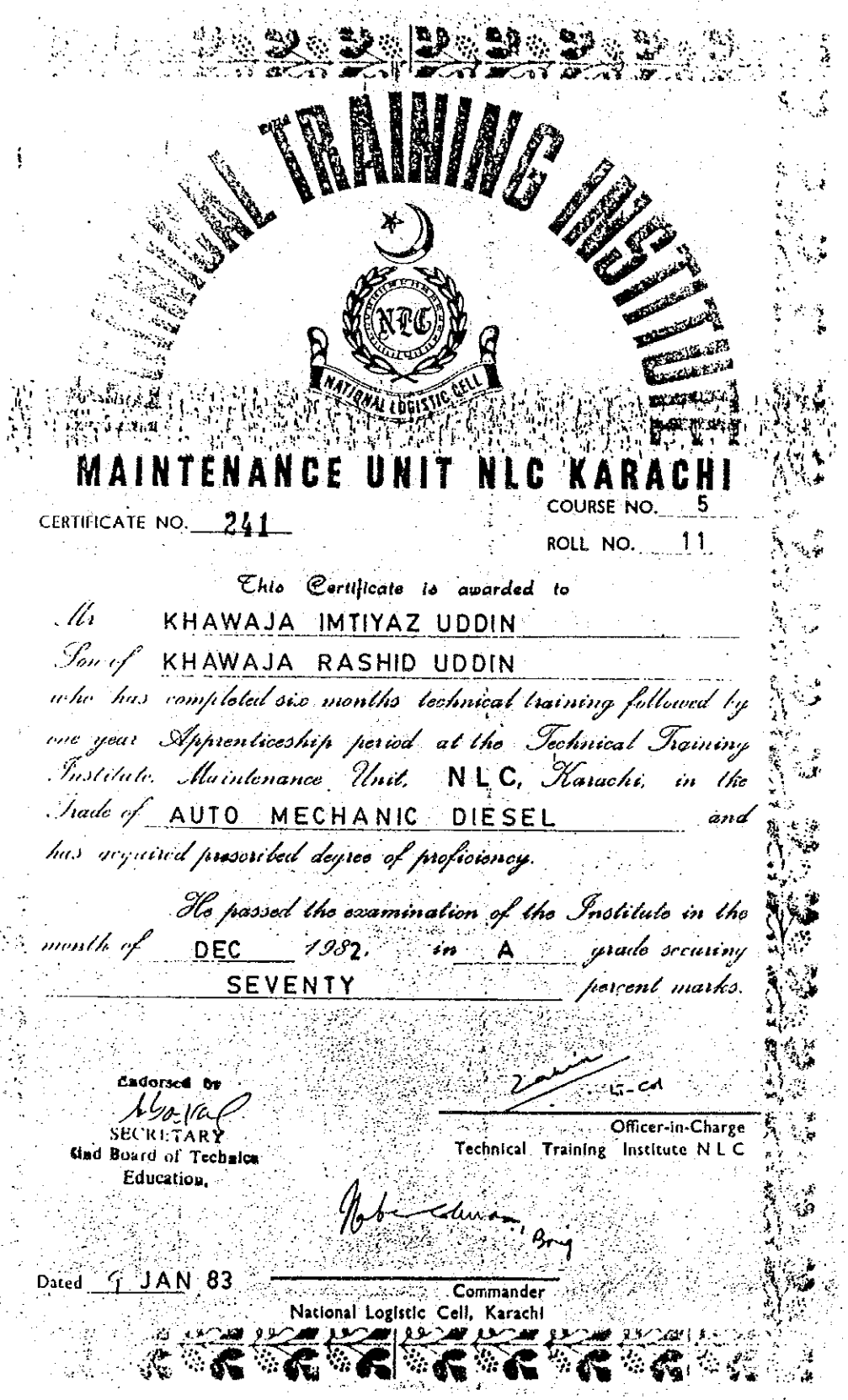
－Mechanic	Couse
－Engineer	Couse
－Operator	Couse
－Management	Couse

・NLCより下記の手当てが支給される。

訓練中	3ヶ月	Rs.200／月
	次の3ヶ月	Rs.300／月
OJT 中	6ヶ月	Rs.400／月
	次の6ヶ月	Rs.500／月

・18ヶ月終了し、本人が希望すれば、NLCに所属できる。

□訓練生卒業証書（入手資料－１）



NATIONAL TRAINING INSTITUTE

NATIONAL LOGISTIC CELL

MAINTENANCE UNIT NLC KARACHI

CERTIFICATE NO. 241

COURSE NO. 5

ROLL NO. 11

This Certificate is awarded to

Mr KHAWAJA IMTIYAZ UDDIN

Son of KHAWAJA RASHID UDDIN

who has completed six months technical training followed by one year Apprenticeship period at the Technical Training Institute, Maintenance Unit, NLC, Karachi, in the Trade of AUTO MECHANIC DIESEL and has acquired prescribed degree of proficiency.

He passed the examination of the Institute in the month of DEC 1982, in A grade securing SEVENTY percent marks.

Officer-in-Charge
Technical Training Institute N L C

Endorsed by
SECRETARY
Sind Board of Technical Education.

Commander
National Logistic Cell, Karachi

Dated 1 JAN 83

□訓練生募集要項（入手資料－２）

Quotations should be submitted to [illegible] (Commercial) by 12th December, 1981 positively. Management has right to accept/reject any or all Quotations without assigning any reason.

MANAGER
(ADMINISTRATION & COMMERCIAL)

P.I.D. (Karachi) Advt. No. 908 (7407-I)

Dawn Dated 4-12-81

NLC APPRENTICESHIP SCHEME

Seventh Apprenticeship course is being inducted by National Logistic Cell for imparting 6 months training in trades such as auto mechanics, auto electricians, welders, turners etc. In addition to imparting complete training on servicing and maintenance of automobiles.

TERMS AND CONDITIONS OF SERVICE

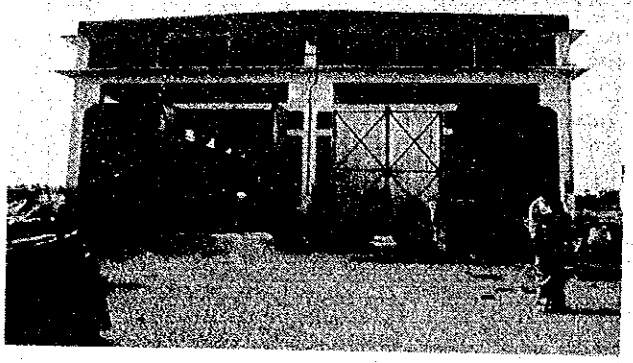
1.	Age	Upto 25 Years.
2.	Qualifications	Matric. F.Sc. will get preference.
3.	Duration	3 months at Service Station followed by 3 months in Workshop.
4.	Remuneration	Rs. 200.00 per month for the first 3 months and Rs. 300.00 per month for the remaining 3 months.
5.	Requirement	On completion of 6 months training; must serve with NLC for a period of one year to specialize in his own field during which time he will be paid Rs. 400.00 per month for first 6 months and Rs. 500.00 per month for the remaining 6 months.
6.	Scope	On fulfillment of above terms and conditions a "Certificate of Merit" will be awarded to each trainee. In case of his absorption in NLC, he will be entitled to a time scale promotion and can rise upto the rank of Foreman.
7.	Training Cycle	Next batch of 75—100 trainees will be inducted on 01 Jan. 1982.
8.	Applications	Application alongwith a self addressed stamped envelope, a passport size photograph and accompanied by a postal order of Rs. 10.00 in the name of Commander Maintenance Unit NLC Karachi must reach HQ Maint Unit NLC Near New Haji Camp Karachi No. 1 by 10 Dec. 1981. All candidates should come for a written test on 13 Dec. 1981 at 0900 hours in HQ Maintenance Unit NLC Near New Haji Camp Karachi for screening and preliminary selection. Those who qualify in the written test will be called for interview and final selection.

P.I.D. (Karachi) Advt. No. 909 (7407-I)

類似施設の現況

NLC
GUJRANWARA
MAINTENANCE
SHOP

点検部門外観



修理工場外観

修理工場内観

建設機械修理機器

□ ＮＬＣ GUJRANWALA MAINTENANCE SHOP

概要： ＮＬＣ輸送車輌の北部方面、整備基地として、ラホールより 60 km西に位置しカラチと同程度の施設を保有している。昨年より建設機械の修理機器を設置したが、まだ技術者が養成されておらず、実際の修理は開始されていなかった。

整備工場：

- 職員数は約 600 人で内容はカラチ工場と同程度である。

- 整備・修理能力は、次の解答があった。

サービス	120 台／日
リペアー	90 台／日
オーバー・ホール	2 台／月

- トラック・トレーラー等の輸送車輌整備施設としては、内容的にも技術的にも充実している。

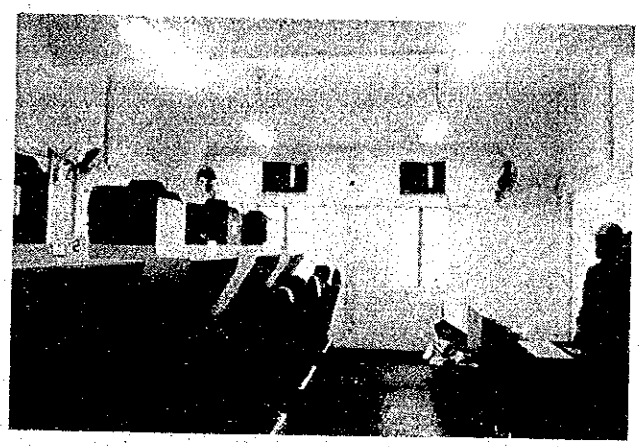
- 整備・修理機械としては、カラチ工場と同程度であるが、より新型機種が導入されている。特に、建設機械の修理用にトラック・リンク・プレスやリビルディング・マシンなども設置されているが、まだ使用されていない状況であった。
- トラック運転手は日本製シミュレーター 6 台を導入し訓練にあてている。

- 敷地は広大であり、各ワークショップや事務所などが点在するレイアウトとなっている。

類似施設の現況

クランク・シャフト再生機

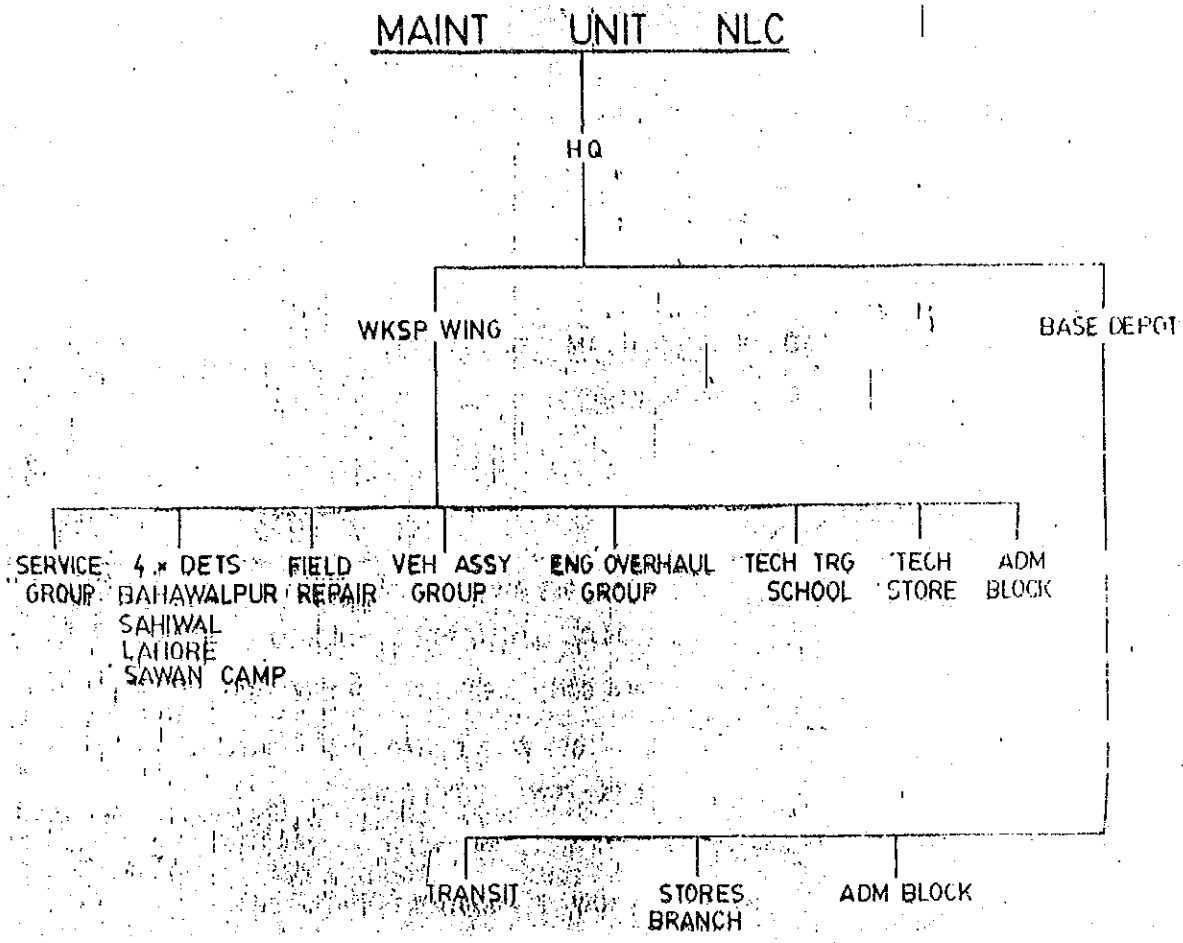
エンジン分解工程



シミュレーター室

消火器具

□ＮＣＬ　整備工場の体勢（入手資料－３）



□ＮＬＣの整備（入手資料－４）

CAPABILITIES

1. CAN SERVICE 120 VEHS IN A DAY.

   (SERVICING INCLUDES COMPLETE INSPECTION AND

   FIRST LINE REPAIR TO ALL 120 VEHS).

2. CARRY OUT MAJOR REPAIRS TO ABOUT 90 VEHS PER DAY.

3. CAN OVERHAUL:-

   a. COMPLETE VEHS.

   b. ENGINE ASSYS.

   c. AXLES.

   d. GEAR BOXES.

   e. MINOR ASSYS.

4. CAN HANDLE ALL NEC STORES REQUIRED FOR ABOVE REPAIRS/SERVICE

5. CAN CARRY OUT REC AND REPAIR TO ANY VEH STRANDED

   IN AREA OF RESPONSIBILITY OF NORTH ZONE.

□ＮＬＣ　グジュランワラ保有の建設機械
（入手資料－５）

DETAIL OF MACHINERY IN BASE DEPOT
GUJRANWALA

S/NO.	MAKE & TYPE	QTY HELD
1.	MOTOR SCRAPER WS 235	6
2.	BULLDOZER STRAIGHT D 80 A 18	2
3	BULLDOZER ANGLE D50 A16	2
4.	WHEEL LOADER W - 70	4
5.	SOIL COMPACTOR WF 22 A	1
6.	NIGATA ASPHALT PAVER NF - 221	1
7.	HINO REFRIGERATION VAN KL - 340	1
8.	HOTTA ROAD MAINT CAR HAMM - 40	2
9.	TADANO CRANE 10 TON	1
10.	SHOVEL DOZER D 60 S	2
11.	ROAD ROLLER KVR - 7	1
12.	HINO LPG GAS TANK ZM - 342 E	5
	TOTAL :-	28

□N L C　RAKHNI-SIBI 道路プロジェクト用

建設機械の保守・整備事項

（入手資料－6）

SEQUENCE OF MAINTENANCE AND REPAIR

RAKHNI - SIBI ROAD PROJECT

1. PERIODICAL MAINTENANCE CARRIED OUT BY THE USER UNDER THE STRICT SUPERVISION OF TECHNICIANS. IT ENVOLVES :-
   a. REPLACEMENT OF LUBRICANTS AND FILTERS.
   b. GREASING.
   c. ADJUSTMENTS.
2. FIELD REPAIR IS CARRIED OUT AT SITE BY A FIELD WORKSHOP. IT ENVOLVES :-
   a. REPLACEMENT OF MAJOR AND MINOR ASSEMBLIES.
   b. ANCILLARY WORK - WELDING, PAINTING & MACHINING.
3. BASE REPAIR IS DONE AT MAINTENANCE UNIT GUJRANWALA AND COVER FOLLOWING :-
   a. OVERHAULING OF ENGINES, TRANSMISSIONS, FINAL DRIVE AND OTHER ASSEMBLIES.
   b. REBUILDING OF TRACKS AND ROLLERS.
   c. RECLAMATION.

□N L C　RAKHNI-SIBI 道路プロジェクト用

建設機械の保有状況

（入手資料－７）

DETAIL OF MACHINERY BEING USED FOR RAKHNI - SIBI ROAD PROJECT

S/NO.	MAKE & TYPE	QTY HELD
1.	WHEEL LOADER W-70	06
2.	PC-20 HYD EXCAVATOR	03
3.	DOZER D50A16	08
4.	SOIL COMPACTOR	03
5.	MOTOR GRADER	03
6.	MOTOR SCRAPER	04
7.	SAKAI ROAD ROLLER	06
8.	SHOVEL DOZER D60S	02
9.	DOZER D80A18	03
10.	KAWASAKI TYRE ROLLER KR20C	02
11.	KVR-7 ROAD ROLLER	03
12.	AGGRIGATE SPREADER	02
13.	PUSHER DOZER D355A3	01
14.	CHIPS SPREADER	01
15.	GEN SET EDG-35	04
16.	AIRMAN COMPR PORTABLE MODEL PDR-250	01
17.	PORTABLE AIR COMPR KOMATSU MODEL EC75Z	02
	TOTAL :-	54

□ＦＷＯ保有の建設機械（入手資料－８）

Annex ' A'

LIST OF MACHINERY/EQUIPMENT

Items	Quantity	A	B	C
Dozer Komatsu D 155-A-I	9	9	–	–
Dozer Komatsu D 80A12/85A12/85A18	144	82	23	9
Dozer Size IV D40A3/D408	11	8	3	–
Wh Loader/Pay Dozer JD-60B/JD-60A international	21	9	4	8
FE Loader FL-230 Furakawa	25	22	3	–
FE Loader Komatsu W-180/W-120	14	14	–	–
FE Loader Carterpiller -C-965/920	2	1	1	–
FE Loader Kawasaki	2	1	1	–
Tractor MF-240 (63 HP)	30	23	5	2
Excavator Hitachi Model -UH-0-62	3	2	1	–
Disc Harrow	3	3	–	–
Dig Line Model-KH-180,2,D/Engin 159H/P	2	2	–	–
Motor Grader Komatsu GD-500 R-I	18	15	1	2
Concrete Vib External/Internal	10	10	–	–
Stone Crusher Kgc	10	2	4	4
Asphalt Plant Niigata/Air Mount	4	3	1	–
Asphalt paver Niigata Model-NF-2202	5	5	–	–
Air Compressor PDR-370/PRR-125/PDR-250	105	59	19	27
Dump Truck 8.5 Ton W-211	77	38	24	15
Dump Truck 18 Ton Model HD-180	35	35	–	–
Dump Truck 32 Ton Model HD-320-2	15	15	–	–
Dump Truck 15 Ton Mitsubishi Model FV-313	29	29	–	–
Truck 5 Ton Tractor Hino Model 2C-101	28	18	6	4
Truck 8 Ton Tractor with 40ton Tralior	1	1	–	–
Truck 6 ton Mitisubishi FV-315 HR2RY	2	2	–	–
Crane Kobelco Model-I-400 36.3 ton	2	2	–	–
Truck 5 ton Hino Brake Down W-211	11	9	2	–
Truck 5 ton R/Veh W-211	2	2	–	–
Truck 25 Ton Crane Nissan	1	1	–	–
Rd Roller Pneumatic 10-29 Ton Sakai Model-JS-290/JS-7409 Kawasaki/Sakai	7	4	–	3
Vib Rd Roller Sakai Model -JK-70/JS-740	12	7	5	–

2) FRONTRIER WORKS ORGANIZATION (FWO)

概要： 運輸通信省 (MINISTRY OF COMMUNICATIONS) に属し、辺境地域の開発を目標に設置された機関で、カラコルム・ハイウェーの建設やカンプール・ダム工事などの大型プロジェクトを実施している。固定的な WORK SHOP としては CHAKULALA (ラワルピンジ市内) のみであり、他にカンプール・ダムなどを含めて 11 ヶ所に流動的なデポがある。
FWOの保有機械は左表の通りであるが、大半の機械はサイトに置かれている。

□ FWO CHAKULALA WORK SHOP

- 建設機械を含む車輌の修理と保管を行っているが、施設としては工場の床が未舗装であったり、建物も古く修理工場としての環境は良くない。

- 職員数は約 450 人であるが、SUB-WORK SHOP に派遣される者やサイトに出張す る者も多く、実際の職員数は一定しない。

- 修理機械は、クランクシャフト研磨機・シリンダーボーリング機・施盤・油圧プレス・エンジン性能試験機など、必要なものは一通り整っているが台数は限られている。

- 最近の修理実績としては、ブルドーザー (14 名) トラック (16 台) コンプレッサー (2 台) エンジン (16 台) のオーバー・ホールなどとの事。ただしオーバー・ホールについては技術不足の為に充分な修理が行えず、昨年メーカー技術者の指導を受けて行った。

- 修理業務の他に、バッテリーの再生や発電気・車体の再生など、リサイクルに対する技術は発達しているが、新機種の新しいメカニズムに対しては技術的に対応できない状況にあると思われる。

- 本計画が開始され、この工場を OJT 実習工場として活用する場合には、施設等の整備に加えて技術面での指導が必要であると思われる。

□ KAMPUL DAM SUB-WORKSHOP

・FWOが辺境開発の一環として日本製の建設機械を大量に導入し、約1ヶ年でダム本体を施工したもので、現在は付帯工事が行われている。主力機械はサイトにて整備保管中である。

・工事最盛期には約 600 名のオペレーターが 3 交代で 24 時間工事を継行し、保守・整備には CHAKULALA より約 180 名の技術者（ENGINEER 10 名，FORMEN 12 名，TECH-NICIAN 150 名）を派遣し、メーカー技術者と協力して行った。

・機械は新車が多く、フィルター交換等の定期整備を中心にした為、特別の修理施設はない。オペレーターに日常点検を指導する為、2 週間の訓練で実施したとの事。

□ TARBELA DAM WORKSHOP

・ダムは既に完成し、ワークショップは工事に使用した機械を売却する為の修理を行なっている。

・ダム工事の特殊性から修理施設は非常に充実している。

↓

大規模、遠隔地、工期が長い、現場の固定、大量の建設機械を使用

・施工にあたってはオペレーターの教育訓練を実施した、コースは CLASS-I が 6 ヶ月で基礎的な事項を教え、成績により CLASS II，III（各々 2 ヶ月）に進級させた。