

8) Equipment Plan

Equipment required for this project can be roughly classified as follows:

o Training Equipment

- . Training equipment for mechanical engineering course
- . " motor vehicle technicians course
- . " construction plant technicians
- . " common with motor vehicle course
- . " construction plant technicians
- . " electrical course
- . " electronic course
- . " audio/visual training aids
- . " physical laboratory

o Training Furniture

o Transportation Vehicle

A) Basic principles for equipment work plan

In selecting equipment, attention will be paid to the following points:

- . Equipment which is durable and easy to operate and maintain will be selected.
- . Necessary equipment will be estimated in accordance with the training scheme so as not to procure excessive equipment.
- . Equipment which can be commonly used will be centralized.
 - Welding equipment will be primarily installed at the welding workshop.
 - Equipment for cutting and grinding etc. will be primarily installed at the mechanical engineering workshop.
 - Common utilization of equipment, will be promoted for motor vehicle/construction plant courses.
 - Common utilization of equipment will be also promoted for electrical and electronics courses.
- . Audio/visual training aids include video and OHP as major materials and A/V room will be equipped with a video projector, a video camera and editing devices, and OHP will be commonly used in classrooms.

- . Training furniture will be limited to that indispensable for conducting training.
- . Transportation vehicles also will be limited to those indispensable for conducting training.
- . In consideration of the maintenance system and availability of parts, those equipment which are easy to maintain will be selected.
- . As cutting tools, a necessary amount of high speed steel tools will be included, and consideration will be given to the provision of carbide tools whereby tool grinding training will be possible for the further promoting of the thought of regrinding and reuse of tools.

8) Equipment Plan

Equipment required for this project can be roughly classified as follows:

o Training Equipment

- . Training equipment for mechanical engineering course
- . " motor vehicle technicians course
- . " construction plant technicians
- . " common with motor vehicle course
- . " construction plant technicians
- . " electrical course
- . " electronic course
- . " audio/visual training aids
- . " physical laboratory

o Training Furniture

o Transportation Vehicle

A) Basic principles for equipment work plan

In selecting equipment, attention will be paid to the following points:

- . Equipment which is durable and easy to operate and maintain will be selected.
- . Necessary equipment will be estimated in accordance with the training scheme so as not to procure excessive equipment.
- . Equipment which can be commonly used will be centralized.
 - Welding equipment will be primarily installed at the welding workshop.
 - Equipment for cutting and grinding etc. will be primarily installed at the mechanical engineering workshop.
 - Common utilization of equipment, will be promoted for motor vehicle/construction plant courses.
 - Common utilization of equipment will be also promoted for electrical and electronics courses.
- . Audio/visual training aids include video and OHP as major materials and A/V room will be equipped with a video projector, a video camera and editing devices, and OHP will be commonly used in classrooms.

- . Training furniture will be limited to that indispensable for conducting training.
- . Transportation vehicles also will be limited to those indispensable for conducting training.
- . In consideration of the maintenance system and availability of parts, those equipment which are easy to maintain will be selected.
- . As cutting tools, a necessary amount of high speed steel tools will be included, and consideration will be given to the provision of carbide tools whereby tool grinding training will be possible for the further promoting of the thought of regrinding and reuse of tools.

B) List of main equipment

a) Workshop training equipment

(mechanical engineering)		Q'ty
1.	Lathe $\phi = 500$	10
2.	Lathe $\phi = 800$	5
3.	NC Lathe	1
4.	Vertical milling machine	4
5.	Universal milling machine	1
6.	Universal cylindrical grinding machine	1
7.	Shaping machine	1
8.	Surface grinding machine	1
9.	Upright drilling machine	2
10.	Surface plate (large)	1
11.	Surface plate (small)	5
12.	Vertical boiler, pump and meter set	1
13.	Carbide tool grinder	1
14.	Universal tool grinder	1
15.	Drill grinding machine	1
16.	Small type toolmaker's microscope	1
17.	Universal projector	1
18.	Electric furnace for quenching	1
19.	Electric furnace for annealing	1
20.	Water bath for quenching	1
21.	Oil bath for annealing	1
22.	Universal testing machine	1
23.	X-ray flaw detector	1
24.	Magnetic flaw detector	1
25.	Ultrasonic flaw detector	1
26.	Surface roughness tester	1
27.	Hardness tester (Shore)	1
28.	" (Brinell)	1
29.	" (Rockwell)	1
30.	Metallurgical microscope	1
31.	Hack-sawing machine	1
32.	Band sawing machine	1

33.	Pipe b ender	1
34.	Pipe threading machine	1
35.	Double head grinder	6
36.	Toolpost grinder	2
37.	Tools and measuring devices	
38.	Diesel engine	1
39.	Air compressor	1

(Motor vehicle technicians)	Q'ty
1. Brake tester	1
2. Side slip tester	1
3. Front lift	1
4. Head light tester	1
5. Wheel alignment tester	1
6. Chassis dynamometer	1
7. Load meter	1 set
8. Wheel balancer (heavy duty)	1
9. Wheel balancer	1
10. Frame lift	1
11. Autolift (2 poles)	2
12. Autolift (4 poles)	1
13. Board-on lift	1
14. Training engines, different types with stand	
15. Passenger cars (second hand)	4
16. Truck 1 ^t (Diesel engine) (second hand)	1
17. Truck 1 ^t (Gasoline engine) (second hand)	1
18. Lorry 10 ^t (Diesel engine) (second hand)	1

(Motor vehicle/construction plat, common use)	Q'ty
1. Jacks, different types	4
2. Hydraulic press	1
3. Portable lubricator	4
4. Forklift 3 ^t	1
5. Brake shoe grinder	1
6. Brake drum lathe	1
7. Flexible fiberscope	1
8. Forklift 0.5 ^t	1
9. Valve refacer	1
10. Valve seat grinder	1
11. Valve seat refacer	1
12. Cylinder honing machine	1
13. Surface grinder	1
14. Cylinder boring machine	1
15. Pin hole honing machine	1
16. Fuel injection pump tester	1

17.	P.T. pump tester	1
18.	Injector flow converter	1
19.	Starter-generator test bench	1
20.	Mica cutter & lathe	1
21.	Distributor test bench	1
22.	Silicon battery charger	1
23.	Fuel consumption meter	1
24.	Engine dynamometer	1
25.	Weight type consumption meter	1
26.	Portable spot welder	5
27.	Tyre changer	1
28.	Air compressor	1
29.	Hot water washer	1
30.	Cut model, different types	
31.	Tools and measuring devices	

(Construction plant mechanics)		Q'ty
1.	Bulldozer, 12 ^t (second hand)	1
2.	Bulldozer, 5 ^t (")	1
3.	Wheel loader 1.0M ³ (")	1
4.	Motor scraper (")	1
5.	Dump truck 10 ^t (")	1
6.	Excavator 0.4M ³ (")	1
7.	Truck crane 4.9 ^t (")	1
8.	Training Diesel engine, with stand various type	
9.	Training Gasoline engine, with stand various type	
10.	Fuel injection pump, various type	
11.	Overhead crane (5 ^t)	1
12.	Overhead crane (3 ^t)	1
13.	Hydraulic cylinder service stand	1
14.	Hydraulic component tester	1
15.	Roller idler press	1
16.	Shoe bolt impact wrench	1
17.	Mobile workshop car	2
18.	Lubricator wagon	1

(Main electrical installation technicians)	Q'ty
1. Training high tension switch board	1
2. Training low tension switch board	1
3. Oil circuit breaker	1
4. Transformer (single phase) 3 pcs/set	3
5. Transformer (3 phase)	2
6. Testing transformer	2
7. Induction voltage regulator	1
8. High voltage tester	1
9. Wiring panel board	10
10. Pipe bender	5
11. Pipe threading machine	4
12. Foot shear	1
13. Lever shear	1
14. Motor-generator set	6
15. Power distribution board (various type)	4
16. Rectifier	2
17. Motor (single phase) various type	
18. Motor (3 phase) various type	
19. Motor (DC) various type	
20. Winding machine (motor drive)	1
21. Winding machine (manual drive)	2
22. Drying oven	1
23. Oil filter	1
24. Balancing machine	1
25. Sequence circuit experimental device	6
26. Room airconditioner	3
27. Refrigerator	3
28. Washing machine	2
29. Tools and measurement devices	

(Radio, television and electronics technicians)

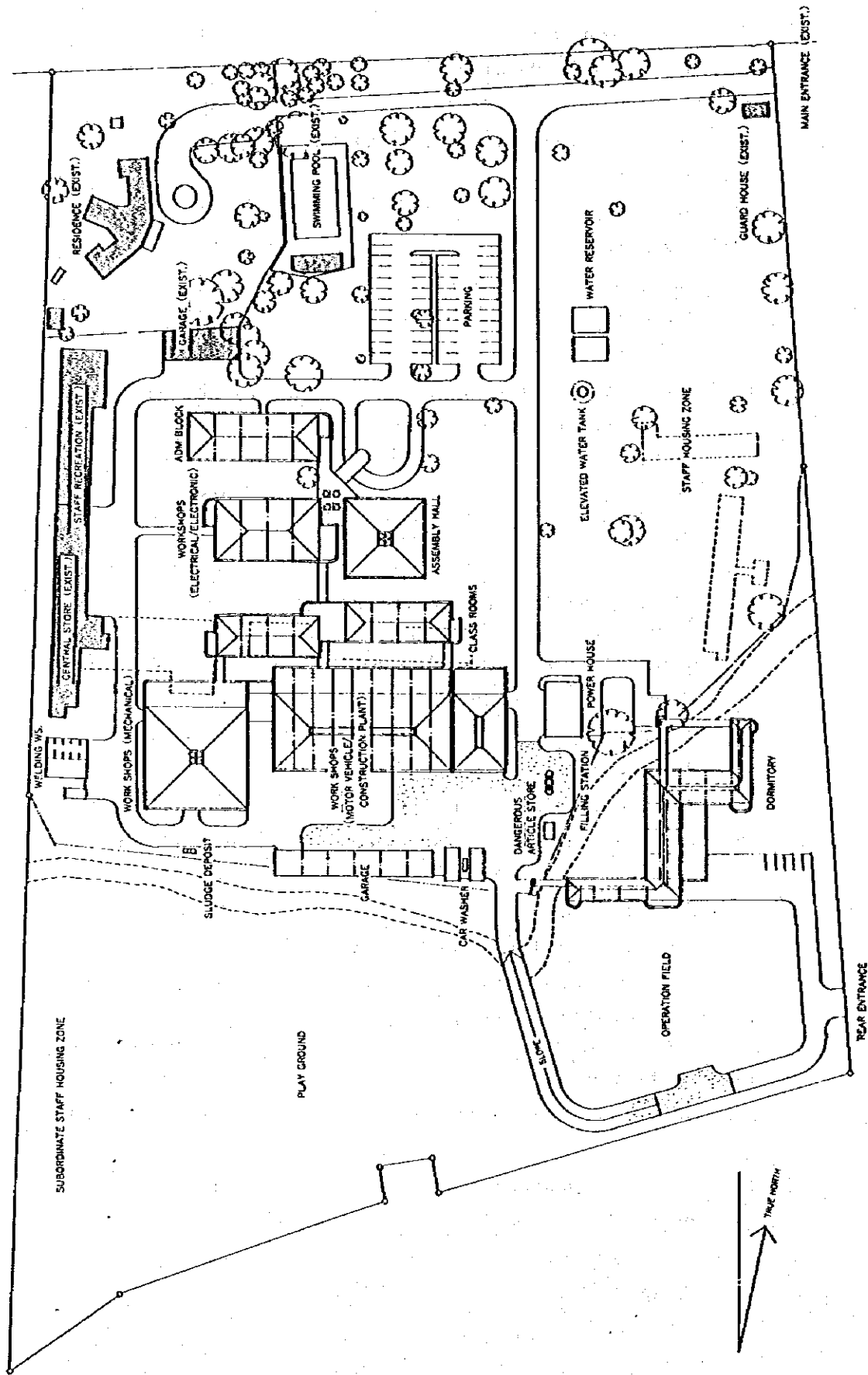
	Q'ty
1. Radio receiver set	8
2. Stereo set	2
3. Video	2
4. Tape recorder	2
5. Colour TV set	6
6. Black and white TV set	2
7. Modulation and demodulation circuit (AM, FM)	2
8. Microcomputer training kit	20
9. Personal computer training kit	5
10. Digital experiment device	5
11. SCR circuit experimental device	2
12. Pulse circuit experimental device	2
13. Electronic circuit experimental device	2
14. Logic circuit experimental device	2
15. Automatic control experimental device various type	
16. Printed circuit etching apparatus	2
17. Pattern generator	2
18. Sweep marker generator	2
19. Low frequency generator	5
20. Single oscillator	2
21. Test oscillator	4
22. DC stabilizer	10
23. Oscilloscope	20
24. Synchroscope	2
25. Transistor test device	2
26. Curb tracer	1
27. Frequency indicator	2
28. Q-meter	1
29. C-meter	1
30. A-D conversion training device	2
31. D-A conversion training device	2
32. Tools and measurement devices	

(Welding)	Q'ty
1. AC arc welder	10
2. Gas welder piping system with 5 outlets	1 set
3. Welding tools	
(Audio/visual training aids)	Q'ty
1. Video camera	2
2. Colour video projector	2
3. Video editor set	1
4. Overhead projector	8
5. 16m/m film projector	1
6. 8m/m film projector	1
7. Slide projector	2
8. OHP film processor	1
9. Photo copying machine	1
10. Duplicating (stencil) machine	1
(Physical laboratory)	Q'ty
1. Thermometer	15
2. Pendulum test device	5
3. Complex pendulum test device	4
4. Pulley experiment apparatus	10
5. Stop watch, various kinds	10
6. Linear expansion experiment apparatus	5
7. Heat conduction experiment apparatus	3
8. Dynamics experiment apparatus	5
9. Precision scale	5
10. Spiral spring	5
11. Scale, various kinds	25
12. Barometer	1
13. Electric crucible furnace	1
14. Spherometer	2
15. Optical bench	1
16. Inertia force scale	1
17. Centrifugal force experiment apparatus	2
18. Specific heat measuring device	2
19. Electric furnace	1
20. Gravitation experiment apparatus	2
21. Joule heat measuring device	1

22.	Solar heat system	1
23.	Magnet, various kinds	10
24.	Compass	30
25.	Magnetic field formation device	1
26.	Plummet	10
27.	Microscope	2
28.	Lux meter	2
29.	Integrating photometer	1
30.	Photometer	1
31.	Fluxmeter	1
32.	Distortion amplifier	2
33.	X-Y recorder	2

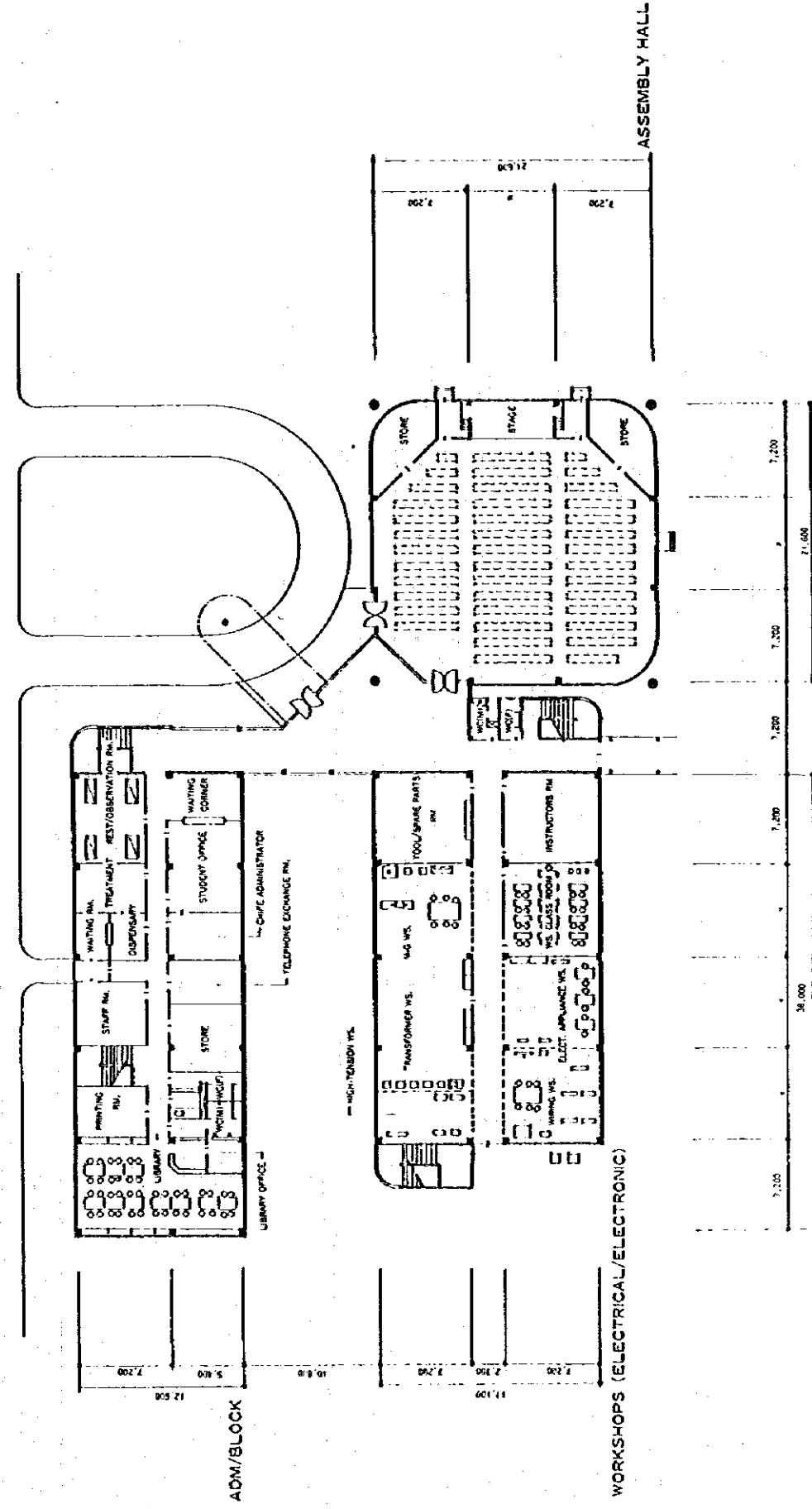
b)	Training furniture	Q'ty
1.	Work bench, various kinds	
2.	Drawing set (drawing table, drawing board (A1), drafter, lamp, chair)	for 20 persons
3.	Classroom tables and chairs set	for 240 persons
4.	Lecturer's table set	14 sets
5.	OHP screen	14 sets
6.	Tool/parts rack etc.	
7.	Folding type chair for Assembly hall	for 340 persons
8.	A/V room chair	for 40 persons
9.	Library tables and chairs set	for 40 persons
10.	Book shelves	6 sets
11.	Dining hall tables and chairs set	for 150 persons
12.	Recreation hall tables and chairs set	for 12 persons
13.	Dormitory bed (double decker w/ mattress)	for 300 persons
14.	Student locker	for 300 persons
15.	Study room tables and chairs set	for 96 persons

c)	Transportation vehicle	Q'ty
1.	Micro bus (20 persons)	2
2.	Station wagon	1
3.	Truck (2 ton)	1



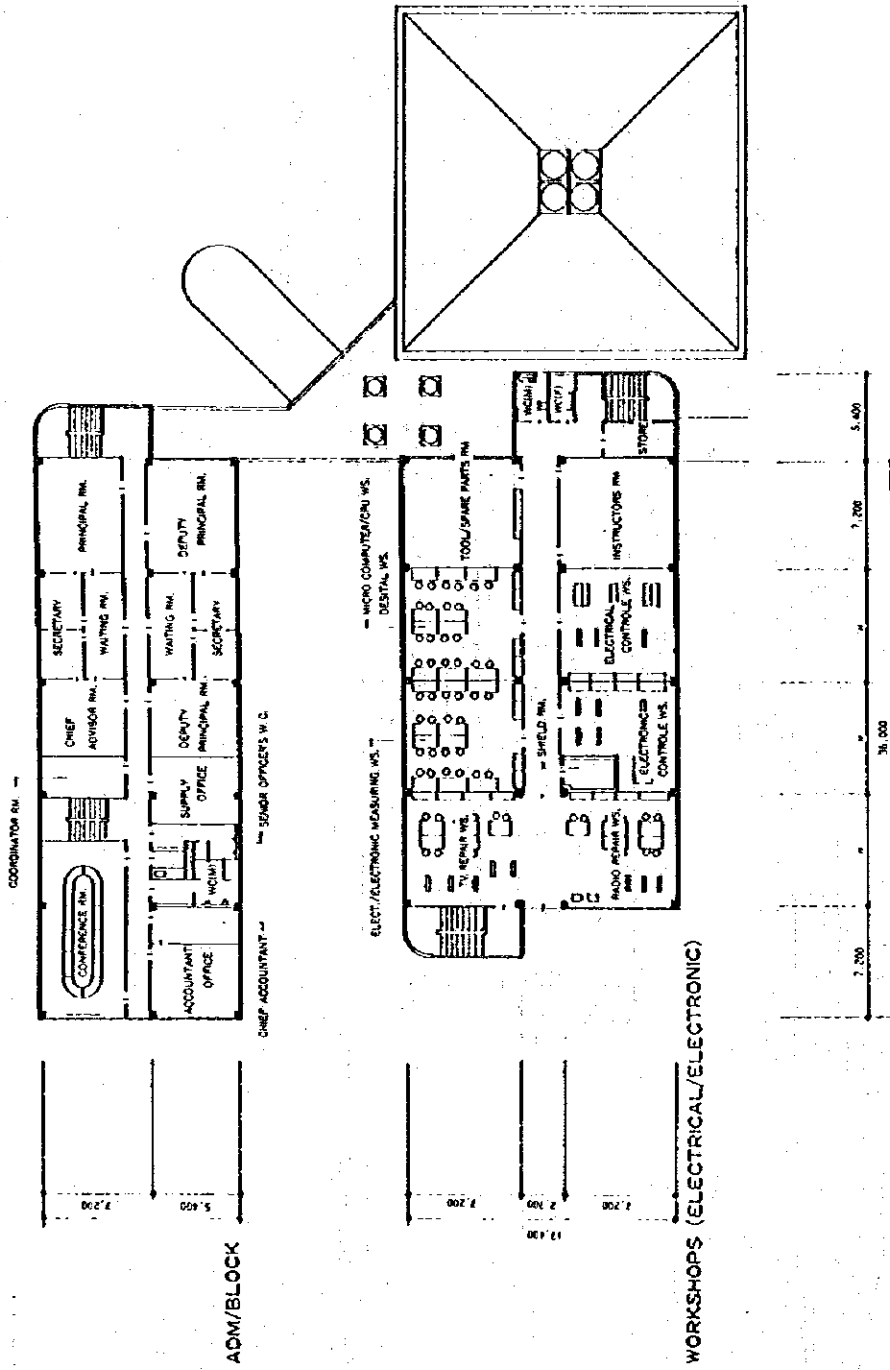
SITE LAYOUT PLAN

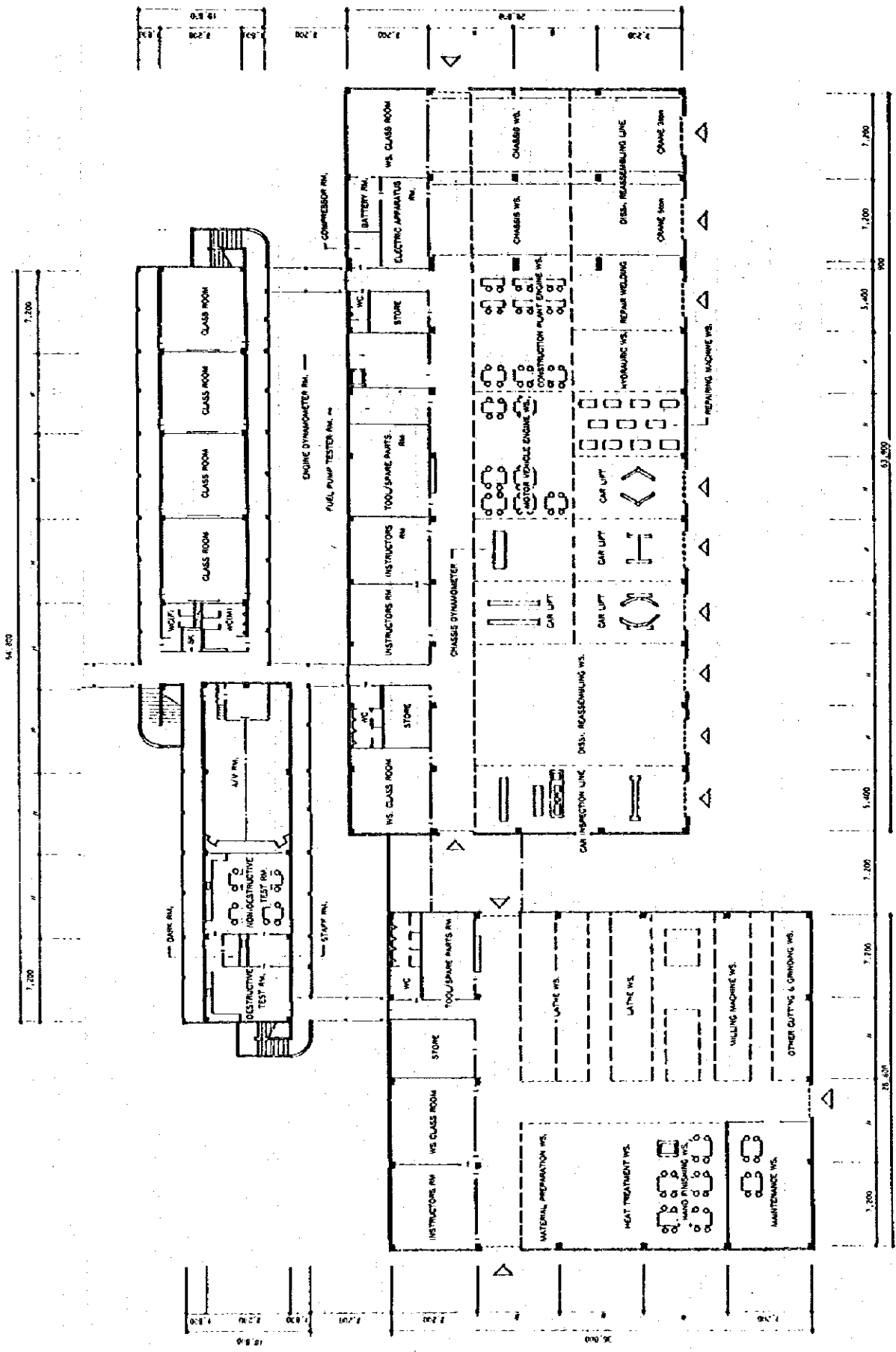
NYS ENGINEERING INSTITUTE



ADM/BLOCK ASSEMBLY HALL WORKSHOPS (ELECTRICAL/ELECTRONIC) GROUND FLOOR PLAN

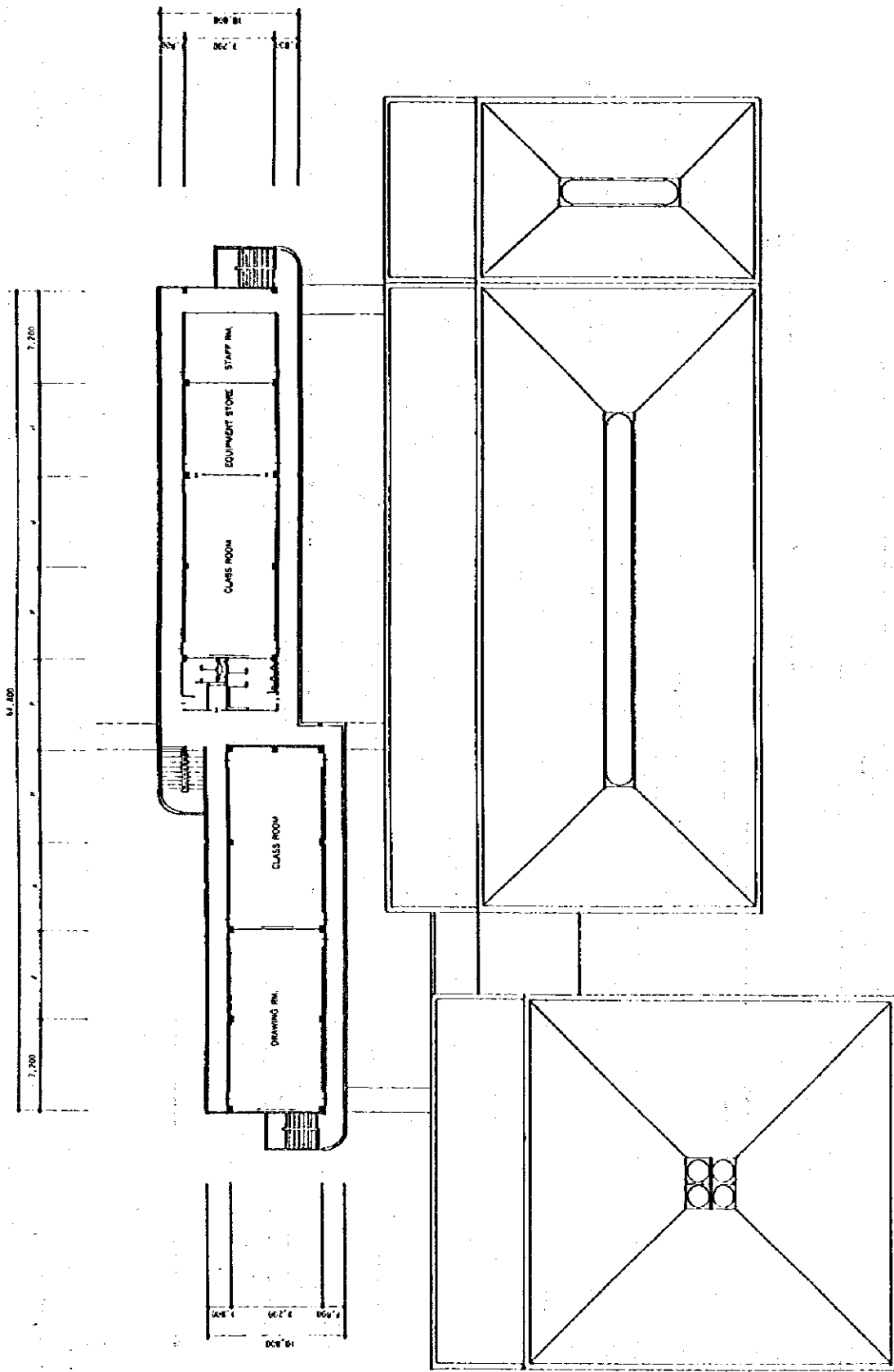
NYS ENGINEERING INSTITUTE





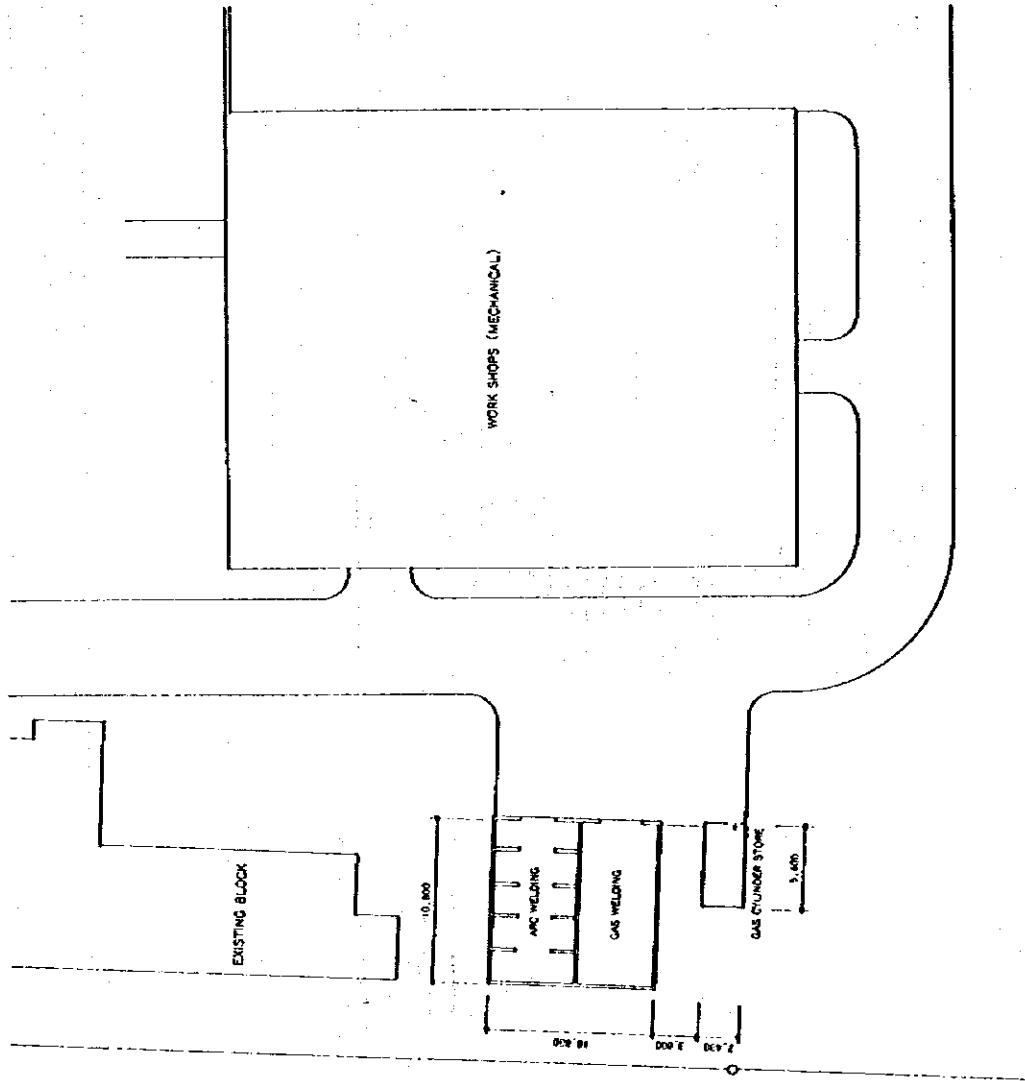
WORK SHOPS CLASS ROOMS GROUND FLOOR PLAN

NYS ENGINEERING INSTITUTE



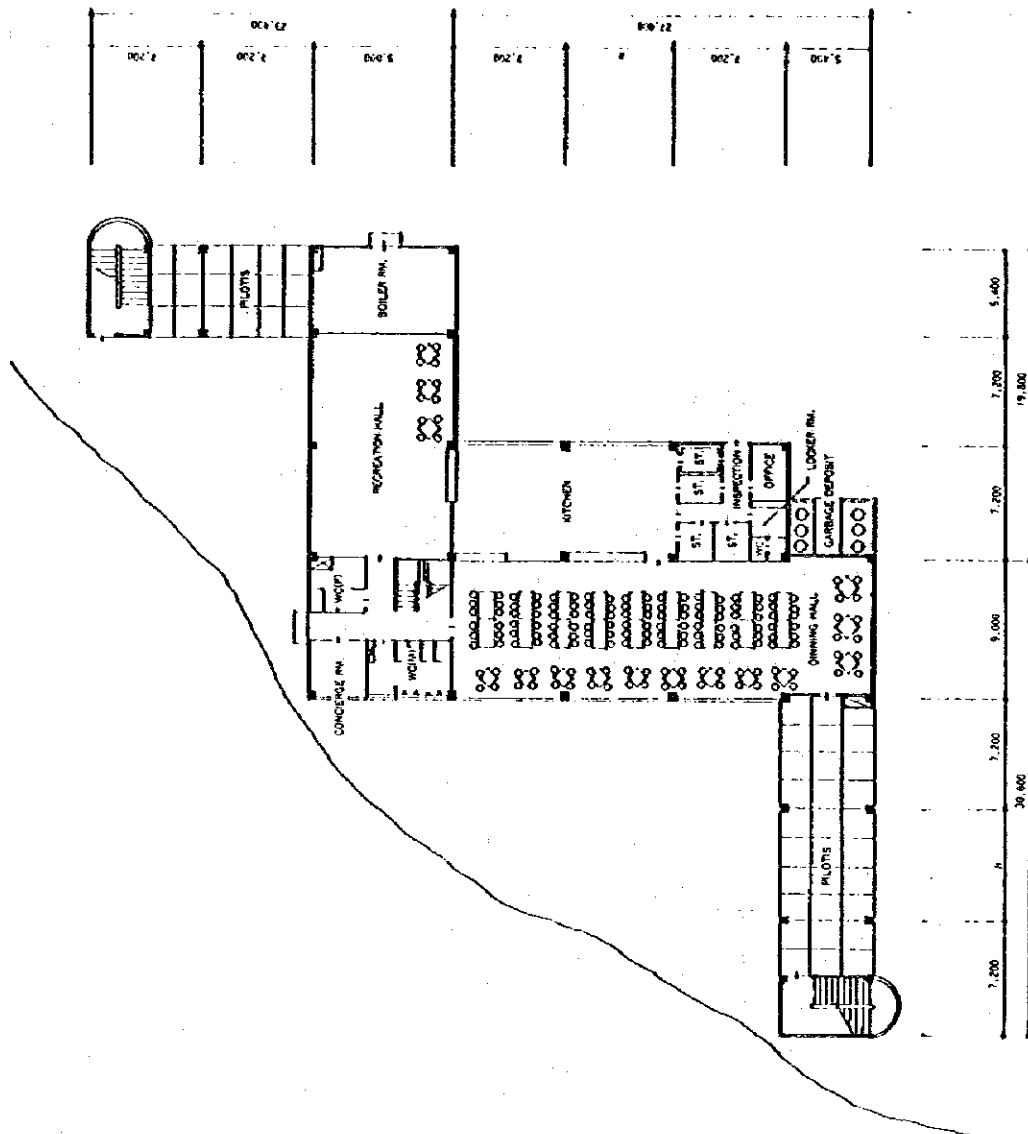
WORK SHOPS CLASS ROOMS 1ST FLOOR PLAN

NYS ENGINEERING INSTITUTE

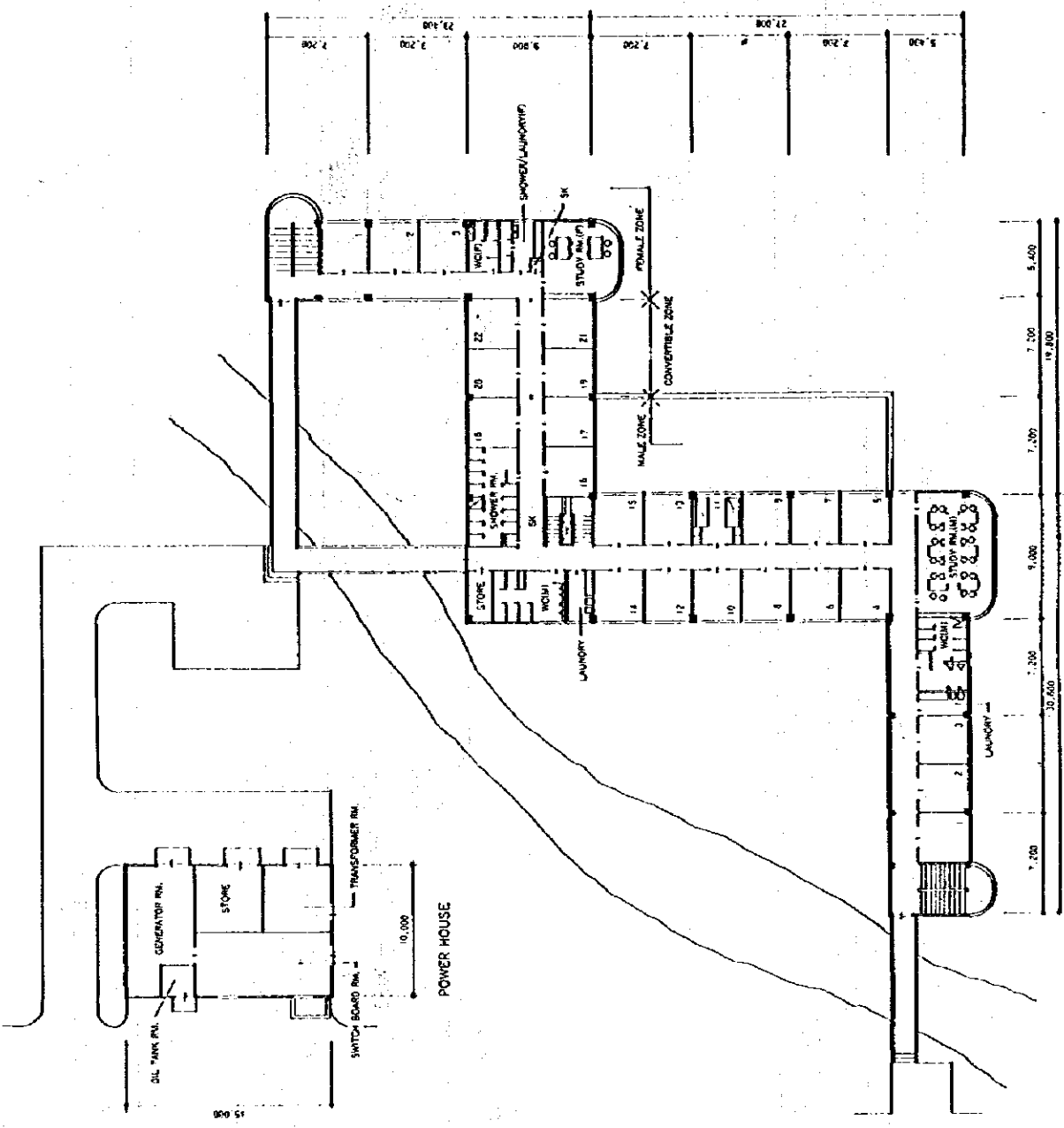


WELDING WS. GROUND FLOOR PLAN

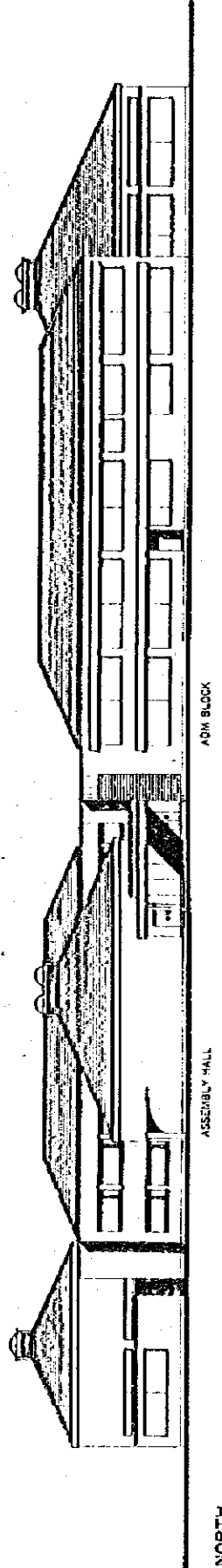
NYS ENGINEERING INSTITUTE



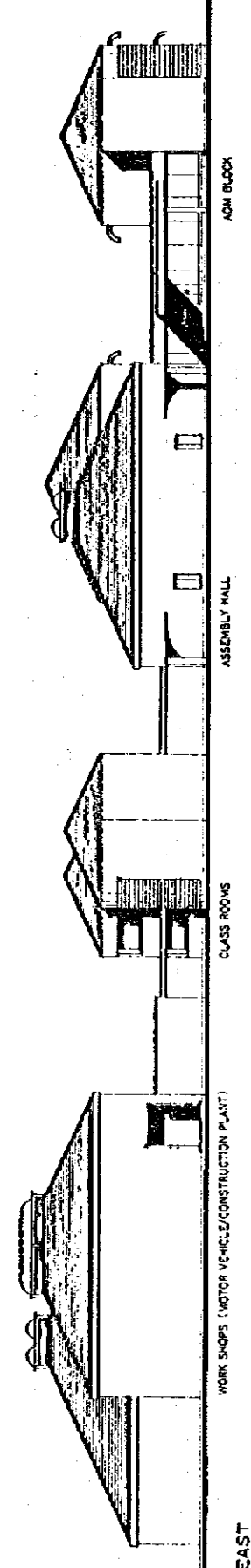
NYS ENGINEERING INSTITUTE DORMITORY/KITCHEN/DINING HALL/RECREATION HALL BLOCK GROUND FLOOR PLAN



NYS ENGINEERING INSTITUTE DORMITORY/KITCHEN/DINING HALL/RECREATION HALL BLOCK 1 ST - 3RD FLOOR PLAN



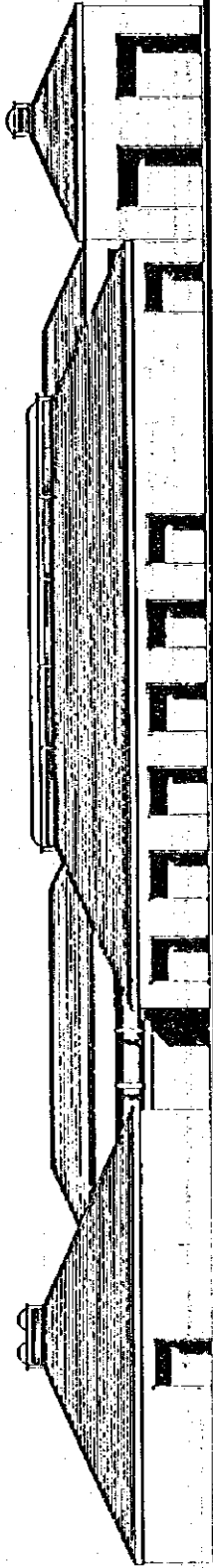
NORTH



EAST

NYS ENGINEERING INSTITUTE

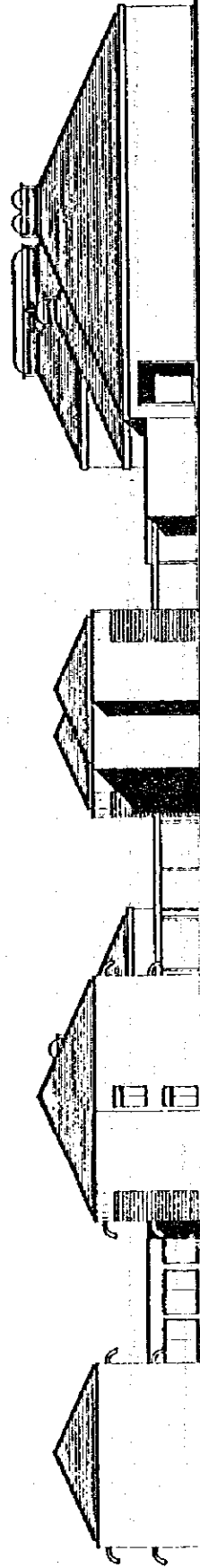
ELEVATION



WORK SHOPS (MOTOR VEHICLE/CONSTRUCTION PLANT)

WORK SHOPS (MECHANICAL)

SOUTH



WORK SHOPS (MECHANICAL)

CLASS ROOMS

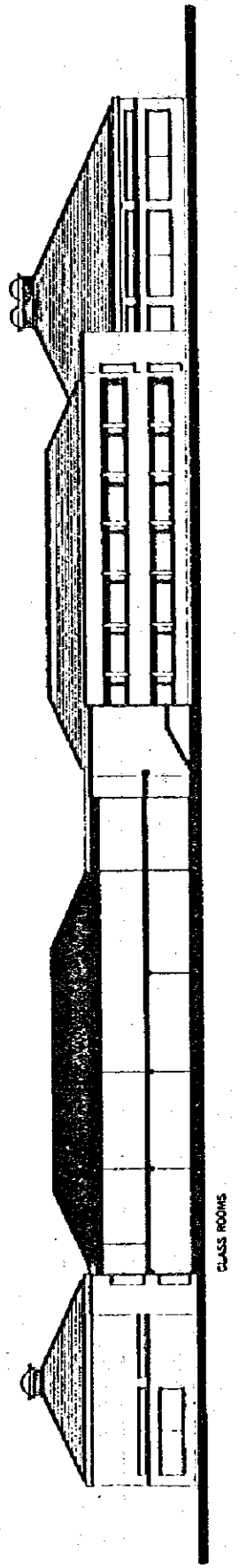
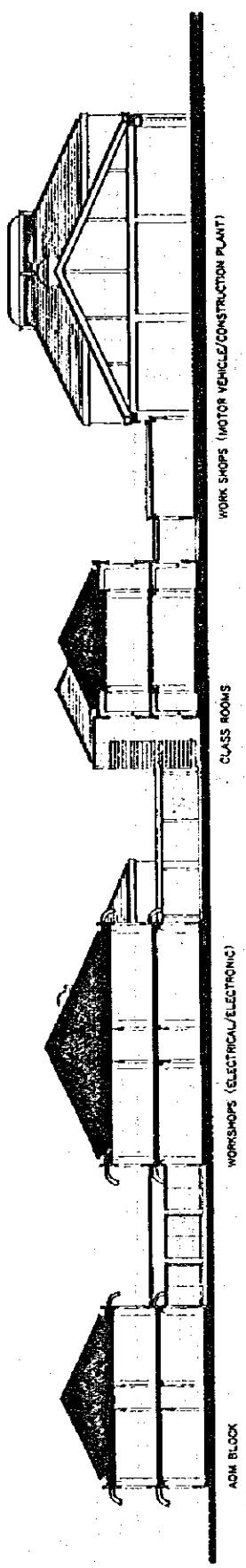
WORKSHOPS (ELECTRICAL/ELECTRONIC)

ADM. BLOCK

WEST

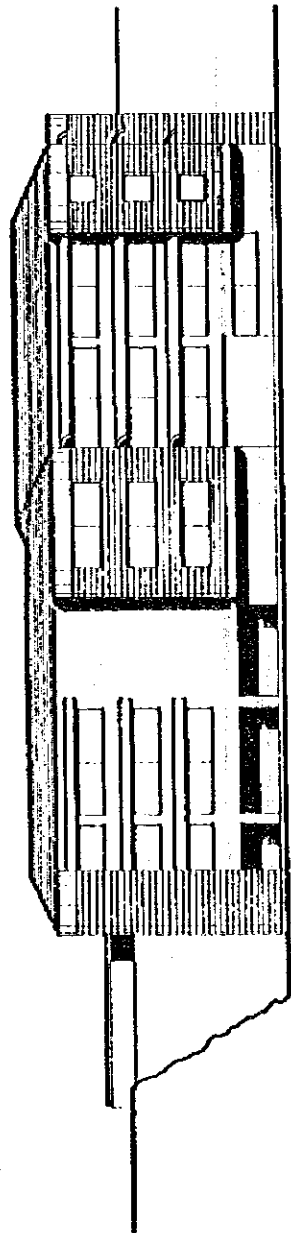
ELEVATION

NYS ENGINEERING INSTITUTE



NYS ENGINEERING INSTITUTE

SECTION



SOUTH



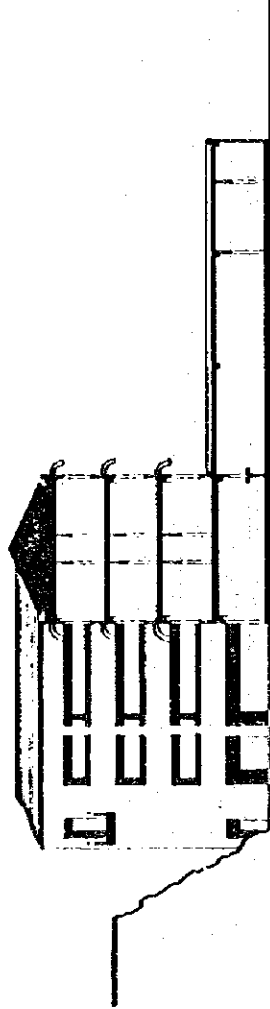
EAST

NYS ENGINEERING INSTITUTE

DORMITORY/KITCHEN/DINING HALL/RECREATION HALL BLOCK ELEVATION



NORTH



WEST

DORMITORY/KITCHEN/DINING HALL/RECREATION HALL BLOCK ELEVATION

NYS ENGINEERING INSTITUTE

4-3 Construction Plan

1) Executing Organization

In Kenya, usually, a variety of authorities will be involved in the project.

A) Office of the President (OP) and NYS.

They are the actual executing organizations for the Project. OP will be involved in inviting comprehensive meeting and giving decision of major items for the Project and on the other hand NYS will take care of individual and technical items.

Classification of the work is not clearly fixed but usually individual items will be discussed with NYS at first and advice and decision will be asked for by OP for important matters.

B) Ministry of Finance (MOP)

Kenyan side signer of Exchange of Note (E/N) and also issuing agency of Authorization to Pay (A/P).

C) Ministry of Works, Housing & Planning (MOWH&PP)

Counter agency for the Consultancy Agreement and also controlling agency during detail design and construction stage.

D) Central Tender Board (CTB)

Authorizing organization of all contracts with the Kenyan Government.

E) Attorney Generals' Chamber (AGC)

Checking agency of Contract Documents.

2) Supervision of Construction

A) Basic principles for supervision

The consultant is requested to conduct whole range of services from the preparation of detail design documents to the supervision of the construction work according to the

policy of Grant Aid and also to the scheme formulated in the Basic Design Study.

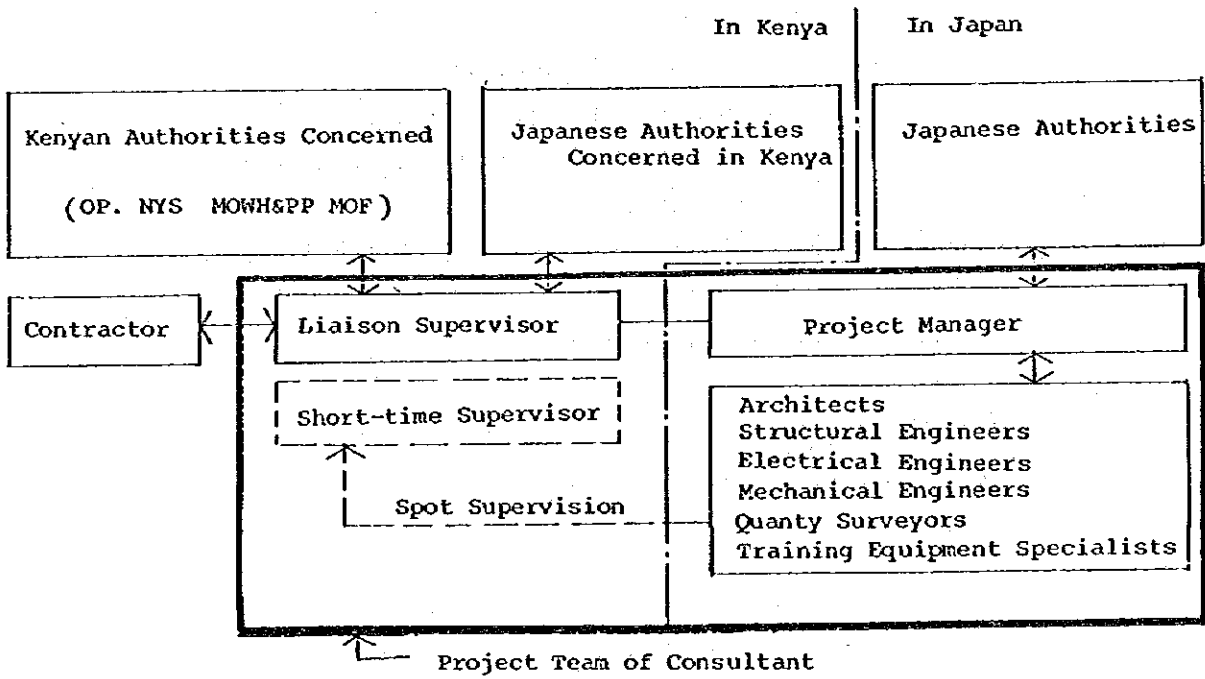
Therefore consultant will be requested to form a project team for smooth implementation of its services both in Japan and in Kenya.

In the supervision stage, a consultant shall dispatch a liaison supervisor who has sufficient abilities of technical matters and coordination of various organizations concerned. In addition, spot supervising engineers will be dispatched in each necessary stage of construction work for inspections, attendance and technical advice.

B) Contents of supervising service

- . Services related to construction contract (Selection of contractor, formation of draft construction contract documents, checking of detailed tender price, attendance at construction contract).
- . Inspection and approval on shop drawings, samples of materials and finish, facilities and equipment.
- . Supervision of execution plan and construction schedule, reporting on the progress of work to the owner and to the Japanese Government.
- . Cooperation to the approving procedure of payment (check of payment request from the contractor etc.)
- . Final inspection and attendance at hand-over
- . 6-month inspection after hand-over

C) System of supervision



3) Demarkation of Work

Outlines of work to be borne by the Japanese Government and those by the Kenyan Government concerned are as follows:

A) Work to be borne by the Japanese Government

a) Buildings and related items

- i) Administration block
- ii) Assembly hall
- iii) Classroom block
- iv) Workshop (electrical/electronics)
- v) " (mechanical engineering)
- vi) " (motor vehicle/construction plant)
- vii) " (welding)
- viii) Student dormitory (dining hall, kitchen, recreation hall)
- ix) External corridor
- x) Power house
- xi) Garage
- xii) Dangerous article store
- xiii) Gas station
- xiv) Car washer plant

b) Infrastructure related work

- i) Elevated water tank and water reservoir
- ii) Sewage system
- iii) Power receiving and transformer facilities
- iv) Telephone exchange facilities
- v) Kitchen facilities

c) External work

- i) Construction and pavement of roads and parking lots within the site (partly)
- ii) Rain water drainage within the site

d) Equipment related work

- i) Training equipment
- ii) Training furniture
- iii) Vehicles for transportation

B) Measures to be taken by the Kenyan Government

- a) To secure the site necessary for the project
- b) To clear the site for construction
- c) Removal of existing buildings, underground facilities and fences (partly)
- d) Construction of fences, gates and guard houses
- e) Construction and pavement of roads and parking lots (partly)
- f) External work and landscaping work
- g) Infrastructure work outside the site
 - i) Electric power in-take
 - ii) Telephone line in-take
 - iii) Sewage work outside the site
- h) Office furniture and utensils
- i) Renovation work of existing buildings.
(Staff recreation building, central warehouse, guard house).
- j) Construction of staff housing
- k) To ensure prompt unloading and customs clearance at ports of disembarkation in the Republic of Kenya and prompt internal transportation therein of the products purchased or provided under the Japanese Grant Aid.
- l) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the Republic of Kenya with respect to the supply of the products and services under the Japanese Grant.
- m) To accord Japanese nationals whose services may be required in connection with supply of the products and services under the Japanese Grant Aid such facilities as may be necessary for their entry into the Republic of Kenya and stay therein for the performance of their work.
- n) To bear all expenses other than those borne by the Government of Japan under the Japanese Grant Aid.

4) Procurement Plan of Construction Materials and Equipment

A) Basic principles of the procurement plan

Procurement of construction materials and equipment will be conducted according to the following principles.

- . Materials and products for the construction of the project that meets Kenya's standard specifications will be procured locally in all cases except where the materials are not locally available, then the project Engineers in consultation with the Chief Material Engineer of Ministry of Transport and Communication should determine whether such material should be imported.
- . Local labour will be hired under the direction of Japanese contractors except those specialists dispatched from Japan for the installation and adjustment work of training equipment and other facilities and equipment.

B) Existing conditions of local materials

The quality, norm and condition of availability of major building materials in Kenya are as follows:

a) Cement

Kenya's cement is produced to B.S. standards, but the quality of cement varies considerably. At present, Kenya exports cement to neighboring countries and there is little anxiety about the shortage of supply.

b) Aggregate

Crushed stones are commonly produced in Tandora in the suburbs of Nairobi and their availability is now stable. There is no problem in strength if they are used for concrete of 210kg/cm^2 .

c) Reinforcing bar

B.S. standard. Twist bar (high tension) and round bar (mild steel) are available and they are harder but brittle compared with Japanese products. There is no problem in availability if the amount of an order is 300 to 400 tons, but if an order exceeds such amount, the delivery of materials tends to become instable. Plants are in Mombasa.

d) Construction steel

B.S. standard. All local products are cold worked. Rolled steel materials are imported products. Availability of materials is unstable.

e) Concrete block

B.S. standard. Production on order. They vary in strength due to improper control of curing period. It is necessary order early and allow sufficient production time.

f) Structural timber

B.S. standard. Cypress, Bodo and cedar were available before, but the cutting of cedar and Bodo is now prohibited and it has become impossible to procure them. Generally, timber is not well dried and warps.

g) Softboard

B.S. standard. This material is commonly used for ceilings of buildings in Kenya. But this is high in price and its supply is unstable. Due to these reasons, rock wool sound insulating boards are recommended.

h) Veneer

B.S. standard. Veneer boards are inferior in resisting water, since the quality of adhesive used is poor. Surface finish is also poor. Production capacity is relatively small and the condition of availability is unstable.

i) Terrazo

There is a possibility to select locally manufactured chips and imported ones, but white cement entirely relies on import and it is high in price and the quantity is limited. It is recommendable to import white cement only from Japan. In Kenya, terrazo means terrazo in-site and their technique at a site of construction is excellent. Plastic joint bar is used.

j) Tile

All tiles such as half-ceramic, ceramic and earthenware, are imported from Europe and European half-ceramic tiles are conspicuous in their irregularity in dimension and

warping, compared with Japanese tiles. Kenya's general method is pressure adhesion method and closed joint.

k) Cement tile

B.S. standard. Cement tiles are manufactured to order, although they have some stock of standard products in relatively small quantity. In giving an order for cement tile, it is necessary to give sufficient time for curing, otherwise products of poor strength may be delivered.

l) PVC tile

B.S. standard. PVC tiles are locally manufactured, but they are rather brittle, as they contain much asbestos. Tiles of certain color may be hard to procure, since their stock is small. Therefore the import from Japan also might be considered up to the availability.

m) Wood block floor

Since locally manufactured wood block floorings vary in thickness, the unevenness of the surface of a floor cannot be corrected, even if it is sanded. But such unevenness creates the feeling of wood. Since they are popular as floor finishing material in Kenya, they are easily obtainable. There is no problem in workmanship.

n) Metal fixtures for doors and windows

B.S. standard. Fixtures are being manufactured, but parts are imported. It is impossible to procure metal fixtures locally in large quantities. If a master key system is desired, it is very difficult to procure it locally.

o) Steel pipe

B.S. standard. Locally produced pipes are available, but they are relatively easy to break at the joint, as their thickness is slightly less than that of JIS. Seamless pipes are not available, and those presently available are not stable in quality since they have pinholes at their joint. Therefore it is recommendable to use Japanese

products in such places where higher quality is required.

p) Joint of steel pipe

B.S. standard. Local products are not available, and most joints are imported from India, Taiwan and China and their quality is not so good. Japanese joints are recommended.

q) Copper pipe

B.S. standard. Copper pipes are all imported and their condition of availability is quite unstable both in terms of price and quantity. Japanese products will be used.

r) PVC pipe

B.S. standard. Most of them are imported and the same condition as the above applies.

s) Concrete pipe

B.S. standard. Concrete pipes are locally manufactured and there is no problem in their supply.

t) Galvanized sheet iron for duct

B.S. standard. Locally manufactured sheets are available, but they are poor in plating technique and local products' plating tends to peel off at the time of processing.

u) Sanitary fixtures and faucet, etc.

B.S. standard. These products are locally manufactured and there is no problem in procuring them, but they are generally poor in quality. Local products are mostly used for local residences but buildings in Nairobi generally use imported products.

v) Electric wire

B.S. standard. Electric wires are locally manufactured and ordinary ones have no problem in supply.

w) Socket, outlet, etc.

B.S. standard. Local products and imported ones are available at the rate of fifty-fifty, and ordinary products have no problem in quality and supply.

x) Lighting fixture

B.S. standard. Ordinary fixtures are being locally manufactured and there is no problem in availability, but the selection of products is rather limited. Philips Co. is manufacturing fixtures by the knockdown system.

y) Electric bulb

B.S. standard. Incandescent lamps and fluorescent lamps are being locally manufactured and there is no problem in availability.

C) Procurement plan of individual equipment and raw material

Work	Materials/ Equipment	Local	Import	Remarks
Reinforced Concrete	Cement	<input type="radio"/>		Only when local supply is unstable
	Reinforcing bar	<input type="radio"/>	<input type="radio"/>	
	Aggregate	<input type="radio"/>		
	Mixing agent		<input type="radio"/>	
Form Work	Form material (general)	<input type="radio"/>		
	Separator		<input type="radio"/>	
	Circular form		<input type="radio"/>	
Steel Work	Rolled steel		<input type="radio"/>	Overhead crane girder etc. Only the size of unstable supply will be imported
	Cold worked steel	<input type="radio"/>	<input type="radio"/>	
	Anchor bold		<input type="radio"/>	
Concrete Block & Stone	Concrete block	<input type="radio"/>		100x200x400, 150x200x400 Only greenish bright gray stone with less water permeability will be used
	Nairobi stone	<input type="radio"/>		
Water Proofing	Asphalt water proofing		<input type="radio"/>	Local asphalt proofing is of inferior quality
	High-Modulus proofing		<input type="radio"/>	
	Mortar water proofing	<input type="radio"/>		
Wood Work	Cypress	<input type="radio"/>		Cedar and Bodo are now prohibited to be cut
Tile Work	Half ceramic tile		<input type="radio"/>	For toilets etc. External pavement
	Brick floor tile	<input type="radio"/>		

Work	Materials/ Equipment	Local	Import	Remarks
Metal Work	Stainless steel		<input type="radio"/>	Coping, grill etc.
	Aluminium		<input type="radio"/>	
	Keystone plate	<input type="radio"/>		Roof boarding
	LSG		<input type="radio"/>	Ceiling base
	Cast iron manhole	<input type="radio"/>	<input type="radio"/>	Only heavy dust type will be imported
	Steel grating		<input type="radio"/>	
	Ceiling inspection hole		<input type="radio"/>	
	Handrail	<input type="radio"/>		
Roof drain	<input type="radio"/>	<input type="radio"/>	Only horizontal roof drain will be imported	
Roofing Work	Cement roof tile	<input type="radio"/>		
Doors & Windows	Aluminium doors & windows		<input type="radio"/>	
	Wooden	<input type="radio"/>		
	Steel doors & windows		<input type="radio"/>	
	Steel shutter		<input type="radio"/>	
Gazing	Ordinary floating glass	<input type="radio"/>		
	Toplight		<input type="radio"/>	
Plastic Work	Mortar	<input type="radio"/>		
	Terrazo in-situ	<input type="radio"/>		
	Colorcreat	<input type="radio"/>		
Painting	Prepared paint	<input type="radio"/>		Product of local A class manufacturer only
	Vinyl chloride resin enamel paint	<input type="radio"/>		"
	Synthetic resin emulsion paint	<input type="radio"/>		"

Work	Materials/ Equipment	Local	Import	Remarks
Interior Finish	Rock wool insulating board		<input type="radio"/>	Only when it is difficult to obtain in certain color
	Toilet booth		<input type="radio"/>	
	Absestos cement board	<input type="radio"/>		
	PVC tile	<input type="radio"/>	<input type="radio"/>	
Electrical Work	Electrical wire	<input type="radio"/>	<input type="radio"/>	Large size and special cable will be imported
	Socket and outlets	<input type="radio"/>		Some kinds will be imported
	Lighting fixtures	<input type="radio"/>	<input type="radio"/>	
	Electric bulb	<input type="radio"/>		
Mechanical Work	FRP tank		<input type="radio"/>	
	Pump		<input type="radio"/>	
	White gas pipe		<input type="radio"/>	
	PVC pipe		<input type="radio"/>	
	Rume pipe		<input type="radio"/>	
	Valves		<input type="radio"/>	
	Sanitary fixtures		<input type="radio"/>	
	Catch basin	<input type="radio"/>	<input type="radio"/>	Part of basin local
	Boiler, Electric hot water server		<input type="radio"/>	Only those required by local norm
	Fire extinguisher	<input type="radio"/>	<input type="radio"/>	
	Fan		<input type="radio"/>	
	Duct material		<input type="radio"/>	
	Air control valve		<input type="radio"/>	
Special Facilities	Kitchen Equipment		<input type="radio"/>	
Equipment Work	Training equipment		<input type="radio"/>	Import except for wooden made
	A/V equipment		<input type="radio"/>	
	Training furniture	<input type="radio"/>	<input type="radio"/>	
	Vehicle of trans- portation		<input type="radio"/>	

4-4 Implementation Schedule

1) Premises for the Formation of the Implementation Schedule

The formation of the implementation schedule will be made on the basis of the following premises.

- . The obligation work and procedural processings borne by the Japanese and Kenyan Government will be executed without delay according to the scheme of Grant Aid.
- . Partial opening of the proposed institutes will not be considered and whole institutes will be open simultaneously.
- . Separate contract of construction work and equipment work will be made and after the completion of construction work, buildings will be once handed over to Kenyan side and soon after that the installation work will be commenced.

2) Overall Schedule

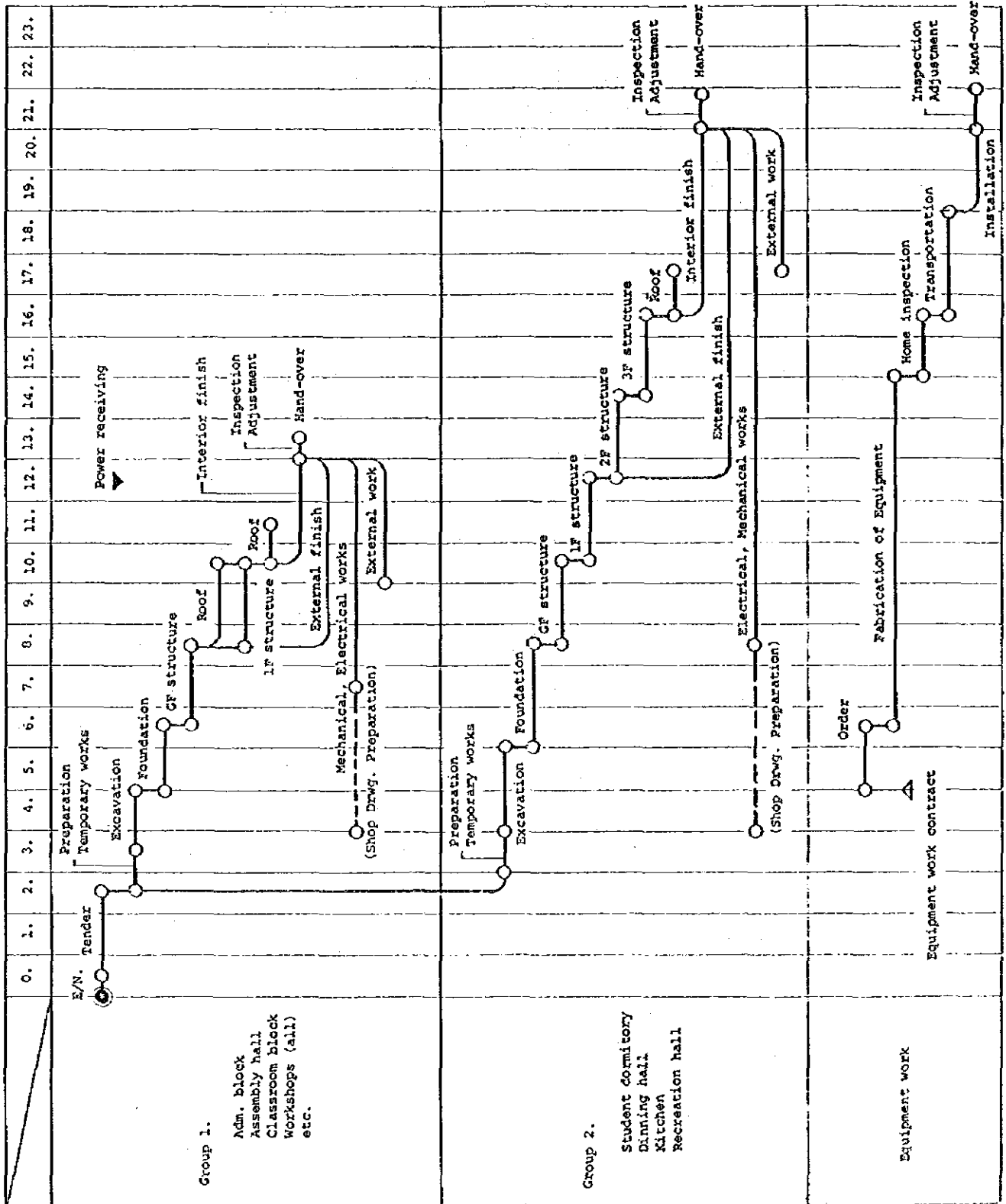
Based on the above-mentioned premises, and by adding the technical conditions, the implementation schedule will be made.

After the Exchange of Note (E/N) is done related to this project, the implementation schedule will be divided roughly into 3 stages.

- (i) Necessary period until the completion of tender documents based on the Basic Design after the verification of Consultancy Agreement. 1 month
- (ii) Necessary period until the Construction Contract through Tender Notice, pre-qualification of Tenderers, opening of Tender and Tender Evaluation. 2 months
- (iii) Construction work will start after the Construction Contract verified by the Japanese Government. Judging from the size, the number of floors etc. of the facilities, whole construction work will be able to be divided into two groups with different construction periods, assuming that the procurement of materials and equipment and the obligation work of both governments will be done smoothly.

Group 1. Administration Block, Classroom Block
Assembly Hall, Electrical/Electronics Workshop,
Mechanical Engineering
Workshop and Motor vehicle/
Construction Plant Workshop 11 months
etc.

Group 2. Student Dormitory inc.
Dinning Hall, Kitchen and
Recreation Hall 19 months



4-5 Operational Expenses

Annual operational expenses of this proposed institute after the completion of the Project is estimated as follows in the value of September, 1985.

	(10 ³ KE)
Personnel expenses (salary and allowances)	156.10
Transportation	15.60
Travel and accommodations	7.80
Communication	3.10
Energy	99.30
Food	246.40
Uniforms	4.50
Miscellaneous	3.10
Training Materials, Consumables	172.00
Maintenance	23.70
	<hr/>
	731.60

The following are the compared data of existing training institutes with the proposed institute.

Name of Institute	(1984/85)	x 10 ³ KE
	Annual Total Operational Expenses	Annual Operational Expenses per trainee
Proposed Institute	731.60	2.44
NYS Mombasa Vocational Training Centre	1,074.30	1.26
NYS Yatta Field Unit	230.30	1.92
NYS Turbo Field Unit	161.00	2.01
Jomo Keyatta College of Agriculture and Technology	1,426.60	2.02
Kenya Polytechnic	1,611.60	0.41
Mombasa Polytechnic	772.60	0.39
Kenya Technical Teachers College (KTTC)	942.30	1.88
Harambee Institute of Technology (HIT)	898.60	0.45

As is shown in the table, annual total operational expenses of this proposed institute is not excessive but realistic compared with other training institutes of NYS etc.

However the operational expenses per trainee is about 2,440 KSh/year and compared with the other vocational training institute and technical education institutes of Kenya, the figure is rather high. The reasons why can be estimated are as follows:

- i) NYS is a full boarding institute, providing all food, uniform etc.
- ii) In other technical education institutes like polytechnics, half of the training in a year (26 weeks) is conducted outside (private firms etc) as OJT, but in the proposed institute almost all training shall be conducted within the institute because of the nature of NYS.
- iii) Technical level training to which workshop training is given highest priority is proposed in this institute, therefore the ratio of workshop training to classroom education is relatively high.

Among the items of operational expense, annual per trainee expense of training materials and consumables, energy and maintenance show rather high figures compared with those of other institutes.

Calculation of the expense of training material and consumables is based on the following conditions.

- . The proposed institute is estimated to spend 80% of training materials and consumables spent in Japanese advanced vocational training school per trainee and per workshop training hour.

But considering the fact that in Kenya many of these materials and consumables are imported, the costs of those will be higher than in Japan.

Based on those reasons, the following figures are assumed as materials and consumable expense per trainee and per workshop training hour.

Mechanical Engineering	11.54 Kshr/hr. Trainee
Motor Vehicle Technicians	12.94 "
Construction Plant Technicians	17.48 "
Main Electrical Installation	11.89 "
Radio, TV and Electronics	11.54 "

. Annual expense is calculated by multiplying the figure by the estimated workshop training hours per year by course.

. Among energy cost, the cost of electricity is absolutely the highest occupying 70% of the total energy cost.

Electricity	68.8 x 10 ³ K£
Diesel oil (for generator)	0.5 x 10 ³ K£
Water	17.4 x 10 ³ K£
LPG (for Kitchen and Student Dormitory)	12.6 x 10 ³ K£
Total	99.3 x 10 ³ K£

. Among maintenance cost, the cost of maintenance for training equipment occupies nearly half of the total figure.

Building (0.12%/year of initial investment)	5.74 x 10 ³ K£
Facilities (0.41%/year of initial investment)	5.90 x 10 ³ K£
Training Equipment (0.41%/year of initial investment)	21.50 x 10 ³ K£
Total	23.69 x 10 ³ K£

4-6 Project Cost

1) Rough Estimate of Work Executed by the Kenyan Side

The following are rough estimation of work executed by the Kenyan side.

Work	Cost (x 10 ³ K£)
. Site clearance (incl. removal of existing facilities)	39.46
. Fence, gate, gatehouse	39.76
. External work, vegetation work	41.78
. Infrastructure work outside site	32.04
. Office furniture, Utensils	38.81
. Renovation of existing buildings	163.21
. Construction of staff housing	1,399.07
Sub total	1,754.12
. Fluctuation and contingency	105.25
Total	1,859.37

CHAPTER 5. EVALUATION OF THE PROJECT

CHAPTER 5 EVALUATION OF THE PROJECT

The technician, as a national qualification of Kenya, means an intermediate professional capacity situated between an engineer and a craftsman. The education of the technician is such an area as extends over both fields of technical education and vocational skill training.

The national objective of developing technicians, in principle, comes from two motives: one is the improvement of the social condition as to level up the national education, to expand employment opportunities or to adjust the imbalance of the nation's income, and the other is the development of the national economy as to raise up national productivity or to promote domestic and international trade.

With regard to the National Youth Service Engineering Institute, the objectives of the establishment are according to those national motives, and in addition, including the training of highly skilled instructors for vocational training units, sub-unit and advanced engineering training centre under NYS.

As mentioned in Chapter-1, requirements of the industrial sector for technician training are shown in the Report of Presidential Committee on Unemployment 1982/1983: the Committee is composed of representative staff of Kenyan industrial sector and the Report is considered to be suggesting the very requirement of the industrial sector.

The Report expresses concern of the industrial sector about the trend that the educated young people of today dislike to work with their hands, and it recommends to rectify such a tendency. It also highly evaluates the activities of NYS which are making much contribution to the building of the nation, and finally proposes that a new institute such as NYS should be established. In addition, the Report points out that Kenya's present technical education places an emphasis on theoretical studies, rather than practical training and graduates of technical institutes are poor in technical skills.

On the other hand, the Government is executing renovation of the educational system in accordance with the National Development Plan.

In the Kenyan 5th Development Plan, the national industrial policy is indicated as follows:

The Kenyan industry should be developed to be labour intensive for

the purpose of keeping equilibrium of employment conditions and national income distribution, rather than capital intensive for the purpose of raising up the national product and income.

As a market, African countries should preferentially aim at fully utilizing available domestic technology over European countries by developing high technology.

Under such circumstances, it is one of the most urgent subjects for the Development Plan to nurture highly skilled technicians, of whom a serious shortage exists in various industrial fields.

It is true that in training technicians, an emphasis is placed on theoretical education, rather than the practical training of skill. This is attributable to the absence of a well equipped facilities which are capable of training young people to acquire sufficient skills.

Actual technician training prescribed in the Industrial Training Act is based on apprenticeship: theoretical technique is to be educated in an educational institute approved by the Ministry of Education and vocational skill is to be trained in a factory approved by the Ministry of Labour as a competent training facility. In consequence, the educational institute for technician training lacks sufficient instructors or training equipment for skill training.

However, most industrial factories expected to be the actual training field are also in the same condition as the educational institute, so that, the requirements of the industrial sector for highly skilled technicians has never been met.

Such aspect of technician apprenticeship training can be solved either by capacitating actual industrial factories to be able to give adequate skill training to their apprentices with skilled instructors and sufficient equipment, or by furnishing the same capacity to the educational institutes for technician training.

The former is substantially more difficult to realize under actual circumstances: if it should be realizable, the aspect would not be treated so seriously in the Development Plan. Consequently, the latter way, though it is a denial of the apprenticeship, is the only effective measure.

The contents of the establishment plan of NYS Engineering Institute, on which the Government of Kenya and the Preliminary Study Team

for Japanese technical cooperation have agreed, that is to build facilities for providing technician training of the most required 5 technical courses which putting much emphasis on skill training, is consistent with the latter measure.

On the contrary, however, that the trend of young people to dislike manual labor is not an easy habit to overcome and will not be served only by creating new training facilities.

Generally, this kind of trend is very difficult to overcome. However, the applicants for this Engineering Institute are limited to servicemen and servicewomen of NYS and are presumably free from this trend.

They have passed discipline training at the time of enrollment in the NYS, and through this intense training, the youth with undesirable attitudes must be screened out.

Under these specific circumstances of NYS, it concluded that this Project is most likely to succeed in the improvement of the technician training.

The industrial sector is keenly reflecting economic interests and demands, and therein, the more useful good is purchased more preferentially and yet at a high price. It is therefore expected that the graduates of this Institute will be highly evaluated and highly paid, and as a result, this Institute may give much influence on many educational institutes for the renovation of technician training.

CHAPTER 6. CONCLUSION AND RECOMMENDATION

CHAPTER 6 CONCLUSION AND RECOMMENDATION

In this chapter, problems surrounding this project are orderly reviewed and countermeasures for respective problems are examined and proposed.

1) Renovation of Educational System in Progress

At present, Kenya's educational system is in a transition period from 7-4-2-3 to 8-4-4. In 1985, the pupils of the first year under the new system are in the 8th grade of primary education, and it will be in 1989, 4 years later, when they will be accepted by this Institute after graduating from junior high school of the new system. At present, the detailed regulations on higher education under the new system have not been completed yet, and details are being prepared by the Ministry of Higher Education. However, these contents have not been made public, and the team was not able to obtain any comments on the detailed rules of the new system being prepared from the Ministry of Higher Education. Consequently, there are many unknown points about the new system. Of those, one point which might have a serious influence on this Project is how the system of technician qualification will be treated in the future. According to the outlines of the new higher education system which has already been published, there are only two kinds of technical qualification, namely Bachelor and Craftsman. In view of this, when detailed regulations are gradually prepared in the future, the following two possibilities can be considered:

The first case will be such that a new qualification system corresponding to the former Technician qualification (Part I by 2-year education, Part II by 3-year education and Part III by 4-year education) will be additionally formulated.

The second case will be such that the former technician qualification will be abolished and the qualification of technician will be formally classified into two systems, Bachelor and Craftsman.

In the first case, it can be expected that the present syllabuses will not be considerably revised and that this institute will maintain its originally planned composition in accordance with the requirements of NYS.

On the contrary, in the second case, it is necessary to drastically revise the present syllabuses and there are three selections for this institute: the first one is that this Institute will be upgraded to an educational organization (university level) for educating bachelors, the second one is that it will be degraded to a skill training institute for nurturing craftsmen, or the third one is that this Institute will be maintained as a peculiar educational institute regardless of the national technical qualification of the graduates. Whichever of those three selections may be realized, however, the contents of the basic design will be effective as long as the objective of the Project, to nurture the technician with vocational skill, is not changed substantially. According to the selection, certain additional facilities may be required, but in any case, none of the facility elements enumerated in the Basic Design will be needed. And in addition, physical flexibility is prepared to a certain degree to accord the respective additional facility elements for those selections in the Basic Design. Consequently, no serious problem will be caused as far as the Grand Aid is concerned. On the contrary, since the Technical Cooperation scheme is likely to be much influenced by those selections, careful attention should be paid to this matter in the future.

2) Balance between Training Period and Syllabus

According to the Industrial Training Act, three years of training is required for the application for the national test of Technician Part II, and half of the period of three years (26 weeks a year, 78 weeks in all) is to be mapped out for in-plant training (skill training).

However, the period of 78 weeks is somewhat too long for formal advanced skill training. So that, to make such long term training fully effective and significant, introduction of some sort of casual training, will be needed. For instance:

- A) Study tour programs to well-managed plants in which a trainee is caused to compile his own record of the tour as an audio/visual training material and make a lecture on it to the other trainees.

B) Outstation training at well-managed plants for a fixed period under a cooperation contract with the plant owner in which a trainee is caused to compile an evaluation note on the actual industrial features and so on.

3) Difference of the Educational Background of the Newly Enrolled Trainees

According to the agreement reached between the Kenyan Government and the Preliminary Survey Team, the qualification for enrollment at this Institute is "O level", but those who have got "Outstanding Final Certificate Achievement" are to be treated as an equivalent qualification. As a result of this, the institute will have two types of trainees: one type of trainees who have the knowledge of junior high school graduates without a vocational skill at all and another type of trainees who differ in knowledge but highly skilled. In the case of a usual educational organization, it is natural that those two groups of students will be separately educated to supplement their insufficient part of knowledge and experiences at the initial stage of school education.

Since this institute is an attached organization to NYS, the institute will have to accept such new trainees who are widely varied in their degree of knowledge and vocational skill, therefore its curriculums would be required to have a wide range of selection.

At the stage of Preliminary Survey for the Technical Cooperation, such an idea was proposed as new students succeeded in the Outstanding Final Certificate Achievement would be put in the 2nd grade class, but such idea would not be a solution to this problem if they would be considerably lower in knowledge than "O" level.

To cover such a difference in the level of knowledge and skill of newly enrolled trainees, it will be necessary to incorporate a wide range of selection into not only the curricula for the first grade, but also the curricula for the second and third grade by partially adopting the "Module System" of ILO, etc.

4) Tendency of the Requirement for Vocational Skill
by the Industrial Sector

The actual condition of the requirement of the present industrial sector for skilled workers, which the team understood through interviews to the related industries is such that the demand for the skilled workers who have all-round directional properties is higher than for those who have a sharp directional property. For instance, such a welder who is capable of performing other jobs such as machine operation, heat treatment, material inspection etc. is more required than a welder who is keenly skilled in welding but has no other skills at all. This trend seems to be natural for the Kenyan industrial sector which is emphasizing labor-intensive development over capital-intensive development and this trend is commonly seen in any industrial field, although its degree may vary by field.

This tendency is not considered as a permanent one, but this fact should not be ignored in an incipient training program. It would be a realistic method to devise a training program in compliance with this tendency at the present, and to revise the training program when the tendency of needs is changed in the future.

In view of these facts, it is recommendable to hold a planning division on the training in the administrative department as a permanent function to cope with the vicissitude of the requirements for skilled workers by the industrial sector.

APPENDICES

- A-1 Members of Japanese Study Missions**
- A-2 Field Survey Schedule**
- A-3 Members of Kenyan Authorities Concerned**
- A-4 Minutes of Discussions**
- A-5 Outline of Training Institutions and
Private Firms Visited**
- A-6 Site Survey Map**
- A-7 Sub-soil Survey Data**
- A-8 Water Quality Data of Nairobi City**
- A-9 Standard of Sewer Discharge**
- A-10 Data of Training Activities of NYS**
- A-11 Financial Data**
- A-12 General Information of Kenya**

A-1 Members of Japanese Study Missions

1) Members of Basic Design Study Mission

Mr. Shozo Ohira Team Leader	Official, Grant Aid Div., Bureau of Economic Cooperation, Ministry of Foreign Affairs.
Mr. Kiyokatsu Tanaka Training Planner	Chief, Vocational Training Standard Sub-Division, Human Resources Development Division, Human Resources Development Bureau, Ministry of Labour.
Miss Nobuko Kayashima Project Coordinator	2nd Basic Design Study Div., Grant Aid Planning & Survey Department, Japan International Cooperation Agency.
Mr. Kiyomichi Ookuma Senior Project Architect	Nihon Architects, Engineers & Consultants, Inc.
Mr. Yutaka Harahata Training Equipment Specialist	Nihon Architects, Engineers & Consultants, Inc.
Mr. Shunji Kawada Architect	Nihon Architects, Engineers & Consultants, Inc.
Mr. Seizo Kobayashi Mechanical Engineer	Nihon Architects, Engineers & Consultants, Inc.

2) Members of Draft Report Explanation Mission

Mr. Kazuo Tanigawa Team Leader	Head, 2nd Basic Design Study Div., Grant Aid Planning & Survey Department, Japan International Cooperation Agency.
Miss Nobuko Kayashima Project Coordinator	2nd Basic Design Study Div. Grant Aid Planning & Survey Department, Japan International Cooperation Agency.
Mr. Kiyomichi Ookuma Senior Project Architect	Nihon Architects, Engineers & Consultants, Inc.
Mr. Shunji Kawada Architect	Nihon Architects, Engineers & Consultants, Inc.

A-2 Field Survey Schedule

1) Field Survey Schedule of the Basic Design Study

Aug. 1	(Th)	Ar. Nairobi	AM; Discussions w/ JICA office PM; Discussions w/ Japanese Embassy Visit to Kenya Medical Research Institute
Aug. 2	(Fr)	Nairobi	AM; Courtesy call & discussions w/ Office of the President (OP) PM; Courtesy call to NYS, Visit to the Project Site
Aug. 3	(Sa)	Nairobi	AM; Team meeting PM; Rough measuring of the Project Site Preparation of Agenda
Aug. 4	(Su)	Nairobi Mombasa	AM; Travel PM; Team meeting
Aug. 5	(Mo)	Mombasa Nairobi	AM; Visit to Mombasa Vocational Training Centre Visit to Yatta Field Unit and (Mr. Tanaka, Harahata) PM; Visit to Mombasa Polytechnic Visit to Thika-Garisa Road Construction Site (Mr. Tanaka, Harahat)
Aug. 6	(Tu)	Nairobi	AM; Jomo Kenyatta College of Agriculture & Technology PM; Meeting w/ NYS
Aug. 7	(We)	Nairobi	AM; Meeting w/ NYS PM; Meeting w/ OP
Aug. 8	(Th)	Nairobi	AM; Meeting w/ NYS PM; Meeting w/ OP
Aug. 9	(Fr)	Nairobi	AM; Meeting w/ NYS Mr. Kobayashi at Nairobi PM; Minutes Discussion at OP
Aug. 10	(Sa)	Nairobi	AM; Team meeting PM; Survey on the construction conditions cost survey

Aug. 11	(Su)	Nairobi	AM; Team meeting (draft minutes) PM; Data analysis
Aug. 12	(Mo)	Nairobi	AM; Visit to Pan African Equipment Co. Site survey (infrastructure) PM; Visit to General Motor Co. & Sanyo Armco Co. Attendance to the start of the topographic survey of the site
Aug. 13	(Tu)	Nairobi	AM; Visit to Metal Box Co. & Layland Kenya Co. Courtesy call to MOWH & PP PM; Signing to Minutes, Survey of existing buildings on site Survey of infrastructure around the site Discussions w/ city water authority
Aug. 14	(We)	Nairobi	AM; Report to JICA office & Japanese Embassy Cost survey PM; Discussion w/ KIE Data collection from Government Press & MOWH & PP
Aug. 15	(Th)	Nairobi	AM; Mr. Ohira, Tanaka, Kayashima & Harahata left Kenya Cost survey (local contractor) Site layout planning work Discussions w/ city council, EAPL & KPTC PM; Minutes of Technical discussions w/ NYS
Aug. 16	(Fr)	Nairobi	AM; Start of test pit work on the site Discussions w/ NYS on the site layout plans PM; Minutes of Technical discussions w/ NYS Visit to KPTC, Construction material survey
Aug. 17	(Sa)	Nairobi	AM; Construction material survey PM; Team meeting, Supervision on test pit work
Aug. 18	(Su)	Nairobi	AM; Data filing PM; Data analysis
Aug. 19	(Mo)	Nairobi	AM; Discussions w/ NYS on the site layout plan PM; Report to JICA office and Japanese Embassy

A-3 Members of Kenyan Authorities Concerned

1) Members concerned with the Basic Design Survey Mission

Office of the President (OP)

Mr. E. A. IDWASHI	Deputy Secretary
Mr. J. K. ARAP MUTAI	Under Secretary

The Ministry of Finance (MOF)

Mr. GAKUNGA	Senior Assistant Secretary
Mr. J. M. WEKESA	Senior Assistant Secretary

The Ministry of Foreign Affairs

Mr. S. K. Langat	Assistant Secretary Asia/ Australian Division
------------------	--

NYS

Mr. G. W. GRIFFIN	Director
Major. M. LANGAT	Deputy Director
Mr. S. A. TONGOI	Deputy Director, Administration
Mr. T. A. NYANGAU	Staff Officer 1, Administration
Mr. P. W. WACHIRA	Senior Educational Officer
Mr. D. N. MUGAMBI	Training Coordinator
Mr. J. N. KAGO	Senior Superintendent, Building

2) Members concerned with the Draft Report Explanation Mission

Office of the President (OP)

Mr. E. A. IDWASHI	Deputy Secretary
Mr. J. K. ARAP MUTAI	Under Secretary

The Ministry of Finance (MOF)

Mr. K. M. S. KIGEN	Senior Assistant Secretary
Mr. J. N. WEKESA	Senior Assistant Secretary

The Ministry of Foreign Affairs

Mr. T. K. MWANGI	Assistant Secretary Asia/ Australian Division
------------------	--

The Ministry of Works, Housing and Physical Planning

Mr. W. S. W. BUSOLO	Group Leader IV
Mr. G. P. K. MWANGI	Quantity Surveyor

NYS

Mr. G. W. GRIFFIN	Director
Mr. S. A. TONGOI	Deputy Director
Mr. C. N. MWANGEMI	Senior Administrative Officer
Mr. P. W. WACHIRA	Senior Educational Officer
Mr. D. K. WASIKE	Senior Superintendent Building

A-4 Minutes of Discussions

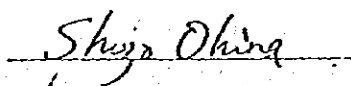
1) Minutes of Discussions of the Basic Design Study Mission

MINUTES OF DISCUSSIONS
ON
THE CONSTRUCTION PROJECT
OF
NATIONAL YOUTH SERVICE ENGINEERING INSTITUTE
IN
THE REPUBLIC OF KENYA

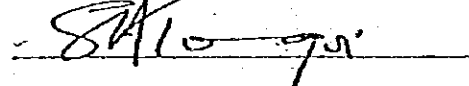
In response to the request made by the Government of the Republic of Kenya for Grant Assistance for the Construction Project of the National Youth Service Engineering Institute, (hereinafter referred to as "the Project"), the Government of Japan has sent through Japan International Cooperation Agency (hereinafter referred to as "JICA"), the basic design study team, headed by Mr. Shozo OHIRA, Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs, from July 29th to August 22nd, 1985. The study team has carried out a field survey, held a series of discussions between August 1st and August 13th and exchanged views with the authorities concerned with the Project.

As a 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.

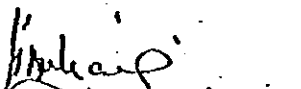
Nairobi August 13th, 1985



Mr. Shozo OHIRA
Leader, Japanese Study Team
Japan International Cooperation
Agency (JICA)



for Mr. G.W. Griffin
Director
National Youth Service



Mr. E. A. IDWASI
Deputy Secretary
Office of the President
The Republic of Kenya

1. Title of the Project

The title of the Grant Aid Project is "the Construction Project for National Youth Service Engineering Institute" (hereinafter referred to as "the institute"). in place of "NIPPON NYS Engineering Institute".

2. Objective of the Project

The objective of the Project is to provide necessary facilities and equipment for the proposed training Institute.

3. Areas of Training for the Institute

(i) Courses	Enrolment	Intake/Year
a. Mechanical engineering	60	20
b. Motor vehicle technicians	60	20
c. Construction plant technicians	60	20
d. Main electrical installation technicians	60	20
e. Radio, television & electronics technicians	60	20
Total	300	100

(ii) The details of the training courses of the Institute are shown in the Minutes of Discussions on Technical Cooperation for the Project, signed between the Office of the President and the Japanese Preliminary Survey Team, dated 7th March, 1985.

4. Site of the Project

The location of the proposed project site in the City of Nairobi is shown in Annex I

5. Request of the Government of Kenya

The Japanese Basic Design Study Team will convey the desire of the Government of Kenya to the Government of Japan that the latter will extend Grant Aid for construction of the buildings and the facilities and provision of the training equipment within the scope of the Japanese Economic Cooperation in grant form (see Annex II).

6. Measures to be taken by the Government of Kenya

The Government of Kenya will take the necessary measures listed in

So

2/6

Annex III on condition that the Grant Aid by the Government of Japan is extended to the Project.

7. System of Japan's Grant Aid

Both sides confirmed that the Japanese Basic Design Study Team explained Japan's Grant Aid Programme and that the Kenyan side understood it.

8. Kenyan Implementation Body of the Project

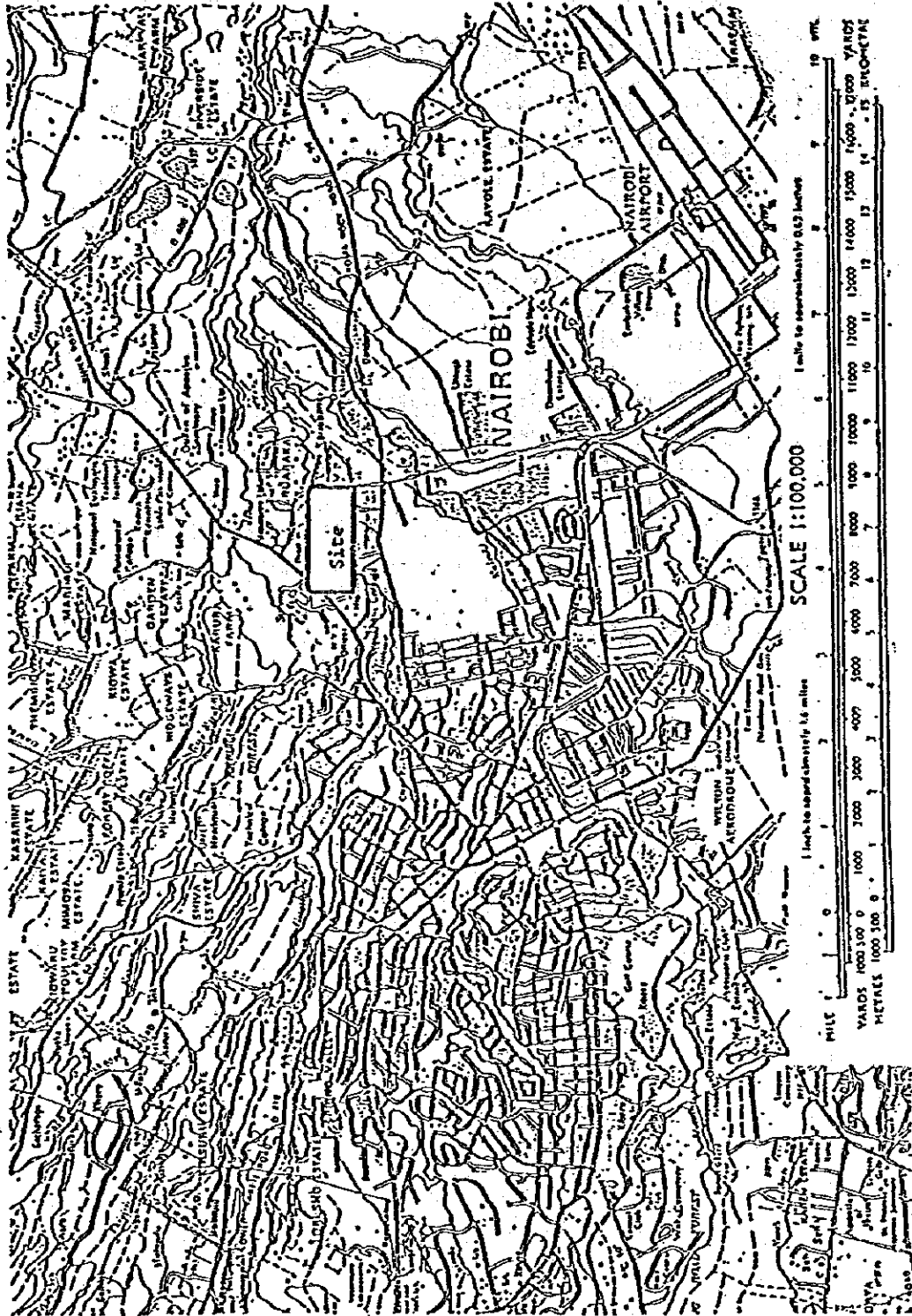
NYS will be the implementing agency of the Project under the administration of the Office of the President.

80

3/6

SAT

Annex 1



ce

416

SMT

Annex II

Request of the Government of Kenya

- (1) Buildings and facilities
 - a) Administration block
 - b) workshops and laboratories
 - c) class rooms
 - d) library
 - e) kitchen & dining hall
 - f) dormitories
 - g) recreation hall

- (2) Equipment necessary for the training of the following courses:
 - a) Mechanical engineering course
 - b) Motor vehicle technicians course
 - c) Construction plant technicians course
 - d) Main electrical installation technicians course
 - e) Radio, television & electronics technicians course

- (3) Institute transport

50

K
ll

5/6

ONE

Annex III

The following measures are required to be taken by the Government of the Republic of Kenya:

1. To secure and clear land necessary for the construction of the facilities.
2. To undertake incidental civil works such as planting, fencing and construction of gates, if needed.
3. To provide facilities for distribution of electricity, telephone, water supply, drainage and other incidental facilities up to the site.
4. To provide general furniture required for administration purposes except those for training purposes.
5. To ensure prompt unloading, tax exemption and customs clearance at the ports of disembarkation in Kenya and prompt internal transportation therein of the products and related training equipment purchased under the Grant.
6. To exempt Japanese nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Kenya with respect to the supply of the products and related training equipment and services under the verified agreements or contracts.
- v. To provide to Japanese nationals whose services may be required in connection with the supply of the products and services under the verified contracts with such facilities as may be necessary for their entry into Kenya and their stay therein for the performance of their work.
8. To maintain and use properly and effectively the facilities constructed and equipment purchased under the Grant Aid.
9. To bear all the expenses, other than those to be borne by the Japanese Grant Aid necessary for the construction of the facilities and provision of the equipment.

80

K
LA

6/6

ENT

2) Minutes of Discussions of the Draft Report Explanation Mission

MINUTES OF DISCUSSIONS

The Draft Report of the Basic Design Study on
the Construction Project of
the National Youth Service Engineering Institute

At the request of the Government of the Republic of Kenya for grant aid for the Construction Project of the National Youth Service Engineering Institute (hereinafter referred to as "the Project"), the Government of Japan decided to conduct a Basic Design Study on the Project. The Japan International Cooperation Agency (JICA) sent the Basic Design Team headed by Mr. Shozo OHIRA from July 29th to August 22nd, 1985.

As a result of the study and discussions, JICA prepared a Draft Final Report on the Study and dispatched a Mission to explain and discuss the Report starting from November 22nd to December 3rd, 1985.

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

Nairobi, November 29th, 1985


Mr. Kazuo TANIGAWA

Leader

Japanese Study Team

The Japan International
Cooperation Agency
(JICA)


Mr. G.W. Griffin

Director

National Youth Service


Mr. E.A. IDWASI

Deputy Secretary

Office of the President

Major Points of Understanding:

1. The Kenyan side principally agreed to the basic design proposed in the Draft Final Report.
2. The Final Reports (10 copies in English) on the Project will be submitted to the Republic of Kenya by the end of January, 1986.
3. The Kenyan side understood the system of Japan's Grant Aid Programme and confirmed the measures to be taken by the Kenyan side towards the realization of the Project.

[Handwritten signatures and initials]

A-5 Outline of Training Institutions and Private Firms Visited

1) NYSAETC (NYS Advanced Engineering Training Centre)

a) Outline

- . Japanese Technical Cooperation was conducted from 26th May, 1975 to 25th May, 1980.
- . Scope of Technical Cooperation
 - Turning, fitting and electrical courses
- . Each course has 3 classes
 - A class - Training target of Trade Test 2
 - B class - Basic course with training target of Trade Test 3
 - C class - Trainees are dispatched from vocational training schools under the Ministry of Labour.
- . Craft apprentice 3rd year course
- . Number of instructors
 - Turning 2 fitting 2 electrical 3
 - Two of these instructors had training in Japan

b) Impressions

- . Workshops were dark and the working condition are not good.
- . Improvement is to be expected for the control and maintenance of cutting tools, measuring devices, hand tools, motors and other spare parts.
- . Considerable lack of tool stock is seen.
- . Further education will be needed especially of tool handling and reusage.
- . Additional space will be needed for drawing lessons in the workshop.
- . The electrical and motorvehicle workshop are not well maintained.
- . Used tyres and cars shall be stored in better order.
- . More effective trainings will be possible by rearranging the workshop environment.

c) Main Equipments

Lathes	ℓ = 500 m/m	Washino	2	Turning/fitting
"	ℓ = 500 m/m	Takizawa	9	"
"	ℓ = 1,000 m/m	Washino	3	"

Milling machine			
Vertical #2	Enshu	1	Turning/fitting
Vertical #2	Hitach	1	"
Horizontal #2	Enshu	1	"
Horizontal #2	Hitach	1	"
Surface grinder 500 strokes	Kuroda	1	"
Cylindrical grinding machine			
$\ell = 500$	Washino	1	"
Shaper 450 strokes	Nishitani	3	"
" 700 stroke	Hokuetsu	2	"
Step-shoe shaper	Chubo	1	"
Universal tool grinder	Makino	1	"
Drill grinding machine	Fujita	1	"
Double head grinder		3	"
Upright drilling machine	Kiwa	1	"
Bench drilling machine	Namiki	6	"
Hydraulic press		1	"
Surface plate 1,000x1,000x140	Fukufuku	5	"
Vee-block 250x250x250		5	"
Workbench 600x1500		17	"
Hacksaw 500 ^t	Washino	1	"
Pipe threader		1	Electrical
Coil winding machine		2	"
Training engine		14	Motor vehicle
Wiring board		5	Electrical
Oscilloscope		5	"
Carbide tool grinder	Waida	1	Turning/fitting
Heating furnaces	Yamada	2	"
Heat treatment tank	"	2	"
Hardness tester	Tokyo	2	"

2) NYS Mombasa Vocational Training Unit (MVTC)

a) Outline

- . Total number of trainee 852
- . Total capacity of trainee will be expanded to 1200 by starting new course of motor vehicle chassis mechanics.
- . Skill training institution under NYS targeting Trade Test 3 (G-III).
- . 10 training courses; Electrical, electronics, motor vehicle electrician, motor vehicle mechanics, turning, fitting, plumbing, carpentry, masonry, welding.
- . Each course has 3 classes (A,B,C) with 20 trainee.
- . Entry qualification is primary school education and duration of training is roughly 12 months.
- . The facilities are scattered around the former british military camp (~ 250 ha) and old amunization storages are used as workshops but some of them were newly built.
- . After the graduation from the institute, the trainees are possibly proceed further training in NYSAETC in Nairobi or in Yatta.
- . Dispensary with 4 sick bays is seen for first aid etc.

b) Impressions

- . Dutch equipments are seen prominently because the dutch technical cooperation was made.
- . In masonry course block masonry trainings are conducted using mortar without cement.
- . In carpentry course american style plainer are used and various types of wood joint are being trained.
- . In motorvehicle mechanics course, the lack of training materials is serious. For example 20 trainees are sharing on training engine in disassembling training.
- . In welding course, welding booths are provided but not exhaust installation.
- . In fitting course, shaper, drilling machines and vertical milling machines 1-2 are seen.

- . In turning course, lathes 12, vertical milling machine 2 etc are equipped and rolling centre and hummer are adopted in the training subjects; relatively high level training.
- . In electrical course, wiring training is being conducted using wiring panel board with ceiling; good.
- . The lack of measuring devices is serious.

3) MOMBASA POLYTECHNIC

a) Outline

- . Technical educational institution for nurturing Higher Diploma and Technician Part III.
- . Courses Dept. of Business Studies
Dept. of Mechanical Engineering
Dept. of Electrical & Electronic Engineering
Dept. of Building & Civil Engineering
Dept. of Mathematics and Applied Science.

b) Main Equipments

- . Mechanical engineering related;

Various pumps

Blower

Resipro-compressor

Gate valve

Check valve

} Cut model and for disassembling

Table top lathe

Lathe $\phi = 800$

Horizontal milling machine #2

Vertical milling machine #1

Hacksaw

Upright drilling machine

Shaper stroke 400 m/m

Turlet lathe

Radial drilling machine

Double head grinder $\phi 250$ m/m

} for Technician Part III

Tool grinder

Universal tool grinder

Horizontal milling machine

Vertical milling machine

Shaper

Surface grinder

} for Diploma

- . Sheet metal and welding related;
 - Gas welding installation
 - Arch welding machine (w/booth)
 - Eyetracer
 - Bender
 - Threading press
 - Shearing machine (large, small)
- . Electrical course related;
 - High voltage power receiving installation
 - Power distribution board (MG, AC, DC)
 - Oscilloscope . ; Measuring devices are extremely well equipped.

4) NYS YATTA FIELD UNIT

a) Outline

- The unit is composed of two different schools; plant operation and mechanics school agriculture school (coffee cultivation)
- In plant operation and mechanics school, there are 2 courses namely plant operator course and plant mechanics course.
- In plant mechanics course, the trainings for Craftman Grade III and Grade II are conducted with duration of training 12 months and 8 months respectively.
- For plant operator, operator licence training of 8 months is conducted.

b) Impressions

- The number of instructor; Kenyan 28
Danish 3
- In the workshop disassembling of engine and the operation training of plant machinery were being conducted but the most of the trainees were doing basic skill work of fitting (filing work).
- In the classrooms theoretical lessons were being conducted and the attitude and working method were excellent.
- Teaching materials about construction machinery (Komatsu, Caterpillar) being prepared by thoes danish instructors will be very usefull also for this new institute.
- Both workshops and classrooms are well maintained.

c) Main Equipments

Lathes	$\phi = 1,000$ m/m	1
Drill grinding machine		1
Bench drilling machine		1
Valve refacer		1
Jack (mechanical, hydraulic)		Various
Overhead crane	5 t	2
Engine cut model		4
Transmission cut model		1
Floor pit for repair		1
Bulldozer, scraper etc.		8
Gas welding apparatus		1 set

5) NYS THIKA-GARISSA ROAD PROJECT UNIT

a) Outline

- Thika-Garissa road construction work (Phase I 68 km completed, Phase II 68 km, 10 km is completed) is governmental project contracted to the private firm but the NYS trainees are also engaging in this project as OJT training (300 NYS trainees among 500 workers).
- The most of plant machineries used in the project are being repaired in the repairshop located about 500 m from Yatta Field Unit.

b) Impressions

- The repairshop is mainly for the changing of damaged parts of machinery and is not sufficient to conduct overhaul work of engine etc. (because of sand and dust).
- It looks difficult to obtain spare parts and actually 6 machinery were unused because of the lack of spare parts.

6) JOMO KENYATTA COLLEGE OF AGRICULTURE AND TECHNOLOGY

a) Outline

- Japanese grant aid and technical cooperation are being conducted. For buildings etc, 5.58 billion yen (Oct. 1978 - March 1985) is donated in total and for the supply of equipment in technical cooperation basis 0.42 billion yen (April 1979 - April 1988) will be made.
- At present Japanese specialist 17, JOCV 15 are dispatched to the college.
- The college has agricultural faculty with 3 departments and engineering faculty with 3 departments (8 courses) holding total figure of student 706.
- The duration of education is 3 years in agricultural faculty and 4 years and 3 months in engineering faculty both targeting Technician Part III.
- The number of Kenyan instructor at present 120.

b) Impressions

- It was long-term holiday when the team visited to the college but all facilities in engineering faculty were open to visitor attended by Japanese experts.

c) Main Equipments

- Mechanical engineering dept.

Lathe	ℓ = 500 m/m	Takizawa	11
"	ℓ = 1,500 m/m	"	2
Cylindrical grinding machine			
	ℓ = 500	Kondo	1
Vertical milling machine, #2		Enshu	1
Universal milling machine, #2		"	1
Surface grinder	stroke 600		1
Upright drilling machine			1

Radial drilling machine	ℓ = 1,500 m/m	Ohya	1
Bench drilling machine		Namiki	1
Universal tool grinder		Makino	1
• Agricultural machine dept.			
Shovel car		Kubota	1
Folk lift		Nissan	1
Bulldozer	D-20	Komatsu	1
Agricultural machine			6
• Electrical dept.			
3φ AC generator			4
D.C Switch board			3
Oil circuit breaker			1
Air circuit breaker			3
Synchroscope			3
• Carpentry dept.			
Carpentry sawing machine			2
Mould shaper			1
Wood lath			2
Drilling machine			3
Plainer etc.			5
• Sheet metal dept.			
Shearing machine			1
Bending machine			1
Hacksaw			1
Pipe cutting machine			1
Upright drilling machine			1
Bench drilling machine			1
Vivro-shearing machine			1
• Motor vehicle dept.			
Load tester	3 t	BANZAI	1
Headlight tester			1

Brake tester	1
Hydraulic press 35 t	1
Lift master	1
Bench drilling machine	1
Floor pit for repair	1

7) PANAFRICAN EQUIPMENT (K) LTD.

a) Outline

- The company undertakes the assembling and maintenance works for Komatsu construction machinery and other car manufacturer's motor vehicles.
- The company has training school and operation training programme. After the test, 10 - 20 trainees are being trained in average skill level.
- At the time of visit, 3 mechanics from dealers were under training of disassembling of motor vehicle engine.
- In the workshop (6 sections) 240 workers are in service.
- The working environment is well maintained and the working attitude of worker is excellent. And it looked that the high level technics is maintained.
- Computalized storage controle is being conducted.
- Teaching materials of hydraulic control valve and torque-converter of Komatsu are used.

b) Main Equipments

Lathe	ℓ = 2,000 m/m	2
"	ℓ = 1,500 m/m	2
Horizontal milling machine	#2	1
Shaper	stroke 500	1
Cylindrical grinding machine		1
Radial drilling machine		1

Upright drilling machine	1
Bench drilling machine	1
Press	1
Polishing machine	1
Shearing machine	1
Gas cutting apparatus	2
Overhead crane 5 t	2
Cut model, hydraulic control valve	1
Cut model, torque converter	1
Cut model, cylinder head rocked arm assy & steering gear and clutches	1
Gear pump assy tester	1
Engine overhaul stand	6
Engine dynamometer	1
Fuel pump tester	1
Fuel injection system testing machine	1

8) GENERAL MOTOR CO. LTD.

- The company was set up as a joint venture company of ISUZU and GM and mainly knock-down manufacturing 200 trucks monthly.
- 95% of motor vehicle spare parts are imported from Japan under the supervision of 3 Japanese engineers.
- Velt conveyor manufacturing system is introduced but the speed is limited.
- Working environment is good.

9) SANYO ARMCO CO. LTD.

- The company was established 18 years ago and has site area of 20,000 m².
- Main products of the company are radios, washing machines and record players and the half assembled products are being imported from Sanyo, Japan and the assemblage of detailed parts and inspections are conducted in this factory.

- As the severe quality control is being conducted in the company the returnratio is rather low.
- Many graduates from polytechnics are in service.
- The adoption of the graduate from Nakuru, and Jomo Kenyatta College of Agriculture and Technology is now under consideration for future recruitment.
- At present 18 workers are being trained in Japan.
- Working environment is not excellent.

10) METAL BOX KENYA LTD, THIKA BRANCH

a) Outline

- The company is manufacturing and dealing (for export) food can and milk can and also started to manufacture PVC pipe (ϕ 1/2 inch - ϕ 12 inch) for building plumbing work.
- The company has training school and repairshop and intensive trainings to newly employed craftsmen are being conducted.
- On the other hand, the production and repair of metal press mould for can production is being conducted within the company and heat treatment facilities are also equipped. In general the company has well equipped facilities although they seemed to be more than 15 years old.
- In training school, test pieces were displayed and they show that the skill of of these trainees is reached to certain level but judging from the cutting and grinding tools and measuring devices seen in the school, further technical improvement will be needed.
- In whole can production process, almost all equipments were british made and the automated process of material cutting - printing - bending - soldering - bottom plate fixing is introduced remaining only inspection and material in-bringing upon human power.

- The adjustment and repair works of can production equipments are being conducted by skill workers and engineers.
- In the PVC pipe production plant, ejaculation machine (3) - USA. Cincinnati Co. made - are equipped and whole pipe production - cutting process is automated.
- Re-use of PVC materials is also being conducted.
- Export price of can products is under the control of Kenyan Government.

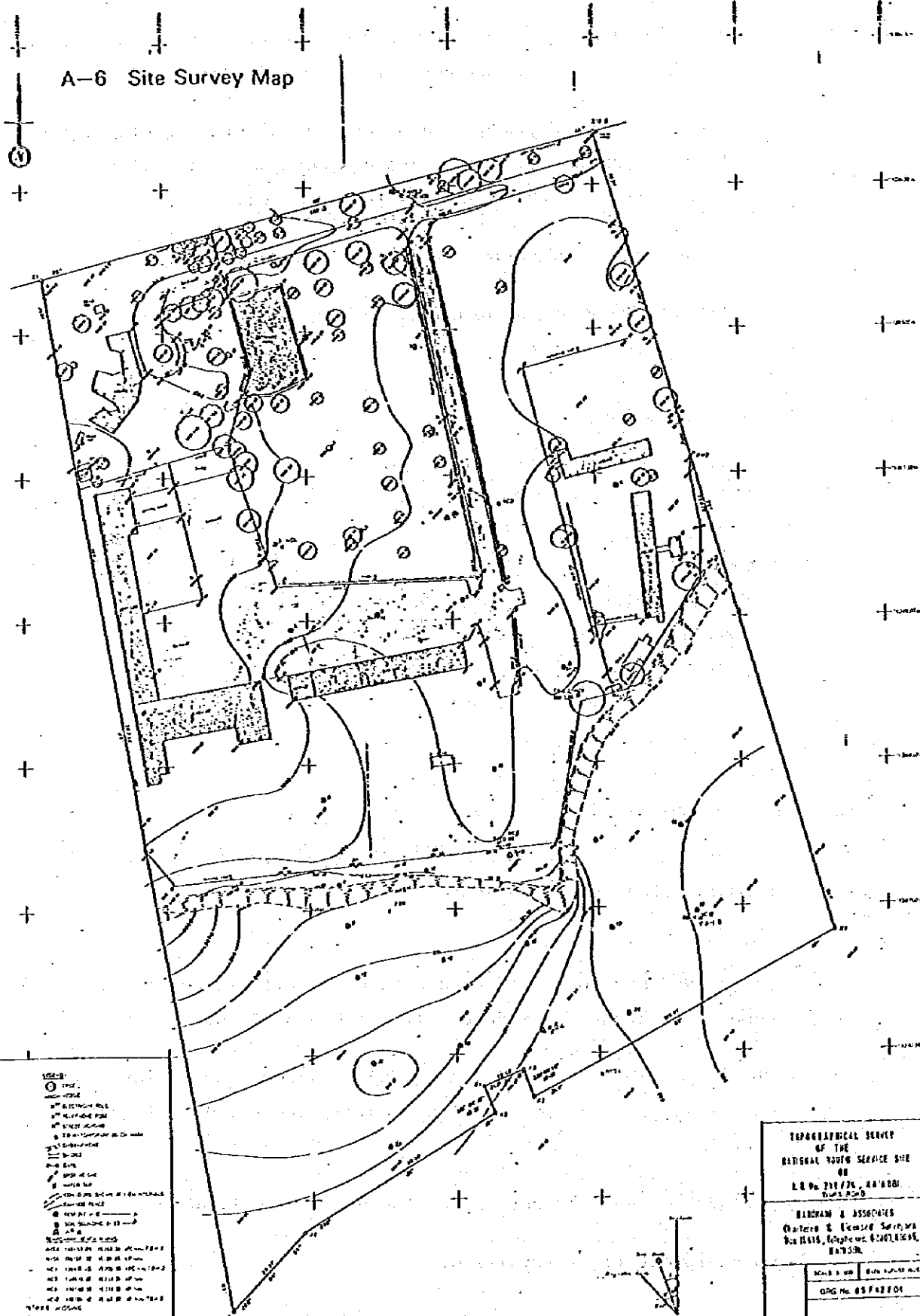
b) Main Equipment

Lathe	$\ell = 2,000$ m/m	2
"	$\ell = 500$ m/m	12
Milling machine	#2	3
Shaper		2
Surface grinder	stroke 600	1
Cylindrical grinding machine	$\ell = 1,000$ m/m	1
Radial drilling machine		1
Double head grinding machine		1
Tool grinding machine		1

11) LAYLAND KENYA LTD.

- The company is knock-down manufacturer of trucks of MITSUBISHI, SUZUKI, NISSAN etc. and spare parts are being imported from Japan.
- It seemed that the inspection upon completion is not being conducted because no such facilities can be seen.
- The company has training school and disassembling training of engine is possibly conducted but mainly the training is done in classroom.
- The working environment of the factory is excellent.
- No equipment to be specified.

A-6 Site Survey Map

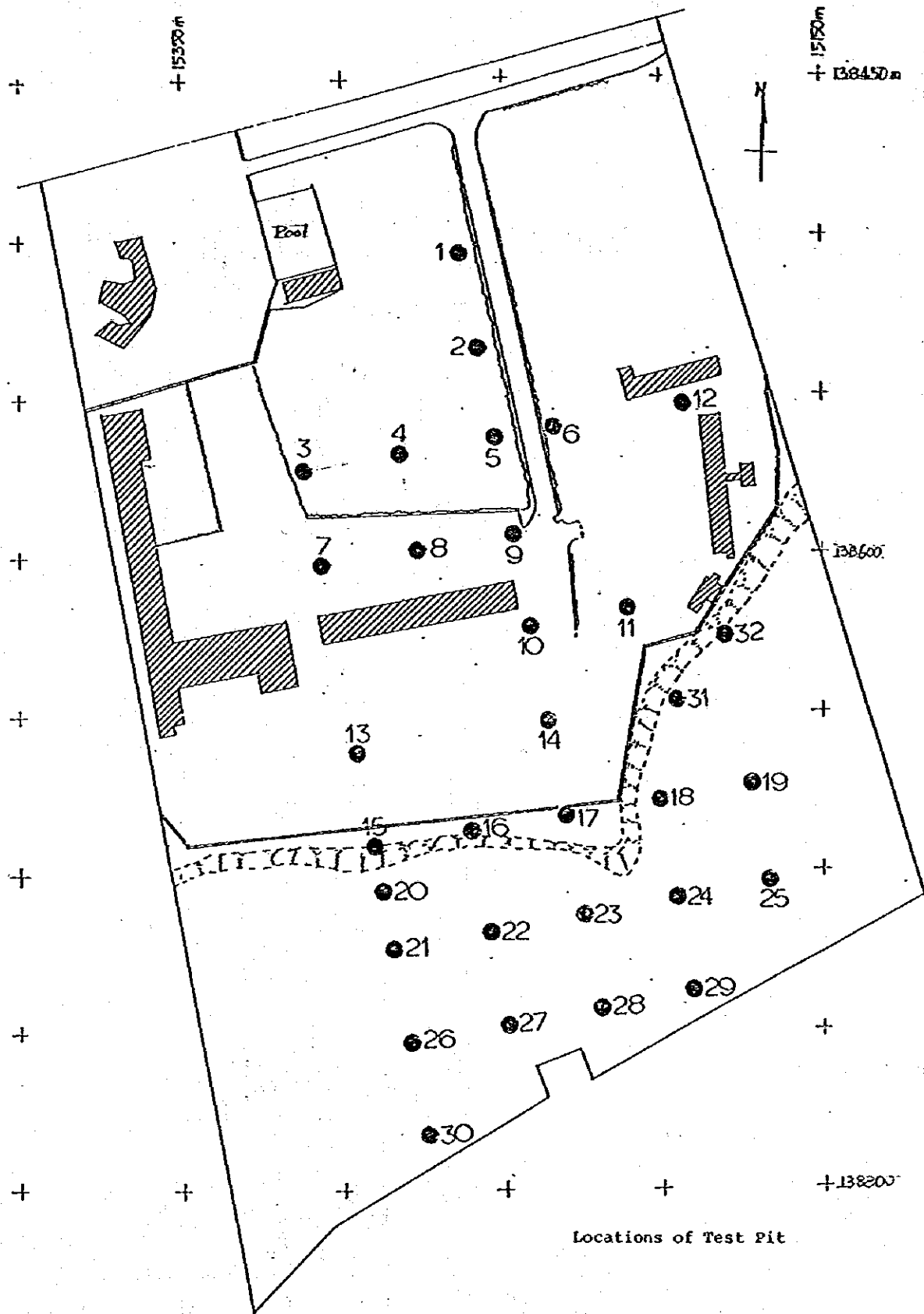


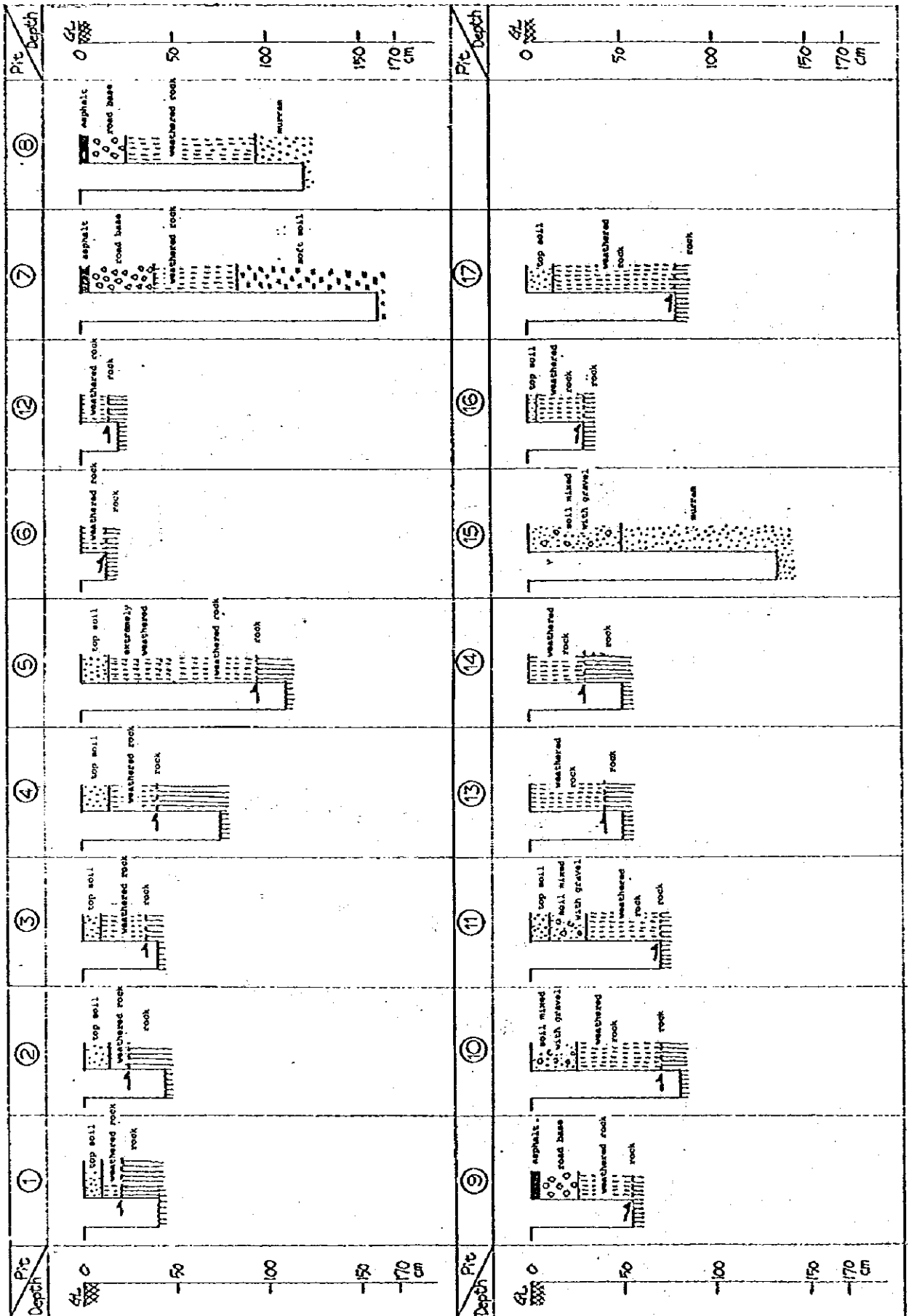
- Legend:**
- 100' - 150'
 - 150' - 200'
 - 200' - 250'
 - 250' - 300'
 - 300' - 350'
 - 350' - 400'
 - 400' - 450'
 - 450' - 500'
 - 500' - 550'
 - 550' - 600'
 - 600' - 650'
 - 650' - 700'
 - 700' - 750'
 - 750' - 800'
 - 800' - 850'
 - 850' - 900'
 - 900' - 950'
 - 950' - 1000'

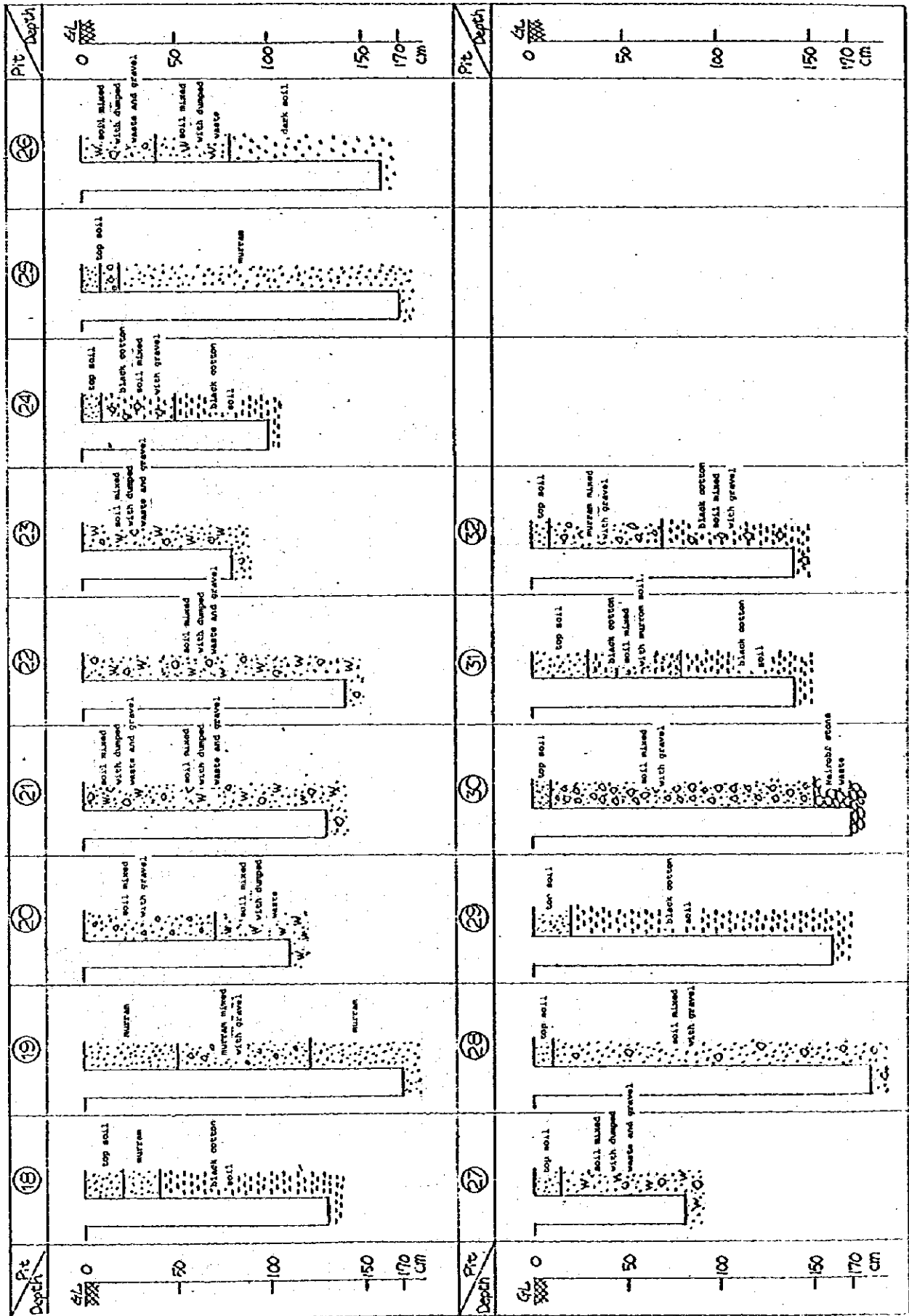
TOPOGRAPHICAL SERVICE
OF THE
NATIONAL YOUTH SERVICE SHE
ON
S.S. No. 211/74, HA'ARODI
HAIFA

BARON & ASSOCIATES
Chartered & Licensed Surveyors
No. 1111, Telephone 520715/520716,
HAIFA.

A-7 Sub-soil Survey Data







A-8 Water Quality Data of Nairobi City

To: C.C. (City Hall)

c.c. C.A.P. (O.V.) Kampala Rd. Depot
Zabote Lab. File

CITY COUNCIL OF NAIROBI
WATER SUPPLY DEPARTMENT
WATER TREATMENT LABORATORY
P.O. BOX 30556, NAIROBI. TEL. 2426; (EXT. 327)

REPORT ON CHEMICAL ANALYSIS OF WATER

Name and address of Sender	Kaboto Water Lab	Substances	mg/l
Sender's reference number	Gigiri Reservoir	Nitrates (NO ₃)	TRACE
Laboratory reference number	0/31/80	Nitrites (NO ₂)	NIL
Nature of sample		Chloride (Cl)	4
Date and time of collection	4/3/80	Free res. (Cl ₂)	0.5
Date and time of arrival at Laboratory	4/3/80	Total res. (Cl ₂)	0.55
Date and time of commencing examination	4/3/80	Combined res. (Cl ₂)	0.05
Appearance		Fluoride (F-)	0.5
Temperature (at time of collection) °C		Sulphate (SO ₄)	15.0
pH - Value	6.3	Lead (Pb)	-
Colour. H.U.	5 <i>Faint</i>	Copper (Cu)	-
Turbidity F.T.U. <i>via tit</i>	0.30 <i>Faint</i>	Zinc (Zn)	-
Taste		Iron (Fe)	0.01
Odour		Manganese (Mn)	0.5
Deposit	NIL	Calcium (Ca)	6.8
Electrical conductivity (Micro mhos/cm ³)	265	Magnesium (Mg)	6.8
		Sodium (Na)	-
		Potassium (K)	-
		Aluminium (Al)	1.5
		Silica (SiO ₂)	10

	mg/l		mg/l
Total Hardness as CaCO ₃	45	Free Carbon dioxide	-
Calcium Hardness as CaCO ₃	17	Aggressive Carbon dioxide	-
Alkalinity to phenolphthalein	5	Dissolved Oxygen	-
Alkalinity to methylorange	63	H/80 P.V. 4hrs. at 27°C	0.30
Carbonate alkalinity as CaCO ₃	10	Free Saline ammonia as (N)	TRACE
Bicarbonate alkalinity as CaCO ₃	53	Albuminoid Ammonia as (N)	0.048
Carbonate Hardness as CaCO ₃	45	C.O.D. 2 hrs.	4
Non-Carbonate Hardness as CaCO ₃	NIL	5 days B.O.D. at 20°C	-
Excess alkalinity as Na ₂ CO ₃	23		
Total dissolved Solids, Residue dried at 180°C	150.0		

Date of Report 31/3/80
 Remarks Sample of water submitted by you.
Results as shown above.

7/7

A-9 Standard of Sewer Discharge

"A" will be employed for this project.

"A"

EFFLUENT STANDARD FOR ACCEPTANCE INTO CITY'S SEWERAGE SYSTEM

- B.O.D. (5 days at 20°C).....not to exceed 450 mg/l
- pH.....to be in the range 6 to 9.
- Temperature.....Not to exceed 35°C.
- Suspended Solids.....Not to exceed 300 mg/l
- 4 hours oxygen absorption for permanganate N./80 at 27°C. 100 mg/l
- Greases: The wastes should not contain more than 100 milligrammes per litre of greases that dissolve in Ethyl-ether.
- Oil, Petrol, Kerosene or other combustible materials must be intercepted.
- TOXICITY: The wastes should not include any toxic materials.

In addition the waste should not contain materials that might damage pipes or treatment works.

The flow must not exceed the capacity of the sewerage system and a meter is to be provided with a log book to record flows which can be inspected by the City Engineer or Medical Officer of Health.

Quarterly tests will be carried out, at the expense of the industry concerned, in accordance with the "Standard Methods for the Examination of Water, Sewage and Industrial Wastes", issued by the American Public Health Association.

"B"

EFFLUENT STANDARD FOR DIRECT DISCHARGE TO NATURAL WATER COURSES

- C.O.D.....Not to exceed 10 mg/l
- Total Nitrogen exclusive NO_3 1 mg/l
- NH_31.5 mg/l
- B.O.D.(5 days at 20°C).....Not to exceed 20 mg/l
- pH.....In the range 6 to 9.
- Temperature.....Not to exceed 25 C.
- Suspended Solids.....Not to exceed 30 mg/l
- Total Dissolved Solids.....Not to exceed 1,500 mg/l
- 4 hours oxygen absorption for permanganate N./80 at 27°C not to exceed 15 mg/l.
- Nitrate as NO_3Not to exceed 45 mg/l

All other standards mentioned in "A" supra viz. greases, oils, toxic materials also apply.

A-10 Data of Training Activities of NYS

Mombasa Vocational Training Unit

	1976	1977	1978	1979	1980	1981	1982	1983	1984	Total
Carpentry	60	58	61	57	58	64	66	66	69	557
Masonry	60	60	59	59	60	60	66	72	71	
Motor V. Mechanics	63	59	60	60	54	66	72	72	74	
Turning	16	19	20	31	33	39	39	39	40	
Fitting	17	17	20	20	30	60	66	72	72	
Electrical Wiring	46	47	47	47	52	54	60	60	66	
Welding	4	4	4	11	5	6	20	23	24	
Plumbing	3	4	3	4	6	8	12	16	40	
Motor V. Electrician	-	-	-	-	-	-	-	16	40	
	269	268	274	289	298	357	399	422	476	

	1981	1982	1983	1984	Total	
Secretarial School	93	189	169	141	592	
Upholstery School	20	56	32	37	145	
Driving School	225	150	81	151	607	
Tailoring/Dressmaking S.	287	300	320	320	1227	
Rural Craft Training Unit	90	90	108	120	408	
Plant Operator	-	-	30	60	90	
Plant Mechanics	-	-	36	60	90	
On-the-job Training	500	504	490	320	1814	All trades
Apprenticeship Training	-	-	-	216	216	All trades

Advance Engineering Training

Course	1981		1982		1983		1984		Total	
	No.	Pass	No.	Pass	No.	Pass	No.	Pass	No.	Pass
Fitting	32	29	39	38	47	40	50	46	168	153
Turning	29	26	29	26	28	26	28	25	114	103
Electrical Wiring	33	32	38	36	43	41	45	43	159	152
	94	87	106	100	118	107	123	114	441	408
Motor V. Mechanic	48	40	71	61	80	67	64	59	263	227
Motor V. Electrician	16	16	18	15	13	10	45	43	92	84
	64	56	89	76	93	77	109	102	355	311
Carpentry	-				15	-	30	-	45	-
Masonry	-				15	-	30	-	45	-
Plumbing	-				90	-	20	-	110	-
					120	-	80	-	200	-

A-11 Financial Data

1) Recurrent Budget of NYS Mombasa Vocational Training Centre (1984/85)

HEAD 358 - TRAINING UNITS

STATION CODE - 6507

SUB-HEAD 340 - CDT

MOMBASA VOCATIONAL TRAINING UNIT

SUB-VOTE/ITEM	ALLOCATION	VOTE HOLDER
000 PERSONAL EMOLUMENTS	KE	
001 Salary	72,008	DSP
050 HOUSE ALLOWANCE	11,000	"
060 OTHER PERSONAL ALLOWANCES	3,400	"
080 PASSAGES AND LEAVE EXPENSES	2,500	DNYS
100 TRANSPORT OPERATING EXP. (KE 19,000)		
101 Running Expenses of Vehicles	9,500	CDT-MVTU
108 Hire of Replacement Transport	7,000	O'C-MTB
109 Nyali-Likoni-Mtongwe Tolls	2,500	CDT-MVTU
110 TRAVELLING AND ACCOM. EXP	4,500	CDT-MVTU
120 POSTAL AND TELEGRAM EXPS.	400	"
121 TELEPHONE EXPENSES	1,950	DNYS
140 ELECTRICITY, WATER AND CONSERVANCY (KE 7,500)		
141 Electricity	3,400	CDT-MVTU
142 Water	4,000	"
143 Conservancy	100	"
160 FOOD AND RATIONS	110,000	"
190 MISCELLANEOUS OTHER CHARGES	1,200	"
220 PURCHASE OF STORES, PLANT AND EQUIPMENT	40,000	DNYS
260 MAINTENANCE		
261 Maintenance of Station	800	CDT-MVTU

2) Recurrent Budget of NYS Yatta Field Unit (1984/85)

SUB-HEAD 440 - CDT

YATTA FIELD UNIT

STATION CODE 5302

	SUB-VOTE/ITEM	ALLOCATION	VOTE HOLDER
		KE	
000	PERSONAL EMOLUMENTS (KE 93,258)		
001	Salary	93,258	DPS
050	HOUSE ALLOWANCE	2,000	PFED
060	OTHER PERSONAL ALLOWANCES	3,450	
080	PASSAGES AND LEAVE TRAVEL	2,000	DNYS
100	TRANSPORT OPERATING EXPENSES (KE 14,000)		
101	Running, Expenses of Vehicles	7,000	CDT-YFU
108	Hire of Replacement Transport	7,000	O'C-MTB
110	TRAVELLING & ACCOM. EXPENSES	5,500	CDT-YFU
120	POSTAL & TELEGRAM EXPENSES	120	"
121	TELEPHONE EXPENSES	943	DNYS
140	ELECTRICITY, WATER & CONSERVANCY (KE 1,640)		
141	Electricity	1,500	CDT-YFU
142	Water	140	"
160	FOOD AND RATIONS	100,000	"
190	MISCELLANEOUS OTHER CHARGES	200	"
220	PURCHASE OF STORES, PLANT & EQUIPMENT	7,135	DNYS
260	MAINTENANCE OF STATIONS	50	CDT-YFU

3) Recurrent Budget of Turbo Field Unit (1984/85)

SUB-HEAD 770 - CDT

TURBO FIELD UNIT

STATIONS CODE 1002

SUB-VOTE/ITEM		ALLOCATION	VOTE HOLDER
		KE	
000	PERSONAL EMOLUMENTS (K£ 54,720)		
001	Salary	52,620	DS/P
050	HOUSE ALLOWANCE	17,200	"
060	OTHER PERSONAL ALLOWANCES	2,100	"
080	PASSAGES & LEAVE EXPENSES	6,500	DNYS
100	TRANSPORT OPERATING EXPENSES (K£ 17,123)		
101	Running Expenses of Vehicles	7,000	CDT-TFU
102	Tools and Sundries	5,623	DNYS
108	Hire of Replacement Transport	4,500	O'C-MTB
110	TRAVELLING & ACCOM. EXPENSES	3,500	CDT-TFU
120	POSTAL AND TELEGRAMS EXPENSES	100	"
121	TELEPHONE EXPENSES	943	DNYS
140	ELECTRICITY, WATER & CONSERVANCY (K£ 2,000)		
141	Electricity	1,000	CDT-TFU
142	Water	1,000	"
160	FOOD AND RATIONS	70,000	"
190	MISC. OTHER CHARGES	240	"
220	PURCHASE OF STORES, PLANT AND EQUIPMENT	5,430	DNYS
260	MAINTENANCE OF STATIONS	445	CDT-TFU

4) Recurrent Budget of Kenya Polytechnic, Nairobi (1984/85)

Kenya Polytechnic, Nairobi

Personal Emoluments		99,672
Gratuity and Pension Contributions		13,125
House Allowances		6,800
Other Personal Allowances		65,000
Passages and Leave Expenses		100
Travelling and Accommodation Expenses		1,000
Payment of Rents and Rates - Residential		85,000
Grants to T.S.C.-Teachers Pers. Emoluments		657,779
Grants to T.S.C.-Teachers Gratuities & Pensions		13,718
Grants to T.S.C.-Teachers House Allowances		160,000
Grants to T.S.C. Teachers Other Pers. Allowances		30,424
Grants and Grants-in-Aid		400,000
Grants-Students' Bursaries		79,000
NET EXPENDITURE	K£	<u>1,611,618</u>

5) Recurrent Budget of Mombasa Polytechnic (1984/85)

Mombasa Polytechnic

Personal Emoluments		31,100
Gratuity and Pension Contributions		2,196
Other Personal Allowances		2,000
Travelling and Accommodation Expenses		200
Payment of Rents and Rates - Residential		26,546
Grants to T.S.C.-Teachers Personal Emoluments		353,621
Grants to T.S.C.-Teachers Gratuities & Pensions		13,928
Grants to T.S.C.-Teachers House Allowances		25,000
Grants to T.S.C. Teachers Pers. Allowances		8,000
Grants and Grants-in-Aid		270,000
Grants-Students' Bursaries		40,000
NET EXPENDITURE	K£	<u>772,591</u>

6) Recurrent Budget of Harambee Institute of Technology (HIT) (1984/85)

Institutes of Technology (Harambee)

Personal Emoluments		11,872
Gratuity and Pension Contributions		2,196
Travelling and Accommodation Expenses		2,400
Payment of Rents and Rates - Residential		8,000
Grants to T.S.C.-Teachers Personal Emoluments		415,963
Grants to T.S.C.-Teachers Gratuities & Pensions		1,500
Grants to T.S.C.-Teachers House Allowances		45,175
Grants and Grants-in-Aid		410,000
NET EXPENDITURE	K£	898,556

7) Recurrent Budget of Kenya Technical Teachers College (KTTC) (1984/85)

Kenya Technical Teachers College

Travelling and Accommodation Expenses		4,000
Payment of Rents and Rates - Residential		26,000
Grants to T.S.C.-Teachers Pers. Emoluments		240,852
Grants to T.S.C.-Teachers House Allowances		21,936
Grants to T.S.C.-Teachers Other pers. Allowances		6,000
Personal Emoluments		613,166
Grants to Students' Bursaries		30,000
NET EXPENDITURE	K£	924,254

8) Development Budget of NYS (1984/85)

National Youth Service

Headquarters Administration Services

Planning, Feasibility and Design	250,000
Additional Transport (Tana River Project)	10
Furniture and Equipment	290,750
Minor Works	-
Kerio Valley Road Project	500,000
Construction of Buildings	200,000
Expansion of Vocational Training	250,000

Tana Basin Road Project

Construction Equipment	4,750,000
Construction of Buildings	2,000,000

GROSS EXPENDITURE	K£	8,240,760
-------------------	----	-----------

Appropriations in Aid

Credit Purch. Vehicle-Japan Comm. Loan & Tech.Aid.	4,750,000
Training Grant from Netherlands	250,750
Training Grants from Japan	250,000

TOTAL APPROPRIATIONS IN AID	K£	5,250,750
-----------------------------	----	-----------

NET EXPENDITURE	K£	2,990,010
-----------------	----	-----------

Training Units

Construction of Buildings	3,123,500
---------------------------	-----------

NET EXPENDITURE	K£	3,123,500
-----------------	----	-----------

Production Units

Minor Works	-
Construction of Buildings	50,000
Bura Irrigation Scheme	150,000
Kirimoni Ranching Scheme	5,000

NET EXPENDITURE	K£	205,000
-----------------	----	---------

NET TOTAL NATIONAL YOUTH SERVICE	K£	6,318,510
-------------------------------------	----	-----------

A-12 General Information of Kenya

Land area;	582,646 km ² (about 1.6 times larger than Japan)
Population;	16.30 million (estimated in 1981) Annual growth rate 3.9%
Constitution;	Form of the state - Republic Legislative power - National Congress . Administrative power - Administrative bodies under the President . Judicial power - Supreme Court . Political party - KANU (Kenya African National Union)
Economy;	GNP per capita - US\$390 (1982) Average GDP growth rate - 1980 3.3 % (actual) 1981 5.5 % 1982 3.3 % 1983 3.3 % (estimate) Currency - Kenya shilling (Kshr.) (1 Kshr. = 13.0 yen Aug. 1985) Industry - Main industries are agriculture, agricultural processing, assembling industries and tourism.
History;	12th Dec. 1963 - Independence as a member of the British Commonwealth of Nations 12th Dec. 1964 - Became a republic.
Language & Religion;	Official language - Kiswahili and English Religion - Christianity, Islam etc.
Tribe;	Main tribes - Kikuyu, Luyia, Luo, Kamba, Kalenjin etc. Among total population 98% Africans followed by Asians (Indian, Pakistani), Europeans and Arabs.

JICA