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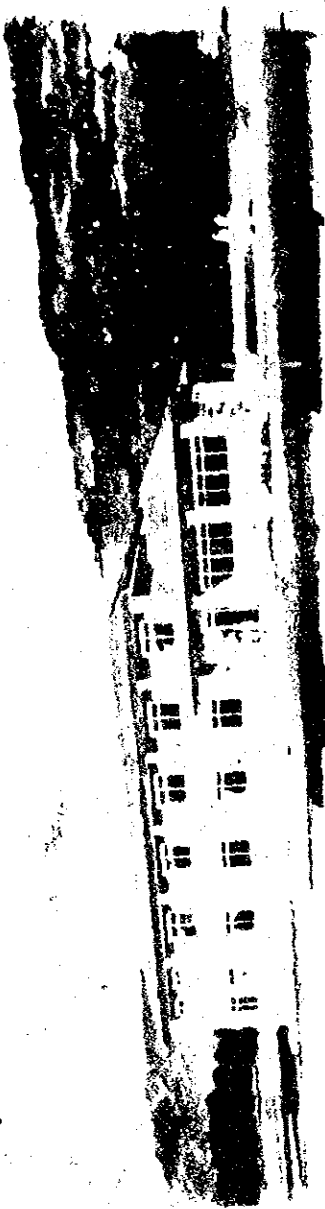
**DRAFT REPORT
ON
PRELIMINARY DESIGN

HEALTH POSTS
AND
WESTERN REGIONAL HEALTH LABORATORY
IN
THE KINGDOM OF NEPAL**

FEBRUARY, 1978

JAPAN INTERNATIONAL COOPERATION AGENCY

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DORMITORY

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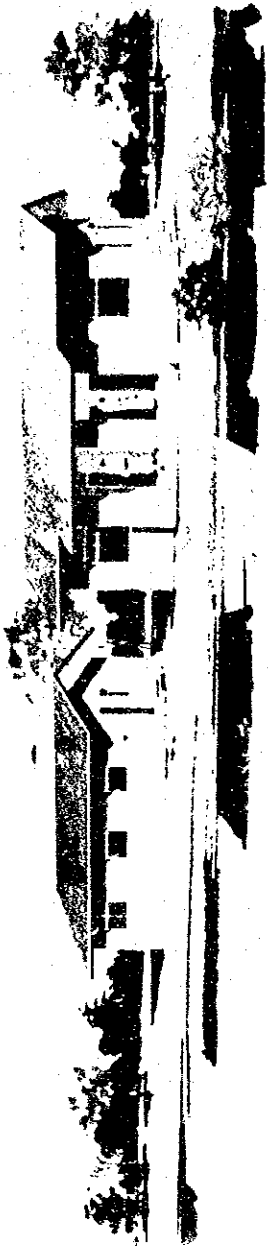


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LABORATORY

PROSPECTED VIEW

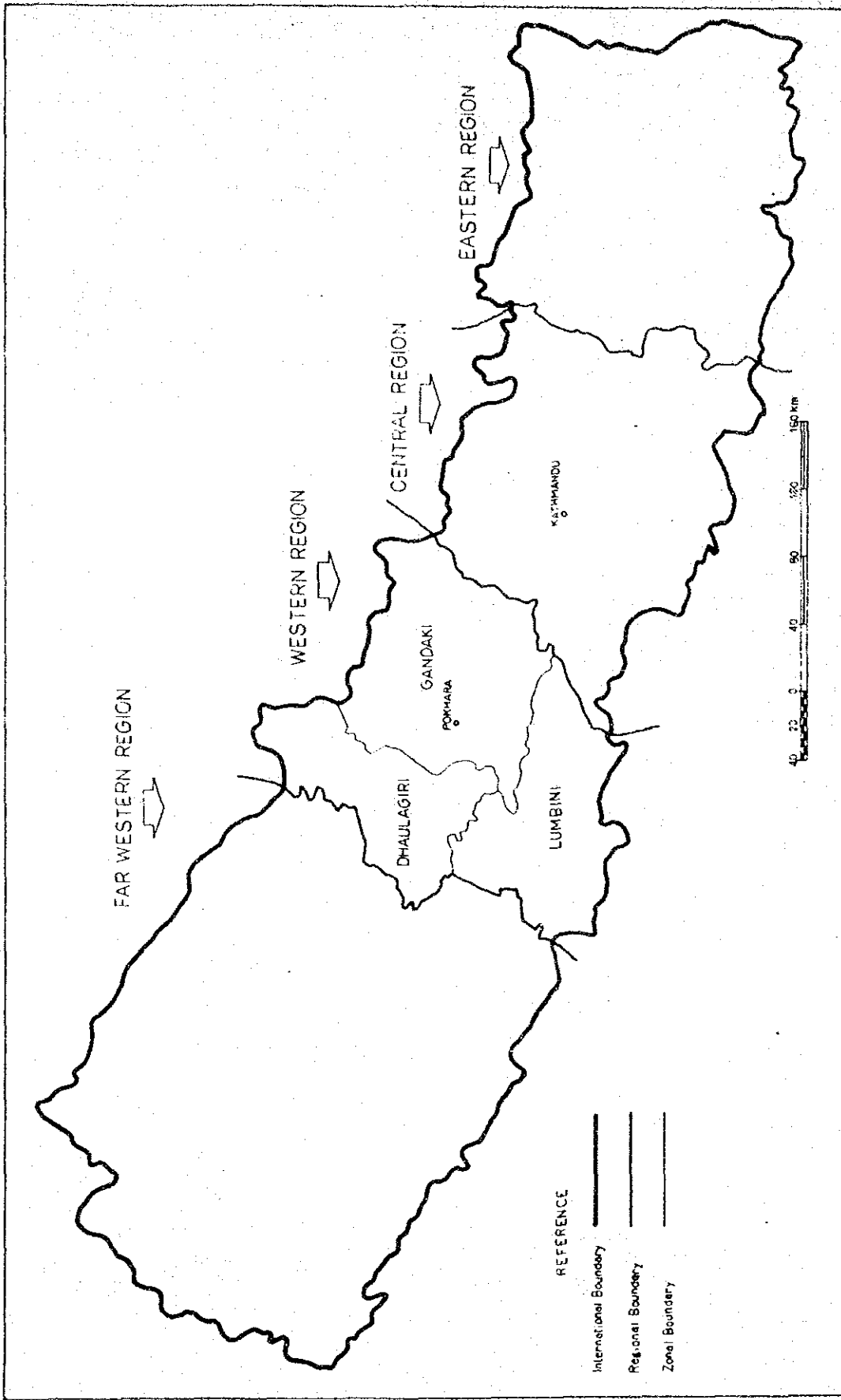


HEALTH POST-2

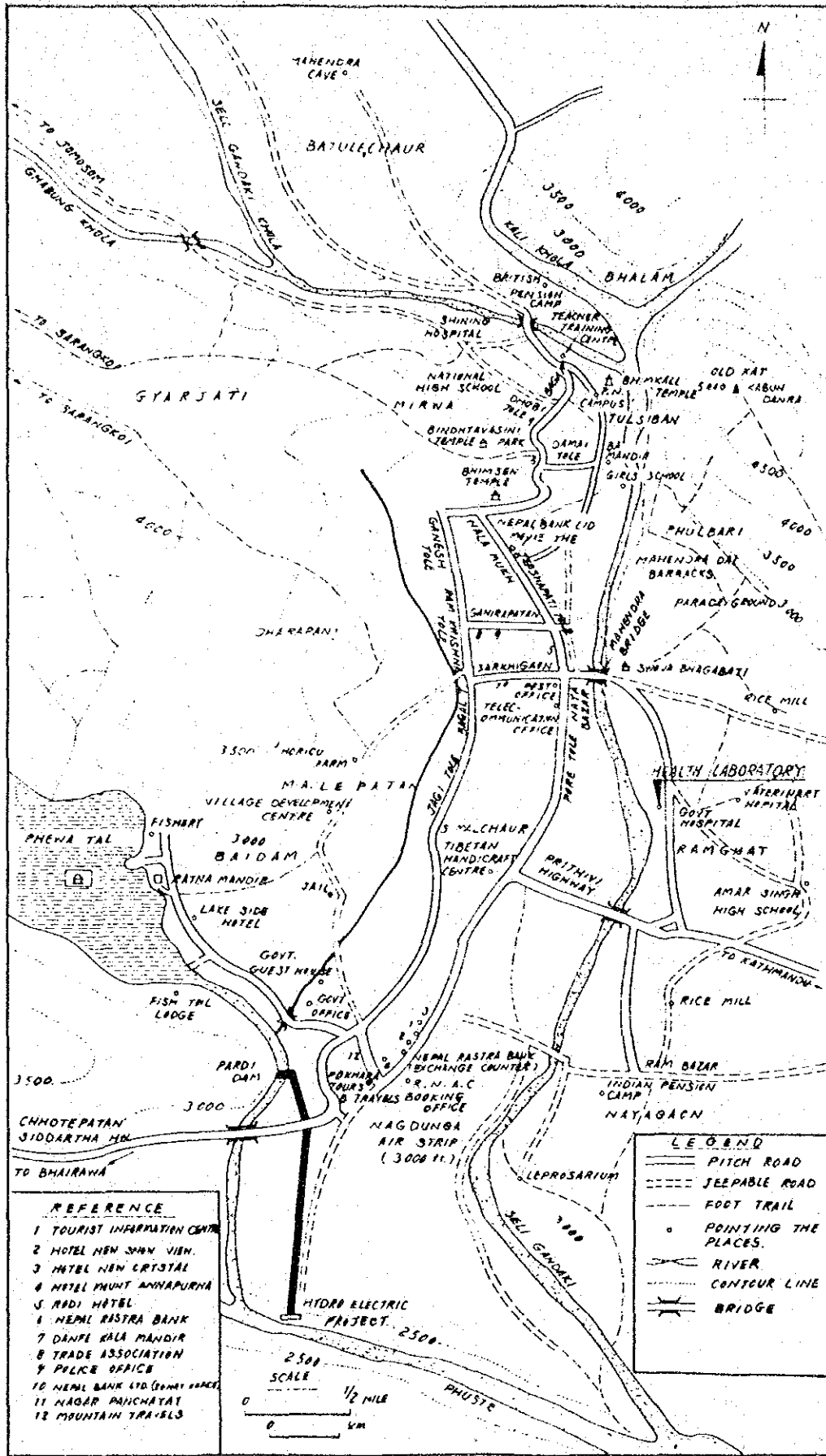


HEALTH POST-1

PROSPECTED VIEW



THE KINGDOM OF NEPAL



INTRODUCTION

This report submitted herewith is a draft of the master plan for the construction of health posts and Western Regional Health Laboratory (hereinafter referred to as Laboratory) in the Kingdom of Nepal.

In response to the request of His Majesty's Government of the Kingdom of Nepal (hereinafter referred to as H.M.G. of Nepal) to the construction of twenty-two health posts and the Laboratory in the western region of Nepal, the Government of Japan decided to cooperate the construction based on a grant assistance and the Japan International Cooperation Agency (JICA) conducted a survey for the preliminary design.

The JICA, fully realizing the significance of the mission assigned to it, organized a survey team consisting of eight experts in the fields of administration, medicine and construction engineering, headed by Dr. Aoki and dispatched it to Nepal at the end of October 1977, for the purpose of carrying out preliminary design for the construction of said facilities, enumerating the supplies required for the facilities and arranging the costs for construction, materials and supplies to be within the scheduled framework of grants.

The team made a field survey for this project for twenty-two days while energetically participating in discussions with the officials of H.M.G. of Nepal, medical and construction engineers concerned, and could collect information and data necessary for the preliminary design.

The team is greatly indebted to H.M.G. of Nepal which has spared no effort extend its unlimited cooperation and assistance to the team for smooth survey work.

The present draft report has been prepared based on the findings of the survey.

The final report will be prepared according to the discussions over the draft report with the officials of H.M.G. of Nepal and the results of a supplementary survey to be conducted concurrently.

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1. BASIC DESIGN

1-1. Overview of the facilities

The project covers the following facilities.

- | | |
|--|----------------------|
| (1) Western Regional Health Laboratory
(hereinafter referred to as Laboratory) | x 1 building |
| (2) Trainees accommodations for the Health
Laboratory above (hereinafter referred
to as Dormitory) | x 1 building |
| (3) Health post (1) (2-story building) | } buildings in total |
| (4) Health post (2) (1-story building) | |

1-1-1. Laboratory

Two-story reinforced concrete structure with steel roof truss.

Construction area	459.63 m ²
Ground floor, floor area	364.98 m ²
First floor, floor area	364.98 m ²
Aggregate floor area	729.96 m ²

1-1-2. Dormitory

Two-story reinforced concrete structure with steel roof truss
partially with a one-story structure.

Construction area	302.76 m ²
Ground floor, floor area	247.80 m ²
First floor, floor area	189.00 m ²
Aggregate floor area	436.80 m ²

1-1-3. Health post (1)

Two-story stone or brick masonry structure with the first floor slab made of reinforced concrete, and with steel roof truss.

Construction area	96.66 m ²
Ground floor, floor area	85.41 m ²
First floor, floor area	78.65 m ²
Aggregate floor area	164.06 m ²

1-1-4. Health post (2)

Stone or brick masonry one-story structure with steel roof truss.

Construction area	191.92 m ²
Floor space	169.3 m ²

1-2. Design principles

The preliminary design has been made according to the following principles.

- (1) The design shall fully incorporate the ideas and demands of the Nepalese users.
- (2) The design shall be in harmony with the natural environments at site.
- (3) The design shall facilitate the maintenance and management in keeping with local conditions.
- (4) The design shall be adapted for the local state of art in construction engineering.
- (5) The design shall be given a flexibility permitting the future changes in use of buildings.
- (6) The design standards shall be established to meet the actual circumstances of the Kingdom of Nepal while taking into account the Japanese laws, regulations and standards concerning buildings, structures and facilities.
- (7) The materials and supplies available locally shall be made most use of, and the materials and supplies from Japan shall be used only if necessary or justifiable so to do.

- (8) As regards the health posts, two standard design plans (one-story plan and two-story plan) shall be prepared in order to permit the choice between the two depending on the natural and economic conditions. After finalizing the site location, skip-floor plan shall be provided as required.

The principles set for the buildings are given in more detail below.

1-2-1. Laboratory

- (1) The horizontal dimensions shall be as agreed upon at the meeting with the officials of the Ministry of Health of H.M.G. of Nepal.
- (2) The design shall be so made as to permit that degree of future expansion set forth in the original plan of the Ministry of Health.
- (3) The building shall not be provided with any structural partition. This will facilitate the modification of geometry whenever so required.
- (4) The floors and wainscottings for the laboratory room and examination room shall be finished with a synthetic resin paint for ease of washing with water.
- (5) The eaves and louvres shall be used to minimize the room temperature change by preventing the direct sunlight from entering the room.

- (6) The building shall be designed for thorough draft and ventilation in consideration of subtropical climate.
- (7) The laboratory room and examination room shall be provided with sinks and work benches tantamount to the Central Health Laboratory's.
- (8) The water supply installation shall be of the gravity system in which water is pumped from a water receiving tank to head tank from which it is distributed gravitationally.
- (9) The Drainage system shall be of the separated type in which soil is run separately from other types of waste water. The soil shall be treated in a septic tank, and the other types of waste water shall be drained by seaking.
- (10) The laboratory shall be served with gas from LPG cylinders.
- (11) The lighting and power circuits for the building shall be served with 400/230 V, 50 Hz. A diesel generator shall be installed for the refrigerator and incubator in order to provide against blackout failure.
- (12) A lightning rod system shall be installed.
- (13) The building shall be provided with a piping harness for one telephone circuit.
- (14) The ventilation shall be of the natural type. Each of the rooms and aisles will be provided with suspension fans.

- (15) Hot water supply and air conditioning facilities shall not be installed.

1-2-2. Dormitory

- (1) The horizontal dimensions shall be as agreed upon at the meeting with the officials of the Ministry of Health of H.M.G. of Nepal.
- (2) The building structure shall be of the same type as the Laboratory.
- (3) The installations to be provided shall be almost the same as the Laboratory, with the exception that the diesel generator and the suspension fan shall not be installed.
- (4) The same design considerations as with the Laboratory shall be provided.

1-2-3. Health post

- (1) The room size shall be nearly as per the original plan prepared by the Ministry of Heal of H.M.G. of Nepal.
- (2) The ceiling height shall be at least 3 meter in Terai Area and at least 2.4 meter in the hilly area.
- (3) Care shall be taken of draft and ventilation.
- (4) The two examination rooms shall be provided with one washbain each, and the dispensary with one laboratory sink. The food demonstration room shall be provided with a sink and served with water.

- (5) The food demonstration room shall be provided with a chimney, and shall use wood as a fuel.
- (6) The lavatory shall be detached, and its two compartments shall be provided with a water cock each.
- (7) Whether or not the lavatory is of the flush type shall be determined upon investigation of topographical conditions after siting.

1-3. Site condition

1-3-1. Sites

a) Laboratory and Dormitory

The site for the Laboratory lies N.Lat. 28°13' by E.Long. 84°00' at an altitude of 918 m. It is a truncated quadrangular pyramid (measuring about 101 m in top length and 166 m in bottom length and 73 m in height) on the southwest of Gandaki Zonal Hospital in Pokhara.

The dormitory site is planned to be located at a part of the belt zone between the river and hospital site to the north of the laboratory site, but no detail data has been obtained.

b) Health Post

The following villages were designated by the ministry of Health as proposed sites for Health Posts. The number of buildings and definite site location shall be finalized after a more detailed survey.

◦ Category-A (total 12 points)

Walling, Dumukauli, Pritamji Ghat, Dumkibas, Rayapur, Karamhawa, Semara Bazar, Majhgaon, Bishnupur, Hathumsa, Khairawa, Chormara.

◦ Category (total 14 points)

Bhirkot, Chilaumbas, Biruwa Bazar, Kristi Nachaune Chaur, Birgha Archale, Suntalitar, Rakuwa, Bunglingtar, Arunodaya, Sambhuhatia, Chipchipe, Jyamaruk, Thaprek, Majhkateli.

1-3-2. Weather conditions

- The weather data recorded at Pokhara are as listed below.

Temperature	◦ Summary (May ~ Sep.): Monthly average maximum, 30.1°C	1966 ~ 1977
	◦ Winter (Dec. ~ Feb.): Monthly average minimum, 7.6°C	
Relative humidity	◦ Monthly average (at 8:40 AM): - [Summer, 79 to 86% [Winter, 59 to 78%	1967
	◦ Monthly average (at 5:40 PM): - [Summer, 70 to 79% [Winter, 41 to 72%	
Reinfall	◦ Daily maximum, 205 mm/d.	1966 ~
	◦ Hourly maximum, 56 mm/h.	1975
Snowfall	◦ nil ○	
Maximum wind velocity	◦ 30 m/sec.	1972 ~ 1975

- The weather data recorded at Bhairawa are as listed below.

Temperature	◦ Summer (May ~ Sep.): Monthly average maximum, 35.2°C	1973 ? 1975
	◦ Winter (Dec. ~ Feb.): Monthly average minimum, 7.6°C	
Relative humidity	◦ Monthly average (at 8:40 AM): - Summer, 53 to 88% Winter, 79 to 94%	1973 ? 1975
	◦ Monthly average (at 5:40 PM): - Summer, 40 to 87% Winter, 36 to 83%	
Reinfall	◦ Daily maximum, 185 mm/d.	1970 ? 1975
Snowfall	◦ nil	
Maximum wind	◦ 32.5 m/sec.	1971 ? 1975

1-3-3. Geology

a) Soil conditions at hilly area

The Pokhara basin is covered with a thin layer of humus soil. At a depth of several tens of centimeters, gravel is beginning to appear in humus soil.

At a depth of 40 to 50 cm, a thin conglomeratic layer is hit. From around 1.0 m deep, conglomeratic sedimentary rocks appear.

The soil bearing power of the conglomeratic sedimentary rock layer is more than 50 tons/m². The top soil above the conglomeratic sedimentary rock layer is somewhat undulating, and the footing depth of the structural foundation should preferably be set at around 1.0 m with the soil bearing power of the conglomeratic layer taken as 30 tons/m².

So far as the topography shows, the hilly area apart from the basin will have almost the same soil profile as above.

b) Soil conditions in the plain

A clayey layer of the same quality is seen almost entirely in the flat terrain. The ground surface has several tens of centimeters of humus soil below which lies an unknown thickness of clayey layer.

The adhesion of the clay is estimated to be considerably large; under natural conditions, the clay can be cut at a slope angle, ϕ , of 45° to 60°. In support of this, some river banks show a natural slope of as steep as 70° to 80°.

It is therefore expected that a soil bearing power of 15 tons/m² will be obtainable. For more detail data, soil tests will be necessary, however.

1-4. Overall plan

The building for which construction site has already been decided is the Health Laboratory alone. The slope of the truncated quadrangular pyramid fringes on a river. The slope appears to be a straight line on the layout drawing, but actually shows an uneven contour though a detail survey map is not available at present. There is a public road on the south of the site, which is enough for vehicular passage.

According to the layout drawing for the expansion of Gandaki Zonal Hospital, the road is expected to be widened to some 24 m at the expense of the construction site for the Health Laboratory.

It should be noted from the viewpoint of overall plan that, although the Health Laboratory is to be constructed adjacent to the building of Zonal Hospital, they are under the control of separate management bodies. The layout design will be made so that the building may come at the center of the construction site upon completion of future expansion work. Since the buildings of the Zonal Hospital are arranged parallel to east-west and north-south crisscross lines, the buildings for the Laboratory will be aligned to them. The main entrance will be provided to face the public road on the south.

The dormitory site has not been finalized yet, but it is assumed to be located at a part of the belt zone to the north of the laboratory site running from the north to the south which is planned to be purchased. Access-ways to the laboratory shall be constructed as a footpath going to the south on the west side of the Zonal Hospital and as a roadway running to the north from the highway along the river.

1-5. Building plan

1-5-1. Layout plan

a) Laboratory

The original plan presented by H.M.G. of Nepal has been subjected to a considerable degree of modification with the dimensions reduced to a half and the floor space of each laboratory room doubled. The layout in the original plan is respected in that the main entrance and staircase are located at the center, that both the ground and the first floor are of the middle corridor type, and that the ground floor is provided with laboratory rooms and stores while the first floor is equipped with general office, seminary room and staff rooms.

The future expansion will be made on the west. In this case, the stores may be converted into a laboratory by partitioning the middle corridor.

Because the main structure is a two-story one of the fireproof type with a first-floor space of not exceeding 400 m² and because the building is for the laboratory use, only a single staircase at the center will do for the time being. If the Laboratory is expanded in the future, another staircase should be installed on the western end of the building not only for the sake of convenience, but also for emergency purpose.

As originally planned, two toilet rooms are installed each on the ground and the first floor, and each toilet room is equipped with two booths.

b) Dormitory

In principle, a bedroom will be installed on the west of main hall, and a cafeteria, kitchen and general office on the east. The

bedroom will be of the two-story structure for separation of male and female by floor.

In line with this, the equal numbers of toilet booths, washbasins and shower booths are provided on each floor (3 toilet booths and 2 shower booths on each floor). A salon, which is located toward the bedroom, permits direct access from the hall.

In Nepal where the climate is subtropical, the Japanese notion that everyone favors the southern, sunny room does not always hold water with the Nepalese. Rather, the room which commands the grandeur of the Himarayas on the north is considered the best.

For this reason, the cafeteria and salon are arranged on the northeastern corner and on the north, respectively, so that the boarders can enjoy the grand view of the Himarayas while having a meal and chatting.

The cafeteria, kitchen and office room are designed to be of the one-story type, and their ceiling can be set high enough irrespective of the ceiling height of the bedroom section.

c) Health Post-(1), (2)

As regards the ground floor plan, the health post (1) gives a higher degree of privacy to the examination room as compared with the health post-(2) because it is provided with a middle corridor, but makes each room smaller. Also, the lines of motion are likely to be constricted at the narrow corridor. In the health post-(2), on the other hand, the hall serves as an access way to each room, making it possible to make each room more spacious.

The Health Post-(2)-2 is a one-story building with nearly the same floor space as the first floor space of the health post (1), and each room is given direct access to and from the outdoors.

A detached lavatory with two booths is installed one each for the health posts.

1-5-3. Structural plan

In the Kingdom of Nepal, there are no laws nor design standards concerning the design of building structures. All rests with the designers.

The external forces on the structures, allowable stress intensities of structural materials, and structural design principles are set as detailed below.

a) External forces

1) Fixed load

The fixed load (dead load of building) is to be calculated to meet specific conditions of each building.

2) Live load

Unit: kg/m²

	For floor design	For design of girder beam, post, wall	Seismic-load
1st floor of Health Post (First floor of Dormitory)	180	130	60
1st floor of Laboratory (excl. seminary room)	300	180	80
1st floor of Laboratory (seminary room)	300	270	160

3) Wind load

The wind pressure, P (kg/m²), to be used for structural calculation is given by the following formula.

$$P = Cq$$

Where, C : wind force coefficient

q : wind pressure (kg/m²)

For a maximum instantaneous wind velocity, V , of 50 m/sec., q is set as follows.

$$q = 40\sqrt{h} \text{ (kg/m}^2\text{)}$$

Where, h : height above ground (m)

4) Snow load = 0

5) Seismic force

Seismic coefficient, $k = 0.10$

b) Allowable stress intensity

1) Allowable stress intensity of reinforcing bar

Type of reinforcement	Long-term allowable stress intensity		Short-term allowable stress intensity
	Tensile	Compression	
SD30 (of Japanese make)	2.0 t/cm ²	2.0 t/cm ²	1.5 times the longterm value
SR24 (of Japanese make)	1.6 t/cm ²	1.6 t/cm ²	ditto
Round bar (of other than Japanese make)	1.4 t/cm ²	1.4 t/cm ²	ditto

2) Allowable stress intensity of concrete

Unit: kg/cm²

Type of concrete	Compression force FC
Machine-mixed	135
Hand-mixed	90

3) Allowable stress intensity of steel

Steels of Japanese make (SS41 (JIS G3101), SSC41 (JIS G3350), STK41 (JIS G3444), etc.) are to be used, and the Standard for Structural Calculation of Steel Structures established by The Architectural Institute of Japan will be followed.

c) Allowable soil bearing pressure

1) Hilly terrain

In the hilly terrain, the long-term soil bearing power for the standard design is set at 30 tons/m² with respect to the conglomeratic ground.

2) Flat terrain

In the flat terrain, the long-term soil bearing power for standard design is set at 15 tons/m² with respect to the hard clayey ground.

d) Principles for structural plan

d-1) Laboratory and dormitory

The Laboratory and Dormitory will be of the iron-reinforced concrete rahmen structure designed in accordance with the standard for structural calculation of reinforced concrete structures established by The Architectural Institute of Japan.

d-2) Health post-(1), (2)

The stone or brick masonry will be applied with due attention paid to the following points.

(1) Burned bricks shall be used at any rate.

(2) The joints shall be set with cement mortar in a manner that will ensure permeation of cement mortar over the entire surface of each joint.

(3) An RC girder shall be placed on top of the wall.

- (4) The wall whose length is less than twice the thickness shall not be handled as aseismic wall.
- (5) The first floor shall be of iron-reinforcec concrete.
- (6) An RC lintel shall be provided on top of the opening whose width is in excess of 1 m.
- (7) The wall thickness shall be at least the following value.

Unit: cm

Type of wall	Floor	Brick masonry		Stone masonry	
		2-story	1-story	2-story	1-story
Loaded	1st	34	-	35	-
	Ground	34	34	40	35
Partition	1st, Ground	22	22	30	30

- (8) Dimensions of stone block

Those stone blocks whose major length is more than half the wall thickness shall account for more than one third the total number of stone blocks to be used.

- (9) The wall volume shall be as per the following table.

	2-stoty building	1-story building
1st floor	15 cm/m ²	-
Ground floor	21 cm/m ²	15 cm/m ²

(10) The length of the loaded wall shall be less than 7.0 m.

1-5-5. Plan for finishing materials

a) Laboratory

a-1) Principal external finishing materials

Roofing	Asphalt shingling (of steel truss structure; light gauge steel purlin, wooden rafters and waterproof plywood siding)
Ceiling of eaves	Paint-finished waterproof plywood on wooden ceiling frame
Post	Paint finish over mortar coating
Outer wall	Ashlaring on concrete wall with an air gap in between
Louver	Baking-finished aluminum shapes
Sash	Aluminum

a-2) Principal interior finishing materials

(1) Laboratory room

Floor	Epoxy resin paint (non-slip finish)
Wainscotting	ditto (w/o non-slip finish)
Wall	Paint-finished mortar
Ceiling	ditto

(2) Corridor, office room, staff rooms, stores, toilets

Floor	Terrazo block
Plinth	Terrazo block
Wall	Mortar finish Paint-finished mortar
Ceiling	Paint-finished waterproof plywood (mortar finish for ground floor)

(3) Seminary room

Floor	Rubber tile
Plinth	Paint-finished mortar
Wall	ditto
Ceiling	Paint-finished cloth on plywood ground

b) Dormitory

b-1) Principal external finishes

Roofing	Asphalt shingling
Ceiling of eaves	Paint-finished waterproof plywood
Post	Paint-finished mortar
Outer wall	Ashlaring on concrete wall with an air gap in between
Sash	Aluminum

b-2) Principal interior finishes

(1) Bedrooms, corridors, office room, toilets and kitchen

Floor	Terrazo block
Plinth	Paint-finished mortar (terrazo block for toilet)
Wall	Paint-finished mortar
Ceiling	Paint-finished mortar for ground floor; paint-finished plywood for first floor

(2) Cafeteria, lounge

Floor	Terrazo block
Plinth	Paint-finished mortar
Wall	Paint-finished mortar
Ceiling	Paint-finished cloth on plywood ground

(3) Shower room

Floor	Finished-in-place terrazo
Wall	ditto
Ceiling	Paint-finished waterproof plywood

c) Health post-(1), (2)

c-1) Principal external finishes

Roofing	Corrugated color iron sheet (light gauge steel for purlin)
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Ceiling of eaves	Paint-finished waterproof plywood
Outer wall	Ashlaring with stone block or brick
Sash	Wooden sash; paint-finished wooden door

c-2) Principal interior finishes

Floor	Mortar troweling
Plinth	Paint finish after mortar troweling
Wall	ditto
Ceiling	ditto (Paint-finished plywood for one-story building or first floor)

1-5-6. Partitions

The partitions shall be of the single-layer brick work, or of stone masonry (wall thickness, 30 mm) or of wood.

1-6. Equipment plan

1-6-1. Plan for electrical installations

a) Power supply

A commercial power supply of AC three-phase 4-wire, 400 V/230 V will be received. A standby power supply will be a 15 kVA diesel generator which is to serve some of medical appliances in the Laboratory.

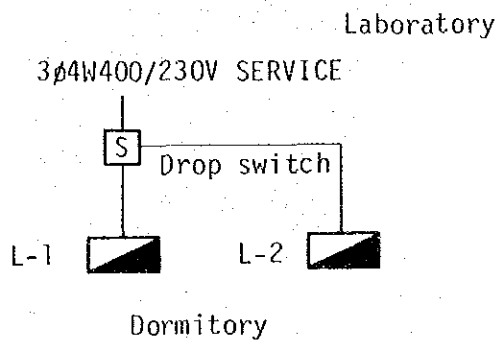
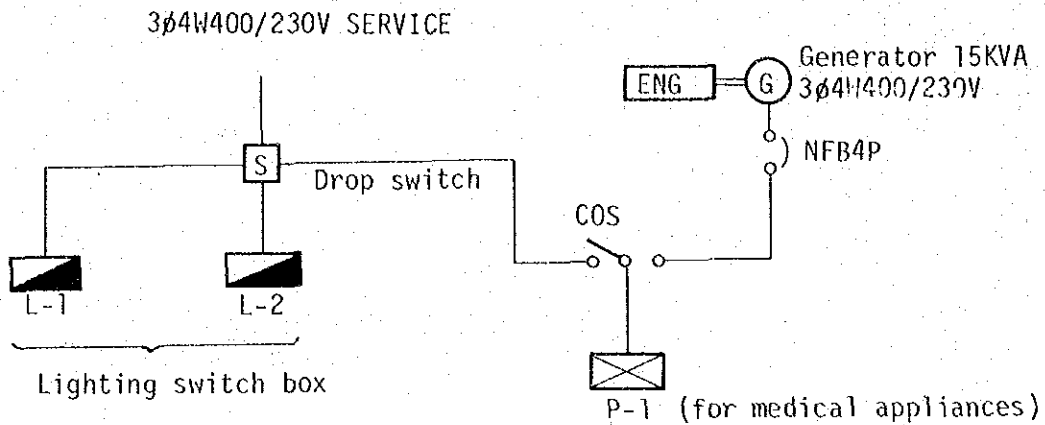
The electrical loads, including luminaires, convenience outlets, machines and fans, will be as follows.

- | | |
|---------------|--------|
| 1) Laboratory | 15 kVA |
| 2) Dormitory | 10 kVA |

b) Trunk wiring

The trunk wiring for the luminaires, convenience outlets, machines and fans will be extended from the low-voltage main switchboard to the lighting switch boxes.

The single-line diagram for each building is illustrated below.



Note: The lighting switch box covers the power circuit.

c) Luminaires and convenience outlets

The rooms, waiting hall and corridors will be illuminated mainly with fluorescent lamps and partly with incandescent lamps.

The intensity of illumination of the rooms is as follows.

Office room	300 lx
Examination room	300 lx
Waiting hall, corridor	100 to 150 lx
Store	100 lx

Bedroom 100 lx

Toilet 100 lx

The convenience outlets will be prepared for general-purpose use, medical appliances and fans. The branch circuits split from the switch boxes will be of flexible cables.

d) Telephone equipment

The Laboratory and Dormitory will be furnished with one telephone circuit each. The telephone circuit will be led in by means of an overhead drop wire.

e) Automatic fire alarm

Those rooms in the Laboratory where fire is used will be provided with a spot type heat sensor which is to automatically work a bell on the ground and the first floor.

f) Manual alarm

Each floor of the Dormitory will be equipped with two manual push-button stations in order to work the bell to give the arrester.

g) Lightning rod system

A lightning rod will be erected on top of each building and will be connected to a buried copper grounding plate through a conductor.

h) Electrical appliances for the buildings

The electrical appliances for the buildings are listed in Tables ME1 through ME4.

1-6-2. Plan for mechanical installations

a) Building users and water consumption

The building users and water consumption are estimated as shown in Table M-1.

b) Water supply facilities for the buildings

Each building will be equipped with a water-receiving tank on the ground which is capable of storing a day's usage.

At the Laboratory and Dormitory, a motor-driven pump will be used to pump water from the receiving tank to a head tank. At the health posts a wing pump will be used for the same purpose.

Two motor-driven pumps will be installed and put to automatic alternate operation in keeping with the water level in the head tank. A wing pump will also be installed to back up the motor-driven pumps in case of blackout failure. Where the motor-driven pump is used, the head tank capacity will be an hour's usage.

Where a wing pump is used, the head tank capacity will be two hours' usage.

The head tank will be installed in the attic or on the rooftop when it is installed for the Laboratory, health post.

For the Dormitory, as a shower room is provided on the first floor, which requires 3 mAq. of water pressure is required at the shower head, a steel structure of 10 m high will be installed on the ground in order to support a head tank.

At each building, water will be supplied from the head tank to supply ends by gravity. Any building will not have indoor hydrants.

c) Drainage system

For each building, soil and other waste water will be separated. For the soil, a septic tank will be installed for treatment, and its effluent will be combined with the other waste water, which is then sent to a soaking pit for infiltration. At such health posts where water is conveyed by hand to the receiving tank, soil will be stored in a soil pit.

The capacity of the septic tank will be calculated according to a relevant Japanese standard concerning the calculation of septic tank capacity for the wastewater treatment tank of septic tank type.

The area of infiltration of the soaking pit will be calculated on condition that the infiltration rate is assumed to be 200 lit/m².d. Namely, the area is determined by dividing the daily water consumption by 200 lit./m².d. The capacity of the soil pit is calculated at about 7.8 m³ if the tank measures 1.5 m in depth and 0.6 m wider than the meter closet booth. It is about 50 days' worth of soil (incl. constant trickling of water).

d) Plumbing fixtures

The plumbing fixtures for the buildings are listed in Table M-2, and the rooms for which they are installed are listed in Tables ME1 through ME4. The water closet booth will have an orissa pan and a water cock.

e) Other facilities for the Laboratory

(1) Gas supply

A gas cylinder will be installed outdoors in order to serve a gas cock in each laboratory room on the ground floor.

(2) Ventilation

The sterilizing room will be ventilated by means of a wall-mounted ventilating fan. Others will be ventilated by natural draft, except the living quarters and corridors which will be equipped with a total number of 29 suspension fans for summer use.

(3) T.B. room facilities

The T.B. room will be furnished with a draft chamber for tubercle bacillus killing.

f) Other facilities for Dormitory

(1) Gas supply

A gas cylinder will be installed outdoors in order to serve the gas range and gas cocks in the kitchen.

(2) Ventilation

The ventilation will be by natural draft only, except that the kitchen alone will be ventilated by means of a wall-mounted fan.

Table M-1 Building users and water consumption

Name of building	Number of users	Water consumption (lit./person/d.)	Daily consumption (lit./d.)	Daily consumption hours (hrs./d.)	Hourly consumption (lit./hr.)	Remarks
Laboratory	Full-timer 30	100				
	Siminar participant 130	10	4,300	8	540	
Dormitory	Resident 30	200	6,000	10	600	
Health Post-(2)	Full-timer 20	100	2,000	8	250	In case of flushing type water closet
Health Post-(2)	Full-timer 20	70	1,400	8	175	In case of non-flushing type water closet
Health Post -(2)-2	Resident 7	50				
	Full-time 13	30	740	10	74	
Health Post-(1)	Resident 7	150				
	Full-time 13	100	2,350	10 8	267.5	In case of flushing type water closet
Health Post-(1)	Resident 7	100				
	Full-time 13	70	1,610	10 8	184	In case of non-flushing type water closet

Table M-2 Specifications of sanitary ware

Name of equipment	Specifications
Flushing type water closet	23" Qrissa Pan, w/trap, 3 gal, flushing cistern, paper holder
Non-flushing type water closet	23" Qrissa Pan, w/paper holder, w/o trap, flushing cistern
Washbasin	Wash Basin 22" x 16", w/c.p. Liquid Soap Container, 24" long Glass Shelf, 24" x 16" Looking Mirror
Laboratory sink	Laboratory Sink 21" x 17" x 7", w/1/2" c.p. fancy type Bib-Cock
Kitchen sink	Kitchen Sink, 24" x 18" x 10", w/1/2" c.p. fancy type Bib-Cock
Shower	3" \emptyset Shower Rose, w/c.p. Consealed Stop Cock, C.P. Soap Dish, 1/2" x 24" Towel Rod

Table ME1 A list of plumbing fixtures, ventilation equipments and electrical appliance for Laboratory

Room Name	Orissa Pan	Wash Basin	Laboratory Sink	LPG Gas Cock	Ceiling Fan	Ventilating Wall Fan	Flourescent Light	Convenience Outlet	Telephone
Reception	-	-	-	-	1	-	(40wx1)x1	-	-
Serology	-	-	1	1	1	-	(40wx2)x2	5	-
Parasitology	-	-	1	1	2	-	(40wx2)x4	6	-
Sterilizing & Wash Room	-	-	1	1	1	1	(40wx2)x2	5	-
T.B.	-	-	1	1	2	-	(40wx2)x4	6	-
Bacteriology	-	-	1	1	2	-	(40wx2)x4	6	-
Biochemistry	-	-	1	1	1	-	(40wx2)x2	4	-
Store Office	-	-	-	-	1	-	(40wx2)x2	2	1
Maintenance Store	-	-	-	-	1	-	(40wx1)x1	1	-
Store	-	-	-	-	-	-	(40wx1)x5	3	-
Machine Room	-	-	-	-	-	-	(40wx1)x1	1	-
W.C.	4	4	-	-	-	-	(40wx1)x1	1	-
Corridor	-	-	-	-	2	-	(40wx1)x5	1	-
General Office	-	-	-	-	2	-	(40wx2)x4	4	-
P.A. & Waiting Room	-	-	-	-	1	-	(40wx2)x2	2	-
Chief	-	-	-	-	1	-	(40wx2)x2	2	-
Staff Room	-	-	-	-	2	-	(40wx2)x4	4	-
Library	-	-	-	-	1	-	(40wx2)x2	2	-
Seminary Room	-	-	-	-	6	-	(40wx2)x12	4	-
Store	-	-	-	-	-	-	(40wx1)x1	1	-
W.C.	4	4	-	-	-	-	(40wx1)x1	1	-
Corridor	-	-	-	-	3	-	(40wx1)x6	1	-

Table ME2 A list of plumbing fixtures, ventilation equipments and electrical appliances for Dormitory

Room Name	Orissa Pan	Wash Basin	Shower	Gas Range	Ventilating Wall Fan	Flourescent Light	Incandesent Light	Convenience Outlet	Telephone	Alarm Switch
Hall	-	-	-	-	-	(40wx1)x3	-	1	-	-
General Office	-	-	-	-	-	(40wx2)x2	-	3	1	-
Cafeteria	-	-	-	-	-	(40wx1)x6	-	4	-	-
Kitchen	-	-	-	1	1	(40wx1)x2 (20wx1)x2	-	2	-	-
Each Bed Room	-	-	-	-	-	(20wx1)x2	-	3	-	-
Salon	-	-	-	-	-	(40wx1)x3	-	3	-	-
Store	-	-	-	-	-	(40wx1)x1	-	1	-	-
W.C.	3	3	-	-	-	(40wx1)x3	-	2	-	-
Shower Room	-	-	2	-	-	-	40wx2	1	-	-
Corridor	-	-	-	-	-	(20wx1)x5	60wx1	1	-	2
Each Bed Room	-	-	-	-	-	(20wx1)x2	-	3	-	-
Store	-	-	-	-	-	(40wx1)x1	-	1	-	-
W.C.	3	3	-	-	-	(40wx1)x3	-	2	-	-
Shower Room	-	-	2	-	-	-	40wx2	1	-	-
Corridor	-	-	-	-	-	(20wx1)x5	60wx1	1	-	2

Ground Floor

First Floor

Table ME3 A list of plumbing fixtures
for Health Post (1)

	Room Name	Orissa Pan	Wash Basin	Laboratory Sink	Kitchen Sink
Ground Floor	Gen. Waiting	-	-	-	-
	Disp. Store & Reception	-	-	1	-
	Dressing Room	-	-	-	-
	Examine Room (Large)	-	1	-	-
	Examine Room (Small)	-	1	-	-
	Field Stuff Room	-	-	-	-
	Corridor	-	-	-	-
First Floor	Each Health Assistnat Room	-	-	-	-
	Each AHW Room	-	-	-	-
	ANM (Large)	-	-	-	-
	ANM (Small)	-	-	-	-
	Food Demonstration	-	-	-	-
	Corridor	-	-	-	-
	W.C.	2	-	-	-

Table ME4 A list of plumbing fixtures
for Health Post (2)

Room Name	Orissa Pan	Wash Basin	Laboratory Sink	Kitchen Sink
Hall	-	-	-	-
Registration	-	-	-	-
Examine Room Mother & Children	-	1	-	-
Examine Room	-	1	-	-
Treatment Room	-	-	-	-
Dispensary	-	-	1	-
Each Health Assistant Room	-	-	-	-
Each AHW Room	-	-	-	-
ANM (Large)	-	-	-	-
ANM (Small)	-	-	-	-
Food Demonstration	-	-	-	-
W.C.	2	-	-	-

2. SCOPE OF CONSTRUCTION

2-1. Laboratory and Dormitory

a) Works, equipments, and materials included in the budget.

1) Buildings

2) External staircases, porches, berms, etc. accompanying the buildings.

3) Electrical and Mechanical Systems for the buildings otherwise noted below.

4) Furniture, fittings, and furnishings listed in Table A-1 to A-3.

b) Works, equipments and materials not included in the budget

1) Disassembly and removal of obstacles.

2) Site preparation and leveling work.

3) Road construction.

4) Landscaping and planting.

5) Outdoor signs.

6) Outdoor lighting.

7) Electrical service up to the connection to leading-in switches.

8) Water service up to the connection to water-receiving tanks.

9) Telephone service up to the connection to terminal boxes; telephones

10) Furniture, fittings, and furnishings not listed in Tables A-1 to A-3; curtains, blinds, etc.

2-2. Health Posts - (1) and (2)

a) Works, equipments, and materials included in the budget.

1) Buildings.

2) External staircases, porches, berms, etc. accompanying the buildings.

3) Mechanical Systems for the buildings otherwise noted below.

4) Furniture, fittings, and furnishings listed in Tables A-4 to A-5.

5) Medical equipments, tools, and supplies listed in Table A-6.

b) Works, equipments, and materials not included in the budget.

1) Disassembly and removal of obstacles.

2) Site preparation and leveling work.

3) Road construction.

4) Landscaping and planting.

5) Outdoor signs.

6) Water service up to the connection to water-receiving tanks.

7) Furniture, fittings, and furnishings not listed in Tables A-4 to A-5; curtains, blinds, etc.

Table A-1 Furniture, Fittings, and Furnishings
in Each Laboratory Room (1)

Room Name	Wooden office desks (900 x 1200)	Wooden office chairs (with the back)	Wooder office chairs (with-out the back)	Curtain rail (extruded aluminum single rail $\ell = 3600$)	Remarks, others
Reception	-	-	-	-	
Serology	-	-	2	1	Work table (with bottom closet)
Parasitology	-	-	2	2	Work table (with bottom closet)
Sterializing & Wash Room	-	-	2	1 ($\ell = 2,000$)	Work table (with bottom closet)
T.B.	-	-	2	2	Work table (with bottom closet)
Bacteriology	-	-	2	2	Work table (with bottom closet)
Biochemistry	-	-	2	1	Work table (with bottom closet)
Store Office	1	1	-	-	
Maintenance Store	-	-	-	1	
Store	-	-	-	3	Wooden (600W x 400L x 2500H, 5 shelves) x 2
Machine Room	-	-	-	-	
W.C.	-	-	-	-	
Corridor	-	-	-	-	

Ground Floor

Table A-2 Furniture, Fittings, and Furnishings
in Each Laboratory Room (2)

Room Name	Wooden office desks (900 x 1,200)	Wooden office chairs (with the back)	Wooden office chairs (with out the back)	Curtain rail (Extruded aluminum single rail $\ell = 3600$)	Remarks, others
General Office	4	4	-	1	Wooden bookcase (1800W x 1800H x 300D wooden, with glass sliding doors). File cases (Steel, 3 drawers, $\ell=900$) x 2.
P.A. & Waiting Room	-	-	-	1	Sofas (750 x 1800) x 2. Table (600 x 900) x 1.
Chief	1 (1200 x 2000)	2 (with the arm-rest)	-	1	Bookcase (1800W x 1800H x 300D, wooden, with glass sliding doors). File case (Steel, 3 drawers, $\ell=900$) x 1
Staff Room	-	-	-	2	Wooden lockers (300W x 180H x 500D x 10 rows) x 2. File cases (Steel, 3 drawers, $\ell=900$) x 2.
Library	-	-	-	1	Bookcase (1800W x 1800H x 300D, wooden, with glass sliding doors) x 1.
Seminary Room	-	72	-	*Double rail x 6 with blackout curtains.	Blackboard (1200H x 3000W). Conference tables (450 x 1800, wooden) x 18. Lecture stand (1000 x 1500, wooden).
Store	-	-	-	1	
W.C.	-	-	-	-	
Corridor	-	-	-	-	

First Floor

Table A-3 Furniture, Fittings, and Furnishings
in Each Dormitory Room

Room Name	Wooden office desks (900 x 1200)	Wooden office chairs (with thr back)	Wooden office chairs (with-out the back)	Wooden office	Curtain rail (Extruded aluminum single rail & = 2000)	Remarks, others
Hall	-	-	-	-	-	
General Office	1	2	-	-	(& = 3900)	
Cafeteria	-	20	-	-	3 (& = 3900)	Tables (wooden 850x1300) x 5
Kitchen	-	-	-	-	-	Work table (with bottom closet). Delivery counter. Handing cupboard.
Each Bed Room	-	-	-	-	1	Beds (wooden, 950x2000) x 2
Salon	-	-	-	-	1 (& = 3900)	Sofas (750x1500) x 4. Carpets (1600x2000) x 2. Tables (450x700) x 2
Store	-	-	-	-	-	
W.C.	-	-	-	-	-	
Shower Room	-	-	-	-	-	
Corridor	-	-	-	-	-	
Each Bed Room	-	-	-	-	1	Beds (wooden, 950x2000) x 2
Store	-	-	-	-	-	
W.C.	-	-	-	-	-	
Shower Room	-	-	-	-	-	
Corridor	-	-	-	-	-	
Ground Floor						
First Floor						

Table A-4 Furniture, Fittings, and Furnishings
in Each Room of Health Post - (1)

Room Name	Wooden office desks (700 x 900)	Wooden office chairs (with the back)	Wooden office chairs (with-out the back)	Curtain rail (Extruded aluminum single rail $\varnothing = 1600$)	Remarks, others
Gen. Waiting	-	-	-	-	Wooden counter (with wooden horizontally sliding sashes) x 1
Disp. Store & Reception	1	2	-	1 ($\varnothing = 2000$)	Wooden closet (900x1800Hx500D, lower 600 without shelf, upper 1200 with 4 removable glass shelves)
Dressing Room	-	-	-	1	
Exam. Room (Large)	1	2	1	1	Examining bed (600x1800, wooden) x 1
Exam. Room (Small)	-	-	-	1	
Field Staff Room	-	-	-	1	
Corridor	-	-	-	-	
Each Health Assistant Room	-	-	-	1 ($\varnothing = 2000$)	Bed (wooden, 950x2000) x 1
Each A.H.W. Room	-	-	-	1	Bed (wooden, 950x2000) x 1
A.N.M. (Large)	-	-	-	1 ($\varnothing = 2000$)	Bed (wooden, 950x2000) x 1
A.N.M. (Small)	-	-	-	1	Bed (wooden, 950x2000) x 1
Food Demonstration	-	-	-	1	Bed (wooden, 950x2000) x 1
Corridor	-	-	-	-	
W.C.	-	-	-	-	

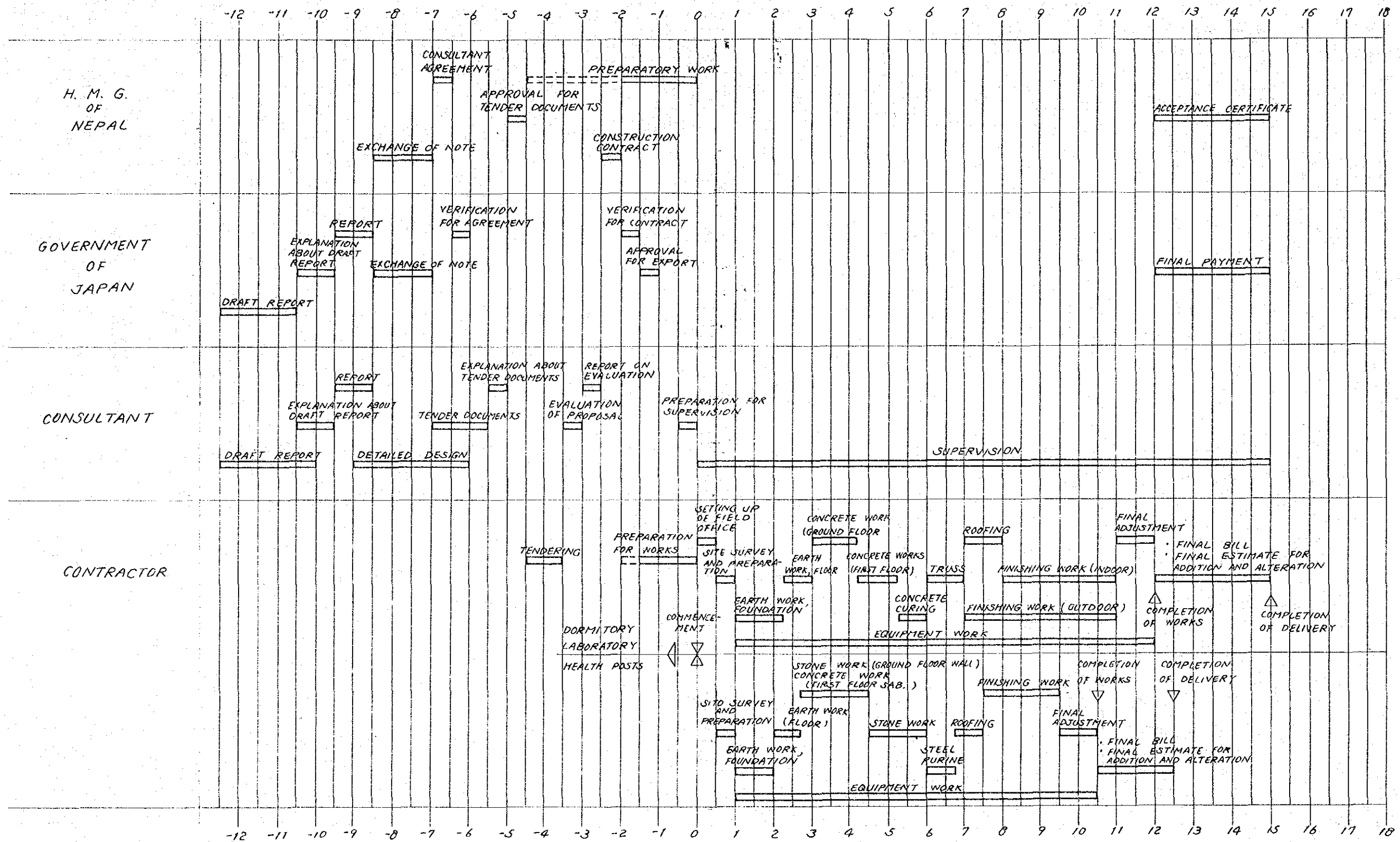
Table A-5 Furniture, Fittings, and Furnishings
in Each Room of Health Post - (2)

Room Name	Wooden office desks (700 x 900)	Wooden office chairs (with the back)	Wooden office chairs (with-out the back)	Wooden office (Extruded aluminum single rail $\lambda = 1600$)	Remarks, others
Hall	-	-	-	-	Wooden counter (with wooden horizontally sliding sashes)
Registration	-	-	-	1 ($\lambda = 2000$)	
Exam. Room Mother & Children	1	2	1	1 ($\lambda = 2000$) 1 ($\lambda = 1600$)	
Exam. Room	-	-	-	1 ($\lambda = 2000$)	Examining bed (600x1800, wooden) x 1
Treatment Room	-	-	-	1 ($\lambda = 2000$)	
Dispensary	1	2	-	1 ($\lambda = 1600$) 1 ($\lambda = 2000$)	Wooden closet (900wx1800Hx500D), lower 600 without shelf, upper 1200 with 4 removable glass shelves)
Each Health Assistant Room	-	-	-	1 ($\lambda = 2000$)	Bed (wooden, 950x2000) x 1
Each A.H.W. Room	-	-	-	1	Bed (wooden, 950x2000) x 1
A.N.M. (Large)	-	-	-	1 ($\lambda = 2000$)	Bed (wooden, 950x2000) x 1
A.N.M. (Small)	-	-	-	1	Bed (wooden, 950x2000) x 1
Food Demonstration	-	-	-	-	
W.C.	-	-	-	-	

No.		Quantity
1	Wash Basin Stand	1
2	Sphygmomanometer	1
3	Instrument Sterilizing Tray 240x180x35mm	2
4	Instrument Sterilizing Tray 210x150x35mm	2
5	Dressing Jars	2
6	Hand Lamp, Koike	1
7	Tongue Depressors	10
8	Percussion Hammer	1
9	Stethoscopes	1
10	Clinical Thermometers	10
11	Pus Basin Sets	2
12	Mouth gag	1
13	Minor Surgical Operation Set	1
14	Surgical Gloves	1
15	Healthmeter	1
16	Tape Measure	3
17	Glass Syringes (Tuberculin 2cc, 5, 10, 20, 50, 100)	2
18	Glass Syringes (Tuberculin 2cc)	20
19	Needles (Intravenous, Hypodermic 1/3, 1/2, 1/1,)	2
20	Needles (Tuberculin)	20
21	Enema Syringe 50cc	2
22	Jar for Forceps	1
23	Sterile Reservoir Stand	1
24	Cotheler (Nelaton)	5

No.		Quantity
25	Ice Bag	2
26	Water Bottle	1
27	Undine Glass	1
28	Basin eye bath	1
29	Sterilizer Forceps Seuated Jars	1
30	Wide Mouth Bottle (White)	5
31	Wide Mouth Bottle (Brown)	5
32	Teurniquet	2
33	Umbilical Scissors	1
34	Instrument Holding Forceps	1
35	Vaginal Speculum Examining (Large Size)	1
36	Vaginal Speculum Examining (Middle Size)	1
37	Umbilical Clamps	1
38	Tooth Extracting Forceps	1
39	Dental Mirror	2
40	Needles (Dental)	20
41	Glass Syringes (Dental)	5
42	Dissectors	3
43	Matress for Examining Table	1

3. TIME SCHEDULE



4. CONSTRUCTION MATERIAL TRANSPORTATION

Concerning transportation of the construction materials supplied from Japan, following matters will be practical.

a) Transportation term

About 50 days. (After leaving Japanese port to arrival at construction sites or maintaining space for temporary bonded storage of materials in Nepal.)

b) Unloading Point

Calcutta (India)

c) Customs clearance point at Nepales border

Raxaul (India), Birganj (Nepal)

5. BUDGET

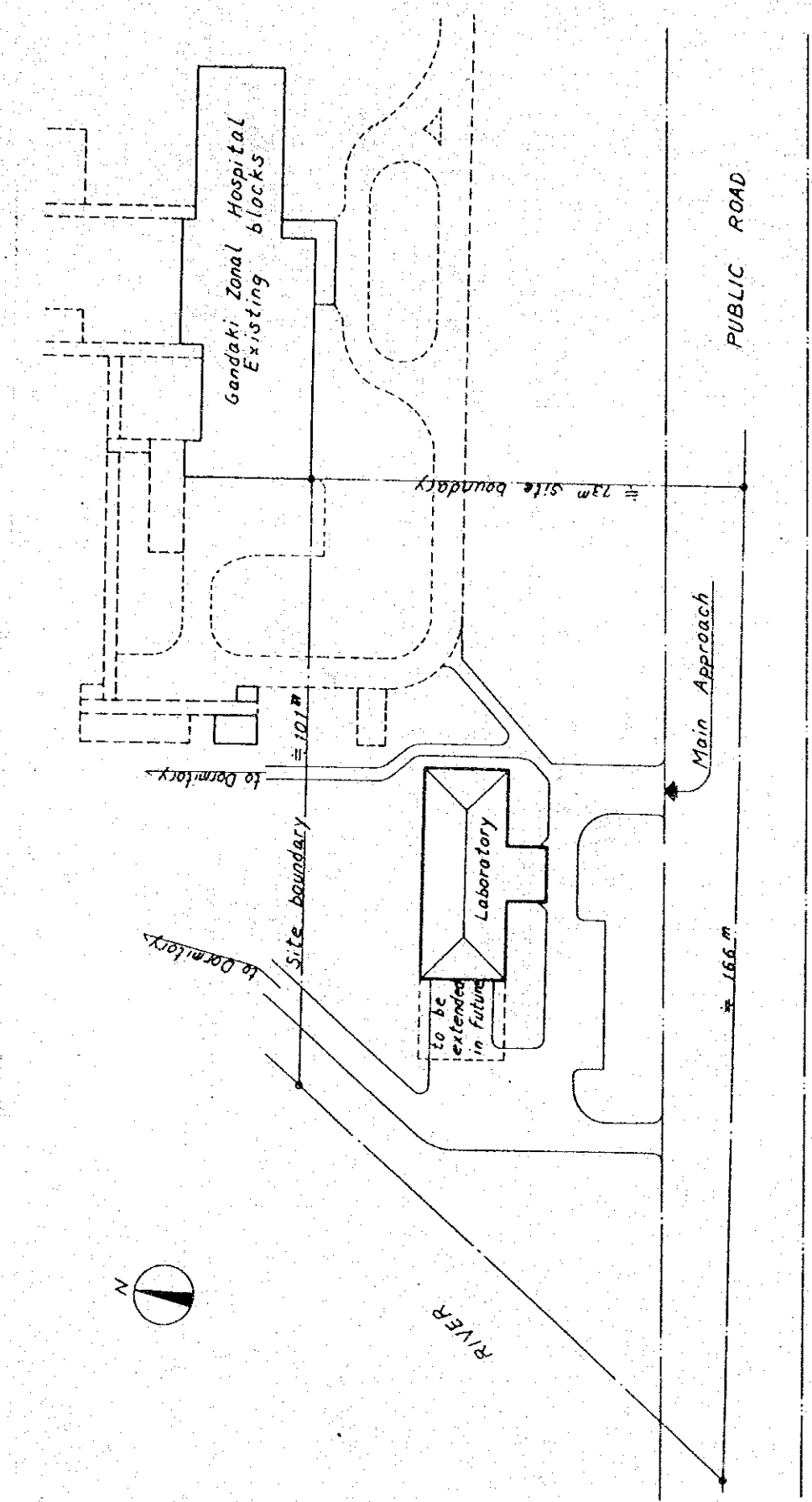
Budget estimate for all buildings equipments, tools and other materials presented by Government of Japan is as follows.

1) Laboratory	¥102,700,000.-
2) Dormitory	¥56,300,000.-
3) Health Post-(1) (¥10,725,000 x 12 buildings)	¥128,700,000.-
4) Health Post-(2) (¥14,060,000 x 10 buildings)	¥140,600,000.-
5) Furniture and furnishings	¥7,700,000.-
6) Medical tools and appliances	¥9,000,000.-
7) Consulting and supervising	¥55,000,000.-
<hr/>	
Total	¥500,000,000.-

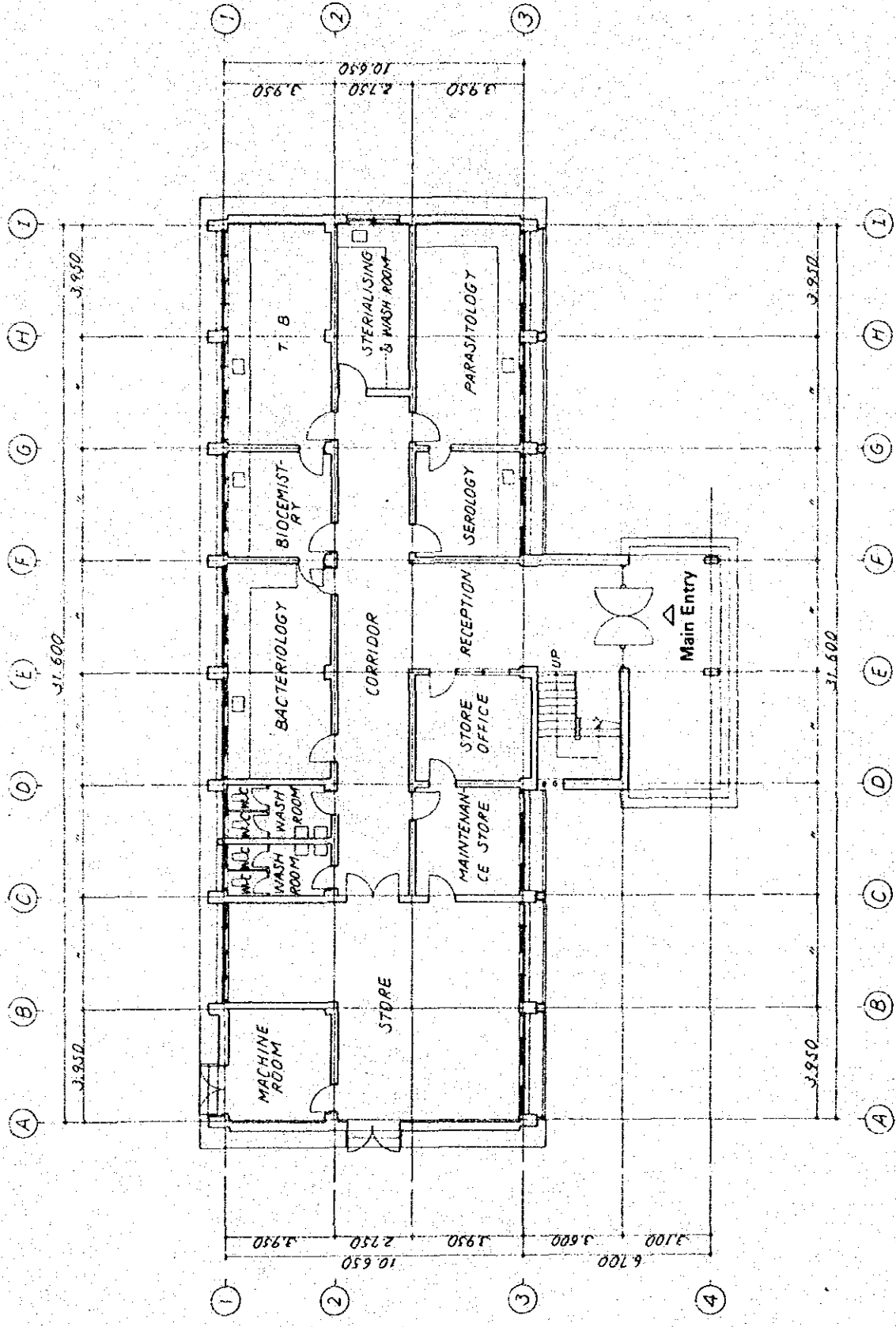
6. DESIGN DRAWINGS

Design drawings prepared for the present preliminary design are composed of the following:

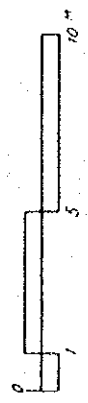
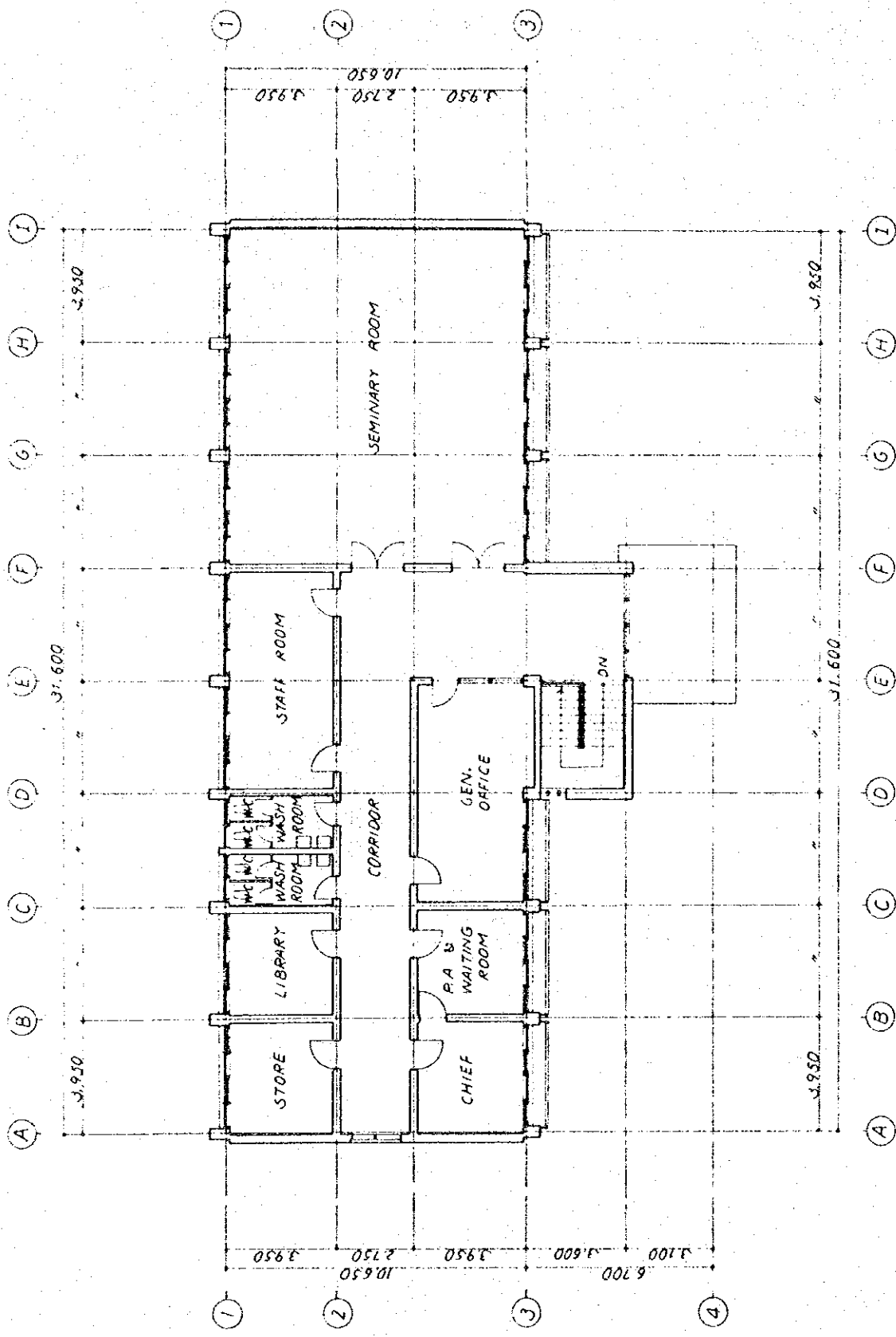
Drawing No.	Title
01	LABORATORY SITE PLAN
02	LABORATORY GROUND FLOOR PLAN
03	LABORATORY FIRST FLOOR PLAN
04	LABORATORY ELEVATION SECTION
05	DORMITORY GROUND FLOOR PLAN
06	DORMITORY FIRST FLOOR PLAN
07	DORMITORY ELEVATION SECTION
08	HEALTH POST-1 PLAN SECTION ELEVATION
09	HEALTH POST-2-1 PLAN SECTION ELEVATION
10	HEALTH POST-2-2 & W.C PLAN SECTION ELEVATION



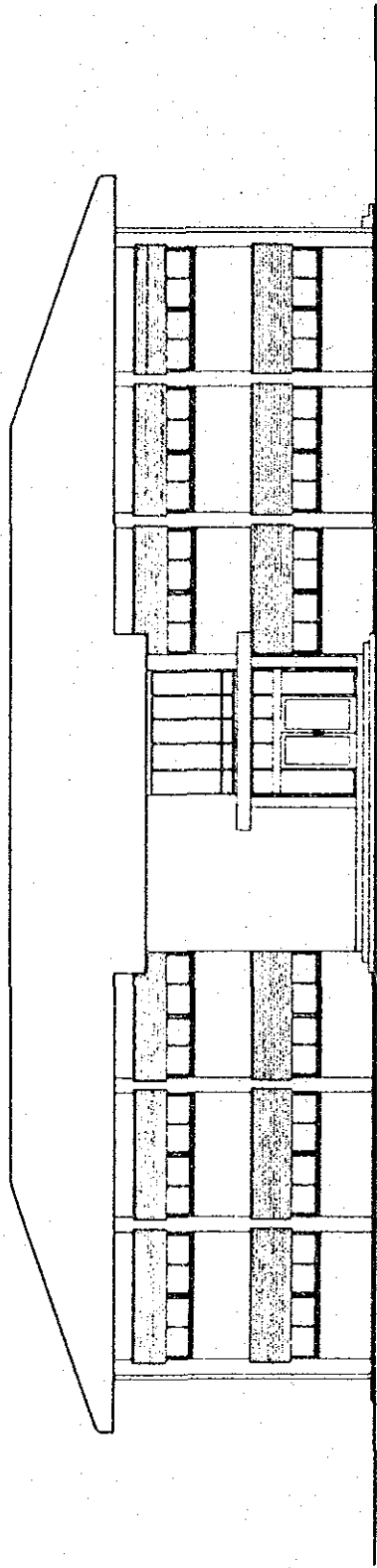
LABORATORY SITE PLAN 01



LABORATORY GROUND FLOOR PLAN 02



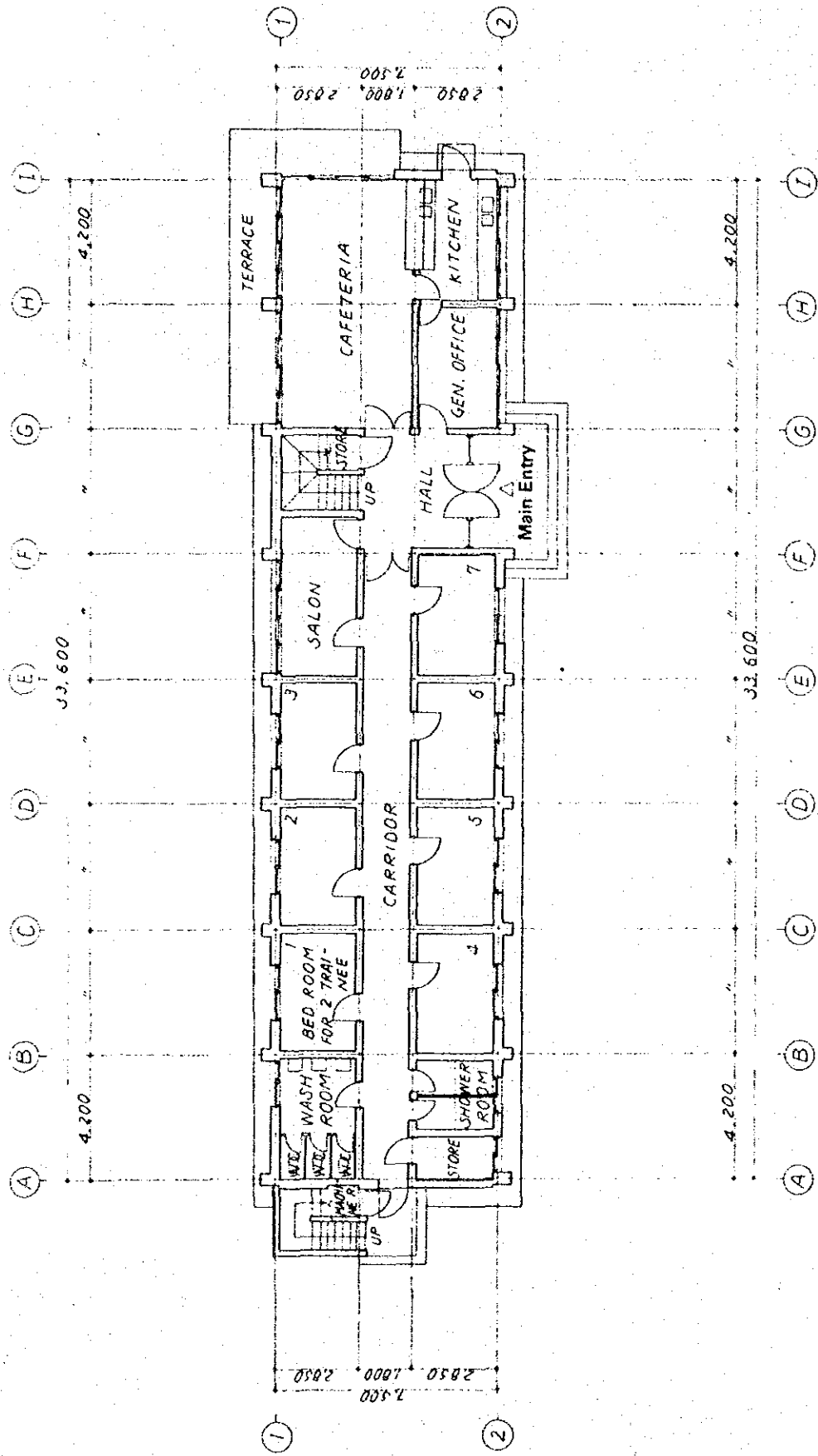
LABORATORY FIRST FLOOR PLAN 03



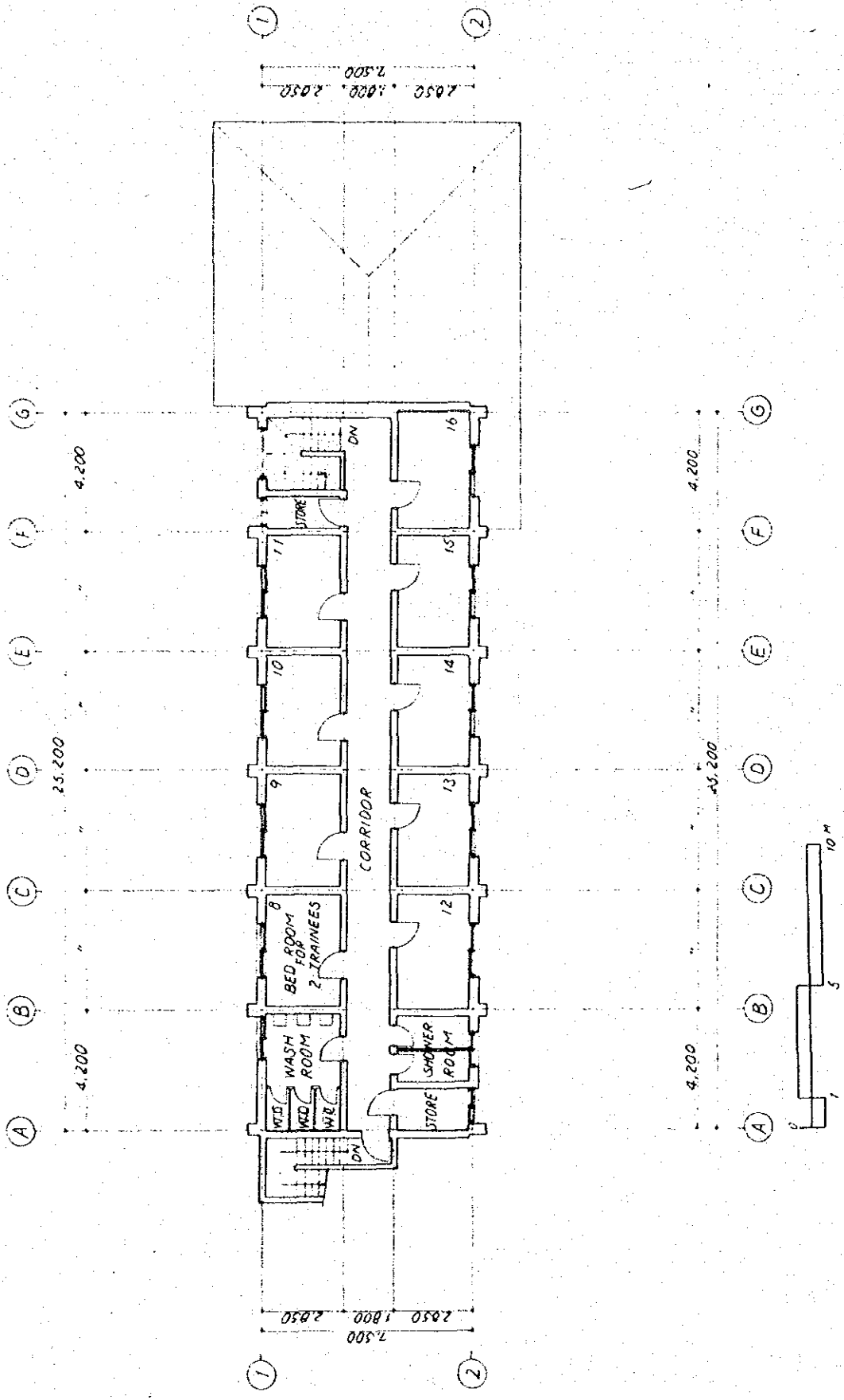
ELEVATION



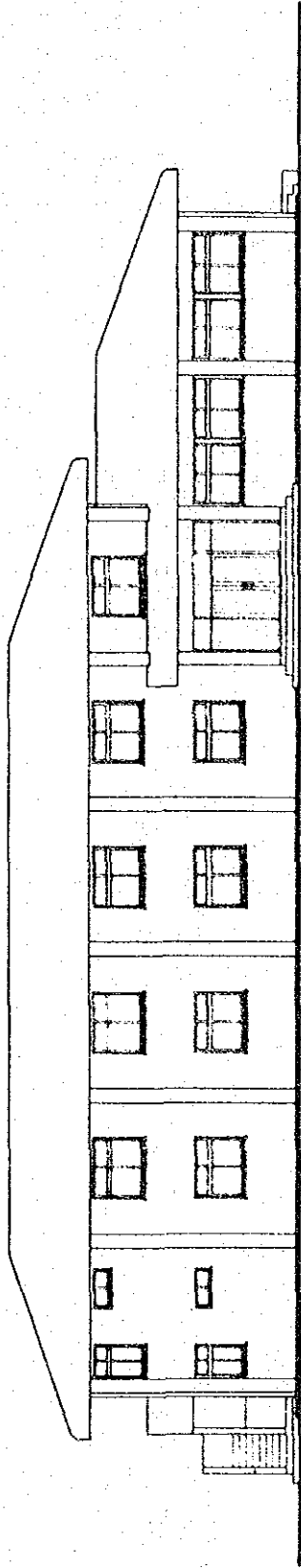
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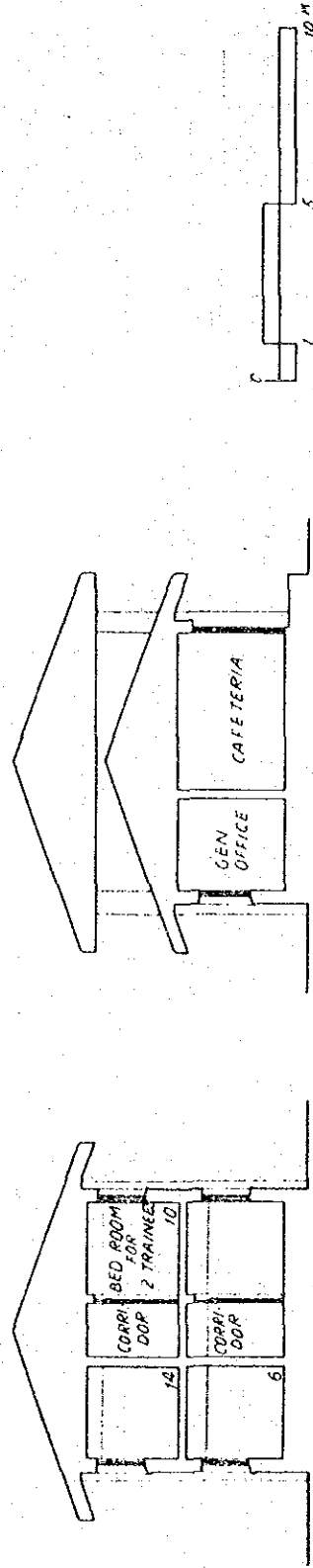
DORMITORY GROUND FLOOR PLAN 05



DORMITORY FIRST FLOOR PLAN 06



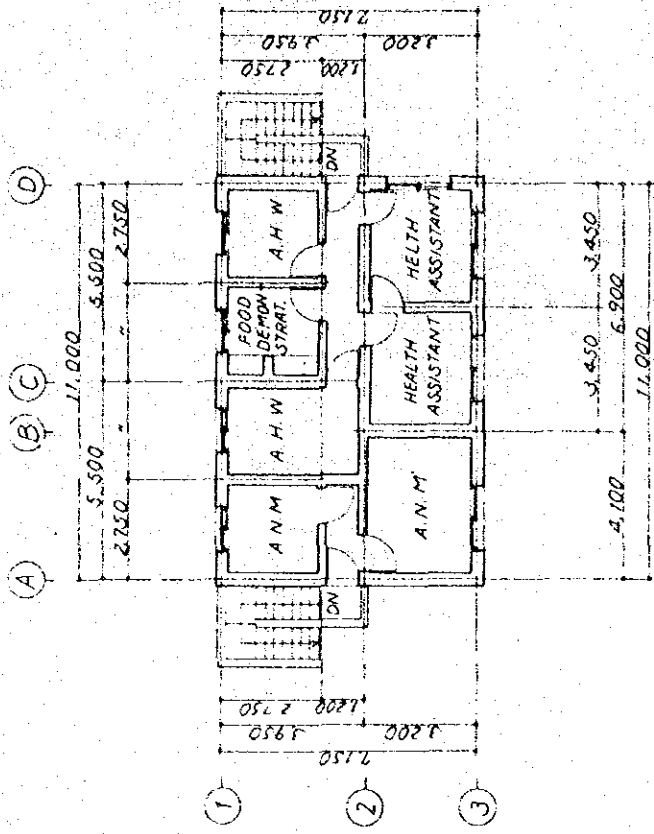
ELEVATION



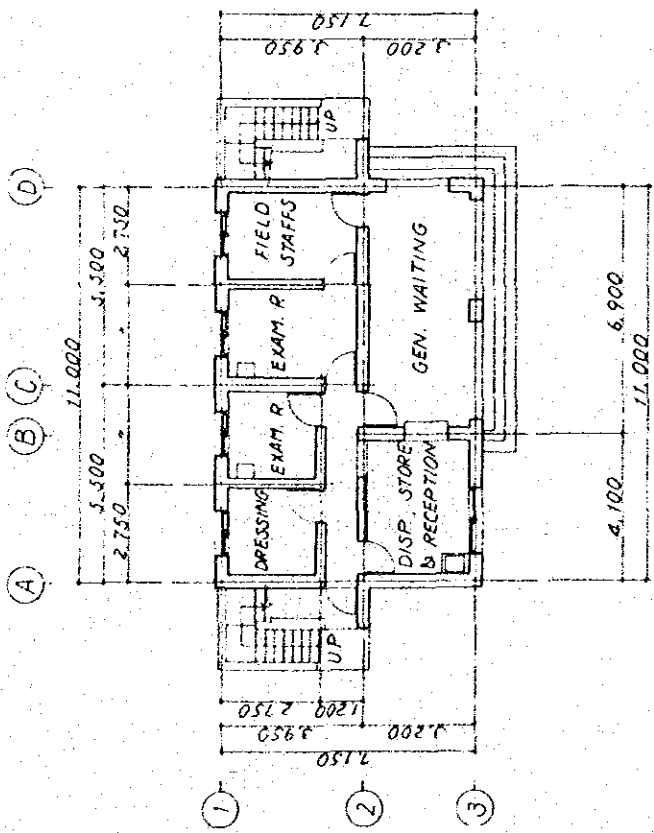
SECTION

SECTION

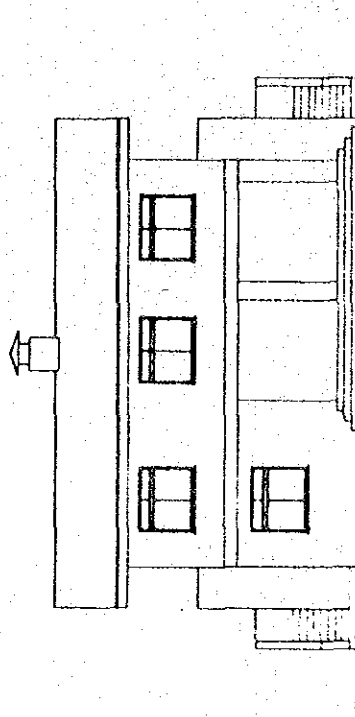
DORMITORY ELEVATION SECTION 07



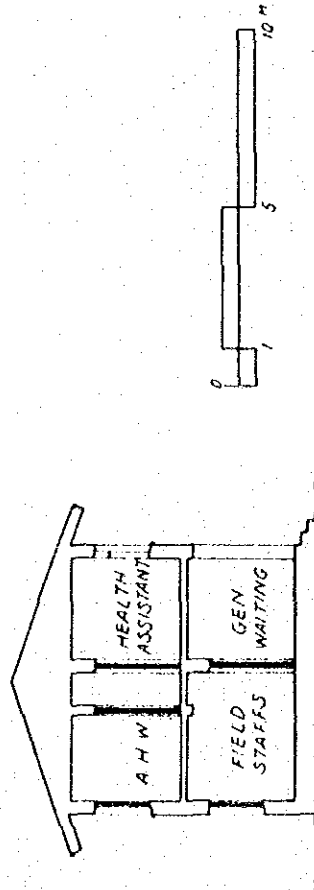
GROUND FLOOR PLAN



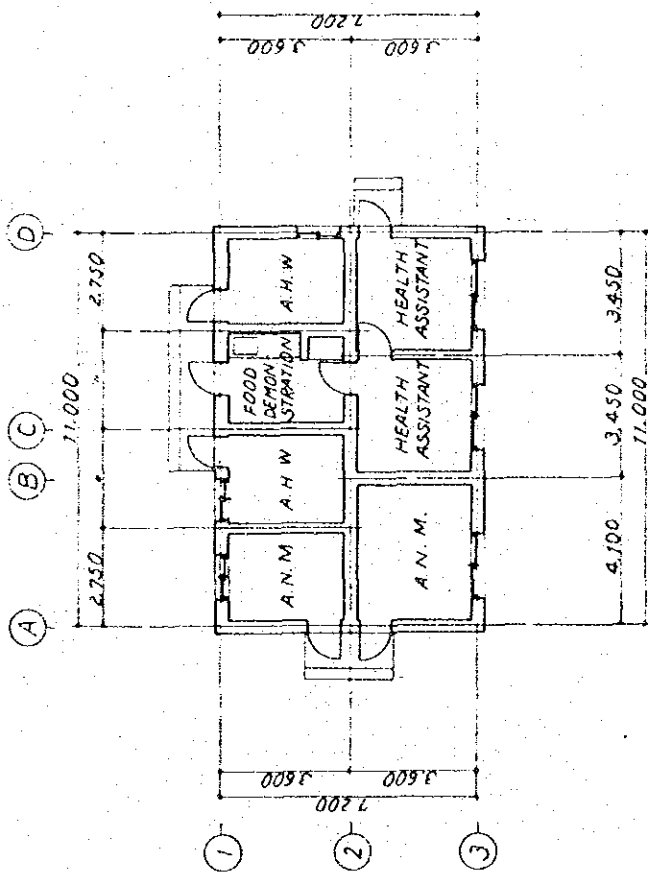
FIRST FLOOR PLAN



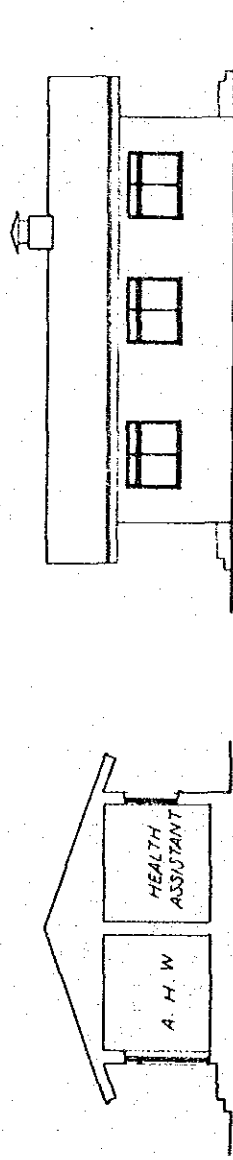
ELEVATION



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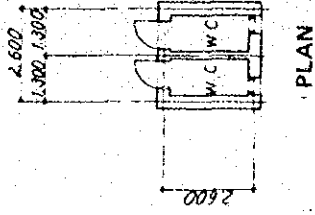


PLAN



SECTION

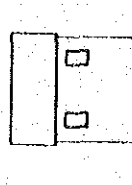
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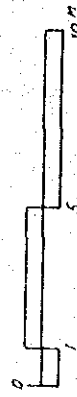
PLAN



SECTION



ELEVATION



HEALTH POST-2-2 & W,C PLAN SECTION ELEVATION 10

