Table 2-3-8 Renovation and Rearrangement of Existing Building

Ground Floor

Room No.	Room Name (Existing)	Ditto (Renovation)	Persons to use	Item of Renovation
102	Conference Room	Accounts Office	11	Floor:PVC Tile, Alm. Partition
103	Store	Dpy Dir's Offic	1	(Shift Only)
113	EM Unit (Head)	ditto	3	Alm. Partition
116	EM Prep Lab	New Electron Microscopy Room		Fixed Window (600x1, 200mm)
117	Store	EM Prep Lab		Lab Table/Wall (1, 800+1, 800 sink)
122	Account Office-1	Histopathology-1		(shift only)
123	Account Office-2	Histpathology-2		(shift only)
124	Exp. Animal (Head)	Invited Resrchr Rm	2	Alm. Partition
128	Store	Haematology-4		(shift only)
132	Store	Nutrition Lab-1		Exhaust for Draft Chamber
133	Parasitology	Nutrition Lab-2		Exhaust for Draft Chamber
134AB	Exp. Animal-1	Nutrition Lab-3		Wall·Ceiling:Repaint
135	Store	Nutrision (Head)	4	Wall·Ceiling:Repaint Alm. Partition
136	Maintenance Workshop	Nutrition Lab-4		Wall·Ceiling:Repaint One Lab Table/Wall (9, 200 x 750mm) Two Center Lab Table (3, 000 x 1, 500mm)
137	Exp. Animal-2 (Breeding Room)	Nutrition Lab-5		Floor:Terr Reporish Wall : Repaint Ceiling:Change Bd. Lignting Fixture, A/C
138	Exp. Animal-3 (Breeding Room)	Library		Same as above
139	Exp. Animal-4 (Breeding Room)			
140B	Exp. Animal-5 (Breeding Room)			Same as above (Floor Conc. 80mm)
140C	Exp. Animal-6 (Breeding Room)	Epidemic Data Analysis Room		Same as bove (Floor Conc. 80mm)
141	A/C Machine Room	Storage		Replace fo A/C, Net Fencing
143	Immunology-1	Epidemiology-1		(shift only)
144	Immunology-2	Epidemiology-2		(shift only)
145	Immunology-3	Epidemiology-3		(shift only)
146	Immunology-4	Epidemiology-4		(shift only)
147	Parasitlgy (Snail)	Epidmlgy-5 (Head)		Alum. Partition
148	Computer Room	Computer Room		Alum. Partition

First Floor

Room No.	Room Name (Existing)	Ditto (Renovation)	Persons to use	Item of Renovation
211	Virology-1	Bacteriology (Head)	3	Alm. Partition
212	Conference (Small)	Invited Resrchr Rm	2	Alm. Partition
214	Virology (Head)	same to the left	2	Alm. Partition
220	Chem-Pathlogy-1	Virology-7		(Shift Only)
224	Chem-Pathology-2	Virology-8		(Shift Only)
225	Chem-Pathology-3	virology-9		(Shift Only)
230	Library	Invited Resrchr Rm	4	(Shift Only)
231	Store/Trans Office	Chem-Pathology-5		(Shift Only)
232	JICA (Nutrition)	Chem-Pathology-6		Lab Sink (1,800 x 750mm)
233	Histopathology-1	Chem-Pathology-7		(Shift Only)
234	Histopathology-2	Chem-Pathology-8		(Shift Only)
239	Nutrition-1	Immunology-1		(Shift Only)
240	Nutrition-2 (Head)	Immunology-2		Replcmnt fo Draft Chamber
241	Nutrition-3	Immunology-3		Replcmnt of Draft Chamber
242AB	Nutrition-4	Immunology-4		(Shift Only)
243AB	Nutrition-5	Immunology-5		(Shift Only)
244	Nutrition-6	Immunology-6		(Shift Only)
245	Epidemiology-1	Immunlgy-7 (Head)	3	Alm. Partition
246	Epidemiology-2	Immunology-8		(Shift Only)
247	Epidemiology-3	Prasitology-1		(Shift Only)
248	JICA (Epidemiology)	Parasitology-2		Replcmnt of Existing Wall
249	Parasitology-1 (Cystoma)	Parasitology-3		One Centre Lab Table (3,600 x 1,500mm)
253	Epidemlgy-4 (Head)	Parasitology-4		(Shift Only)
254	Parastlgy-2 (Head)	Parastlgy-5 (Head)	2	Alm. Partition
255AB	Parasitology-3 (Insectory)	Parasitology-7		Shift to Existing Shed Wall·Ceiling: Repaint

Renovation of Existing Feed Production Shed (Total Floor Area: 45 m²)

Room No.	Room Name (Existing)	Ditto (Renovation)	Item of Renovation
IN-101	Admin. Office	Insectary (Mosquite)	Wall: Repaint, Window: Bd. paint Ceiling: Bd. paint (H=2,000mm) Wooden and Net Doors
IN-102	Feed Prep Room	Insectary (Lava)	Same as above, Partition Wall
IN-103		Preparation Lab	Same as above, Partition Wall Sink (3,000 x 750mm)
IN-104		Snail Breeding Rm	Same as above, Partition Wall
IN-105	Machine Room	Tool Storage	Wooden Door

(3) Structural Plan

A rational and economical type of structure which satisfies the planned usage and functions of the new facilities will be employed taking the level of construction technology in Ghana into consideration. The adequate type of foundation will be selected based on the geological survey report while referring to the foundation structure of the existing faciliteis. As far as the design load and design standards are concerned, Japanese design standards will be used with consideration being given to the relevant standards in Ghana and their actual performance.

1) Ground Conditions and Foundation Type

The geological formation of the planned construction site consists of; an upper layer of clay or sandy clay of some 2 m in thickness; a middle layer of lateritic gravel or pan of some 2 m in thickness; a lower mixed layer of lateritic pan and quartz schist of some 6 m in thickness; and extremely hard bedrock of quartz-mica schist of some 20 m in thickness. The lateritic layer some 2 m below the ground will be used as the supporting layer and spread foundations will be used as in the case of the existing facilities. The results of the soil survey conducted during the field survey period indicates that a soil bearing capacity of 20 KN/m^2 can be expected.

2) Type of Structure and Design Standards

The structure will be a RC rigid frame structure which is commonly used and which is both economical and rational. Locally produced concrete blocks will be used for the exterior and partition walls. The roof structure will comprise steel beams on top of concrete pillars. In regard to the design, the following standards will be used while referring to the National Building Regulations of Ghana (1996).

- Dead load and live load : Building Standards Act Enforcement Regulations (Japan)
  JASS Building Load Guidelines
- Wind load : as above
- RC structure : JASS RC Design Standards

- Steel Structure : JASS Steel Structure Design Standards
- Seismic load : Ghana Seismic Code

Next table shows the main live loads based on the above structural conditions

Table 2-3-9 Main Live Loads (KN/m²)

	Floor	Pillars/Beams/ Foundations	Seismic Force
Laboratory	4,000	2,400	1,600
Office	3,000	1,800	800
Conference Hall	3,600	3,300	2,100
Corridor/Balcony	3,000	1,800	800

In calculating the design wind load, the maximum design wind velocity is set at 40 m/s based on an instantaneous maximum wind velocity of 28.3 m/s recorded in Accra in the past and the actual wind load will be determined on the basis of the Ghanaian National Building Regulations using this design wind velocity.
In regard to seismic force, as the isoseismal line around Legon where the project site is located is VII or lower, seismic acceleration of 0.08 g will be used.

3) Structural Materials

Local structural materials will be used where possible. Only those materials of which the quality, precision, price and/or supply capacity are judged to be inadequate will be procured from Japan or a third country. The design strength of concrete will be fc = 25 N/mm.

- Cement : normal Portland cement
- Coarse aggregate : local crushed stone
- Fine aggregate : local river sand
- Reinforcing bars : Japanese deformed bars SD 295, SD 345 (JIS G 3112) equivalent
- Structure steel : Japanese H-sections and light steel
  SS 400A (JIS G 3101) equivalent
  SSC 400 (JIS G 3350) equivalent

(4) Building Service Equipment Plan

1) Basic Principles

The planned facilities under the Project include laboratories handling hazardous pathogens and animal breeding rooms where a high degree of cleanliness is essential. Special care must be taken so that researchers can both safely and efficiently conduct their work and to prevent any contamination of the ambient environment.

i) The service equipment plan must be highly flexible to accommodate future changes of the research and testing activities.
ii) All of the systems should be economical in terms of the electricity, fuel and maintenance costs.
iii) The machinery and parts should selected with a high degree of compatibility in view of easy replacement in the case of a breakdown.
iv) While the safety of researchers is a priority for the P3 laboratories, complicated systems should be avoided as much as possible in view of easy maintenance.
v) The introduction of simple systems should be planned for the animal rooms as long as the breeding/raising conditions do not adversely affect the test results.
vi) An emergency power supply system will be planned for the P3 laboratories and animals rooms for the safety and maintenance of a proper breeding/raising environment.

2) Air-Conditioning and Ventilation Plan

Depending on the purpose of each room, the systems described below will be introduced taking ①temperature control, ②humidity control, ③cleaness control, ④ differential pressure control and ⑤ air current control into consideration. The outside air conditions will be as follows.

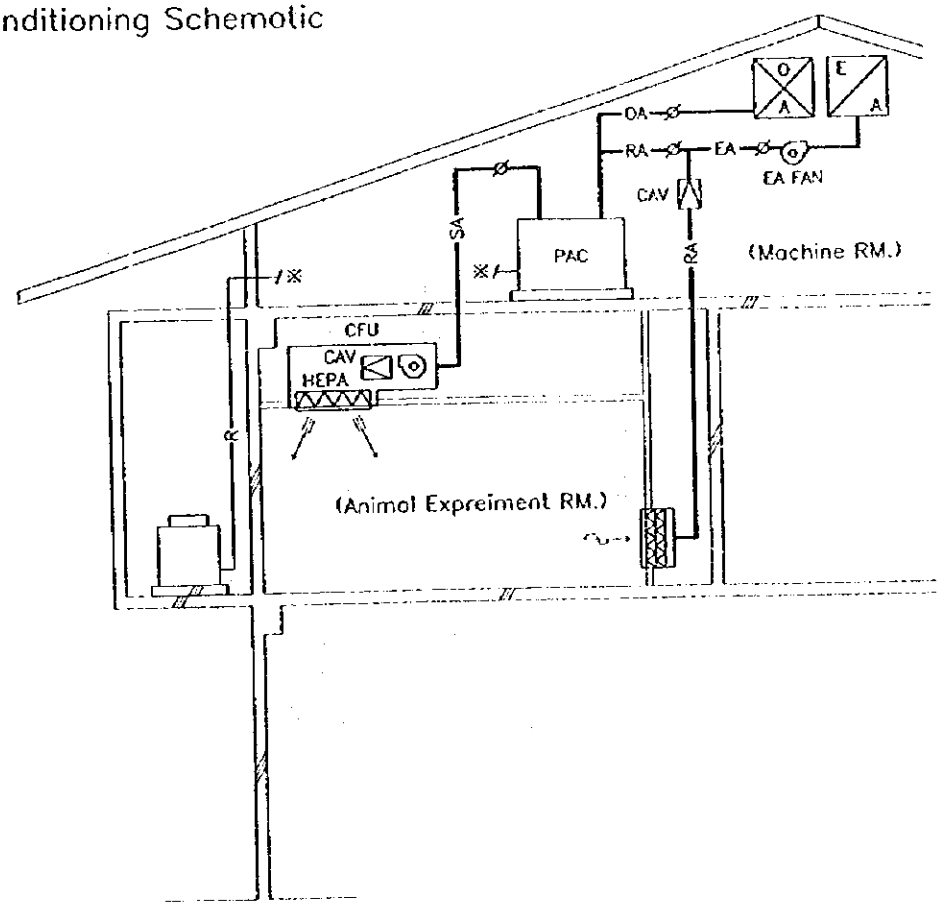
Outside air conditions: DB 33°C, WB 27°C
(1993 Ashrae Handbook Fundamentals)

(a) Package-Type Air-Conditioning System

Purpose of installation	:	a duct system will be used to control room temperature and air circulation; medium efficiency and high efficiency (MEPA and HEPA) filters are installed in the animal rooms to ensure cleanliness and to remove hazardous pathogens
Design temperature	:	25°C ± 2°C
Ventilation speed	:	20 times/hour (outside air : 30% intake)
Subject rooms	:	animal breeding rooms and animal experiment rooms

Animal Experiment Lab.

Air Conditioning Schemotic

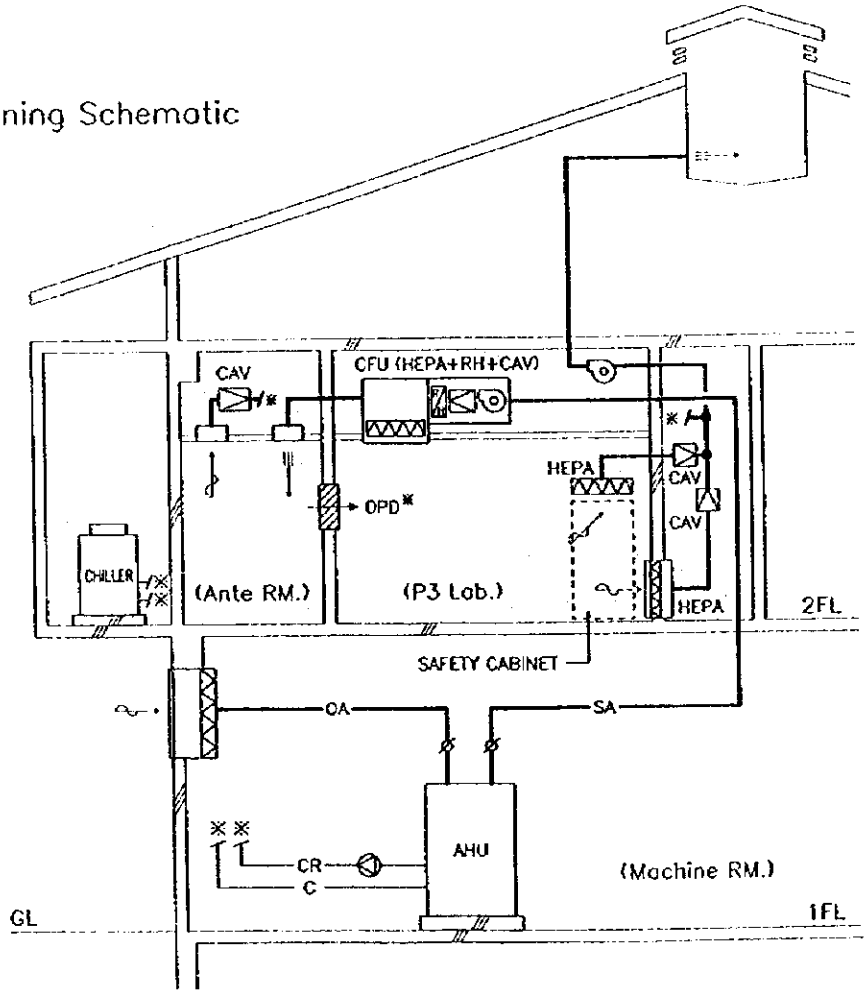


b) All Flesh, All Exhaust Package-Type Air-Conditioning System

Purpose of installation	:	medium efficiency and high efficiency (MEPA and HEPA) filters are installed to remove pathogenic organisms while using the duct system to regulate the differential pressure on the principle of total displacement using outside air as a bio-hazard prevention measure
Design temperature	:	24°C ± 2°C
Design humidity	:	55% ± 10%
Ventilation speed	:	25 times/hour (total outside air system)
Subject rooms	:	P3 laboratories (bacteriology and virology)

P3 Lab.

Air Conditioning Schematic



※Differential Pressure Damper
(with Differential Pressure gauge)

(c) Separate-Type Air-Conditioning System

Purpose of installation	:	for those rooms requiring air-conditioning and de-humidification for the protection of testing equipment, etc. even though strict temperature and humidity control is not required
Design temperature	:	26°C
Subject rooms	:	precision equipment laboratories, training laboratories, administration office, seminar rooms, conference hall and canteen, etc.

3) Ventilation System

(a) While natural ventilation will be used where possible for the general ventilation of the machine room, generator room and boiler room, etc., a mechanical ventilation system may be used to compensate for an insufficient ventilation volume.

(b) The contaminated air discharged from the safety cabinets installed in the laboratories will be discharged by a ventilation fan through the roof.

(c) A ventilation fan will be installed in those laboratories for which a separate-type air-conditioning system is employed for the ventilation of these laboratories.

(d) A ventilation fan will be installed in those rooms where such a fan is required due to their new function as laboratories following the refurbishment and unit relocation of the existing facilities.

4) Plumbing Plan

(a) Water Supply System

The existing elevated water tank has a capacity of approximately 50 tons and the gravity water supply system is usually used via the water supply pipe (PVC; diameter: 100 mm) from the main reservoire of the University. This reservoire is located on the top of Legon Hill some 180 feet higher than the NMIMR and is expected to provide a water pressure of approximately 6 kg/cm^2. For the present Project, no new water tank will be installed and direct connection will be made to the left of the front entrance of the existing facility for branching out. The daily water supply volume will be examined in the section analysing the maintenance cost of the new facilities.

(b) Hot Water Supply System

- An independent electric water heater used to be provided for each washing room of the existing facilities but these have now been removed after breaking down due to aging. As a result, there is currently no hot water supply system. Under the Project, a water heater will only be installed in the washing & sterilisation room in the animal building, mainly for the washing of cases. The existing storage-type electric water heater will be relocated and solar panels will be mounted on the roof to compensate for the supply capacity shortage of the heater.

- PVC pipes for hot water use (HIVP) will be used for the hot water supply.

(c) Water Drainage System

Waste water from the planned facilities will be drained by four separate channels for ① ordinary waste water, ② laboratory waste water, ③ animal waste water and ④ storm water.

No special sewage treatment plant will be introduced for the P3 laboratories and waste water originating from the handling of pathogens will be sterilised by an autoclave and then drained as part of the laboratory waste water.

- Storage tanks will be provided to regularly sterilise as well as neutralise laboratory waste water and animal waste water for subsequent treatment together with ordinary waste water. The planned treatment method will use the biological decaying process to reduce the BOD level to 90 ppm or lower prior to ground infiltration via porous pipes.

- The waste water treatment system for the existing facilities was constructed by the Ghanaian side and two soak pits of 1.2 m in diameter and 2.4 m in depth are linked together. As this system has no sterilisation and neutralisation units, the lids of these soak pits will be modified to establish a chemical inlet.

- Storm water will be drained o the existing drainage ditches.

(d) Sanitary Fixtures

- Low tank-type closets, urinals, washbasins, slop sink and mirrors, etc. will be installed for each WC. Slop sinks and washbasins will also be installed in strategic locations in the animal building.

5) Fire Extinguishing System

- The fire extinguishing system required for the planned facilities will feature easy maintenance and practical effectiveness.

- Dry powder extinguishers will be provided in the laboratories and animal breeding rooms at intervals of not more than 100 feet. A CO_2 fire extinguisher will be installed in the machine room, generator room and boiler room.

6) Piping for LPG and Special Gases

- As a centralised supply system makes the repair of gas leakage difficult, an independent supply system will be employed. A cylinder(s) will be placed outside each room where the supply of special gas(es) is requested for gas supply to places of use via a white steel gas pipe.

- A sleeve will be installed for the special gas supply pipe to the precision equipment laboratory in the P3 laboratory building.

7) Boiler

- An oil-fired high pressure boiler will be installed to supply high pressure steam to the high pressure autoclave to be introduced in the washing/sterilisation room in the animal building.

8) Incinerator

- A biological incinerator with an incineration capacity of 50 kg/hr will be installed to deal with infected waste from laboratories and animal house. The waste will initially be kept in the storage room so that the incinerator is used at a frequency of approximately once a week.

- The exhaust duct (chimney) for the incinerator will be as high as approximately 7 m above the ground level.

9) Kitchen Equipment

- Canteen shall be served with cooked foods and drinks therefor cooking equipment are not planned here.
- A gas range and a double sink, etc. will be installed in the kitchen of the canteen.

(5) Electrical Installation Plan

1) Power Lead-In and Power Source

The high voltage substation located on the premises of the existing NMIMR has a transformer (11 KV/415 V, 760 KVA) from which power is distributed to the power room of the existing NMIMR via underground cable. At the time of the visit by the field survey team, the meter on the distribution panel in the power room indicated approximately 200 KW, thereby affording the electric capacity planned under the Project.

- Power receiving method : three-phase, four wire, 415 V/240 V from the existing transformer
- Switchboard : exclusive distribution panel to be installed in the existing power room
- Distribution capacity : approximately 300 KVA
- Stable power source : automatic voltage regulator (AVR) for P3 Lab (50kVA)
- Protective relay circuit : - cut of the voltage fluctuation of more than ± 15 - 20%
  - automatic switching-over to the on-site generator from commercial power supply

2) Emergency Power Source

A diesel power generator will be installed to maintain the power supply to the P3 laboratories and animal rooms at the time of a power cut.

- Generator capacity : 170 KVA
- Power specifications : three-phase, four-wire, 415 V/240 V, 50 Hz
- Generator load : air-conditioning and ventilation system in the P3 laboratories and animal rooms; part of the receptacles circuitry in the P3 laboratories
- Battery : capacity of 150 AH for emergency lighting, operation display and warning

3) Trunk Line

Power will be distributed to the lighting panelboard and power control board of each planned facility from an exclusive distribution panel. The trunk line will use a metal conduit and IV cable. While a 100 V receptacle circuit is laid throughout the existing NMIMR, some 40 low voltage transformers (240 V/100 V), supplied as part of equipment provided under past technical cooperation, have been kept as reserves. In view of their availability, a new 100 V receptacle circuit will be laid under the Project. The power systems for the trunk lines and branch lines are described below.

- Trunk lines for lighting and power equipment : 3-phase, 4-wire, 415 V/240 V
- Lighting and receptacles : 1-phase, 2-wire, 240 V
- Power for fans and equipment : 3-phase, 3-wire, 415 V

The main load capacities are given below.

- Ordinary lighting and receptacles : 75 KW
- Power for air-conditioning : 150 KW
- Power for laboratory equipment : 75 KW (Total: 300 KW)

4) Lighting System

(a) Lighting Fixtures

- In order to reduce the running cost, the light sources for lighting fixtures will be fluorescent lamps of the sizes which are locally available. Incandescent lamps will also be used in some areas for reasons of architectural design.

- Dual fluorescent lamp stabilisers will not be used. Two single fluorescent lamp stabilisers will be used instead for a pair of fluorescent lamps so that the failure of one stabiliser will not totally prevent the lighting from coming on.

- The use of a sterilising lamp (UV) or sealed lighting fixture will be planned for P3 laboratories and their anterooms, washing/sterilising rooms and waste storage, etc.

- Small switching zones will be planned to reduce the running cost.

The approximately luminous intensity of the different rooms will be as follows.

- Laboratories	:	400 - 500 lux
- Administration office	:	300 - 400 lux
- Library	:	400 - 500 lux
- Animal breeding rooms	:	100 - 200 lux (with timer)
- Toilets and corridors	:	50 - 100 lux

(b) Receptacles

Apart from receptacles for general use, including cleaning, receptacles serving laboratory equipment will be provided to suit the equipment distribution and capacity of each laboratory. The power will be single-phase, two-wire, 240 V and no 100 V receptacles will be installed. In those laboratories where the installation of large equipment is planned, a distribution panel providing three-phase, 415 V power will be installed.

(c) Ceiling Fans

A ceiling fan(s) will be installed in ordinary rooms where air-conditioning will not be provided.

5) Power Equipment Panel

A power control panel will be installed in each machine room to supply power to the air-conditioners and fans, etc. The warning of an abnormal power load for each panel or machine room will be displayed on the warning panel installed in the maintenance office.

6) Telephone System

The existing telephone switchboard of the NMIMR connects seven external lines to some 70 extensions. As this switchboard is capable of handling upto 380 extensions, the new facilities will be served by the same switchboard. Metal conduits will be used from the switchboard to the telephone outlets in each room via a relay terminal board. The piping arrangements will accommodate the future installation of direct lines and extensions in the future.

7) Interphone System

An interphone system will be planned for two P3 laboratories for communication with outside.

8) Fire Alarm System

A fire alarm system will be planned in accordance with the Fire Services Law in Ghana and Japan. Push-button type emergency bells will sound at the time of an emergency, such as a fire, to ensure the early detection/reporting of fires, etc. and safe evacuation.

9) Audio Visual System

The following equipment will be planned to create an audio visual system in the conference hall.

- audio system, video projector, slide projector, OHP and screen

10) Lightning Arrester

Lightning rods similar to those used by the existing facilities will be planned to protect the new facilities from lightning.

(6) Construction Materials Plan

The basic principle for the selection of the construction materials is the selection of those materials and finishing which are popularly used for local construction work due to their suitability vis-a-vis the local climate in order to achieve easy to maintain facilities. The use of the materials shown in the table below will be planned depending on the specific purpose of use of each room while taking economy, durability and easy cleaning, etc. into consideration.

Table 2-3-10 Comparison Between Local and Selected Construction Methods

	Local Method	Selected Method	Reason for Selection
[Exterior] Roof	- Tile roof (pitched) - Flat roof	- Pitched roof (sheet metal roofing)	Poor quality of tiles or asphalt waterproofing has led to the leaking of rainwater
Walls	- Paint finish - Washed terrazzo - Local stone veneer	- Spray tiles	Local paint has poor weatherability
Windows and Doors	- Aluminium - Wood	As left	Aluminium windows and doors will be used for the exterior while wooden products will be used for the interior. Steel products may be used where necessary
[Interior] Floor	- In-situ terrazzo - PVC tiles - Mortar binding	- In-situ terrazzo - PVC tiles	Easy cleaning
Walls	- Paint finish (EP) - Wooden rib veneer	- Paint (EP)	Commonly used and easy to maintain; ceramic tiles to be used for areas where water is used
Ceiling	- Soft boards - Paint finish	- Rockwool acoustic boards - Silicate-calcium boards (paint finish)	Superior acoustic performance; silicate-calcium boards to be used in areas where water is used

The planned facilities include laboratories handling pathogenic organisms and animal breeding rooms where cleanliness is essential. Local constructors generally find it difficult to handle or repair the finishing materials for clean rooms. Accordingly, finishing materials which can be locally dealt with for repair or other purposes will be selected under the Project at the expense of a certain degree of cleanliness.

1) Exterior Finishing Materials

i) Roof

Many of the facilities on the premises of the University of Ghana have a pitched tile roof while newer structures have a flat roof with asphalt waterproofing, however leak rainwater to some extent. The existing facilities of the NMIMR have a pitched roof with colonial roofing. In consideration of the heat insulation effect of a flat roof and harmony with the surrounding environment, a pitched roof with sheet-metal roofing will be used for the new facilities.

ii) Exterior Walls

Because of the low weatherability of locally produced paint, imported paint will be used for the exterior wall finish. Spray tiles will be used for the Project for even better weatherability.

iii) Windows and Doors

For the protection of the research facilities from the local high temperatures, high humidity and sand dust blown by the Hamattan, aluminium windows and doors will be used because of their good airtightness. As locally manufactured aluminium windows and doors have weak members, inferior processing precision and poor airtightness, those made in Japan or a third country will be considered. In the case of interior doors, veneered flush doors will be used as in the case of the existing facilities. In addition, steel doors will be introduced where high airtightness is required.

2) Interior Finishing Materials

i) Floor

An in-situ terrazzo finish is commonly used in Ghana and office floors, etc. are generally carpeted. For the Project, an in-situ terrazzo finish will be used in view of durability and easy maintenance. PVC tile flooring or locally produced wooden

parquet flooring will be used for the administration office and the conference hall respectively to ensure comfortable space.

ii) Interior Walls

Mortar with a paint finish which is commonly used in Ghana will be adopted. Ceramic tiles or spray tiles will be used in areas of water use and upto a height of approximately 2 m in the case of those walls which require cleaning with water. Locally produced wooden ribs will be partially used in the conference hall where sound absorption effects are required to improve the acoustic efficiency.

iii) Ceiling

Rockwool acoustic boards will be used for those rooms where dust should be avoided and which require sound absorption effects. In the case of the washing & sterilization rooms where the humidity tends to be high because of the frequent use of water, silicate-calcium boards with high water resistance will be used with a paint finish. Locally produced wooden ribs will be partially used for the conference hall which requires high acoustic efficiency to ensure the absorption and/or diffusion of reflected sound.

The planned use of the finishing materials described above is outlined in the following table.

Table 2-3-11 Main Finishing Materials

1. P3 Laboratory Building

Room Name	Floor	Wall	Ceiling	Reason to Select
Laboratorys	Terraz Polish	Paint (VP)	Acoustic BD.	durability; easy maint
P3 Labs	Terraz Polish	Spray Tile	Sil BD. (VP)	cleanness; air-tightness
Adm. Office	Terraz Polish	Paint (EP)	Acoustic BD.	comfort; easy maint
Workshop	Conc Grading	Spray Tile	Faced Conc(EP)	durability; economic
Machine Room	Mortar	Fair Faced CB	Faced Conc	economic
WC	Terraz Polish	Ceramic Tile	Sil BD. (VP)	durability; easy cleanng
Corridor	Terraz Polish	Paint (EP)	Acoustic BD.	easy maintenance

2 .Experimantal Animal Building

Room Name	Floor	Wall	Ceiling	Reason to Select
Animal Breeding	Morter Trowel	Faced CB(VP)	Faced Conc(EP)	economic; easy maint
Feed Preparetion	Morter Trowel	Faced CB(VP)	Faced Conc(EP)	economic; easy maint
Breeding Room	Terraz Polish	Spray Tile	Sil BD. (VP)	cleanness; air-tightness
Animal Exp. Room	Terraz Polish	Spray Tile	Sil BD. (VP)	cleanness; air-tightness
Wash/Ster. Room	Terraz Polish	Ceramic Tile	Sil BD. (VP)	ckeanness; easy cleaning
Admin Office	Terraz Polish	Paint(EP)	Acoustic BD.	comfort; easy maint
WC	Terraz Polish	Ceramic Tile	Sil BD.(VP)	durability; easy cleaning
Corridor	Terraz Polish	Paint(EP)	Acoustic BD.	easy maintenance

3 .Conference Hall Building

Room Name	Floor	Wall	Ceiling	Reason to Select
Seminer Room	Wood Flooring	Paint(EP)	Acoustic BD.	comfort; sound proof
Canteen	Wood Flooring	Paint(EP)	Acoustic BD.	comfort; easy maintennce
Lounge	Terraz Polish	Paint(EP)	sil BD. (VP)	durability; easy maint
Conference Hall	Wood Flooring	Paint(EP) Wooden Rib	Acoustic BD. Sil BD.(EP)	comfort; sound proof; durabirity
Lobby	Wood Flooring	Paint(EP)	Wooden Rib	comfort; easy maintennce
Prep./Store	Morter Trowel	Paint(EP)	Acoustic BD.	durability; economic
Machine Room	Morter Trowel	Faced CB	Faced Conc.	durability; economic
WC	Terraz Polish	Ceramic Tile	Sil BD. (VP)	durability; easy clean
Corridor	Terraz Polish	Paint(EP)	Sil BD. (VP)	durability; east maint

(7) Equipment Plan

1) Basic Principles of Equipment Plan

The following basic principles will be adopted for the equipment plan.

i) The equipment to be selected should be general-purpose equipment which is required by the planned facilities and which is essential for the research activities in the next project-type technical cooperation.

ii) In the case of equipment for the P3 laboratories and animal testing, the existing equipment will, in principle, be used in an effective manner while the provision of the minimum quantity of new general-purpose equipment will be examined.

iii) The supply of parts will be considered for that equipment which can be repaired with the replacement of parts among that equipment which has broken down at the existing facilities.

iv) The introduction of wall-mounted or central laboratory tables will be considered as necessary following the renovation of the existing facilities and the relocation of various units.

v) The number of local agents in Ghana is currently limited. By encouraging manufacturers to establish local agents during the equipment selection stage, it is hoped that close links will be established between the NMIMR and such agents to create a maintenance/repair system.

vi) In regard to the equipment selected under the Project, it is assumed that the Ghanaian side will make efforts to consolidate its technical capability and system to conduct standard maintenance and inspection in addition to a certain degree of repair work.

2) Consumable and Spare Parts

Some of the equipment to be supplied will require reagents, consumable and/or spare parts. In the case of reagents and consumable, the necessary quantities will be provided under the Project, taking the time lag from order placement to the commencement of use into consideration. The term of the validity of the reagents, etc. to be supplied will also be considered when determining the quantities to be provided.

In the case of spare parts, their necessity will be examined for each equipment. Assuming precise inventory control, upto one year supply of spare parts will be included within the scope of the Project. While the expected life of filters, including HEPA filters, will depend on the use environment and duration of actual operational use, one set of spare filters will be planned for each equipment using filters based on an assumed life of two years.

3) Selection of Equipment

A) Equipment used for facilities based on the project

Considering the present activities and maintenance conditions of the equipment as well as the basic concept of the project, we investigated equipment requested and came up with a list of the results of equipment selection, shown on the following page. Evaluation of the requested equipment is based on the following criterion.

i) Criterion of procurement

a. Equipment needed for daily operations of the Experiment Room or hazardous experiments.

b. Equipment needed for the study of HIV and tuberculosis which will be major subjects of the future technical cooperation.

c. Equipment needed for doing experiments efficiently by sharing.

d. Equipment needed for technology transfer according to the future technical cooperation, e.g. training course.

e. Maintenance equipment needed for the equipment currently used at the facilities and used for hazardous experiments.

f. Equipment which should be renewed because of becoming too old.

g. Equipment needed for implementation of the project although it is not listed.

ii) Criterion of Dis-procurement

h. Equipment which can be transferred from the existing site or procured themselves.

i. Equipment which can be procured based upon the future technical cooperation or not needed at the present circumstances.

j. Equipment delisted from the equipment portions because alternative equipment will be used or it will be supplied as a part of facilities.

The following Table shows investigation results of requested equipment.

Table 2-3-11 Investigation Result of Requested Equipment

P3 Laboratory

Item No.	Equipment to be requested	Requested Q'ty	Ghana's Priority	Procurement							Dis-procurement			Remarks	Procure-ment Q'ty
				a	b	c	d	e	f	g	h	i	j		
	Lab .(Conventional)														
1	Autoclave (middle, horizontal)	1	C								○				—
2	Autoclave (middle, vertical)	1	C	○											1
3	Central Lab. Table	1	A										○	Changed to Corner Table	—
4	Centrifuge (3,000 rpm)	1	B	○											1
5	Incubator	1	B	○											1
6	Biological microscope	1	B	○											1
7	Reagent Store	1	B	○										Changed to Refrigerator	1
8	Sink	1	A	○											1
9	Side Table	1	A	○											1
9-2	Corner Lab. Table									○					1
300	Stool									○					2
	Lab(P2)														
10	Autoclave (middle, horizontal)	1	C								○				—
11	Autoclave (middle, vertical)	1	A	○											1
12	Central Lab. Table	1	A								○			Changed to Side Table	1
12-2	Corner Table									○					1
13	Centrifuge (3,000 rpm)	1	A	○											1
14	High speed centrifuge (20,000 rpm)	1	A	○											1
15	Incubator	1	B	○											1
16	CO_2 Incubator	1	C									○			—
17	Reagent Store	1	A	○										Change to Refrigerator	1
18	Refrigerator	1	C										○	Use above equipment	—
19	Freezer (-35℃)	1	A									○			—
20	Safety Cabinet, IIA	1	A	○											1
23	Sink	1	A	○										Transferred to Preparation Room (2)	1
300	Stool									○					2
	Cold Room														
21	Equipment shelf	1	C									○			—
47-2	Freezer (-85℃)									○					1
41	Liquid Nitrogen Canister	1	A	○										Transferred from P3 (HIV)	1
	Washing Room														
24	Side Table	1	A									○			—

Item No.	Equipment to be requested	Requested Q'ty	Ghana's Priority	Procurement							Dis-procurement			Remarks	Procure-ment Q'ty
				a	b	c	d	e	f	g	h	i	j		
	Freezer Room														
25	Freezer (-130℃, horizontal)	1	C									○			—
	Lab-2(P3) (HIV, Others)														
26	Autoclave (middle, horizontal)	1	A	○										Changed to small	1
27	Autoclave (middle, vertical)	1	B	○											1
28	Autoclave, large	1	B									○		To small/middle	—
29	Central Lab. Table	1	A	○										Replaced by Side Table	2
30	Bio-Centrifuge (3,000 rpm)	1	A	○											1
31	CO_2 Incubator	1	A	○											1
32	Freezer (-85℃, horizontal)	1	A	○											1
33	Freezer (-35℃)	1	A										○		—
34	Bio-High speed centrifuge (20,000 rpm)	1	B	○											1
35	Incubator	1	C										○		—
36	Pass Box	1	A	○											1
37	Phase contrast microscope	1	A	○											1
38	Reagent Store	1	A	○										Changed to Refrigerator	1
39	Safety Cabinet (IIB type)	1	A	○											1
40	Bio-Ultracentrifuge (40,000 rpm)	1	B	○											1
42	Anemometer	1	A	○											1
300	Stool									○					2
	Lab-1(P3) (TB)														
43	Autoclave (middle, horizontal)	1	A										○		—
44	Autoclave (middle, vertical)	1	A	○										Changed to small	1
45	Side Lab. Table	2	A	○										Reduced	1
46	Bio-Centrifuge (3,000 rpm)	1	A	○											1
47	Freezer (-85℃, horizontal, middle)	1	A	○											1
48	Incubator(middle)	1	A	○											1
49	Pass Box	1	A	○											1
50	Biological microscope	1	A	○											1
51	Reagent Store	1	A	○										Changed to Refrigerator	1
52	Safety Cabinet (IIB type)	1	A	○											1
53	Bio-Sink	1	B										○		—
300	Stool									○					2

Item No.	Equipment to be requested	Requested Q'ty	Ghana's Priority	Procurement							Dis-procurement			Remarks	Procure-ment Q'ty
				a	b	c	d	e	f	g	h	i	j		
	Precision Inst. Lab														
54	Central Table	1	A	○											1
55	Sink	1	A	○											1
56	Side Table	1	A	○											2
56-2	Corner Table									○					1
57	Computer	1	A	○											1
58	DNA Sequencer	1	A									○			---
59	ELISA Reader	1	A	○											1
22	Equipment shelf	1	A	○						○				Transferred from Washing Room	1
60	Flow cytometer	1	B									○			---
61	PCR System	1	C									○			—
300	Stool									○					4
	Training Lab														
62	Teaching microscope (5 person)	1	C								○				—
63	Biological Microscope	5	A	○											5
64	Central Table	2	A	○										Increased	3
22	Equipment shelf	1	A	○						○				Increased	2
65	Sink	1	A	○										Increased	2
66	Side Table	1	A	○											1
300	Stool									○					16
	Administration Room														
305	Lab. Clothing (PS Lab.)										○				—
	Maintenance Shop														
67	Working Bench	2	B								○				—
68	Machine for Maintenance	1	A	○											1

Existing Facilities

Item No.	Equipment to be requested	Requested Q'ty	Ghana's Priority	Procurement							Dis-procurement			Remarks	Procure-ment Q'ty
				a	b	c	d	e	f	g	h	i	j		
	Electron Microscope Dept.														
69	Electron Microscope Transmission type, without scanning function	1	A	○											1
70	Specimen Preparation Equipment	1	B	○											1
71	Ultra Microtome	1	B	○											1
72	Knife Maker	1	C								○				—
300	Working Chair									○					2
	Others														
73	Central table	5	B								○				—

Item No.	Equipment to be requested	Requested Q'ty	Ghana's Priority	Procurement							Dis-procurement			Remarks	Procure-ment Q'ty
				a	b	c	d	e	f	g	h	i	j		
74	Safety cabinet	3	B								○				—
75	Replacement parts for existing equipment	1	B	○											1

Laboratory Animal Unit

Item No.	Equipment to be requested	Requested Q'ty	Ghana's Priority	Procurement							Dis-procurement			Remarks	Procure-ment Q'ty
				a	b	c	d	e	f	g	h	i	j		
	Breeding and Growing														
	Grasscutter (Growing and Breeding)														
76	Breeding Shelf	2	A	○										Reduced	1
77	Grasscutter Reproduction Cage	25	A	○										Reduced	6
78	Breeding Shelf	5	A	○										Reduced	1
79	Grasscutter Cage	150	A(116) C(34)	○										Reduced	15
80	Grasscutter Balance	1	A	○											1
	Rabbit (Growing and Breeding)														
81	Breeding Shelf	2	A								○			Use existing equipment	—
82	Rabbit Reproduction Cage	12	A								○			Use existing equipment	—
83	Breeding Shelf	3	A								○			Use existing equipment	—
84	Rabbit Cage	45	A								○			Use existing equipment	—
85	Breeding Shelf	3	A								○			Use existing equipment	—
86	Rabbit Cage	27	A								○			Use existing equipment	—
87	Rabbit Balance	1	A	○											1
	Guinea Pig (Growing and Breeding)														
88	Breeding Shelf	2	A	○										Reduced	1
89	Guinea Pig Reproduction Cage	16	A	○										Reduced	3
90	Breeding Shelf	4	A	○										Reduced	1
91	Guinea Pig Cage	80	A(25) C(53)	○										Adjusted	16
92	Guinea Pig Balance	1	A	○											1
	Hamster and Rat (Growing and Breeding)														
93	Breeding Shelf	1	A								○			Use existing equipment.	—
94	Rat Cage (for Hamster)	16	C(16)								○			Use existing equipment.	—
95	Breeding Shelf	2	A								○			Use existing equipment.	—

Item No.	Equipment to be requested	Requested Q'ty	Ghana's Priority	Procurement							Dis-procurement			Remarks	Procure-ment Q'ty
				a	b	c	d	e	f	g	h	i	j		
96	Rat Cage (for Rat)			○										Use existing equipment and supply additional	7
96	Rat Cage (for Hamster)	50	A	○										Use existing equipment and supply additional	5
97	Rack	4	A								○			Use existing equipment.	—
98	Rat Cage	64	A								○			Use existing equipment.	—
99	Hamster and Rat Balance	1	A	○											1
	Mouse (Growing and Breeding)														
100	Rack for Mouse	6	A								○			Use existing equipment.	—
101	Mouse Cage	150	A(13) C(137)								○			Use existing equipment.	—
102	Mouse Balance	1	A								○			Use existing equipment.	—
135	Vinyl Isolation	3	A	○										A full set (3 sets)	1
	Stock and Preparation														
103	ERECTA Shelf	2	A	○											2
104	Porta Washer with Disinfectant	1	B	○										Changed to cleaner	1
105	Working Table	5	B	○											5
106	Feed Container Carry	2	B	○										Reduced	1
107	Cart	2	A	○											2
108	Hand wash Stand	2	C	○											2
109	Freezer (-5 C degree)	1	A									○			—
96-1	Spare Cage (for Rat/Hamster)									○					20
96-2	Rat Cage (for Mouse)									○					16
	Office														
110	Office Desk w/Chair, large	1	B									○			—
111	Office Desk w/Chair, small	2	C									○			—
112	Steel Cabinet	2	C									○			—
113	Filing Cabinet	2	B									○			—
114	No-Frost Refrigerator	1	B									○			—
115	Sink with Drain board	1	A									○			—
116	Personal Computer w/printer	2	A(1) C(1)									○			—
117	Conference Table	1	C								○				—
118	Swivel Office Chair	5	C								○				—
119	Television with Video System	1	C								○				—
120	Copy Machine	1	B								○				—

Item No.	Equipment to be requested	Requested Q'ty	Ghana's Priority	Procurement							Dis-procurement			Remarks	Procure-ment Q'ty
				a	b	c	d	e	f	g	h	i	j		
	Diagnostic and Autopsy														
121	Laboratory Side Table	2	A	○											2
122	Sink with Drain board	1	A	○											1
123	Working Chair	4	A	○										Reduced	2
124	Hanging Cabinet (3 pcs/set)	1	B										○		—
125	Steel Cabinet	1	B	○											1
126	Filing Cabinet	1	B								○				—
127	Medical Refrigerator	1	A								○				—
128	Biological Clean Bench	1	A									○			—
129	Working Table	2	A								○				—
130	Microscope for Two Observer	1	A									○			—
131	Biological Microscope	1	A	○											1
132	ELISA System	1	A										○		—
133	Dissecting Microscope	1	A									○			—
134	LN2 Tank	1	A									○			—
136	Electrophoresis	1	A									○			—
137	Cryostat Microtome	1	C									○			—
138	Refrigerated Centrifuge, floor type	1	A	○										Changed to ordinary tabletop type	1
139	Constant Temperature Bath	1	A	○											1
140	Animal Holder	1	A									○			—
141	Dissecting Set	2	A(1) C(1)									○			—
142	Boiling Sterilizer	1	A	○											1
143	Medical Freezer	1	A	○										Changed to Refrigerator	1
144	Cooled Incubator	1	A	○										Changed to ordinary one	1
145	CO_2 Incubator	1	A									○			—
146	Clinical thermometer	1	A									○			—
	Dressing Room														
147	Dressing Locker	2	A	○											2
196	Dressing Locker	2	A	○											2
148	Drain board	1	A										○		—
197	Drain board	1	A										○		—
	Washing and Sterilizing														
149	High Pressure Steam Sterilizer	1	A										○		—
150	Pass Box	1	A										○		—
151	Shallow Sink	1	A	○											1
152	Deep Sink	1	A	○											1
153	Drain/Dry Shelf	3	A	○											3
154	Sterilizing Box, small	5	B	○										Changed to one for feeding	5

Item No.	Equipment to be requested	Requested Q'ty	Ghana's Priority	Procurement							Dis-procurement			Remarks	Procure-ment Q'ty
				a	b	c	d	e	f	g	h	i	j		
155	Sterilizing Box, large	5	B	○										Changed to one for bedding	5
156	Rubber Spatula	10	C									○			—
157	Working Table	2	C	○											2
158	Steel Cabinet	2	C									○			—
159	Cart	3	B	○											3
160	Porta Washer with Disinfectant	1	B	○										Without Disinfectant	1
161	Washing machine	1	B									○			—
	Post morten														
162	Medical Freezer for Carcass	1	A	○										Changed to Refrigerator	1
165	Steel Rack	3	B							○					3
	Warehouse (Equipment)														
163	Steel Rack(large)	1	B								○			Replaced by No.165	—
164	Steel Rack(medium)	1	B								○			Replaced by No.165	—
	Stock														
165	Steel Rack	3	B								○				—
166	Cart	4	A(2) C(2)								○				—
167	Feed Container Carry	4	C								○				—
	Animal Experiment														
168	Ice Machine	1	B	○											1
169	Medical Refrigerator	1	C								○				—
170	Cooled Incubator	1	C									○			—
171	ERECTA Shelf	1	C								○				—
172	Steel Cabinet	1	C								○				—
173	Hand wash Stand	1	B	○											1
	Dissection/Operation														
174	Breeding Shelf	2	B								○			Use existing equipment	—
175	Mouse Cage	72	B								○			Use existing equipment	—
176	Breeding Shelf	2	B	○										Use existing equipment and supply additional	1
177	Rat Cage	50	B	○										Reduced	16
178	Breeding Shelf	2	B	○										Reduced	2
179	Guinea Pig Cage	32	B	○										Reduced	18
180	Breeding Shelf	2	B	○										Changed to another one	2
181	Rabbit Cage	24	B	○										Reduced	18
182	Laboratory Side Table	4	A	○										Reduced	2
183	Working Table	2	B	○											2
184	Wagon	2	C									○			—
185	Mouse Automatic Balance	1	A	○											1

Item No.	Equipment to be requested	Requested Q'ty	Ghana's Priority	Procurement							Dis-procurement			Remarks	Procure-ment Q'ty
				a	b	c	d	e	f	g	h	i	j		
186	Rat Automatic Balance	2	A	○											2
187	Rabbit Automatic Balance	1	A	○											1
188	Boiling Sterilizer	2	C	○										Reduced	1
189	Dissecting Set	4	C	○										Reduced	2
190	Mouse Holder	2	A	○											2
191	Rat Holder	2	A	○											2
192	Operating Table	10	A	○											10
193	Dissecting Table for Rabbit	2	A	○											2
194	Animal Scaffold	1	A										○		—
195	Animal Hair Clipper with Blades	2	A(1) C(1)	○										Reduced	1
301	Sink									○					1
22	Equipment Shelf									○					1
123	Working chair									○					3
	Animal Experiment														
198	Tattoo Machine	1	A									○			—
199	Jet Fog (Atomizer)	2	A	○										Reduced, changed to Formalin gas generator	1
200	BBH-Unit (Mouse)	1	A											Changed to another one	—
201	Mouse Cage	16	A											Changed to another one	—
202	BBH Unit (Rat)	1	A											Changed to another one	—
203	Rat Cage	16	A											Changed to another one	—
204	BBH Unit (Guinea Pig)	1	A											Changed to another one	—
205	FRP Guinea Pig Hanging Cage	16	A											Changed to another one	—
206	BBH Unit (Rabbit)	1	A											Changed to another one	—
207	FRP Rabbit Hanging Cage	9	A											Changed to another one	—
208	Filter Unit with Silencer	4	A											Changed to another one	—
209	Negative Rack with Blower	1	A	○										Changed to another one; quantity was adjusted	2
210	Mouse Cage	25	A	○										Quantity was adjusted	50
211	Negative Rack with Blower	1	A	○										Quantity was adjusted	2
212	Rat Cage	16	A	○										Quantity was adjusted	32
213	Negative Rack with Blower	2	A	○										Quantity was adjusted	2

Item No.	Equipment to be requested	Requested Q'ty	Ghana's Priority	Procurement							Dis-procurement			Remarks	Procure-ment Q'ty
				a	b	c	d	e	f	g	h	i	j		
214	Guinea Pig Cage	9	A	○										Quantity was adjusted	18
213	Negative Rack with Blower			○											2
215	Rabbit Cage	9	A	○										Quantity was adjusted	18
216	Biological safety Cabinet	1	A	○											1
217	Working Table	2	B	○											2
218	Wagon	2	C									○			—
219	Hand wash Stand	1	B	○											1
220	Mouse Automatic Balance	1	A	○											1
221	Rat Automatic Balance	2	A	○											2
222	Rabbit Automatic Balance	1	A	○											1
223	Autoclave, small	3	A	○											1
224	Pass Box	1	A									○			—
303	Side Table									○					2
304	Equipment Shelf									○					1
302	Sink									○					1
123	Working Chair									○					3
	Monkey Breeding Room														
225	Negative Rack with Blower	2	A	○										Changed to another one	1
226	Monkey Cage	4	C	○											4
227	Working Table	1	B	○											1
228	Hand wash Stand	1	A										○		—
	Monkey Experiment and Quarantine														
229	Wagon	1	B	○										Changed to Side Table (Stainless Steel)	1
230	Automatic Balance	1	A	○											1
231	Boiling Sterilize	1	A	○											1
232	Dissecting Set	2	A(1) C(1)										○		—
233	Catching Gloves	5	A(3) C(2)	○										Reduced	3
234	Catching Net	2	A	○											2
235	Face Guard (Goggles)	2	A	○											2
302	Sink with Drain board	1	A	○											1
237	Freezer for carcass	1	A										○		—
304	Equipment Shelf									○					1
	Raw Materials Stock Manufacturing														
238	Storage	1	A	○										Changed to another one	1
239	Steel Rack	2	C	○											2
240	Steel Cabinet	1	C	○											1
241	Pellet Mill	1	A	○											1
242	Dryer	1	C								○				—

Item No.	Equipment to be requested	Requested Q'ty	Ghana's Priority	Procurement							Dis-procurement			Remarks	Procure-ment Q'ty
				a	b	c	d	e	f	g	h	i	j		
243	Working Table	2	A	○											2
244	Digital Balance	1	A	○											1
245	Cart	2	A	○											2
	Fowl (Breeding)														
83	Shelf			○											1
246	Pen for Fowls	1	C										○		--
	Sheep (Breeding)														
247	Fold for Sheep	1	C										○		--
	Others														
248	Laboratory Wear, etc.	10	A								○				--

B) Repairs of equipment used at the existing facilities

We investigated the equipment which were requested to be repaired along with the remodeling of the existing facilities. For this investigation, we, consultants, inspected all the equipment needing repairs with head of each department and maintenance staff; and confirmed the necessary points such as present conditions, purpose of use, defective parts and replacement parts. Then, we came up with a report on equipment to be repaired and discussed how to repair the equipment. Based on the report, we asked manufacturers in Japan about the feasibility of procuring replacement parts and estimation of them. The results, described on the next page, are classified into the following points:

a. Equipment judged by Japanese engineers that it can be repaired and any necessary replacement part can be procured.

b. Equipment judged by maintenance staff of the NMIMR or staff using the equipment that it can be repaired or replaced, and any necessary replacement part can be procured.

c. Equipment judged by engineers of the agency on site that it can be repaired and any necessary replacement part can be procured.

d. Impossible to be repaired because of becoming too old and other reasons.

e. Impossible to investigate because of lack of information or no response from manufacturers.

The following Table shows the results of investigation of the possibility of repair on defective existing equipment.

Planned equipment layout and list are attached on (8) - Basic Design Drawings.

Investigation of the possibility of repairing of the defective equipment

	Name of Department Name of Equipment	Results					Judgment	
		a	b	c	d	e	Possible	Impossible
	VIROLOGY							
1	CLINI BATH		O				O	
2	REAGENT WATER SYSTEM					O		O
3	ROSS TEMP ICE MAKER					O		O
4	AUTO STILL				O			O
5	CO_2 INCUBATOR					O		O
6	SAFETY CABINET	O					O	
7	CLEAN BENCH	O					O	
8	CLEAN BENCH	O					O	
9	SAFETY BENCH					O		O
10	CLEAN BENCH					O		O
11	CLEAN BENCH					O		O
12	CLEAN BENCH					O		O
	BACTERIOLOGY							
1	SAFETY CABINET	O					O	
2	ELECTRIC BALANCE WITH AC ADAPTER		O				O	
3	AUTO STILL		O				O	
4	INCUBATOR				O			O
5	INCUBATOR	O					O	
6	PYRO MULTI MAGNESTIRRER		O				O	
	IMMUNOLOGY							
1	FACSCAN - BECTON DICKINSON					O		O
2	CLEAN BENCH (HITACHI)					O		O
3	AUTO STILL YAMATO				O			O
4	AQUARIUS	O					O	
5	KUBOTA CENTRIFUGE		O				O	
6	STERILGARD HOOD					O		O
7	TITERTEK MICROPLATE WASHER							
	NUTRITION							
1	CLINICAL CHEMISTRY ANALYZER					O		O
2	BOMB CALORIMETER					O		O
3	AMINO-ACID INTEGRATOR (CALCULATOR)					O		O
4	AMINO-ACID PEN RECORDER					O		O
5	FAT EXTRACTOR		O				O	
6	CLEAN BENCH					O		O
	HAEMATOLOGY							
1	HAEMOGLOBINOMETER				O			O
2	DEEP FREEZER (AMANO)					O		O
3	HEMAT 12 BLOOD ANALYSER (CELL COUNTER)					O		O
	ELECTRON MICROSCOPY							
1	BALANCE					O		O
2	OLYMPUS BH MICROSCOPE WITH MP-CBAD PHOTO UNIT				O			O
3	PET CLEANER					O		O

	Name of Department Name of Equipment	Results					Judgment	
		a	b	c	d	e	Possible	Impossible
4	ELECTRON MICROSCOPE		O				O	
5	AUTOMATIC PREPARATIVE ULTRACENTRIFUGE		O				O	
6	DISSECTING MICROSCOPE		O				O	
7	WATER COOLER					O		O
8	ULTRA MICROTOME				O			O
	PARASITOLOGY							
1	COMPOUND MICROSCOPE				O			O
2	INVERTED MICROSCOPE				O			O
3	COOLING UNIT					O		O
4	SPECTROPHOTOMETER					O		O
5	MAGNETIC STIRRER					O		O
6	HOT STIRRER				O			O
7	WATER BATH WITH SHAKE		O				O	
8	ROLLER PUMP					O		O
9	CLEAN BENCH					O		O
	CHEMICAL PATHOLOGY							
1	PH METER		O				O	
2	WATER BATH					O		O
3	REFRIGERATOR					O		O
4	LIQUID CHROMATOGRAPH, CHROMATOPAC					O		O
5	SAFETY CABINET				O			O
6	SAFETY CABINET					O		O
	EPIDEMIOLOGY							
1	REFRIGERATOR		O				O	
2	MICROSCOPE				O			O
	LABORATORY ANIMALS							
1	WATER BOILER					O		O
2	CLEAN AIR RACK (2)				O			O
3	CLEAN AIR RACK (1)	O					O	
4	CLEAN AIR RACK (1)					O		O
5	REFRIGERATOR				O			O
6	AUTOCLAVE	O					O	

Results

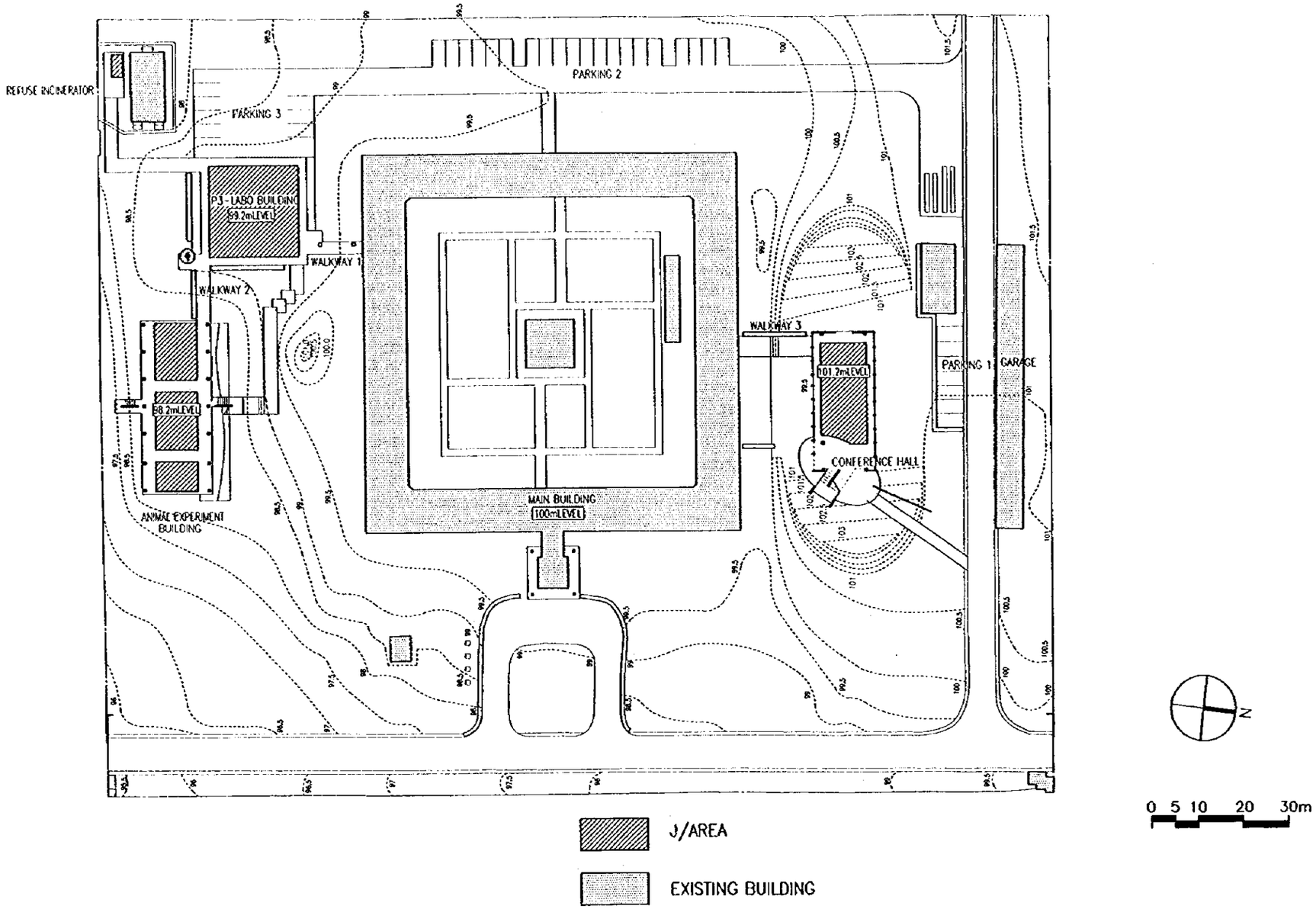
a. Equipment judged by Japanese engineers that it can be repaired and any necessary replacement part can be procured.

b. Equipment judged by maintenance staff of the NMIMR or staff using the equipment that it can be repaired or replaced, and any necessary replacement part can be procured.

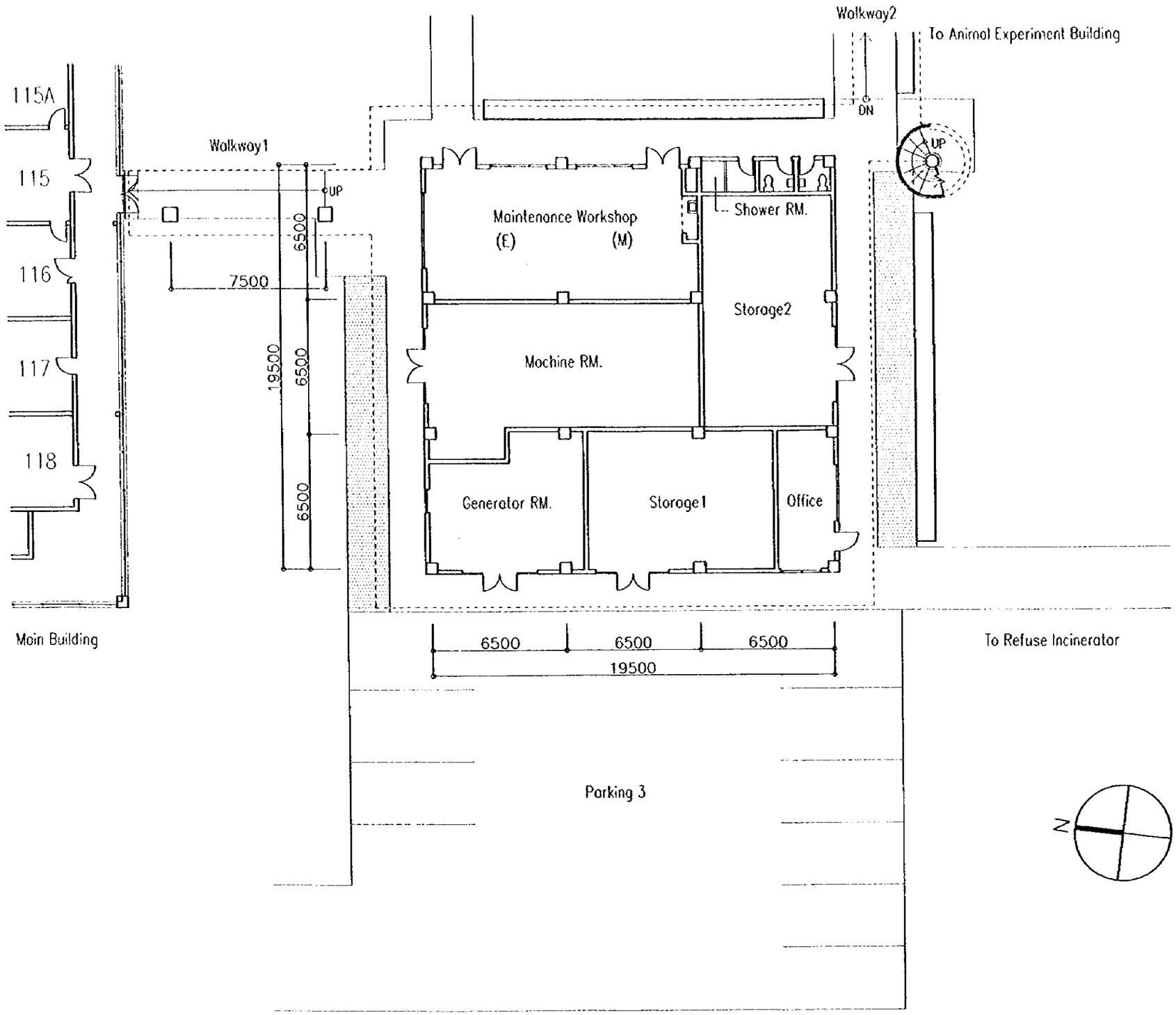
c. Equipment judged by engineers of the agency on site that it can be repaired and any necessary replacement part can be procured.

d. Impossible to be repaired because of becoming too old and other reasons.

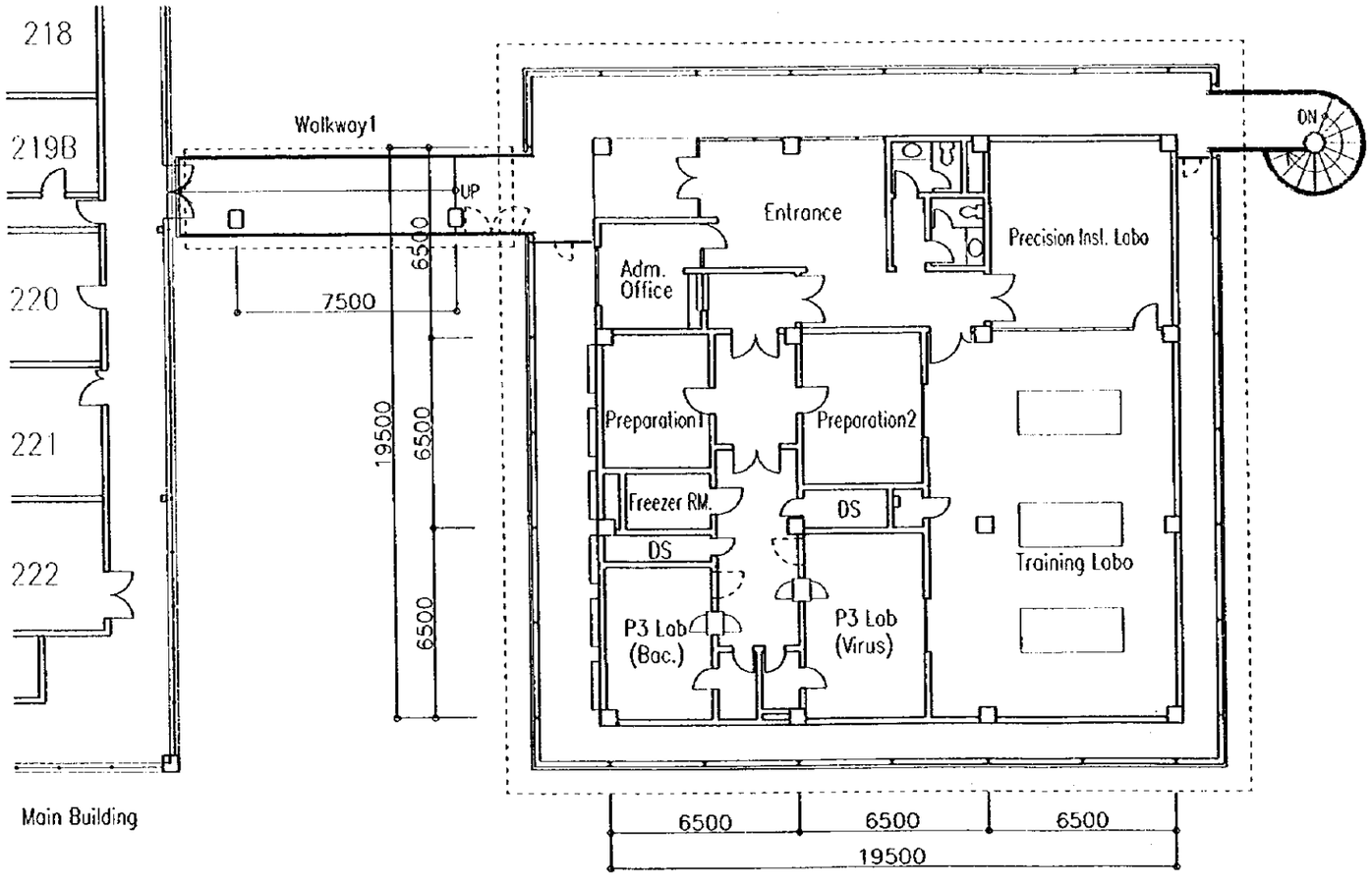
e. Impossible to investigate because of lack of information or no response from manufacturers.

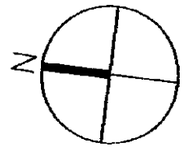


REVISION		株式会社 久米設計 KUME SEKKEI	DATE / CHECKED / DRAWN	THE PROJECT FOR RENOVATION AND EXPANSION OF NOGUCHI MEMORIAL MEDICAL INSTITUTE IN GHANA	SHEET NO. 1
				SITE PLAN 1/1000	PROJECT NO.

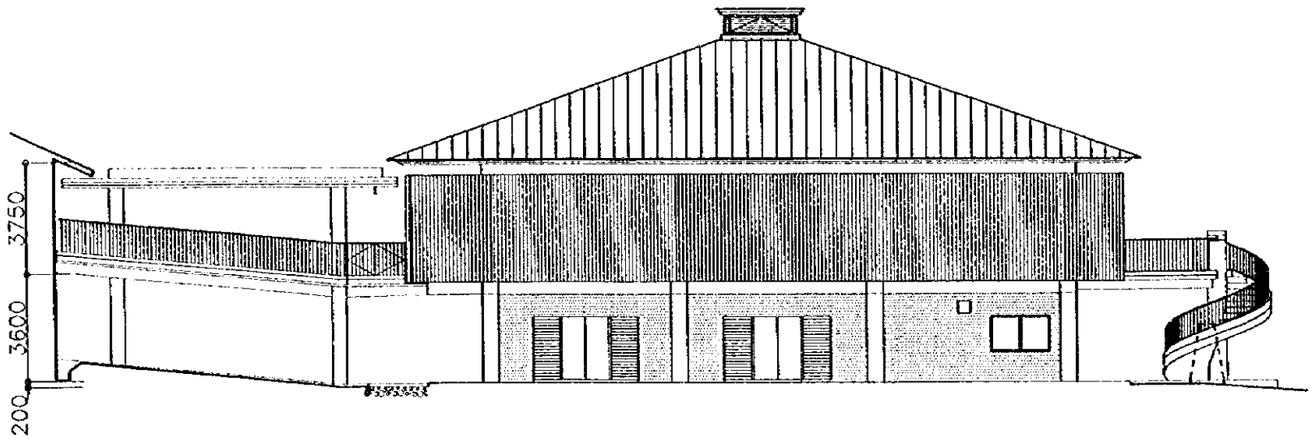


REVISION		株式会社 久米設計 KUME SEKKEI	DATE / CHECKED / DRAWN	THE PROJECT FOR RENOVATION AND EXPANSION OF NOGUCHI MEMORIAL MEDICAL INSTITUTE IN GHANA	SHEET NO. 2
			PA	P3-LABO. BUILDING GROUND FLOOR PLAN 1/200	PROJECT NO.

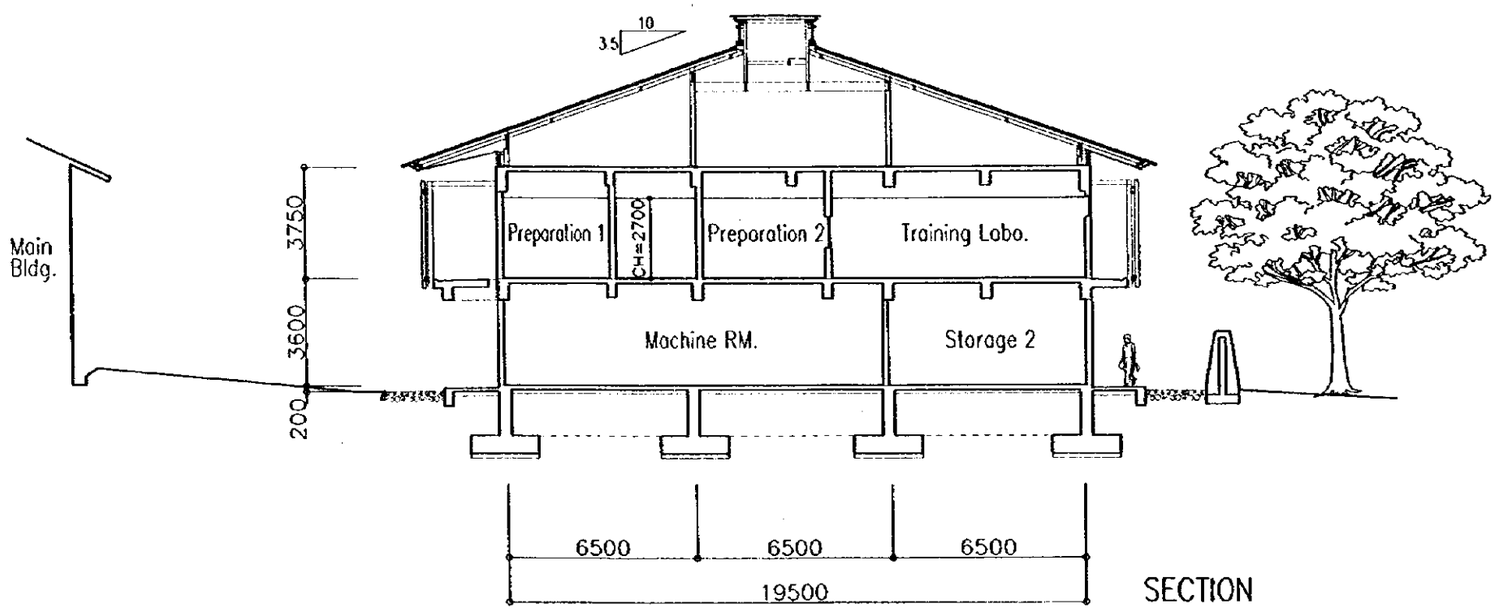




REVISION	株式会社 久米設計 KUME SEKKEI	DATE / CHECKED PA / DRAWN	THE PROJECT FOR RENOVATION AND EXPANSION OF NOGUCHI MEMORIAL MEDICAL INSTITUTE IN GHANA P3-LABO. BUILDING 1st. FLOOR PLAN 1/200	SHEET NO. 3 PROJECT NO.

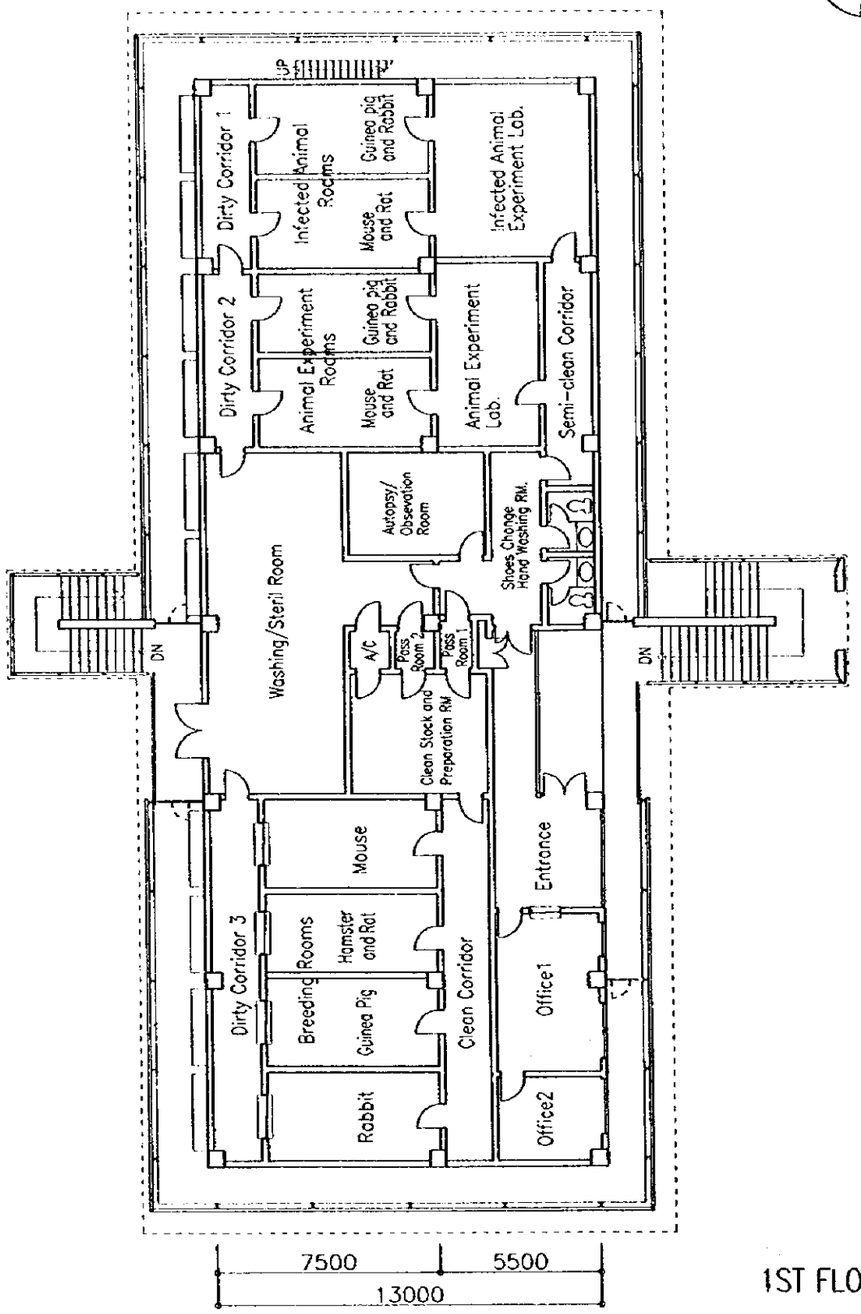


WEST SIDE ELEVATION

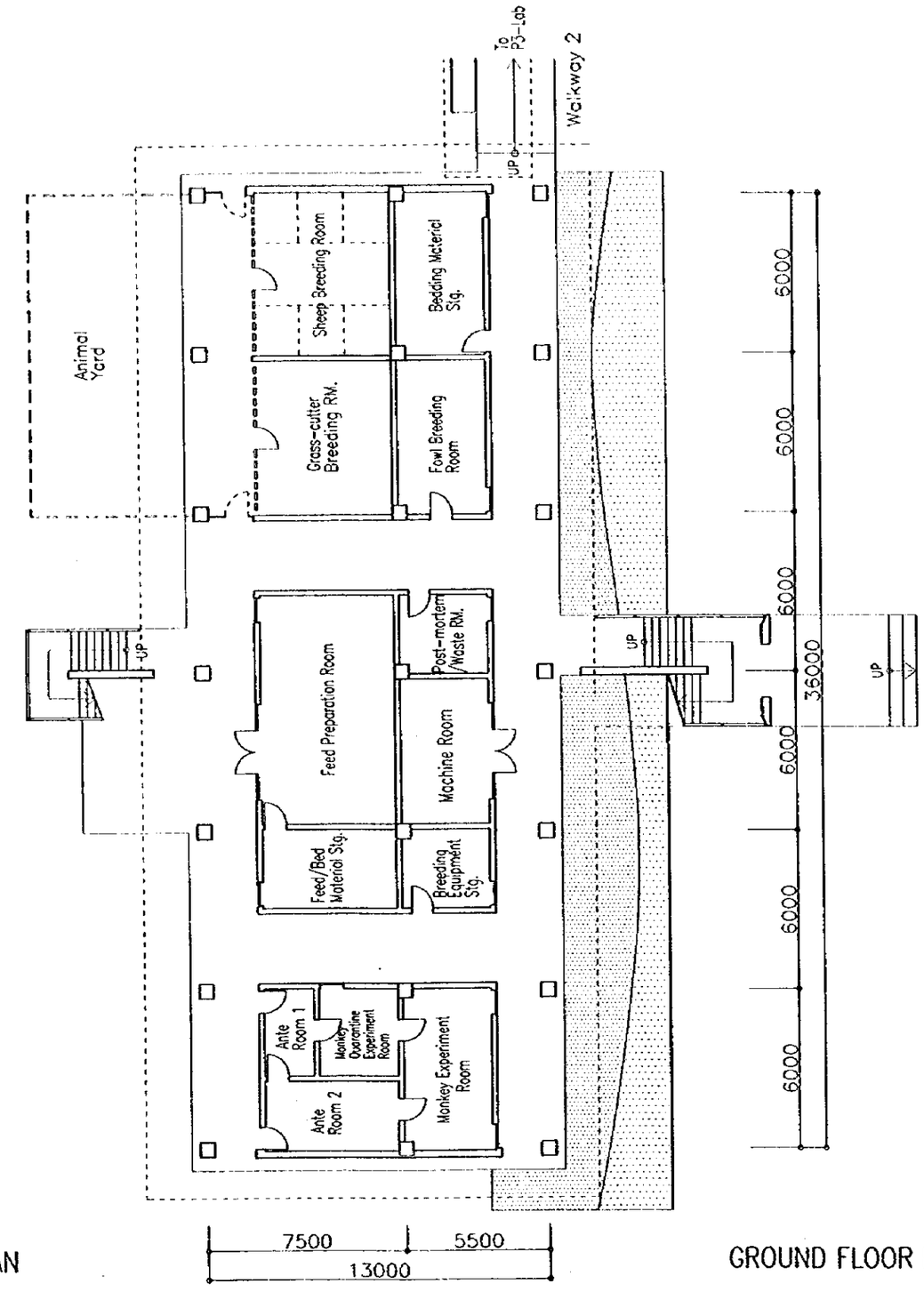


SECTION

REVISION		株式会社 久米設計 KUME SEKKEI	DATE / CHECKED PA / DRAWN	THE PROJECT FOR RENOVATION AND EXPANSION OF NOGUCHI MEMORIAL MEDICAL INSTITUTE IN GHANA	SHEET NO. 4
				P3-LABO. BUILDING ELEVATION・SECTION 1/200	PROJECT NO.

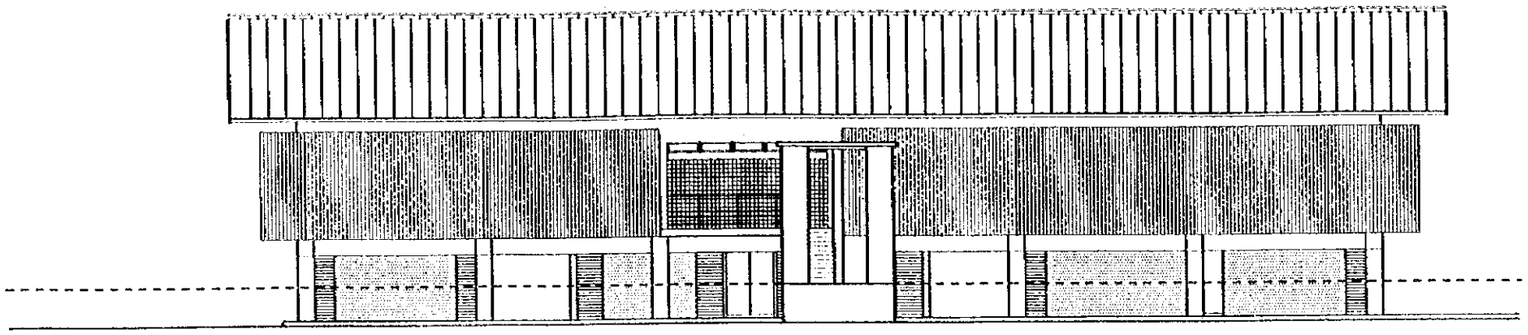


1ST FLOOR PLAN

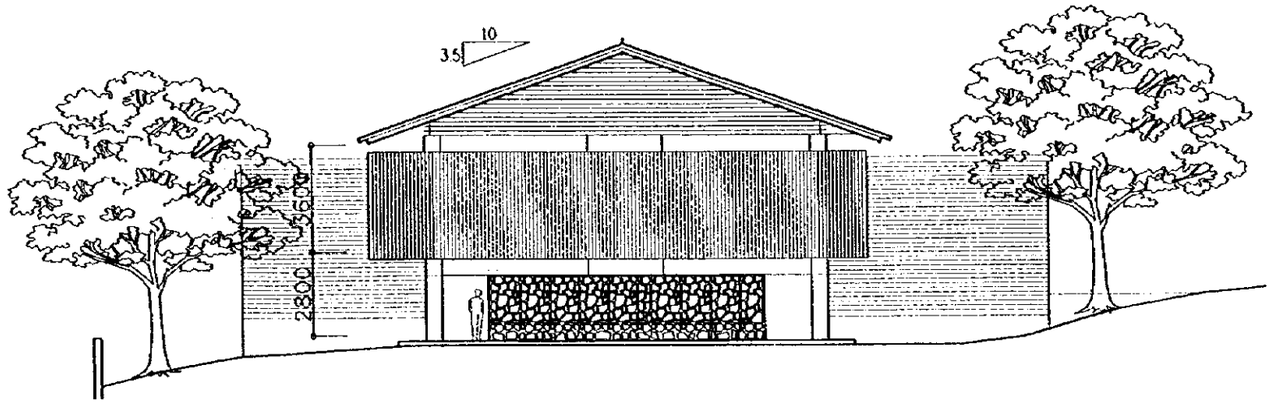


GROUND FLOOR PLAN

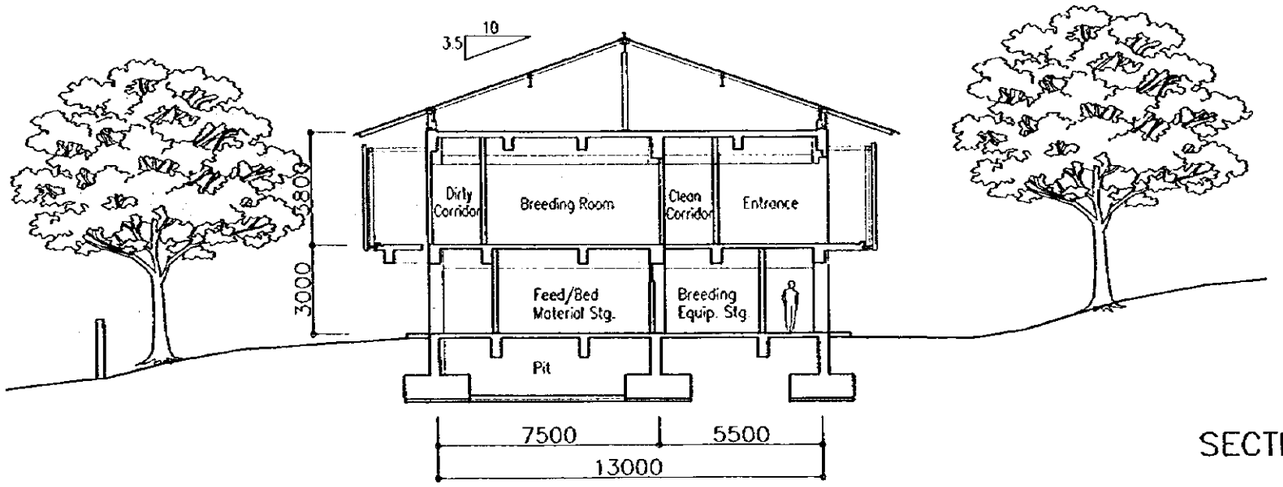
REVISION		株式会社 久米設計 KUME SEKKEI	DATE / CHECKED / DRAWN	THE PROJECT FOR RENOVATION AND EXPANSION OF NOGUCHI MEMORIAL MEDICAL INSTITUTE IN GHANA	SHEET NO. 5
			PA	ANIMAL EXPERIMENT BUILDING PLAN 1/200	PROJECT NO.



NORTH SIDE ELEVATION

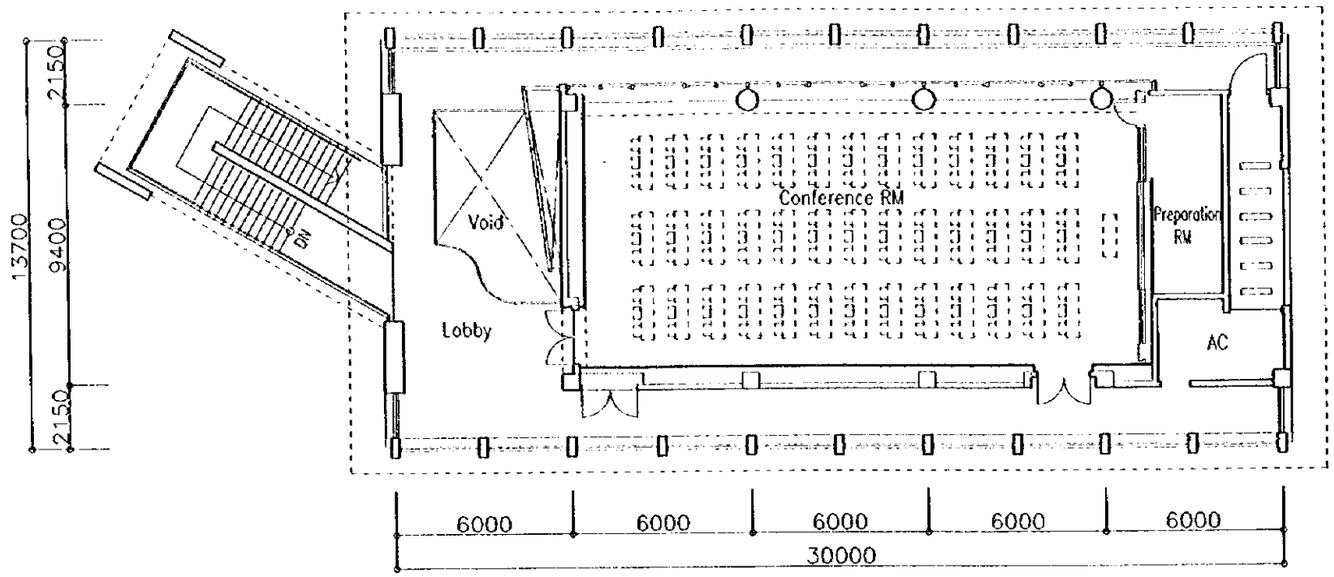


EAST SIDE ELEVATION

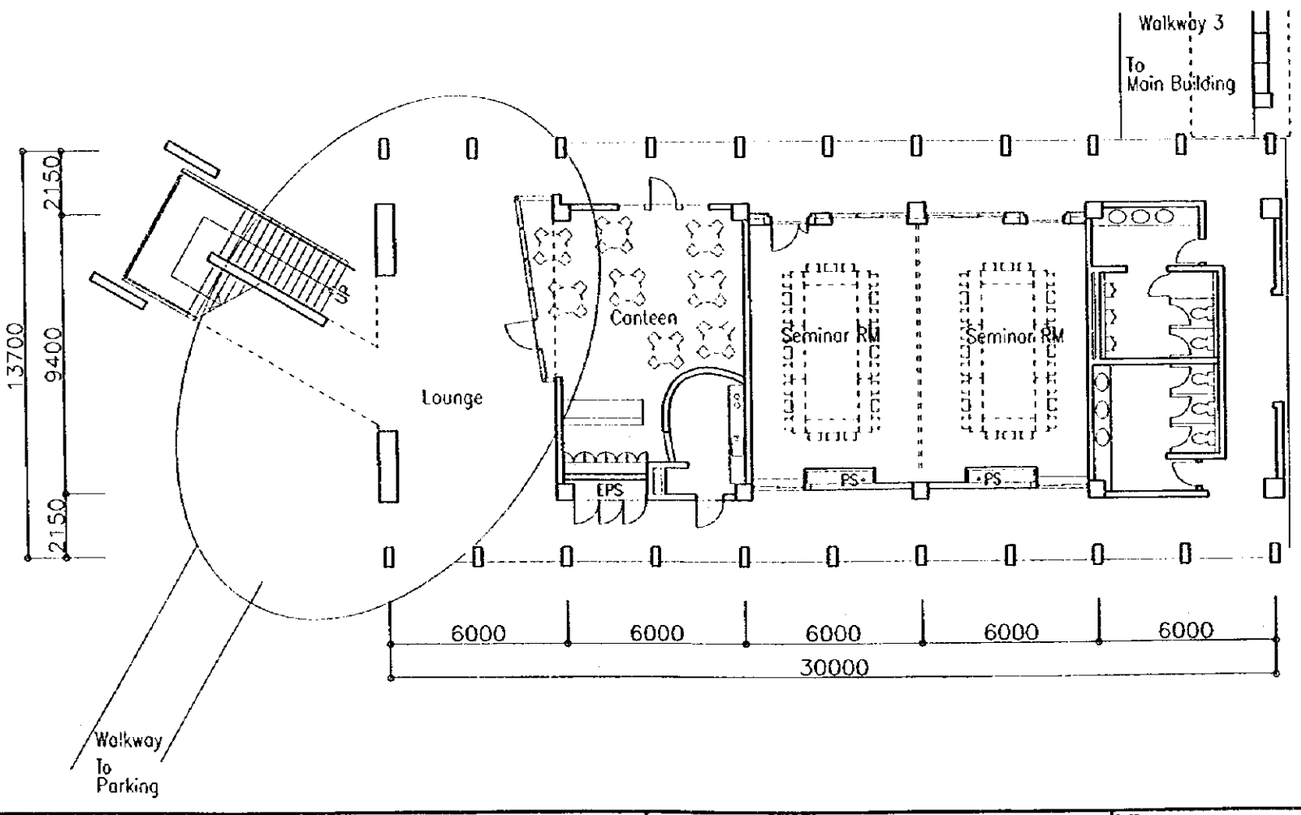


SECTION

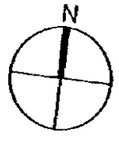
REVISION		株式会社 久米設計 KUME SEKKEI	DATE CHECKED PA DRAWN	THE PROJECT FOR RENOVATION AND EXPANSION OF NOGUCHI MEMORIAL MEDICAL INSTITUTE IN GHANA ANIMAL EXPERIMENT BUILDING ELEVATION SECTION 1/200	SHEET NO. 6 PROJECT NO.



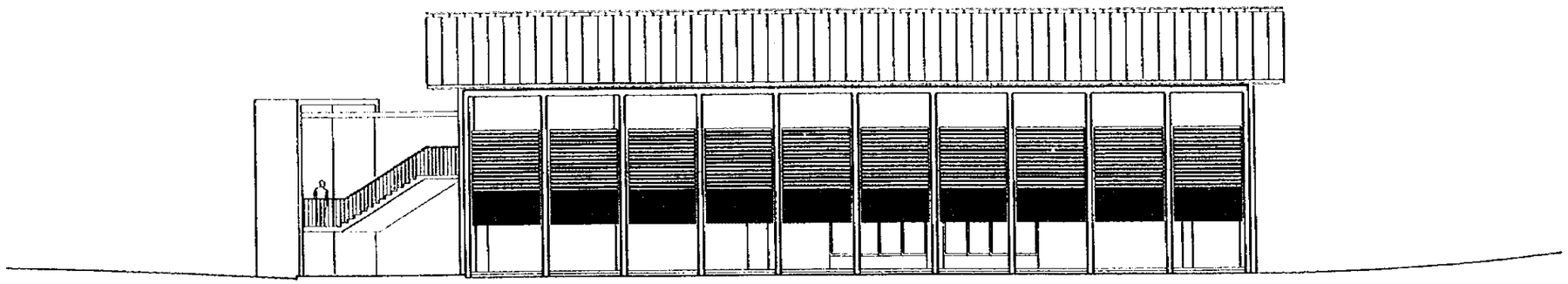
1ST FLOOR PLAN



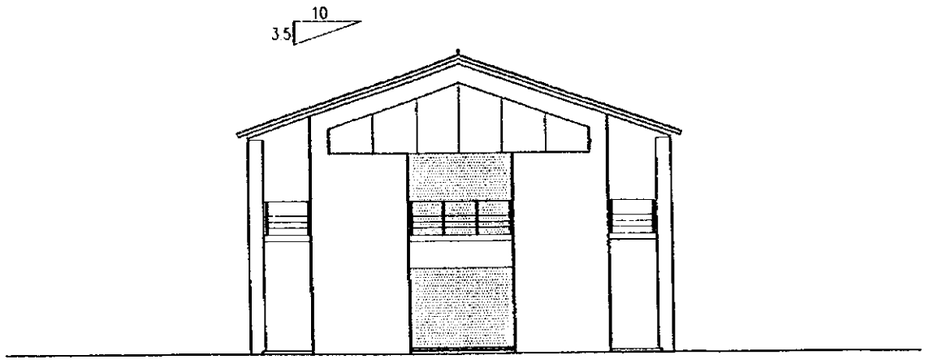
GROUND FLOOR PLAN



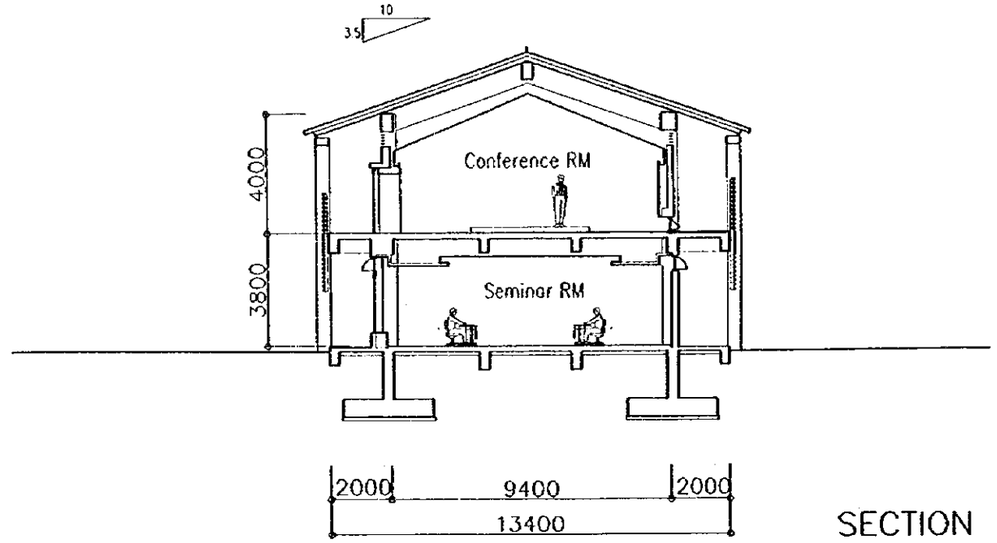
REVISION		株式会社 久米設計 KUME SEKKEI	DATE / CHECKED / DRAWN	THE PROJECT FOR RENOVATION AND EXPANSION OF NOGUCHI MEMORIAL MEDICAL INSTITUTE IN GHANA	SHEET NO. 7
				CONFERENCE HALL PLAN 1/200	PROJECT NO.



NORTH SIDE ELEVATION

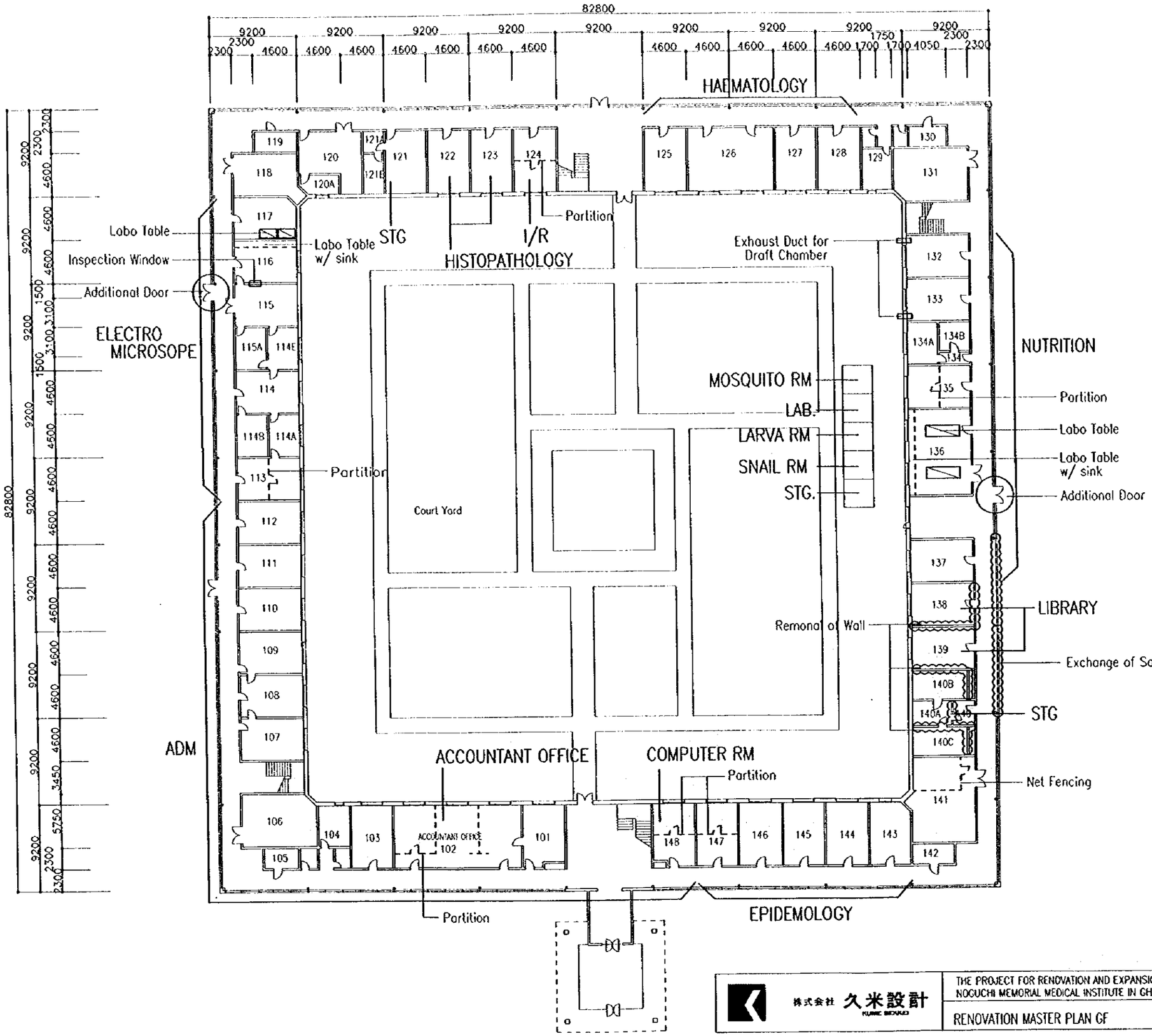


WEST SIDE ELEVATION

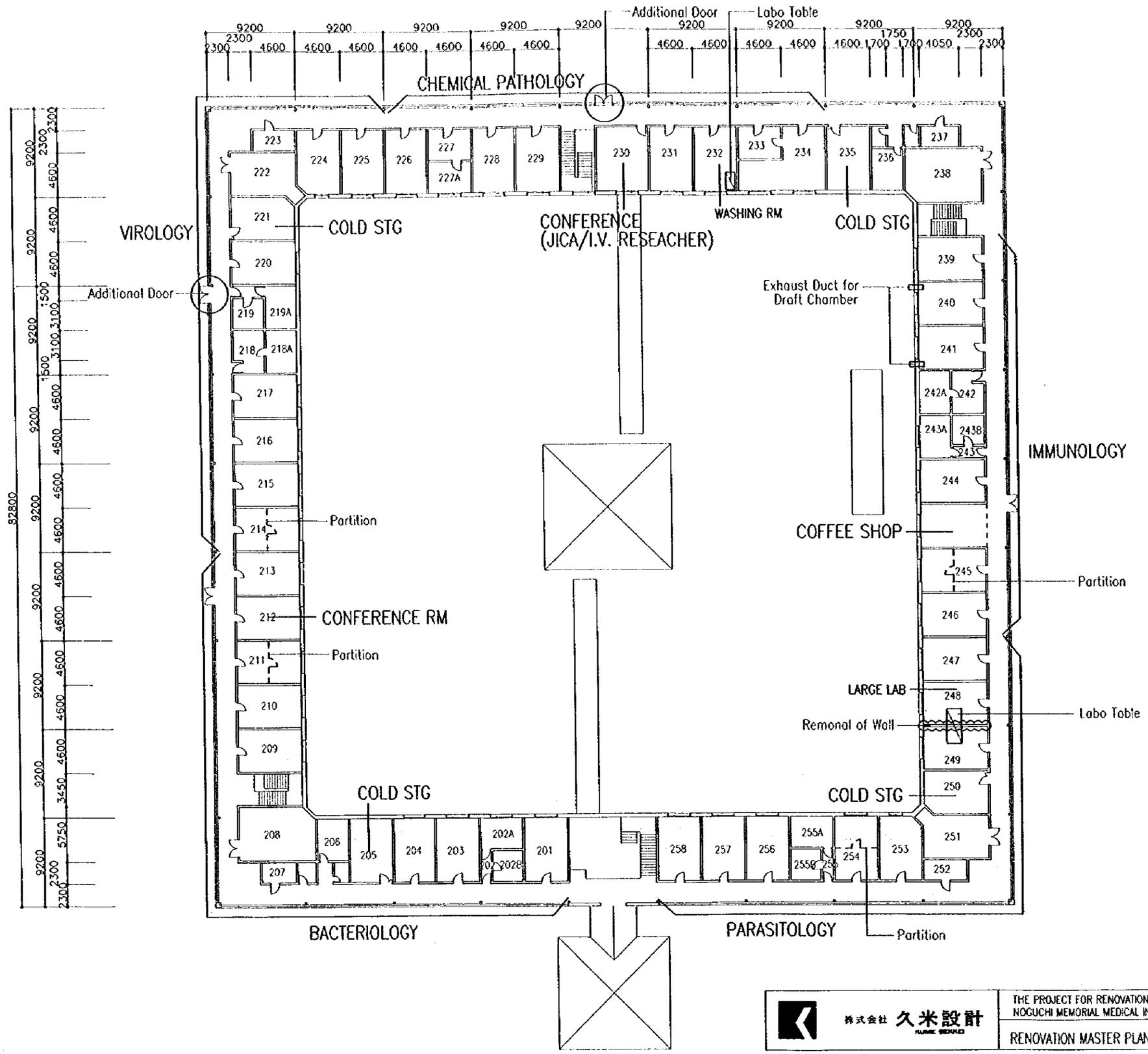


SECTION

REVISION		株式会社 久米設計 KUME SEKKEI	DATE CHECKED PA DRAWN	THE PROJECT FOR RENOVATION AND EXPANSION OF NOGUCHI MEMORIAL MEDICAL INSTITUTE IN GHANA CONFERENCE HALL ELEVATION · SECTION 1/200	SHEET NO. 8 PROJECT NO.

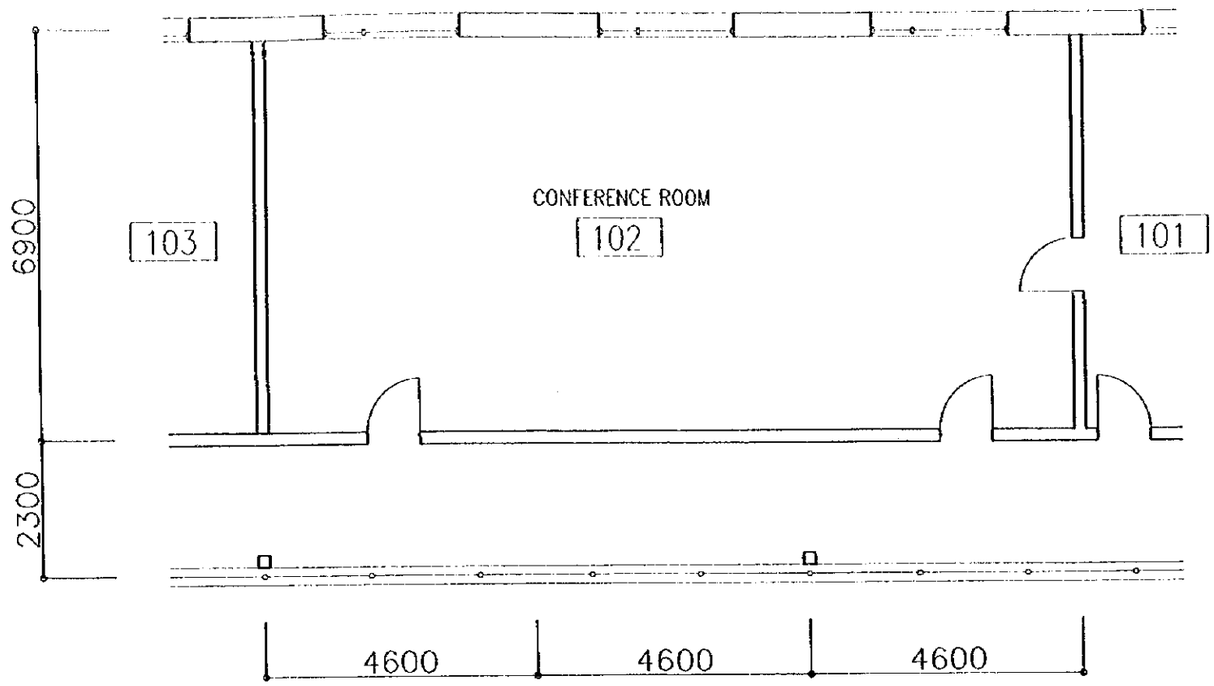


株式会社 久米設計	THE PROJECT FOR RENOVATION AND EXPANSION OF NOGUCHI MEMORIAL MEDICAL INSTITUTE IN GHANA	ARCH- 9
	RENOVATION MASTER PLAN GF 1/400	

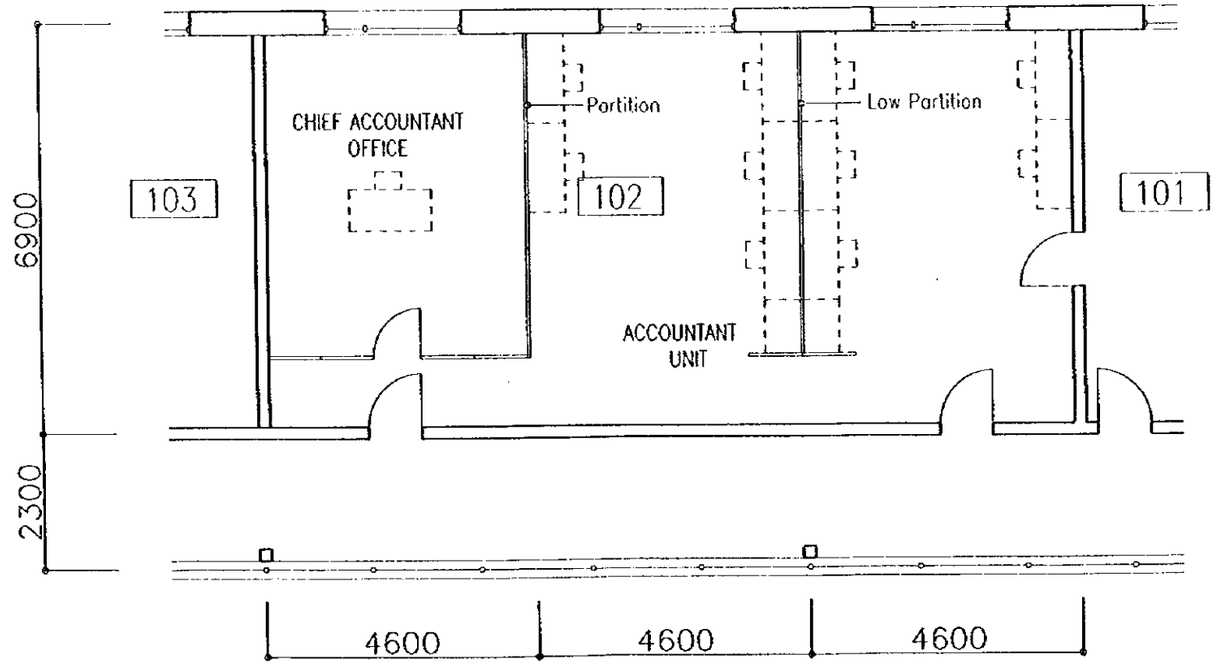


株式会社 久米設計	THE PROJECT FOR RENOVATION AND EXPANSION OF NOGUCHI MEMORIAL MEDICAL INSTITUTE IN GHANA	ARCH-10
	RENOVATION MASTER PLAN 1ST.F 1/400	

BEFORE RENOVATION



AFTER RENOVATION

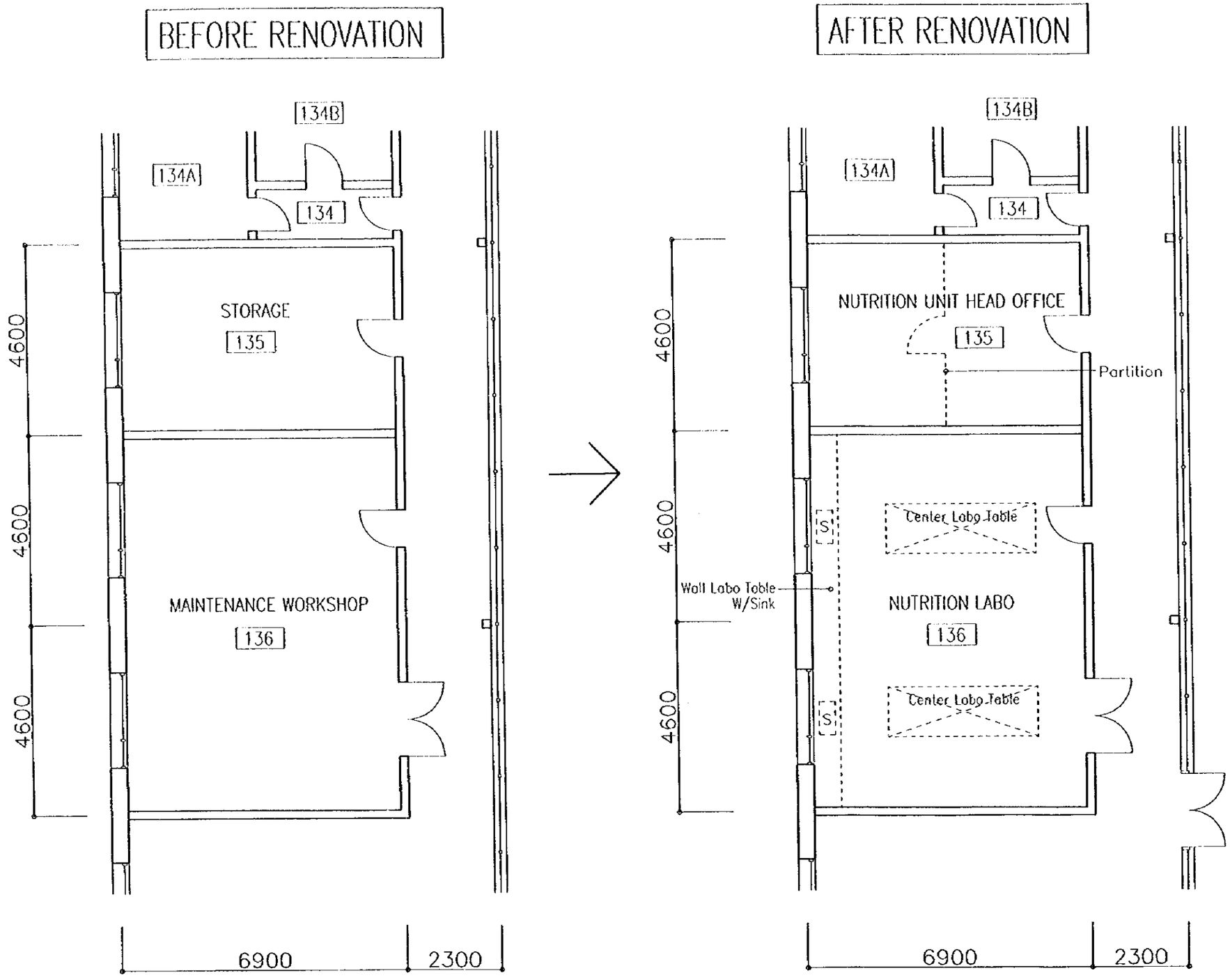


102

Floor : PVC Tile
H=2000mm

Others :
Partition / Low Partition

検図	訂正	株式会社 久米設計 KUME SEKKEI	DATE / CHECKED PA / DRAWN	THE PROJECT FOR RENOVATION AND EXPANSION OF NOGUCHI MEMORIAL MEDICAL INSTITUTE IN GHANA RENOVATION PLAN (102:CONFERENCE ROOM) 1/100	SHEET NO. 11 PROJECT NO.



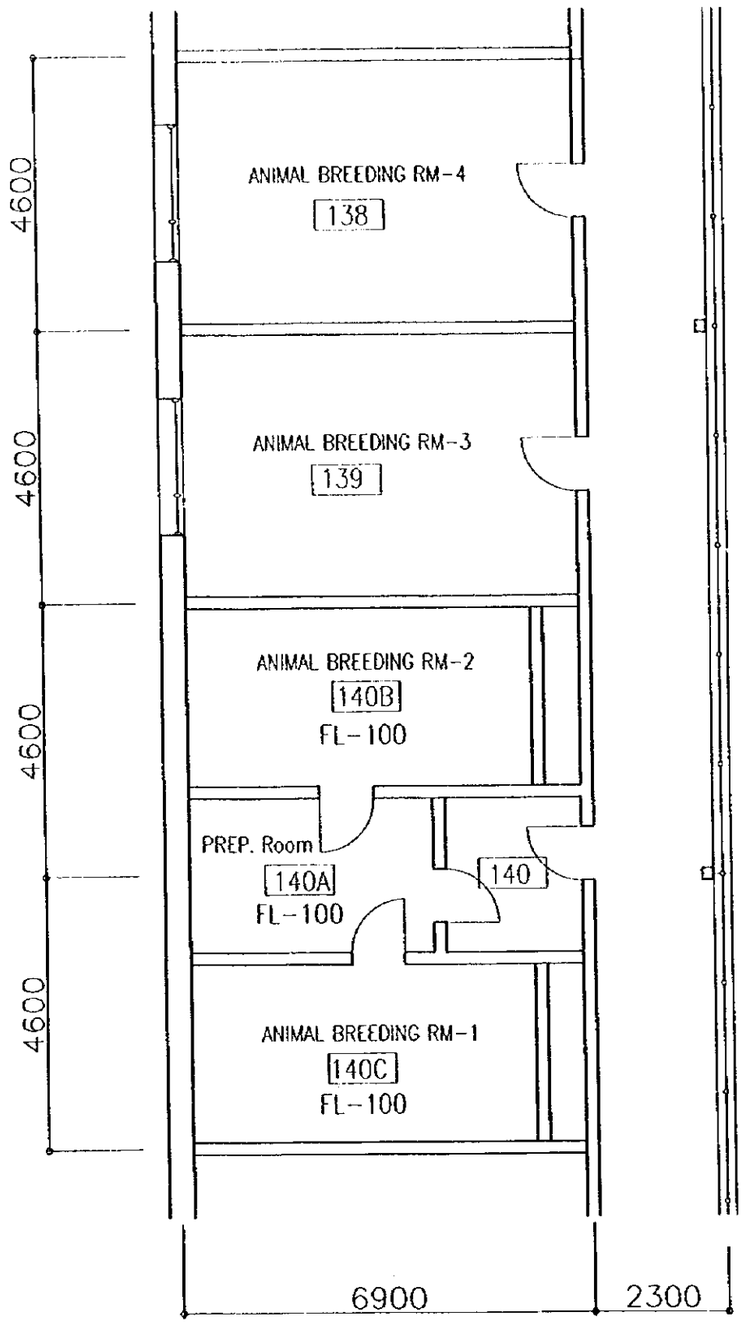
135
Partition

136

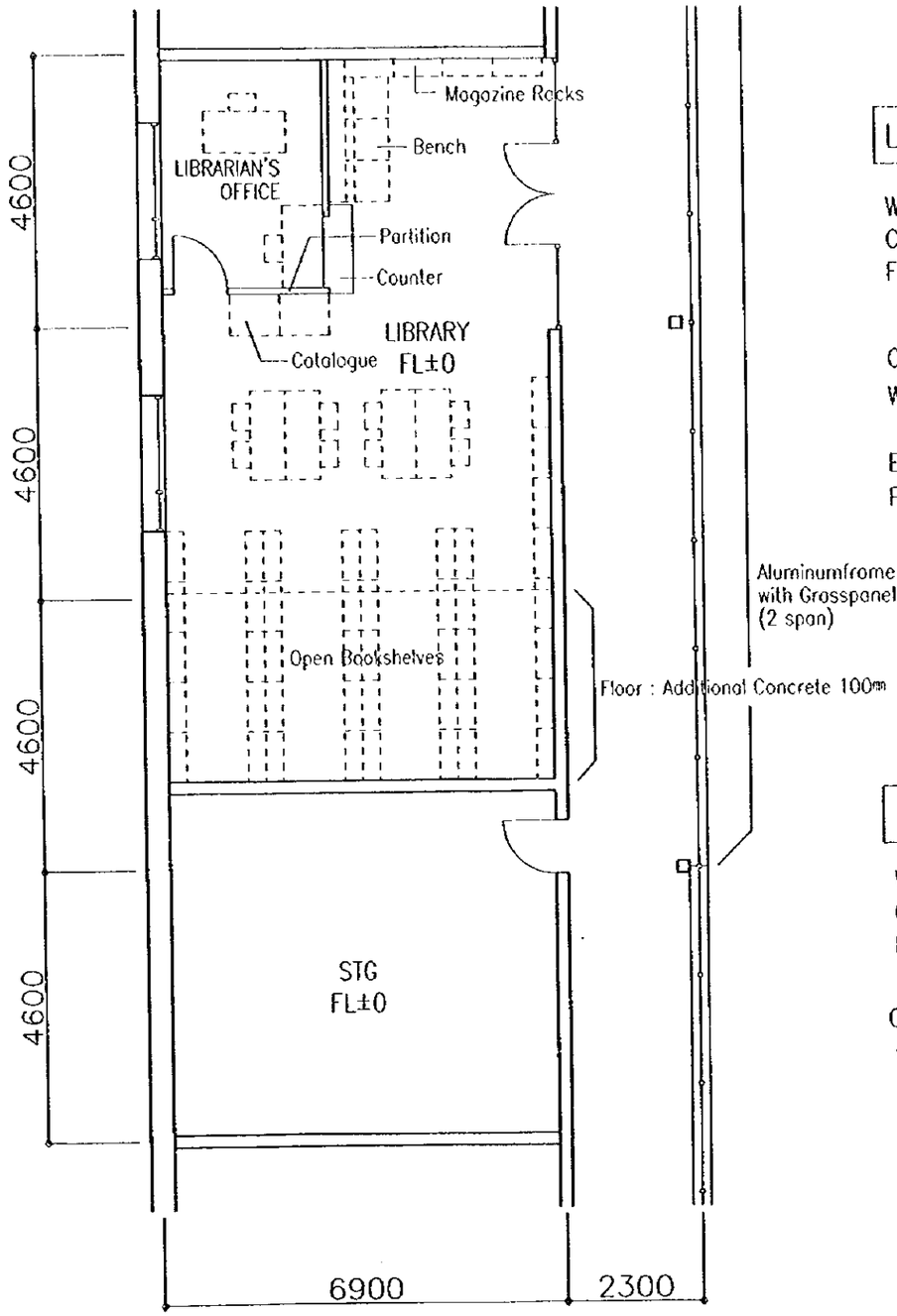
Wall : Repainting
Ceiling : Repainting
Others :
Wall Labo Table L=9000mm
Center Labo Table
L=3600mm 2nos.

特記 :	訂正	株式会社 久米設計 KUME SEKKEI	DATE / CHECKED P.A / DRAWN	THE PROJECT FOR RENOVATION AND EXPANSION OF NOGUCHI MEMORIAL MEDICAL INSTITUTE IN GHANA RENOVATION PLAN (135,136) 1/100	SHEET NO. 12 PROJECT NO.

BEFORE RENOVATION



AFTER RENOVATION



LIBRARY

Wall : Mortar repainting
Ceiling : Acoustic Boad
Floor : Tile Carpet
(Partialy Additional Concrete 100㎜)

Others
Wall Remonal : L=7000㎜ (2 parts)
L=4600㎜ (Corridor side)
Entrance Door and Grass Panel
Partition

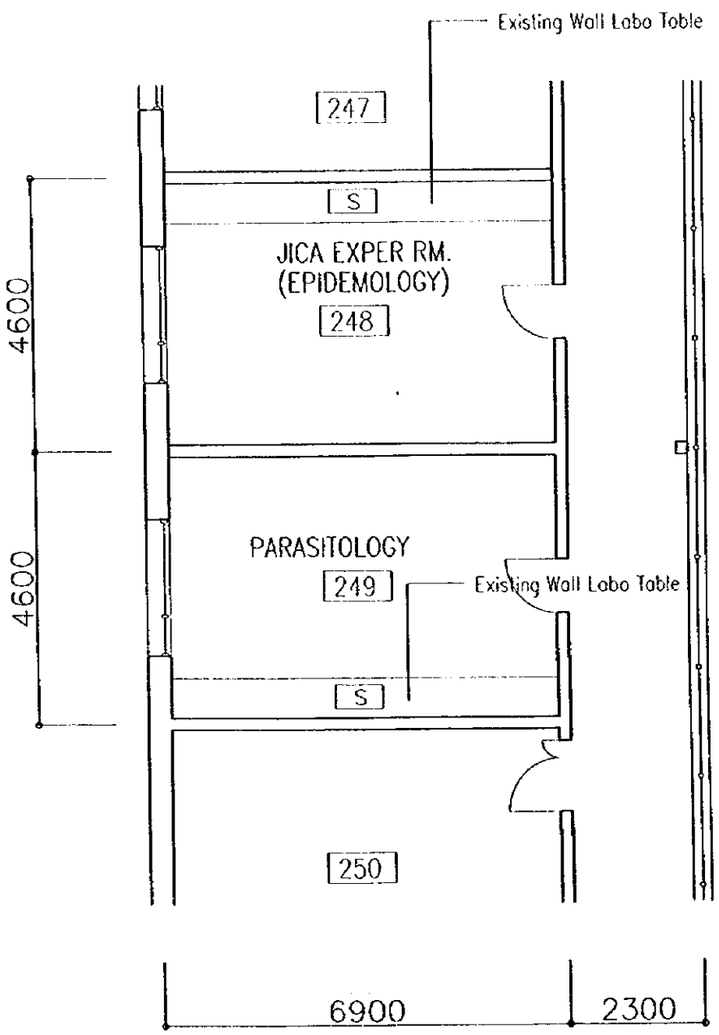
STG

Wall : Mortar repainting
Ceiling : Acoustic Boad
Floor : Terrazzo Repolishing
(Additional Concrete 100㎜)

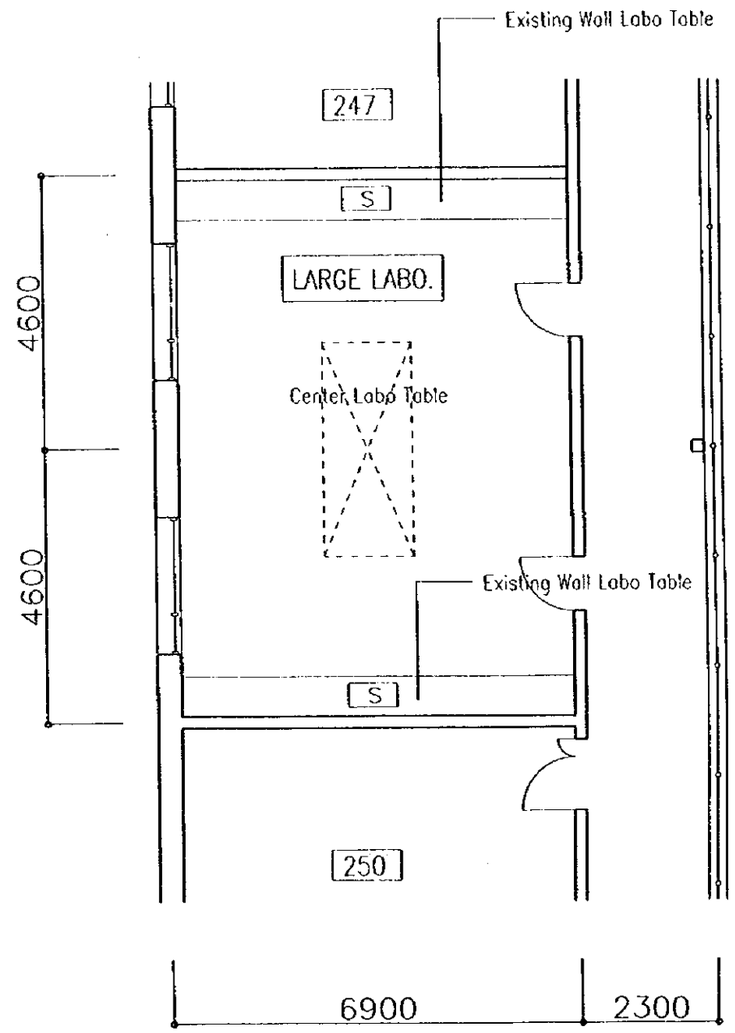
Others
Wall Remonal : L=7000㎜ (2 parts)
L=4600㎜ (Corridor side)

株式会社 久米設計 KUME SEKKEI	DATE / CHECKED PA / DRAWN	THE PROJECT FOR RENOVATION AND EXPANSION OF NOGUCHI MEMORIAL MEDICAL INSTITUTE IN GHANA	RENOVATION PLAN (138,139,140A,140B,140C) 1/100	SHEET NO. 13 / PROJECT NO.

BEFORE RENOVATION



AFTER RENOVATION



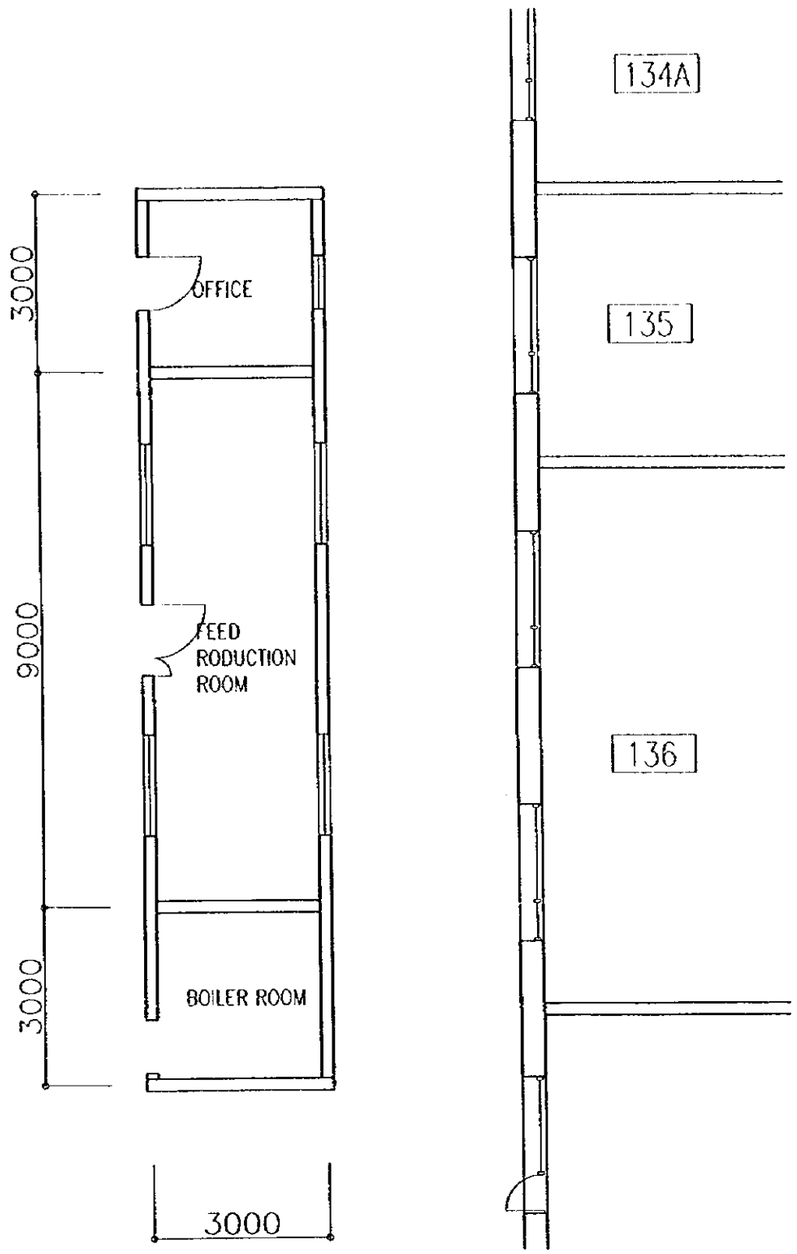
LARGE LABO.

Wall rmoval

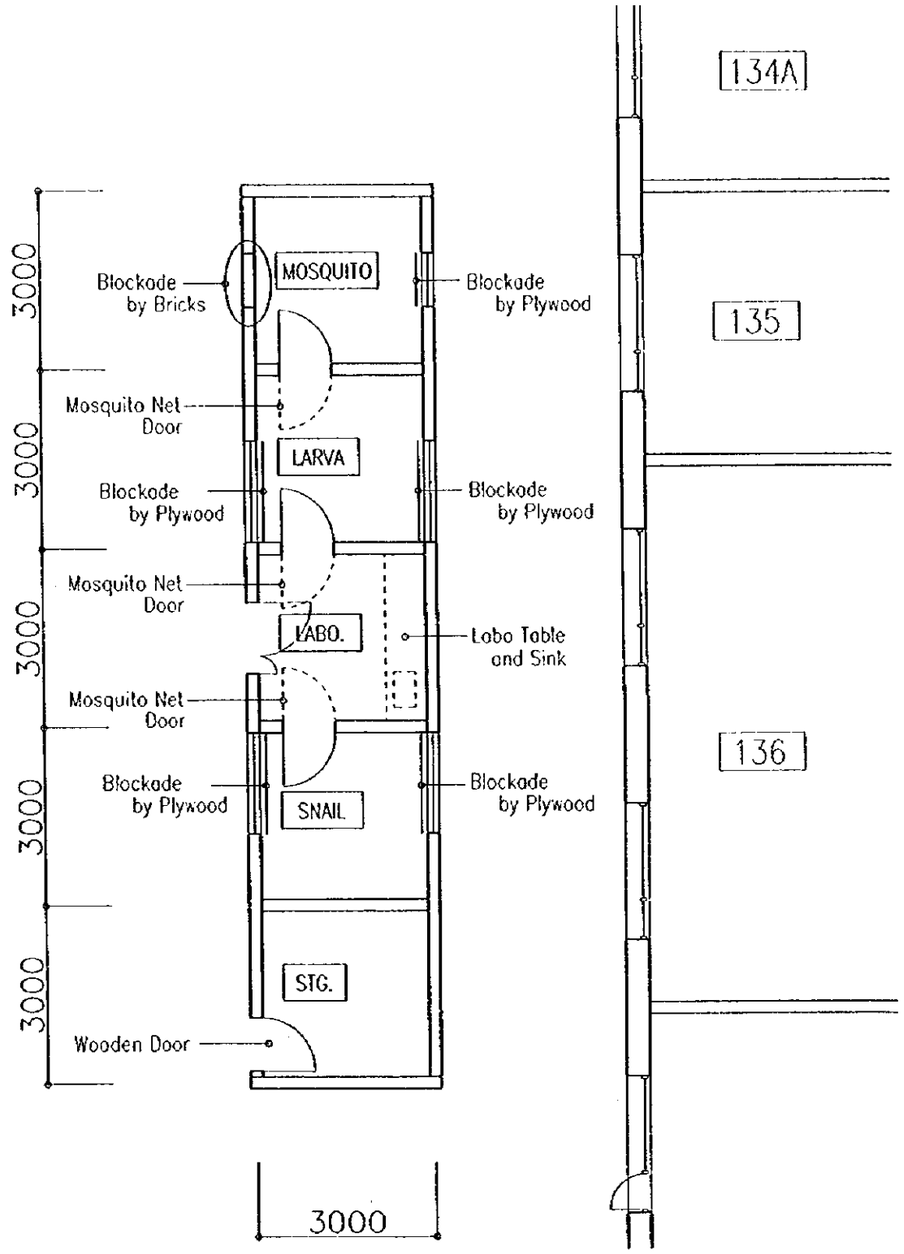
Center Labo Table : 1500㎜×3600㎜

特記	訂正	株式会社 久米設計 KUME SEKKEI	DATE / CHECKED PA / DRAWN	THE PROJECT FOR RENOVATION AND EXPANSION OF NOGUCHI MEMORIAL MEDICAL INSTITUTE IN GHANA RENOVATION PLAN (248,249) 1/100	SHEET NO. 14 PROJECT NO.

BEFORE RENOVATION



AFTER RENOVATION



Ceiling : Calcium silicate boad
w/ paint
H=2000㎜

Others
Partition Wall : L=3000㎜×2nos.
Wooden Doors
w/ Mosquito Net Door
Blockade of Window
by Plywood 5nos.

検図	訂正	株式会社 久米設計 KUME SEKKEI	DATE / CHECKED PA / DRAWN	THE PROJECT FOR RENOVATION AND EXPANSION OF NOGUCHI MEMORIAL MEDICAL INSTITUTE IN GHANA RENOVATION PLAN (FEED PRODUCTION SHED) 1/100	SHEET NO. 15 PROJECT NO.

List of Planned Equipment

P3 Laboratory

Item No.	Equipment to be requested	Main Features	Planned Quantity
Lab .Preparation (1)			
2	Autoclave (middle, vertical)	Vertical, Capacity: 56 ℓ	1
4	Centrifuge (3,000 rpm)	Table top, 3,000 rpm	1
5	Incubator	Capacity: 159 ℓ	1
6	Biological microscope	1,000X, binoculars	1
7	Refrigerator	+4℃, 200 ℓ	1
8	Sink	1800 x 750 x 800mm	1
9	Side Lab. Table	2400 x 750 x 800mm	1
9-2	Corner Table	1000 x 1000 x 900mm	1
300	Working Chair	Seat hight: 500 ~ 630mm	2
Lab. Preparation (2)			
11	Autoclave (middle, vertical)	Vertical, Capacity: 56 ℓ	1
12	Side Lab. Table	2400 x 750 x 800mm	1
12-2	Corner Table	1000 x 1000 x 900mm	1
13	Centrifuge (3,000 rpm)	Table top, 3,000 rpm	1
14	High speed centrifuge (20,000 rpm)	20,000 rpm	1
15	Incubator	Capacity: 159 ℓ	1
17	Refrigerator	+4℃, 200 ℓ	1
20	Safety Cabinet, IIA	Class IIA	1
23	Sink	1800 x 750 x 800mm	1
300	Working Chair	Seat hight: 500 ~ 630mm	2
Freezer Room			
47-2	Freezer (-85℃)	1860 x 800 x 945mm	1
41	Liquid Nitrogen Canister	464 ϕ x 675mm	1
P3 Lab. (1)			
26	Autoclave (small, horizontal)	Table top	1
27	Autoclave (middle, vertical)	Vertical, Capacity: 56 ℓ	1
29	Side Lab. Table (Stainless Steel)	1800 x 750 x 900mm	2
30	Bio-Centrifuge (3,000 rpm)	762 x 660 x 394mm	1
31	CO_2 Incubator	710 x 577 x 984mm	1
32	Freezer (-85℃, horizontal, small)	750 x 700 x 945mm	1
34	Bio-High speed centrifuge (20,000 rpm)	20,000 rpm, Biological	1
36	Pass Box	Through way: 600x600x600mm	1
37	Phase contrast microscope	1,000-power binoculars	1
38	Refrigerator	+4℃, 200 ℓ	1
39	Safety Cabinet (IIB type)	Class IIB type	1
40	Bio-Ultracentrifuge (40,000 rpm)	40,000 rpm, Biological-safety	1
42	Anemometer	Measurement range: 0 ~ 2.0m/S	1
300	Working Chair	Seat hight: 500 ~ 630mm	2
P3 Lab. (2)			
44	Autoclave (small, vertical)	Vertical, Capacity: 56 ℓ	1
45	Side Lab. Table (Stainless Steel)	1800 x 750 x 900mm	1
46	Bio-Centrifuge (3,000 rpm)	762 x 660 x 394mm	1

Item No.	Equipment to be requested	Main Features	Planned Quantity
47-1	Freezer (-85℃, horizontal, small)	750 x 700 x 945mm	1
48	Incubator	Capacity: 560 ℓ	1
49	Pass Box	Through way: 600x600x600mm	1
50	Biological microscope	1000X, binoculars	1
51	Refrigerator	+4℃, 200 ℓ	1
52	Safety Cabinet (IIB type)	Class IIB type	1
300	Working Chair	Seat hight: 500 ~ 630mm	2
Precision Inst. Lab.			
54	Central Table	3000 x 1500 x 900mm	1
55	Sink	1800 x 750 x 800mm	1
56	Side Lab. Table	2400 x 750 x 800mm	2
56-2	Corner Table	1000 x 1000 x 900mm	1
57	Computer	Desk-top with Rack	1
59	ELISA Reader	Plate reader with Washer	1
22	Equipment Shelf	1800x750x800mm	1
300	Working Chair	Seat hight: 500 ~ 630mm	4
Training Lab.			
63	Biological Microscope	1000X, binoculars	5
64-1	Central Table(for Training)	3000 x 1200 x 900mm	2
64-2	Central Table(for Lab.)	3000 x 1500 x 900mm	1
22	Equipment Shelf	1800 x 600 x 1800mm	2
65	Sink	1800 x 750 x 800mm	2
66	Side Lab. Table	2400 x 750 x 800mm	1
300	Working Chair	Seat hight: 500 ~ 630mm	16
Workshop (E)			
68	Machine for Maintenance	Repair tools such as MA meter	1

Laboratory Animal Unit

Item No.	Equipment to be requested	Main Features	Planned Quantity
	BREEDING AND GROWING		
Grasscutter			
76	Breeding Rack	1660 x 510 x 1260mm	1
77	Breeding Cage	700 x 500 x 420mm	6
78	Rearing Rack	2050 x 510 x 1260mm	1
79	Grasscutter Cage	350 x 500 x 420mm	15
80	Grasscutter Balance	6,000g	1
Rabbit			
87	Rabbit Balance	6,000g	1
Guinea Pig			
88	Breeding Rack	1540 x 500 x 1460mm	1
89	Cage (Breeding)	400 x 500 x 420mm	3
90	Breeding Rack	1540 x 500 x 1460mm	1
91	Cage	350 x 400 x 300mm	16
92	Guinea Pig Balance	1,000g	1
Rat			

Item No.	Equipment to be requested	Main Features	Planned Quantity
96	Cage (Rat/ Hamster)	270 x 430 x 200mm	7
Hamster			
96	Cage (Rat/Hamster)	270 x 430 x 200mm	5
99	Hamster and Rat Balance	1,000g	1
Mouse			
135	Vinyl Isolator, 3 sets w/operation accessories	1300 x 700 x (600+750)mm	1
Clean Stock and Preparation Room			
103	Mobile Shelf	1820 x 610 x 2200mm	2
104	Cleaner	Vacuum pressure: 3,300mm Aq.	1
105	Working Table	600 x 900 x 800mm	5
106	Feed Container Carry	With two containers	1
107	Cart (Stainless Steel)	900 x 600mm	2
108	Hand wash Stand	340 x 710 x 780mm	2
96-1	Spare Cage (for Rat/Hamster)	270 x 430 x 200mm	20
96-2	Spare Cage (for Mouse)	270 x 430 x 200mm	16
Autopsy Room & Diagnostic Lab.			
121	Side Lab. Table	1500 x 750 x 900mm	2
122	Sink	1800 x 750 x 900mm	1
123	Working Chair	Seat hight: 500 ~ 630mm	2
125	Steel Cabinet	1760 x 400 x 1820mm	1
131	Biological Microscope	1,000X, binoculars	1
138	Centrifuge (Table Top)	3,000 rpm	1
139	Constant Temperature Bath	690 x 460 x 500mm	1
142	Boiling Sterilizer	Electric heat type	1
143	Refrigerator	+4℃, 200 ℓ	1
144	Incubator	97 ℓ	1
Dressing Room			
147	Dressing Locker (Lab. Staff)	For four persons	2
196	Dressing Locker (Animal Staff)	For four persons	2
Washing and Sterilizing			
151	Shallow Sink	1800 x 750 x 800mm	1
152	Deep Sink	1800 x 750 x 800mm	1
153	Drain/Dry Shelf	1500 x 510 x 1490mm	3
154	Sterilizing Box, for food	400 x 300 x 300mm	5
155	Sterilizing Box, for bedding	400 x 300 x 300mm	5
157	Working Table	600 x 1800 x 800mm	2
159	Cart (Stainless Steel)	900 x 600mm	3
160	Mobile Washer	Electric, Mobile type	1
Post mortem			
162	Refrigerator for Carcass	+4℃, 200 ℓ	1
165	Steel Rack	1205 x 455 x 1802mm	3
Warehouse			
Animal Experiment Unit			
168	Ice Machine	Ice-making ability: 39kg/day	1
173	Hand wash Stand	Two tubs	1
176	Clean Rack (Rat)	1310 x 630 x 2000mm	1
177	Rat Cage (Plastic)	270 x 430 x 200mm	16
178	Clean Rack (Guinea Pig)	1310 x 740 x 2030mm	2

Item No.	Equipment to be requested	Main Features	Planned Quantity
179	Guinea Pig Cage	350 x 400 x 300mm	18
180	Clean Rack (Rabbit)	1310 x 740 x 2030mm	2
181	Rabbit Cage	350 x 500 x 420mm	18
182	Side Lab. Table	2400 x 750 x 900mm	2
183	Working Table	600 x 900 x 800mm	2
185	Mouse Automatic Balance	200g	1
186	Rat Automatic Balance	1,000g	2
187	Rabbit Automatic Balance	6,000g	1
188	Boiling Sterilizer	Electric heat type	1
189	Dissecting Set	A set of 37 items	2
190	Mouse Holder	Brass	2
191	Rat Holder	Brass	2
192	Operating Table	Plastic	10
193	Dissecting Table for Rabbit	Stainless steel	2
195	Animal Hair Clipper with Blades	Electric type	1
301	Sink	1800 x 750 x 900mm	1
22	Equipment Shelf	1800 x 600 x 1800mm	1
123	Working Chair	Seat hight: 500 ~ 630mm	3
Infection Experiment Unit			
199	Formalin gas generator	Electric type	1
209	Negative Rack with Blower	1310 x 580 x 2000mm	2
210	Mouse Cage (Plastic)	220 x 320 x 130mm	50
211	Negative Rack with Blower	1310 x 630 x 2000mm	2
212	Rat Cage (Plastic)	270 x 430 x 200mm	32
213	Negative Rack with Blower	1310 x 740 x 2030mm	2
214	Guinea Pig Cage	350 x 400 x 300mm	18
213	Negative Rack with Blower	1310 x 740 x 2030mm	2
215	Rabbit Cage	350 x 500 x 420mm	18
216	Biological safety Cabinet (IIA)	1500 x 780 x 2200mm	1
217	Working Table	600 x 900 x 800mm	2
219	Hand wash Stand	340 x 710 x 780mm	1
220	Mouse Automatic Balance	200g	1
221	Rat Automatic Balance	1,000g	2
222	Rabbit Automatic Balance	6,000g	1
223	Autoclave, small	Table top	1
303	Side Lab. Table	2400 x 750 x 900mm	2
304	Equipment Shelf	1800x600x1800mm	1
122	Sink	1200 x 750 x 900mm	1
123	Working Chair	Seat hight: 500 ~ 630mm	3
Monkey Quarantine Room			
225	Monkey Rack	1300x850x1800mm	1
226	Monkey Cage	590 x 600 x 660mm	4
227	Working Table	600 x 900 x 800mm	1
Monkey Experiment Room			
229	Side Lab. Table (Stainless Steel)	1800 x 750 x 900mm	1
230	Automatic Balance	100kg	1
Monkey Ante Room			
231	Boiling Sterilizer	Electric heat type	1
233	Catching Gloves	Leather	3
234	Catching Net	Net (540x650x500mm)	2

Item No.	Equipment to be requested	Main Features	Planned Quantity
235	Face Guard (Goggles)	Plastic	2
229	Side Lab. Table (Stainless Steel)	1800 x 750 x 900mm	1
304	Equipment Shelf	1800x600x800mm	1
302	Sink	1200x750x900mm	1
Feed Production Room & Storage			
238	Refrigerator	+4℃, 200 ℓ	1
239	Steel Rack	1205 x 605 x 2102mm	2
240	Steel Cabinet	1760 x 400 x 1820mm	1
241	Pellet Mill	Milling ability: 80kg/hour	1
243	Working Table	1800 x 750 x 900mm	2
244	Digital Balance	50kg	1
245	Cart		2
Fowl (Breeding)			
83	Breeding Rack	2280 x 510 x 1350mm	1
Sheep (Breeding)			

Existing Site

Item No.	Equipment to be requested	Main Features	Planned Quantity
Electron Microscope Dept.			
69	Electron Microscope Transmission type, without scanning function	Manigification: 800X ~ 600,000X	1
70	Specimen Preparation Equipment	Embedding materials, etc.	1
71	Ultra Microtome	Range: 5nm ~ 5 μm	1
300	Working Chair	Seat hight: 500 ~ 630mm	2
Others			
75	Replacement parts	Spare parts for repairs	1

Equipment to be repaired under the Project

Equipment to be repaired				
Unit		Equipment	Q'ty	Contents
1	VIROLOGY	CLINI BATH	1	Supply of Spare Parts
6		SAFETY CABINET	1	Supply of Spare Parts, fixed by Japanese engineer
7		CLEAN BENCH	1	Supply of Spare Parts, fixed by Japanese engineer
8		CLEAN BENCH	1	Supply of Spare Parts, fixed by Japanese engineer
2	BACTERIOLOGY	ELECTRIC BALANCE WITH AC ADAPTER	1	Supply of Spare Parts
3		AUTO STILL	1	Supply of Spare Parts
5		INCUBATOR	1	Supply of Spare Parts, fixed by Japanese engineer
6		PYRO MULTI MAGNESTIRRER	1	Supply of Spare Parts
4	IMMUNOLOGY	AQUARIUS	1	Supply of Spare Parts
5		KUBOTA CENTRIFUGE	1	Supply of Spare Parts
7		TITERTEK MICROPLATE WASHER	1	Supply of Spare Parts
5	NUTRITION	FAT EXTRACTOR	1	Supply of Spare Parts
	HAEMATOLOGY			
6	ELECTRON MICROSCOPY	DISSECTING MICROSCOPE	1	Supply of Spare Parts
5	PARASITOLOGY	MAGNETIC STIRRER	1	Supply of Spare Parts
7		WATER BATH WITH SHAKE	1	Supply of Spare Parts
1	CHEMICAL PATHOLOGY	PH METER	1	Supply of Spare Parts
1	EPIDEMIOLOGY	REFRIGERATOR	1	Supply of Spare Parts
2	LABORATORY ANIMALS	CLEAN AIR RACK (2)	1	Supply of Spare Parts
3		CLEAN AIR RACK (1)	1	Supply of Spare Parts
4		CLEAN AIR RACK (1)	1	Supply of Spare Parts
6		AUTOCLAVE	1	Supply of Spare Parts

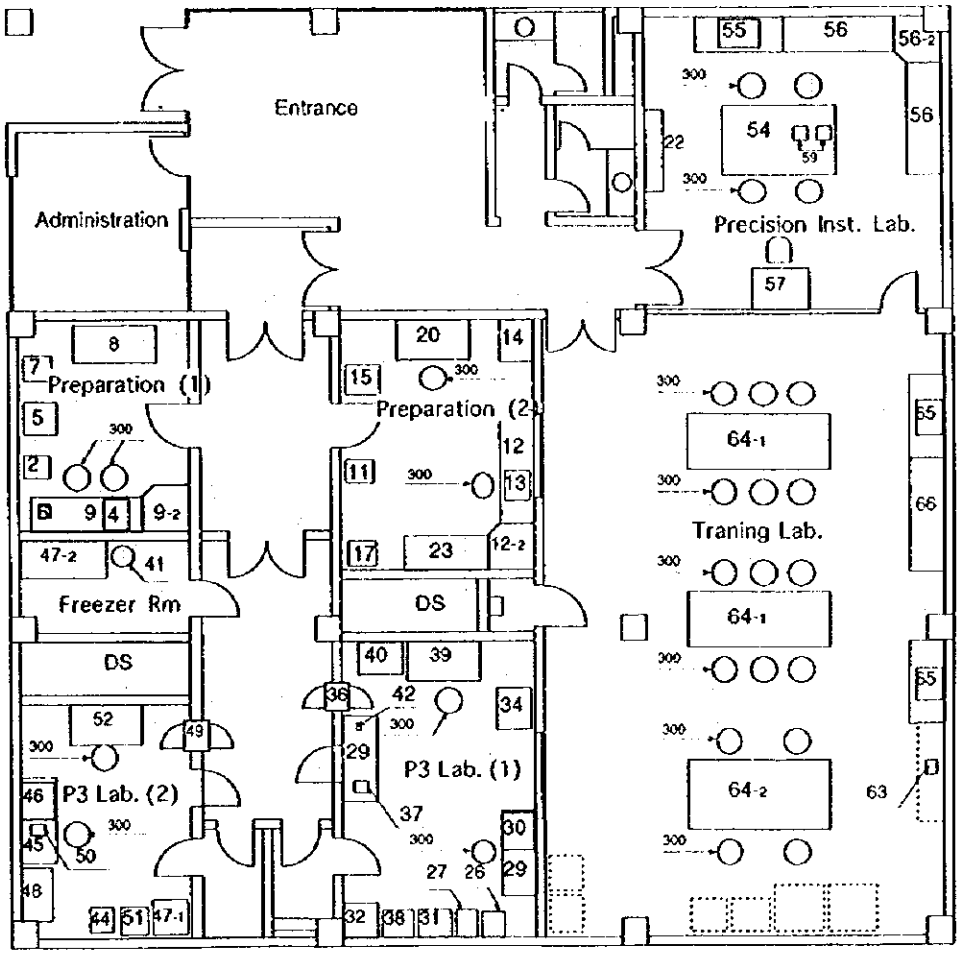
Equipment Installation Plan

P3 LABORATORY (2nd floor)

Lab. Preparation (1)		Qty
2	Autoclave (middle, vertical)	1
4	Centrifuge (3,000 rpm)	1
5	Incubator	1
6	Biological microscope	1
7	Refrigerator	1
8	Sink	1
9	Side Lab. Table	1
9-2	Corner Table	1
300	Working Chair	2
Lab. Preparation (2)		
11	Autoclave (middle, vertical)	1
12	Side Lab. Table	1
12-2	Corner Table	1
13	Centrifuge (3,000 rpm)	1
14	High speed centrifuge (20,000 rpm)	1
15	Incubator	1
17	Refrigerator	1
20	Safety Cabinet, IIA	1
23	Sink	1
300	Working Chair	2
Freezer Room		
47-2	Freezer (-85℃)	1
41	Liquid Nitrogen Canister	1

P3 Lab. (1)		Qty
26	Autoclave (small, horizontal)	1
27	Autoclave (middle, vertical)	1
29	Side Lab. Table (Stainless Steel)	2
30	Bio-Centrifuge (3,000 rpm)	1
31	CO_2 Incubator	1
32	Freezer (-85℃, horizontal, small)	1
34	Bio-High speed centrifuge (20,000 rpm)	1
36	Pass Box	1
37	Phase contrast microscope	1
38	Refrigerator	1
39	Safety Cabinet (IIB type)	1
40	Bio-Ultracentrifuge (40,000 rpm)	1
42	Anemometer	1
300	Working Chair	2
P3 Lab. (2)		
44	Autoclave (small, vertical)	1
45	Side Lab. Table (Stainless Steel)	1
46	Bio-Centrifuge (3,000 rpm)	1
47-1	Freezer (-85℃, horizontal, small)	1
48	Incubator	1
49	Pass Box	1
50	Biological microscope	1
51	Refrigerator	1
52	Safety Cabinet (IIB type)	1
300	Working Chair	2

Precision Inst. Lab.		Qty
54	Central Table	1
55	Sink	1
56	Side Lab. Table	2
56-2	Corner Table	1
57	Computer	1
59	ELISA Reader	1
22	Equipment Shelf	1
300	Working Chair	4
Training Lab.		
63	Biological Microscope	5
64-1	Central Table (for Training)	2
64-2	Central Table(for Lab.)	1
22	Equipment Shelf	2
65	Sink	2
66	Side Lab. Table	1
300	Working Chair	16

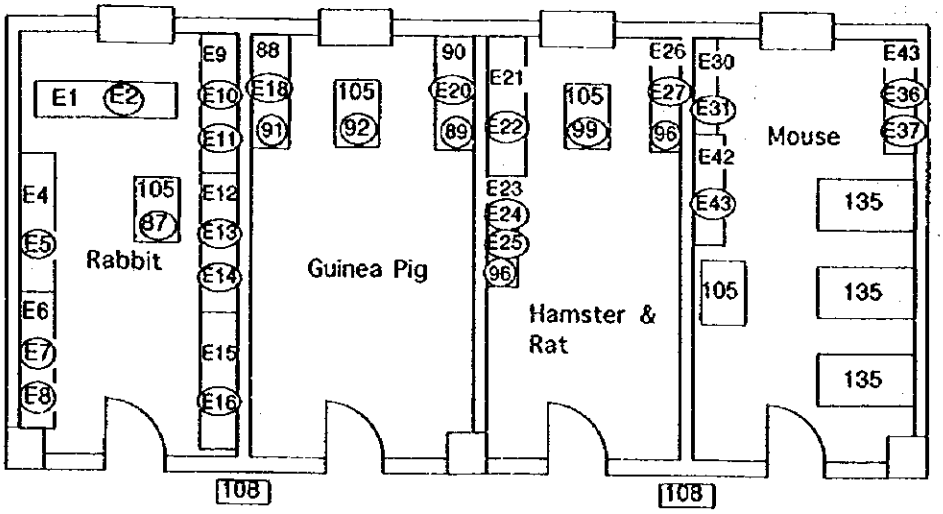


LABORATORY ANIMAL UNIT

BREEDING AND REARING UNIT

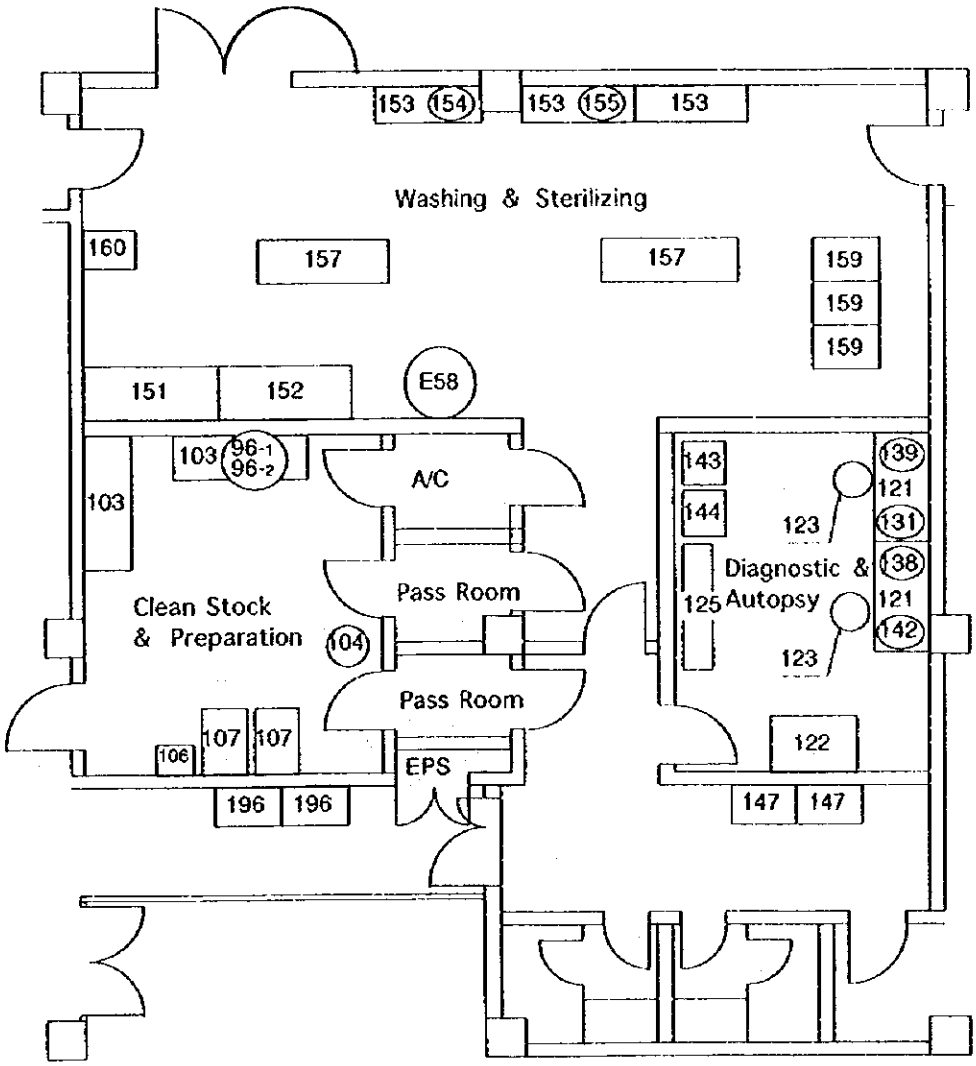
Remarks: The item number which starts from "E" indicates the existing equipment which will be transfered, while the item number without "E" indicates the equipment procured under the project

RABBIT		Qty	HAMSTER/RAT		Qty
E-1	Rack (Breeding) (SS)	1	RAT		
E-2	Cage (Breeding) (Al.)	6	E-21	Rack (SS) (England)	1
E-4	Rack (Breeding)	1	E-22	Cage (Breeding) (Vinyl,White)	16
E-5	Cage (Breading)	6	E-23	Rack (SS)	1
E-6	Rack	1	E-24	Cage (Vinyl) (Clea)	2
E-7	Cage (Rearing)	6	96	Cage (Plastic)	7
E-8	Cage (Stock)	1	E-25	Cage (Stock) (Alminum) (Clea)	7
E-9	Rack	1	HAMSTER		
E-10	Cage (Breeding)	5	E-26	Rack	1
E-11	Cage (Stock)	1	E-27	Cage	15
E-12	Rack	1	96	Cage (Plastic)	5
E-13	Cage (Young stock)	6	99	Hamster and Rat Blance	1
E-14	Cage	3	MOUSE		
E-15	Rack	1	ddY		
E-16	Cage	9	E-30	Stand (Hanging) Rack (WHO)	1
87	Rabbit Balance	1	E-31	Cage (Hanging type) (Vinyl)	15
GUINEA PIG			C/57/BL/6		
88	Breeding Rack	1	E-42	Rack (Steel)	1
E-18	Cage (Breeding)	6	E-43	Cage (Aluminum)	9
91	Cage (Breeding)	3	Balb/c		
90	Breeding Rack	1	E-35	Rack	1
E-20	Cage (Stock and Experimenting)	5	E-36	Cage (Aluminum)	13
89	Cage (Breeding)	16	E-37	Cage (Aluminum)	4
92	Guinea Pig Balance	1	135	Vinyl Isolator, 3 sets w/operation accessories	1



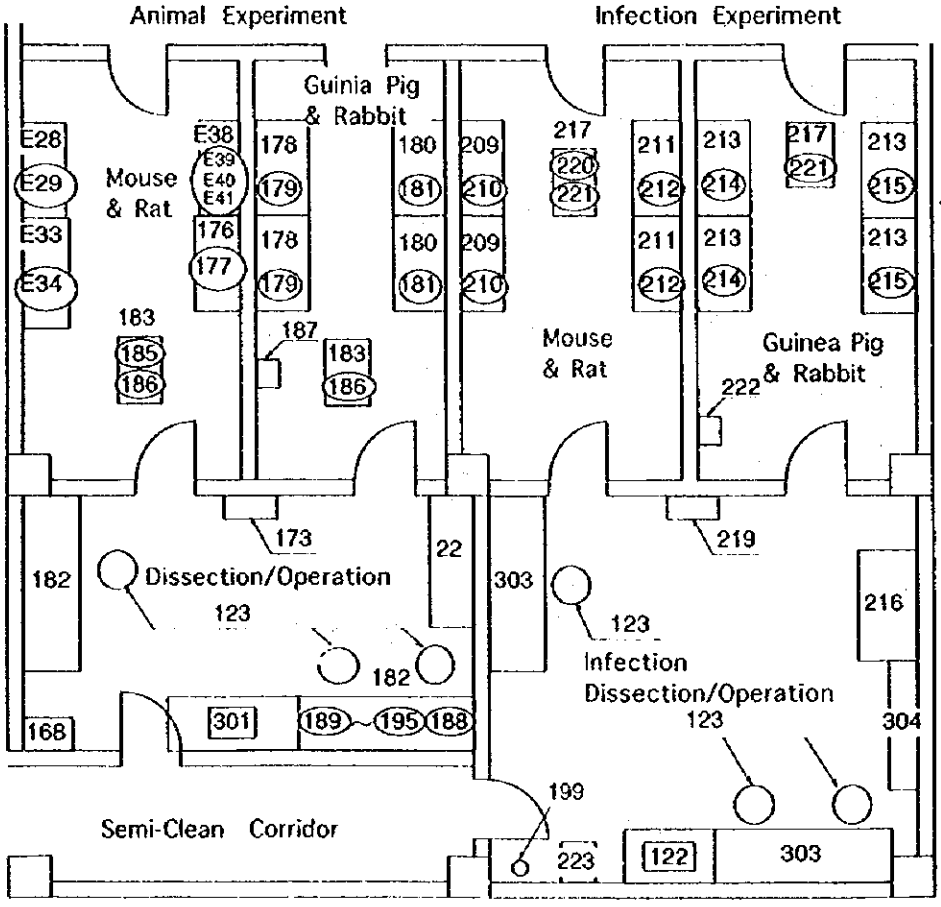
WASHING AND STERILIZING
CLEAN STOCK AND PREPARATION
DIAGNOSTIC AND PREPARATION
DRESSING ROOM

CLEAN STOCK AND PREPARATION		Qty			Qty
103	Mobile Shelf	2	142	Boiling Sterilizer	1
104	Cleaner	1	143	Refrigerator	1
105	Working Table	5	144	Incubator	1
106	Feed Container Carry	1	DRESSING ROOM		
107	Cart (Stainless Steel)	2	147	Dressing Locker (Lab. Staff)	2
108	Hand wash Stand	2	196	Dressing Locker (Animal Staff)	2
96-1	Spare Cage (Rat/Hamster)	20	WASHING AND STERILIZING		
96-2	Spare Cage (Mouse)	16	151	Shallow Sink	1
DIAGNOSTIC AND AUTOPSY			152	Deep Sink	1
121	Side Lab. Table	2	153	Drain/Dry Shelf	3
122	Sink with Drain board	1	154	Sterilizing Box, for food	5
123	Working Chair	2	155	Sterilizing Box, for bedding	5
125	Steel Cabinet	1	157	Working Table	2
131	Biological Microscope	1	159	Cart (Stainless Steel)	3
138	Centrifuge (Table Top)	1	160	Mobile Washer	1
139	Constant Temperature Bath	1	E-58	Boiler	1



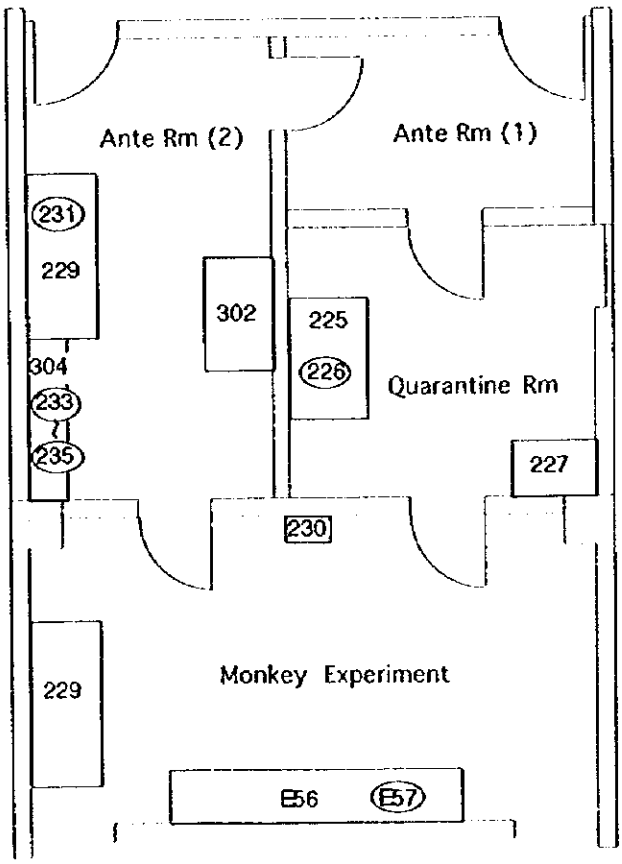
DISSECTING / OPERATION, ANIMAL EXPERIMENT
INFECTION EXPERIMENT

DISSECTING / OPERATION, ANIMAL EXPERIMENT		Qty			Qty
168	Ice Machine	1	E-34	Cage (Aluminum)	15
173	Hand wash Stand	1	E-38	Clean Rack	1
176	Clean Rack (Rat)	1	E-39	Cage	10
177	Rat Cage (Plastic)	16	E-40	Cage (Plastic)	8+2
178	Clean Rack (Guinea Pig)	2	E-41	Cage (Plastic)	6
179	Guinea Pig Cage	18	INFECTION EXPERIMENT		
180	Clean Rack (Rabbit)	2	199	Formalin gas generator	1
181	Rabbit Cage	18	209	Negative Rack with Blower	2
182	Side Lab. Table	2	210	Mouse Cage	50
183	Working Table	2	211	Negative Rack with Blower	2
185	Mouse Automatic Balance	1	212	Rat Cage (Plastic)	32
186	Rat Automatic Balance	2	213	Negative Rack with Blower	2
187	Rabbit Automatic Balance	1	214	Guinea Pig Cage	18
188	Boiling Sterilizer	1	213	Negative Rack with Blower	2
189	Dissecting Set	2	215	Rabbit Cage	18
190	Mouse Holder	2	216	Biological safety Cabinet (HA)	1
191	Rat Holder	2	217	Working Table	2
192	Operating Table	10	219	Hand wash Stand	1
193	Dissecting Table for Rabbit	2	220	Mouse Automatic Balance	1
195	Animal Hair Clipper with Blades	1	221	Rat Automatic Balance	2
301	Sink	1	222	Rabbit Automatic Balance	1
22	Equipment Shelf	1	223	Autoclave, small	1
123	Working Chair	3	303	Side Lab. Table	2
E-28	Clean Rack (Clea)	1	304	Equipment Shelf	1
E-29	Cage	20	122	Sink	1
E-33	Clean Rack (SS)	1	123	Working Chair	3



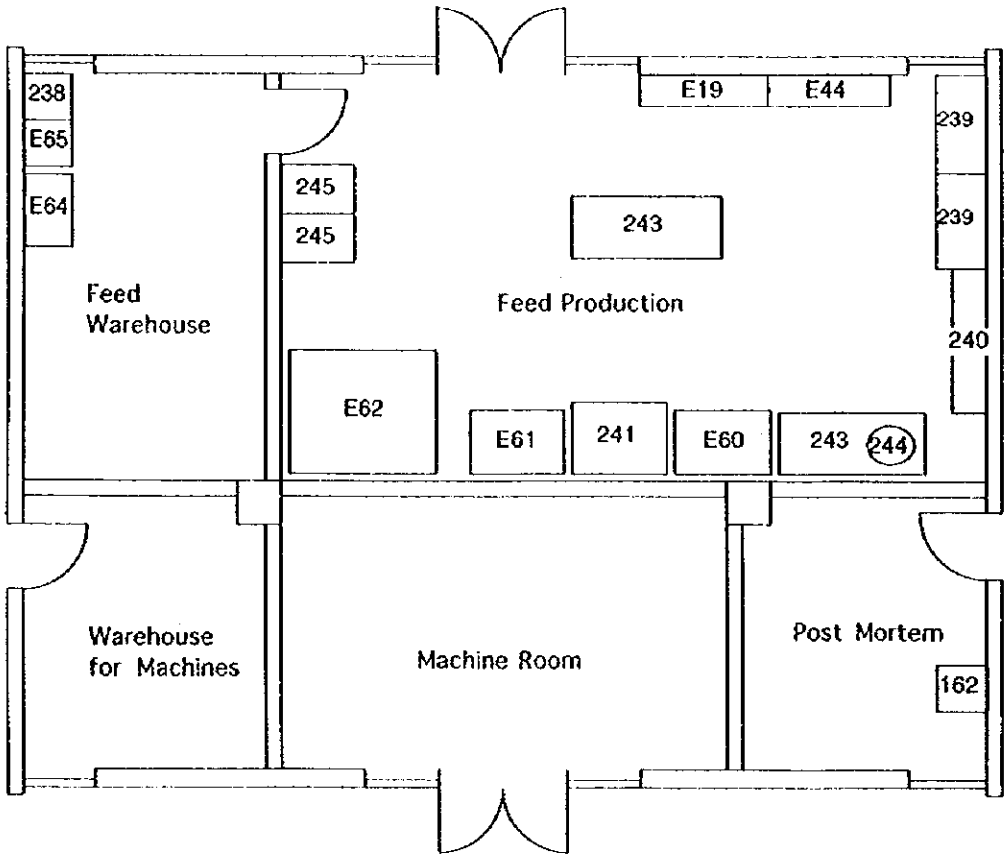
MONKEY UNIT

MONKEY QUARANTINE ROOM		Qty
225	Monkey Rack	1
226	Monkey Cage	4
227	Working Table	1
MONKEY EXPERIMENT		
229	Side Lab. Table (Stainless Steel)	1
230	Automatic Balance	1
E-56	Rack for Monkey	1
E-57	Cage for Monkey	10
MONKEY ANTE ROOM		
231	Boiling Sterilizer	1
233	Catching Gloves	3
234	Catching Net	2
235	Face Guard (Goggles)	2
229	Side Lab. Table (Stainless Steel)	1
304	Equipment Shelf	1
302	Sink	1



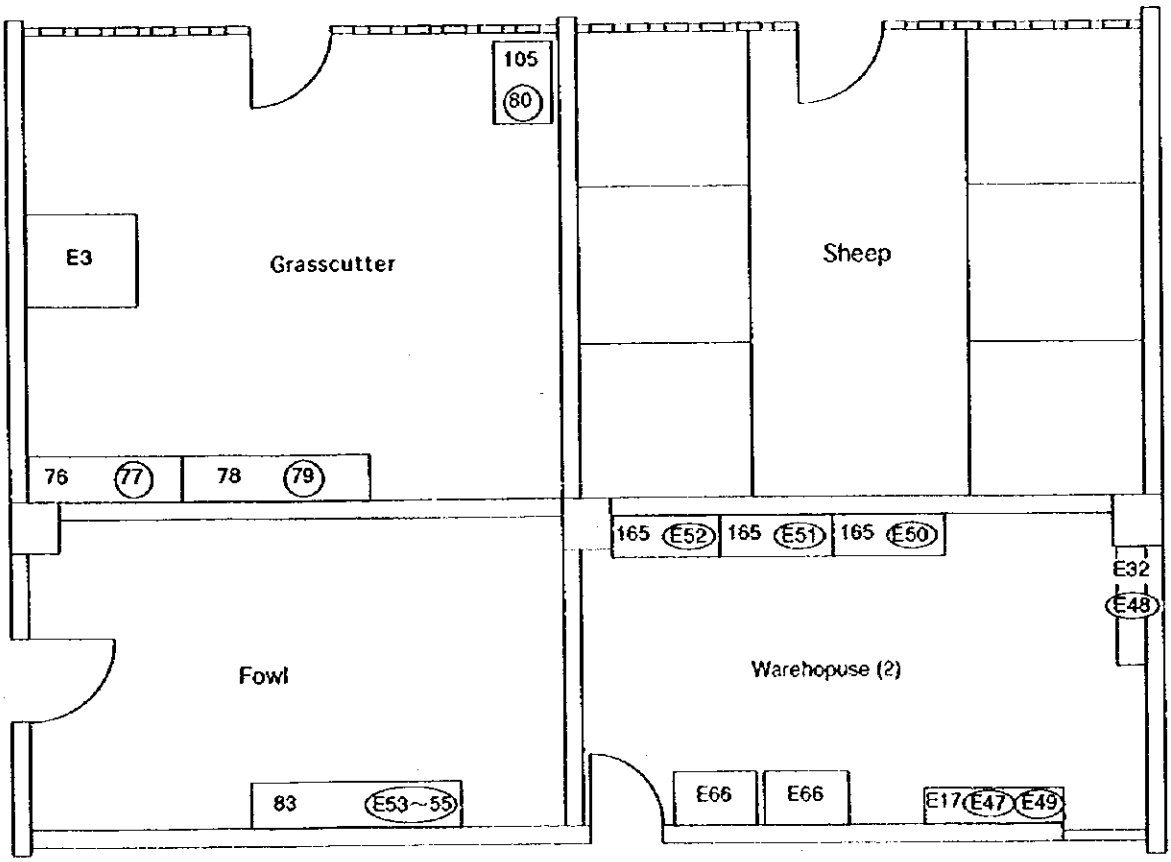
FEED PRODUCTION AND STORAGE

FEED PRODUCTION AND STORAGE		Qty
238	Refrigerator	1
239	Steel Rack	2
240	Steel Cabinet	1
241	Pellet Mill	1
243	Working Table	2
244	Digital Balance	1
245	Cart	2
E-19	Rack	1
E-44	Rack	1
E-60	Pellet Mill (USA) (Old)	1
E-61	Pellet Mill (Japanese) (Old)	1
E-62	Drier	1
E-64	Wooden Case for bedding	1
E-65	Refrigerator	1
POST MORTEM		
162	Refrigerator for Carcass	1

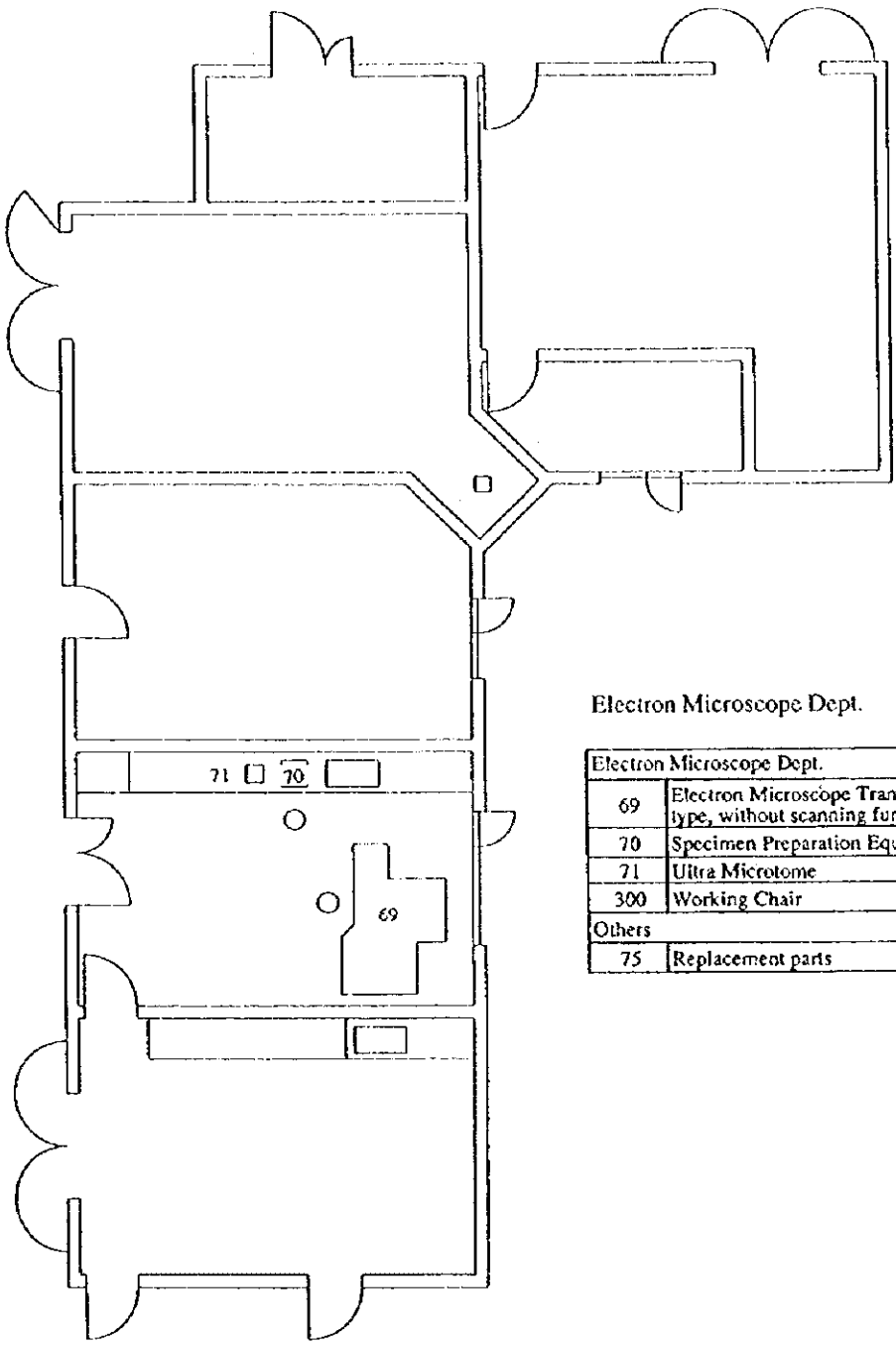


GRASSCUTTER, FOWL, SHEEP BREEDING AND WAREHOUSES

GRASSCUTTER		Qty
76	Breeding Rack	1
77	Breeding Cage (Reproduction)	6
78	Rearing Cage	1
79	Cage	15
80	Grasscuter Balance	1
E-3	Cage (Ghanian made)	1
FOWL BREEDING		
83	Breeding Rack	1
E-53	Cage (Chicken)	4
	Cage (Chicken)	1
E-54	Cage (Chicken)	2
E-55	Cage (Chicken)	1
WAREHOUSE (2)		
E-17	Rack	1
165	Steel Rack	3
E-32	Stand (Hanging) Rack	1
E-48	Hanging Cage (Mice, ddY)	36
	Hanging Cage (Mice, ddY)	10
E-49	Cage (Mice, Aluminum)	30
E-47	Cage (Rat/Hamster, Breeding)	26
E-50	Cage (Mice, C/57/BL/6)	50
E-51	Cage (Rat, Stock) (Aluminum)	6
E-52	Nest box (Rabbit Breeding)	3
E-66	Cart	2



Electron Microscope Dept.



Electron Microscope Dept.

Electron Microscope Dept.		Qty
69	Electron Microscope Transmission type, without scanning function	1
70	Specimen Preparation Equipment	1
71	Ultra Microtome	1
300	Working Chair	2
Others		
75	Replacement parts	1