upgrading of the construction industry of Thailand can be achieved.

4-1-5 Policies for Coping with the Managerial and Maintenance Abilities of the Executing Agency

Management, administration and maintenance of the School is to be carried out by the Central Juvenile Observation and Protection Center. Judging from the current status of existing facilities and the budget allocation, they seem to be having a hard time staffing the School and maintaining and facilities and equipment. Consequently, the facility design should focus on a functional layout of the facilities that can be managed by a minimum number of staffs and facilities that require minimum maintenance costs. Natural ventilation and natural lighting is recommended wherever possible. The design should place importance on energy saving measures that avoids dependency on mechanical systems while ensuring simplification of utility systems and durability of materials and equipment. Materials and construction methods that are both durable and easy to maintain and manage should be taken into account in the selection of building materials.

The equipment plan should also aim at selecting spare parts and expendables that are easy to obtain and maintain, systems that are simple and save energy, and equipment that are economical in the long run in terms of maintenance.

4-1-6 Policies on Scope and Level of Facilities

In the Facility Planning, the facilities to be provided by the Japanese grant aid are the Administration Bldg. in the General Area, Central Zone (Academic Education Bldg., Central Bldg., Cafeteria, Gymnasium etc.), Vocational Training Zone (Workshop - 1, 2, 3, 4) and the Living Zone (Dormitory -1, 2, 3, 4, 5, 6) in the Training Area. The work to be covered by the Thai side are the staff housing outside the project site, the fences surrounding the General Area and Vocational Training Area, gates and the gatehouse.

As to the landscaping work within the site, the basic design work is carried out under the Japanese grant aid on the understanding that a providing an amenable and comfortable environment and facilities as a comprehensive project is essential for the psychological well-being of the juveniles housed at the Vocational Training School.

The natural conditions, social circumstances, conditions of the construction industry, managerial capacity of the executing agency and the technical level in Thailand are taken into account in the basic design for the facilities of the Vocational Training School. Efficient and effective facility planning is adopted to reduce the cost for the Project. The facility plan should not be too distant from the facility level of the staff housing to be provided by the Thai side.

4-2 Study and Examination on Design Criteria

4-2-1 Applicable Codes and Standards

The codes and standards of Thailand shall be applied in principle. In cases where there are no relevant codes or standards, or the existing ones are deemed insufficient, the standards and provisions of Japan or other foreign countries may be applied on a case-by-case basis. The following shows the major codes and standards to be applied for the architectural, utility and equipment design of the Project.

(1) Architectural Design

1) Building Control Act B.E. 2522, 2534, 1979

2) Control of Building Act (No. 2) B.E. 2535

3) Memorandum of Criteria and Reason Supplementing Ministerial Regulation No. 13 (B.E. 2535)

4) Ministerial Regulation No. 33 (B.E. 2535)

5) By-Law of the Bangkok Metropolis
Re: Control of the Construction of Buildings 1979

6) Thai Industrial Standard (TIS)

7) Japanese Industrial Standard (JIS)

(2) Utility/Equipment Design

1) Laws and Standards on Pollution Control in Thailand 1989

2) Standards of Fire Prevention B.E. 2526

3) Japanese Electrotechnical Committee's Standard (JEC)

4) Standards for the Japan Electrical Manufacturer's Association (JEM)

5) Japanese Heating, Air-conditioning and Sanitary Standard (HASS)

6) Thai Industrial Standard (TIS)

7) Japanese Industrial Standard (JIS)

4-2-2 Establishment of the Grade of Facilities

As mentioned in the Design Principles, the facilities for the Project should be of an appropriate grade to serve as a model for juvenile vocational training institutions in

Thailand in future. On the other hand, the grade should not largely deviate from that of the recently constructed Nakon Sawan Province Juvenile Training School. The grade of the Administration Bldg. and the Work Shop Bldg. should be equivalent to those of the governmental facilities in Thailand and the Trade & Industry School of the Ministry of Education, Thailand, respectively. The grade of the Academic Education Bldg. is to be close to that of other intermediate-level educational institutions in Thailand. As to the Dormitories and the Central Bldg., the grade of juvenile training facilities of Japan shall be referred to because the training education practiced in Japan will be introduced in those facilities and the dormitories will also serve as educational facilities. In particular, the provision of rooms for psychological drama and group test/counseling in the Central Bldg. is the first attempt of its sort to be carried out in Thailand.

4-2-3 Establishment of the Size of Facilities

Analysis was made on the number of rooms required for each facility and the floor area required for each room, with due consideration given to the vocational training program, function of facilities, number of juveniles and the requests made from the Thai side. In calculating the floor area, reference was made to the Government Building Standard of Thailand and the standard for similar facilities in Japan. The specific scale of the facilities in terms of floor area is as follows: Administration Space: 6 m^2 - 8 m^2/person, Classrooms furnished with tables and chairs to accommodate 26 persons which is the standard capacity for each training course: 1.5 m^2/person. Cafeteria large enough for 200 persons to dine at the same time: 1.5 m^2/person. Gymnasium large enough to accommodate one basketball court. Workshop with sufficient floor space required for each training course, established with reference to the standard of the Japanese Ministry of Labor.

As to the net usable floor area, the traffic area accounts for 35% in the Japanese standard for calculation of floor area of new governmental administration offices. However, this ratio is based on the Japanese system which assumes that a central corridor is located within the administration office, whereas administration offices in Thailand usually have a semi-open corridor for natural ventilation and natural lighting with louvers for sunshades and balconies. It is therefore inevitable for the net usable floor area of administration offices in Thailand to have a lower ratio compared with Japanese offices. The circumstances and practice in Thailand have been taken into account in the facilities for the Project and 40% of the total floor space of the Administration Bldg. and the Central Bldg. are used as traffic area.

As a result, 17,100 m^2 has been established as the total floor area for architectural design in the Project.

The specific number of rooms required for each facility and the floor area required for each room are given in 4-3-2 Architectural Design.

In consideration of the level of education the juveniles receiving the vocational training, which is equivalent to the graduate level of primary school (compulsory education), it is

inappropriate to select vocational training equipment that are of a grade too distant from the juveniles' ability to handle them.

4-3 Basic Plan

4-3-1 Site and Layout Plan

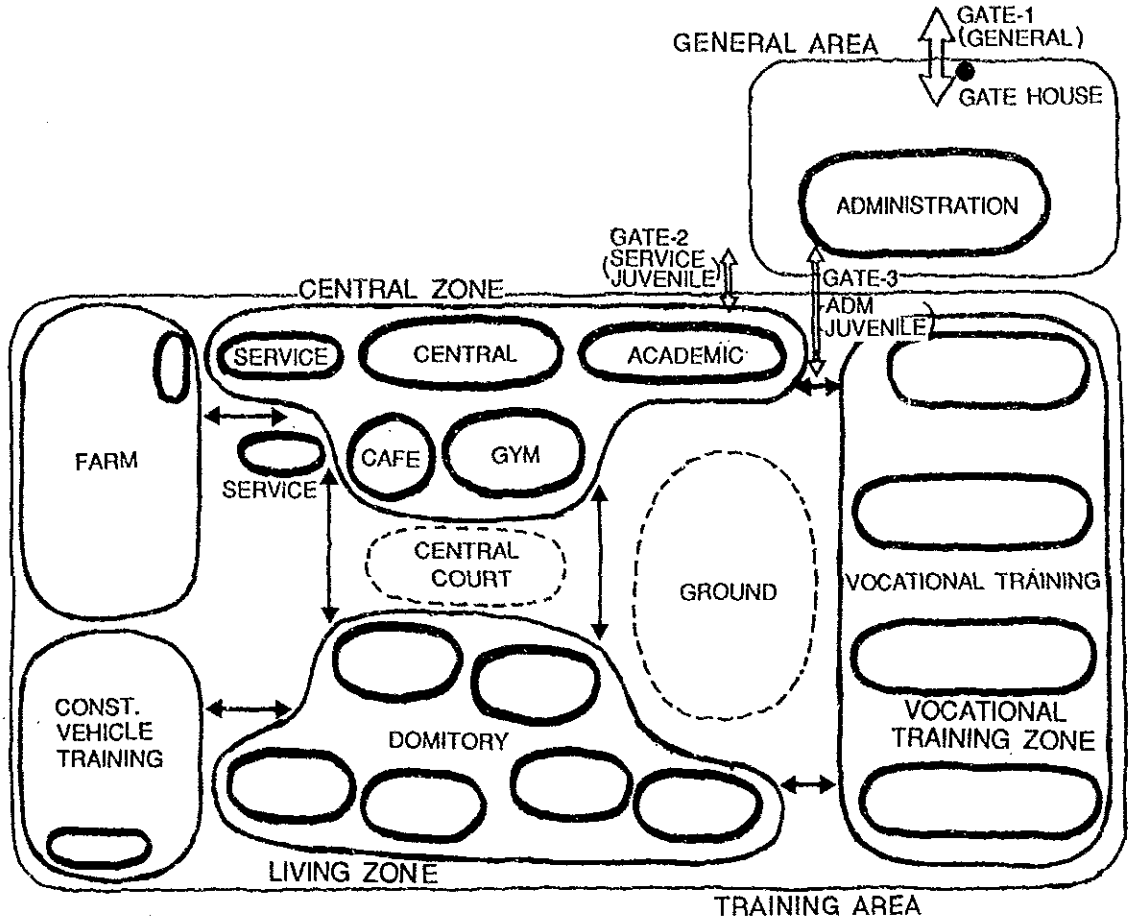
The Thai side will provide an area of 54,000 square meters as a project site composed of a juvenile training/living area 300 meters east to west and 160 meters south to north and an administration area 100 meters east to west and 60 meters south to north. While the administration area will be fenced by a 2-meter-high fence as a general area, the juvenile training/living area will be protected by a 3-meter-high wall and fence as a training area. Fencing work of the two areas will be performed by the Thai side. The Thai side will also install a gate and a gatehouse at the entrance to the administration area, and another gate at the passageway between the training/living area and the administration area, which is for administration use as well as for juveniles who go to the administration area for meetings with visitors.

The Administration Building in the administration area has a spacious front yard and it is placed on the south side in order to provide a enough space for turning cars around. The flow line between the section where juveniles meet their families and the staff and juvenile training/living area is placed on the southwest side of the administration building for easy access. The training/living area is divided into three large zones; the central zone, the vocational training zone, and the living zone. The central zone is composed of Academic Education Building, Central Building, Service Building, Cafeteria, and Gymnasium, and it is positioned as a center of education and guidance. It is located in the north center of the site. The vocational training zone is composed of four Work Shops to teach seven subjects, and it is located on the east side of the site. The living zone is composed of six Dormitories, and it is located in the south center of the site.

A soccer ground and an open space inbetween these three zones are for outdoor physical education and recreational activities. Juveniles will go back and forth between the three zones almost everyday during their stay. By going back and forth between the three different zones which are psychologically and physically separated, they will feel as if they are attending school in an ordinary society.

Construction Vehicle Operation Training Field and Farm for self-support are located on the west side of the training/living area to prevent noises of construction vehicles from intruding into the other training rooms. The security concept of the training/living area is generally based on the outer wall guarding system adopted by the existing institutions in Thailand. However, teachers and guards will keep watch during vocational training hours, and no outer wall guarding will be performed.

Chart 4-1 Diagram of Site Plan



4-3-2 Architectural Design

(1) Administration Building

Administration Building is composed of two-story-open Entrance Hall and four wings with Show Room in the center. Two wings on the first floor north form a management section with General Affairs Office, Night Duty, two Interview Rooms, Staff Lounge, Storage of Office Supply and Documents, and Storage of Juveniles Belongings. West Wing on the south is one-storied. Rooms needed for meetings of juveniles and their families are placed on the border line between the training/living area and the general area so that the flow line of juveniles and that of visitors will meet there. East Wing is a service section using the two-storied Piloti area as Garage for four administration cars, Electrical Room, and Storage.

Two wings on the second floor north form a staff training section composed of Director's Room, Secretary Room, Experts Room, two Seminar Rooms, Conference Room for meetings including parents' meetings, and Library for Staff. East Wing

on the second floor south forms a guest section composed of Guest Rooms for trainees and visiting families, Guest Lounge, and Linen Storage.

Administration Building is a flat-roofted two-storied reinforced-concrete structure partially one-storied. The external appearance accentuates the facade with a Monier-tiled steel-frame sloped roof in the center. North Wing and South Wing each has a one-side-open corridor on the south side and the north side respectively, creating a sense of unification through the two corridors facing each other.

(2) Academic Education Building

Academic Education Building is a one-storied reinforced-concrete structure which adopts the Thai school style of one-side-open corridors. It is composed of three Classrooms with a seating capability of 26 each, Instructor's Room, Storage, AV Education Room with a seating capability of 200, and Toilet for Juveniles. The roof is a Monier-tiled sloped roof with some monitor roofs, allowing lighting and ventilation.

(3) Central Building

As a center of the training/living area, it attracts juveniles with its capabilities for counseling, health consultation, reading, etc. Central Building is a one-storied reinforced-concrete structure partially two-storied, and the roof is a Monier-tiled sloped roof with some monitor roofs like Academic Education Building. The first floor includes Library, Health Instruction Room, two Examination & Treatment Rooms, Sick Room, Psychologist and Social Worker's Office, three Counseling Rooms, Psychodrama Room, Observation Room, and Group Counseling and Testing Room. The second floor includes six Individual Psychotherapy Rooms, Instructor's Room, and two Counseling Rooms which need a quite environment.

Since the plane figure of the second floor becomes larger than that of the first floor when natural lighting and ventilation are taken into consideration, it is possible to make the piloti area of the first floor a semi-outdoor space where people can get together. It is also possible to give a sense of openness and diversity to a linear one-side-open corridor by connecting an one-side-open corridor.

(4) Service Building

Service Building, which supports everyday life of juveniles, is composed of Kitchen, Food Storage, Barber, Laundry, Storage for Clothes, and Supply Storage. It is a one-storied reinforced-concrete structure, and the roof is a Monier-tiled sloped roof with some monitor roofs, allowing lighting and ventilation.

(5) Gymnasium

Gymnasium is placed on the south side of Central Building. It is used as a space for physical exercise on rainy days as well as a hall of ceremonies. It is large enough to have one basketball court with Stage and two Storages. All the sides except the

Stage side are open without a wall, and a handrail is provided around. In consideration of occasions when Gymnasium is used together with the open space on the south side, stairs are provided on the south side which can be used as spectator seats of the open space. The structure is reinforced-concrete columns and beams up to the roof, and the roof is a steel-frame sloped roof. It is Monier-tiled to be in harmony with the surrounding facilities.

(6) Cafeteria

Cafeteria is located on the south side of Central Building with a seating capacity of 200. Washstands, sinks, and tableware washing sinks are provided in the corners. All the four sides are open with a handrail around. The structure is the same as Gymnasium.

(7) Shower Building

While the existing institutions use a water tank from which users ladle water to pour it over them, this Shower Building has an improved system of shower heads from which users can take a shower, 36 shower heads are provided so that users can take a shower efficiently twice a day within a limited period of time. For security reasons, the shower room is partitioned not by booths but by 1.5-meter-high walls. Washing stands and laundry sinks on the east side of the shower room have 24 faucets. Floors and partition walls are tiled for easy maintenance. The structure is reinforced-concrete columns and beams up to the roof, and the roof is a lightweight steel-frame sloped roof covered with Roman tiles.

(8) Toilet Building

The toilet system of the existing institutions need to be improved. Toilet Building has ten Thai-style toilet booths and ten urinals. The height of a toilet booth is 1.2 meters for security reasons, and the urinals are sanitary fixtures. Floors and partitions are tiled for easy maintenance. The structure, the roof framework, and the roofing materials are the same as Shower Building.

(9) Dormitories (6 Buildings)

Each Dormitory is two-storied. The piloti area of the first floor is used as a place for rest and gatherings and as a connecting corridor between the dormitories. The second floor is used as a living space for 36 juveniles for 5 dormitories and 20 juveniles for 1 dormitory. The existing institutions have one large sleeping room with open toilets on one side of the room. One of the characteristics of this project as a model institution is the idea to divide one large room by ventilative low partition walls of about 1.2 meters high into 6 sections for 6 people each, for the purpose of having educational activities in Activity Space of Dormitories as well as to ensure minimum privacy for juveniles and to teach them to be aware of their territory of living.

Dormitory has Activity Space in the north center, and six Group Rooms and two Study Rooms surround Activity Space on the south side. Activity Space (living room) and Group Rooms (bedrooms) divided by low partition walls and storage cabinets are basically designed as one large room. Instructor's Room and Toilet for Juveniles face Activity Space, and Patrol Corridor for security surrounds the building. It is a two-storied reinforced-concrete structure and the roof is a Monier-tiled sloped roof with some monitor roofs allowing lighting and ventilation.

While each Dormitory is designed as an individual structure, two Dormitories are connected as one security unit by Patrol Corridors on the second floor for security reasons. Two Dormitories are placed about 6 meters apart (east to west) to ensure lighting and ventilation. Six Dormitories are arranged in a quarter line of about 6 meters (south to north) in the direction of the constant wind.

(10) Workshops (4 Buildings)

Each Workshop is one-storied with two workshops on the east and the west. Entrance, Locker Room, Instructor's Room, Storage, and Toilets for Juvenile and Staff are placed back to back in the center. The standard area of each workshop is 450 square meters, which may be more or less depending on the subject taught there. The height is about 5 meters at the caves, and it is the same for every workshop. One of the eight workshops will be used as a place store finished products and materials common to every subject. Four Workshops will offer a total of 7 subjects.

The structure is reinforced-concrete columns and beams up to the roof, and the roof is a steel-frame sloped roof covered with Roman tiles. Monitor roofs are placed on the ridge for ventilation and lighting. The entrance to each workshop has an opening to allow passage of vehicles north and south so that tools, materials and finished products can be easily carried in and out.

Since the central section that includes Instructor's Room, Storage and others does not need a high ceiling, it will be a reinforced-concrete flat-roofed structure with a top light in the center for natural lighting and ventilation.

(11) Construction Vehicle Operation Training Building

This training building sits next to the outdoor vehicle operation training field away from the Workshops for 7 subjects. It is an one-storied structure housing Garage for 4 construction vehicles, Classroom, Instructor's Room, Storage, and Toilets for Staff and Juveniles. The structure is reinforced-concrete columns and beams up to the roof, and the roof is a lightweight steel-frame sloped roof covered with Roman tiles. Classroom and Instructor's Room will have a double ceiling to ensure ventilation and insulation of attic.

(12) Garage for Farm Machineries

As a storage for farm machineries and tools, it will be placed adjacently to the self-management farm. It is an one-storied building housing Garage for tractors, lawn mowers and other machines, Storage for Farm Tools including fertilizers, Locker Room, Toilets for Staff and Juveniles, etc. The structure will be the same as that of the above Construction Vehicle Operation Training Building.

(13) Connecting Corridor

Connecting Corridor establishes a flow line between the zones and offers convenience in rainy weather. It is 2.5 meters wide, and the floor level is as high as that of each facility (about 1 meter). The structure is reinforced-concrete columns and beams up to the roof. The roof is a lightweight steel-frame sloped roof covered with Roman tiles.

The followings are the rationale for the size established for each building, based on the analysis and studies on 4-2-3 Establishment of Size of Facilities.

Rational for size established for each building

(1) Administration Bldg.

Name of Room	Function	No. of Rooms	Total Floor Area Needed
Entrance Hall	: Entrance for staff and visitors.	1	60 m^2
Display Hall	: Space for exhibits of how the training is carried out the and goods produced.	1	60 m^2
General Affairs Office	: Room for 8 administration staffers. Office device space and broadcast room space is required. Anteroom for meeting juveniles is required. 8 persons x 6 m^2 = 48 m^2 Broadcasting room: 10 m^2 Office device space: 10 m^2	1	70 m^2
Night Duty	: Night duty room for 1 supervisor.	1	10 m^2
Interview Room	: 2 rooms are needed for juveniles interviewed by related organizations and meeting with their family. 2 rooms x 12 m^2 = 24 m^2 Anteroom: 10 m^2	2	35 m^2
Staff Lounge	: Room for staff to relax, chat, and have meals. 30 persons x 1.5 m^2 = 45 m^2	1	45 m^2
Storage of Juveniles' Belongings	: The juveniles' belongings are stored here during their period of training. 200 persons x 0.1 m^2 = 20 m^2	1	20 m^2
Storage of Office Supply and Documents	: Records and documents of the juveniles as well as office supply are stored here. Period of storage is 10 years for records and 5 years for documents. Office supply space: 5 m^2 Document space: 15 m^2	1	20 m^2
Waiting Room for Visitors	: Waiting room for visitors. Includes space for shops selling gifts for juveniles and daily commodities, and storage for shops. 40 persons x 1 m^2 = 40 m^2 Reception: 5 m^2 Shops: 30 m^2 Storage for Shops: 5 m^2	1	80 m^2
Visiting Room	: 4 visiting rooms are needed, each accommodating a maximum of 5 persons. Corridors for juveniles and visitors should be provided separately so that their circulation can be clearly distinguished. 5persons x 2 m^2 = 10 m^2 10m^2 x 4rooms = 40 m^2 Corridor for Juveniles: 15 m^2 Corridor for Visitors: 15 m^2	4	70 m^2
Waiting Room for Juveniles	: Accommodates 20 juveniles. 1 Toilet is required. 20 persons x 1 m^2 = 20 m^2 Toilet: 3 m^2	1	23 m^2
Director's Room	: To be used by the Director. Requires the same scale of office space as those of existing facilities.	1	20 m^2

Name of Room	Function	No. of Rooms	Total Floor Area Needed
Secretary Room	: Room for 1 or 2 secretaries. Requires a waiting lobby (ante-room for Director's Room).	1	25 m^2
Experts Room	: Room for 1 or 2 experts and 1 secretary. 3 persons × 8 m^2 = 24 m^2	1	25 m^2
Conference Room	: Room to be used for meetings with Juveniles's families, lectures to visitors, and meetings among staffers. 58 persons × 1.2 m^2	1	70 m^2
Seminar Rooms	: Rooms for lectures given to trainees and small meetings. 15 persons × 1.5 m^2 = 23 m^2 23 m^2 × 2 rooms = 45 m^2	2	45 m^2
Library for Staff	: Library and document storage staff and trainees. Seats for 10 users is required. Stores 2,000 books. 2,000 books ÷ 200 books/m^2 = 9 m^2 10 persons × 1.5 m^2 = 15 m^2	1	25 m^2
Guest Room	: Guest room used by trainees from outside Bangkok and families of juveniles. 4 rooms each sleeping 2 persons, with toilet and shower, is required. 10 m^2 × 2 persons = 20 m^2 Toilet/shower: 4 m^2 24 m^2 × 4 rooms = 96 m^2	4	95 m^2
Guest Lounge	: Dining/living room for guests.	1	20 m^2
Linen Storage	: Storage for linen supply, etc.	1	10 m^2
Toilets	: 2 for staff and 1 for visitors. 15 m^2 × 3 = 45 m^2	3	45 m^2
Kitchenet	Required in 2 locations on each floor.	2	10 m^2
Garage	: Garage for parking four official-use cars. 4 cars × 20 m^2 = 80 m^2	1	80 m^2
Storage for Garage	: Storage for tools.	1	25 m^2
Electrical Room	:	1	20 m^2
(Sub-total of Net Floor Area)	: 60%		(1,008 m^2)
Corridors, etc.	: 40% (including balconies)		672 m^2
Total	: 100% (including balconies)		1680 m^2

(2) Academic Education Bldg.

Name of Room		Function	No. of Rooms	Total Floor Area Needed
AV Education Room	:	A room seating 200 in foldable chairs. Also used as a classroom. 200 persons x 0.8 m^2 = 160 m^2	1	160 m^2
Projection & Storage	:	Storage for AV equipment, chairs and tables for multi-purpose usage of AV Education Room.	1	20 m^2
Classrooms	:	Rooms used for teaching English, mathematics, etc., and used by each vocational training course. 26 persons x 1.5 m^2 = 39 m^2 39 m^2 x 3	3	120 m^2
Instructor's Room	:	Requires office space for 5 instructors of academic subjects and meeting space for instructors of vocational training. 4 persons x 6 m^2 + 1 person x 8 m^2 = 32 m^2 18 persons x 1.2 m^2 = 22 m^2	1	55 m^2
Storage for Teaching Material	:	Storage for teaching materials.	1	40 m^2
Air-conditioning Machine Room	:	Air-conditioning system Machine room for the A/V Education Room.	1	20 m^2
Toilet	:	1 Toilet for juveniles.	1	15 m^2
Storage	:	Storage for furnitures, etc.	1	5 m^2
(Sub-total of Net Floor Area)	:	75%		435 m^2
Corridor Area	:	25%		145 m^2
Total	:	100%		580 m^2

(3) Central Bldg.

Name of Room	Function	No. of Rooms	Total Floor Area Needed
Psychologist and Social Workers' Office	: Includes rooms for 2 psychologists and 2 social workers and 3 counselling rooms. 2 persons × 8 m^2 + 2 persons × 12 m^2 = 40 m^2 Counselling Room: 3 rooms × 6 m^2 = 18 m^2	1	58 m^2
Psychodrama Room	: A room where juveniles perform role-playing drama. A semi-circular stage is provided. Accommodates 20 juveniles. Stage: 8 m^2 20 persons × 2 m^2 = 40 m^2	1	48 m^2
Observation Room	: A room where counsellers observe and record the psychodrama being performed. Requires space for storing musical instruments etc. used for musical therapy.	1	13 m^2
Group Counselling/ Test Room	: Room where group counselling, IQ test etc. are performed. 30 persons × 1.5 m^2 = 45 m^2	1	45 m^2
Health Instruction Room	: Also used as a waiting room for juveniles. Office space for 1 nursing officer and 1 nurse, respectively. Office: 2 persons × 6 m^2 = 12 m^2, Toilet 9 m^2 Waiting: 24 persons × 1 m^2 = 24 m^2	1	45 m^2
Examination & Treatment Room	: A clinic where 1 part-time physician and 1 part-time dentist each take turns in examining and treating patients. Includes Medicine Storage.	2	35 m^2
Sick Room	: Sick room for 10 patients. 10 persons × 4.5 m^2 = 45 m^2	1	45 m^2
Library	: Stores 10,000 books, divided into books for reading and books for storing. Seats for 38 persons are provided. 10,000 books ÷ 250 books/m^2 = 40 m^2 Seats: 38 persons × 1.3 m^2 = 50 m^2 Office space for Librarian: 5 m^2	1	95 m^2
Individual Psycho-therapy Rooms	: Used for cases when intensive individual psychotherapy is required. 1-person rooms with bed, desk and toilet. Each Room: 10 m^2 × 6 rooms = 60 m^2	6	60 m^2
Counselling Rooms	: Rooms for conducting counselling on juveniles treated in Individual Psychotherapy Rooms. 13 m^2 × 2 rooms = 26 m^2	2	26 m^2
Shower Room	: Room where juveniles treated in Individual Psychotherapy Rooms can wash their hands and clothes and take a shower.	1	6 m^2
Instructor's Room	: Room where a instructor does office work and takes a nap. A toilet is provided. Includes observation space for a monitor TV.	1	20 m^2

Name of Room	Function	No. of Rooms	Total Floor Area Needed
Toilet	: 1 toilet for staff.	1	23 m²
Patrol Corridor	: A corridor where guards patrol at night.		70 m²
Kitchenet	: For staff	1	5 m²
(Sub-total of Net *Floor Area)*	: 60%		594 m²
Corridors, etc.	: 40% (including pilotis)		406 m²
Total	: 100%		1,000 m²

(4) Service Bldg.

Name of Room		Function	No. of Rooms	Total Floor Area Needed
Kitchen	:	Kitchen for 200 meals. 200 persons x 0.4 m^2 = 80 m^2	1	80 m^2
Food Storage	:	Fresh food items are bought daily. Rice and condiments are stored. 200 persons x 0.1 m^2 = 20 m^2	1	20 m^2
Barber	:	3 barber chairs, waiting space for 10 persons. 3 persons x 6 m^2 = 18 m^2 10 persons x 1 m^2 = 10 m^2	1	30 m^2
Laundry	:	2 washing machines, 1 spindry machine and 1 drying machine are installed. 1 instructor and 3-5 juveniles work together.	1	45 m^2
Working Corner	:	2 sewing machines and 1 repair table.	1	15 m^2
Uniform Storage	:	Storage for uniforms worn by juveniles. 200 persons x 0.1 m^2 = 20 m^2	1	15 m^2
Supply Storage	:	Storage for daily commodities of juveniles. 200 persons x 0.15 m^2 = 30 m^2	1	30 m^2
Toilet	:	Toilet for staff provided in one location (1 WC each for male and female staffers).	1	7 m^2
Space for Delivery Carts	:	Space for delivery carts used in the Kitchen and Laundry.		20 m^2
(Net Floor Area)	:	75%		262 m^2
Corridors, etc.	:	25%		88 m^2
Total	:	100%		350 m^2

(5) Gymnasium

Name of Room		Function	No. of Rooms	Total Floor Area Needed
Hall	:	A Hall large enough for volleyball and basketball games. Also used as Auditorium for graduation and other ceremonies. Gymnasium 600 m^2 Stage 50 m^2 2 Storages totalling 50 m^2	1	700 m^2
Total				700 m^2

(6) Cafeteria

Name of Room		Function	No. of Rooms	Total Floor Area Needed
Cafeteria	:	200 seats. Includes hand and dish washing spaces. 200 seats × 1.5 m^2 = 300 m^2 Hand and dish washing space 25 m^2	1	325 m^2
Total				325 m^2

(7) Shower Bldg.

Name of Room		Function	No. of Rooms	Total Floor Area Needed
Shower Room	:	200 persons take a shower in 6 shifts. 36 shower heads. 36 heads × 1.5 m^2 = 54 m^2	1	54 m^2
Long Basin Room	:	24 faucets, 24 × 1.5 m^2 = 36 m^2	1	36 m^2
Connecting area	:	Connecting area with corridor.		20 m^2
Total				110 m^2

(8) Toilet Building

Name of Room		Function	No. of Rooms	Total Floor Area Needed
Toilet	:	10 Water closets and 10 urinals.	1	50 m^2
Connecting area	:	Connecting area with corridor.		15 m^2
Total				65 m^2

(9) Dormitory - 1, 2, 3, 4, 5, 6

Name of Room		Function	No. of Rooms	Total Floor Area Needed
Activity Space	:	Space for meetings, lectures and recreational activities. 36 persons x 2.3 m^2 = 82 m^2	1	82 m^2
Group Rooms	:	6 rooms for 6 persons each (with beds and desks) at 5 Dormitories. 5 rooms for 4 persons (with beds and desks) and 1 room for spare at 1 Dormitory. 5.2 m^2 x 6 persons = 32 m^2 32 m^2 x 6 rooms = 192 m^2	6	192 m^2
Study Rooms	:	2 rooms per Dormitory. 10 m^2 x 2rooms = 20 m^2	2	20 m^2
Instructor's Room	:	1 person room for Dormitory Instructors. 1 room per Dormitory.	1	15 m^2
Toilet	:	1 location per Dormitory: 15 m^2	1	15 m^2
1F Piloti	:	Place for resting and gathering on holidays and during recess. 36 persons x 4 m^2 = 144 m^2	1	144 m^2
1F Piloti	:	The floor-less portion of the Piloti.	1	254 m^2
2F Patrol Corridor	:	A Corridor where guards patrol at night.		150 m^2
(Sub-total of Net Floor Area)	:	90% (including 1F Piloti and 2F Patrol Corridor)		872 m^2
Corridors, etc.	:	10%		98 m^2
Total	:	100%		970 m^2
Total for 6 Dormitories:				5,820 m^2

(10) Workshop - 1

Name of Room		Function	No. of Rooms	Total Floor Area Needed
Woodwork Workshop	:	Includes Machine Workshop, Painting & Drying Areas, Storage for Materials, etc. 26 persons x 17.2 m^2 = 447 m^2	1	450 m^2
Welding/Sheet Metal Work Workshop	:	Includes space for shearing, machine tooling, assembling, welding and painting. 26 persons x 16.7 m^2 = 447 m^2	1	450 m^2
Locker Room	:	Room for changing into work clothes. 26 persons x 0.45 m^2 = 12 m^2	2	20 m^2
Instructor's Room	:	Room for 2 instructors. Requries storage space for expensive measuring equipment. Office for 2 persons x 8 m^2 = 16 m^2	2	40 m^2
Storage	:	Space for storing some of the tools and training materials.	2	60 m^2
Toilet	:	1 Toilet for juveniles, 1 for staff.	2	30 m^2
(Sub-total of Net Floor Area)	:	90%		1,050 m^2
Corridors, etc.	:	10%		105 m^2
Total	:	100%		1,155 m^2

Workshop - 2

Name of Room		Function	No. of Rooms	Total Floor Area Needed
Machining Workshop	:	Includes space for measuring workshop. 26 persons x 20.8 m^2 = 540.8 m^2	1	540 m^2
Electric Wiring Workshop	:	Includes space for control/measuring workshop. 26 persons x 13.3 m^2 = 346 m^2	1	360 m^2
Locker Room/ Instructor's Room/ Storage/Toilet	:	Same as for Workshop - 1.		
(Sub-total of Net Floor Area)	:	90%		1,050 m^2
Corridors, etc.	:	10%		105 m^2
Total	:	100%		1,155 m^2

Workshop - 3

Name of Room		Function	No. of Rooms	Total Floor Area Needed
Automobile Maintenance Workshop	:	Includes inspection area. 26 persons x 20.1 m^2 = 530 m^2	1	540 m^2
Airconditioner Repairing Work	:	Includes area for measuring. 26 persons x 12.8 m^2 = 333 m^2	1	360 m^2
Locker Room/ Instructor's Room/ Storage/Toilet	:	Same as for Workshop - 1.	2	150 m^2
(Sub-total of Net Floor Area)	:	90%		1,050 m^2
Corridors, etc.	:	10%		105 m^2
Total	:	100%		1,155 m^2

Workshop - 4

Name of Room		Function	No. of Rooms	Total Floor Area Needed
Printing Workshop	:	Includes space for photo typesetting, plate-making and Dark Room. 26 persons x 14 m^2 + Dark Room 80 m^2 = 444 m^2	1	450 m^2
Locker Room	:		1	10 m^2
Instructor's Room	:		1	20 m^2
Storage	:		1	30 m^2
Toilet	:		1	15 m^2
Storage for Materials & Products	:	Storage for raw materials and finished production, shared by all the courses. 10% of the total workshop spaced used by the 7 vocational courses.	1	360 m^2
(Sub-total of Net Floor Area)	:	90%		885 m^2
Corridors, etc.	:	10%		90 m^2
Total	:	100%		975 m^2
Total for 4 Workshops	:			4,440 m^2

(11) Construction Vehicle Operation Training Bldg.

Name of Room		Function	No. of Rooms	Total Floor Area Needed
Construction Vehicle Operation Classroom	:	Room where lectures for Construction Vehicle Operation Training Course are given. 18 persons × 2 m^2 = 36 m^2	1	35 m^2
Garage for Training Vehicles	:	Garage for 4 training vehicles. Large/special type: 3 units × 34 m^2 Large type: 1 unit × 25 m^2	1	130 m^2
Instructor's Room	:	Room for 2 instructors. 2 persons × 8 m^2 = 16 m^2	1	20 m^2
Toilet	:	1 Toilet for juveniles, 1 Toilet for staff	1	15 m^2
Storage	:	Storage for tools, etc. Storage for tools 7 m^2 Storage for combustibles 5 m^2 Others 20 m^2	1	35 m^2
(Sub-total of Net Floor Area)	:	90%		235 m^2
Corridors, etc.	:	10%		25 m^2
Total	:	100%		260 m^2

(12) *Garage for Farm Machineries*

Name of Room		Function	No. of Rooms	Total Floor Area Needed
Storage for Farm Tools	:	Storage for farm tools, fertilizers, etc.	1	25 m^2
Garage	:	*Garage for tractors and lawn movers.*	1	25 m^2
Locker Room	:	26 persons × 0.45 m^2 = 11.7 m^2	1	10 m^2
Storage	:		1	9 m^2
Toilet	:	1 Toilet for juveniles, 1 Toilet for staff.	1	6 m^2
Total	:	100%		75 m^2

(13) Connecting Corridor

Name of Room		Function	No. of Rooms	Total Floor Area Needed
Connecting Corridor	:	Width: 2.5 m		1,695 m^2
Total of (1)~(13)	:			17,100 m^2

4-3-3 Structural Design

(1) Basic Policies

1) To adopt a structural mode that conforms to the state of affairs and the natural features of Thailand as well as the size, form and the purpose of the building.

2) To adopt locally available materials and equipment and locally practiced methods wherever possible in due consideration of the supply and the quality of local materials and construction techniques.

3) To adopt a structural mode that is economic and durable.

(2) Structural Design

1) Reinforced concrete rigid frame structures common in Thailand shall be the primary structural mode. However, steel frame shall be used for large-span roof structures partially. Walls shall be bricks or concrete blocks stacked in frames.

2) Foundation

According to the boring test data, a reliable support layer lies deep underground in the project site. Therefore, pile foundation shall be used as the foundation mode. Pile length and bearing capacity will be determined in detail after confirming the total weight of the building at the time of detailed design.

3) Structural calculation shall follow the design standards of the Architectural Institute of Japan and it shall be done according to allowable design method. Allowable stress of structural materials shall be determined based on the Thai and the Japanese standards as well as the local workability and the fluctuation in quality.

(3) Design Loads

Design loads such as external forces to act on the building shall follow Article 63 of 'By-Laws of the Bangkok Metropolis, Re: Control of the Construction of Building, 1979."

1) Dead Load

- Reinforced Concrete 2.4 t/m^3
- Structural Steel 7.85 t/m^3
- Bricks and Blocks 1.9 t/m^3

- Weights of other finishing materials shall be determined at the time of detail design.

2) Live Load

• Roof (general)	50 kg/m^2
• Roof (concrete eaves))	100 kg/m^2
• Toilet	150 kg/m^2
• Dormitory Room	200 kg/m^2
• Office Room	250 kg/m^2
• Classroom, Meeting Room, Hallway, Stairway	300 kg/m^2
• Library, Gymnasium, Machine Room, Dining Room, Workshop	500 kg/m^2

- Others shall be determined according to the actual circumstances.

3) Wind Load

Wind load is based on the By Laws of the Bangkok Metropolis.

Height	Velocity Pressure
Under 10 meters	50 kg/m^2
10 to 20 meters	80 kg/m^2
20 to 40 meters	120 kg/m^2

Wind pressure coefficient is based on the Japanese standard.

4) Earthquake Load

Since the area including the project site has never experienced a major earthquake that would cause damage to buildings, earthquake load is not taken into consideration in this project.

(4) Structural Materials

Major materials to be used are as follows:

a.	Reinforcing Bars	Deformed bars SD30 (TIS), Round bars SR24 (TIS)
b.	Concrete	Fc = 210 kg/cm^2 (28-day cylinder test)
c.	Cement	Portland cement (ASTM)
d.	Structural Steel	SS400 (JIS) or equivalent

e. *Piles* PC piles

4-3-4 Plumbing System Design

(1) Water Supply

1) Water Supply

A water supply system consisting of wells, pumps, sand separator, water tanks, elevated water tank, and main water supply pipe will be provided by the Thai side up to the boundary of the site, whereas the works within the site will be provided by the Japanese Side. Water will be supplied directly within the site by gravity.

- Anticipated Water Supply Volume

The following is the anticipated water consumption in the site

Staff	76	p	×	0.150	$m^3/p/d$	× 1.2	=	14	m^3/d
Trainee	200	p	×	0.400	$m^3/p/d$	× 1.1	=	88	m^3/d
Visitor	30	p	×	0.100	$m^3/p/d$	× 1.1	=	4	m^3/d
Watering	5,000	m^2	×	0.010	$m/m^2/d$		=	50	m^3/d
Total								156	m^3/d

- Main Water Supply Pipe

The maximum water flow rate is as follows. The water supply pipe will be 100 mm in diameter.

Staff	14	m^3/p	÷	8	h/d	÷ 60	min/h	× 4	=	0.116 m^3/min
Trainee	88	m^3/p	÷	12	h/d	÷ 60	min/h	× 6	=	0.733 m^3/min
Visitor	4	m^3/p	÷	8	h/d	÷ 60	min/h	× 4	=	0.034 m^3/min
Watering	0.020	m^3/min.				× 2 sets			=	0.040 m^3/min
Total										0.923 m^3/min

2) Cold Drinking Water

Water coolers of bottle type will be installed near the Toilets, and in the Cafeteria, Classroom, Work Shops, etc.

3) Rain Water Supply

Rain water on the roof of the buildings will be collected to rain water tanks on the ground level. It will be used for washing and watering.

4) Water Treatment

If the quality analysis of the well water reveals that water treatment is necessary, ceramic filters will be installed for water used for cooking in the Kitchen.

(2) Hot Water Supply System

1) For Tea Service

Electric heaters of about 1 Kw are provided in the Kitchenets etc. for boiling water in kettles.

2) For Kitchen

An electric water heater will be provided in the Kitchen and hot water will be distributed to sinks.

3) For Showers and Kitchens in the Administration Zone and Guest Rooms

A point-of-use electrical water heater is installed in the Shower Rooms and an electric heater is used to boil water for tea services in the Kitchen.

4) For Taking a Shower after Vocational Training Using Machine Oil

For taking a shower after vocational training using machine oil such as automobile maintenance and airconditioner repair, hot water will be supplied from an electrical water heater, supplemented by an auxiliary solar water heating system.

(3) LP Gas Supply

LP gas will be supplied to the Kitchen. LP gas cylinders will be installed outdoors immediately outside the Kitchen.

(4) Fuel Oil Supply

A fuel oil tank for training vehicles will be provided.

(5) Sanitary Drainage

Sanitary drains from Toilets, Shower Rooms and Kitchens will be piped to a waste water treatment plant and subsequently drained into a waterway provided by the Thai side. The quality of the treated water should conform to local standards: Minimum requirements: BOD - 30 ppm, SS = 40 ppm, Settleable S = 0.5 ppm, TDS = 500 ppm, Sulfide = 1.0 ppm, Free Residual Chlorine = 0.3 ppm, Nitrogen; ORG-N = 10 ppm, pH = 5-9, Oil and Grease = 20 ppm.

(6) Sanitary Fixtures

1) Dormitory

- Toilet for Juveniles - Water closets (Thai type), urinals, long sink
- Instructor's Room - Water closets (Western type), wash basin

2) Service Building

- Barber - Wash basin

3) Cafeteria

- Cafeteria - Long sink

4) Shower Building

- Shower Room - Shower head (1 control valve is provided for every 5 heads)

5) Toilet Building

- Toilet for juveniles - Water closet (Thai type) urinal, long sink

6) Others - Toilets for juveniles are of Thai type whereas those for teachers are of Western types.

(7) Kitchen

The following Kitchen utensils and equipment for serving meals to 200 juveniles are provided.

Gas table
Tilting gas kettle for soup
Gas rice cooker
Sink
Working tables
Rack
Cabinet
Refrigerator/freezer, reach-in type
Weighing measure, others

(8) Refuse Disposal

Refuse and garbage will be collected separately and tentatively kept in a storage area. An incinerator will be provided.

Volume of refuse is estimated as follows:

Staffs	76	×	0.08 kg/day	=	6 kg/day
Juveniles	200	×	1.00 kg/day	=	200 kg/day
Visitors	30	×	0.08 kg/day	=	3 kg/day
			Total	=	209 kg/day

4-3-5 Ventilation and Air Conditioning Design

(1) Ventilation

1) Natural ventilation is incorporated into the architectural design wherever possible. However, where forced ventilation is required, ventilation fans are installed.

Kitchen: Exhaust hood, exhaust fan

Work Shops (Welding/Sheet metal work): Exhaust hood, exhaust fan

2) Ceiling fans are installed in occupied rooms.

(2) Airconditioning

Split-type room airconditioners will be installed in the following rooms: Director's Room, General Affairs Office, Conference Room, Seminar Rooms, Health Instruction Room, Examination & Treatment Room, Psychodrama Room.
A package air conditioner will be installed in AV Education Room

(3) Fire Fighting System

A fire fighting system is installed in accordance with local codes and standards (Building Control Act-B.E. 2522, 2534 and Standards of Fire Prevention - B.E. 2526).

1) Fire Extinguisher

A 4.5 kg-chemical fire extinguisher will be installed for each 1,000 m2 and within distance not longer than 45 m for neighboring fire extinguisher.

2) Wet Standpipe with Fire Hose and Nozzle

Wet standpipe, with 25 mm diameter 30 m long hose reel and 65 mm diameter fire hose valve, will be installed.

3) Hydrants will be installed on a water distribution main pipe. The diameter of the pipe is required to be 100 mm or more. Hydrants will be 65 mm double-outlet type. They will be basically installed at the location not less than 12 m from buildings.

Chart 4-2 Water Supply System Diagram

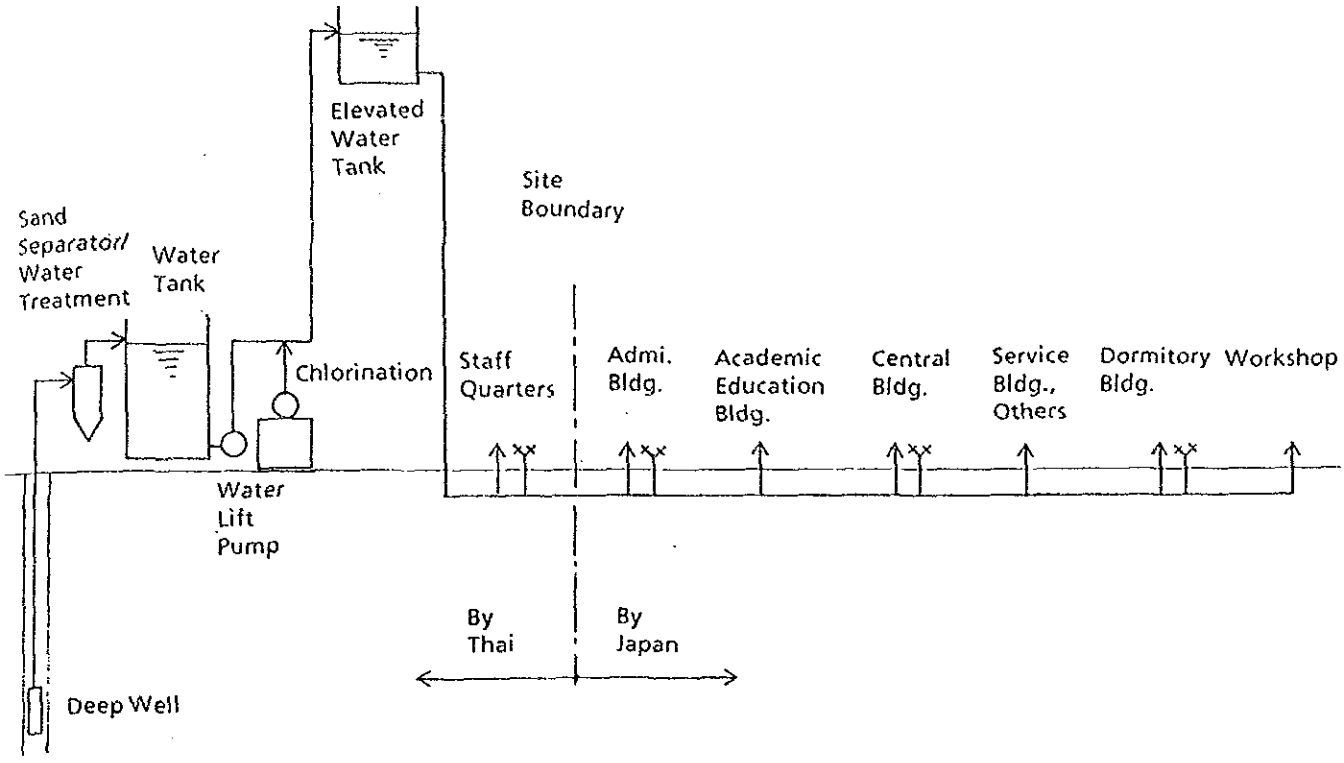
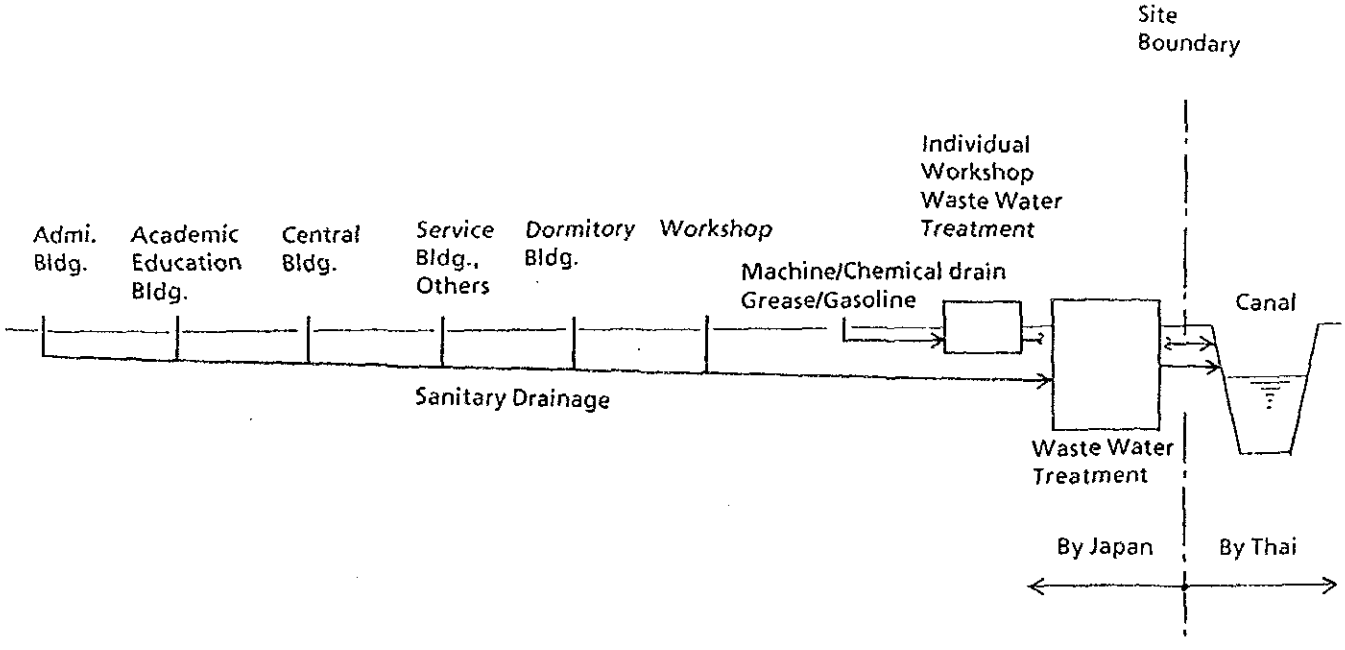


Chart 4-3 Waste Water System Diagram



4-3-6 Electrical System Design

(1) Electrical System

1) Power Intake

High tension voltage lines are to be drawn into the site by the Thai side and a transformer will also be provided. The Japanese side will be responsible for drawing in the power cable from the secondary side of the transformer up to the power intake panel in the Electricity Room. The voltage of the power supplied will be 3-phase 4-line 380V - 220 V, 50 Hz. The power intake system within the site is as follows:

Power load	3-phase 3 lines	380 V 50Hz
Lighting/receptacles load	3-phase 4 lines	220V 50Hz

Shown below are the rough estimates of power load for various equipment within the facilities. The capacity of the transformer provided by the Thai side is expected to be around 500 KVA.

	Connected Load (KVA)	Demand Factor (%)	Actual Load (KVA)
Lighting/receptacles	250	25	63
Airconditioner/ventilator	100	50	50
Equipment for Vocational Training	500	40	200
Waste Water Treatment Plant	25	30	8
Fire Pump	40	0	(40)
			321 KVA
Total	915 KVA		(361) KVA

N.B.: The figures in parenthesis indicate the case in which the fire pump is taken into account.

2) Main Line

Power is supplied from the power distribution board in the Electricity room to the distribution panels for lighting and receptacles installed in each building, the motor control panel, and the power distribution panel for vocational training devices, through CV cables and THW wires, etc. These main lines are laid out in cable racks and cable trays.

3) Ventilation/airconditioning Devices

Motor control panel is installed so that power can be distributed to each of the ventilation/airconditioning devices.

4) Power Distribution to Vocational Training Equipment

Power distribution panel is installed so that power can be distributed to the training equipment within the Workshops.

5) Lighting and Receptacles

The highly efficient fluorescent lamps are used as a rule as lighting fixtures for the buildings so that both the energy and costs can be saved. Lighting switches are installed in each room. this saves energy because the light can be turned off in rooms that are not in use. The system also allows flexibility in selecting an illuminance suitable for different purposes.

The average illuminance for the main rooms are as follows:

Administrative Room	200 - 250 Lux.
Teacher/Counselor Room	200 - 250 Lux.
Workshop	150 - 200 Lux.
Classroom	150 - 200 Lux.
Kitchen	150 - 200 Lux.

- Emergency Light

  Emergency lights with self-contained battery are provided in the corridors etc. as stipulated by the local regulations.

- Receptacles

  Receptacles are provided where necessary in each room with the exception of Group Rooms and Study Rooms in the Dormitory.

- External Lighting

  External lighting fixtures will be installed along the road within the project site.

(2) Communication System

1) The Thai side will cooperate with the Post, Telegraph & Telecommunication Co., Ltd. (TOT) to secure about 5 trunk lines and to draw in the lines up to the terminal panels within the buildings. A private automatic branch exchange is installed in the General Affairs Office in the Administration Bldg. Telephone devices are provided in the main rooms to allow communication by extension lines.

2) Public Address

Speakers are installed in the main rooms and corridors, etc. of each building to allow domestic broadcast including paging and announcements. Amplifiers and microphones are provided in the General Affairs Office in the Administration Bldg.

3) TV Antenna

An antenna is mounted on the roof of the Administration Bldg. and TV terminals are provided where necessary.

4) TV Camera for Monitoring

System - 1: TV cameras are installed in 6 locations of the Activity Space in the Dormitories, and a monitor TV is provided in a Night Duty Room in Administration Bldg.

System - 2: TV cameras are installed in the 2 Individual Psychotherapy Rooms in the Central Bldg. and monitor TV's are provided in the Psychologist and Social Worker's Office (1F) and Teacher's Room (2F).

5) Emergency Alarm

An emergency alarm system consisting of a manual push button, indication lamp and bell is provided in key locations of each building. The main control panel is installed in the General Affairs Office in the Administration Bldg. and a sub indication panels is provided in the Psychologist and Social Worker's Office in the Central Bldg.

6) Fire Alarm

Fire alarm bells are provided in each building. The button is pushed when a fire is found and the report is indicated on the control panel in the General Affairs Office in the Administration Bldg.

Chart 4-4 Electrical System Diagram

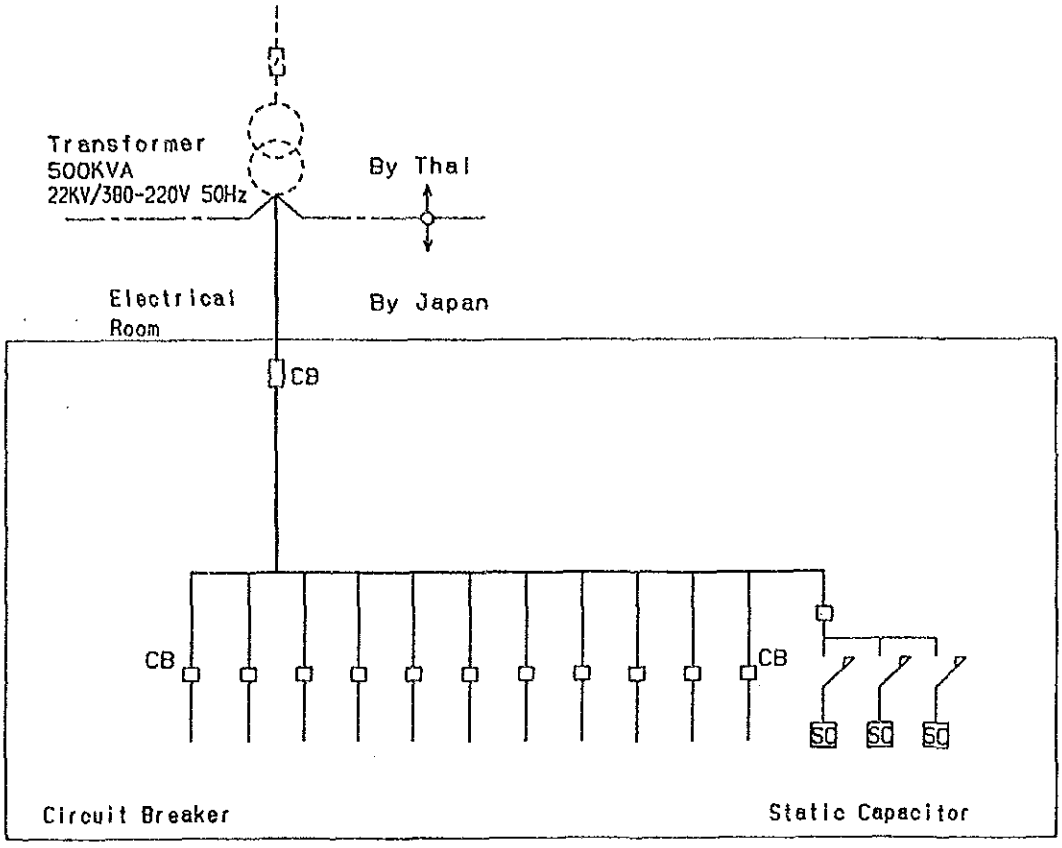


Chart 4-5 Main Line Riser Diagram

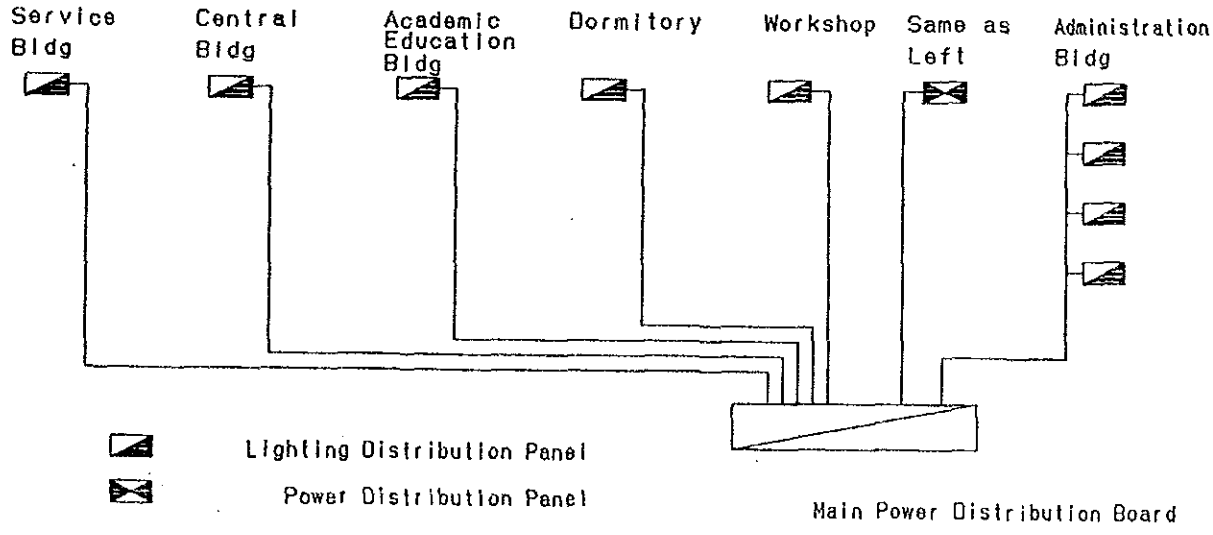


Chart 4-6 Telephone System Riser Diagram

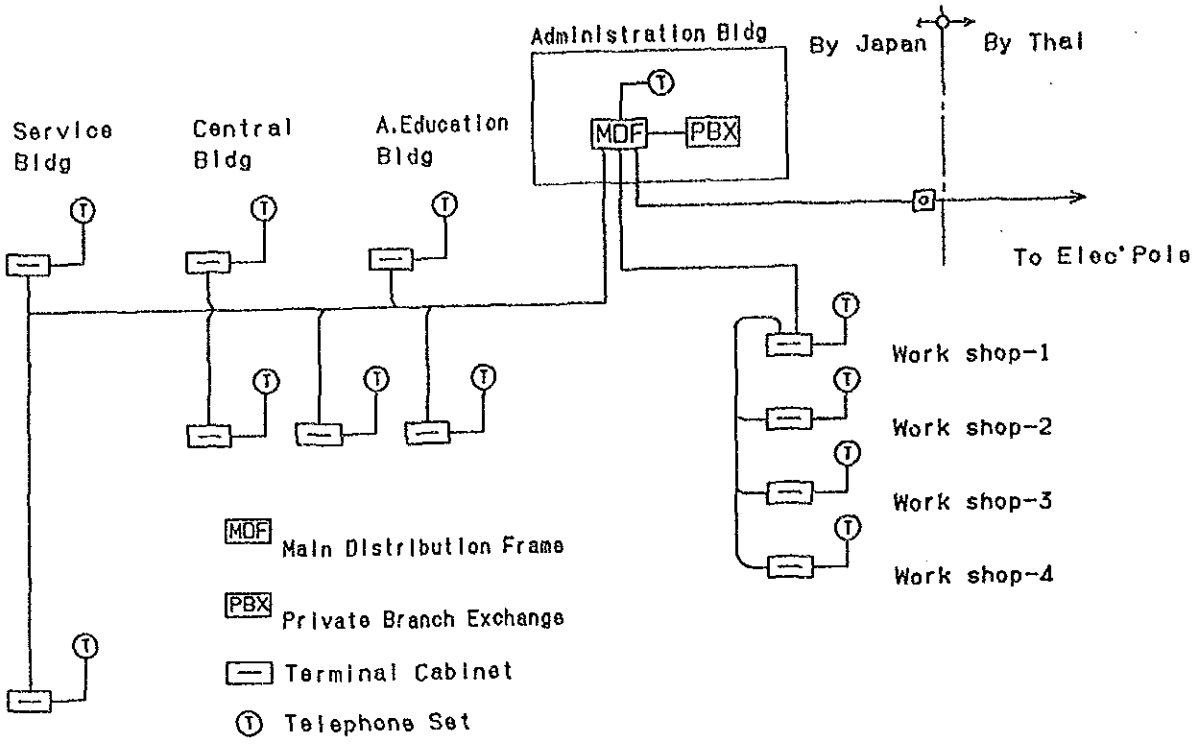
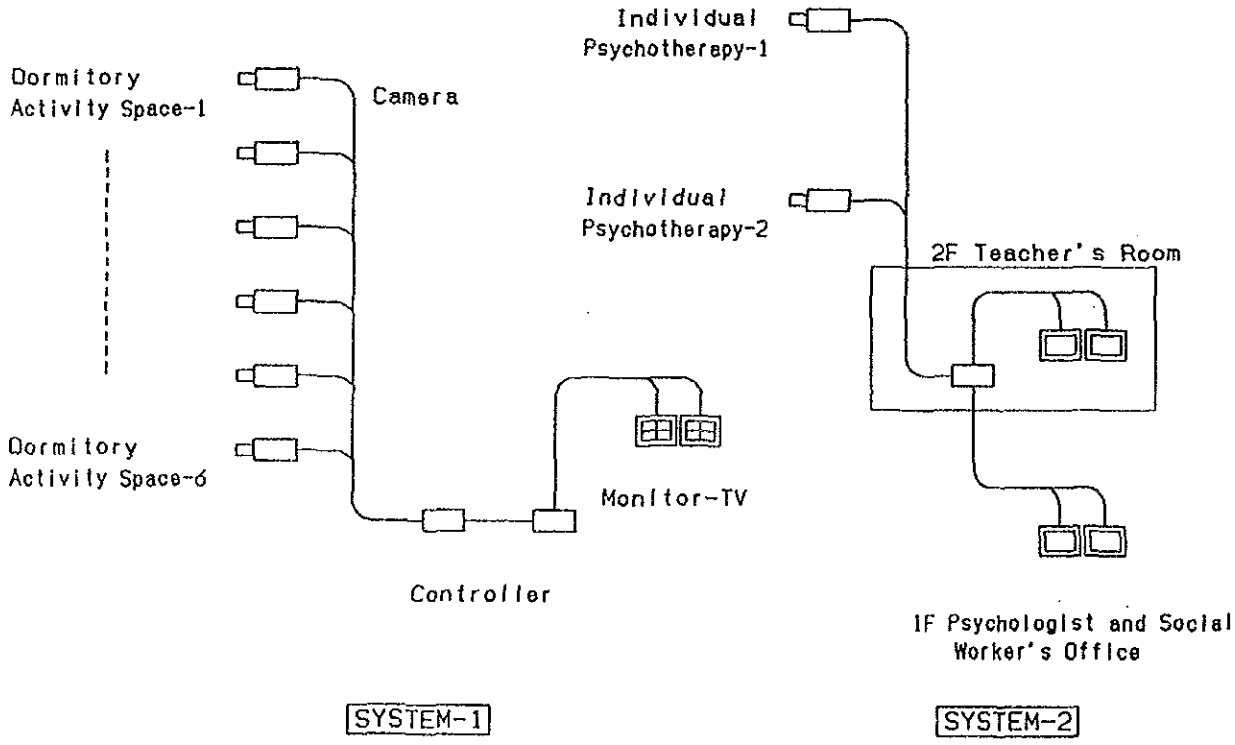


Chart 4-7 CCTV System Riser Diagram



4-3-7 Construction Materials Plan

In selecting the construction materials and equipment for the Project, emphasis has been placed on adopting materials and construction methods that not only match the natural and social conditions of Thailand but are also commonly used locally.

The following construction material and equipment plan has been drawn up to suit the functions of each facility, with due consideration given to economy, durability, and ease of maintenance and management.

(1) Exterior Finishing Material

1) Roofs

- Flat Roof
  Administration Bldg., part of the Workshops
  The concrete slab is used, with a waterproofing by polyurethane coating. Insulation blocks ensure effective heat insulation.

- Sloped Roof Covered with Monier Tiles
  Part of Administration Bldg., Academic Education Bldg., Central Bldg., Service Bldg.,Gymnasium, Cafeteria, Dormitories.

  The sloped roof is of concrete slab or steel frame structure and covered with Monier roof tiles (cement tiles). A double ceiling structure promotes air ventilation and heat insulation through the space between the roof and the ceiling. No ceiling is provided for the Gymnasium and Cafeteria which are open facilities without walls.

- Sloped Roof Covered with Roman Tiles
  Shower Bldg., Toilet Bldg., Workshops, Construction Vehicle Operation Training Bldg., Garage for Farm Machineries, Connecting Corridors.

  The sloped roof is of steel frame structure and covered with Roman tiles. Double ceilings are not provided in these facilities because their usages do not require them.

2) External Walls

- The walls are of the most common type in Thailand, cement plastered walls of piled concrete blocks and concrete columns and beams painted with emulsion paint. Paint for external use will be adopted. Ventilation blocks and hollow blocks are used extensively depending on the usage and specific portions of the facilities.

3) External Doors and Windows

- Aluminum Windows
  Administration framed Bldg., Workshops Aluminum jalousie windows

manufactured in Thailand will be used combined with casement windows and fixed windows.

- Wooden Doors and Windows
  Academic Education Bldg., Central Bldg., Service Bldg., Dormitories, Construction Vehicle Operation Training Bldg., Garage for Farm Machineries.

  Wooden framed casement windows most commonly used in Thailand will be used combined with jalousie windows and fixed windows. As to doors, wooden flush doors will be used in principle.

(2) Interior Finishing Material

1) Floor

- Polished Terrazo ..... Circulation Areas, Classrooms, Teacher's Room, etc.

  Polished terrazo is a highly durable floor material, suitable as both indoor and outdoor material, most popularly used in Thailand. The material is adopted for areas and rooms exposed to a large number of people including juveniles and visitors.

- Vinyl tile ..... Offices, Conference Room, Seminar Room, Storage, etc.

  The material is adopted for areas and rooms that are used by a fairly limited number of people.

- Parquet Floor ..... Group Rooms, Activity Space, Study Rooms, Guest Rooms, Individual Psychotherapy Rooms, etc.

  Parquet floor is used mainly in Dormitories, etc. where juveniles walk in their bare feet. The material has already been adopted in the existing dormitory and has proved to be both durable and easy to maintain.

- Carpet ..... Psychodrama Room

  Carpet is used for absorbing noise and alleviating the level of sound created in the room.

- Polyurethane Resin Flooring ..... Gymnasium

  The material is used because it has adequate elasticity to prevent injuries by accidents, without interfering with the physical training carried out in the Gymnasium.

- Epoxy Resin Flooring ..... Workshops

The material is selected for its dust-proof and wear-proof properties which are essential to working areas.

- Ceramic Tiles ..... Toilets, Shower Rooms, Kitchenet, Laundry, Kitchen, etc.

  The material is adopted for rooms where water is used.

2) Walls

- Cement Plaster Finished with Paint

  Cement Plastered walls finished with paint are used in most rooms. Paint for exterior use that ensures high durability against weathering is adopted for outdoor area and rooms such as Toilet, Shower Room, Laundry and Kitchen where water is used.

- Ventilation Blocks, and Hollow Blocks Finished with Paint

  The materials are used in rooms such as Toilets and Storages that require natural ventilation and natural lighting and where there is not need to provide doors and windows.

- Ceramic Tiles

  Ceramic tiles are adopted for rooms where water is used; Toilets, Shower Rooms, Laundry, Kitchen, etc.

- Acoustic Walls

  Acoustic walls consisting with perforated plywood and glasswool are adopted in rooms such as AV Classroom and Psychodrama Room that require sound absorption functions.

3) Ceiling

- Acoustic Board ..... Offices, Seminar Rooms, Education Room, Health Instruction Room, Sick Room, Examination & Treatment Room, Psychodrama Room, visiting Rooms, Interview Rooms, etc.

  Acoustic boards are used in rooms that require certain degrees of sound absorption.

- Plaster Board ..... Waiting Room, Corridors, Guest Rooms, Teacher's Rooms, Library, Barber, Group Rooms, Activity Space, Study Rooms, Storages, etc.

Plaster Board is used as material for double ceilings for facilities where sound absorbing function is not called for but ventilation is required through the attic.

- Cement Board ..... Shower Rooms, Kitchenets, Toilets, Kitchen, Laundry, etc.

Cement board is used as ceiling material for rooms where water is used that require ventilation through the attic.

4-3-8 Equipment Plan

(1) Major equipment for general education

The main equipment and materials to be prepared (according to the aforementioned selection plan for equipment and materials to be supplied) will be as follows.

No.	Equipment/ Material Name	Specification	Q'ty	Applications
1	Pickup truck	Diesel engine: 1,000 kg	1	Transport of food and articles
2	Microbus (small)	Capacity: 12 people	1	Emergency transport of small numbers of people for entry, release, transfer, medical examination at external locations, etc.
3	Microbus (large)	Capacity: 26 people	1	Transport of large numbers of people, such as all trainees for about one course, for training at a facility, excursions, field training, etc.
4	Computer		1	For selection of enrolled trainees, measurement of training effectiveness, and introduction of statistical methods, such as collection and analysis of various statistical materials
5	Prophylactic unit		1	For light dental treatment by dental hygienists
6	Tractor	Riding type (medium)	1	For farming work for cultivating wide areas of arable land
7	Video projector	150 inches	1	For efficient vocational and academic education
8	Basketball backstops		1 set	For exercising and playing basketball

(2) Main equipment and materials for vocational training

1) Welding and Sheet Metal Work Course

No.	Equipment/Material Name	Specification	Q'ty
1	Hand bending three rollers	2.4~2.6 x 100~115 x 1300 mm	1
2	Shearing machine	2.3 x 1600~2000 mm Motor: 2 HP	1
3	TIG welding machine	Output current: 300 A	1
4	Bar bender	Manual folding Capacity: 1.2 x 1600~2000 mm	1

2) Automobile Maintenance Course

No.	Equipment/Material Name	Specification	Q'ty
1	Two-pole lift	3t, wide type Head: 1700 mm 3500~3700 (W) x 1200~1500(D) x 2700~2800 (H) mm	2

3) Electric Wiring Course

No.	Equipment/Material Name	Specification	Q'ty
1	Drying oven	Internal dimensions: 1000 x 500 x 1000 mm (W) (D) (H) Temperature range: 0 - 200 °C	1
2	Insulation puncture tester	Portable type	1

4) Woodworking Course

No.	Equipment/Material Name	Specification	Q'ty
1	Hand feed planer	Table width: 300 mm Revolution speed: 5000 r.p.m.	1
2	Automatic single surface planer	Machining width: 500 mm Revolution speed: 5000 r.p.m.	1
3	Circular saw with sliding table	Diameter of circular saw: 305 mm Shaft tilt angle: 0 - 45°	1
4	Straight-line rip saw	Diameter of circular saw: 305 mm Revolution speed: 4500 r.p.m.	1
5	Universal circular saw	Diameter of circular saw: 355 mm Revolution speed: 2500 - 5000 r.p.m.	1
6	Wood working lathe	Swing: 400 mm Center-to-center distance: 1000 mm	1
7	Wood working press	Press plate size: 910 x 1820 mm Stroke: 1500 mm	1
8	Dust collecting system	Cyclone type: 7.5 KW	1
9	Universal tool grinder	Grinding capacity: 455 mm	1
10	Glue spreader	Effective width: 1000 mm Effective thickness: 2~50 mm	1
11	4 Spindle tenoner	Tenoning length: 80 mm Workpiece size: 400 W x 125 mm	1

5) Machining Course

No.	Equipment/Material Name	Specification	Q'ty
1	Precision lathe	Swing: 360~500 mm Center-to-center distance: 500~800 mm	13
2	Universal milling machine	Table work plane: 1350 x 270 mm Main shaft revolution speed: 68 - 1760 r.p.m.	1
3	Special accessory for milling machine (Universal indexing device)		1
4	Shaper	Stroke: 520 mm	1
5	Upright drilling machine	Swing over bed: 550 mm Drilling capacity: 50 mm	1
6	Band sawing machine	Cuting capacity: 250 mm W 280 x H 250 mm	

6) Printing Course

No.	Equipment/Material Name	Specification	Q'ty
1	Offset printing press	Monochromatic machine Max. paper size: 480 x 660 mm	1
2	Offset printing press	Monochromatic machine Max. printing area: 300~365 x 432~470 mm	1
3	Offset printing press	Two color machine Max. paper size: 432~470 x 300~365 mm	1
4	Power cutter	Length: 760 mm With safety device	1
5	Bookbinding machine	Wire stitching	1
6	Bookbinding machine	Wireless stitching For small lots	1
7	Duplicate printer		1
8	Process camera		1
9	Film processor		1
10	Buckle & knife folding machine		1

7) Airconditioner Repairing Course

No.	Equipment/Material Name	Specification	Q'ty
1	Refrigeration cycle training unit	Rotary compressor type Equipment: 600 (L) × 600 (D) mm	1
2	Refrigeration cycle training unit	Reciprocating type Equipment: 700 (L) × 600 (D) mm	1

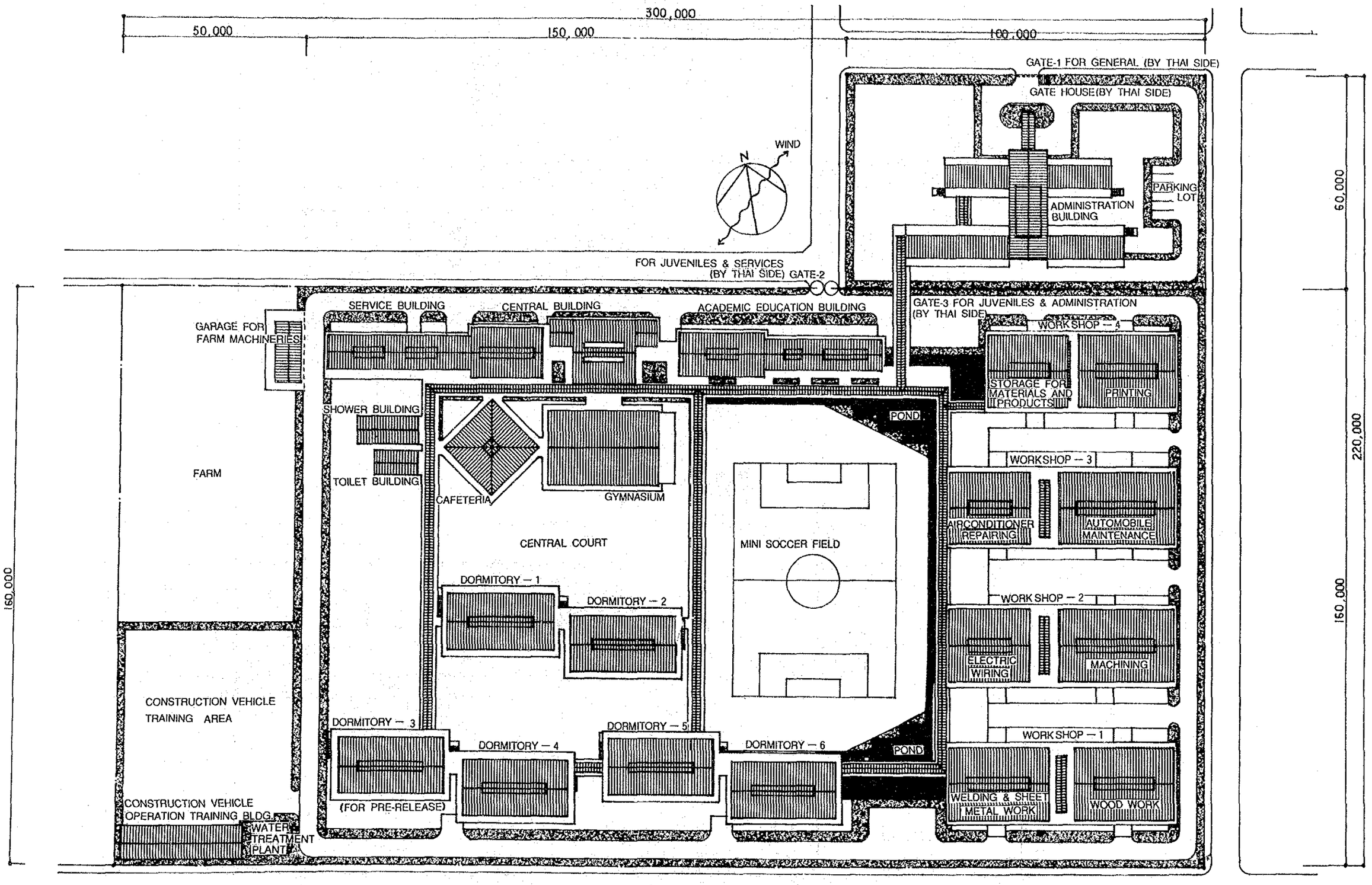
8) Construction Vehicle Operation Course

No.	Equipment/Material Name	Specification	Q'ty
1	Swamp bulldozer	Output: 130 PS	1
2	Wheel loader	Bucket capacity: 1.1 m^3	1
3	Motor grader	Output: 115 PS / 2500 RPM	1
4	Hydraulic excavator	Bucket capacity: 0.45 m^3	1

4-3-9 Basic Design Drawings

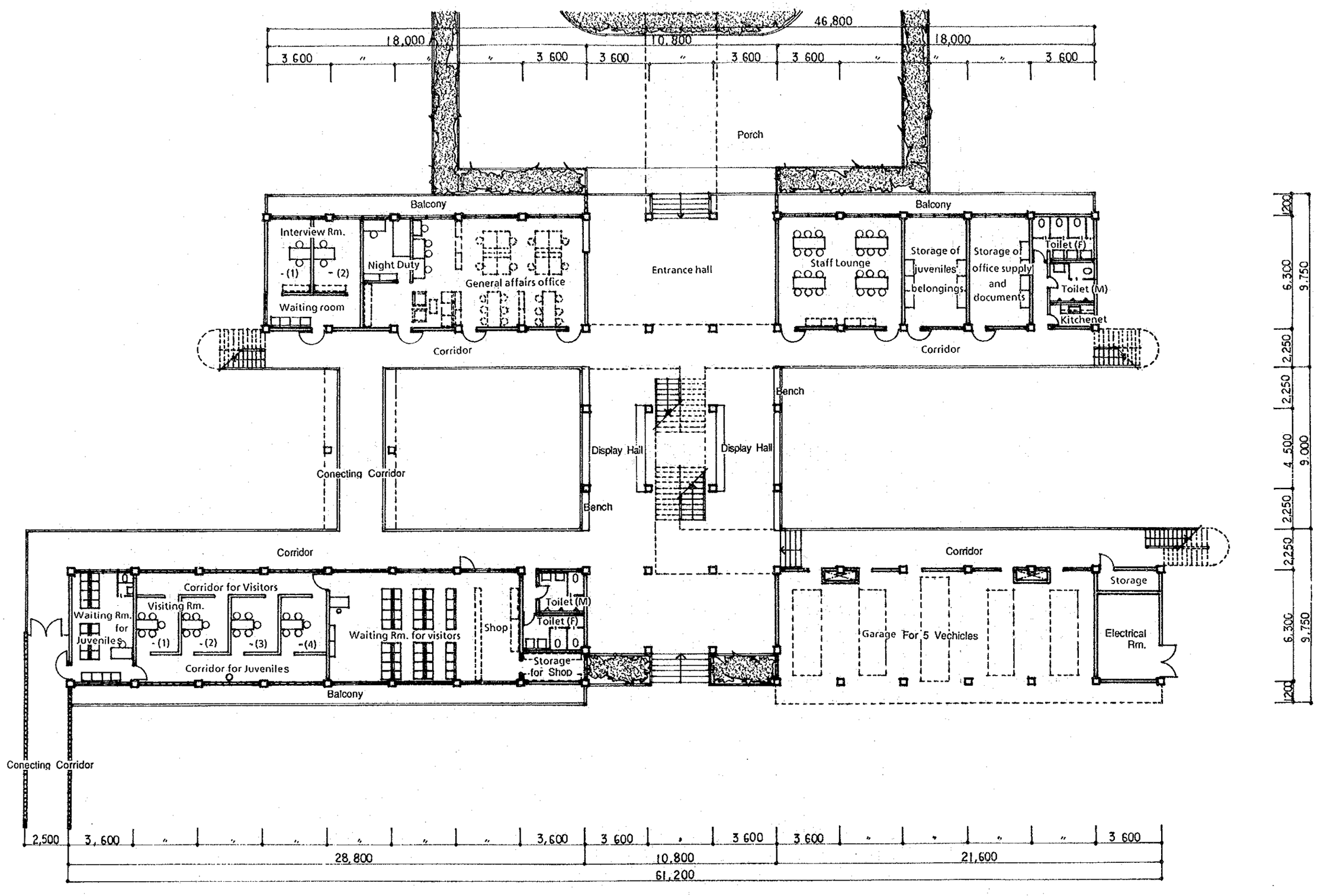
01 Site Plan
02 Administration Bldg. -1
03 Administration Bldg. -2
04 Administration Bldg. -3
05 Academic Education Bldg. -1
06 Academic Education Bldg. -2
07 Central Bldg., Gymnasium, Cafeteria -1
08 Central Bldg., Gymnasium, Cafeteria -2
09 Central Bldg., Gymnasium, Cafeteria -3
10 Service Bldg., Shower Bldg., Toilet Bldg., Construction Vehicle Operation Training Bldg, Garage for Farm Machineries -1
11 Service Bldg., Shower Bldg., Toilet Bldg., Construction Vehicle Operation Training Bldg, Garage for Farm Machineries -2
12 Dormitory -1
13 Dormitory -2
14 Workshop -1
15 Workshop -2

THE VOCATIONAL TRAINING SCHOOL

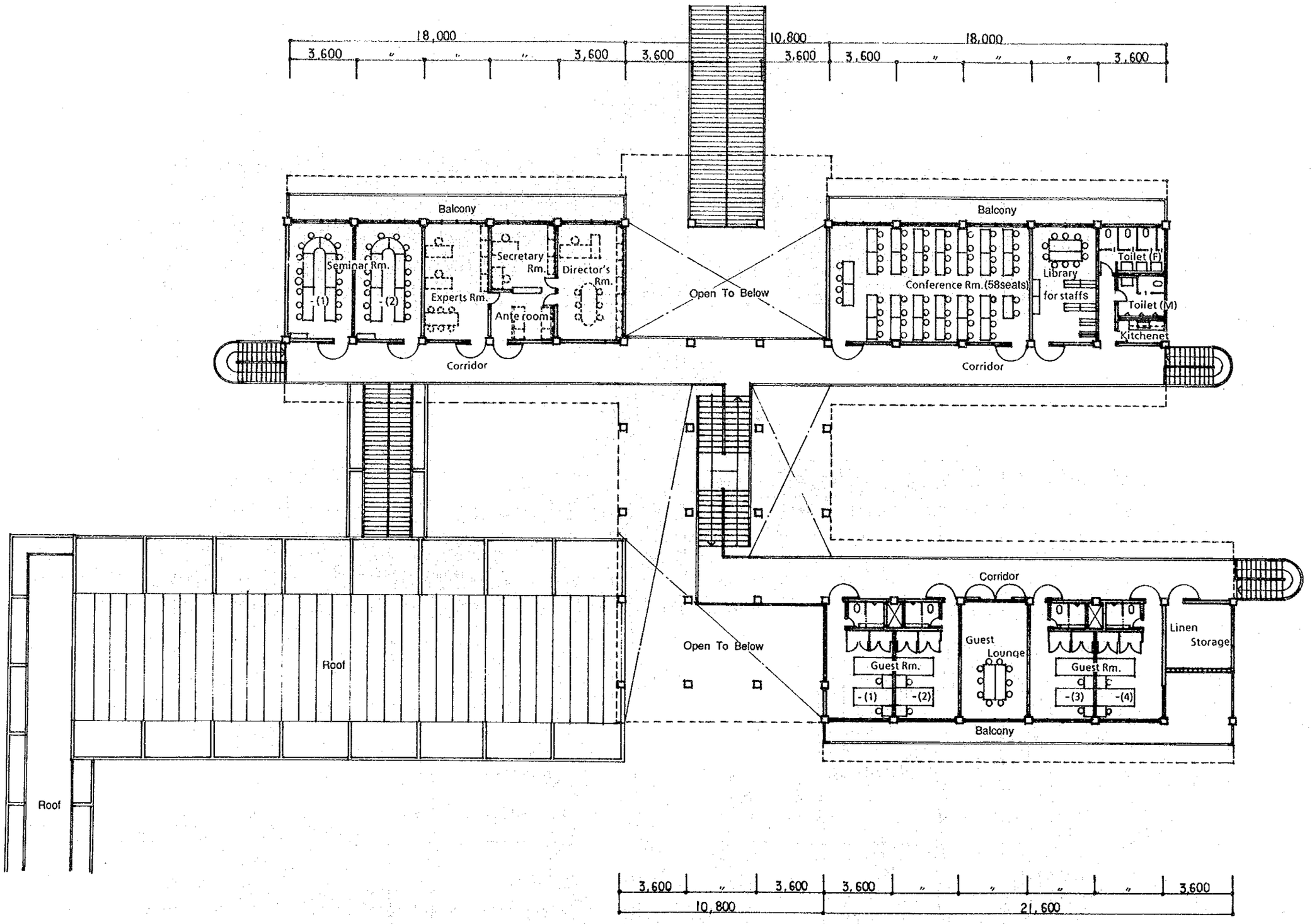


	SITE PLAN	S=1/1,000	—	01

A-3 1



	ADMINISTRATION BLDG.—1	1st FLOOR PLAN	S=1/200	—	02



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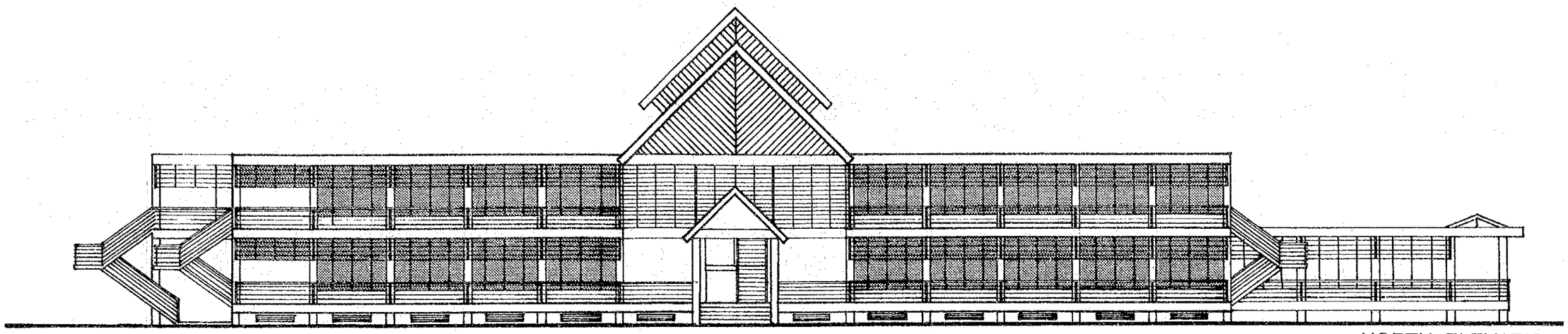
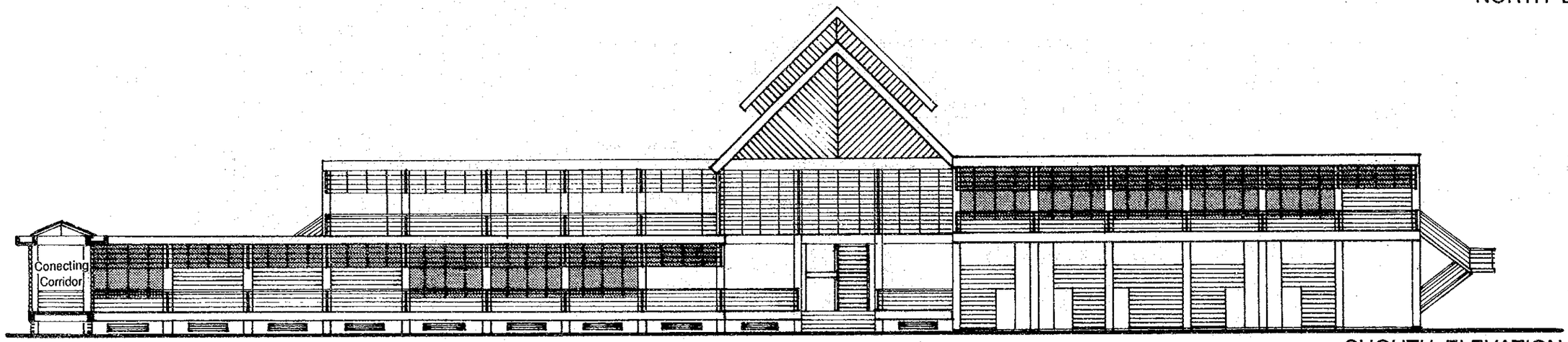
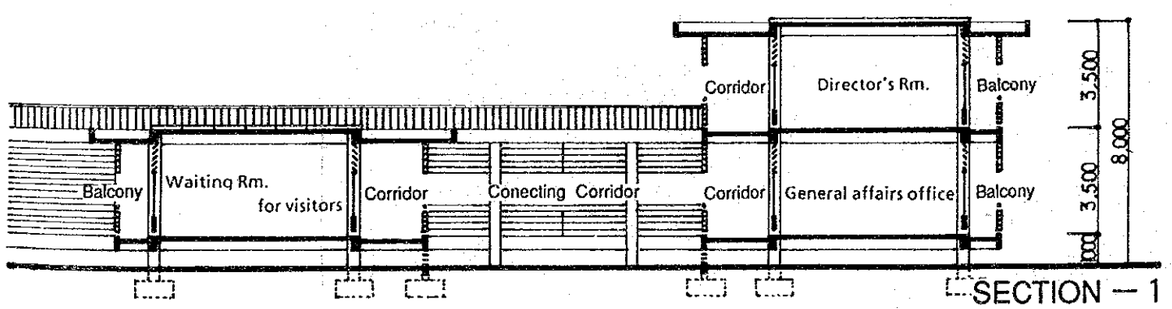


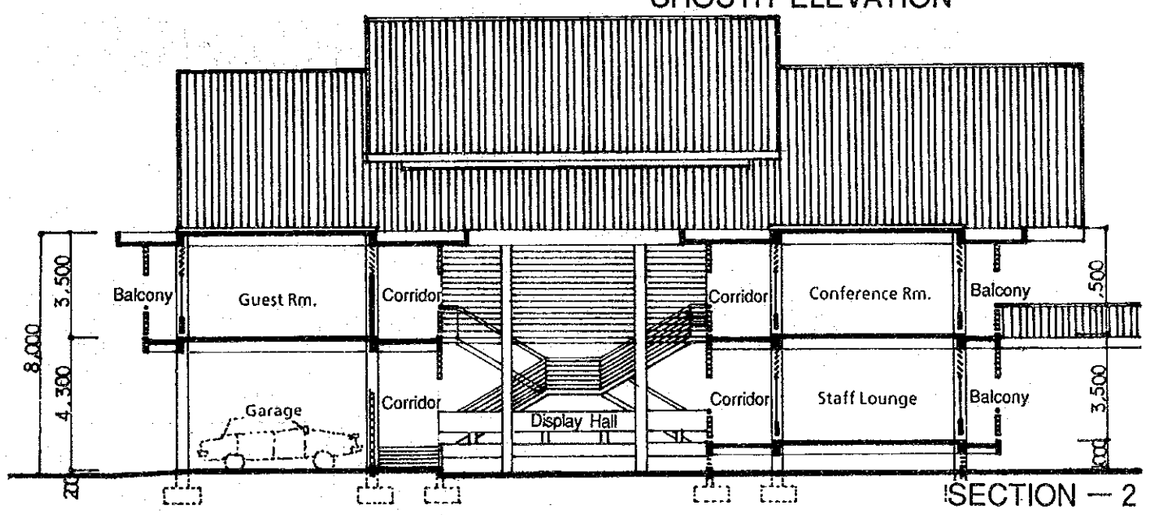
NORTH ELEVATION



SHOUTH ELEVATION



SECTION — 1



SECTION — 2

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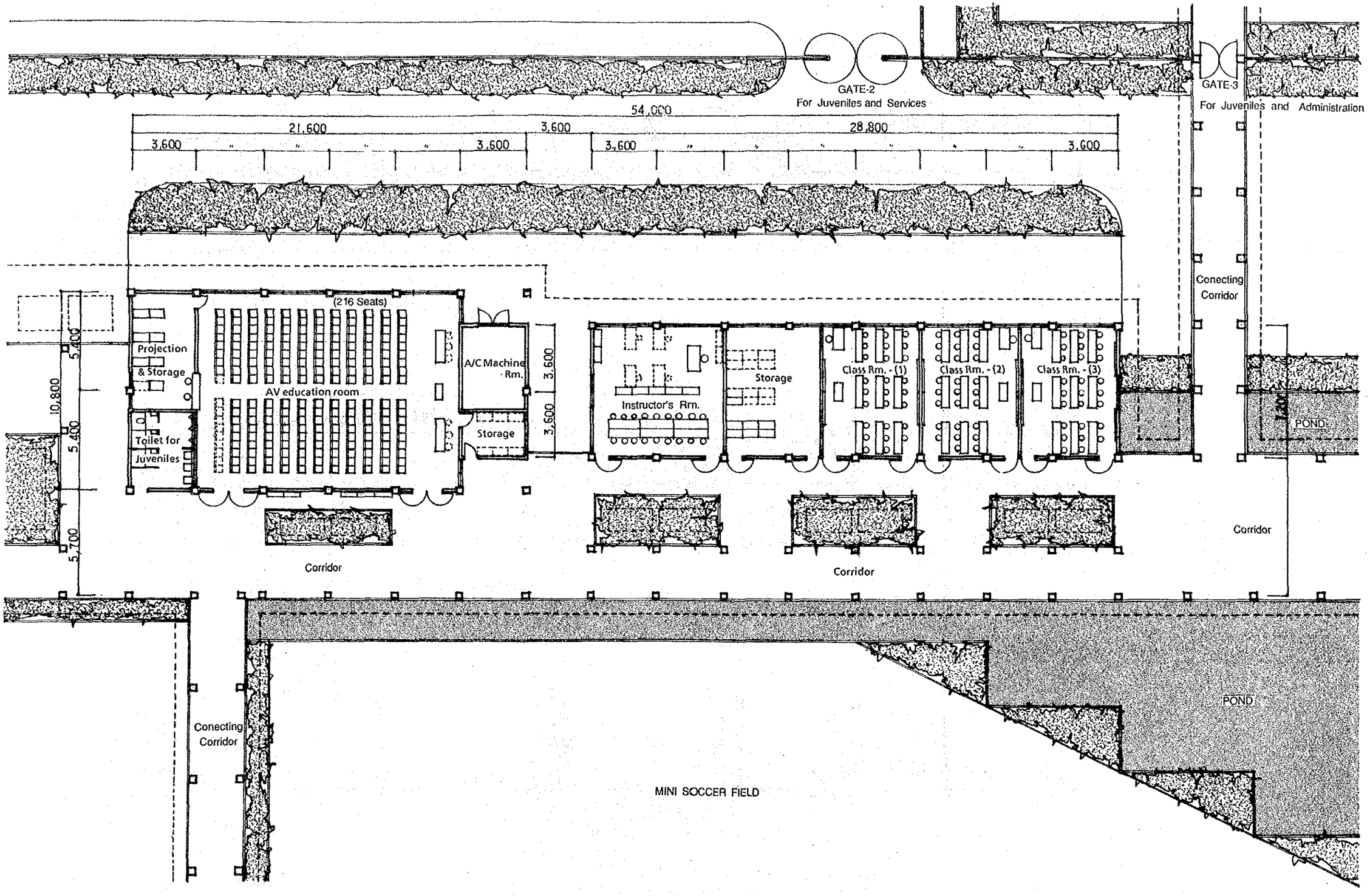
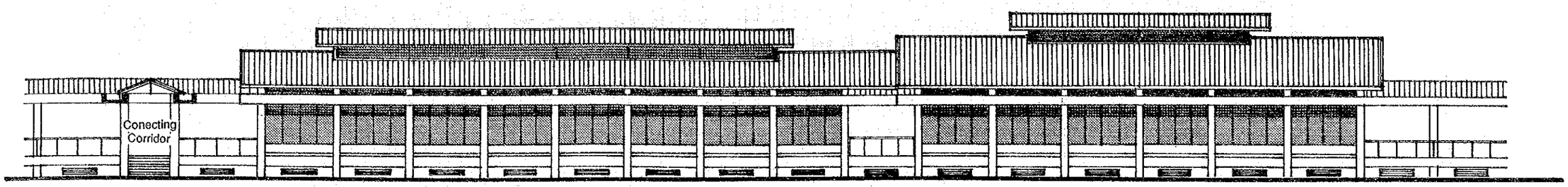


	ACADEMIC EDUCATION BLDG.—1	1 st FLOOR PLAN	S=1/200	—	05



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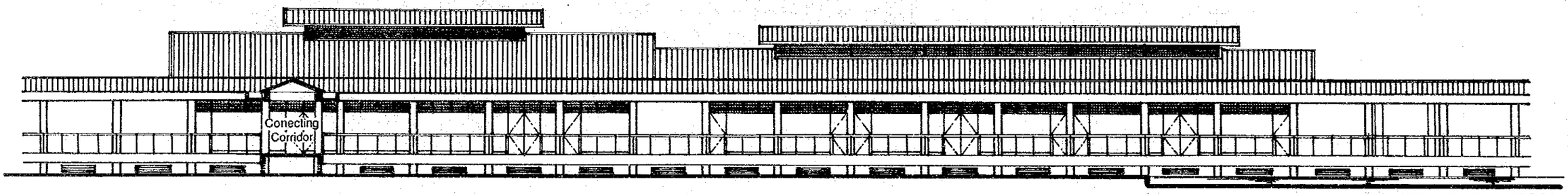
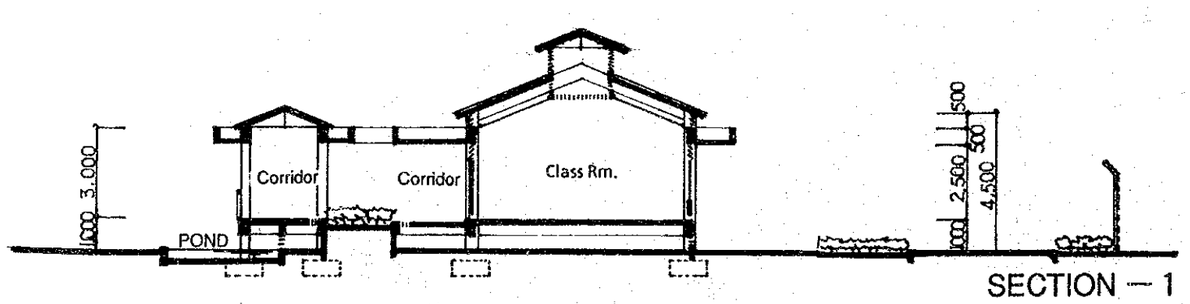
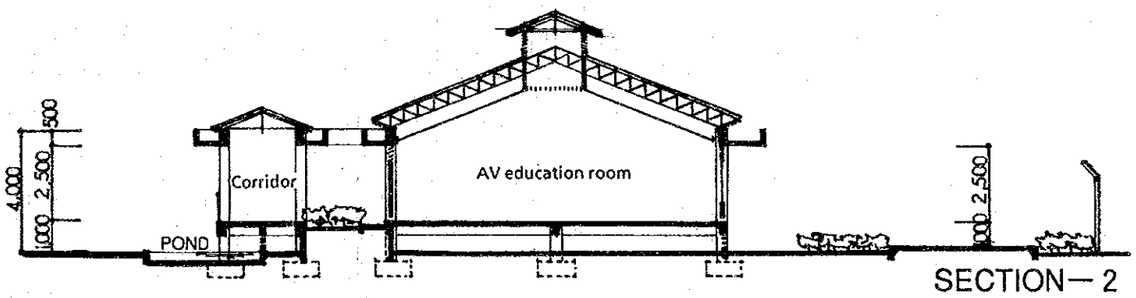


SOUTH ELEVATION



SECTION — 1



SECTION — 2

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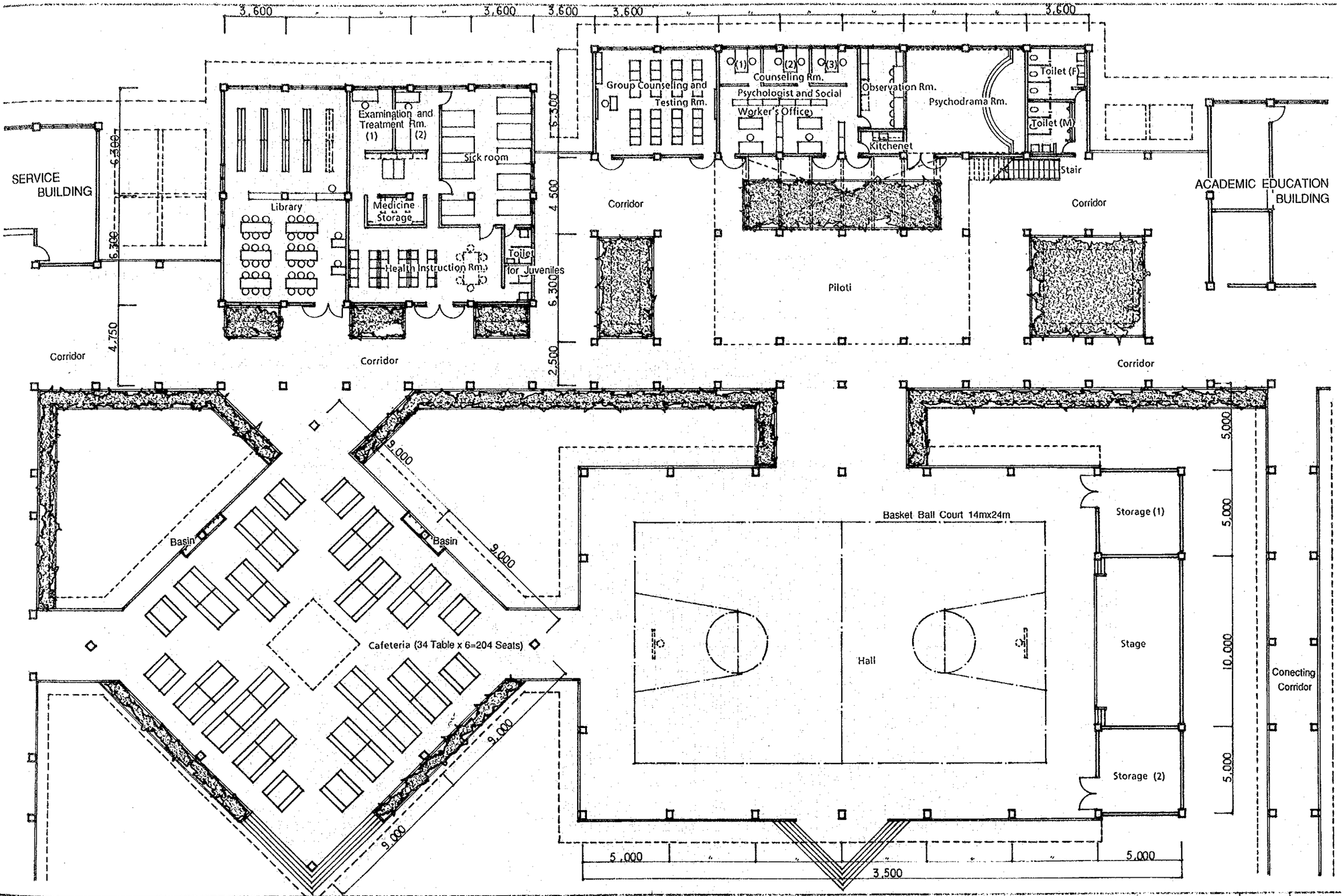
THE VOCATIONAL TRAINING SCHOOL



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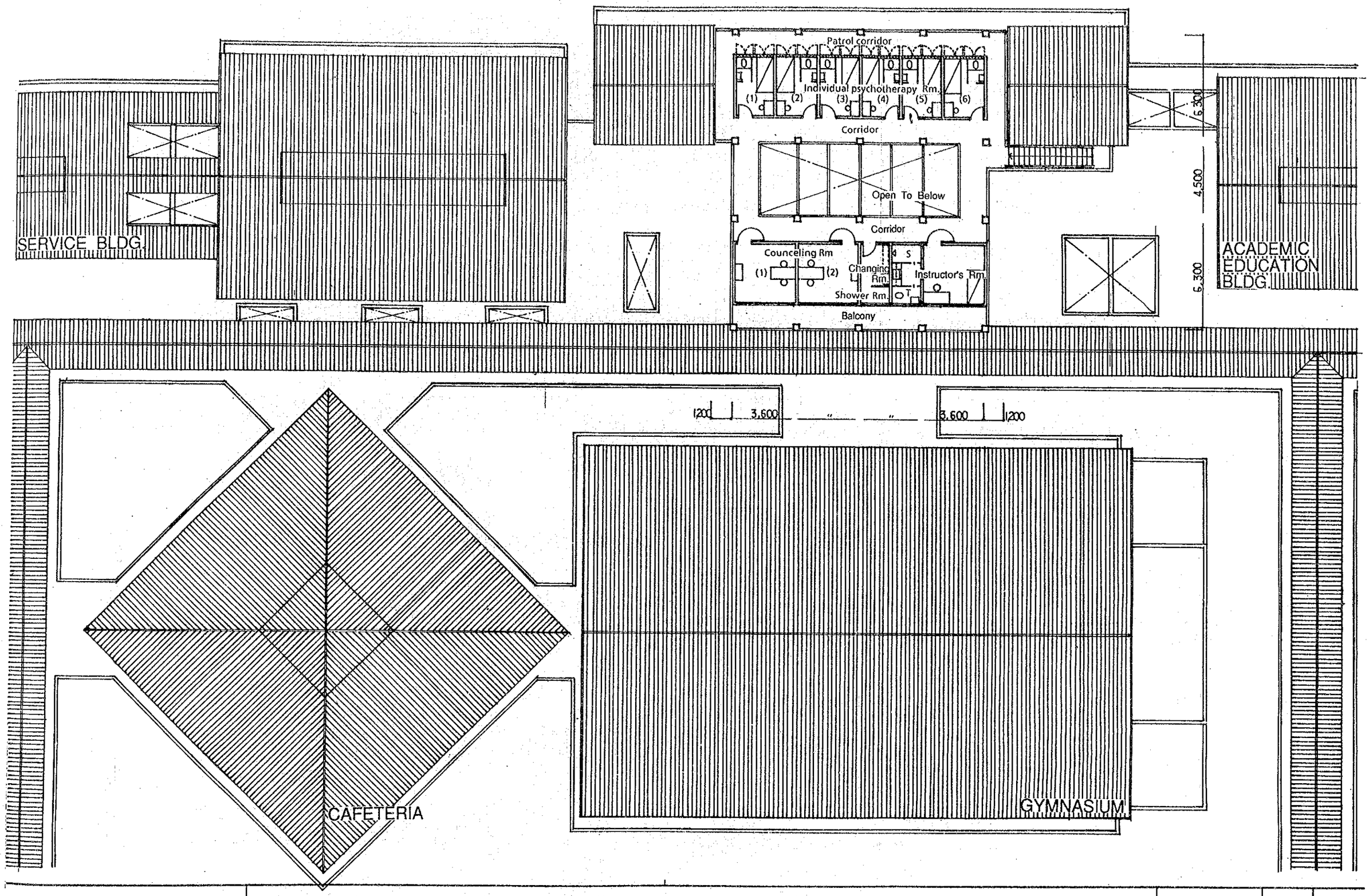
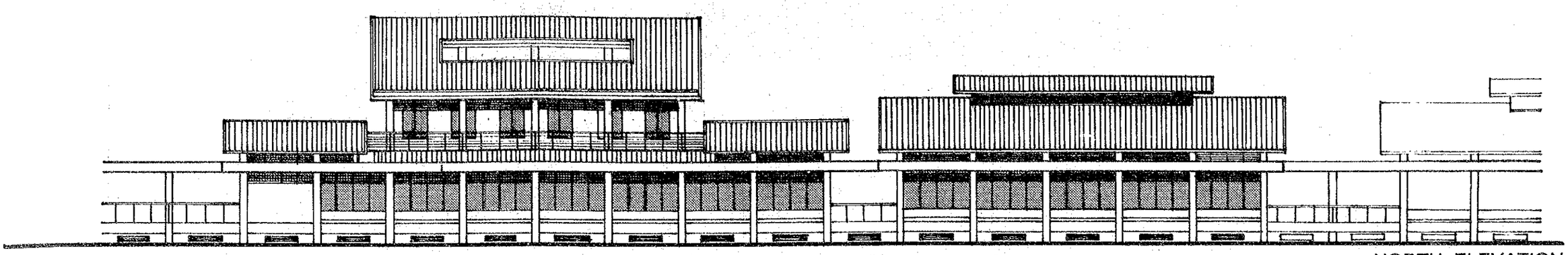
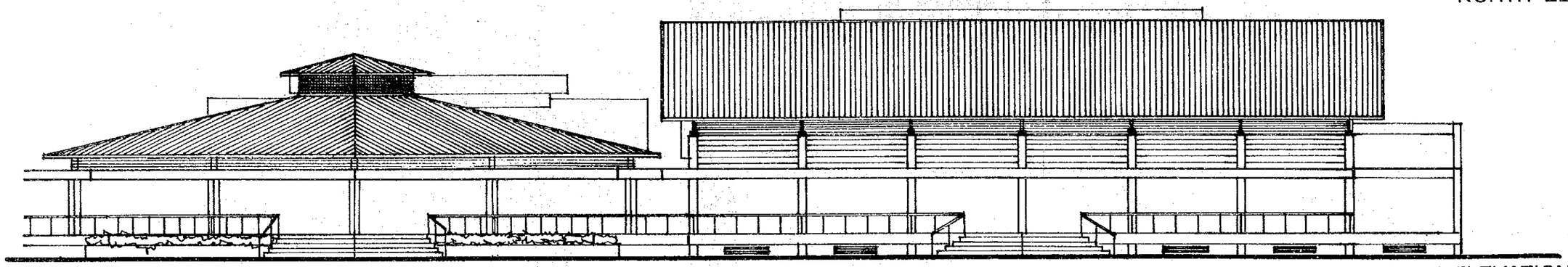


CENTRAL BLDG. CAFETERIA GYMNASIUM— 2	2 nd FLOOR PLAN	S = 1 / 2 0 0	—		0 8

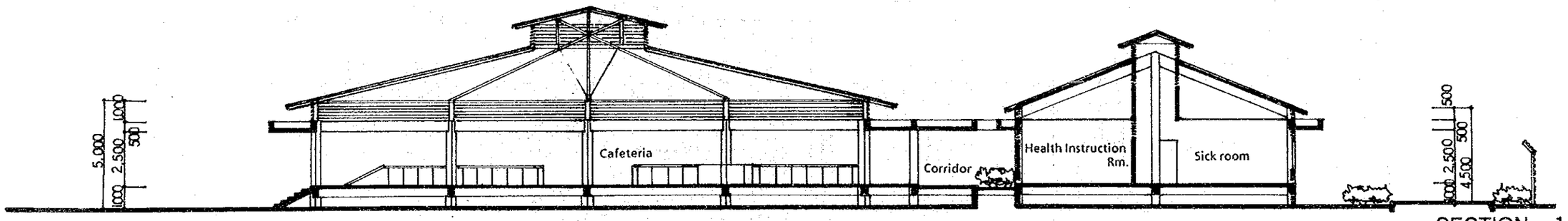
A3—1



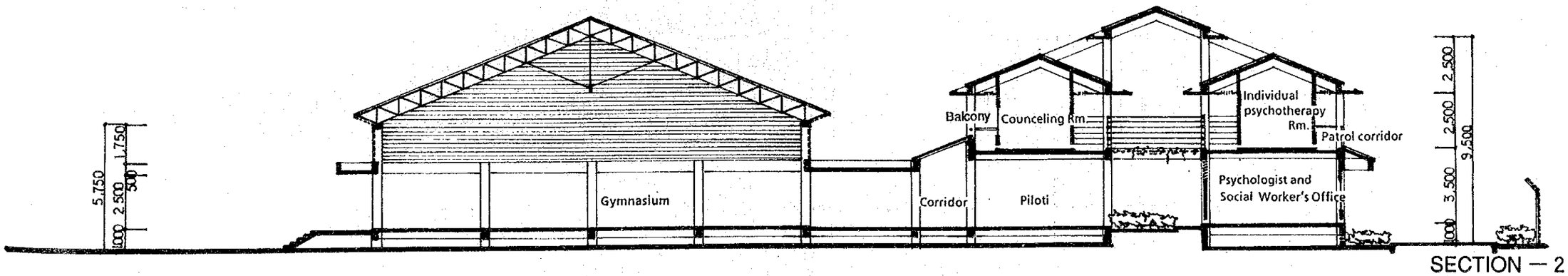
NORTH ELEVATION



SOUTH ELEVATION

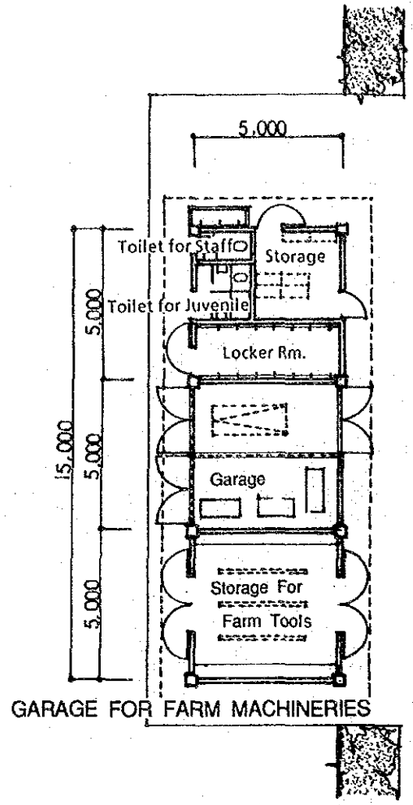


SECTION—1

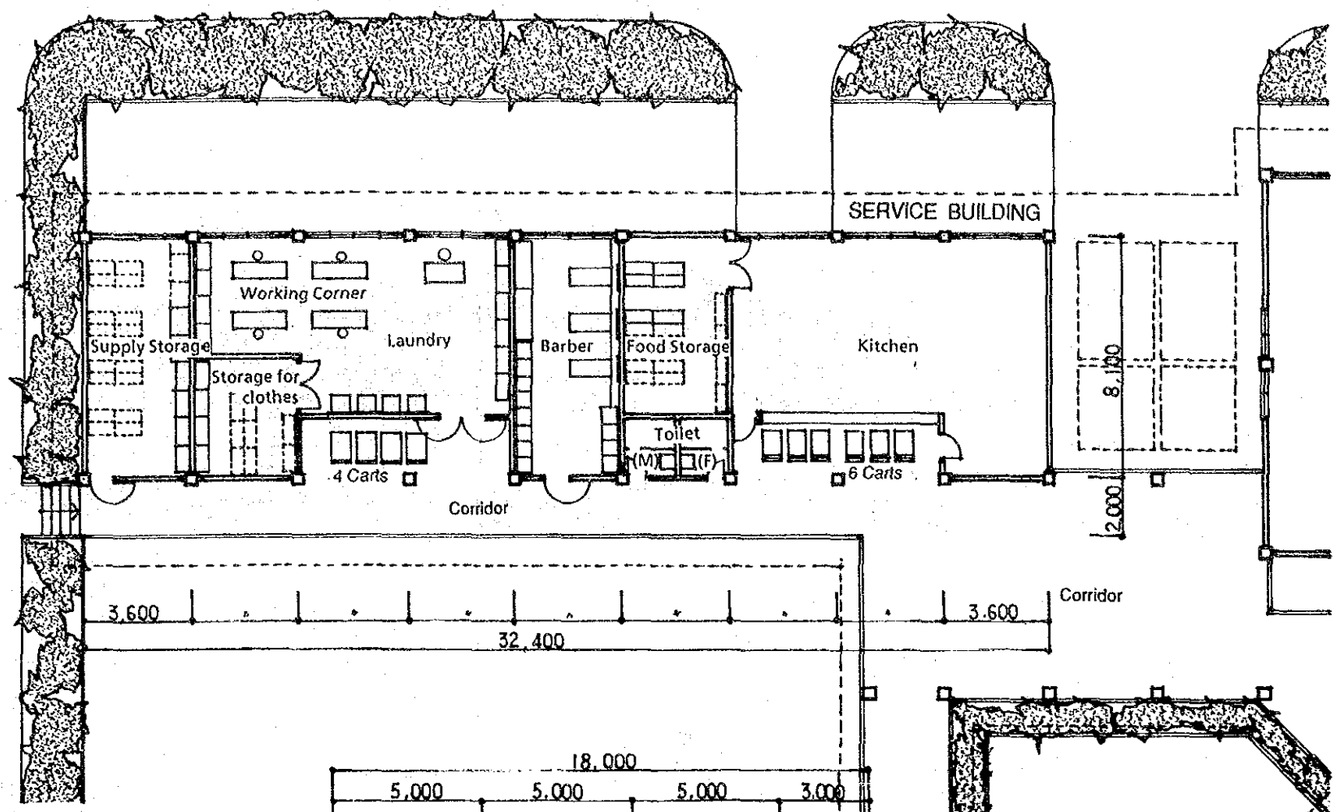


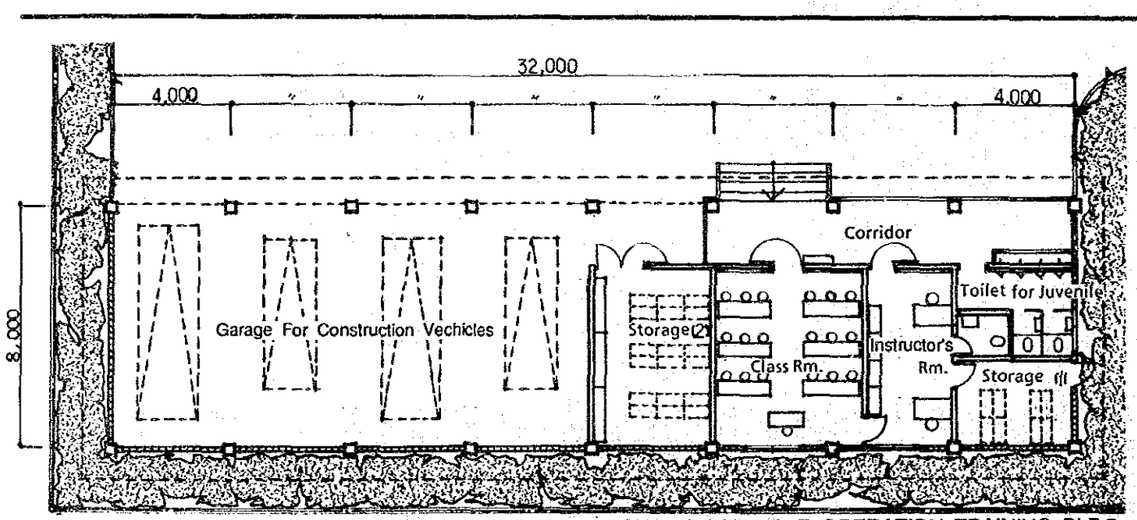
SECTION — 2

	CENTRAL BLDG. CAFETERIA GYMNASIUM — 3	ELEVATION, SECTION	S = 1 / 2 0 0	—	0 9

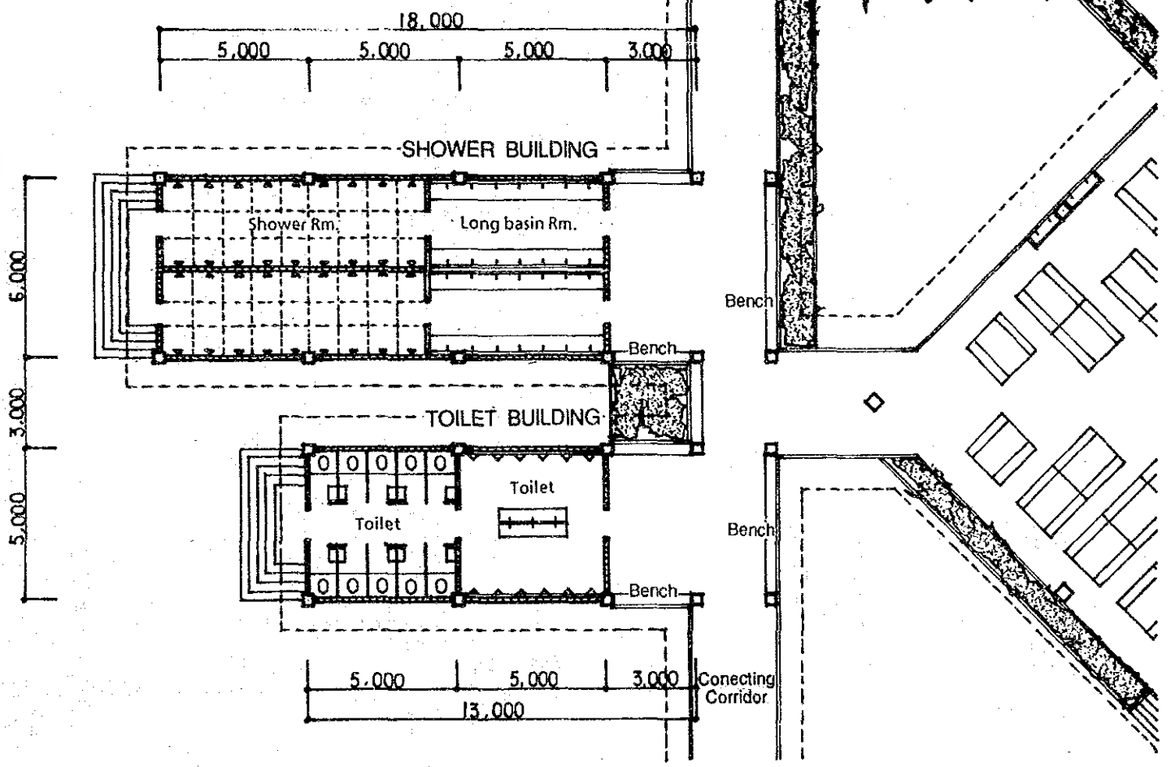


GARAGE FOR FARM MACHINERIES

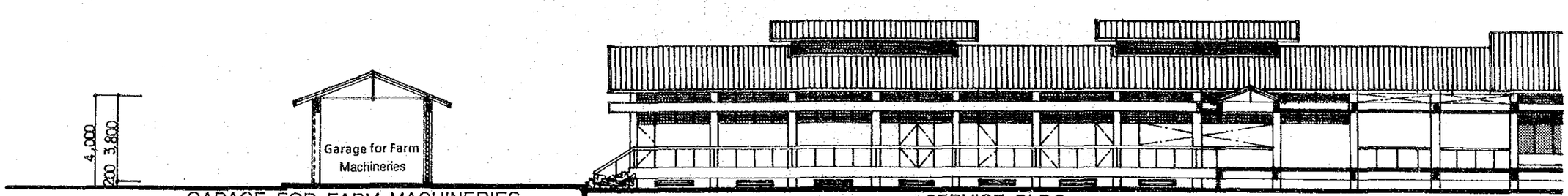




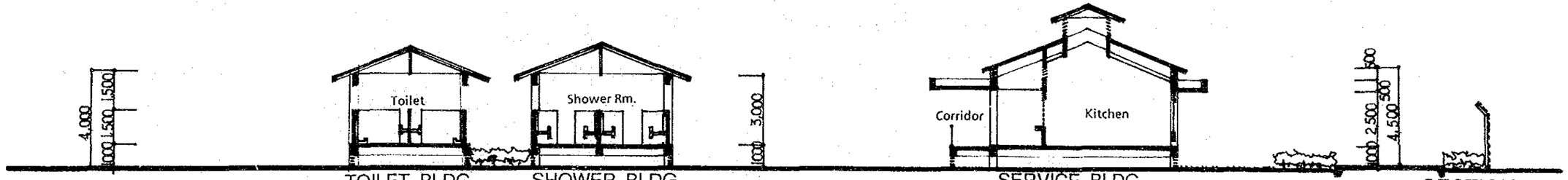
CONSTRUCTION VEHICLE OPERATION TRAINING BLDG.



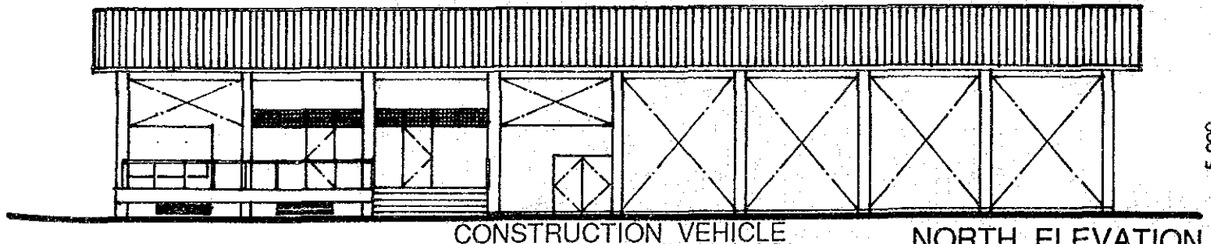
SERVICE BLDG...SHOWER BLDG. TOILET BLDG. CONSTRUCTION VEHICLE OPERATION TRAINING BLDG. —1 GARAGE FOR FARM MACHINERIES	1st FLOOR PLAN	S=1／200	—	10



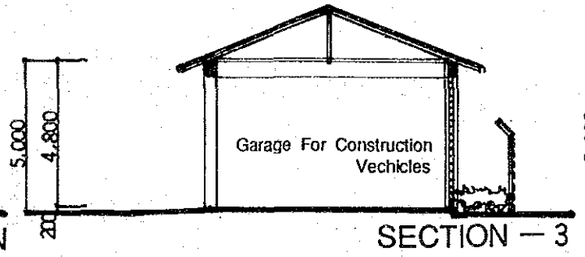
GARAGE FOR FARM MACHINERIES　　SERVICE BLDG.　　SOUTH ELEVATION , SECTION — 1



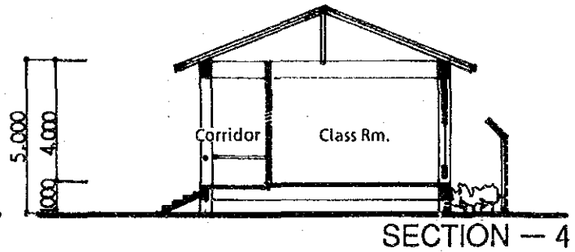
TOILET BLDG.　　SHOWER BLDG.　　SERVICE BLDG.　　SECTION — 2



CONSTRUCTION VEHICLE OPERATION TRAINING BLDG.　　NORTH ELEVATION

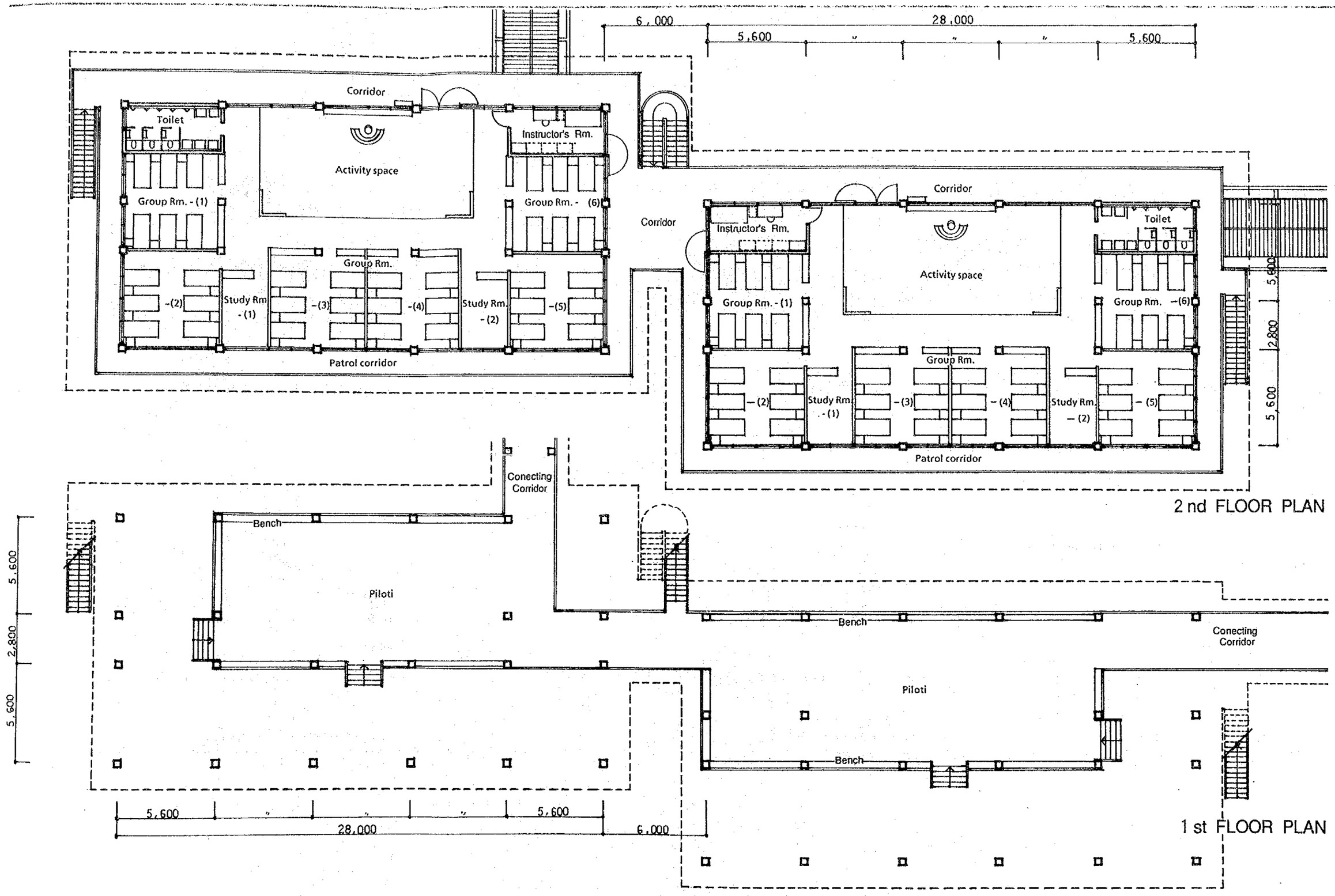


SECTION — 3



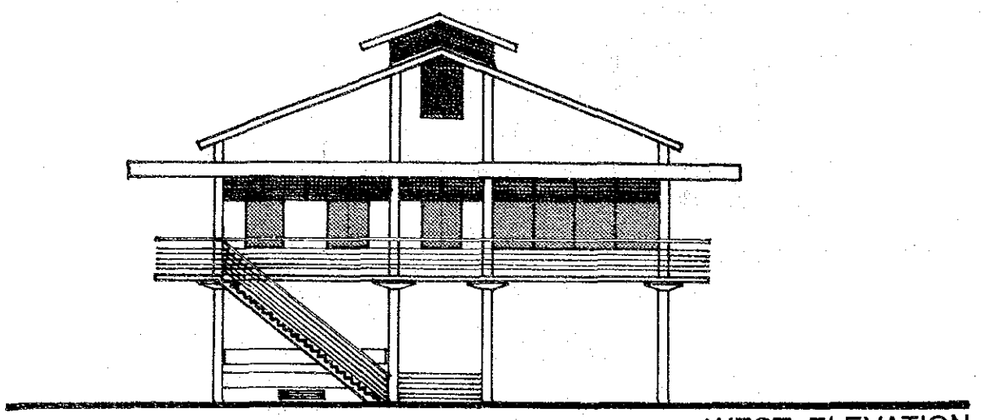
SECTION — 4

	SERVICE BLDG..SHOWER BLDG. TOILET BLDG. CONSTRUCTION VEHICLE OPERATION TRAINING BLDG. — 2 GARAGE FOR FARM MACHINERIES	ELEVATION, SECTION　S = 1 / 2 0 0	—	1 1

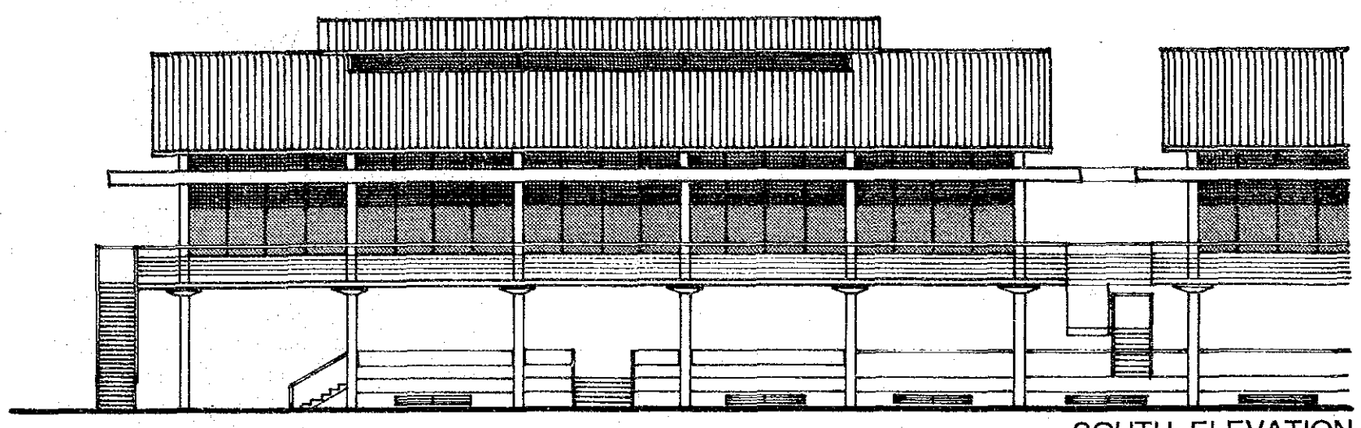


DORMITORY — 1	1st , 2nd FLOOR PLAN	S＝1／200	12

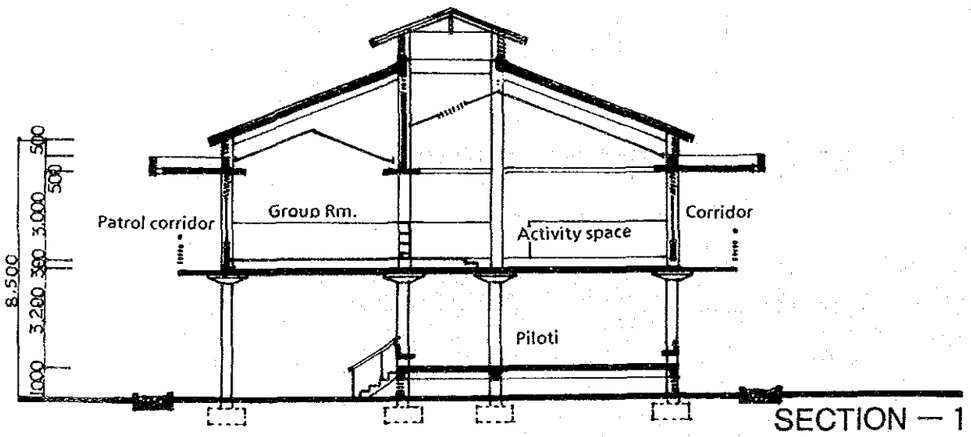
A3 1



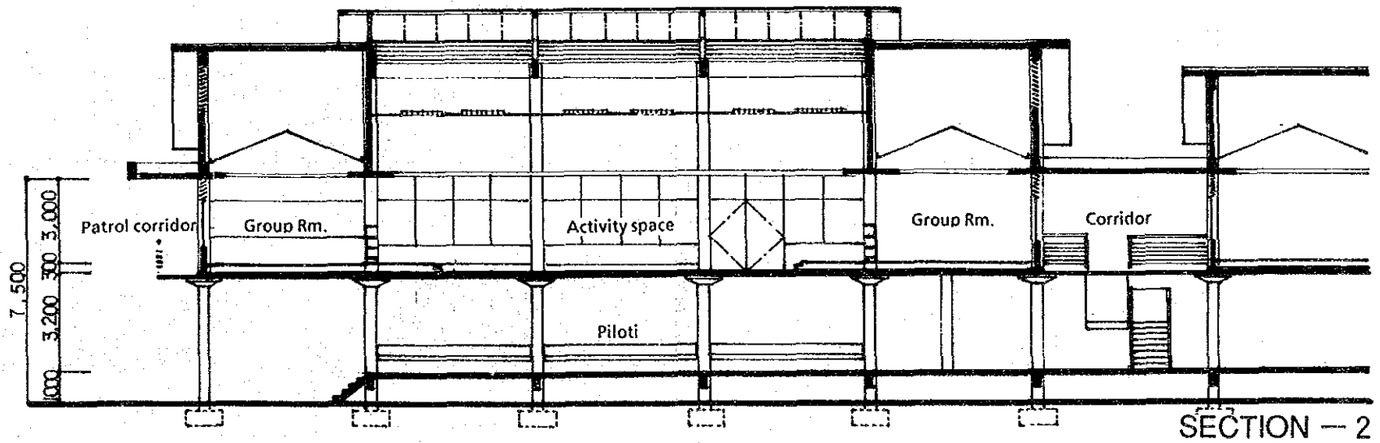
WEST ELEVATION



SOUTH ELEVATION

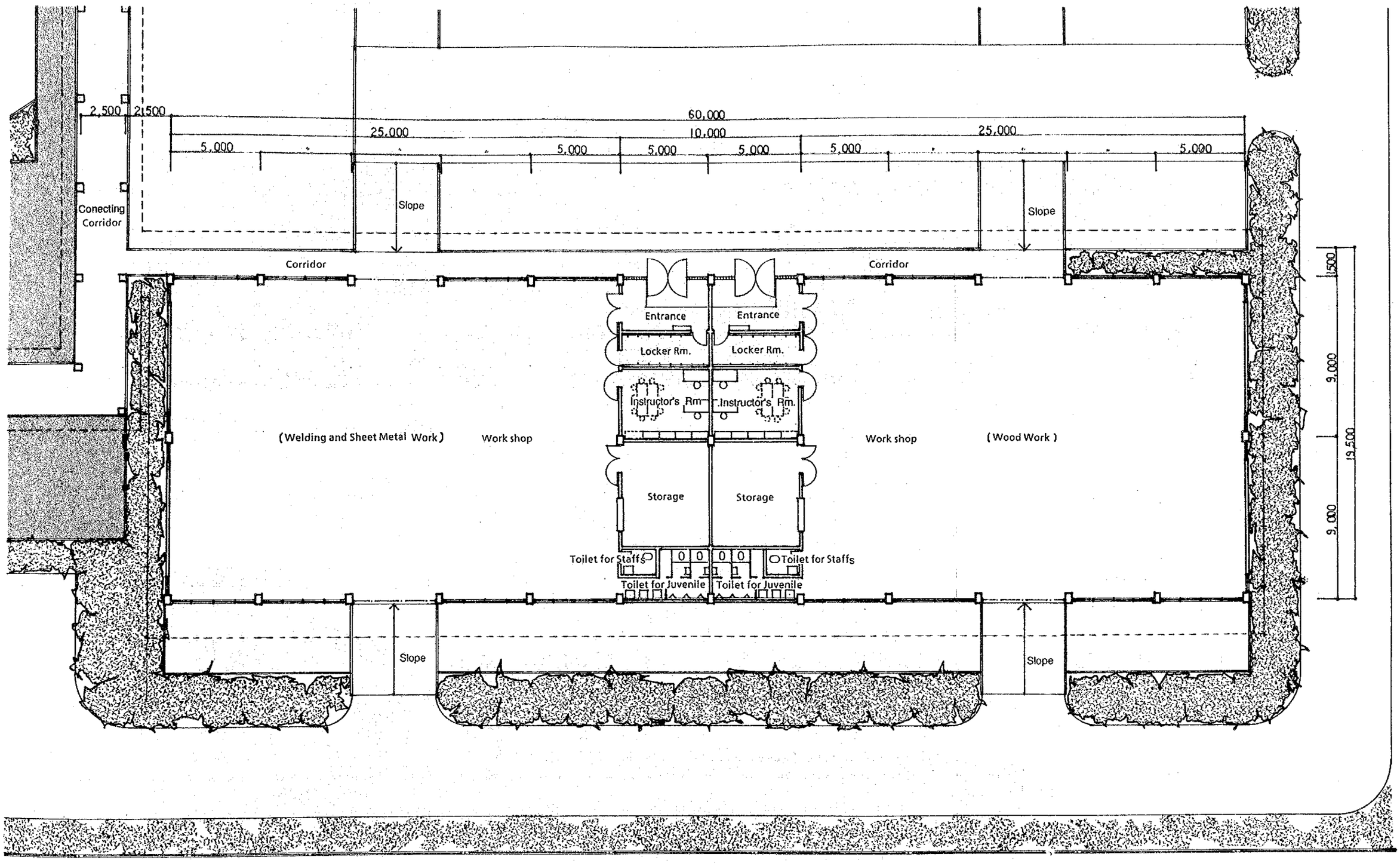


SECTION — 1



SECTION — 2

	DORMITORY — 2	ELEVATION, SECTION	S＝1／200	—	13



	WORKSHOP — 1	1 st FLOOR PLAN	S＝1／200	—	14

A3 1