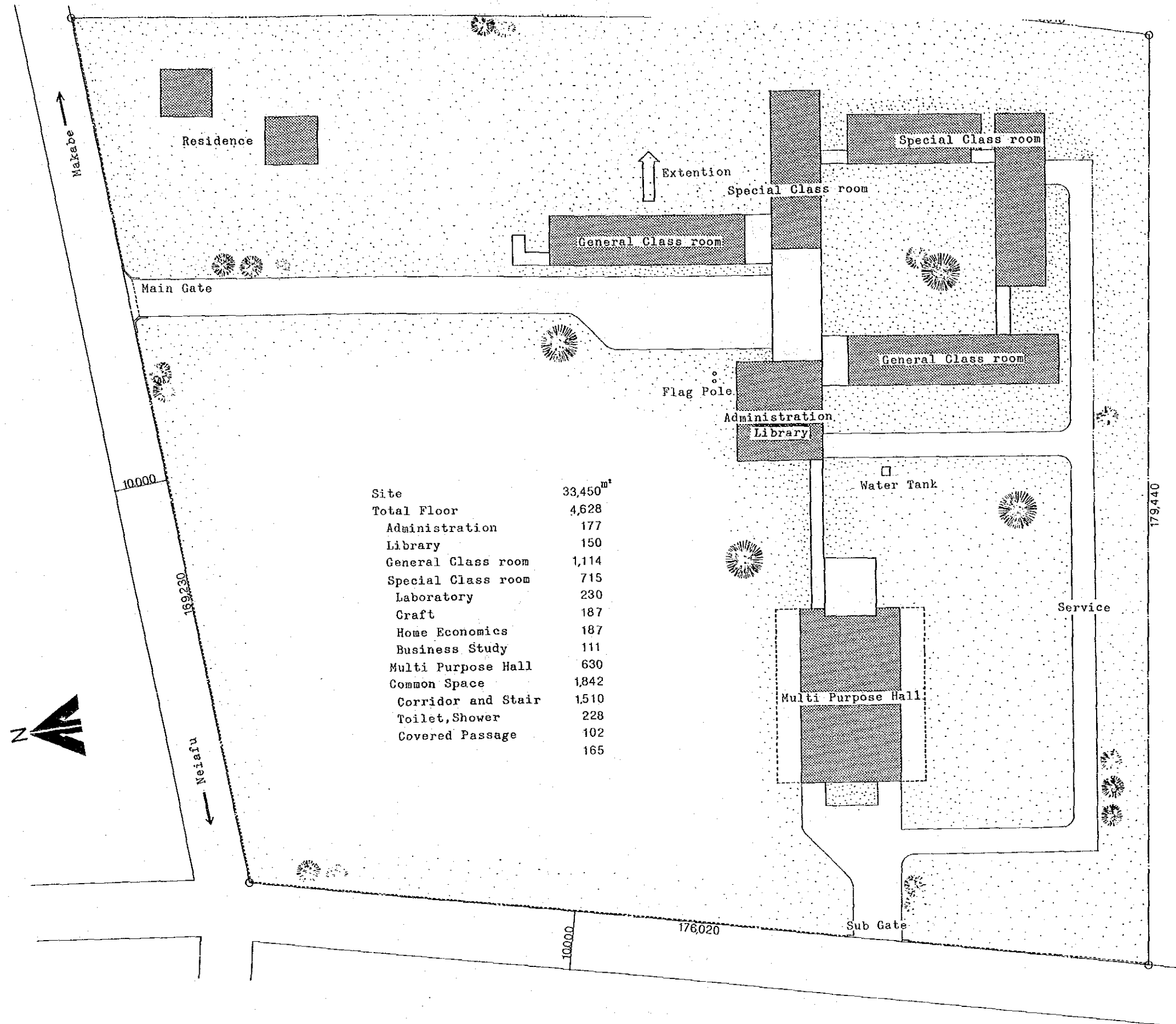


4-3-5 Equipment

The furnitures and equipment of the Vava'u High School which will be covered by the grant-in-aid to be provided by Japan will be those ones required for the function of the following rooms.

- | | |
|--|--|
| 1) Library | Bookshelves, etc. |
| 2) Laboratories | Experiment benches, etc. |
| 3) Handicraft classroom
(vocational training) | Band saw, circular saw, lathe,
drilling machine, etc. |
| 4) Home economics classroom | Sewing machine, washing machine,
sink, etc. |
| 5) Commercial course classroom | Typewriters, etc. |
| 6) Multi-purpose hall | Apparatuses for basketball,
badminton, etc. |

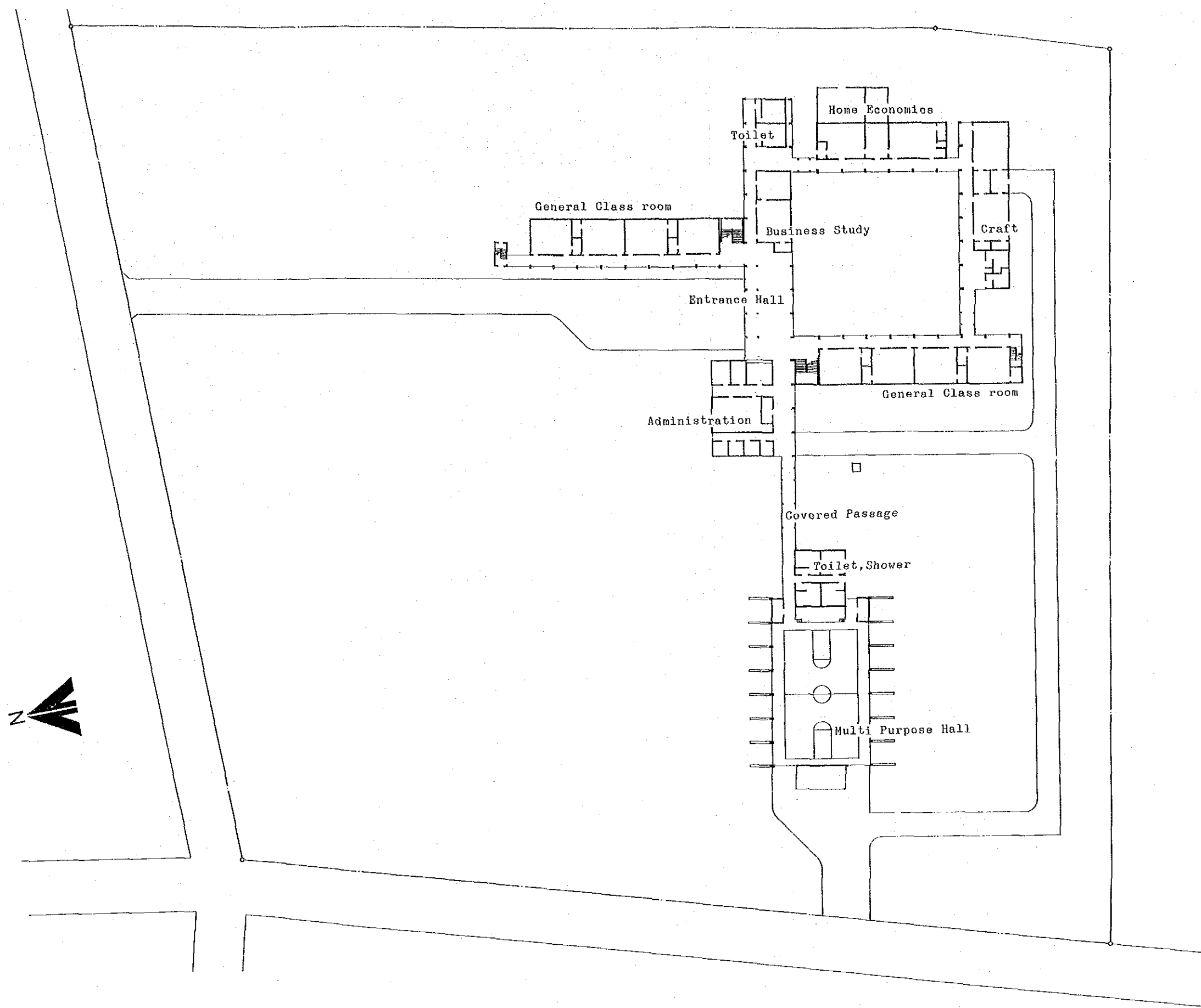
4-3-6 Preliminary Drawing



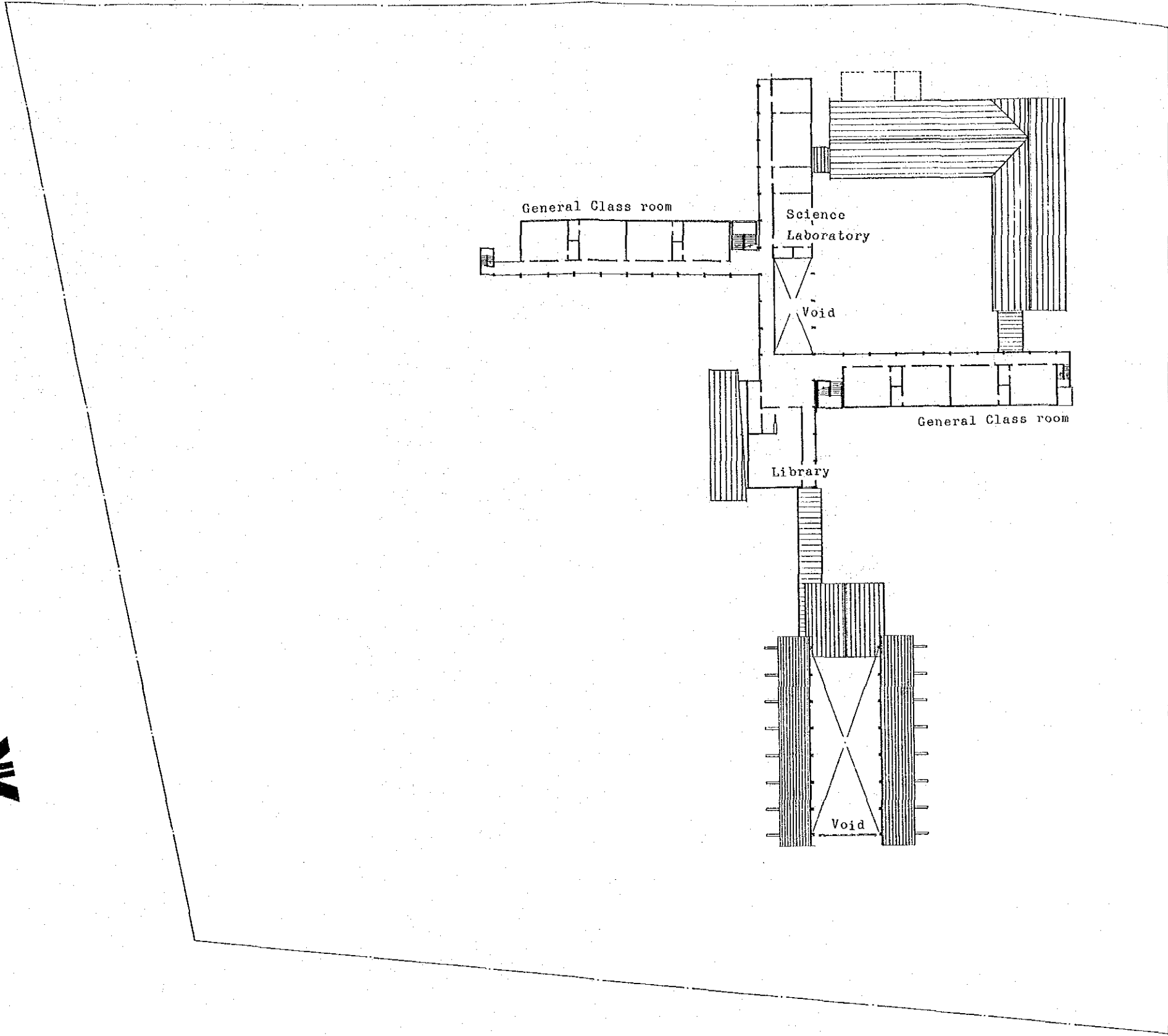
Site	33,450 ^m ²
Total Floor	4,628
Administration	177
Library	150
General Class room	1,114
Special Class room	715
Laboratory	230
Craft	187
Home Economics	187
Business Study	111
Multi Purpose Hall	630
Common Space	1,842
Corridor and Stair	1,510
Toilet, Shower	228
Covered Passage	102
	165



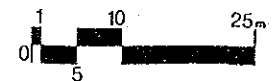
SITE PLAN

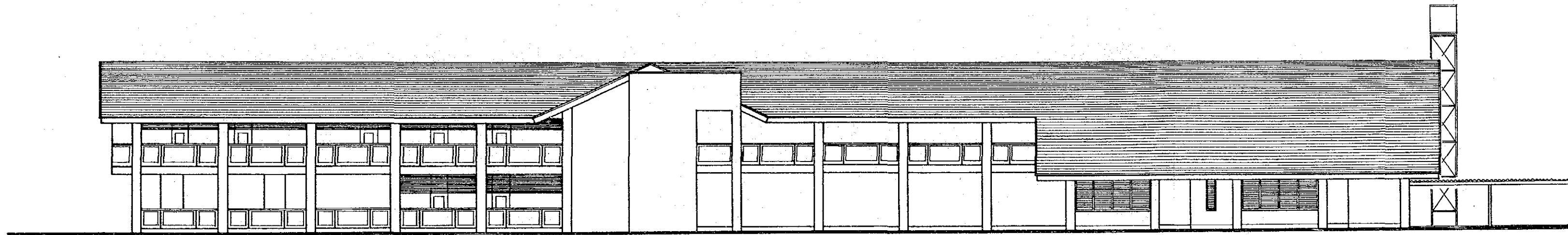


GROUND F. PLAN 

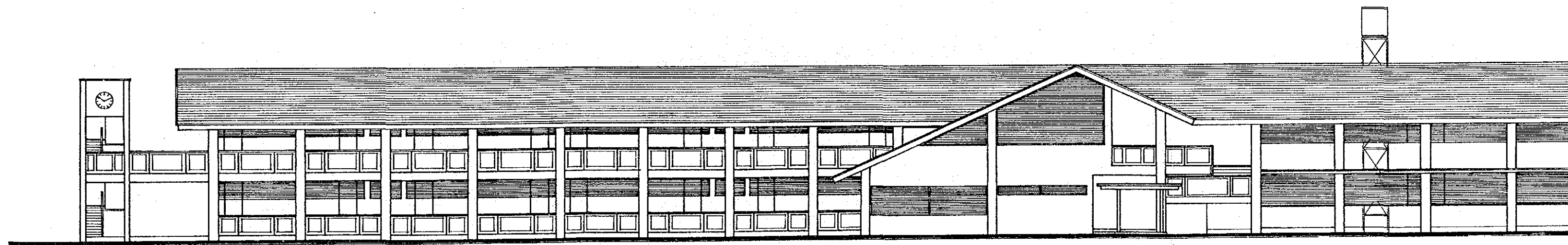


1st.F. PLAN

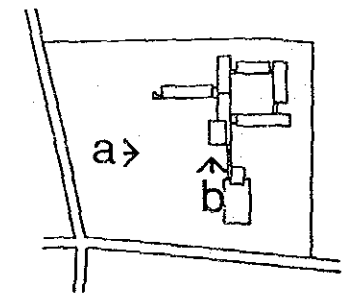
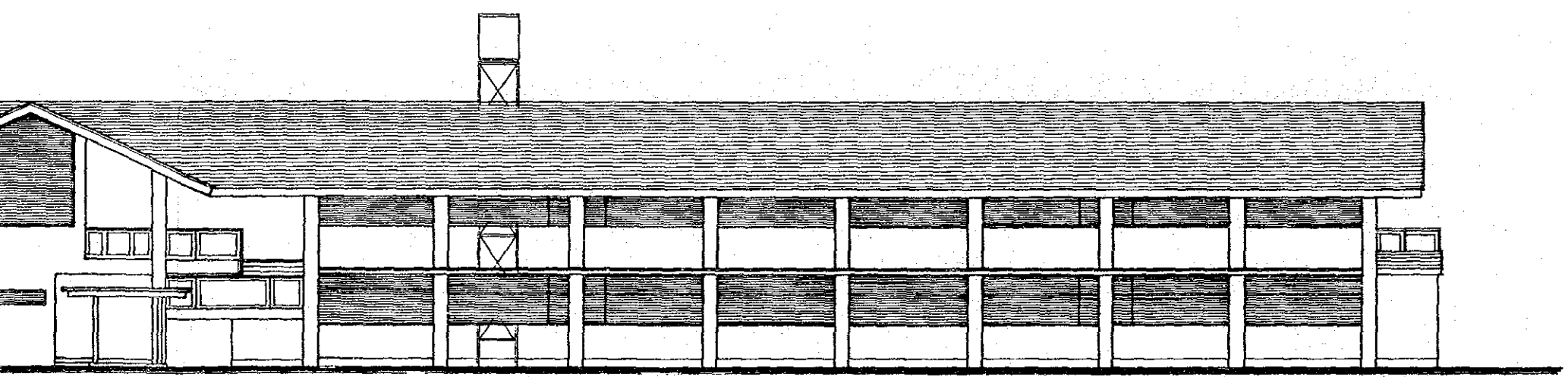
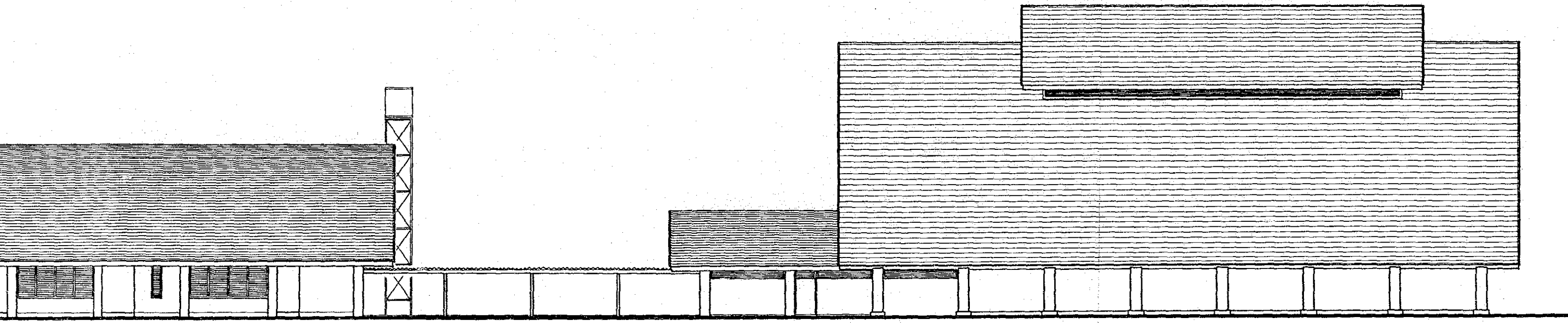




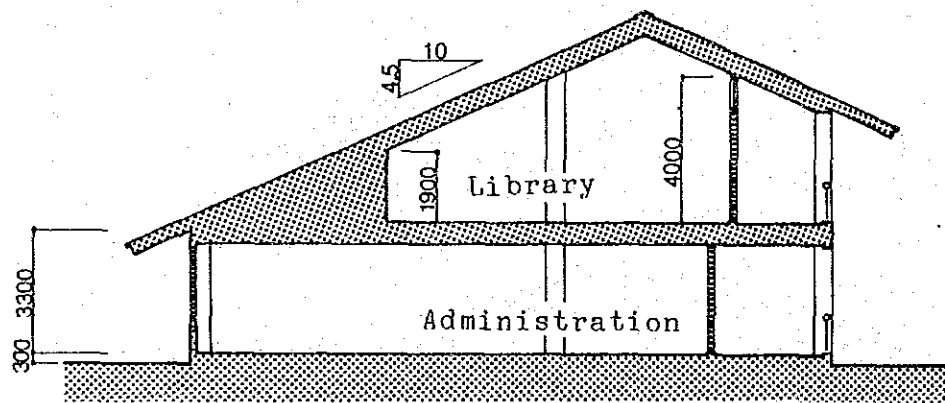
a - SIDE



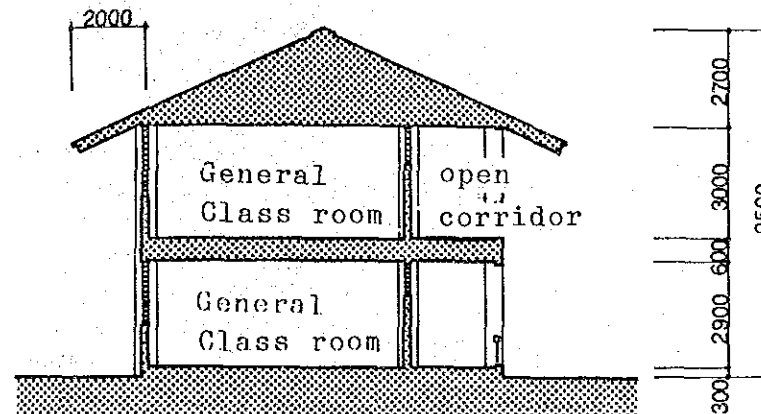
b - SIDE



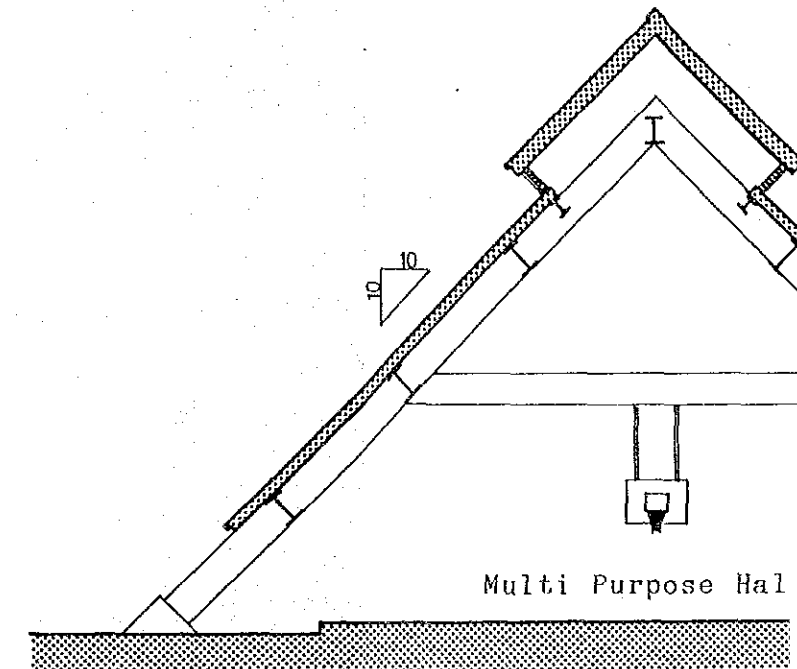
ELEVATION S. 1:200



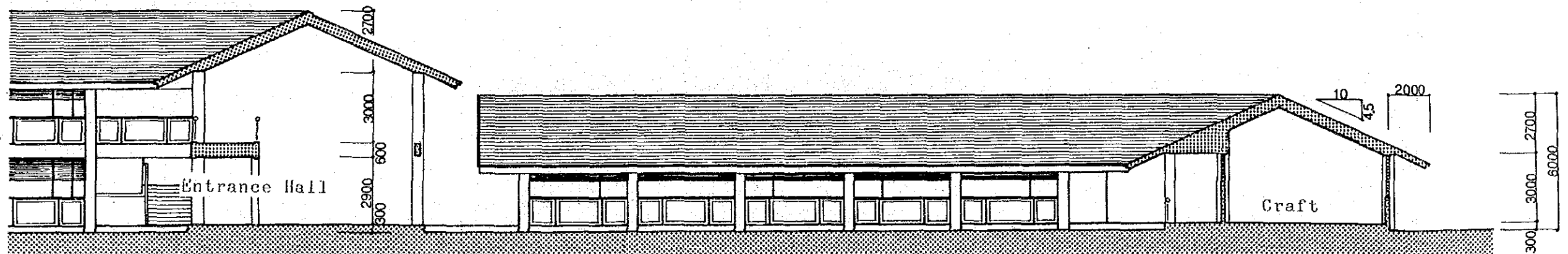
a-SECTION



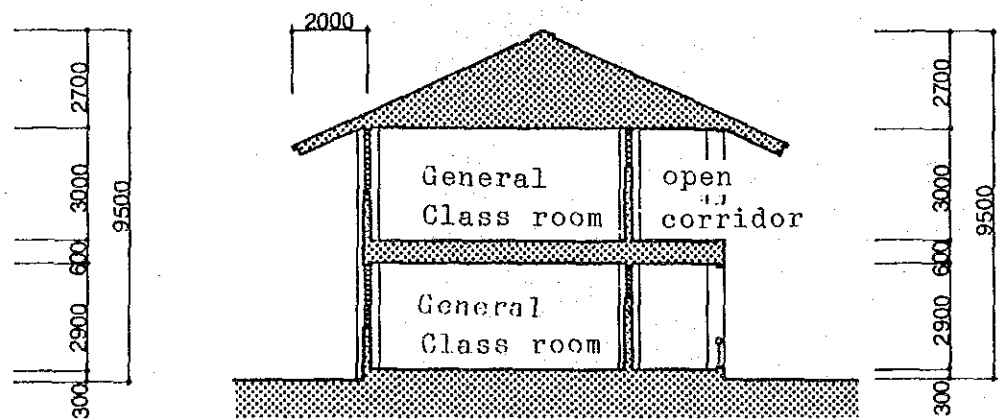
b-SECTION



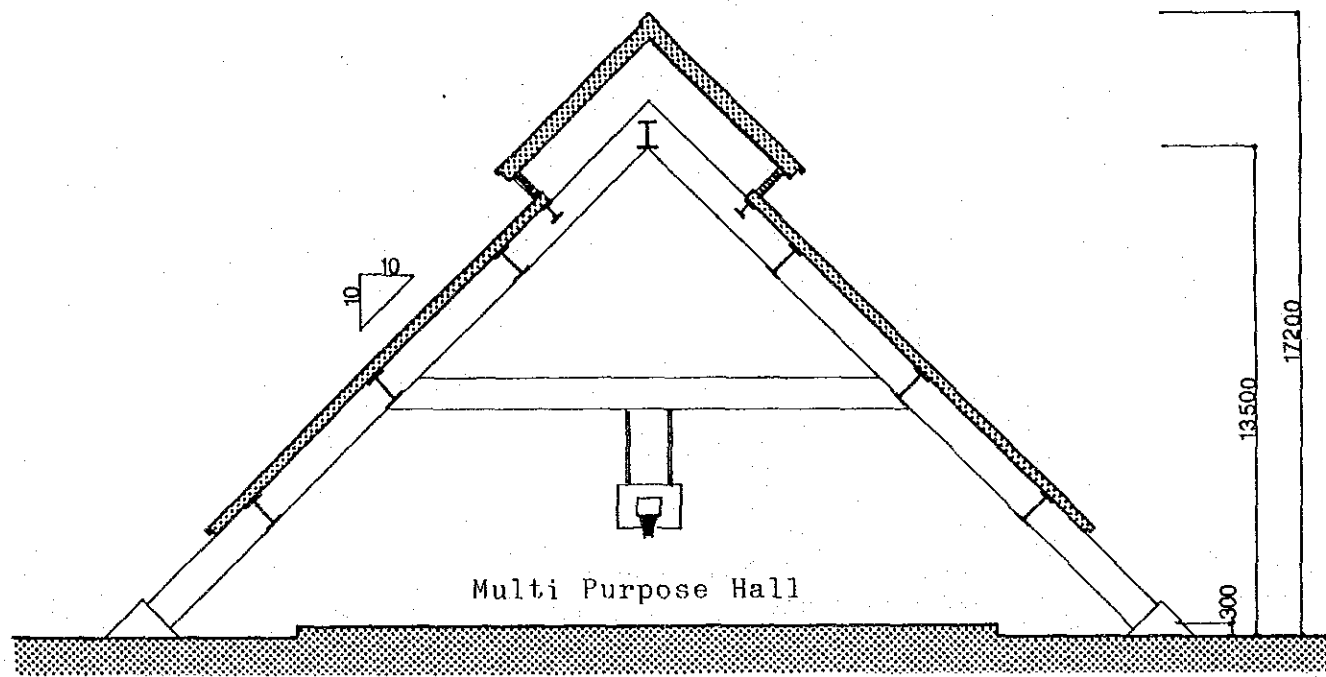
c-SECTION



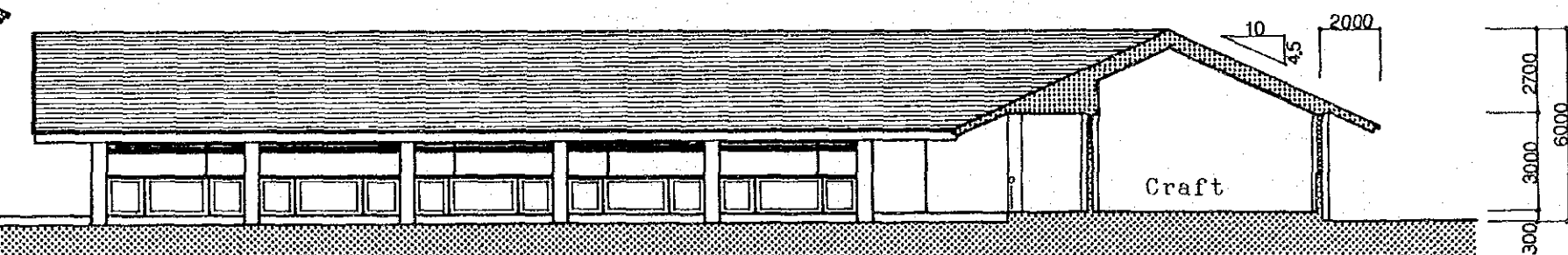
d-SECTION



b-SECTION

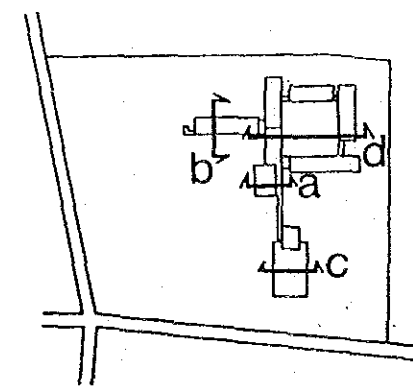


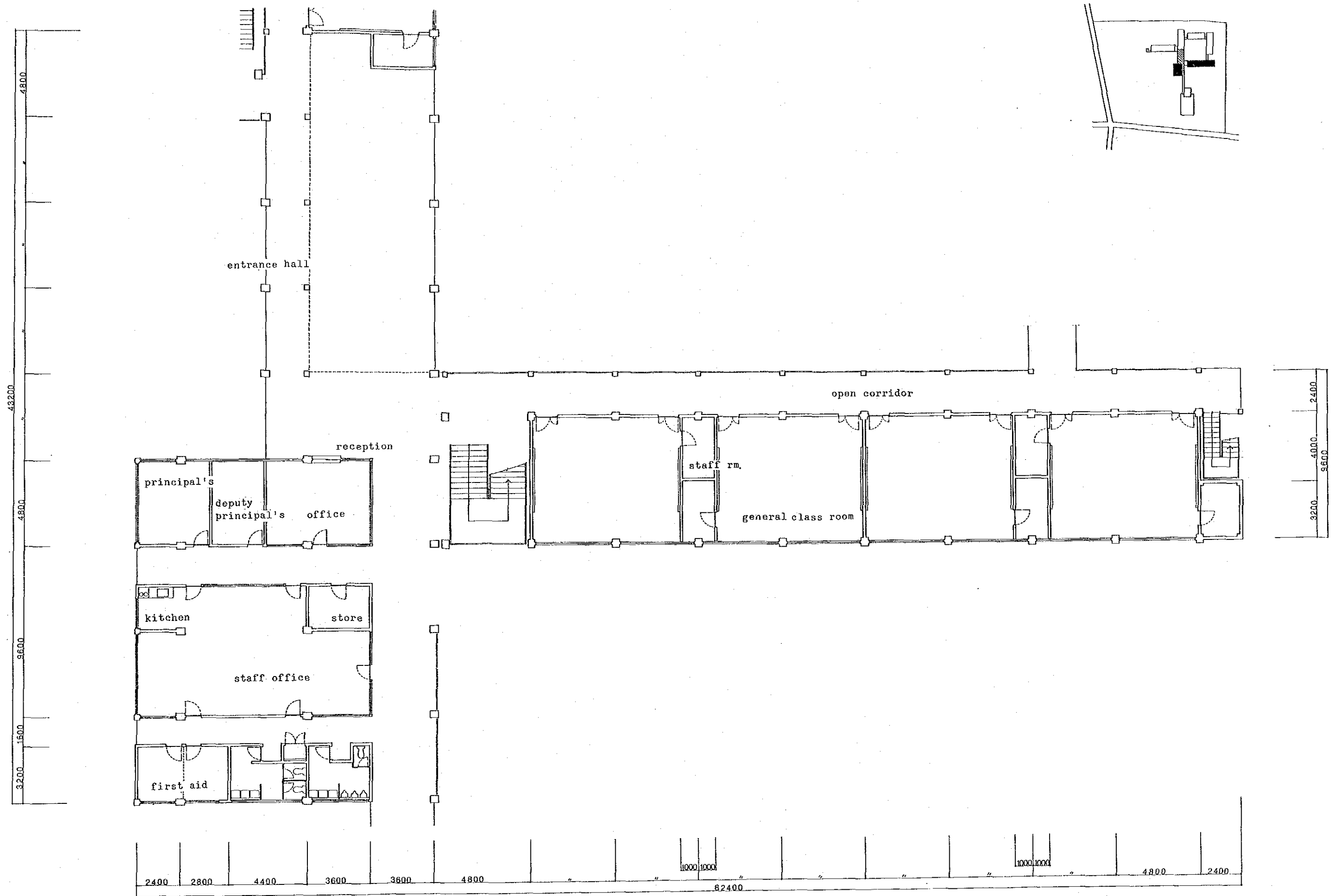
c-SECTION



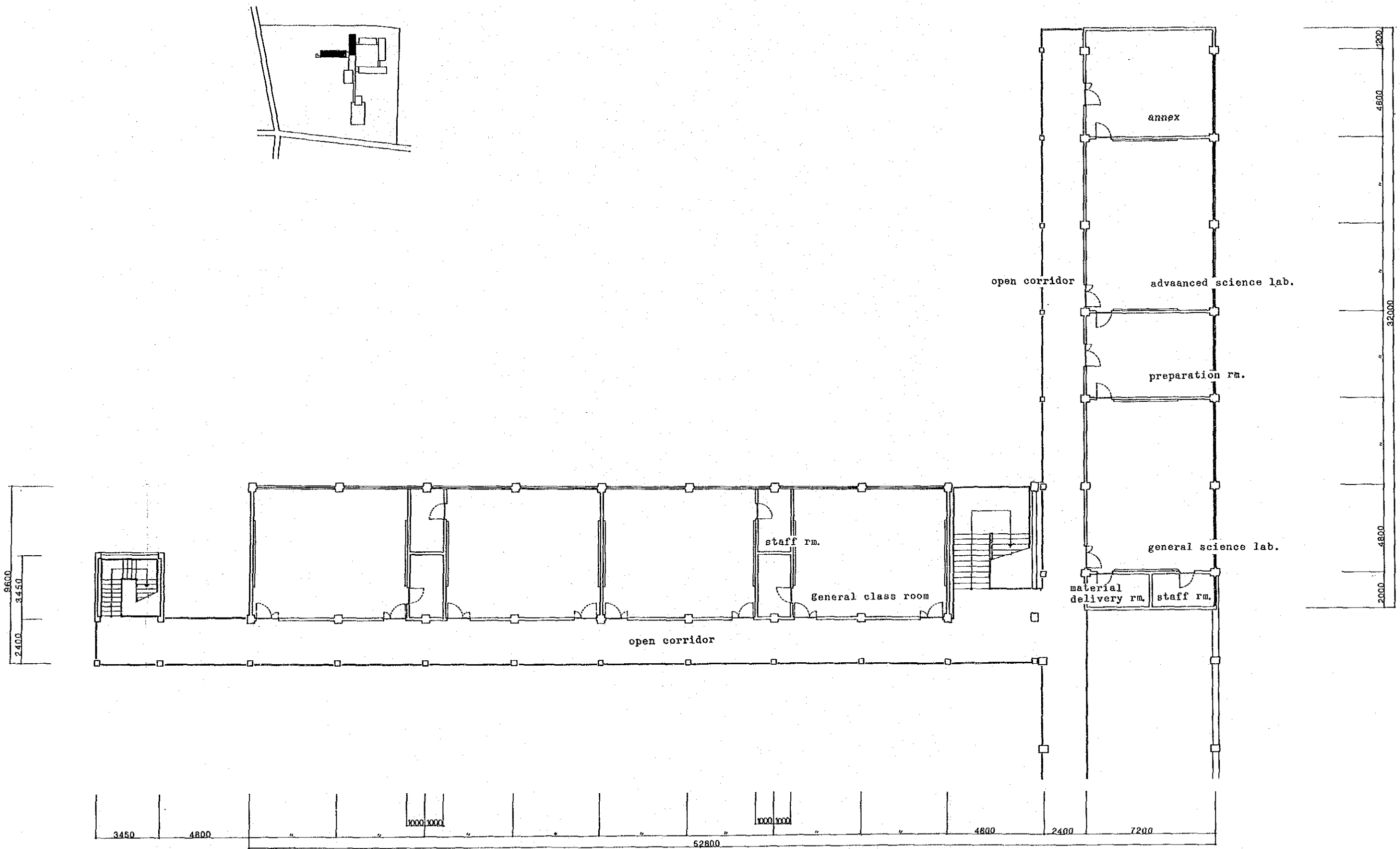
SECTION

S. 1:200

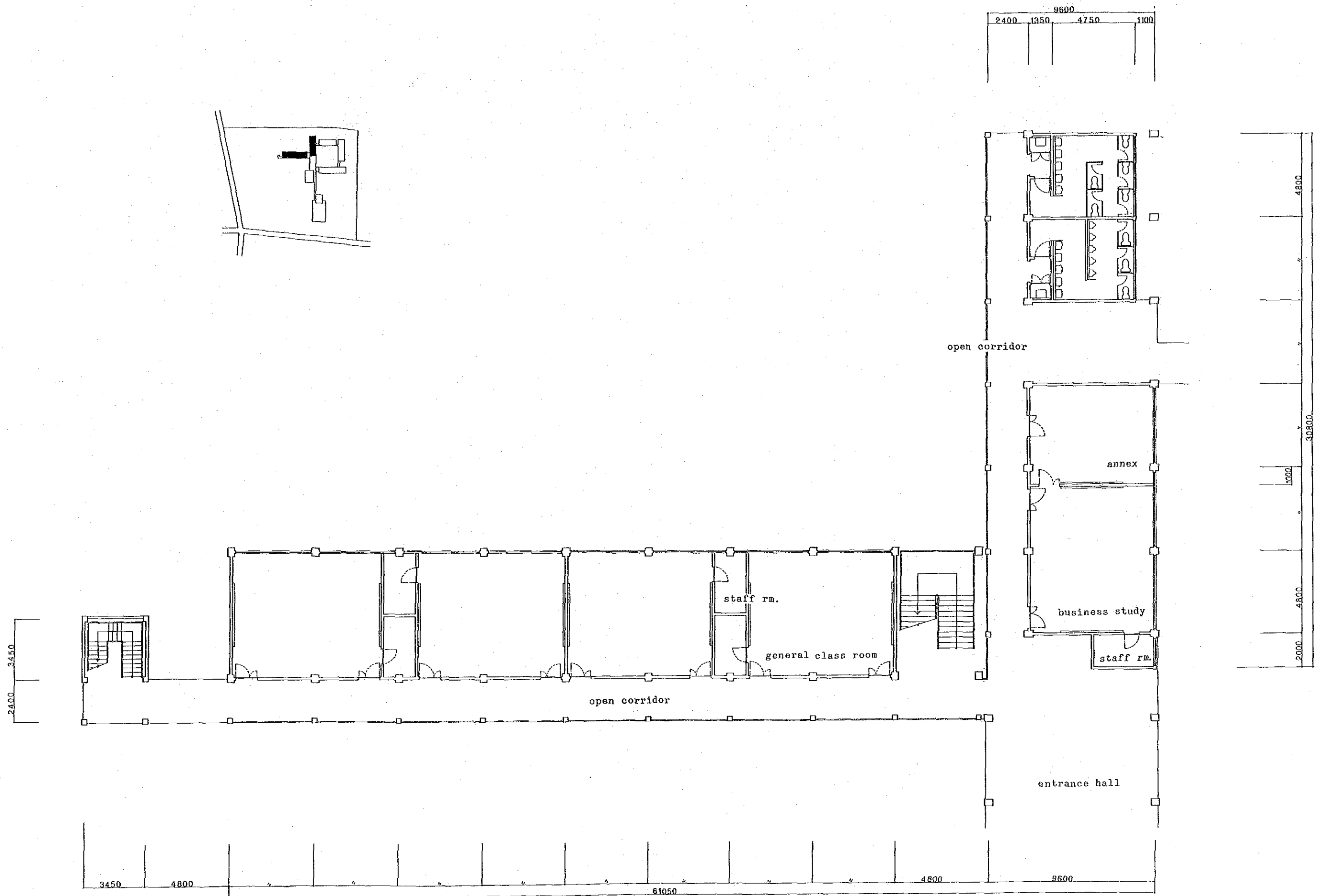




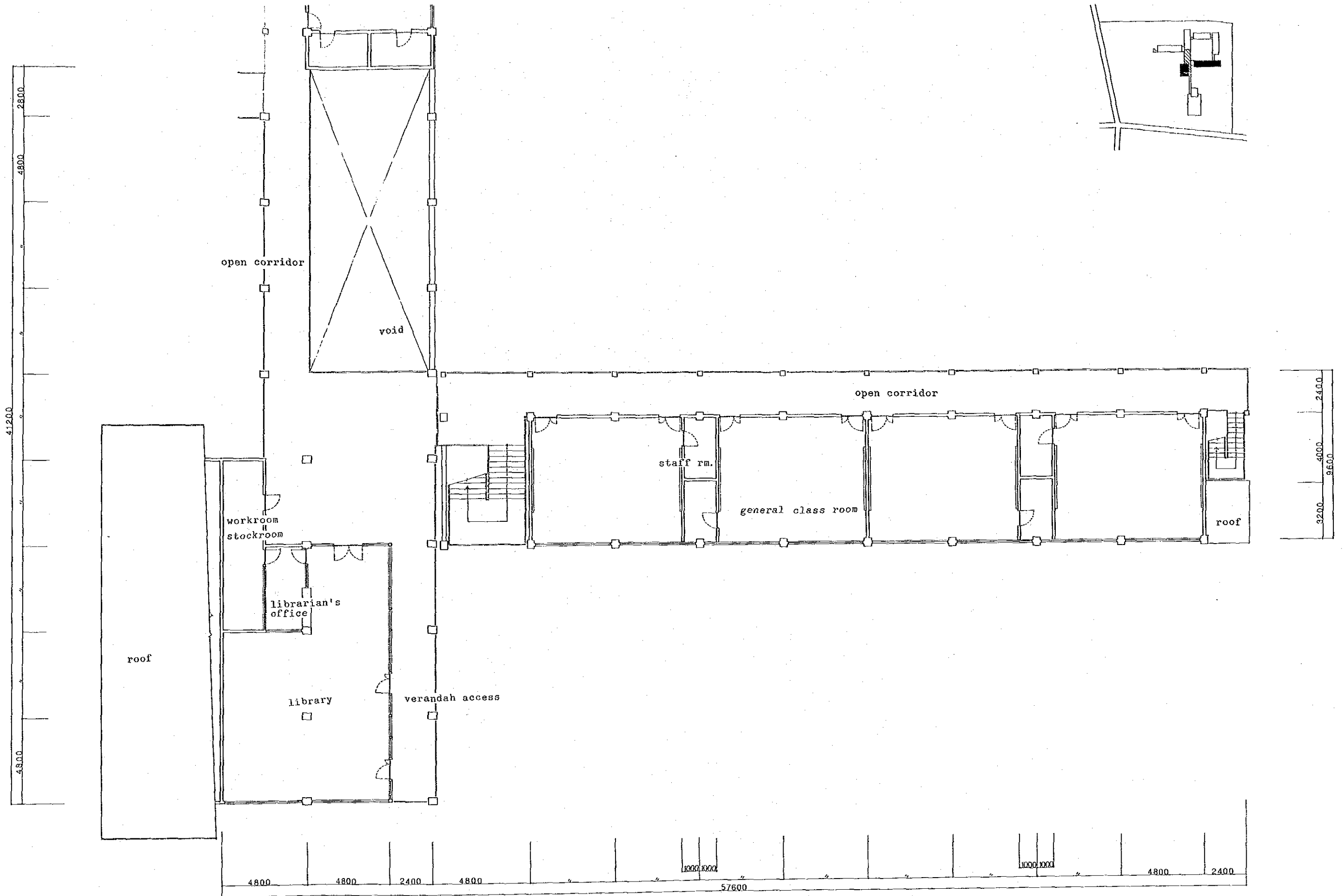
ADMINISTRATION, GENERAL CLASSROOM GROUND F. PLAN S. 1:200



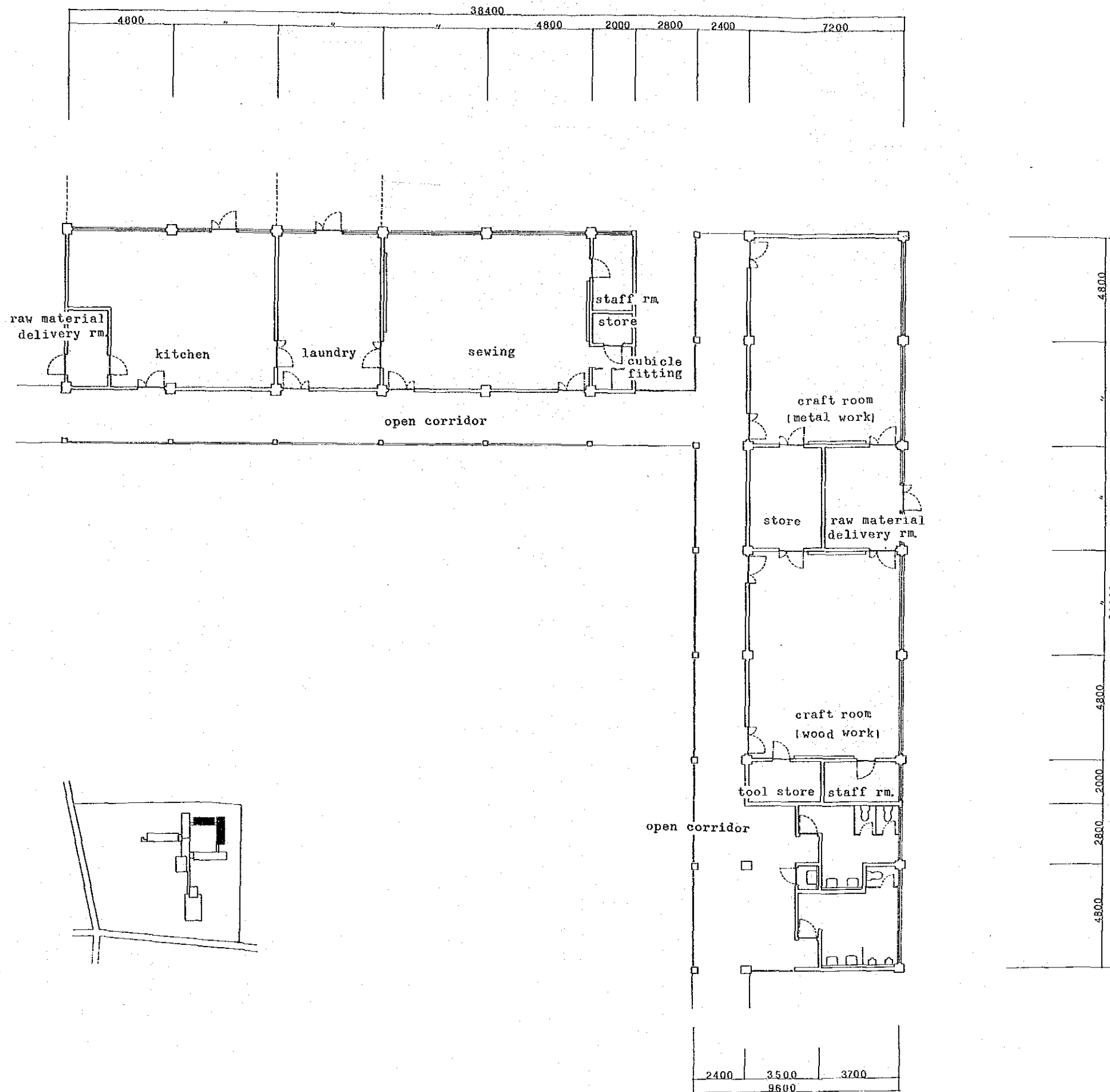
GENERAL & SPECIAL CLASSROOM 1^{ST.}F. PLAN S. 1:200



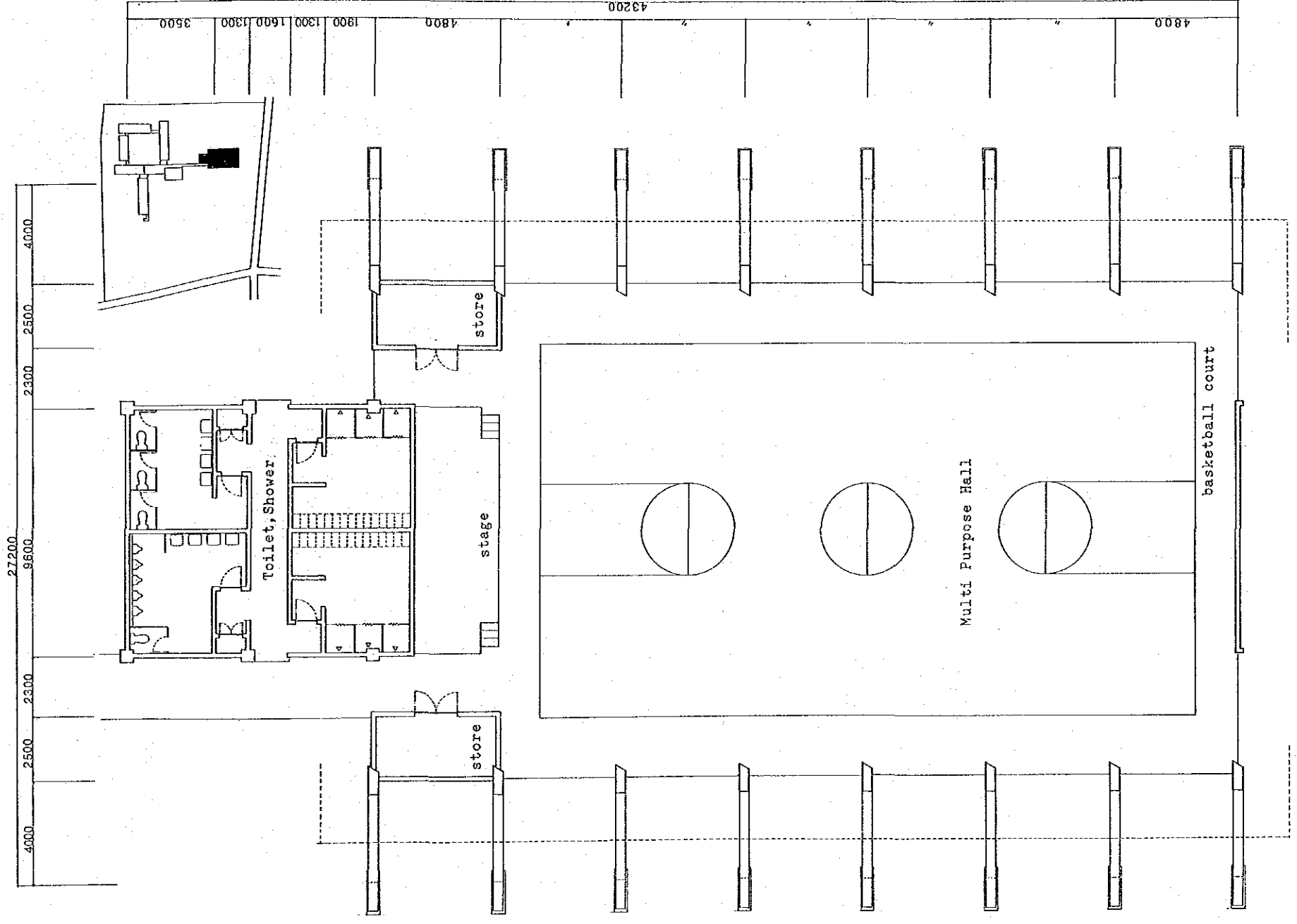
GENERAL & SPECIAL CLASSROOM GROUND F. PLAN S. 1:200



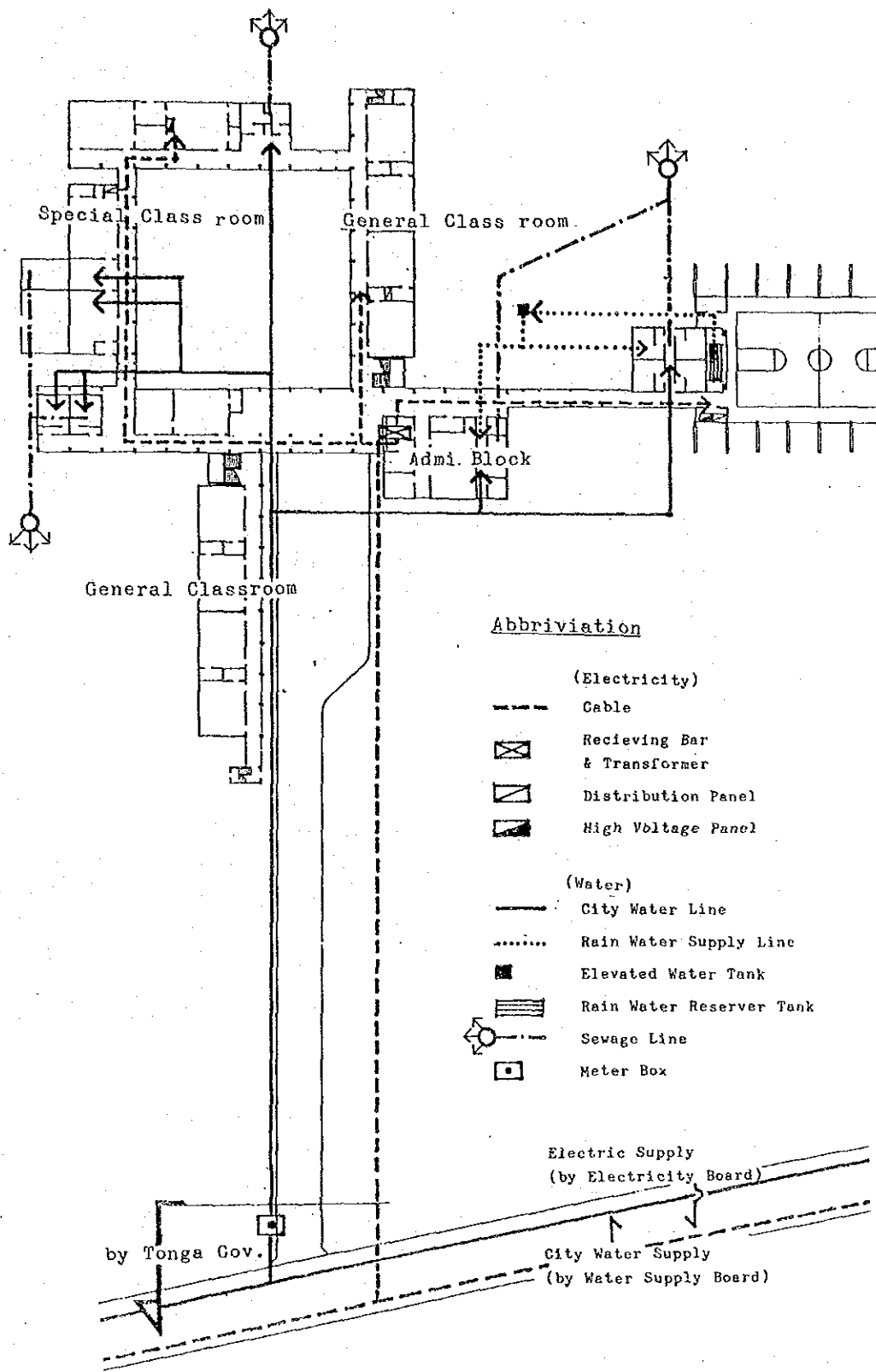
LIBRARY, GENERAL CLASSROOM 1^{ST.}F. PLAN S. 1:200



SPECIAL CLASSROOM PLAN S. 1:200



MULTI PURPOSE HALL PLAN S. 1:200



CHAPTER 5

IMPLEMENTATION OF THE PROJECT

Chapter 5

IMPLEMENTATION OF THE PROJECT

5-1 Organization for Implementation of the Project

(1) Construction Period and Organ in Charge of the Implementation of the Project (Ministry of Education)

The Ministry of Education will be the organ in charge of the implementation of the Project, therefore, being the counterpart for every negotiation related to the construction work.

Ministry of Education

- Director of Education Mr. Paula Bloomfield
- Senior Education Officer Mr. Mana Latu

Most of the negotiations during the construction work will be carried out in the home office of the Ministry of Education located in the Tongatapu Island.

The Ministry of Works will provide assistance for implementation of this Project.

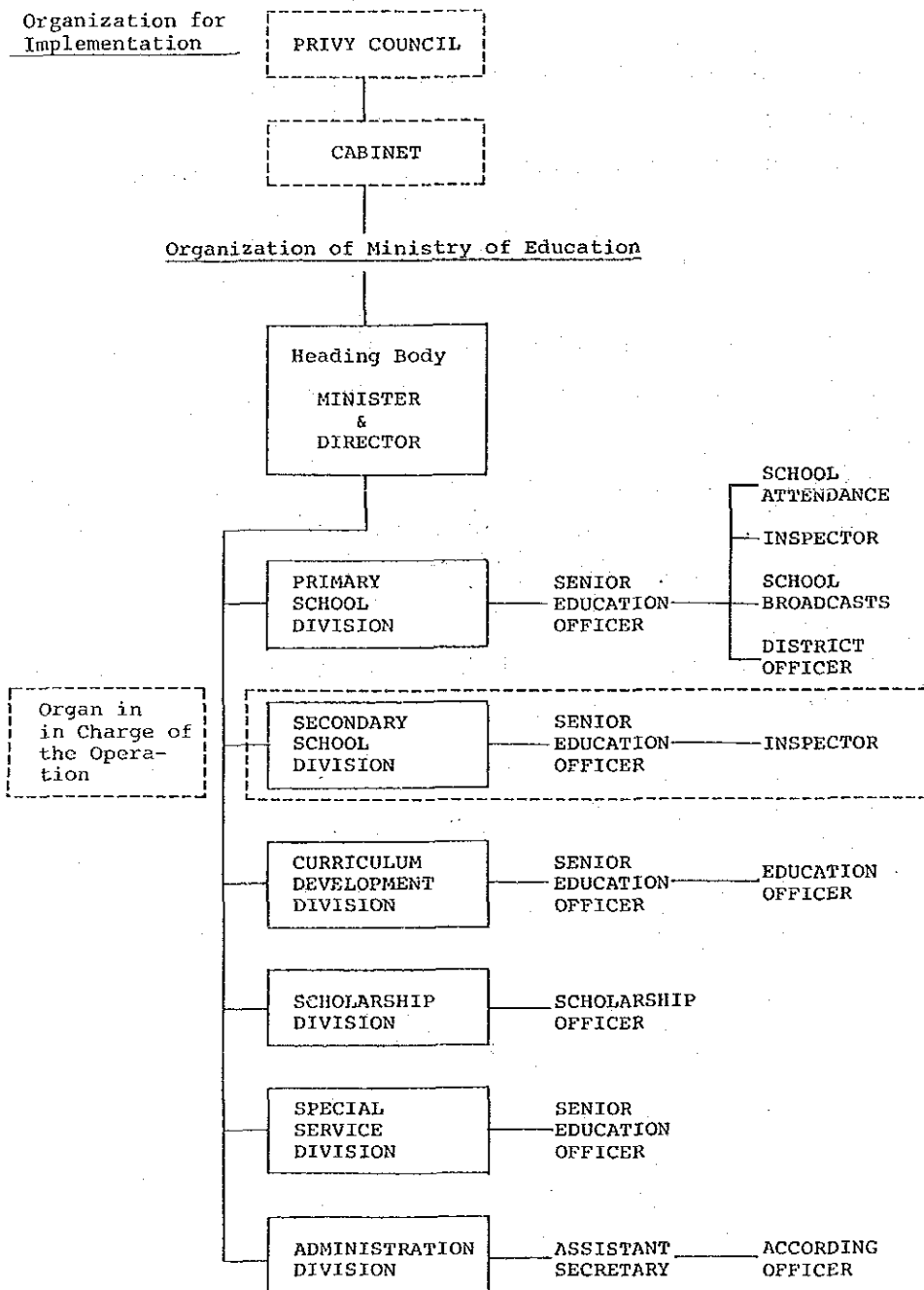
Ministry of Works (MOW)

- Director of Works Mr. David S. Keith
- Assistant Director Mr. Sione Taumopeau

(2) Organ in Charge of the Operation of the Vava'u High School

Secondary School Division of the Ministry of Education.

At the present time the principal and the vice-principal of the Vava'u High School have not been nominated yet. Authorities of the Ministry of Education told us that capable and talented officers of the Ministry will be picked up and assigned to the posts in question.

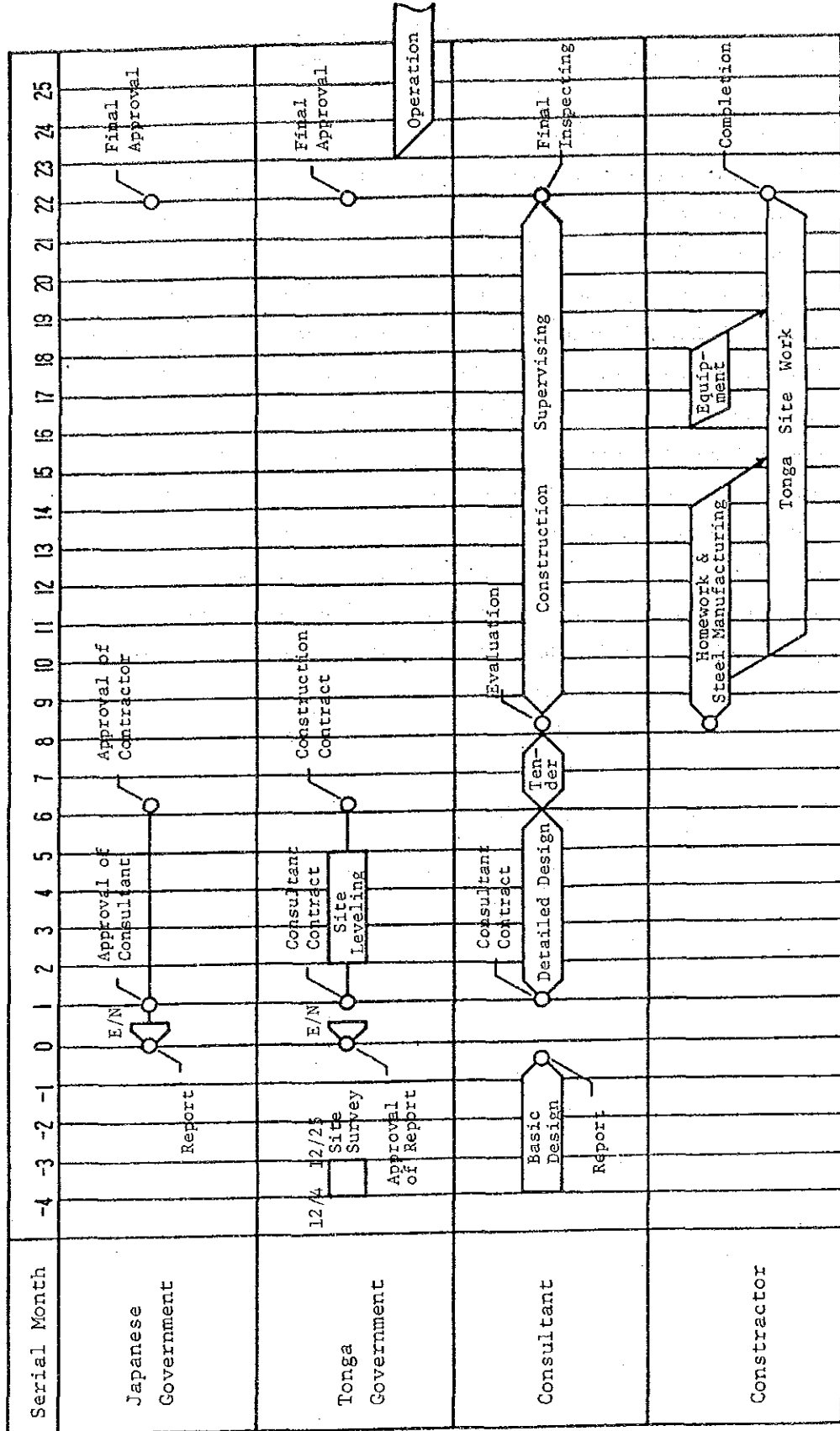


5-2 Schedule of the Project

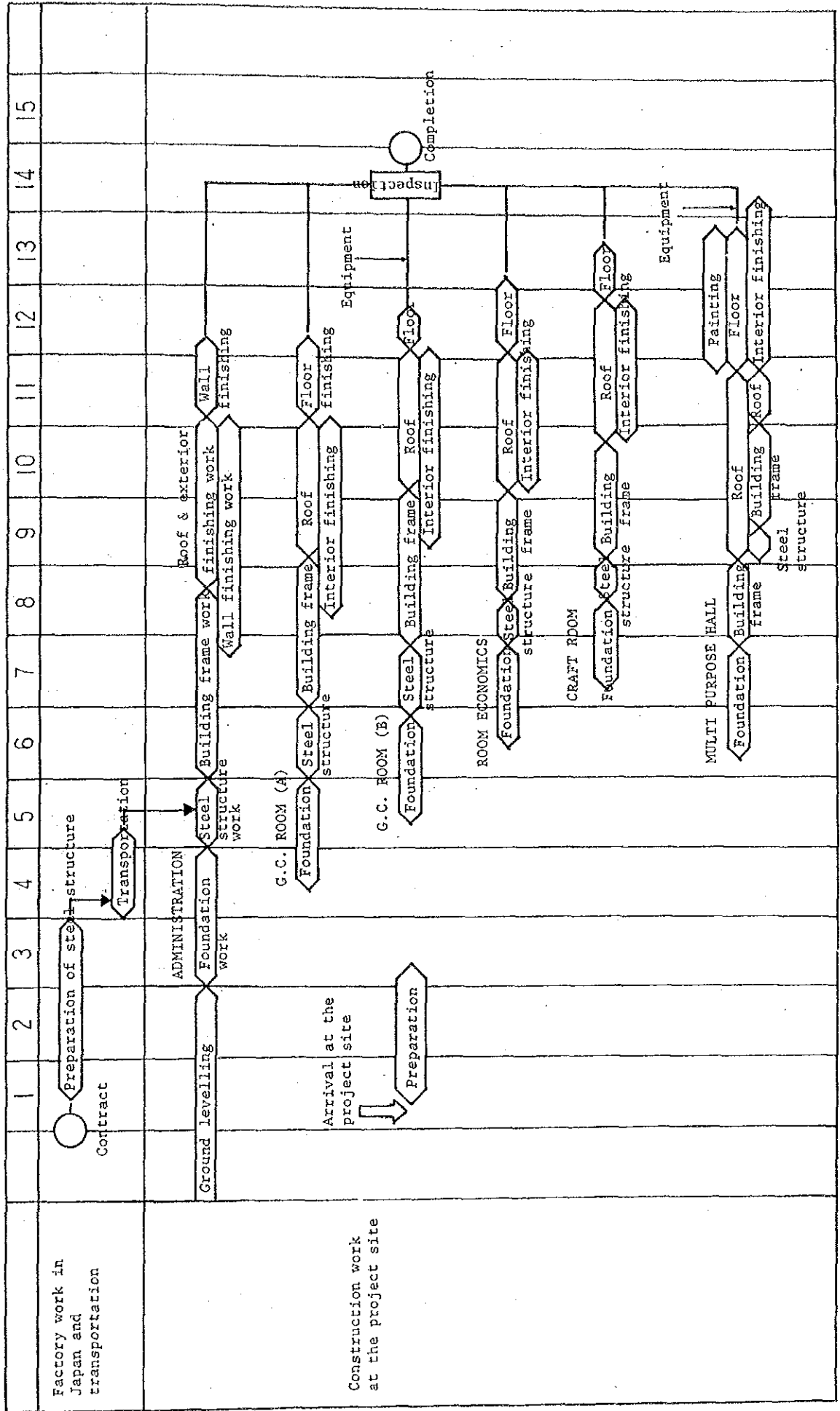
The local construction methods will be adopted in the scheme of execution, and generally speaking the construction work will be carried out in a labour-intensive way. The introduction of construction machines anew is difficult both technically and financially. The construction machinery to be used in this project will be concrete mixers, arc welding machine and hand carts. The manpower required during the construction work is estimated to be of the order of 15,000 to 18,000 men. It is presumed that it will be necessary to recruit sub-contractors from the Tongatapu Island because the number of workers available in Vava'u Island is limited. As for the construction materials, there are very few materials available in the domestic market and consequently, the execution of the import procedures without delay will be an important factor in the management of works progress. Special attention shall be paid in the foundation work, because it will be executed during the rain season (December to March). The bearing power of the ground is impoverished considerably when the ground is disturbed, because it consists of soil of the volcanic ash family. Accordingly, it is important to take measures to prevent excessive excavation and infiltration of rain water.

Implementation Schedule

* The E/N is assumed to be 0.



Progress Chart of Works



5-3 Scope of Works

(1) Scope of Works under the Responsibility of Japan

Construction of the buildings after the completion of the ground levelling work to be carried out by the Government of Tonga.

(2) Scope of Works under the Responsibility of the Government of Tonga

- 1) Provision of the site
- 2) Removal of the trees off the site and ground levelling by cutting and banking.
- 3) Supply of electricity, including the installation of the power receiving switchboard at the place of the site indicated in the general drawing.
- 4) Supply of water, including the installation of the water meter at the place of the construction site indicated in the general drawing.
- 5) Construction of every facility to be provided at places distant more than 1 m from the external wall of the buildings, i.e., internal roads, gates, walls, fences, plantation of greenery, outdoor lighting, etc.
- 6) Provision of every equipment, apparatus, furniture, etc., required for the appropriate operation of the Vava'u High School except the equipment and apparatuses included in the grant-in-aid to be provided by Japan.

(3) Approximately Cost of the Works under the Responsibility of the Government of Tonga

1) Ground levelling	T\$4,313
2) Gates, walls, fences, etc.	T\$3,393
3) Paving work of internal roads of the school	T\$14,427
4) Electricity & water supply work	<u>T\$12,766</u>
Total	T\$34,894

Two residence of the administration personnel

T\$34,000

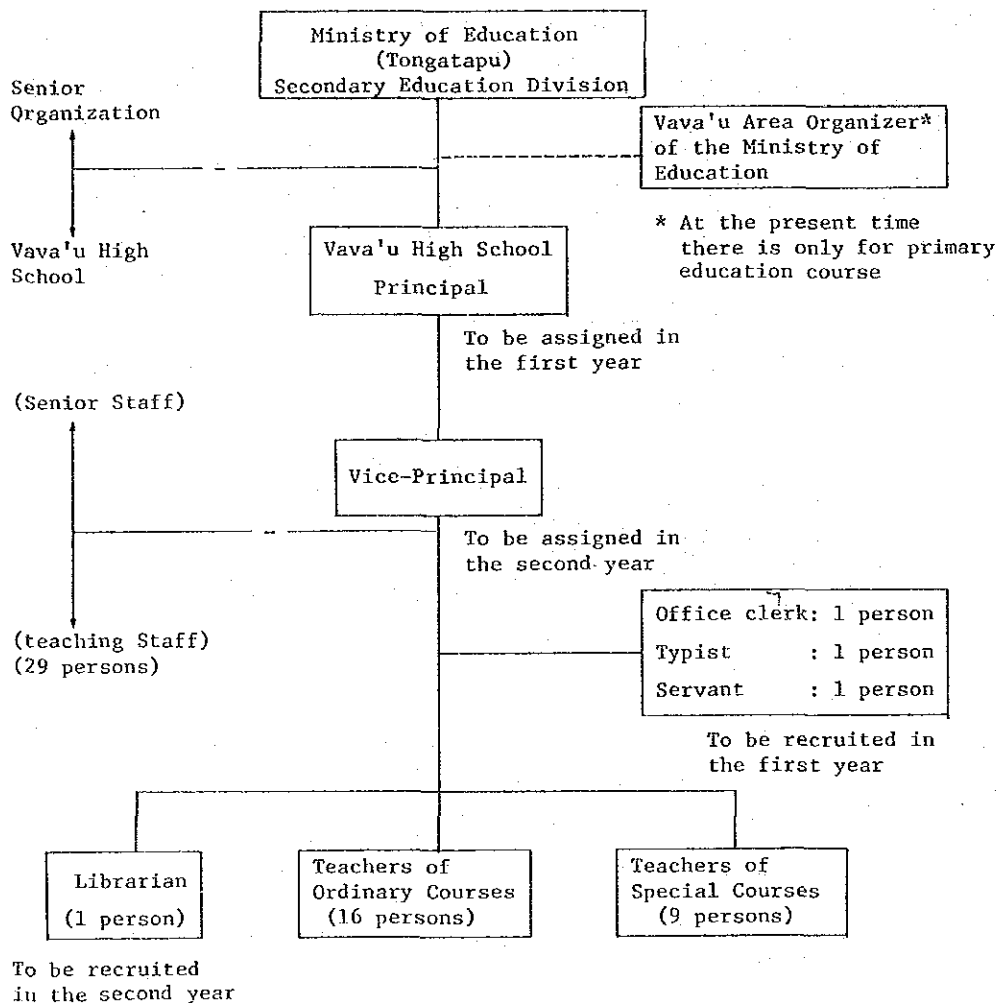
Residence of the Administration Personnel

These residences will be required because the principal and the vice-principal will come from the Tongatapu Island, and furthermore it is the custom in Tonga to administrate the school with the principal and vice-principal living in the school site throughout the year.

5-4 Operation and Administration Plan

(1) Administration

A teaching staff consisting of 29 persons plus principal and vice-principal will be in charge of the operation and administration of the new Vava'u High School. During the vacation period and in the holidays the teachers will take care of school in shift. The school staff resident in the site (principal and vice-principal) will take care of the school during the night.



Teachers' recruiting plan

- 1st year	5 teachers
- 2nd year	4 teachers
- 3rd year	5 teachers
- 4th year	8 teachers
- 5th year	3 teachers

TOTAL 25 teachers

(2) Operation

The Vava'u High School will start its operation as a 7-year (Form 1 to Form 7) coeducational (approximately 1:1 proportion) ordinary high school and the admission of students of the Form 7 will begin only in the 5th year. Each school year will have capacity for 70 students and each class will consist of 35 students. The number of students in the first 5 years of operation of the Vava'u High School will be as follows:

- 1st year 70 students
- 2nd year 140 students
- 3rd year 210 students
- 4th year 350 students
- 5th year 490 to 500 students

The school hours will consist of 4 hours in the morning (8:30 to 12:30) and 2 hours in the evening (1:30 to 3:30), totalling 6 hours a day. The students will attend school 5 days a week. The school years will consist of three trimesters.

- 1st trimester Mid February to mid May
- 2nd trimester Mid May to mid August
- 3rd trimester Mid September to mid December

This three-trimester system is the standard school year adopted in Tonga.

The classes will be given in the home room, with exception of the special courses and drafting. The special courses are physical education, sciences, handicraft, artcraft and home economics. The teaching staff will consist of Tongan teachers. The staff office and the staff room are the spaces reserved for use by the teachers in the school. The staff room will be used by the teachers to prepare their classes.

The students will attend school by walk, horseback, bicycle and motor boat in the case of students coming from remote islands. The students will carry lunch, which will be eaten in the home room.

Fences will be constructed along the roads and the borders of the site, because the use of the facilities of the school is subject to approval upon application.

(3) Maintenance

The occurrence of dirt and garbages of various kinds begins with the start of operation of the school. The cleaning of the ordinary classrooms will be carried out by the students, while the cleaning of the special classrooms will be carried out by the servant (handy man/janiter). The cleaning consists of the routine cleaning including garbage dumping, cleaning of the external facilities, etc., and the periodic maintenance including the cleaning of windows, walls, ceiling, etc. General supplies are sufficient as cleaning utensils, and it is not necessary to use any special apparatus. Special attention shall be paid to the cleaning of the toilets, because they are prone to become insanitary. The most important difference between Japan and Tonga referring to the cleaning is the dust. The ground of both Tongatapu and Vava'u consists of clay. Such being the case, dust is carried by the wind and the desks of the school are covered with dust in a single day. Anyway, the necessity of ensuring hygiene is common to both people. Such being the case, countermeasure which consists of wiping repeatedly with damp cloth is a problem to be solved hereafter. It is not possible to cope with the problem with the janiter alone, because the scale of the school is too large.

As for the maintenance and repair of the electrical system, the required actions can generally be started after the stoppage of its function, because the system of the school is simple. With regard to the water supply and drainage system however, it is indispensable to carry out a periodic maintenance, because other-

wise new investments will be required in order to restore the system ready to function in the case of any failure. Such being the case, a regular maintenance and inspection is required. One of the serious problems regarding the maintenance of the water system is the lime contained in the running water. Nevertheless, this is a problem to be solved by the supplier, and its solution by the user is quite difficult.

As for the method of the maintenance and control, the water supply and drainage system shall be operated in order to confirm that there is no abnormality, and furthermore it is important to keep the whole system in daily running state. The water-receiving tank and the elevated tank shall be cleaned regularly at intervals of approximately 6 months. The cleaning is an easy work which requires no special utensil and accordingly it can be carried out by the handy man.

Utensils such as vacuum cleaner, sweeper, mop, brush, squeegee, plunger (rubber cap), etc., and agents such as wax, detergent, disinfectants, etc., are required to carry out the maintenance and cleaning of the buildings.

(4) Approximate Cost for Administration and Operation of the School

The Government of Tonga was planning to set up this school in 1980. According to the said plan, it was expected to increase gradually the number of students and to expand the buildings and equipment during the first 5 years after the start of operation, in order to accomodate 500 students in 1985, which is the full capacity of the Vava'u High School. According to the present state of things of the Project, it is to start the operation of the school in 1985. Furthermore, the operation at full capacity in 1985 is not impossible at all, depending on the number of students, number of teachers, quantity of teaching materials and equipment of the school.

This can be a theme to be studied with care, for its future imple-

mentation.

Nevertheless, the costs for operation of the school is calculated in the followings on the premise that it will reach full capacity only 5 years after the start of operation. The personnel expenditure shares the largest proportion of the operation cost, followed by the expenditures for replenishment of the teaching materials and equipment (textbook, supplies general, supplies manual, equipment general, etc.). It is difficult to sum up these costs item by item. Therefore, the operation cost of the Tonga High School 1982 is used as a reference. The oncost corresponding of each year is calculated proportionally to the number of students.

If the inflation is taken into consideration at a considerable rate in the calculation of the operation cost several years ahead, there is risk of increasing further the error. Therefore, the cost required at the present time (1983) is calculated in this report. Furthermore, the initial investment for acquisition of equipment, apparatuses, etc., required in the first 3 years of operation are not calculated proportionally to the number of students, and is allotted evenly in the 3 years instead. There are 3 foreign teachers in the Tonga High School, but in this project the costs are calculated on the premise that the whole teaching staff consists of Tongan teachers. The total cost for operation of the school in the first 5 years will be T\$348,200.- (¥8,200 million), with 86% of that total consisting of personnel expenditure.

Estimation of the Cost Required to Operate the School in the First 5 Years (T\$)

Item	Year	1st Year	2nd Year	3rd Year	4th Year	5th Year	Total
Personnel Expenditure		24,000	43,000	58,000	82,000	91,000	298,000
Oncost		5,000	7,000	9,600	12,700	15,900	50,200
Total		29,000	50,000	67,600	94,700	106,900	348,200

The operation of the Vava'u High School will require an annual budget of T\$106,900.- from the 5th year on. The annual budget for operation of the Tonga High School (approximately 730 students) is T\$188,850. The rather high cost per student in the Tonga High School is a consequence of the expensive salary of teachers recruited from foreign countries.

5-5 Procurement

(1) The materials, machinery and equipment required in this Project will be procured from the following sources.

Name	Unit	Quantity	Produced in Tonga	Imported	Japanese Product
Crushed coral stone for foundation bed	m ³	398	○		
Crushed coral stone coarse aggregate	"	460	○		
Sand	"	425	○		
Cement	t	414		○	
Reinforcing bar	"	91		○	
Steel frame	"	402			○
Concrete block (Thickness 200, 150, 100)	Unit	54,130	○		
Galvanized steel sheet	m ²	4,650		○	
Hard board 1000 x 2000	Board	381		○	
Wood for structure	m ³	48		○	
Wood for structure	"	4		○	
Paint	Kg	4,974			○
Glass louver window	Unit	1,138		○	
Glass for louver	Sheet	7,576		○	
Wooden flush door	Unit	117		○	
Aluminum flush door	"	4		○	
Sanitary war	"	58		○	○
Sinks for cleaning & shower	Places	12		○	○
Electric cords	m	21,338			○
Lighting fixtures	Unit	576		○	○
Equipment & apparatuses	1 set			○	○

(2) Method of Procurement

The construction material available in Tonga is only coral stone aggregate. There are 3 ways to procure the other construction materials.

- 1) To import from Japan
- 2) To import from New Zealand and Australia
- 3) To procure imported commodities from the Commodities Board of Tonga or from private importers.

The most appropriate way of procuring the required construction materials shall be determined by taking into consideration the procurement cost, procurement term and term of works. There are two items which seem appropriate to import from Japan.

1) Steel frame

Cause: It is recommendable to import the steel frame from Japan because it requires dimensional inspection at the manufacturer and shipping inspection. The steel frame can be procured at rather cheap prices and within a shorter term compared with third countries.

2) Paint

Cause: Quality and reliability of the product.

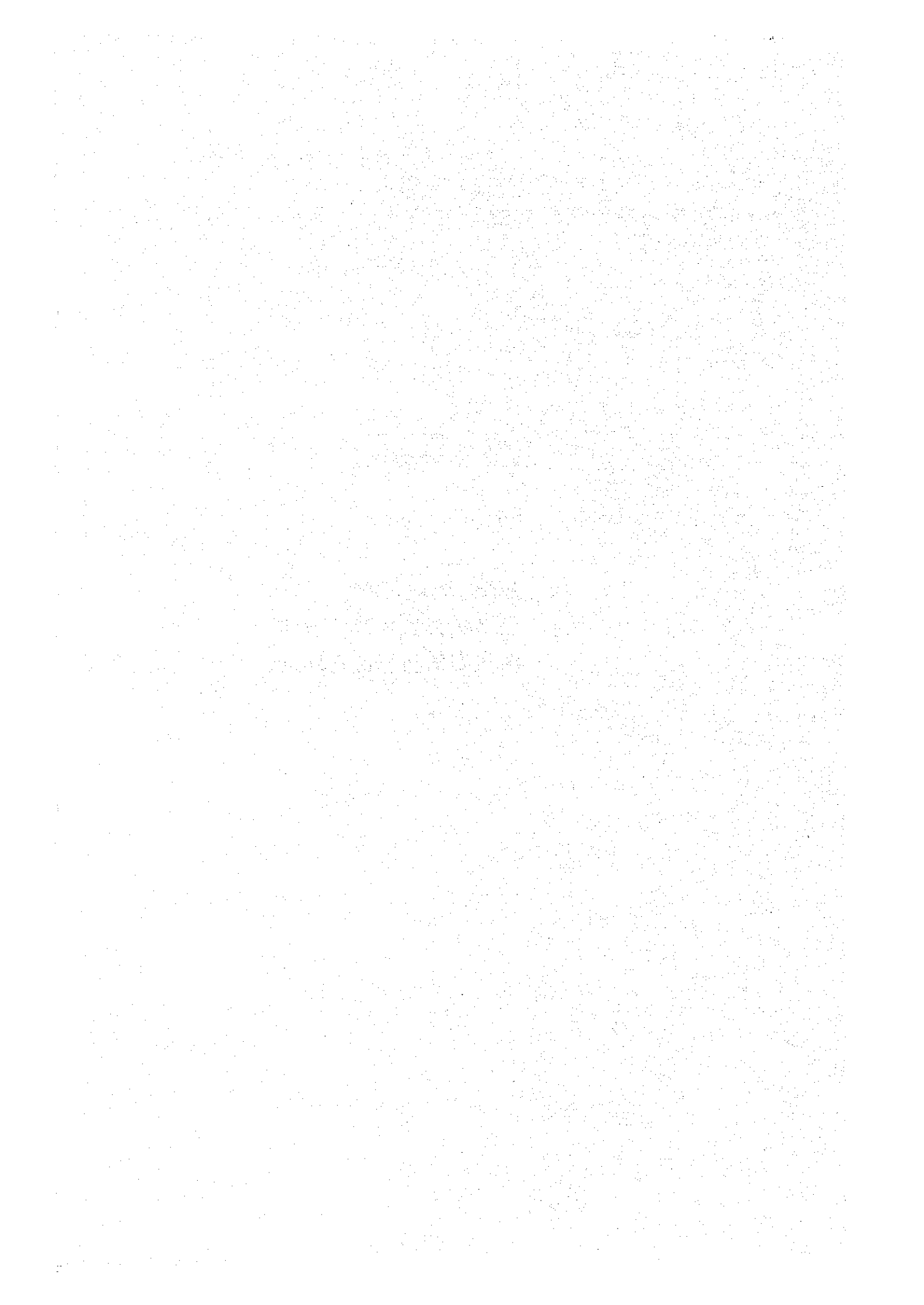
On the other hand, it is not recommendable to procure materials from Japan when they are not compatible with products used commonly in Tonga on the occasion of the repair and replacement. Examples of such materials are window frames, galvanized steel sheet for roof thatching, lighting apparatuses, piping, etc.

As for the method to transport materials from Japan, once a month there is a regular service to Suva (Fiji). As for the transportation from Suva to Tongatapu and further to Vava'u, there are several

services a month run by the Pacific Forum Line, Union Maritime Services, Shipping Corporation of Polynesia Ltd., etc. Vava'u, the project site, is provided with an international port with 7 m water depth, and accordingly depending on the circumstances it is possible to consider the direct transportation of the materials without transit via Tongatapu.

CHAPTER 6

EVALUATION, CONCLUSION AND RECOMMENDATION



Chapter 6

EVALUATION, CONCLUSION AND RECOMMENDATION

6-1 Evaluation of the Project

Methods applied in the case of ordinary projects are not appropriate in the case of educational facilities. Consequently, the evaluation of the project is carried out by making an analysis of the pertinence of its targets. It is presumed that this project will bring effects in the (1) educational level, (2) regional level and (3) national level.

(1) Effects of Educational Level

- 1) Upgrading of the scholastic attainments of the secondary school students of Vava'u.
- 2) Elimination of the unbalance in the educational level (the unbalance referring to the number of public schools and the number of students will practically be eliminated).
- 3) Establishment of the first secondary education organ in Vava'u.
- 4) Unification of the contents of education.
- 5) Expansion of the scope of administration of the Ministry of Education as a result of 3) and 4). (The new school will accommodate approximately 20% of the students of Vava'u).

(2) Effects of Regional Level in Vava'u

- 1) Fostering of medium grade manpower for promotion of the projects for regional development.

- 2) Creation of more employment. (Principally in jobs related to construction).
- 3) This project will contribute to the activation of the local society and economy as a result of the aforementioned facts. (This effect is expected to be particularly conspicuous in this remote island which has had so far a small scale economical activity).

(3) Effects of National Level in Tonga

- 1) Contribution to the fostering of talented men in Tonga (one of the targets of this school is to bring it in line with the educational level in overseas countries).
- 2) Materialization of the most important theme of the current development plan in the educational field.
- 3) Contribution to the social and economical development as a result of the foregoing.
- 4) Contribution to prevent the demographic migration from Vava'u to Tongatapu (students, parents and workers).
- 5) Contribution to a balanced national service

It is possible to make a rough quantization of some of the above items. For example, the creation of more employment is expected to contribute to prevention of the demographic drainage, and an increase the number of students passing various examinations is measurable. However, this kind of evaluation is subject to considerable errors. Therefore, the essential effects of this Project cannot be discussed in quantitative terms only.

All of the aforementioned facts are in accordance with the targets

of the policy of the Government of Tonga. Accordingly, these targets are compatible with the various projects and plans that are being set forth at the present time.

The aid provided by Japan for construction of a primary school, which was successfully completed in 1979, is one of the backgrounds which led the Government of Tonga to request this aid Project to the Government of Japan. The Government of Tonga considers that the implementation of education development aids of this kind is particularly meaningful.

It is expected that the careful implementation of the project and operation of the school will contribute to attain further effective results, in view of the social and economical activities in the Vava'u Island.

It is concluded that the implementation of this Project is pertinent both for Tonga and for Japan.

6-2 Conclusion

The highest educational institutions of the Kingdom of Tonga have been so far the Tonga High School and the Tonga College located in Tongatapu Island. This project is aimed at setting up a public school of the same level in Vava'u Island. It can be considered an epoch-making feat, in view of the eagerness of the Tongan people regarding the education of their children.

The problems related to the implementation of this project are as follows.

- The variety of the commodities produced in this area is limited
- Ocean transportation cost is expensive
- Skilled construction workers are rare
- Work supervision capacity is not sufficient

However, it is not impossible to solve these problems.

The implementation of this project was wished earnestly, from the points of view of both the national policy and the people's livelihood. It is concluded that the aid provided by this Project can be evaluated very highly, as a result of the analysis of the relevant factors. It is recommended that the Japanese Government start the aid as soon as possible.

6-3 Proposition

We suggest to the Ministry of Education of Tonga that an Executive Committee in charge of implementation of the Project be set up as soon as possible in order to effect its earliest completion. As for the members of the said Executive Committee, it is recommended to include the future principal of the Vava'u High School, the technical personnel of the Ministry of Construction and the Vava'u Area Organizer of the Ministry of Education. The Executive Committee shall undertake the following jobs, in order to prepare the ground for a smooth implementation of the Project.

- (1) Measures related to ensure a budget to cover the investments to be provided by the Government of Tonga (preparation work such as ground levelling, etc., and recruiting of the personnel required for the time being).
- (2) Presentation of any guarantee provision for funds required after the start of operation of the high school.
- (3) Preliminary negotiations with authorities related to the subject in order to make possible a smooth implementation of the Project.
- (4) In the beginning, this project was planned by assuming to construct the building and procure equipment step by step in accordance with the number of students, reaching full capacity in 1985, five years after the start of operation of the Vava'u High School. However, in this new version of the Project, the building will be completed in 1985, with capacity for full scale operation. Such being the case, the Tongan Authorities are requested to urge the recruiting

of teachers and procurement of teaching materials, in addition to negotiations with schools operated by the churches, referring to mutual cooperation with them, acceptance of their students, etc., in order to make possible the most effective operation of the new Vava'u High School.

CHAPTER 7


REFERENCE DATA

Minutes of Discussion
on
The Establishment of the Vava'u High School
in the Kingdom of Tonga

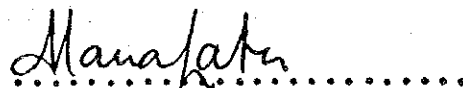
In response to the request made by the Government of the Kingdom of Tonga for the Establishment of the Vava'u High School in Vava'u (hereinafter referred to as "The Project"), the Government of Japan has sent, through Japan International Cooperation Agency (hereinafter referred to as "JICA"), a team headed by Mr Takeshi KOMORI, staff in charge of Basic Design of Grant Aid Department, JICA, to conduct a basic design study for 18 days from December 6th, 1982. The team carried out a field survey, held a series of discussions and exchanged views with the authorities concerned.

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

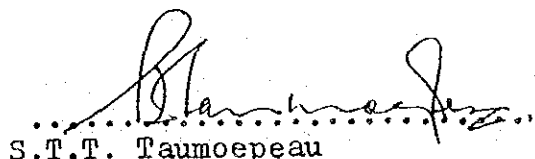
December 15, 1982



Takeshi, KOMORI
Leader
Japanese Survey Team



Mana, LATU
Acting Director of Education
Ministry of Education



S.T.T. Taumoepeau
Secretary for Foreign Affairs
Ministry of Foreign Affairs

ATTACHMENT

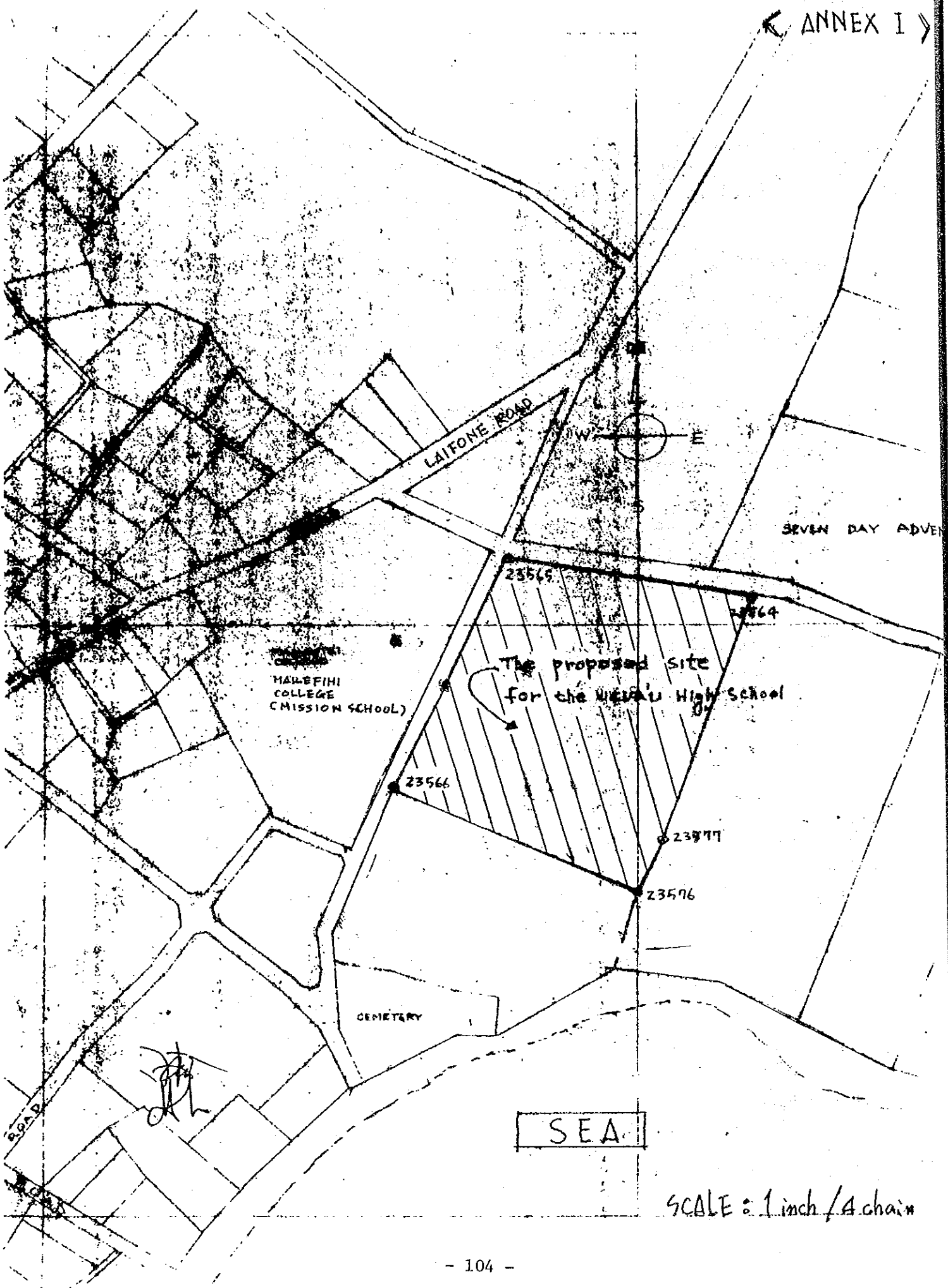
1. The objective of the Project is to provide necessary buildings and equipments for the establishment of the Vava'u High School (hereinafter referred to as "the School").
2. The proposed site of the Project is the land acquired by the Government of the Kingdom of Tonga. The site is twenty five yards away from the main road (Laifone Road) through the main township of Neiafu.
The project Site is shown in Annex I.
3. The School will undertake its activities with following basic objectives:
 - (1) Make quality education as found in the two existing government high schools readily available to the people of Vava'u.
 - (2) Improve the quality of secondary education in Vava'u.
 - (3) Increase the number of secondary school places and thereby meet the demand for more facilities at this level.
 - (4) Establish a government Form 1-7 High School in Vava'u with a target roll of 500.
4. The Japanese Survey Team will convey to the Government of Japan the desire of the Government of the Kingdom of Tonga that the former takes necessary measures to co-operate in implementing the Project and provides the building in Annex II and other items listed in Annex III within the scope of Japanese economic cooperation programme in grant form.
5. The Government of the Kingdom of Tonga explained its desire for additional two official houses to accommodate the principal and the vice principle of the School within the school compound as follows:
 - (i) It is most desirable for the Principal and his

deputy to reside in the school compound to look after the buildings and facilities so that they could manage the school more efficiently.

- (ii) It is most likely that the school facilities will be used also at night and for certain community activities.
 - (iii) The beauty of the plan is likely to be affected if these two structures are not part of the total plan even if built separately.
 - (iv) It is a normal practice with schools of this type for the two most senior officers to be residential especially with Tonga being prone to suffer from natural disasters such as earthquakes and tropical hurricanes.
6. The Government of the Kingdom of Tonga will take necessary measures listed in Annex IV on condition that the grant assistance by the Government of Japan is extended to the Project.
7. Both sides confirmed that Japanese Survey Team explained Japan's Grant Aid Programme and Tonga side understood it.



ANNEX I



SEA

SCALE : 1 inch / 1/4 chain

ANNEX II

Building Component

(a) Administration

- . 1 Principal's office
- . 1 Deputy Principal's office
- . Staffroom for 25 staff members
- . Other subsidiary rooms

(b) Library/Resource Unit

- . Library
- . Librarians' office
- . Workroom/Stockroom

(c) General Classrooms

- . 16 classrooms each with one small store room and office

(d) Specialist Classrooms

- . 2 Laboratories for General Science and Advanced Science with annex.
- . 1 Preparation Room with stores serving all laboratories.
- . 2 Craft rooms for metal and wood works
- . 1 store and raw materials delivery
- . 1 Small Tool Room
- . 1 Home Economics Unit comprising of Kitchen, Sewing and Laundry.
- . 1 Business Studies Room

Handwritten initials/signature

(e) Hall

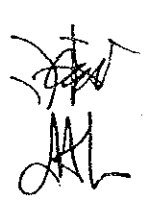
- . multi-purpose hall (for assembly, basketball, badminton etc.)

(f) Toilets

ANNEX III

Equipments List with Priority Order

(Section)	(Equipment Item)	(Priority)
1. Library	book rack	A
	chair	A
	information counter	B
	desk	A
	index cabinet	B
2. Laboratories	laboratory bench	A
	black board (movable)	B
	storage case	B
	sink and taps	A
	work table and stool	B
	Display wall board	B
	Gas system for burners	A
Science equipment and chemicals	A	
3. Industries		
(1) Wood Work		
	Work table	A
	black board (movable)	B
	stool	A
	fret saw	A
	circular saw	A
	lathe	A
	storage cabinet	B
	electric plane	A
	lavatory	B
	shelf	B
(2) Metal Work		
	work table	A
	black board (movable)	B
	stool	A
	vise	A
	unit base	A
	grinder	A
	lathe	A
	ball machine	A
	hearth	A
	welding set	A

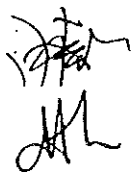


(Section)	(Equipment Item)	(Priority)
	lavatory	B
	Shelf	B
	storage cabinet	B
4. Home Economics		
(1) Laundry	washing machine	A
	sink	A
	iron	A
	iron board	A
	storage cabinet	B
(2) Sewing	cutting table	A
	work table	A
	teacher's table	B
	sewing machine (Elect.Hand)	A
	storage cabinet	B
(3) Kitchen	cooking table	A
	kitchen (Gas, Kerosene Stove, sink)	A
	cupboard	B
	cleaning locker	B
(4) Common	black board (movable)	A
	stool	A
5. Business Study	typewriter	A
	typewriter desk and chair	A
	filing cabinet	A
	desk and chair	B
	cabinet	B
	black board	B
6. Hall	basketball board set	A
	basketball	A
	badminton net & pole	A
	badminton cock	A
	badminton racket	A
	gymnastic tools	A

ANNEX IV

Following arrangements are required to be taken by the Government of the Kingdom of Tonga:

1. To secure a lot of land necessary for the construction of facilities and to clear, fill and level the site as needed before the start of the construction.
2. To provide facilities for distribution of electricity, telephone, water supply and drainage and other incidental facilities outside the Building.
3. To ensure prompt unloading, tax exemption, customs clearance at ports of disembarkation in Tonga and prompt internal transportation therein of the products purchased under the grant.
4. To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Tonga with respect to the supply of the products and the services under the verified contracts.
5. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into Tonga and stay therein for the performance of their work.
6. To maintain and use properly and effectively that the facilities constructed and equipment purchased under the grant.
7. To bear all the expenses, other than those to be borne by the grant, necessary for the construction of the facilities as well as for the internal transportation of the products and services under the grant.
8. To undertake incidental civil works such as planting and fence, if needed.



Members of the Survey Team

Leader	Takeshi KOMORI	Japan International Cooperation Agency (JICA), Grant-in-Aid Department
Planning	Kenji FUKUNAGA	Fukunaga Architects & Engineers
Architecture	Masayuki ASABUKI	- ditto -
Facilities & Equipment	Haruhiko ISHIGAKI	- ditto -

Itinerary

Day	Date (Day of week)	Itinerary	Contents of Survey
1st	Dec. 4th (Sat.)	Leaving Tokyo	
2nd	Dec. 5th (Sun.)	Arriving at Auckland	
3rd	Dec. 6th (Mon.)	Arriving at Tongatapu Visit to the Ministry of Education	Explanation of the Inception Report to the Ministry. Explanation of the contents of the request by the Ministry.
4th	Dec. 7th (Tue.)	Tonga High School → Teacher Training School → → Tonga College → Ministry of Education → Houma Primary School	Inspection of schools (classroom size, construction material, facilities, equipment & materials, teaching curriculum). The Ministry of Education agreed on the Inception Report. Arrangements for obtainment of data & information. Request of construction of residence in the site.

(to be continued)

Day	Date (Day of week)	Itinerary	Contents of Survey
5th	Dec. 8th (Wed.)	Leaving Tongatapu, arriving at Vava'u Visit to the Project site	Confirmation of the location and configuration of the site and state of things of the infrastructure.
6th	Dec. 9th (Thu.)	Project site/Vava'u District office of the Ministry of Education	Surveying/Questionnaire survey of the state of thing of the education in the Vava'u Island.
7th	Dec. 10th (Fri.)	Two construction sites→ Regional office of the Ministry of Construction → Water Supply Board→ Power Supply Board→ Neiafu Port Facilities	Construction companies, construction capacity, term of delivery, construction cost, construction materials, wage, supply of water, supply of power.
8th	Dec. 11th (Sat.)	Vava'u Neiafu Port→ Copper Island→ Neiafu Port	Inspection of the state of things of the education in distant islands.
9th	Dec. 12th (Sun.)	Discussions in Tonga, preparation of the Minutes draft.	
10th	Dec. 13th (Mon.)	Leaving Vava'u, arriving at Tongatapu. Visit to the Ministry of Education/Ministry of Land Survey & National Resources	Minute discussion/Confirmation of the Project site map and acquisition of land.
11th	Dec. 14th (Tue.)	Ministry of Education→ Publishing Division of the Tonga Government→ Statistics Division of the Tong Government→ Ministry of Works	Minutes discussions, data & information gathering, request of the data & information related to the construction.
12th	Dec. 15th (Wed.)	Ministry of Education→ Ministry of Foreign Affairs	Minutes signature, discussions in Tonga.
13th	Dec. 16th (Thu.)	Ministry of Land, Survey & Natural Resources → Ministry of Works	Request of detailed surveying of the site, investigation of the geology and construction standards.
14th	Dec. 17th (Fri.)	Ministry of Education→ Ministry of Construction→ Central Planning Board→ Ministry of Works	Confirmation of the course and other aspects of students that completed the high school. Collection of data & information. Vava'u Development Project.

(to be continued)

Day	Date (Day of week)	Itinerary	Contents of Survey
15th	Dec. 18th (Sat.)	Shipping company→ Bookstore	State of things of the transportation & freight, collection of teaching materials/ Preparation of the basic draft.
16th	Dec. 19th (Sun.)	Previous arrangements in Tonga	Preparation of the basic project draft.
17th	Dec. 20th (Mon.)	Ministry of Works→ Visit to construction sites → Ministry of Education	Two construction sites, one building constructed with foreign aid, prefabricated yard, inspection of a stone pit, discussion on the basic project draft.
18th	Dec. 21st (Tue.)	Ministry of Education→ Newspaper Division→ Meteorology Division→ Ministry of Works	Discussions on the basic project draft, collection of design data.
19th	Dec. 22nd (Wed.)	Ministry of Education/ Tonga College	Discussion on the basic project draft, inspection of materials & equipment.
20th	Dec. 23rd (Thu.)	Leaving Tongatapu, arriving at Suva	Visit of courtesy and report to the Japanese Embassy.
21st	Dec. 24th (Fri.)	Leaving Suva, arrival at Nandi	
22nd	Dec. 25th (Sat.)	Leaving Nandi, arrival at Tokyo	

List of Interviewed Persons

Mr. Maa'fu Tupou	Vava'u Governer	
Mr. John Kite	Acting Secretary to Government	
Mr. George Aho	Secretary to Cabinet	
Mr. S.T.T. Taumoepeau	Secretary for Foreign Affairs	(Ministry of Foreign Affairs)
Mr. Paula Bloomfield	Director of Education	(Ministry of Education)
Mr. Mana Latu	Senior Education Officer (incharge)	
Mr. Kite Keiaho	Vava'u Area Organizer	
Mr. Siua Helu	Senior Inspector	
Mr. Simi Tekiteki	Principal of Tonga High School	
Mr. Ikani Fifita	Vice Principal of Tonga High School	
Miss Ana Taufe'ulungaki	Principal of Tonga College	
Mr. Visesio Pongi	Vice Principal of Teacher Training College	
Mr. Melio Kupu	Teacher of Tonga College (Industrial)	
Mr. Hemani Ofa	Principal of Falevai Primary School	
Mr. David S. Keith	Director of Works	(Ministry of Works)
Mr. Sione Taumoepeau	Assistant Director	
Mr. David Allbury	Quantity Surveyer	
Mr. Garry Prince	Senior Draughtman	
Mr. Sione Naa'lemoto	Land Valuer	(Ministry of Land, Survey and Natural Resources)

Mrs. Ilaisaane Pongi	Acting Government Statistician	(Statistics Board)
Mr. Paul Lavulo	Acting Director of Planning	(Central Planning Board)
Mr. Palei Kolotau	Local Manager of Vava'u	(Tonga Electricity Power Board)
Mr. Sione Lousi	Local Manager of Vava'u	(Tonga Water Supply Board)

Results of the Geological Analysis of the Project Site

Geological samples of the Project site were collected and submitted to analysis in Japan aiming at obtaining data for design of the foundation.

1. Contents of the Tests

Tests referring to the following items were carried out, in view of the available quantity of the sample.

- | | |
|-------------------------------|------------|
| - Moisture content ratio test | JIS A 1203 |
| - Specific gravity test | JIS A 1202 |
| - Plasticity test | JIS A 1205 |

(Color - yellowish brown)

2. Results of the Tests

- | | |
|--|-------|
| - Limit of plasticity | 43.5% |
| - Specific gravity | 2.9 |
| - Water content in percent of dry weight | 53% |

Test of Water Content in Percent of Dry Weight

$$W_n = 52.9\%$$

Generally speaking, soils containing less than 20% of moisture belong to the sandy type family, while those ones containing more than 40%-50% of moisture belong to the clayey type family (clay & silt). In particular the Kanto loam contains approximately 100% moisture and soils of organic nature have more than 200%.

The results of the tests indicate that the sample in question contains 52.9% and accordingly it is presumed to belong to the clayey soil

family. Nevertheless, the water content in percent of dry weight presents pronounced variations depending on the conditions of the sample, its state of conservation, etc. This sample is presumed to have suffered considerable changes because it was tested several days after being collected, and furthermore it was conserved in a plastic film cylindrical container. If the loss is assumed to be of the order of 40%, its water content in percent of dry weight becomes of the order of 74%, a value close to that one of the Kanto loam which is also a clayey soil.

Specific Gravity Test

$$G_s = 2.897$$

The value of the specific gravity in most of the soils is of the order of 2.65, with few variations. When the specific gravity is smaller than 2.65 the sample is presumed to contain organic matter and on the other hand, when it is larger the sample is presumed to contain much iron. The specific gravity of this sample is rather and accordingly it is appropriate to presume that it contains iron. In other words, it belongs to the family of volcanic rocks.

In the case of the Kanto loam the specific gravity is larger than other types of soil and is contained within the limits of 2.7 to 2.9 and this is an important peculiarity. The specific gravity of 2.897 of the soil sample collected at the project site suggests that it is similar to the Kanto loam of Japan.

Plastic Limit Test

$$W_p = 43.5\%$$

When the water content in percent of dry weight becomes lower than the limit of plasticity, the soil becomes brittle, cracks break out with ease and the soil does not deform freely any more. In other words, it is the limit where the soil changes from the plastic state to the semi-solid state. Generally speaking the limit of plasticity is of the order of 30% to 50% in the case of the Kanto loam. The

results of the test indicate that the sample in question is contained within the aforesaid limits, and accordingly it is presumed to belong to the Kanto loam family. The limit of plasticity is of the order of 10% to 30% in most of the alluvium silt layers.

Japanese Unified Classification

It is not possible to make a clear judgement without carrying out the liquid limit test. Nevertheless, the sample in question is classified as V (volcanic ash clayey soil), judging from the color, feel and visual appearance.

According to the empirical appearance, the name of the sample in question is clayey silt.

3. Soil Name

Data and information referring to the sample are insufficient as can be seen from the foregoing. Nevertheless, in view of our experience, it is presumed to be a material similar to the Kanto loam (volcanic ash clayey soil) of Japan.

Nature of the Soil

This is the type of soil widely distributed in the plateaus of the Kanto region in Japan. It is a soil with special prosperities in spite of the low value of the N. The Kanto loam has a large void ratio of the order of 3 to 4 and a large water content in percentage of dry weight of the order of 100%. The unit weight is small due to the large void ratio, and the specific weight of the soil particle itself is relatively large because it contains large amounts of heavy minerals. It has a large pre-loading and is in overconsolidated state due to the development of the skeleton texture. Furthermore, it has a large viscosity and at the same time there is internal friction and consequently it presents properties of both clay and sand. Such being the case, it is used as bearing layer of light

weight buildings, and the obtained bearing power is contained within the limits of the order of 5 to 15 t/m², depending on the area.

4. Estimation of the Value of the Bearing Power

The value of the bearing power is calculated, by assuming that sample submitted to the test is similar to Kanto loam of Japan.

4-1 Calculation Formula

$$q_a = \frac{1}{3} (\alpha \cdot C \cdot H_c + \beta \cdot \gamma_1 \cdot B \cdot N_r + \gamma_2 \cdot D_f \cdot N_q) \text{ t/m}^2$$

where;

$\alpha \cdot \beta$: Shape factor

C: Cohesion (t/m²)

B: Foundation width (m)

$\gamma_1 \cdot \gamma_2$: Unit weight of the soil (t/m³)

Df: Penetration effect (m)

$N_c \cdot N_r \cdot H_q$: Function of the angle of internal friction

4-2 Estimation of the Various Values, Value of the Bearing Power

- Cohesion (Estimation to the safety side)

$$C = 3 \text{ t/m}^2$$

- Angle of internal friction

$$\phi = 5^\circ$$

therefore;

$$N_c = 5.3$$

$$N_r = 0$$

$$N_q = 3.4$$

Consequently the second term of the calculation formula becomes zero.

- Unit weight of the soil

$$\gamma_2 = 1.2 \text{ t/m}^2$$

- Penetration effect

$$D_f = 1.0 \text{ m} \quad (\text{Estimated value})$$

- Shape factor

$$\alpha = 1.3 \quad \text{Independent foundation}$$

$$\begin{aligned} q_a &= \frac{1}{3} (1.3 \times 3.0 \times 5.3 + 0 + 1.2 \times 1.0 \times 3.4) \text{ t/m}^2 \\ &= 6.86 + 1.36 \\ &= 8.22 \text{ t/m}^2 \rightarrow 8 \text{ t/m}^2 \end{aligned}$$

JICA