CHAPTER 3 CONDITIONS OF PROJECT AREA

3-1 General Condition of the Site

3-1-1 Location and Conditions of Periphery

The Philippine Normal College is located at the central urban area of Manila at the intersection of Taft Avenue (40m wide) and Ayala Boulevard (25m wide). Rizal Park, Manila City Hall, National Museum and Ministry of Finance are situated in the vicinity. Pasig River runs about 0.4 km north of the college, separating Manila's old town from its new town. About 1.5 km upstream, Malacañang Palace, the official residence of the President of the Philippines, is located. Taft Avenue is one of the arteries which run through Metropolitan Manila from north to south. At present, monorail transit systems which will link Baclaran with the city of Caloocan is under construction along Arroceros Street. Ayala Boulevard which connects Malacañang Palace with Roxas Boulevard along the coast line of Manila Bay is known for its roadside trees. The traffic of limousines carrying Philippine Government officials and prominent Filipinos and foreigners is brisk. Located on the other side of Pasig River is a commercial zone, where nearby there are many universities and colleges, and the traffic of vehicles and people is significantly brisk.

The site is approximately 42,000sq m(including about 8,000sq m for a domitory). The site faces Taft Avenue in the east, with Ayala Boulevard in the east and Arroceros Street in the west. On most of its northern side, it lies contiguous to the YMCA. In the southern corner of the city block in the east across Ayala Boulevard, the site of the domitory (known as the Normal Hall) is situated. It lies adjacent to the Technological University of the Philippines in the north. (Fig. 4-1)

The city of Manila lies on a virtually flat alluvian layer and the site is near to the estuary of Pasig River about at 1.5 m above sea level. Most of the roads are paved with asphalt but in a heavy rainfall, the area is flooded about 50 cm on rare occasions due to poor drainage system.

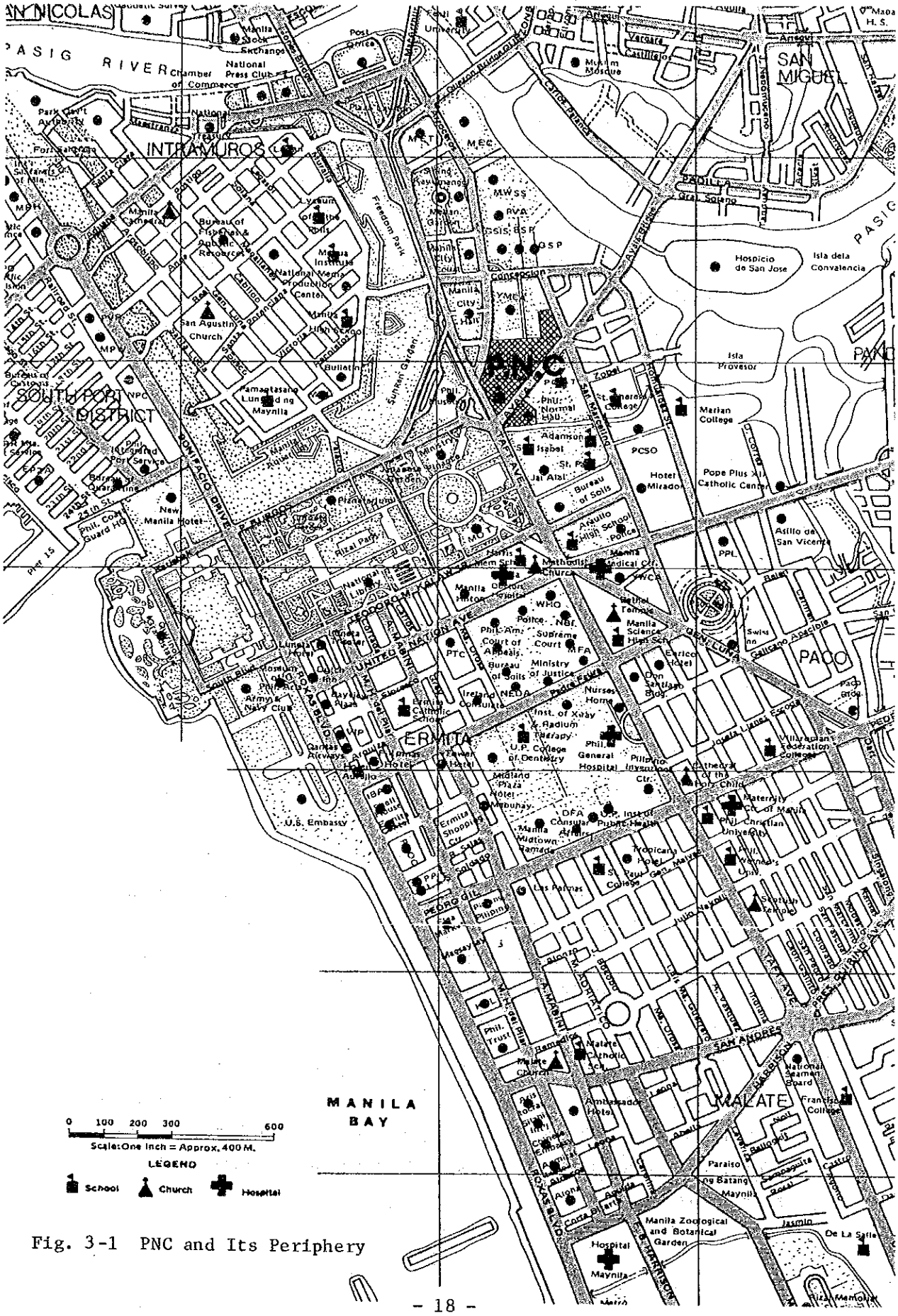
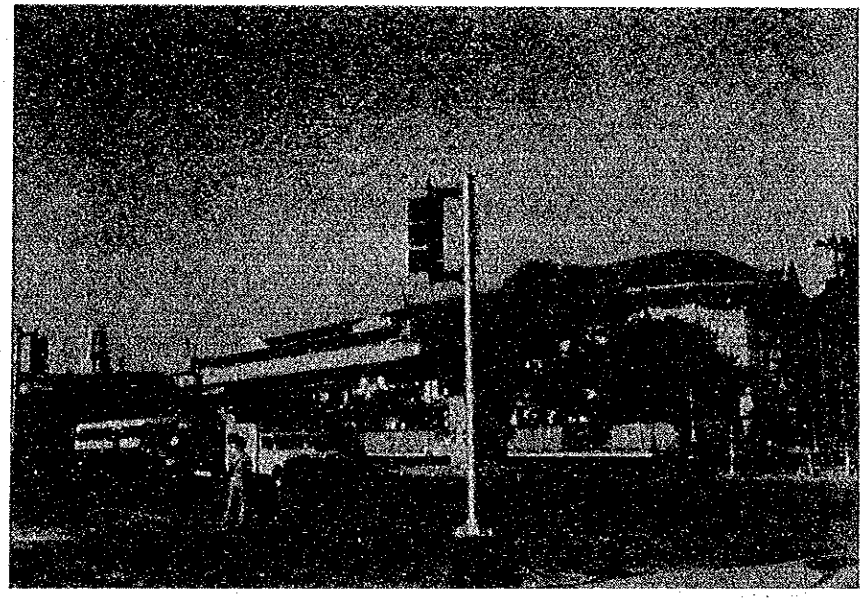
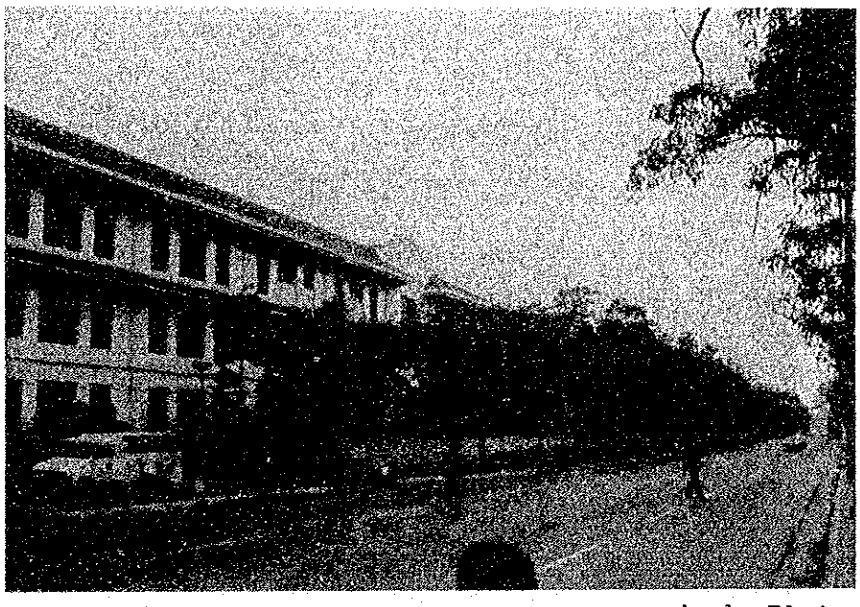


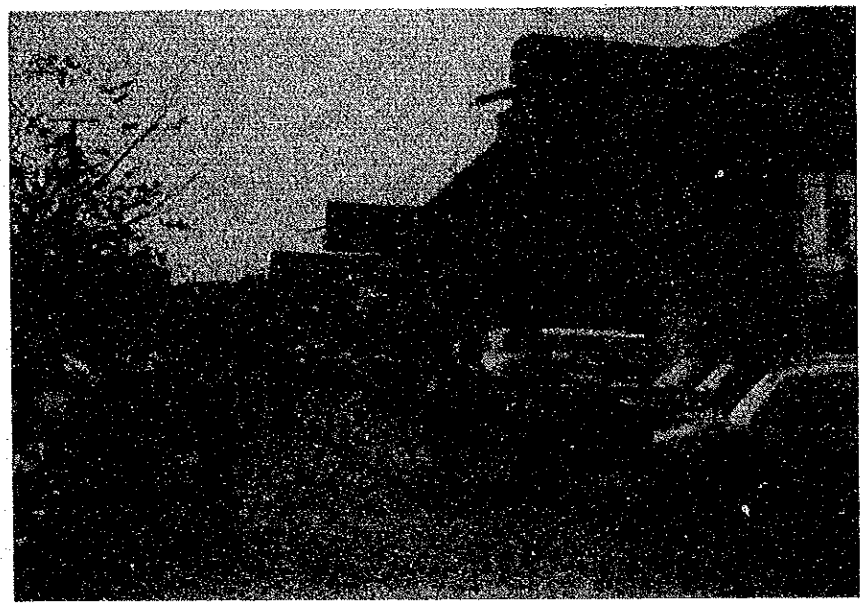
Fig. 3-1 PNC and Its Periphery



Taft Avenue



Ayala Blvd.



Arroceros St.

San Marcelino St.

3-1-2 Present Situation of the Site

East side of the site along Ayala Boulevard is approximately 310m , south side along Taft Avenue is 120 m and west along Arroceros Street 130 m. Except triangular portion of the site along San Marcelino Street, the land is almost square or trapezium.

The site is practically flat and there is virtually no difference in height between it and its peripheral roads. On the campus, 20 buildings are dotted to enclose a playground, and the campus is fenced by concrete block walls studded with bricks. For the access to the site, the main gate to the main building at the intersection of Taft Avenue and Ayala Boulevard, a service gate close to San Marcelino Street (facing the high school) and another service gate on Arroceros Street facing the gym are used. (Fig. 3-2, Table 3-1)

Subtropic evergreen trees are planted almost every area on the campus. In particular, the Narra trees planted along the northern edge of the playground are magnificent. The trees planted in the front yard on the side of Ayala Boulevard are also beautiful. Most of the playground is turfed.

The Spanish roofing tiles and the molded external walls of the main building (constructed in 1910) and the Laboratory School Building (1924) along Taft Avenue and Ayala Boulevard offer fine spectacles along with the roadside trees of Ayala Boulevard.

On the other hand, as regards the renovation of the existing facilities, some of them are under progress and improvements are gradually going on. But these efforts are not sufficient.

The future program includes:

(1) Demolishing of the office (3) and transfer of administration section, rearrangement of classrooms in the main building (1) after completion of the new office building (24).

(2) Repair and expansion of the high school classrooms after completion of construction of classrooms (13).

(3) Upon completion of construction of the new library building the existing temporary library rooms which sporadically exist

in the main building (1) and the laboratory school building (5) shall be utilized as classrooms, as before.

(4) The curriculum library center (23) shall be remodelled into home economics laboratory classrooms.

This would result in more space for classrooms and expanded enrollment which at present is kept down to correspond to available space for instruction.

Consequently, even though there might be some other expansion and replenishment work of the campus facilities, there is no fear of overall removal program to be proposed again.

In selecting the site under this project, it would seem the most advisable to demolish and remove the six buildings which are adjacent to the north side (facing Ayala Boulevard) of the laboratory school building in view of their deterioration, as practically the entire part of the periphery of the site is surrounded by streets. Once a new building is constructed there, the landscape of the area facing Alaya Boulevard would become all the more striking.

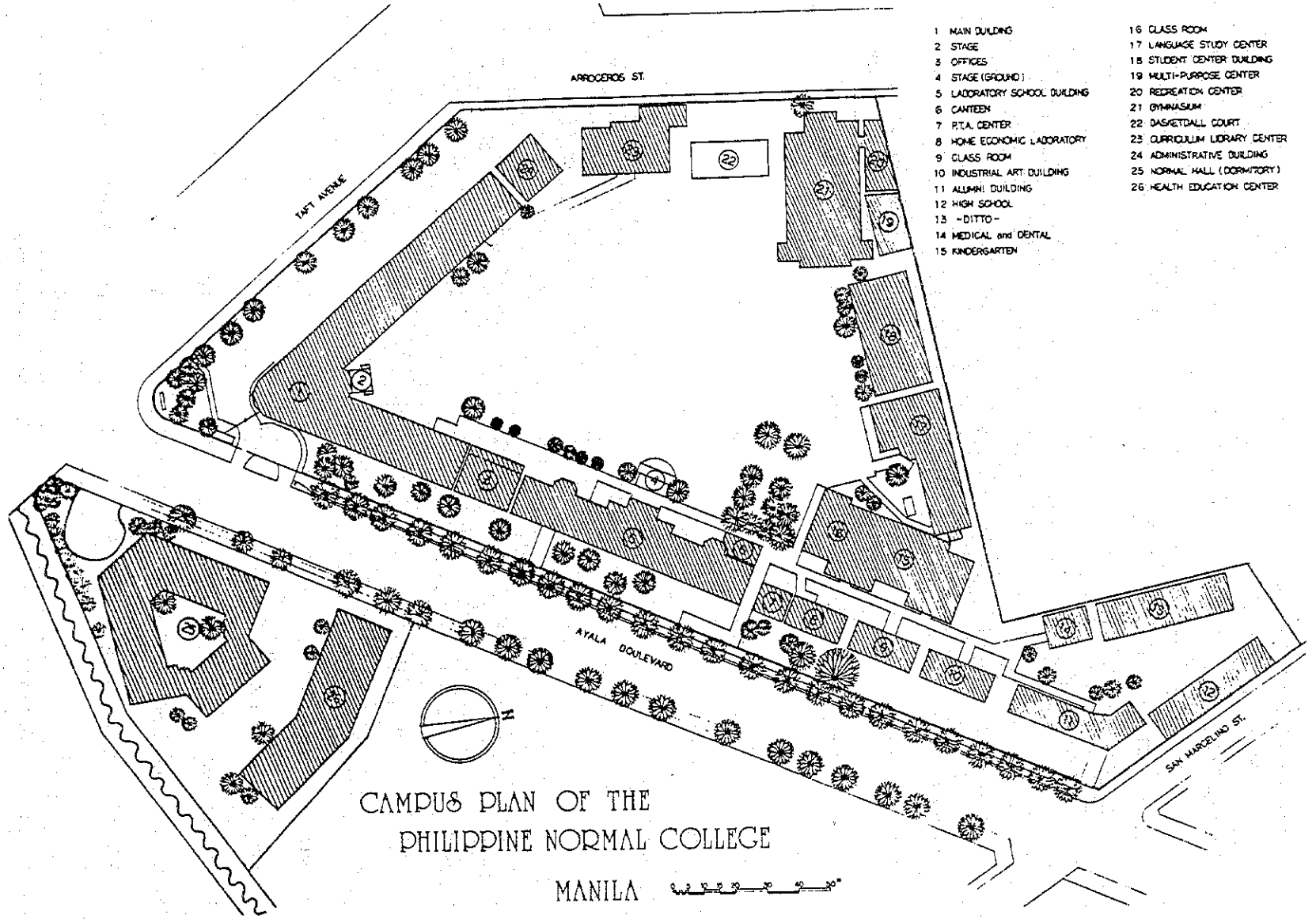


Fig. 3-2 Existing Site Plan

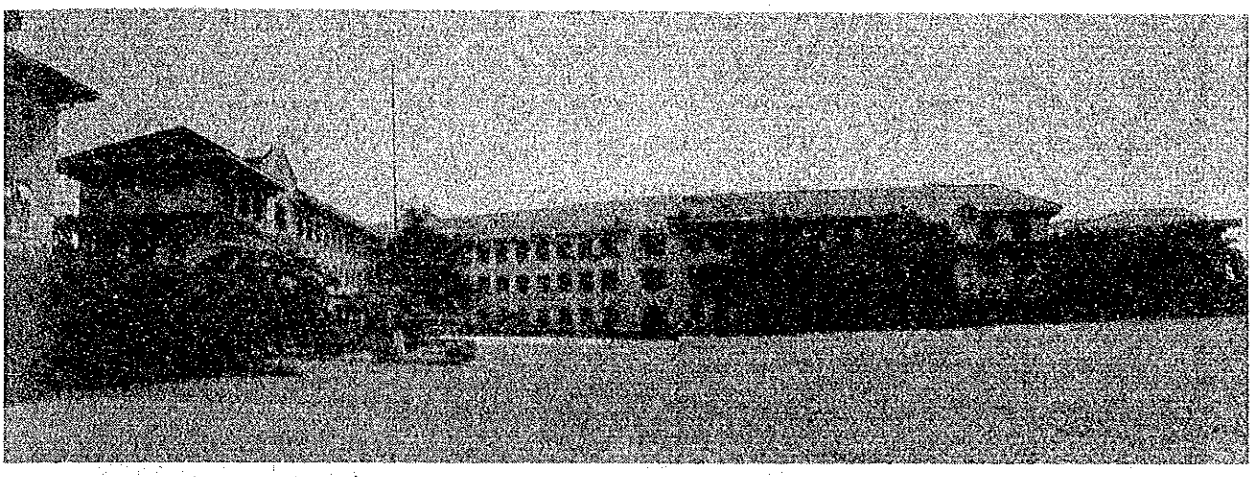
The existing buildings at the site are outlined below:

Table 3-1 List of Existing Buildings on the Campus

Name of building	Number of floors	Structure	Floor area (sq m)	Remarks
1. Main Bldg.	3	RC	6,204	
3. Office	1	W	198	Planned to be demolished
5. Laboratory School Bldg.	3	RC	2,885	
6. Canteen	1	W	83	
7. P.T.A. Center	1	W	84	Planned to be demolished this time
8. Home Economics Laboratory	2	W/RC	362	"
9. Classroom	1	W	196	"
10. Industrial Arts Bldg.	2	W/RC	464	"
11. Alumni Bldg.	2	W/S	679	
12. High School	1	W	804	Not utilized
13. "	2	RC	981	Partly utilized with the rest under construction
14. Medical and Dental	2	RC	335	
15. Kindergarten	1	W	450	Planned to be demolished this time
16. Classroom	1	W	160	"
17. Language Study Center	3	RC	3,188	
18. Student Center Bldg.	2	RC	1,321	
19. Multi-Purpose Center	1	S	177	
20. Recreation Center	2	RC	211	
21. Gymnasium	2	S	1,310	
23. Curriculum Library Center	2	W	852	
24. Administration Bldg.	3	RC	900	Under construction
Total			21,844	

Note: 2,4, ... Outdoor stage
22 ..... Basketball court

W .... Wooden structure
S .... Structural steel
RC ... Reinforced-concrete



Campus (South Side)
From left to right, the main building (1), and the office building (24) (under construction)

Campus (on the side of the project area)
From left to right, the Language Study Center (17), the Classroom Building (16), the Home Economics Laboratory (8), and the Laboratory School Building (5).

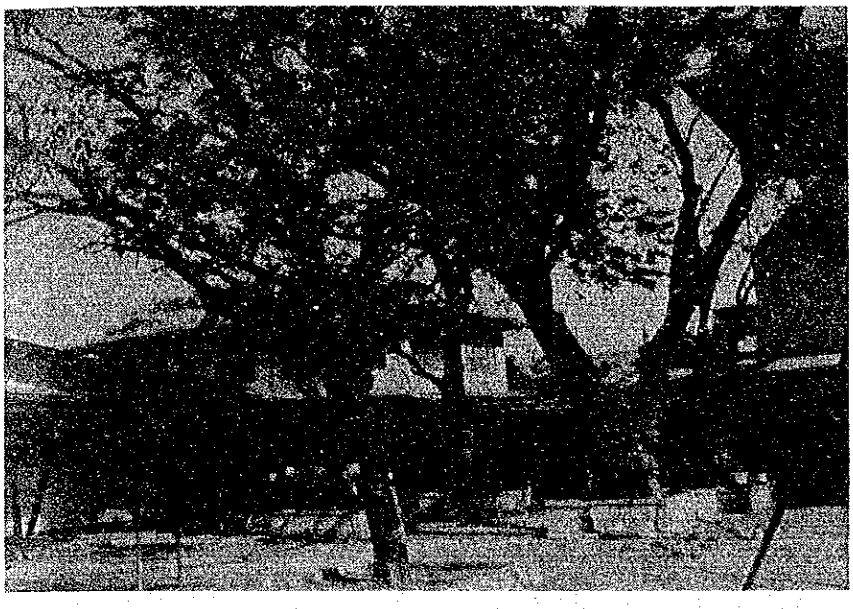
3. Office
(viewed from the front yard facing Alaya Blvd.):
The office building (3) (right)
The main building (1) (left).

6. Canteen:

Connecting corridor (front) and the Laboratory School Building (5) (back)

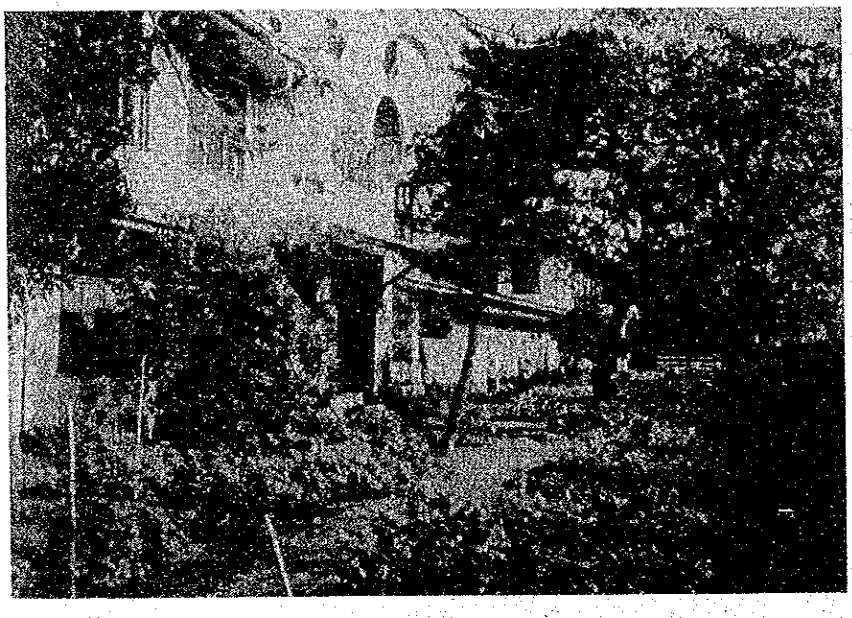
7. PTA Center

(viewed from front yard facing Ayala Blvd.):
The Laboratory School Building (5) (left)
The Home Economics Laboratory (8) (right)

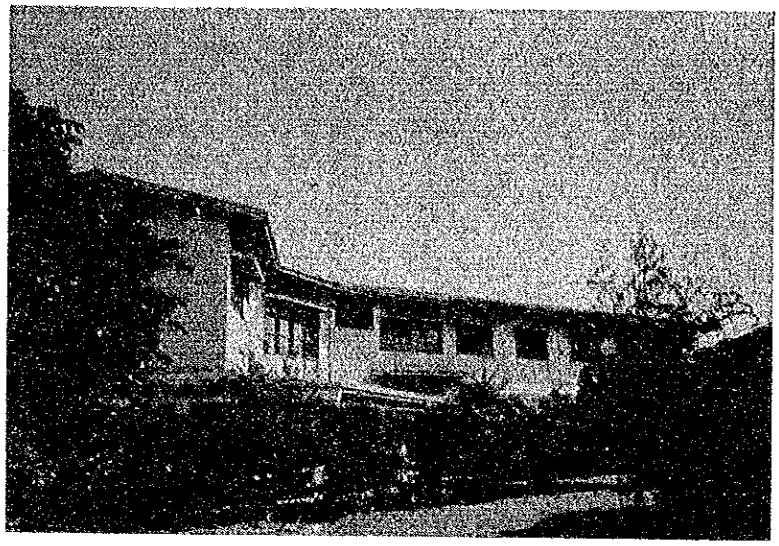


8. Home Economics Laboratory Building:

Classroom Building (16) (left) and Laboratory School Building (5) (right)



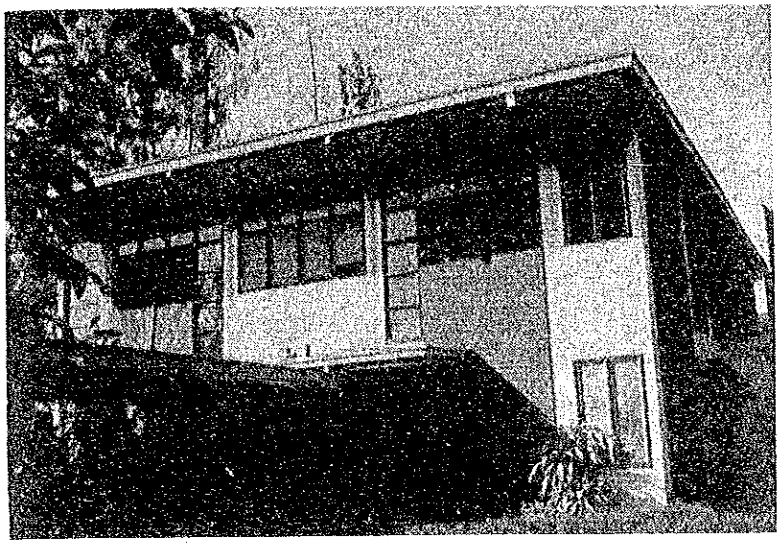
From left to right, Home Economics Laboratory Building (8), Classroom Building (9) and Industrial Arts Building (10). (viewed from the front yard facing Ayala Blvd.)



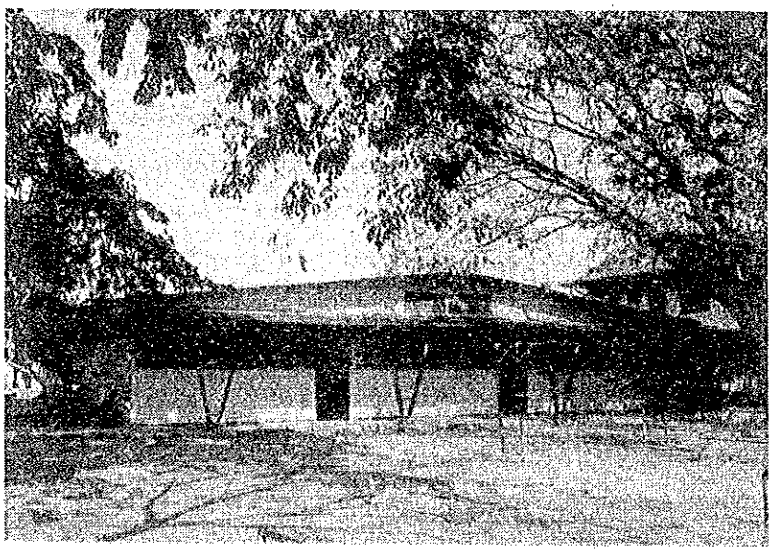
11. Alumni Building

12. High School
(not utilized)

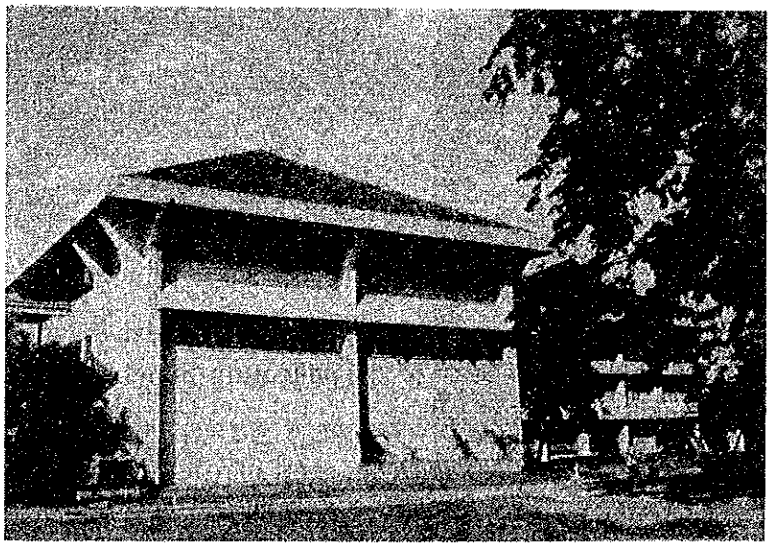
13. High School
(right half yet
to be completed)



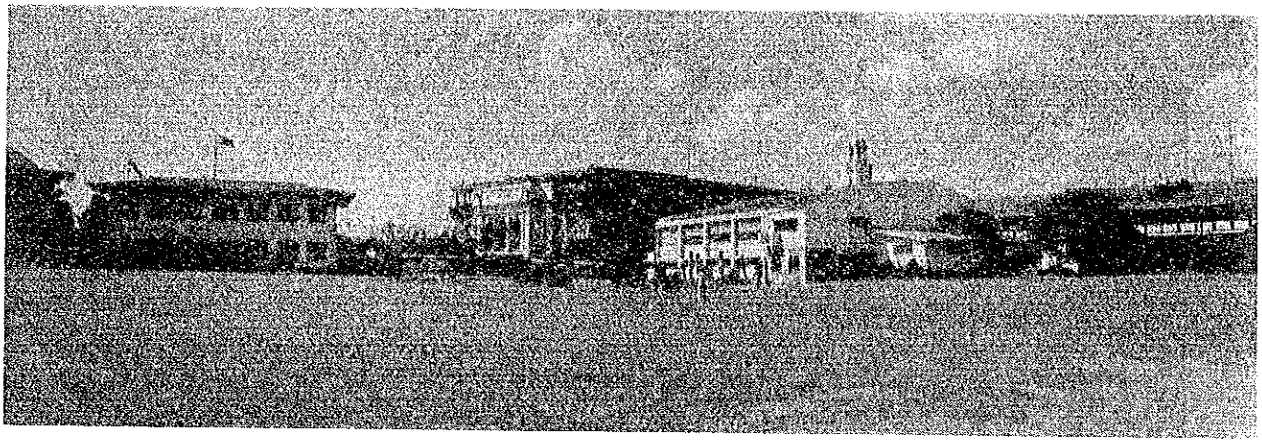
14. Medical and Dental Building



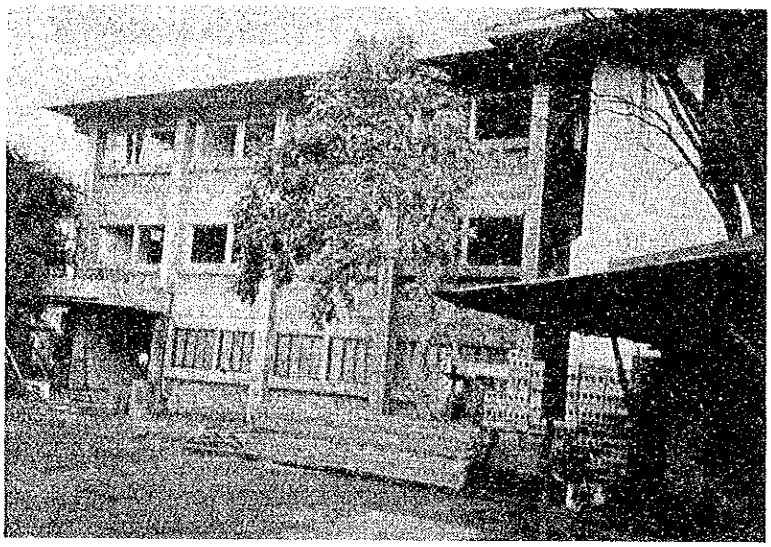
16. Classroom Building



17. Language Study Center



From right to left, the Student Center Building (18), Gymnasium (21) and Curriculum Library Center (23) (the Manila City Hall is also in sight).



24. Office Building (under construction)

Connecting corridor.

3-1-3 Subsurface Conditions

The site is located on alluvium layers which had developed along Manila Bay in the Cainozoic Era. Results of boring and standard penetration test performed at three bore holes on the building site are shown in Fig. 3-3.

At the immediate subsurface depths of 2 - 5 meters, there are clayey silty sand with N-Values* (Blows/30 cm) of 10 - 20 and with relatively firm consistency, although varying degrees of consistency are encountered in places. The soil bearing capacity of this stratum is estimated at 1,500 lbs/sq ft (≒ 7 tons/sq m long-term), which would be adequate enough to bear light-weight and low-storied building with equal weight distribution. Further, subsidence and sand liquefaction may emerge.

At successive depths of down to 15 meters, there is grey clayey silt with some sand and shell fragments, with N-Values of 5 or below and with very stiff consistency. Yet in the place where a silty sand stratum is encountered in between, its underlying clayey silt stratum is with brownish colour and with high N-Values. At a further depths of 15 meters and more, there is a brown silty clay with hard consistency, with N-Values of 50 and more, which is composed of diluviums. If the pile foundation is to be adopted, reliable bearing could be obtained in the vicinity of this stratum.

The underground water level is only 1 - 2 meters deep, and provisions must be taken during excavation activities against seepage, owing to the likelihood of water table to rise further during the rain season.

* N value : Result of Standard Penetration Test (SPT). Number of blow means blow counts to drive the drilling rods with Reimond sampler into the ground for the depth of 1 foot. Weight of drop hammer is 140 lb. and fall should be 30 in.

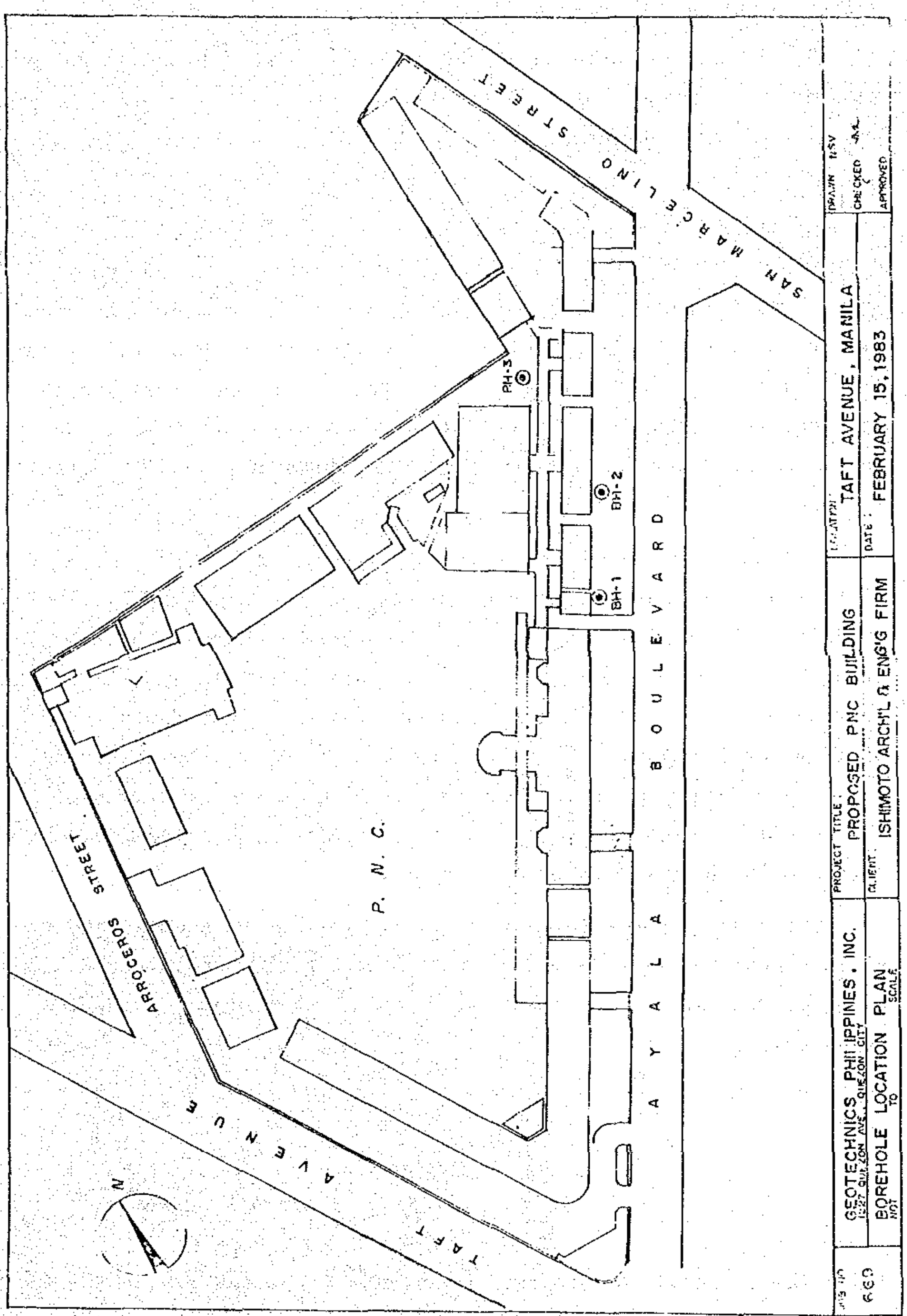


Fig. 3-3 Borehole Location Plan

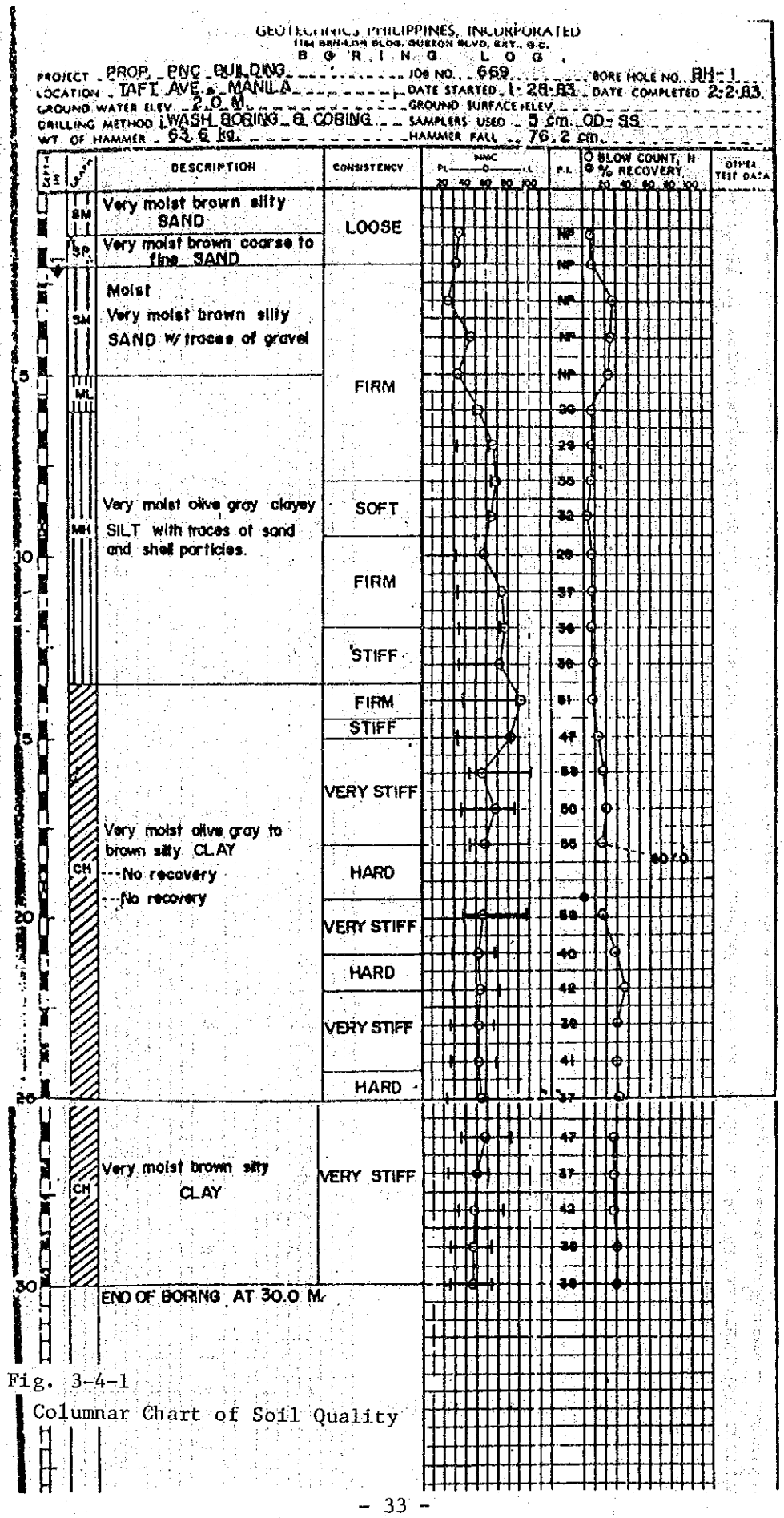


Fig. 3-4-1

Columnar Chart of Soil Quality

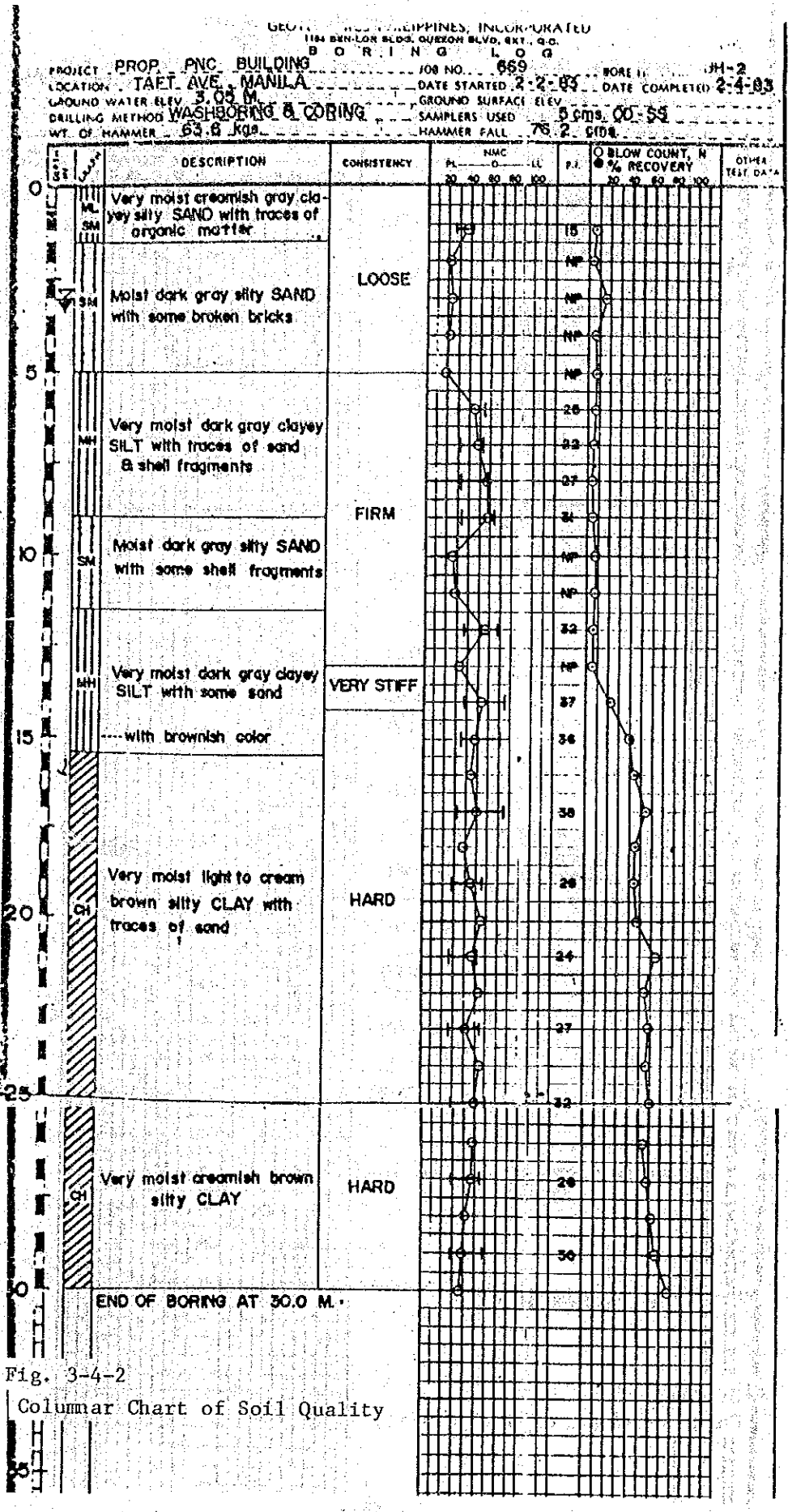


Fig. 3-4-2

Columnar Chart of Soil Quality

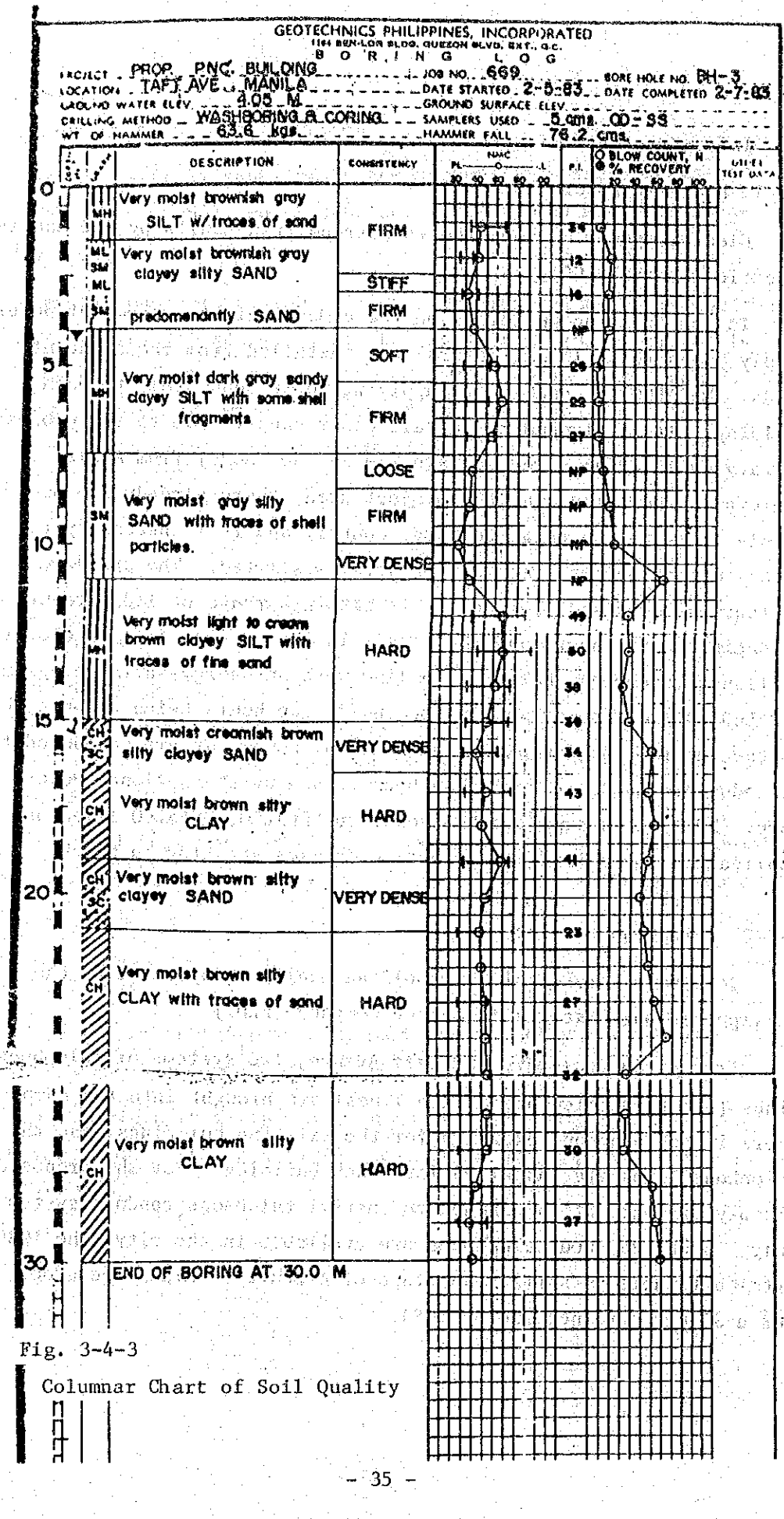


Fig. 3-4-3

Columnar Chart of Soil Quality

3-2 Infrastructure

3-2-1 Electric Power

Electric power is supplied to Metropolitan Manila by the Manila Electric Co. (MERALCO).

To the existing buildings on the campus, eight systems of power supply lines (with 13 wattmeters) are installed from the adjacent roads. MERALCO is capable of supplying power separately to each building. It is planned to install power supply line to the proposed library building at a low voltage (3ø 3W 230V 50Hz) from Ayala Boulevard. Aerially over the project area, there already are power supply lines to the Language Study Center, and it is necessary to relocate them before construction work is started. The standard voltage is 230 V and fluctuation is within a range of ±10 percent, depending on the hour, and the result is the service life of electric appliances becoming shorter. In line with an energy-saving program, MERALCO cuts off power supply for one to two hours twice a month, but in the future, the frequency and hours of power cut are scheduled to be reduced. As the tarrifs had been raised by the National Power Corp. (NPC) which supplies the power to MERALCO, MERALCO filed an application for raising the electric charges starting in March.

3-2-2 Telephone Service

Telephone service of Metropolitan Manila is operated by the Philippine Long-Distance Telephone Company (PLDT).

From Ayala Boulevard and Taft Avenue, two systems of telephone lines (about 20 telephone office lines) are brought into the campus. There is no telephone exchange for the existing buildings, and the telephone lines are installed into each building. For the proposed library project, it is planned to install telephone conduit system only. About 280,000 telephones are available in the city (the 1980 data) but there is still a shortage of circuits. Plans are afoot for a 50 percent increase by 1984.

3-2-3 Service Water Supply System

Service water is supplied by the Metropolitan Water Works and Sewerage System (MWSS), which supplies 1,267,000 cu m/day to about 460,000 places.

A water supply main, 150 ϕ - 100 ϕ mm, runs along Ayala Boulevard as shown in Fig. 3-5 and water may be supplied to facilities at the site. However, it is impossible to directly supply water, because the water supply pressure widely fluctuates within a range of 0.4 - 0.7 kg/sq m and water supply is cut off.

3-2-4 Sewerage

The sewerage is managed and maintained by MWSS as is the case with the service water supply system but does not cover the entire area of the city.

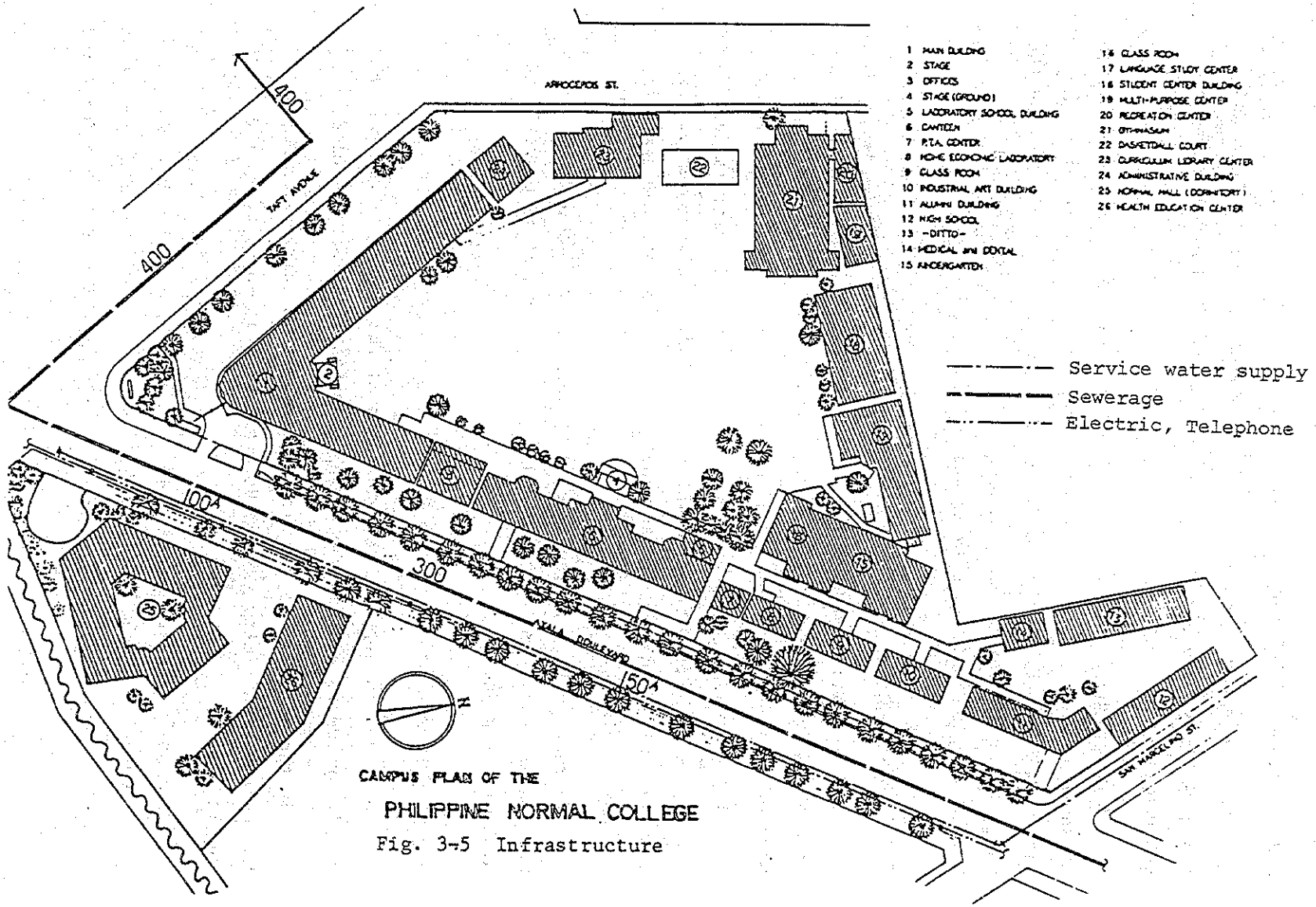
The drainage system is of such a type that rainwater is drained together with household waste water. No final treatment facilities are available, and they are eventually discharged into the sea without any treatment.

In the vicinity of the site, a drainage pipe, 300 ϕ mm is buried under Ayala Boulevard as indicated in Fig. 3-5 and it is possible to discharge sewage.

3-2-5 City Gas

City gas is supplied to some parts of the city. In general, a supply system is adopted whereby propane gas cylinders are used.

In the vicinity of the site, a gas main is laid by the Manila Gas Corporation. City gas (5,200 Kcal/cu m) is supplied to the existing kitchen.



CAMPUS PLAN OF THE

PHILIPPINE NORMAL COLLEGE

Fig. 3-5 Infrastructure

3-3 Conditions for Construction

(1) To acquire land, it is necessary to remove and demolish the six buildings north of the Laboratory School Building (5), and for the removal of each building, plans are worked out for:

(7) P.T.A. Center ..... Used only as a waiting room now. Particular room is not needed.

(8) Home Economics Laboratory (Elementary & High School libraty plus two classrooms)
..... This can be moved to Laboratory School Bldg. (5) and High School Bldg. (12) (which is not in use) will be modified.

(9) Classroom Bldg. (3 classrooms)
..... This can be transferred to Language Study Center (17) (4 rooms can be allocated.)

(10) Industrial Arts Bldg. (Industrial art room for Elementary & High school plus 2 classrooms)
..... High School Bldg. (12) (which is not in use) will be modified.

(15) Kindergarten ..... Permanently moved and built next to Health Education Center (26)

(16) Classroom Bldg. (3 classrooms)
..... Portion of Normal Hall (25) (Girl's dormitory) which is not in use now will be modified. But by the completion of this Project, Administration Bldg. (24) is ready so that those will be transferred to the Main Bldg. (1)

Consequently, there will be no problems for the removal of the six buildings. (Fig. 4-6)

(2) As regards the construction site, the area in which the high school is located and which juts out toward San Marcelino Street will be shut off (consideration should be given to the construction of a connecting passageway to the high school in the project) so, during the construction, there is a need to prepare a safe passageway particularly for students on the side of YMCA.

(3) It is necessary to transfer the electric power and telephone lines and water supply, sewer and gas pipes connected with the buildings which are to be demolished, including the power supply lines aerially stretching over the construction site from Ayala Boulevard to the Language Study Center (17), at the same time when the buildings are demolished.

(4) To move in construction materials, it is necessary to demolish a part of the wall fence facing Alaya Boulevard and borrow the front yard east of the Laboratory School Building (5) and other places as the site for a warehouse, etc., for the construction work. This site will be safely administrated along with the whole construction site by the contractor.

(5) The cut and felling of the existing trees in the campus will be minimized.

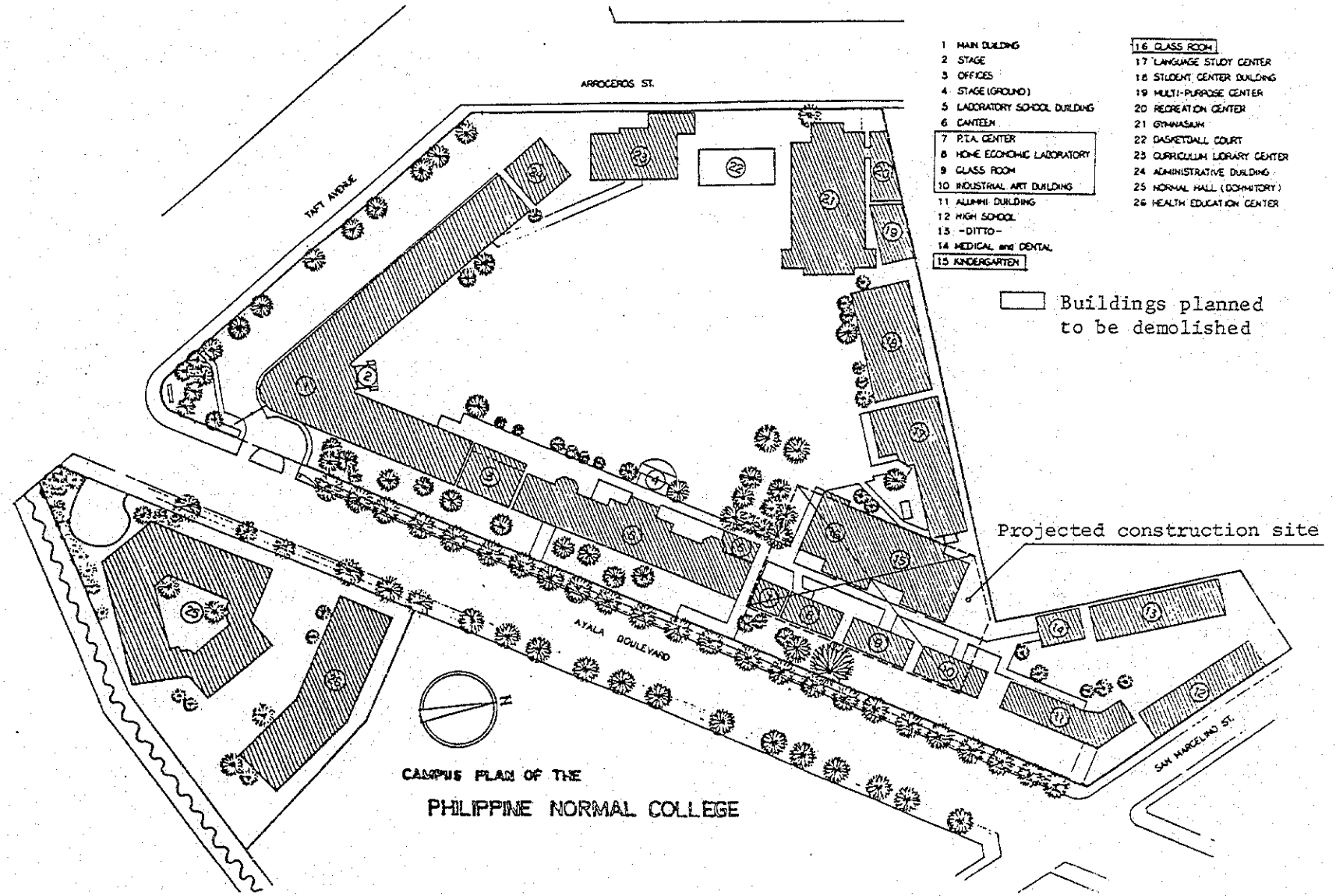


Fig. 3-6 Site of Normal College and Chart for Projected Demolishing

Chapter 4 BASIC DESIGN

CHAPTER 4 BASIC DESIGN

4-1 Basic Design Policies

The basic policies of this Basic Design are as follows:

(1) To harmonize the Library with existing buildings and facilities, with due consideration given to the prevailing site conditions and also to future master plans of the PNC. (Layout and Appearance)

(2) Utilization of locally accepted construction methods and material, with due consideration given to the natural conditions at the site; massive use of concrete block walls, with reinforced concrete skelton, and supplemented with carpentry such as wood partitions; pebble washout finish and synthetic adobe finish by surface chipping etc. (Building Section, Solar Design, Economy and Building Maintenance)

(3) The design of the Library should be a clear manifestation of its functions, and is to be clean and simple, worthy of an educational facility. (Floor Plan, Structure, Finish and Utility Plans, Economy)

(4) Administration, management and maintenance of the building is to be considered in its design, by avoiding unessential building elements and costs and selecting equipment and material on this score. (Durability and Economy)

(5) Special attention will be paid to the building's facade, symbolism, economy and durability etc, while duly honouring its functions (Floor plan)

4-2 Substance of the Plans

4-2-1 Scale Programs

(1) Total Floor Area

There are two standards for calculating necessary floor area.

In the case of National Universities:

Area for library (sq m)	(Standards for National School Buildings Necessary Floor Area Calculation, 1978 - Ministry of Education)
1a + 2b + 5.3 (A x 1.5 - 0.1a - 0.16b) + 300	
Note: * Limited to, but for one building in total campus area, another 300 sq m can be given. * When the result of parenthesis become a minus value, it is considered zero.	
Calculation Factors:	a ..... Number of Undergraduate Students b ..... Number of Graduate Students A ..... Number of Holdings (unit 1,000 books)

If Metcalf K.D. (USA) Method is adapted:

Total of	Minimum area per one user	2.5 sq m (Including common use area)
	Area per one staff member	10 - 12 sq m
	Open shelves	160 books/sq m
	Closed shelves	*233 books/sq m
	Reading room area per person	*1.8 sq m/seat - 2.5 sq m/seat

Looking at both methods, Metcalf K.D. does not show a clear relevance to closed shelves and reading room areas sos that the first method will be used this time.

(Reference: Calculation result from Metcalf method is shown in P- 46)

In Philippine Normal College:

a ..... 3,622 (day session students only. There are 834 evening session students which makes the total 4,456 students)

b 533

A 302

Therefore,

3,622 + 2 x 533 + 5.3 (302 x 1.5 - 0.1 x 3,622 - 0.16 x 533) + 300

= 3,622 + 1,066 + 6 + 300

= 4,994 (sq m)

However, use by night time students as well as consortium students should be taken into consideration. Therefore;

c ..... night time students (two students equal to one of day time students)

834 x 0.5 = 417

d ..... consortium students (2% is the forcasted users)

10,000 x 0.02 = 200

So,

1a + 2b + c + d + 5.3 (A x 1.5 - 0.1a - 0.16b) + 300

= 5,611 (sq.m)

Furthermore, Elementary and High School Library and Library Science Library are included in this Project, therefore;

Elementary school : For 720 students with 2 classrooms (80 to 96 students) = 96 seats

High school : For 480 students with 1 classroom (40 to 48 students) - 48 seats

Reading room area : 144 seats x 1.8 sq m/seat ≒ 260 sq m

Reference, Librarian's room, Work room: 20 sq m x 3 = 60 sq m

Total stack area : 6,132 books ÷ 175 books/sq.m = 70 sq.m (low stack)

Common use area : qua 25/100 (260 + 60 + 70) x 3/4 ≒ 520 sq m

*Library Science Library

Number of Students: 250 250 x 30% = 75

75 x 2.5 sq m/person = 187.5

Common use area : qua 25/100 187.5 x 4/3 = 250 sq m

5,611 + 520 + 250 = 6,381 sq m

Therefore, the target of total floor area is set to around 6,400 sq.m.

Reference : Calculation Result from Metcalf Method

	1,110	x 2.5 =	2,775
	69	x 10 =	690
	50,000	÷ 160 =	312
	250,000	÷ 233 =	1,073
	900	x 1.8 =	1,620
+)	210	x 2 5 =	525
			6,995 sq m

(2) Area of Stack Rooms and Reading Room

Stack Rooms			
Closed stack room:	233 vols/sq m	Illust Tip Standard Data for Architectural Design	Architectural Institute of Japan
Open-shelf room:	175 vols/sq m	"	"
Reading Room			
Bench:	1.3 - 2.0 sq m/person	"	"
Seat:	2.5 - 3.5 sq m/person	"	"
Reading by undergraduates	1.8 sq m/person	Procedure for Planning of University Libraries' Facilities, Ministry of Education, (1966)	
Reading by graduates Reading by faculty member	2.5 sq m/person		

As for the ratio of an open stack room to a closed stack room, no significant signs are observed for domestic university libraries. Under this project, the ratio of a closed stack room to an open stack room will be set at 5/1.

Closed stack room: 250,000 vols ÷ 233 vols/sq m = 1,073 sq m

Open stack room: 500,000 vols ÷ 175 vols/sq m = 286 sq m

Reading room:
- 900 persons x 1.8 sq m/person = 1,620 sq m
- 210 persons x 2.5 sq m/person = 525 sq m

(3) Composition of Space

The ratio of reading, lending, reference, stack room, conference, administration, corridors, etc., is:

$$\frac{\text{Reading, lending, reference, stack rooms}}{\text{Conference, administration, corridors, etc.,}} = \frac{50 - 60\%}{50 - 40\%}$$

in the case of a Japanese university which is the same in scale as this college.

On the basis of the above data, the gross floor space is computed on a trial basis.

1,073 + 286 + 2,145 = 3,504

Conference, administration, corridors, etc. 2,330 ~ 3,500 sq m

Gross floor area: 5,800 ~ 7,000 sq m

Consequently, the aforementioned 5,611 sq m may be considered extremely significant.

4-2-2 Rooms under Plan

Table 4-1 Rooms under Plan

1. Administrative Function

Room	User	Objective	Capacity	Standard Area
Chief Librarian's Office	chief librarian	- official duties & reception of visitors	chief librarian & secretary	
Conference Room	main staff & school heads	- conference	40 persons (36+4)	@2.0sq.m/person
Librarian's Room	2 librarians	- includes meeting corner	2 persons	general office space x 2 @5sq m/person x 2 = 10
Technical Processing, Receiving & Shipping, Bindery Room	staff	- receiving/arrangement/ classification of books - card preparation and arrangement - bookbinding & repair-ment	15 persons	@10-12sq m/person
Staff Lounge (Locker Room Combined)	staff	- small internal meeting corner - dressing room	15 persons lockers for 30	@2sq m/person
Storage	-	for supplying articles & miscellaneous articles	-	-
Janitor Room	-	-	2 persons	

Others: Elevator (for administration use and the handicapped), Dumbwaiter one each

2. Reader's Services Function

Room	User	Objective	Capacity	Standard Area
Reading Room (under graduate students) " " (graduate students & instructors)	under graduate students 4,500 graduate students 500 instructors 300	others: - consortium students - alumni - various associations - educators in the country Total 54,500	250persons x 3 = 750 180 persons	@1.8sq m/person @2.5sq m/person
Open Shelves	ditto	accommodation of books	about 55,000 books	@175 vols/sq m
New Book Display Area	ditto	newly arrived books exhibition	-	-
Reference Room	ditto (staff)	looking-up & checking of various materials	90 persons (4)	@3.5sq m/seat
Catalogue Corner	ditto	300,000 sheets searching of books	-	17,000 sheets/sq m
Circulation Area	ditto	lending and receiving of books	(8)	
Browsing Area	ditto	corner for browsing through newspapers, etc.	10 persons	@3.5sq m/seat
Japanese Collection Room	ditto	reading of Japan related books and exhibition of materials	14 persons	@3.5sq m/seat
Closed Shelves	staff(partly used by researchers)	accommodation of books	about 300,000 books	@233vols/sq m

Room	User	Objective	Capacity	Standard Area
Elementary & High School Library (including the space for blind & deaf children)	elementary school students - 720 high school students - 480 blind & deaf elementary, high school students and from outside -2,000	education of library utilization method and the way it should be. education of blind & deaf children	Total 144 persons about 6,000 books	@1.8sq m/person @80 vols/sq m (low stack)
Reference Room of the above-mentioned	ditto	reference corner for the above-mentioned	-	-

3. Audio-Visual Function

Room	User	Objective	Capacity	Standard Area
Audio-Visual Room	mainly for under graduate students but open to all library users	audio-visual (film projection & music)	150 persons	@1.2-1.5sq m/person
Micro-Filming Room	ditto	production & storage of micro-film	4 persons	-
Visual Room	ditto	utilization of visual aids	10 persons	-
Listening Room	ditto	utilization of audio aids	10 persons	-

4. Learning Function

Room	User	Objective	Capacity	Standard Area
Library Science Library	library science majoring under-graduates & graduates 250 students	practical training of Library Science	40 persons	@2.5sq m/person
Chairman's Room	chief professor	including official duties & reception of visitors	-	-
Seminar Room	library science majoring under-graduate & graduate students	for lectures	18 persons x 2 12 persons	@2.0sq m/person
Group Study Room	under-graduate and graduate students	-	6 persons	-
Type-Writing Room	ditto	-	6 persons	-

5. Public Utilities

Room	Things to be Taken Into Consideration	Note
Entrance Hall	Partly used for exhibition (students' works and for general)	Exhibition panels (movable type)
Staircase	-	
Corridor	-	
Comfort Room	Separate rooms for men and women	

Standard Area: Taken from "Procedure for Planning of University Libraries' Facilities" (Ministry of Education), "Illust Tip Standard Data for Architectural Design" (Architectural Institute of Japan).

4-2-3 Functional Operation

The aforementioned rooms are functionally linked to one another as shown in the following chart.

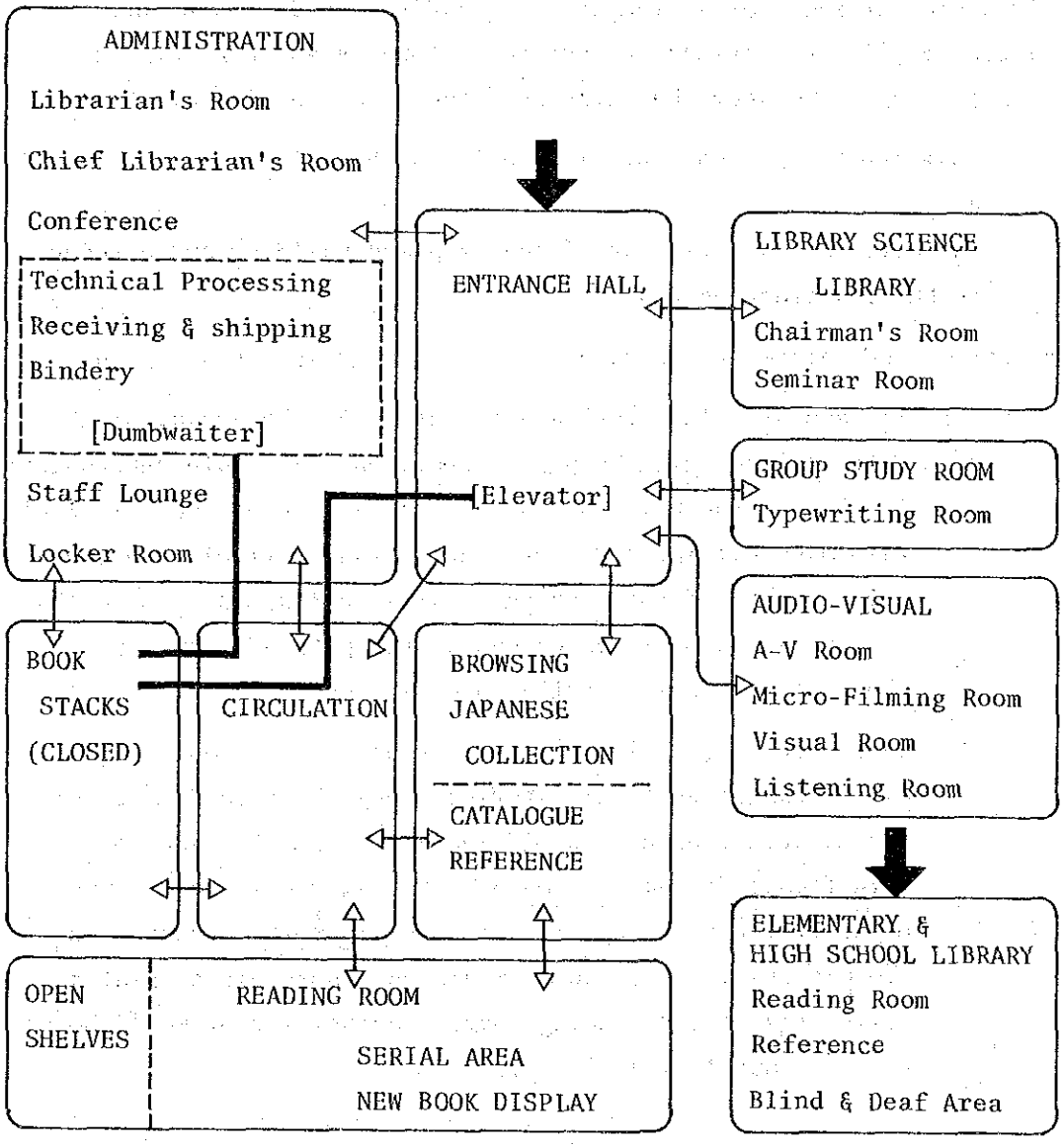


Fig. 4-1 Function Flow Chart

4-3 Layout

4-3-1 Selection of Block Plan

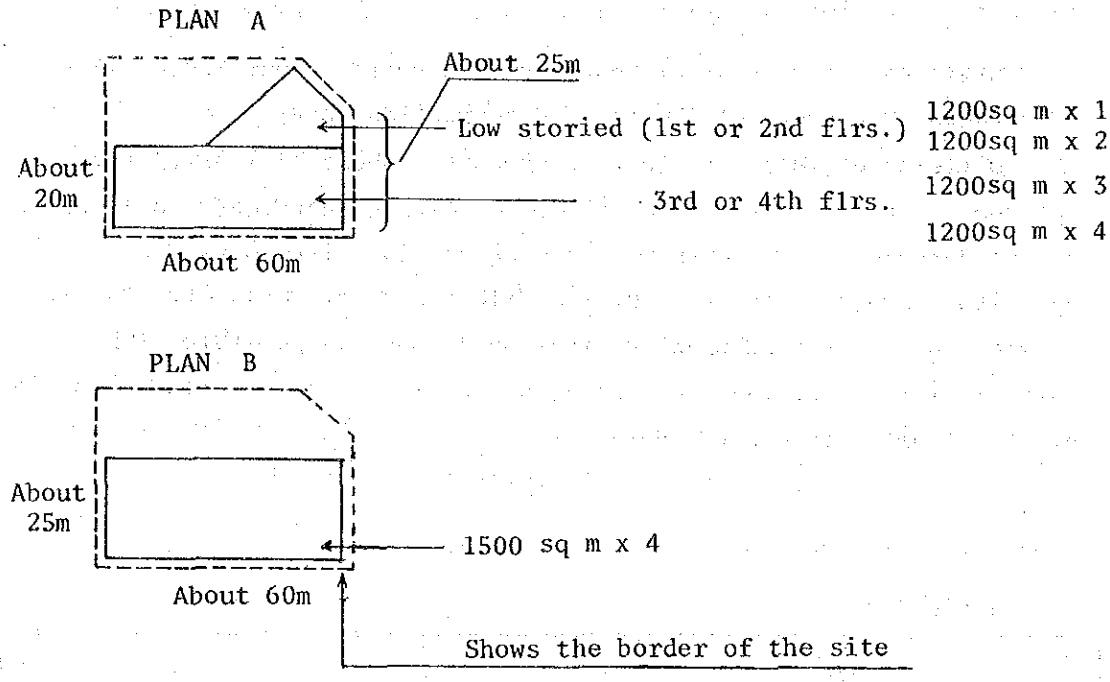
Approximately 3,000 sq m of the land is provided for the project site, so that when total area of about 6,400 sq m is taken into consideration, it is possible to envision a tower structure (six floors or so), simple two-story building and other, but in view of:

* relation to, and harmony with, existing buildings on the campus*1; and
* the efficient utilization of the proposed building and a economy in the construction cost, *2

either of the following two plans is conceivable as a block plan.

Note: *1 In case of a low-storied structure: As the ground of this site is inferior, the pile foundation cost would unnecessarily rise if the building was horizontally expanded. It would also make natural lighting ventilation difficult and the avialability of the playground will be reduced. The building would become inconvenient as the path of flow inside the building unnecessarily long.

*2 In the case of a high-rise structure: If the building higher than five or six stories above the ground, the building construction cost would suddenly begin to rise to a significant degree, it would become difficult to use the upper of the building (the elevator is to be reserved for administrative use) and it would be impossible to plot a large area of the reading room. Another factor would be a poor rentable rate.



4-3-2 Basic Elements

For selection study of block plan, layout and floor plan the following two items are important:

* Necessity of Basement
* Air-conditioning facilities (for the reading and other main rooms of the building)

The both will be the most basic factors for block plan and floor plan for further study on the initial and running costs.

(1) Basement

An increase of about ¥ 120 million (about 8.6 percent of the total construction cost) in the construction cost is estimated. If the running cost required for the operation of the ventilation facilities or the possibility of the roads being flooded are taken into consideration, there should be no positive reason why basement should be constructed.

(2) Air-conditioning Facilities

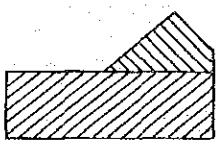
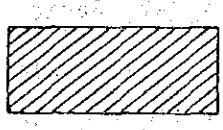
Difference (increase) in construction cost: About ¥27.4 mil. (about 2 percent of the total construction cost)

Difference (increase) in running cost: About ¥4.1 mil./year

The above increase may be estimated, suggesting that there would be a considerable increase in the running and facility costs. As a substitute program, the premise is a floor plan by which efforts will be made to work for natural ventilation as much as possible with the installation of ceiling fans and archetectural considerations so as to create a comfortable environment.

4-3-3 Comparative Evaluation of Block Plan

Table 4-2

Type	A	B
Block Plan / Item evaluated		
1. Vicinity landscape/public-relations effects	○	○
2. Harmony and compatibility with existing facilities	△	○
3. Conservation and positive use of existing trees	○	○
4. Vacant space at the site	△	○
5. Structure plan	△	○
6. Rentable space ratio	○	○
7. Construction cost	△	○
8. Flow line in the campus	△	○
9. Plan for construction of temporary works	△	○
Overall evaluat on	○	◎

Note: Very good ◎ Good ○ Not so good △

Unlike Plan B, Plan A features a protrusion on the side of the high school's site, with the result that the sight toward the high school's site would be entirely blocked, making use of its land perpetual (2), vacant space on the site would naturally be reduced (4), the building would become irregular in shape, a more or less disadvantage in terms of structural planning (5), and the construction cost would be adversely affected. Particularly because the soil conditions of this site is poor, there would be a rise in the volume of piling work (7), and even if the flow line to and from the high school could be dealt with under the floor plan (8), it would be difficult to leave flow line during the construction work.

4-4 Building Plan

4-4-1 Overall Floor Plan

As stated in the foregoing, Plan B entails somewhat greater problems than Plan A, but it should be evaluated in a comprehensive perspective along with the results of a floor plan. Another floor plan will also be prepared for Plan B. As a result of further study of both Plans A and B, two plans each are prepared as follows:

(1) Plan A-1

Two stories in the low section and 3 stories in the high section. Elementary and high school library (1st flr.) and A-V room (2nd flr.) in the low-storied section.

(2) Plan A-2

One story in the low section and four stories in the high section. Elementary and high school library in the one-storied section.

(3) Plan B-1

Four stories all over.
Uppermost floor: A-V room and closed stack room.

(4) Plan B-2

Four stories all over.
Uppermost floor: A-V room and administrative sector.

Through all plans, a big span would be required for the A-V room (whether the building is of a low-story or four-story structure), so that it is indispensable to provide it on the uppermost floor for reason of structural planning (in terms of economy).

(1) Plan A-1

The site would be put to as much use as possible, the elementary and high school library, a separate sector, would be treated as though it were a separate building, the A-V room would be placed on the second floor, for convenience sake, and closed book stacks would be placed on the first floor in an attempt to reduce (more or less) the structural load. Here, the building would become irregular in external appearance.

Items evaluated in Table 4-3	
(1), (2)	Natural lighting and ventilation would be poor particularly on the west side of the 1st and 2nd floors.
(3)	It would be convenient for the A-V room to be allocated on the 2nd floor. As the administrative sector is placed on the same plane as the closed stack room, it would be difficult to link the stacks to the reading room with a close flow line. (It would take a long distance for the vertical flow line of book - the dumbwaiter - which is to be directly linked to the circulation counter on the upper floor, to be closely tied in with the administrative sector, receiving and shipping room and bindery and also connected with the closed stack room. This means that, for a library of this magnitude, it would be possible to achieve a better solution if the vertical flow line, rather than the horizontal, is utilized.)
(6)	Reading room would be big in size.
(7), (8)	The flow line to and from the A-V room, etc., would be problematical.
(9)	The building would be irregular in shape and the building area would become greater, raising the piling cost.
(10)	Influenced by (1) and (2).

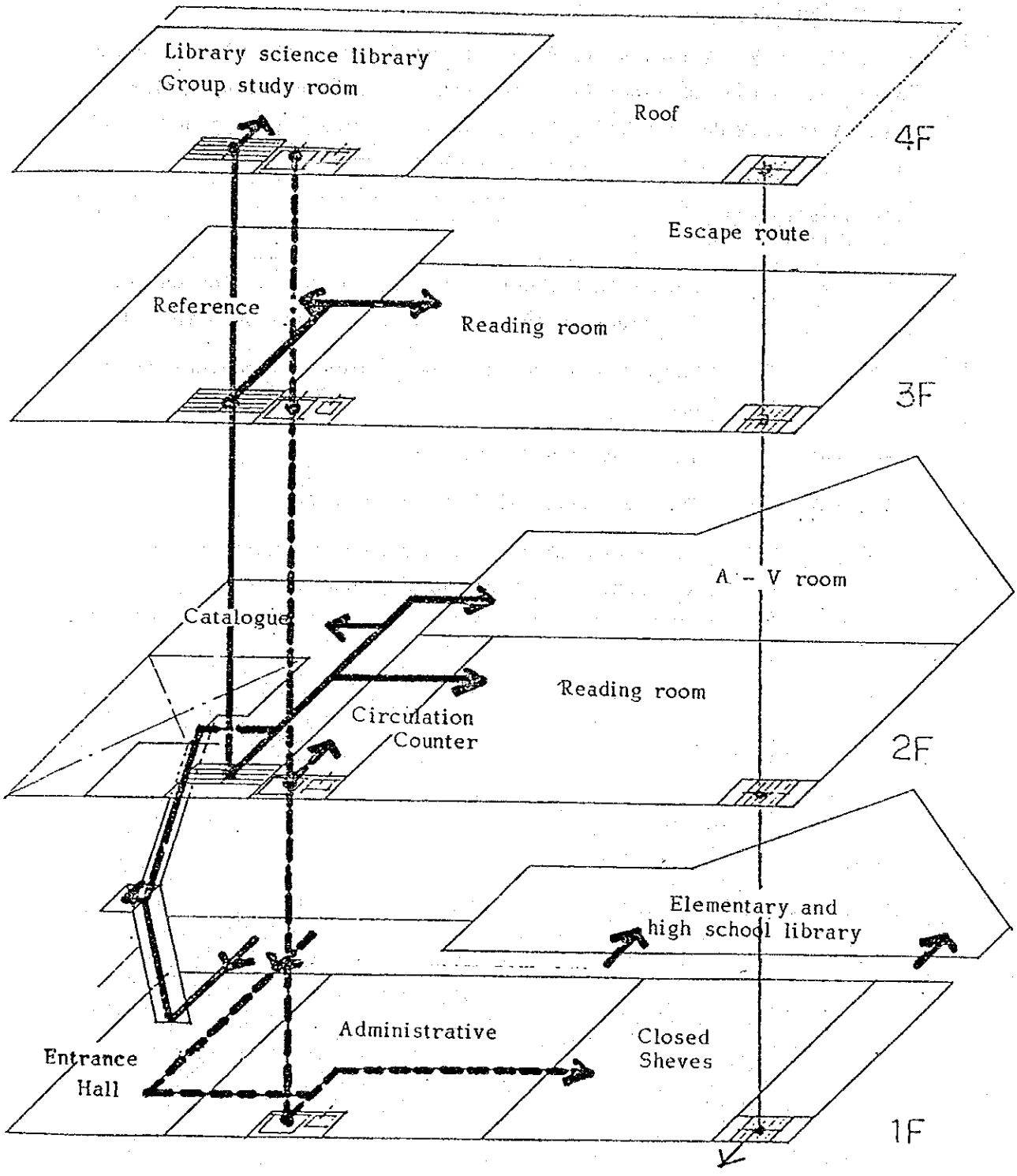

Library science library
Group study room
Roof
4F
Escape route
Reference
Reading room
3F
A - V room
Catalogue
Reading room
Circulation
Counter
2F
Elementary and
high school library
Administrative
Closed
Sheves
Entrance
Hall
1F

Fig. 4-2 A-1

(2) Plan A-2

This plan is similar to Plan A-1 and features the placing of the A-V room on the 4th floor (the flow line would become longer than Plan A-1) with due consideration given to natural lighting and ventilation.

Items evaluated in Table 4-3	
(1), (2)	Better than under Plan A-1, but the arcade on the 1st floor would be enclosed by walls on both sides.
(3)	The A-V room would become somewhat inconvenient to use.
(5), (6)	The same as under Plan A-1
(7), (8), (9)	The same features as under Plan A-1
(10)	It would become necessary to air-condition the A-V room as a result of (1) and (2).

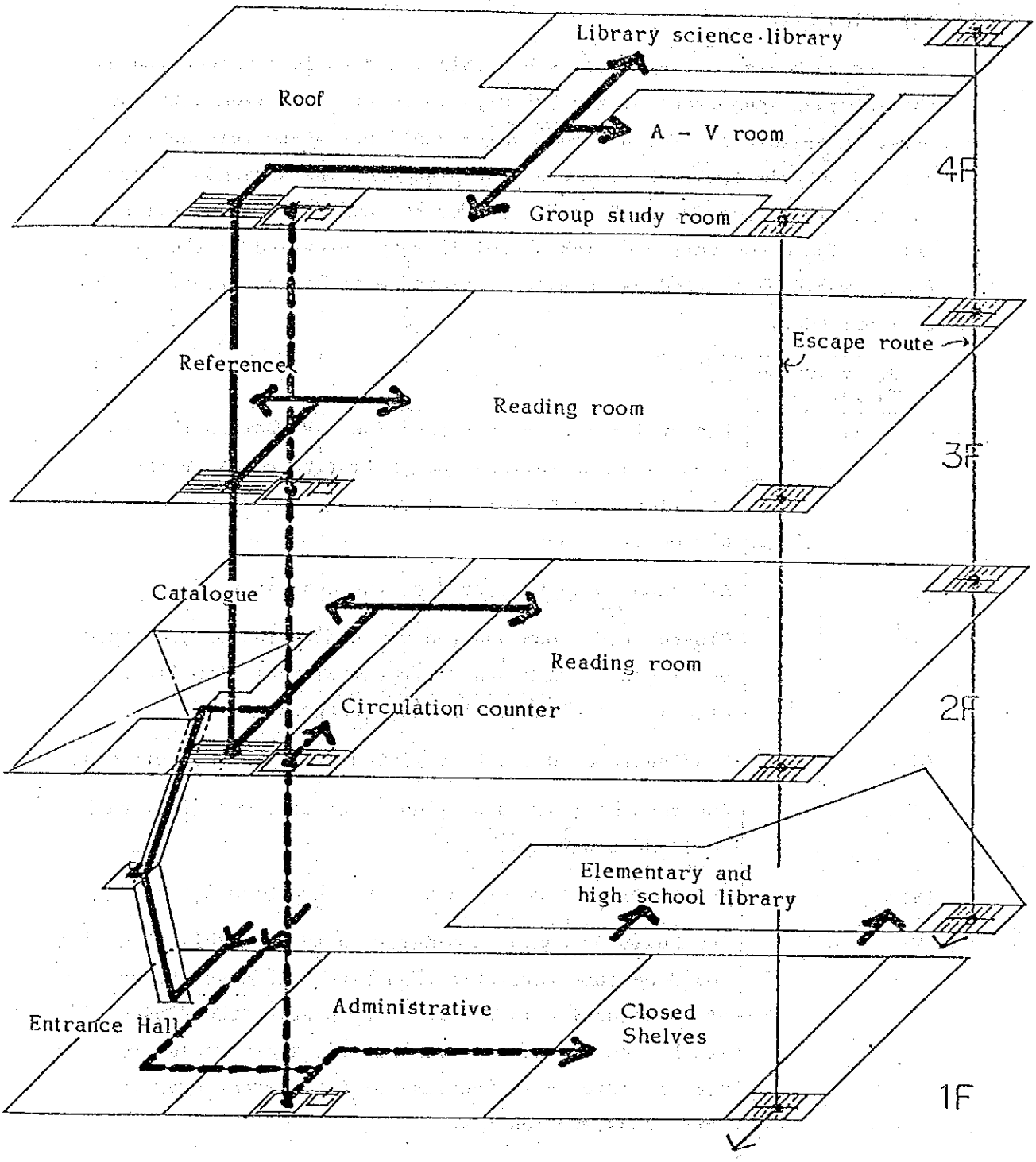

Library science·library
Roof
A - V room
4F
Group study room
Escape route
Reference
Reading room
3F
Catalogue
Reading room
Circulation counter
2F
Elementary and
high school library
Entrance Hall
Administrative
Closed
Shelves
1F

Fig. 4-3 A-2

(3) Plan B-1

As much area of the site as possible would be left unoccupied and the external appearance of the building would be harmonized with the existing buildings. The A-V room which would be put to less horizontal use and the closed stack room would be placed on the uppermost floor and the first floor would be utilized for the administrative office only. (The elementary and high school library, provided on the first floor, would be treated as an annex building with access directly from outside.)

Items evaluated in Table 4-3	
(1), (2)	Except for the areas around the A-V room on the 4th floor and the various administrative rooms on the 1st floor, each room would be afforded with open air on two sides.
(3)	A-V room would be placed on the 4th floor.
(5)	Closed stack room and the administrative office would be linked to each other with a vertical flow line via circulation counter placed in between.
(6)	Reading rooms would be splitted at right and left sides.
(7)	Entrance hall would be simple, centering on its stair-well and staircase.
(8)	The corridor area would be less than Plan A.
(9)	The building would be orderly in shape. This plan would be more favorable than Plan A because the area of construction is smaller. By placing the closed stack room on the uppermost floor, there would presumably involve an increase of 0.6 percent over the total construction cost.
(10)	As a result of (1) and (2), it would require to air-condition the A-V room.

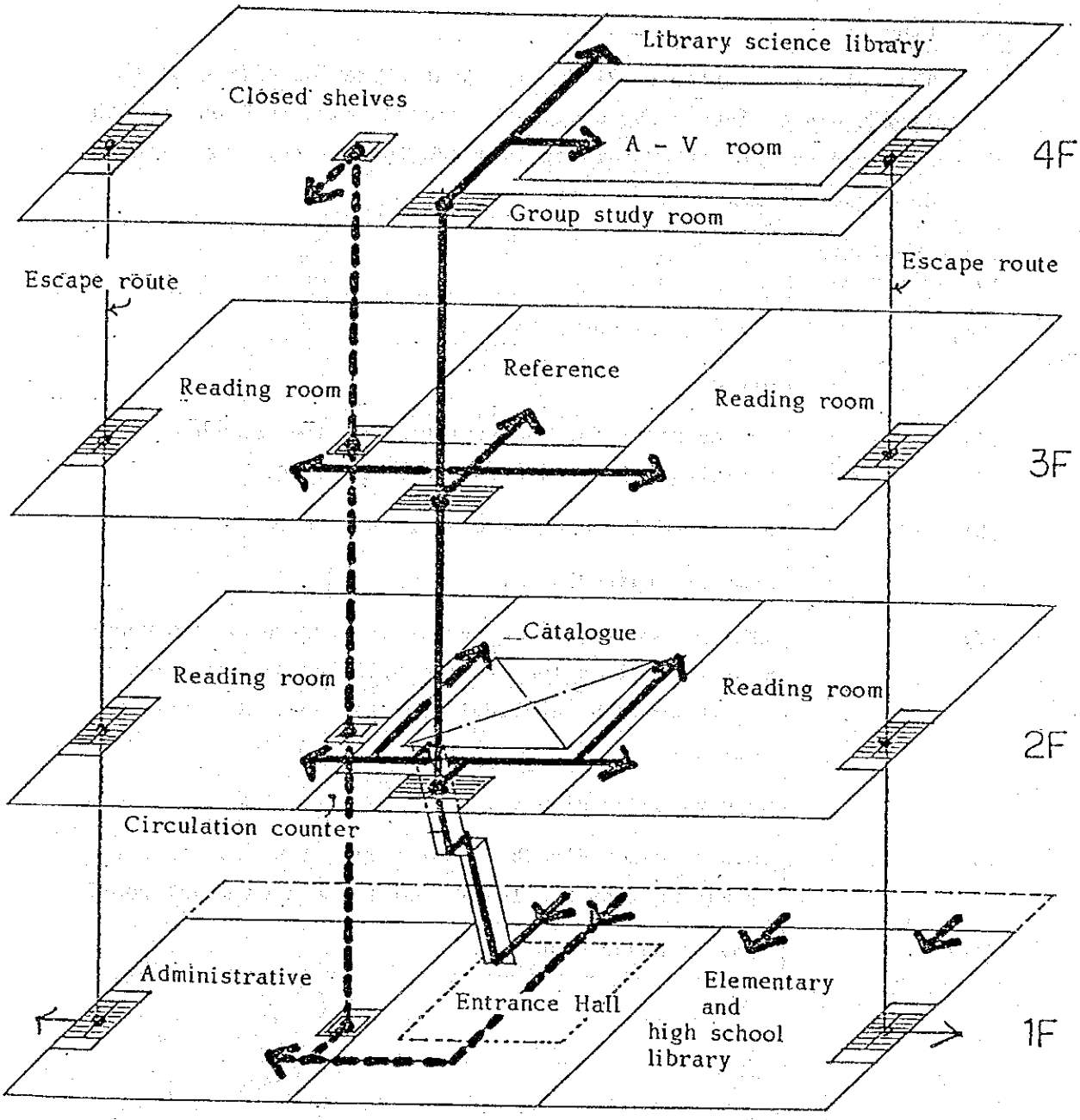

Library science library
Closed shelves
A - V room
4F
Group study room
Escape route
Escape route
Reading room
Reference
Reading room
3F
Catalogue
Reading room
Reading room
2F
Circulation counter
Administrative
Entrance Hall
Elementary
and
high school
library
1F

Fig. 4-4 B-1

(4) Plan B-2

This plan is similar to Plan B-1. Administration office on the 1st floor would be interchanged with the closed stack room on the 4th floor (to reduce the structural loading) and the reading rooms would be made bigger rooms.

Items evaluated in Table 4-3	
(1), (2)	The same as under Plan B-1
(3)	Ditto
(4)	Inconvenient for the routine flow line, such as building maintenance and book handling.
(5)	Flow line for book receiving is problematical.
(6)	Same as under Plan A.
(7)	If the administrative sector is located on the uppermost floor in a low-storied building of four floors or so, it would be difficult for the general public to locate it.
(8)	Same as under Plan B-1.
(9)	Same as under Plan B-1, but eliminating the effects emanating from the loading of the closed stack room.
(10)	Same as under Plan B-1.

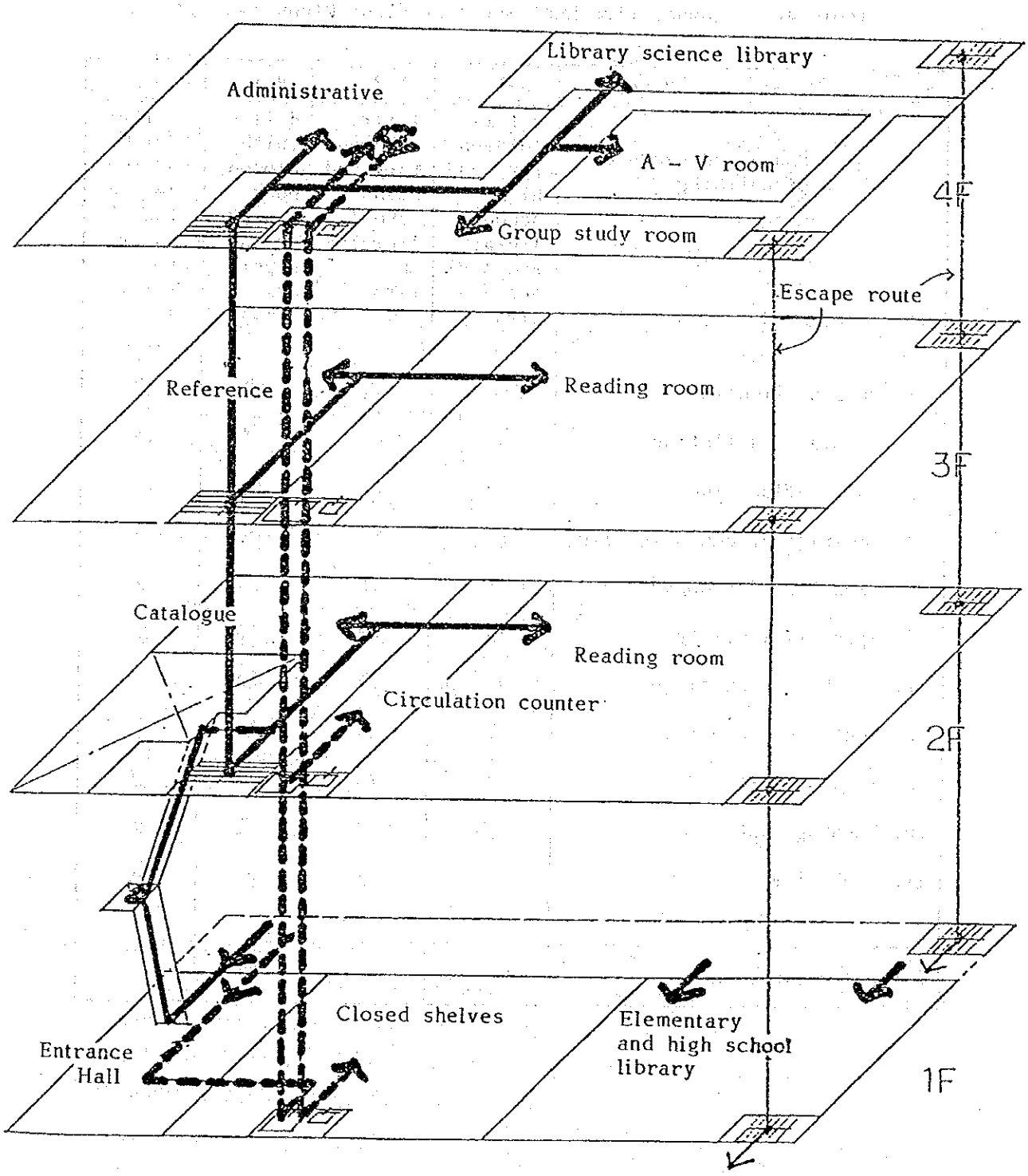

Library science library
Administrative
A - V room
Group study room
4F
Escape route
Reference
Reading room
3F
Catalogue
Reading room
Circulation counter
2F
Closed shelves
Elementary
and high school
library
Entrance
Hall
1F

Fig. 4-5 B-2

Table 4-3 Comparative Evaluation of Floor Plans

Plan / Shape and Feature of Building / Item Evaluated	A-1	A-2	B-1	B-2
	2 flrs. (elementary and high school library and A-V) and 3 flrs.	1 flr. (elementary and high school library) and 4 flrs.	4 flrs. (with closed book stacks on the uppermost flr.)	4 flrs. (with admin. sec. on the uppermost flr.)
1. Natural lighting	×	△	◎	◎
2. Natural ventilation	×	△	◎	◎
3. Users' flow line	◎	○	○	○
4. Administrations' flow line	◎	◎	◎	△
5. Flow line for books	×	×	◎	×
6. Space flexibility	◎	◎	○	◎
7. Legibility on plane	△	○	◎	○
8. Rentable space ratio	△	△	◎	◎
9. Initial cost	△	△	○	◎
10. Running cost	○	○	◎	◎
11. Symbolism	△	△	◎	△
Overall evaluation			◎	

4-4-2 Structural Plan

The Philippines are situated on the Pacific-rim earthquake belt and the Philippine Trench lies off its Pacific coast. Plate tectonics suggests that the Philippines is located at a point where the Pacific plate (Philippine plate) comes in. Consequently, there are many earthquakes of an oceanic type as is the case with Japan. Big earthquakes with magnitudes of 7-8 are registered. Given this factor, there is a need to give full consideration to the resistance of the building against earthquake and work out plans to make it strong and resilient.

(1) Systems

1) Foundation System -- The foundation will be supported by prestressed concrete piles.

For this building, 1,500 lbs/sq ft (≒ 7 tons/sq m) of soil bearing capacity may be expected in the immediate subsurface soil conditions. As the building weight is relatively big for this soil bearing capacity, a raft foundation is conceivable, but a pile foundation will be the best choice when a possible subsidence or unequal subsidence of the building owing to a consolidated subsidence of the intermediate layer (clay layer) and a possible destabilization of the building due to a liquefaction of the subsurface soils or when the safety factors are taken into consideration as the proposed building holds a public character.

As regards pile materials, prestressed concrete piles seem to be the best choice in light of availability, economy and workability. Reliable bearing is found on clay layer at 15.0 m depth. Yet considering variations, depending on the place, reliable bearing will be set at a depth of 18.0 m, and the pile length will be determined after a piling test.

2) Framing System -- The building will be a reinforced concrete rigid frame structure

In the Philippines, reinforced concrete frame is popular. This framing method is cheap and stable. The reinforced concrete frame is superior to other structures and steel frames in terms

of resistance against earthquake and weather proof. Consequently, the building will be made a reinforced concrete rigid frame supplemented with column and beam where necessary. Moreover, the well-balanced installation of seismic walls will be a good choice in terms of resistance against earthquake and economy.

3) Floor System

Because stack rooms and other heavy weight facilities are to be accomodated in view of the nature of the building and it is necessary to prevent under deflection and vibration, it is advisable to use a rigid reinforced concrete floor slab system. It is also advisable to provide joists where necessary so that the area of the slabs may not exceed* 25 sq m.

* Architectural Institute of Japan, "Guideline for counter measures for Hair Cracks of reinforced concrete structures".

(2) Structural Design

1) Design References

The building will be designed in conformity with the Uniform Building Code (UBC) of the United States, American Concrete Institute (ACI) and others, according to the local practice.

2) Design for Earthquake Resistance

As stated earlier, it is necessary to give full consideration to earthquakes. In other words, the building will have to have adequate rigidity and tenacity. For this purpose, an attempt will be made to balance the rigidity of the building to prevent distorsion. In particular, an attempt will be made to distribute seismic walls in a well balanced manner to avoid uneven concentration, and further to provide columns and beams and to make such cross-sectional design that shear yield may not exceed deflection yield. Seismic walls will also be provided with adequate shear strength so that there may not develop cracks in the early stage. The rooftop and other protrusions will be strengthened for fear of cases where they are affected by an earthquake to a greater degree than expected.

3) Design Load

The loads are to be taken in compliance with the UBC and other recommendations, but in the course of detail design, it will be accomodated with full consideration given to reality and future addition of equipment.

4) Wind Forces and Other External Forces

Basically, the UBC and other recommendations will also be taken into account for wind forces and other external forces.

4-4-3 Span

On the basis of 6-7 m x 6-7 m, which is the most economical span for a reinforced concrete structure, the "module" which is best fitted to the layout of closed stack rooms is set at 1.35 m, bringing the span set at 6.750 m x 6.750 m (multiple proportion). (Fig. 4-6)

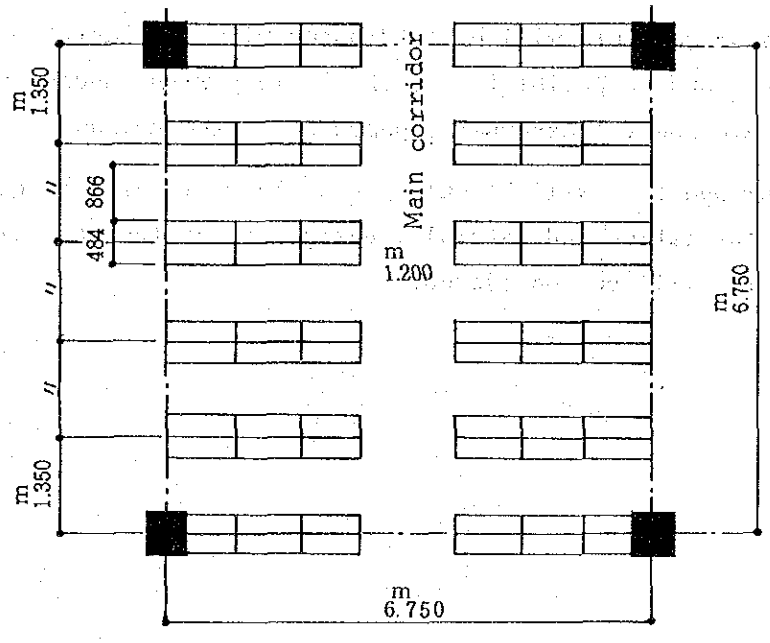


Fig. 4-6 Module and Layout of Closed Stack Room

4-4-4 Head Clearances

As regards head clearances, floor to beam clearance will be set at 3.0 m (floor to ceiling clearance 3.7 m) for the first floor where the administrative sector and elementary and high school library are to be placed, and the access to the second floor — the principal floor of the library — will be fac-litated (by lowering floor to ceiling clearance of the first floor as much as possible). Floor to beam clearance will be set at 3.3 m (floor to ceiling clearance of 4.0 m) for the reading rooms which are situated on the second and third floors but are large halls not equipped with an air-conditioning system. On the fourth floor, floor to ceiling clearance will be set at 3.7 m for common rooms, but for the audio-visual room, which is a spacious hall with a projection room, floor to beam clearance will be set at 4.4 m.

4-4-5 Others

(1) Design for External Appearance

The design concepts will be intriduced with consideration given to the harmony and compatibility of the library with landscape of Ayala Boulevard and the external appearance of the campus.

Exterior openings will be enlarged as large in area as possible to provide ventilation and natural lighting and at the same time movable louvres will be considered.

Table 4-4 Finishing Plan (Exterior)

Item	Precondition		Construction Method		Reason for Selection
		Required Performance	I	II	
Exterior	◦Exterior Surface Finishing		synthetic adobe finish by surface chipping	tile-like coating	I. Cost-wise inexpensive, but the color appearance of the material does not harmonize the street.
		appearance	△	○	II. Although imported material, maintenance can be easily performed and the color appearance suits the street.
		durability against weather	○	○	
		indigenous supply	○	×	
		cost peso/sq m	117.7	245	
	◦Exterior Opening		aluminum sash	steel sash	I. Imported material and too expensive in cost.
		appearance	○	△	II. General construction emthod and can be supplied indigenously. A little inferior in air-tightness but it is not much of a problem because the Project does not plan to install so many air-conditioning equipments.
		water-proof	○	△	
		durability against weather	○	△	
		indigenous supply	×	○	
		cost peso/sq m	890	350 - 400	

Item	Precondition		Construction Method		Reason for Selection
		Required Performance	I	II	
Exterior	◦Roof		concrete slab + bituminous membrane waterproofing + topping concrete + mortar	roofing tile + truss	II. Although expensive, comparing to I, it is general in material which can be found in the country and in construction method. Also, superior in insulation against heat and has good appearance harmonizing the street.
		appearance	△	○	
		water proof	○	○	
		heat insulation power	○	○	
		durability against weather	○	○	
		indigenous supply	○	○	
		cost peso/sq.m	303.4	592.6	
	◦External Wall		concrete	concrete block + mortar	II. Popular method in the Philippines and economical in cost.
		workability	△	○	
		water-proof	○	△	
		durability against weather	○	△	
		indigenous supply	△	○	
		cost peso/sq.m	234.2	124.1	

(2) Interior Design

Plans will be formulated so that roughly an intermediate grade of interior finish work may be carried out. The materials will be selected for each part of facilitate from the view point of easy for the maintenance and control to reduce the running cost.

Table 4-5 Finishing Plan (Interior)

Item	Precondition		Construction Method		Reasons for Adoption
		Required Performance	I	II	
Interior	°Floor Finish - reading room - general office rooms		vinyl sheet	vinyl asbestos tile	I is better in walking condition comparing to II, but can not be supplied domestically which will make the cost very high.
		sound absorption	×	×	
		appearance	△	△	
		walking condition	○	△	
		resistance against wear	△	△	
		indigenous supply	×	△	
		cost peso/sq.m	115.2	73.8	
	°Floor Finish - entrance hall		marble block	vinyl asbestos tile	I is more expensive cost-wise, but for the atmosphere of the entrance hall, I is suitable. Also, I is superior in resistance against wear, water proof and walking condition.
		appearance	○	△	
		walking condition	○	△	
		resistance against wear	○	△	
		indigenous supply	○	○	
		cost peso/sq.m	196.7	73.8	
	°Wall Finish - reading room		plywood(Nara) w/furring string + clear lacquer	mortar + vinyl paint	Decided from cost comparison.
		appearance	○	○	
		indigenous supply	○	○	
		cost peso/sq.m	142.4	79.5	

Item	Precondition		Construction Method		Reasons for Adoption
		Required Performance	I	II	
Interior	°Wall Finish - conference room - chief librarian's room		plywood(Nara) w/furring string + clear lacquer	mortar + vinyl paint	Decided from cost comparison.
		appearance	○	○	
		indigenous supply	○	○	
		cost peso/sq.m	142.4	79.5	
	°Finish of Ceiling - reading room		acoustic mineral board	mortar	I. Excellent in sound absorption power. Even though imported, it is generally popular material in the country. II. Should be used in the rooms not necessary of sound absorption.
		sound absorption	○	×	
		appearance	○	×	
		indigenous supply	×	○	
		cost peso/sq.m	140	45.6	