

Chapter 1 Background of the Project

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(1) Background of the Request

The Government of Maldives established its Basic Education Plan in 1980 to promote the improvement of primary education and the literacy rate in the country. As a result, the number of primary school students increased from 30,621 to 50,733 and the illiteracy rate dropped from 10% to 7% in 1995. The primary school gross enrolment ratio during the period from 1990 to 1996 was up an average of 136% for males and 132% for females. The improvement of primary education is still regarded as the most important theme in the country. According to the Education Master Plan 1996 to 2005, the targeted is to extend the period of primary education from the present 5 years to 7 years in order to improve the quality of education.

In the Maldives, most buildings built in the 1980s have structural defects, such as cracking and concrete exfoliation in the major structures that are caused by inappropriate construction materials due to the lack of high quality materials. The Third Primary School (Thaajuddeen School) is one of those buildings. Thus, the Government of Maldives conducted a building inspection in 1995 and provided repair work to the buildings of the Third Primary School in 1997. However, in spite of the repair work, structural defects were not fully corrected. In addition, due to the limited capacity of the school, present facilities cannot satisfy the desire of parents wishing to transfer their children to public schools from the community and private schools. So, the Government of the Maldives, in accordance with the pre-qualifications necessary to apply for financial assistance from Japan's Grant Aid system, established the "Project for Reconstruction of the Third Primary School in Male'," and then requested grant aid assistance from the Government of Japan to reconstruct and expand the school buildings.

(2) Outline of the Request

1) Prior to the Field Survey

The components of requested facilities are as follows:

Classroom (a total of 35 classrooms), Art and Craft Room, Music Room, Science Room, Computer Room, Audio-visual Room, Library, Sports Hall, School Hall, Lobby, General Office, Staff Meeting Room, Principal Room,

Assistant Principal Room, Staff Room, Teaching Aids Room, Supervisors Room, Counseling Room, First Aid Room, Prayer Room, Storage Space, Staff Toilets, Student Toilets, Machine Room, Stairs and Corridors, Quiet Area (Multi-purpose space)

2) Revisions during the Field Survey

The Ministry of Education submitted the revised list of components of facilities during the period of the field survey. “Quiet Area” was eliminated and “Administrator Room”, “Secretary Room”, “Print Room”, “Pantry”, “Electric Room” were added in the revised list.

Chapter 2 Contents of the Project

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2-1 Basic Concept of the Project

2-1-1 Overall Goal and Project Objective

(1) Overall Goal

A total of 15 schools (6 public primary schools, 2 public Islam schools, 4 community schools and 3 private schools) conducted primary education in Male' during the fiscal year 2001. These schools regulate the number of second and higher grade students they admit from other schools due to capacity shortages. Thus, when a second grader or higher moves to Male' from another island, the student has to enter either a community school or a private school. And, while public primary schools are free of charge, the community schools and the private school require tuition fees. This situation hinders the objectives of the Provision of Free Basic Education in the Government's "Education for All" policy. The Project's overall goal is the improvement of accessibility to public primary schools by eliminating the present admission system regulations.

(2) Project Objective

The objective of the Project is to enlarge school capacity to accommodate more students at the Project school by increasing safe classrooms.

2-1-2 Outline of the Project

The Project will reconstruct the Third Primary School in Male' (Thaajuddeen School) as it has a dangerous building structure caused by faulty construction. This reconstruction will secure the number of safe classrooms there and will increase the number of classrooms to 35 classrooms instead of the present number of 25 for the objective of enlarging school capacity to accommodate more students.

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policies

2-2-1-1 Basic Policies (Set up of Facility Components and Scale)

(1) Scale of Facilities

Due to the classroom shortages in Male', the number of students in the second and higher grades who can transfer to a public primary school is limited. Thus, when a student in the second or higher grade moves into Male' from another atoll, the student has to enter a community school or a private school. Although public primary schools are free of charge, community schools and private schools charge tuition. In addition, it is generally regarded that the contents of classes and the quality of facilities in the public schools are better than those of the community and private schools. Among the parents of students in the second and higher grades, there is a strong desire to send their children to a public school. In view of this situation, the Ministry of Education has established policies to increase the number of students that can be accommodated at public schools by building more classrooms in Male'. This is to ease the number of students in the second and higher grades transferring to public primary schools. As a result, the Government of Maldives has requested the construction of 35 new classrooms under this Project of the Government of Japan. There will be 10 classrooms more than the existing number of 25 (in usable condition) at the Third Primary School in Male'.

Although there is a tendency of a slight increase in the number of first grade students in the public schools in Male' as well as the entire country, the population of the younger generation in Male' and the entire country has declined over the past five years, according to the national census. Further, the number of first to seventh graders in Male' has been almost unchanged or has decreased slightly since 1996. From this tendency, it is believed that the number of primary school students on the island of Male' will not change much in the future.

Table2-1 Number of First to Seventh Grade Students in Male'

G1-G7	1996	1997	1998	1999	2000	2001	2002	Average Annual Increase Rate
Entire Male'	14,675	15,097	15,057	14,701	14,544	13,326	-	-
	Increase Rate	2.9%	-0.3%	-2.4%	-1.1%	-8.4%	-	-1.9%
Public Schools	10,053	10,187	10,216	10,193	10,135	9,712	9,958	-
	Increase Rate	1.3%	-0.3%	-0.2%	-0.6%	-4.2%	2.5%	-0.2%

Table2-2 Number of First Grade Students in Male'

G1	1996	1997	1998	1999	2000	2001	2002	Average Annual Increase Rate
Entire Male'	1,402	1,291	1,414	1,400	1,552	1,438	-	-
	Increase Rate	-7.9%	9.5%	-1.0%	10.9%	-7.3%	-	0.8%
Public Schools	1,396	1,283	1,414	1,373	1,543	1,424	1,455	-
	Increase Rate	-8.1%	10.2%	-2.9%	12.4%	-7.7%	2.2%	1.0%

At present, when students in the atolls are ready to go on to higher grades, a large number of them transfer to schools in Male' without regard to the paying of tuition or whether the schools are public or private. So, even if the public schools adopt the free "transfer to public primary schools" system in Male', it seems that the number of future students transferring to schools in Male' will not increase significantly. As a result of the free transferring system, the number of students who are obliged to attend community schools or private schools at present may enter public schools.

Table2-3 Number of Students in Primary Education by Each Grade in Male'

Grade	Public Primary Schools	Total in Male' in 2001	% of Public Primary Schools
Grade 1	1,414	1,428	99.0%
Grade 2	1,540	1,600	96.3%
Grade 3	1,354	1,497	90.4%
Grade 4	1,345	1,639	82.1%
Grade 5	1,215	1,755	69.2%
Grade 6	1,358	2,438	55.7%
Grade 7	1,486	2,969	50.1%
Total	9,712	13,326	72.8%

Table2-4 Number of Students in Primary Education by Each School in Male'

Type and Number of Schools	Number of Students in 2001	%	
Public Primary School	6	9,712	72.9
Public Islam School	2	371	2.8
Community School	4	2,341	17.5
Private School	3	902	6.8
Total		13,326	100

In summary, the following assumptions can be made: 1) the number of first to seventh grade students in Male' will remain about the same; 2) the number of students who transfer from other islands to Male' will not change much in the future. Thus, the increase in the number of public school students due to a "free transferring system" is equal to the number of students presently going to community and private schools (3,243 in 2001) and the total number of public school students to accommodate is 12,955.

By assuming there will be 12,955 students in 2005(the target year of the Project & the completion year of the Education Master Plan 1996 to 2005), the number of necessary classrooms is calculated as being 216¹. As the number of existing classrooms is 186 (the audio-visual room at the Fourth Primary School and the science room at the First Primary School are not included), there will be 30 classrooms short. But since school management in the Maldives considers 1,500 students per school as ideal, with space for up to 2,100² students maximum, the government requested from Japan the construction of 35 classrooms. The number of 35, which should be enough to accommodate 2,100 students, is the same as the Fifth Primary and the Sixth Primary Schools which were recently established.

If 35 classrooms are constructed as the Maldives side requested, the total number of classrooms at all public primary schools in Male' will be 196. Although the number of students per classroom will be 33, slightly more than the standard figure of 30 in the Maldives, there shouldn't be any problem because in the present number of 196 classrooms, schools have a maximum of 32 to 33 students to a class.

The bottom line is that if all public primary schools in Male' adopt the "free transferring system" as the Ministry of Education explained, the 35 classrooms requested by the Maldives side can be considered to be an appropriate figure.

¹ Note: Based on a premise that the number of students is 30 per class and conducting two-shift classes

² 30 pupils per class × 10 classes per grade (5 classes × 2 shifts) × 7 grades

(2) Facility Components

The necessity of each requested component of facilities to be built shall be based on the following criteria.

- ① The components of facilities should satisfy the minimum functions required by the curriculum for primary education at present and near future.
- ② The number of classrooms, other rooms and facilities should accommodate the minimum requirements considering the present and future needs of the educational system and school age population.

1) General Teaching Area

a) Classroom (a total of 35 classrooms)

No need to mention the necessity of classrooms.

b) Art and Craft Room and Associated Preparation Room

An art and craft room was provided to the Sixth Primary School that was constructed under Japan's Grant Aid Program. However, due to the necessity of having a computer room, the art and craft room was changed to a computer room³, but it still wasn't ever used. Among the existing 6 primary schools presently in Male', only the Fifth Primary School has an art and craft room. Considering that other primary schools do not have an art and craft room, the necessity of having one is not so high. Thus, the construction of an art and craft room will not be covered in the facility components of the Project.

c) Music Room and Associated Storage Room

All primary schools in Male' have a music room. But, as sound from a music room interrupts other classes, it is reasonable to build the music

³ Note: Strictly speaking, the art and craft room was diverted to a music room, and the original music room was diverted to a computer room.

room separate from ordinary classrooms. In addition, every primary school in Male' has a fife and drum band as an extra-class activity. As the Project school has various musical instruments, a storage room is necessary.

d) Computer Room and Associated Storage Room

The Guidelines for the Installation of a Computer Room at Primary Schools were issued in 1999. From July, 2000, computer rooms were installed at all public primary schools in Male' and most of the Atoll Education Centers, so computer education has been available. The schools provide only the space for computer education and other related classes. The actual classes with computer equipment, management and maintenance of computer rooms are run by a private company. The company collects tuition from students for the classes (the fee is 50Rf for two periods a week for public primary students in Male'). The computer classes are basically held two periods per week for all grades 1 to 7. In Male', most students take computer classes.

In the existing facilities of the Project school, a computer room is provided and computer classes are being held. Maintenance of computer equipment and the preparation of class contents are contracted to a private company. Basically, there are no problems related to the management and maintenance of computer equipment. Thus, it is considered appropriate for the Project to build a dedicated room, like a multi-purpose room, for computer education.

e) Science Room and Associated Preparation Room

Sixth and seventh graders were included as primary school students due to the extension of the educational period in the Maldives. As a result, a science room is needed at each primary school for science curriculum. Presently, 3 of the total 6 primary schools in Male' already have a science room and are conducting science classes. One of the remaining schools is expected to have a science room and start science classes within the school fiscal year 2002. Thus, it is considered appropriate to build a room for science classes at the Project school. But, sixth and seventh grade chemistry, physics and biology classes, which require separate classrooms, will not be provided. It should be sufficient to build a common use science

room for these classes.

f) Audio-visual Room and Associated Preparation Room

All 6 primary schools in Male', except for the Fourth Primary School, have an audio-visual room. Use of the audio-visual room varies from school to school. Some schools have a set class schedule for using the rooms and others use the rooms based on a reservation system. According to school staff, audio-visual education using videos is very useful to attract students' attention. The average is one unit per week of audio-visual education. As for teaching materials, some schools purchase materials at their own discretion. However, most schools generally borrow teaching materials from the Educational Development Center. At the Project school, language laboratory equipment is provided in the existing audio-visual room for language education classes. In addition, seminars at PTA meetings use OHP equipment in the room. Thus, it is considered appropriate to build an audio-visual room.

g) Library

The library of every public primary school in Male' is used not only for general library activities such borrowing of books, but also for ordinary classes. Thus, library time is scheduled; language education classes are decided according to the library schedule. The supply of books comes from library funds that are generally included in school management and maintenance funds. In addition, donations for buying books are actively solicited by some individuals and the PTA. In particular, the Project school has approximately 20,000 books, the largest number among all the public primary schools in Male'. Thus, the Project's rebuilding of the library is considered a must. Two librarians, one in the morning and the other in the afternoon, are assigned to library operations.

h) School Hall/Sports Hall and Toilets

The hall is used not only for physical education classes but also for extra-curricular activities, school meetings, and for the multi-purpose uses of the community. Thus, it is considered appropriate to construct a multi-purpose hall for physical education classes and other purposes.

i) Store

The Maldives side requested the building of a store in the general teaching area. The use of this store should be included in other storerooms.

2) Administrative and Staff Space

j) Lobby

The lobby is a space located near the main school entrance and is used for school reception, a waiting area and for the placing of a bulletin board. It is a half-enclosed space. It may be built by enlarging part of a corridor. Thus, it is not regarded as a room.

k) General Office

The general office is for general clerical, accounting, and other incidental work. In accordance with the AE Section of the Ministry of Education, the number of general administrative personnel at each public primary school will be maintained at a set number in the future. The total number of administrative personnel at the Project school in 2002 will be 22 (except for the administrator). Each of the other public primary schools in Male' will have almost the same amount of staff. It is considered appropriate to construct a general office at the Project school.

l) Administrator Room

The administrator room is for the exclusive use of the administrator. It is appropriate to separate this office from the general office as is the custom in the Maldives, and the nature of the work makes it necessary. Thus, an exclusive use administrator room will be built in the general office space.

m) Principal Room and Associated Toilet

This is the office of the school principal. Based on the custom in the Maldives and the nature of principal's position and work, a dedicated office should be provided. As in other public primary schools, a private

toilet will be built for the principal's office at the Project school.

n) Secretary Room

In general, an exclusive secretary is assigned to the principal and assistant principals at each public primary school in Male'. Thus, the Maldives side has requested a secretary room in the Project. But, since it is possible to secure space for secretaries in the supervisors room which is adjacent to the principal room and assistant principal room, no exclusive use secretary room will be built under the Project.

o) Assistant Principal Room

While the principal administers the entire work of the school, two assistant principals are assigned to each public primary school in Male'. One is in charge during the morning session and the other in the afternoon session to assist the principal. It is considered appropriate to build a room for the assistant principals under the Project.

p) Print Room

Every public primary school in Male' is provided with equipment for printing and copying. Simple everyday printing like copies for office work are done there. Also, printing of test materials and the sorting and storing paper are done there. It is considered necessary to provide a print room in a corner of the general office.

q) Staff Meeting Room

Every public primary school in Male' periodically holds ① supervisor meetings, ② PTA meetings, ③ school board meetings, ④ teacher's subject meetings and ⑤ grade teachers meetings. About 10 to 20 people usually attend these meetings. PTA meetings are held almost every day for about one month at the beginning of each semester in order to discuss school activities. Thus, it is considered appropriate to build a meeting room in the Project school.

r) Staff Room

About 70 teachers will be assigned (excluding supervisors, librarians and health care assistants) to the Project school during the fiscal year 2002. It is appropriate to build a staff room in the school.

s) Resource/Teaching Aids Room

This room is used for the storing teaching materials and for class preparation. As the Project school owns a substantial amount of teaching materials, it is considered necessary to have a storeroom. Public primary schools in Male' usually store teaching materials in the libraries and the librarians manage them. Therefore, the storeroom for the Project school should be built in a corner of the library.

t) Supervisors Room

It is standard to assign three supervisors per 500 students to each public primary school in Male'. 8 supervisors will be assigned to the Project school in the fiscal year 2002. The supervisors manage the teachers and should have their own desks and chairs. Thus, it is appropriate to build an exclusive use room for supervisors at the Project school.

u) Prayer Room

All people in the Maldives are Moslem. Thus, it is appropriate to install a prayer room for teachers and staff members as well as for students.

v) Pantry

The total number of teachers and staff members at the Project school in fiscal year 2002 will be approximately 170. Half of them will work the morning shift and the other the afternoon shift and will be in the school at the same time. Thus, it is appropriate to provide a pantry for them.

3) Other Service Spaces

w) First Aid Room

Two health assistants are assigned to each public primary school in Male'. They conduct various health-related activities. Considering the fact that about 10 to 20 students visit the first aid room every day, installation of a first aid room at the Project school is considered necessary. The Ministry of Education has requested to provide two or three beds and a toilet in the first aid room. From a religious viewpoint, it is inappropriate to provide co-use beds for adolescent males and females. The plan is to install two beds and they will be separated for males and females by a curtain. No toilets will be installed in the first aid room because a universal toilet will be constructed adjacent to the first aid room. The planning of the first aid room should take gender aspects into consideration.

x) Counseling Room

Two counselors will be assigned to each public primary school in Male'. However, due to the lack of professionals, supervisors and elder teachers or some parents at the schools will act as counselors. As privacy is important in any aspect of counseling, the Maldives side has requested a room for this purpose. However, as counseling may be conducted in other rooms, such a special use room will not be covered by the Project.

y) Sports Storage

A sports storage will be built adjacent to the school hall to store existing physical education equipment, sports gear and plastic chairs used in the school hall.

z) Toilet

Student toilets and staff toilets will be installed on each floor separately between males and females.

Student toilets will be built as follows. (a) 2 toilets each on the 1st to 3rd floors considering the travel distance (b) 1 toilet on the ground floor due to the less number of classrooms and shorter travel distance. The necessary

number of toilet booths is calculated based on one per 50 male and female students respectively.

Staff toilets will be built as follows. (a) 1 two-booth toilet for males and females respectively on the ground floor with many administrative and staff rooms, (b) 1 one-booth toilet for males and females respectively on the 1st floor with a staff room, (c) 1 one-booth toilet for females on the 2nd and 3rd floor respectively considering no administrative and staff rooms are planned there and female teachers occupy the majority of the staff.

A universal toilet will be built next to a first aid room on the ground floor due to its frequent use, which also should be usable for the handicapped people. Toilets for a school hall will be installed also on the ground floor considering the use of a school hall and a schoolyard by area residents.

aa) Others

A machine room, an electric room, stairs and corridors, a storage space and a schoolyard should be constructed by the Project.

Table2-5 Facility and Equipment Use Conditions at Public Primary Schools in Male' (2001)

No.	Name of Room	Name of School	1 Iskandharu	2 Jamaaluddin	3 Thaajuddin	4 Kalaafaanu	5 Imaduddin	6 Ghiyasuddin
1	Expected No. of Students in 2002 (※ 1)		2,182	1,723	1,412	1,620	1,580	1,462
2	Classroom	No. of Classroom	37	31	25	25	35	33
		No. of Class (※ 1)	73	58	48	53	53	48
		Use Rate (※ 2)	98.6%	93.5%	96.0%	106.0%	75.7%	72.7%
		No. of Special Class	None	2	None	None	None	None
3	Use Rate of Special Classroom (※ 3)	Science Room	-	35.0%	-	37.5%	77.5%	27.5%
		Music Room	78.8%	75.0%	53.8%	58.8%	85.0%	62.5%
		Art & Craft Room	-	-	-	-	71.3%	-
		Audio-visual Room	Multipurpose	68.8%	LL Room	-	50.0%	o
		Computer Room	102.5%	108.8%	102.5%	107.5%	87.5%	100.0%
		Library	80.0%	72.5%	57.5%	58.8%	81.3%	63.8%
		Sports Hall	85.0%	60.0%	o	67.5%	57.5%	o
		Other	-	-	-	-	School Hall	-
4	Computer Room (※ 4)	No. of Computer	30	35	30	32	32	30
		Tuition/Student (Rf)	50	50	50	50	50	50
		Attendance Rate Among All Students (%)	100%	100%	100%	100%	100%	G1-G5:100% G6-G7:80%
		Permanent Instructors	3	15	1	3	7	3 on Shift
5	Library	Number of Books	15,000	11,700	19,885	10,000	4,000	7,061
6	Teaching Material	Storage Room	Installed	Installed	Installed	Library	None	Installed
		Responsible Person	Librarian	Librarian	Not Fixed	Librarian	Supervisor	Supervisor
		Inventory	Listed	Listed	Listed	Listed	Listed	Listed
7	Sports Gear (※ 5)	Gear Storage	Installed	Installed	Installed	Installed	None	Installed
		Managing Person	SSV	SSV	SSV	SSV	SSV	SSV
		SSV Room	Installed	Installed	Installed	None	Installed	Installed
		Inventory	Listed	Listed	Listed	Listed	Listed	Listed
8	Music Teaching Materials	Material Storage	Music Room	Music Room	Installed	Music Room	Installed	Installed
		Managing Person	Music Teacher	Music Teacher	Music Teacher	Music Teacher	Music Teacher	Music Teacher
		Inventory	Listed	Listed	Listed	Listed	Listed	Listed
9	Audio-visual Materials (※ 6)	Material Possession	Little	Little	None	None	Yes	None
		Place to Borrow	EDC	TVM	EDC	EDC	EDC	EDC, TVM
10	Meeting Room	Room Possession	None	Installed	None	Installed	Installed	Installed
		No. of Attendees	10 to 16	About 13	About 15	12 to 15	8 to 17	13 to 17
11	Counseling Room	Room Possession	None	Installed	None	None	None	Installed
		Qualified Counselors	None	2	None	None	1	None
		No. of Counseling	2/week	5/day	Every Day	5/day	3 or 4/day	4 or 5/day
12	First Aid Room (※ 7)	Used Person/Day	10 to 15/day	8 to 10/day	20/Day	5 to 10/Day	8 to 10/Day	8 to 14/Day
		Having Toilets	None	Installed	None	None	None	None
		No. of Beds	2	1	1	1+(2 spares)	1	1+(Having 1)
13	Print Room	No. of Printers	2	2	1	2	1	1
		No. of Copy Machines	2	1	1	2	2	1
14	Canteen	No. to Accommodate	20	15	12	20	9	15
		Operation	Contracted	Contracted	Contracted	Contracted	Contracted	Contracted
		Sale per Day	Not Known	1000Rf/Day	400Rf/Day	700Rf/Day	300Rf/Day	500Rf/Day
		Contractor Fee	500Rf/Month	500Rf/Month	-	1,500/Month	500Rf/Month	1500Rf+ 10%
		Use of Students	No	No	No	No	No	Only 6&7 Gdr.
15	Lending of Facilities (※ 8)	Frequency	Twice/Month	1or2 Times/M.	0.5 Time/M.	Every Weekend	3or4 Times/M	Frequently
		Facility to Lend	G, H, C	G, H, C	G, H	G, C	G, H	G, H, C

※ 1 Source : MOE's AM Section, Staff Requirement for Year 2002(Final)

※ 2 Number of Classrooms ÷ Number of Classes ÷ 2 Shifts

※ 3 Use Rate: 8 class-units/day for morning and afternoon, 5 days a week. "o" indicates yes but no set schedule. "—" indicates none.

※ 4 All 6 schools have entrusted private firms to supply equipment and teaching materials and operate the classes.

※ 5 SSV : Sports Supervisor

※ 6 TVM : TV Maldives, EDC : Educational Development Center

※ 7 All 6 schools have first aid rooms.

※ 8 G : Schoolyard, H : School Hall, C : Classroom

2-2-1-2 Policies for Natural Conditions

(1) Consideration for a Sun and Monsoon Climate

Classroom buildings, where students spend the most of their time during the day, shall be oriented in an east–west direction in order to prevent strong sunlight in the mornings and late afternoons and devastating southwestern monsoon winds and rains from entering rooms.

(2) Consideration for Natural Ventilation

By taking into consideration the humidity and high temperatures, special attention shall be given to allow for breezes and natural ventilation when deciding the arrangement of each building and room and their sizes, locations and types of openings. A ceiling fan shall be installed in each room where people stay long.

(3) Eaves

Eaves shall be installed above windows to prevent direct sunlight and rain from entering even if the windows are open. The type of sashes with open and close functions shall be decided upon by examining safety and rain into rooms from an overall viewpoint.

(4) Consideration for flooding

The groundwater table in Male' is quite high, approximately 1m below the ground surface, and roads are often flooded during the rainy season. Thus, the ground floor level of a building shall be set at 700mm above the road surface.

(5) Consideration for Selecting Building Materials

The Project school is located close to a beach. So, because of the salt breeze, the use of steel material shall be limited to a minimum from an overall viewpoint. In addition, to prevent possible termite damage, wood use shall be carefully examined. If wood is to be used, it must have adequate anti-termite treatment.

(6) Natural Conditions and Structure Design

As the Project site is located on the soft reclaimed land, building foundations shall be designed by taking into account uneven sinking and settling. The Maldives is positioned outside of all the world's earthquake zones, and there are no records of any earthquakes. However, to secure building safety, certain lateral forces of wind shall be designed into the building structure.

2-2-1-3 Policies for Social-Economic Conditions

(1) Effective Use of the Land

In order to effectively use the precious land in this highly populated island, Project buildings shall be four-stories high, the limit for primary school buildings. This also allows for making the schoolyard as large as possible, more planting of scarce trees and building expansion in the future.

(2) Securing of Open Space

The small island of Male' is highly populated and open space for children to play is extremely scarce. By taking this situation into consideration, a practical-shaped schoolyard should be as large as possible for children's ball games; and for running, a 50m straight track should be included in the planning.

(3) Consideration for Religious Customs

The Maldives is a pious Moslem country, so a prayer room shall be constructed that can accommodate use by males and females at the same time. Also, a first aid room shall be built which both males and females can use at the same time.

(4) Consideration for the Handicapped

For purposes of access for the handicapped as well as the Sixth Primary School, a ramp shall be installed from the road to the ground floor level of school buildings. Also a universal (handicapped accessible) toilet shall be

built on the ground floor.

(5) Consideration for Multi-Purpose Use of School Facilities

As public facilities are not very developed in the Maldives, area residents use school facilities for various purposes. Taking this into account, the school hall entrance shall be planned in such a way as to connect directly to the road, so that not only students but also area residents can easily use the school hall as well as the schoolyard.

(6) Economic Rationale Considerations

As mentioned in paragraph (1) above, classroom buildings (except a school hall with a long structure span) shall be planned as simple structured four-story buildings so that the total area for exterior finish work will be at a minimum. Stairways and sanitary facilities shall be arranged at the same location on each floor so that the compact space may be created in them to keep the length of pipes short thereby saving construction costs.

(7) Effective Use of Natural Water Resources

This island-country doesn't have any rivers, so the obtainable supply of city water is expensive and must be used only for drinking purposes. To keep facility maintenance costs down, rainwater and well water as natural water is to be effectively used for various purposes.

(8) Installation of Lighting Fixtures

Considering that school facilities are used in the evenings for classes and at night for area residents and club activities, etc., lighting fixtures shall be installed in each area and room.

(9) Consideration for Emergencies & Disasters

Emergency lighting systems, lighted emergency exit signs and fire hydrants on each floor shall be installed in accordance with local administrative guidelines. Only the wire conduits shall be installed for fire alarm systems which the Maldives side may complete afterwards.

2-2-1-4 Policies Regarding Construction

(1) Construction Materials and Equipment

The Maldives produces only coral sand and stone that are presently under a mining ban, and has no manufacturing facilities to produce building materials. In view of this situation, the country mostly has to rely on imported materials, like cement, gravel, reinforcing bars, metal sashes, doors, board, tile, paint, electrical wires, pipes, and equipment. These materials are imported from Singapore, Malaysia, India, Indonesia and Sri Lanka. Industrial products of high quality are imported mainly from Singapore.

Therefore, the building materials and equipment for the Project have to be selected in view of not only cost and quality, but also maintenance.

(2) Supply of Labor

There has been a lot of building construction going on in Male' recently. Almost all workers, with some exceptions, are foreigners.

In the Maldives, there are an extremely large number of school children. Particularly in Male', where secondary education facilities are located, this is obvious. Also, highly educated people, mainly government office workers, are concentrated in Male'. Because of that, and the fact that people customarily hate to engage in construction work, it is difficult to hire Maldivian workers, except for some foremen and semi-skilled workers, to do construction jobs. Thus, they have to rely on foreigners for their supply of skilled workers, mainly from Sri Lanka, India and Bangladesh.

When hiring foreign workers, it is necessary to obtain a foreign worker recruitment permit from the Ministry of Labor, in accordance with the Employment Opportunity Protection Policy of the Government of the Maldives. A separate recruitment permit must be obtained for each project. It is not possible to hire foreign workers at any time in the Maldives. A Project construction contractor has to obtain a foreign worker recruitment permit in advance through the Ministry of Education, after estimating the required number of workers.

(3) Transportation

All building materials and equipment coming into the Maldives must be by ship. Thus, a good plan for shipping by sea must be carefully prepared so that it will not adversely affect the Project's construction schedule. In particular, the timing of the arrival of reinforced steel bars after construction begins is crucial, as any delay will seriously interrupt the total construction schedule. Transportation time by sea from Singapore, India and Sri Lanka to the Maldives is 20 to 25 days, 5 to 7 days and 7 to 10 days respectively. Two shipping companies operate regular freighters between Singapore and Male' twice a month. The existing unloading facilities at Male' Port are truck cranes. Most ships unload cargo by using their own cranes.

To have trouble-free shipments of building materials and equipment for the Project, it is necessary to carefully prepare and process the various documents. Full cooperation from the Maldives side is absolutely necessary for customs clearances at the Port in Male'.

(4) Local Contractors

There are five to seven local construction contractors with sufficient capability to undertake large-scale projects for the Government of Maldives. However, there are not that many large-scale building construction projects in the Maldives, and these local contractors lack the experience of constructing medium to high-rise buildings.

But, although the country has to rely on foreign workers from Sri Lanka and India for carpentry and skilled work, it will be no problem to use the local contractors as subcontractors under a Japanese prime contractor for the Project.

(5) Local Consultants

There are freelance architects and engineers other than those who work for private architect offices and companies. Among them there are organizations that are made up of architects and engineers who work for the Ministry of Construction and Public Works. Their professional capabilities are relatively high. For the preparation of the construction supervision plan,

it is best to utilize these consultants who are fully familiar with local conditions.

(6) Laws and Rules Related to Building Construction

In the Maldives, the government administration office will provide guidance and information for the preparation of architectural plans regarding the rules related to building height limits and the easing of a building's overhang above the road. However, standards similar to Japan's Building Standards Act have not been set up yet. Rules, laws and standards for school facilities have also not been established. There are some permits and approvals, though, which must be obtained from the following authority:

The Maldives Housing Development Board
The Ministry of Home Affairs, Housing and Environment

The following approvals are entrusted to each organization.

Structure design approval:

The Ministry of Construction and Public Works

Fire fighting equipment and facilities approval:

The Fire Department of the National Security Service

2-2-1-5 Policies for Capability of Project Operation and Maintenance Implementing Agency

The repair and maintenance of school facilities is carried out under the responsibility of the Ministry of Education and each concerned school. Funds for repair and maintenance are approximately 6% of a school's total operating budget. Janitors at each school do the daily cleaning chores and also the small maintenance jobs and repair work. Outside contractors are hired to do large-scale repair and maintenance work. Basically, the existing repair and maintenance capabilities are fine and work quite well.

However, considering the financial condition of the government and the general construction situation in the country, facilities of the Project shall be carefully designed for easy repair and maintenance as well as keeping these costs as low as possible.

2-2-1-6 Policies for Deciding Grade of Facilities

Facility design, content and grade shall be prepared in accordance with the above-mentioned policies. They are generally the same as those used in the Fourth and Sixth Primary School projects in Male' implemented under Japan's Grant Aid Program and other public primary school projects in Male' by other donors. Exact specifications shall be based on the overall aspects of construction costs and facility repair and maintenance costs. The paint finish for external wall, cement mortar finish for internal floor of classrooms etc., paint finish on cement mortar for internal wall and ceiling are basically the same as those used for other facilities by foreign donors. Although another donor uses ceramic tiles for the floor finish of special classrooms in the Fifth Primary School etc., cement mortar is used for the Project to reduce the building cost.

2-2-1-7 Policies Regarding Construction Time Period

From the viewpoint that most building materials must be imported, 12 months will be required for Project construction. In addition, it is assumed that the majority of workers to be hired for Project construction will be Sri Lankan. Thus, it will not be necessary to consider non-work days for Ramadan, so there should be no problem to complete the Project construction within one fiscal year. The most important aspects to be considered for the construction period are 1) the work progress of the Maldives side, and 2) the arrival time of building materials. For these reasons, the content and details of work to be undertaken by the Maldives side shall be confirmed at an early stage of the detailed design period for the Project; and the shipping plan of building materials procured from foreign countries shall also be carefully prepared.

2-2-2 Basic Design

2-2-2-1 Arrangement Plan of Facilities

The most important aspect for the facility arrangement plan is to enable the effective use of precious land resources in Male' and create a comfortable educational environment, as follows:

(1) Each building shall be arranged close to site boundary lines in such a way that the school yard is as large as possible and has a shape that makes the most practical use of the most space.

(2) To help lessen the exposure of the strong morning and afternoon sunlight and rain whipped in by the southwestern monsoon winds, the general arrangement of classroom buildings where students spend the most time shall be in an east-west direction.

(3) The east-west oriented classroom buildings shall be located close to existing roadsides, not the northern area side where existing buildings are, as that northern area's plan for development has not yet been decided. By doing so, comfortable, natural ventilation may also be maintained between the road and the schoolyard.

(4) The special classroom building with the library shall be located between the two classroom buildings to allow for a short and comfortable walk between classrooms.

(5) The administration building shall be arranged between the two classroom buildings in such a way that it faces the schoolyard so that the students and the schoolyard may be easily observed from rooms in the administration building.

(6) Locating the 4-story school buildings along the existing eastern and southern roadsides creates a more stable environment as the schoolyard is out of view from the roads and the southeast police station. Another plus is that much noise from the schoolyard doesn't reach the hospital in the south.

(7) The school hall shall be located on the western side of the site in order to secure a quiet classroom environment away from any generator noise coming from the hospital.

(8) With the possibility of the school hall also being used by area residents, it shall be placed facing the road so that a sub-entrance can be built.

(9) In Male', it is a common practice for parents to take their children to school and then pick them up after school. This creates traffic jams before

and after school which are very inconvenient to the area residents. Thus, the main gate and sub-gate in front of the school hall shall be from the southern road and not the eastern road with the heavier traffic. In addition, a spacious piloti which can be used as a waiting place shall be provided at the entrance.

2-2-2-2 Floor Plan

- Of the Project facilities mentioned above, the southern and northern buildings should be classroom buildings, the eastern building should be a special classroom building, the western building should be a school hall and the two-storied center building should be an administration building.
- In order to keep the circulation of people moving freely and walking time shorter, connecting corridors shall be installed on the schoolyard side of the school buildings. In general, windows in each room shall be installed on the side of buildings that face the road. Because of the hot temperatures and high humidity in Male', the use of natural ventilation shall be considered when making the floor plans of each building.
- For convenience and for safety in emergencies, stairways shall be installed as are the toilets, at convenient, easy-to-find locations at the ends or sides of buildings.

The floor plans of major rooms are as follows:

(1) Classrooms

Classrooms shall be 6m × 8m in size and of rectangular shape, in accord with MOE standards. The classrooms shall be such that the blackboard is installed on the longer side so that the distance between the teacher and the students may be shorter. Windows shall be installed in the south and north walls to secure natural lighting and ventilation.

(2) Special Classrooms

Music rooms, science rooms, audio-visual rooms and other multi-purpose rooms shall be constructed on the second and third floors of the special

classroom building. Each of these rooms shall have a floor area of 70m² and a connecting room with a floor area of 17m² for class preparation and the storing of teaching materials and equipment.

(3) Library

Because the library is frequently used by all students, it shall be on the first floor of the special classroom building. As librarians are responsible for teaching materials, a teaching aids room shall also be built. In addition, because teachers are the most frequent users of the library, it shall be connected to the teachers' room across the corridor for their convenience.

(4) School Hall

The school hall will be used not only for sporting events, but also for meetings of area residents. Because of its multi-purpose use, a stage as well as a storage room for sports equipment and chairs shall be built. Access shall be secured at both sides of the stage in order to enable direct entrance to the stage from outside. And because area residents will use the school hall, one of the entrances shall be installed directly facing one of the roads. The windows will be also on the west side and their locations shall be carefully arranged so that natural ventilation may be easily taken advantage of, even during the monsoon rains.

(5) General Office

As office clerks will also do reception work, the general office and other related rooms shall be arranged on the ground floor at a location close to the main entrance of the special classroom building. Those offices and rooms shall also be of the shortest possible distance to the administration building due to the nature of the work of the clerks. The administrator room and the printing room shall be built inside the general office and will face to the outside.

(6) Administrative Rooms

Administrative rooms shall be arranged on the ground and first floors. The principal room, assistant principal room and supervisors room shall all be

arranged next to each other for convenience of communication. The room of the supervisors, who have to keep an eye on the activities of students and school conditions in general, shall be arranged on the schoolyard side on the ground floor of the administration building located between the two classroom buildings. The entire space on the first floor of the administration building shall be used for a teaching staff room to allow easy observation of the classrooms and schoolyard.

(7) Prayer Room

The Islam prayer room, to be used by students and staff, shall be arranged at the western corner on the ground floor of one classroom building in order to secure a quiet environment and be away from the general population. The rectangular-shaped room shall be so arranged that one of the walls will face in the direction of Mecca (65° west of due north). Separate entrances for males and females shall be installed. A cylindrical column symbolizing an equal division of space shall be installed at the center of the room. As people take their shoes off upon entering the room, the floor shall be slightly higher than the ground floor level. An ablution basin shall be installed in the entrance hall for the rinsing of prayers.

(8) Schoolyard

The school buildings shall be placed in such a way that a rectangular-shaped, middle space is created with the buildings surrounding the space on 3 sides. This space should be used as the schoolyard. The long, narrow open space between the classroom building and the administration building should also be used as part of the schoolyard.

(9) Roof Terrace

The roof of the administration building should be used as a terrace and be accessible from a corridor. It should be used as supplementary space to the schoolyard and the school hall, as well as for other various purposes.

Table2-6 Planned Rooms (1)

Name of Room	No.	Floor Area (m ²)	Use Purpose and the Number of People to be Accommodated
General Teaching Area			
Classroom	35	(49.50x35) 1,732.50	To conduct ordinary classes (7 grades × 10 Classrooms) ÷ 2 shifts. 30 students per classroom, one teacher per classroom.
Music Room	1	90.70	For music education (all graders) 30 students per class and one teacher per room.
Store Room	1		To store musical instruments.
Science Room	1	90.45	For science education (6th and 7th graders) 30 students per class. One teacher per room.
Preparation Room	1		To store medicines and equipment.
Audio-visual Room	1	90.70	For language classes and environmental education (1st to 5th graders) using audio-visual equipment.
Store Room	1		To store teaching equipment and materials.
Multi-purpose Room	1	90.45	30 students per class. One teacher per room.
Store Room	1		To store teaching materials.
Library	1	107.67	For ordinary library and language education (reading). To accommodate 30 students and one librarian and to keep 20,000 books.
Teaching Aids	1	18.92	To store various teaching materials and data.
School Hall	1	692.96	For physical education, school meetings, recitals and other school related activities. One basketball court and one volleyball court for children and two badminton courts. To accommodate 1,050 (one shift) standing students. It may be also used for conference, meetings, parties, and examination etc.
Stage	1		For school meetings and recitals.
Store Room	3	54.32	To store chairs.
Sports Storage	1		To store sports gears.
Floor Area of General Teaching Area			2,968.67 m ²

Table2-7 Planned Rooms (2)

Name of Room	No.	Floor Area (m ²)	Use Purpose and the Number of People to be Accommodated
Administrative and Staff Space			
General Office	1	113.52	For general administrative work. Approximately 35 staff members.
Administrator Room	1	13.07	One administrator. A safe will be installed.
Print Room	1	17.82	To install one print machine and two copy machines. Also to store paper, stationary supplies and test materials.
Meeting Room	1	36.34	To accommodate a total of approximately 20 people.
Principal Room	1		For principal's office (1 person)
Toilet for Principal	1	25.15	Only for principal's use.
Assistant Principal Room	1	25.15	For two assistant principals (one each for morning and afternoon sessions) . Two sets of desks and chairs will be installed.
Supervisors Room	1	52.98	For 8 supervisors. 8 sets of desks and chairs will be installed.
Staff Room	1	139.61	For teaching staff. To accommodate 35 teachers for one session. Co-use desks and lockers dedicated to each teacher will be installed.
Prayer Room	1	48.77	For Islam prayer. To conduct Koran teaching. An ablution basin will be installed outside the prayer room.
Pantry	1	41.46	For making hot water for teachers and staff members. A sink will be installed.
Floor Area of Administrative and Staff Space			513.87 m ²

Table2-8 Planned Rooms (3)

Name of Room	No.	Floor Area (m ²)	Use Purpose and the Number of People to be Accommodated
Service Spaces			
First Aid Room	1	27.92	To provide first-aid treatment to injured and sick students. To conduct physical checkup (including scale and height measure). A health assistant will be stationed at all time.
Store Room	2	22.98	To store outdoor-sports gear and equipment and cleaning and maintenance equipment.
Store Room	2		To use spaces under stairways to store documents.
Staff Toilets	5	271.13	For teachers and staff use (on each floor)
Student Toilets	7		One on the ground floor and two each on the first to third floors. A drinking fountain will be installed near each toilet. One booth per 50 students.
Toilets for School Hall	2		For people who use the school hall. Also for people who use the schoolyard.
Universal Toilet	1		One on the ground floor. It should be usable for physically handicapped people.
Machine Room	1	25.07	To install water supply pumps and control board. Water shall be pumped up into the elevated tank then distributed by gravity. (Water well construction shall be borne by the Maldives side.)
Electric Room	1		To house receiving panel. After branched off, to wire to each distribution board.
Corridors etc.	—	1,574.79	Spaces for corridors, stairways and pilotis etc.

Floor Area of Service Spaces	1,921.89 m ²
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TOTAL FLOOR AREA	5,404.43 m²
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2-2-2-3 Section Plan

(1) Ground Floor Level

To avoid flooding during the rainy season, the elevation of the ground floor shall be 700mm higher than the road surface. In addition, the floor level of each room shall be set 20mm higher than the corridors in order to prevent rainwater from flowing into a room via the corridors.

(2) Floor Height

The floor-to-floor height in the buildings should be 3.5m for the sufficient ceiling height to help lessen excessively high room temperatures and maintain a comfortable educational environment suitable for rooms with an area of 50 to 70m².

(3) Slab Structure

The building floors shall be made of reinforced concrete, so that together with the installed insulating material and the space between the ceiling and roof, sufficient sound insulation capability (from the upper floors) as well as heat insulating capability will be provided.

(4) Roof Shape

By taking into consideration the necessity for collecting rainwater on the roof and easy maintenance, the shape of the roof shall be a simple shed roof, except some portions that shall be flat.

(5) Eaves

To lessen exposure from the strong sun and allow natural ventilation through open windows even during a rainy day, eaves shall be installed above the windows.

2-2-2-4 Structure Plan

(1) Soil Conditions

The Project site is made up of filled land close to the beach. It is flat and rectangular in shape, approximately 90m by 40m. Boring tests, where the building foundations are to be laid, were made at 4 locations to depths of 14.65m at one spot, and approximately 12m at the other three spots. Standard penetration tests were conducted at 1m intervals. The results of the boring tests showed that the depths from the surface down to the ground which will bear the weight of the building foundations varied at each borehole location. The N-values of the standard penetration tests were 7 to 8 at a depth of GL-1.0m (depth from ground level; loose sand), 8 to 11 at depths between GL-2 to -3m (medium loose sand), and mixed cobble-medium loose sand at depths between GL-4.0 to -5m. The soil is mainly composed of medium to hard compacted, weathered coral sand. The layers of soil are almost the same at the four boring locations, except for borehole No. 4, where composed organic matter and rubbish pieces were found at GL-3.0m. This matter and rubbish is common in filled land. Groundwater tables were quite high, in the range from GL-63m to GL-0.84m.

(2) Foundation Type

The Project buildings will consist of two 4-story classroom buildings, one 4-story special classroom building, one 2-story administration building and one 1-story school hall. The weight of the heaviest 4-story buildings will be approximately 6.0tons/m². The classroom building, the special classroom building and the administration building that will be constructed at Borehole No. 2 (BH02) and Borehole No. 3 (BH03), should be supported by mat foundations on GL-1.36m ground. The soil at Borehole No.1 (BH01), where the other classroom building is to be constructed, varies greatly from good soil to filled soft soil. Thus, the ground there should be excavated down to GL-3.0m, and then re-filled with good sandy soil up to GL-1.36m. Mat foundations should be constructed on the good soil. The weight of the school hall to be constructed at Borehole No.4 (BH04) will be relatively light. The ground should be excavated down to GL-3.0m and refilled with good sandy soil. Mat foundations should be constructed on the good soil. As the

groundwater table is high, reinforcing bars for foundations should be installed down to GL-1.25m.

(3) Allowable Weight Bearing Capacity of the Ground

Based on the N-values obtained from the above-mentioned boring tests, the bearing strength of the ground shall be 7.5tons/m² at Boreholes No. 1 (BH01), No. 2 (BH02) and No. 3 (BH03); and 5.0tons/m² at Borehole No. 4 (BH04).

(4) Building Structure Type

The Maldives is located in the Indian Ocean, southward of India and westward of Sri Lanka. The area is situated in a no-earthquake zone. Thus, lateral forces to the structure design are only wind forces. So, the frame structures of the Project buildings should be reinforced concrete. In general principle, walls that are supposed to take the lateral forces should be non-bearing walls made of reinforced-concrete blocks. In the Maldives, concrete-brick blocks are generally used for walls. So, considering the bearing strength of the Project site ground, lightweight hollow blocks should be used for the Project.

The structure types of these Project buildings are as follows:

- 1) Administration building: One 2-story building.
 - Reinforced-concrete frame structure
 - Walls: Hollow concrete blocks (non-bearing type)

- 2) Classroom buildings: Two 4-story buildings
 - Reinforced-concrete frame structure
 - Walls: Hollow concrete blocks (non-bearing type)

- 3) Special classroom building: One 4-story building
 - Reinforced-concrete frame structure
 - Walls: Hollow concrete blocks (non-bearing type)

- 4) School Hall: One 1-story building
 - Shorter side members:

General Area at Cross Section:

Column: Reinforced-concrete (independent type)

Beam: Steel-frame lattice structure

Gable at cross section:

Reinforced-concrete structure

Walls: Hollow concrete blocks

• Longitudinal section: Reinforced-concrete frame structure

Walls: Hollow concrete blocks

(5) Applicable Standard

In general principle, the preparation of the structural design of Project facilities shall be based on the following Japanese structural design standards:

1) Architectural Institute of Japan:

Reinforced Concrete Structure Design Standards

2) Architectural Institute of Japan:

Steel Structure Design Standards

(6) Building Materials

1) Concrete:

Compression Strength: $f_c = 210\text{kg/cm}^2$ or

$f_c = 180\text{kg/cm}^2$ (strength of cylindrical section)

As the soil and groundwater at Project site contain sulfate, sulfate-resisting cement shall be used for the foundations.

The water-cement ratio shall be less than 50%.

2) Steel Bars:

Yield strength: $f_g \geq 4,000\text{kg/cm}^2$ for $d \geq 16\text{mm}$

$f_g \geq 2,800\text{kg/cm}^2$ for $d < 16\text{mm}$

3) Steel Frame:

Yield strength: $f_g \geq 2,400\text{kg/cm}^2$

4) Concrete Blocks:

JIS A5406 Class A or equivalent

(7) Design Load

The design of the structures shall be based on the following design load factors:

1) Live Load

Table2-9 Design Load (unit : kg/m²)

Structural Member	Floor/ Small Beam	Main Frame / Foundation
Roof truss	60	30
Flat roof; no walking	80	60
Terrace and walking area on roof	230	180
Floor; general area	230	210
Library	400	300

2) Seismic Forces: Not Applicable

3) Wind Load: 100kg/m² (equivalent to wind speeds of 40m/sec)

2-2-2-5 Electrical Facility Plan

(1) Power Receiving Facility

An electric room shall be built in a school building. A 3-phase 4 wire 400/230V power supply shall be received then distributed to each room through the switchboard.

(2) Main Wires

In accordance with BS standards, electric wires shall be installed in conduits and connected from the electric room to each distribution board.

(3) Power Facility

Power supply to and operation of the following equipment should be conducted:

- a) Well Water Pumps: One set of automatic switching two pumps
- b) Rain Water Pumps: One set of automatic switching two pumps

The pumps the control boards shall be installed in the machine room under the northeastern stairway for the well water and on a corner of the electric room for the rainwater.

(4) Lighting Fixtures

Lighting fixtures should be basically the ceiling mounted type (a pipe hanging type should not be used because of possible corrosion). Fluorescent tubes should be used. An indication lamp shall be installed at every emergency exit for hazard prevention purpose. Illumination in each room shall be as follows:

Classrooms, special classrooms and library:	200 to 300Lux on desk
Prayer Room:	200 to 300Lux on floor
Offices:	250 to 350Lux on desk
School Hall:	250 to 350Lux on desk
Corridor and Piloti:	30 to 50Lux on floor

(5) Outlets

An adequate number of outlets should be provided in each room. The special classroom should be provided with ordinary outlets and special outlets (with grounding connections) for equipment use. Electric grills (double type) should be installed in the pantry. An exposed-type distribution board shall be installed in the multipurpose room for various uses.

(6) Announcing Facility

An announcing facility having a chime function shall be installed for announcing ordinary notices and class starting and ending. An adequate number of speakers shall be installed in corridors vice each classroom. The announcing equipment shall be installed in the general office.

An exclusive use announcing facility (including an ordinary microphone and wireless microphone) shall be installed in the school hall. The announcing equipment shall be an external input connection capable type. Its amplifier should be installed at the stage wing.

(7) Telephone

Telephone outlets (telephone units to be installed by a separate project) shall be installed in the general office, administrator room, principal room, assistant principal room, supervisors room, meeting room, staff room and

first aid room. In addition, empty conduits shall be installed between each room for the future installation of telephone cables (separate project). A switchboard shall be installed in the general office under a separate project. A terminal board shall be installed in the multipurpose room for the use of future communication classes.

(8) Lightning Rods

The Maldives standards do not specify the installation of a lightning rod on a school building. Thus, they will not be installed on the Project buildings.

(9) Automatic Fire Alarm System

In order to follow the recent administrative guidance in the Maldives, the Japanese side will install empty conduits. The installation of alarm cables and equipment units shall be undertaken by the Maldives side.

2-2-2-6 Water Supply and Drainage Plan

(1) Well Facility

One well shall be constructed within the Project site (undertaking of the Maldives side). Automatic-switching two submersible pumps shall be installed. Well water shall be pumped up into an elevated well-water storage tank and then distributed to toilets for flushing.

(2) Water Supply Facility

City water is basically used for drinking purpose only. However, when rainwater is short, the city water should be used for other purposes. As the city water has sufficient pressure, it should be directly connected to each faucet. By taking into consideration the effect to the soft ground by rainwater load, a rainwater-receiving tank shall be constructed in a pit underneath the two-story administration building. Collected rainwater on the building roof shall be stored in the tank. Rainwater in the tank shall be pumped up by a set of automatic alternate-operating two pumps into the elevated rainwater storage tank and then distributed to each faucet for washing hands, sprinkling the schoolyard, etc.

City water shall be also provided to the ablution basin located outside the prayer room.

(3) Drainage Facility

Sewerage and wastewater shall be directly connected to the drainage mains located underneath the east and south side roads. Two connections for each sewerage and wastewater shall be built in the east and south.

(4) Sanitary Wares

Water closets should be of the western type that are recently widely used in ordinary houses. A water tank (well water) shall be installed in each toilet booth for flushing. In accordance with the local custom, a water faucet (city water) shall be provided in each booth for washing. In addition, five sets of sinks shall be provided in the science room.

(5) Indoor Fire Hydrants

As administrative guidance was conducted recently, a firewater storage tank shall be constructed using the part of the building structure under the administration building in order to store rainwater. As a preventive measure against droughts, it shall be planned to enable to use city water also. A pump and control board shall be installed in part of the electric room to be built stairway. 2 or 3 fire hydrants shall be provided on each floor in accordance with the administrative guidance.

(6) Gas Facility

No gas facility will be installed by the Project.

(7) Ventilation Facility

Ventilation facilities shall be provided with the following rooms:

- Electric Room: Class 3 ventilation system
- Machine Room: Class 3 ventilation system
- Principal, Staff and Universal Toilets (enclosed rooms):
Class 3 ventilation system

No ventilation system will be provided with toilets facing outside.

(8) Ceiling Fans

Ceiling fans shall be provided in each room where people stay long. An adequate number of ceiling fans shall be provided in the school hall.

2-2-2-7 Building Material and Equipment Plan

(1) Roof

Considering the basic plan for collecting roof rainwater and for having an easy repair and maintenance system, steel roofing, commonly used in the Maldives, shall be installed on the reinforced concrete roof slab. As steel roofing is vulnerable to salt damage due to its close proximity to the sea, the roofing material should be aluminum-zinc alloy plated steel plate. The part of the roof to be used for many various activities shall be of reinforced concrete slab provided with waterproofing treatment and a protective concrete layer.

(2) Walls

The walls will consist of reinforced-concrete columns and beams to form frame structures, and then filled with non-bearing hollow-concrete blocks. As a general rule, both exterior and interior walls shall have a coating of paint on the mortar finished base. Contraction joints shall be installed in the walls between different material portions at regular intervals in order to prevent surface cracking. The color of the paint shall be a light white color for sufficient reflected illumination in the room. Wall portions that are subject to getting dirty easily shall be tile finished.

(3) Floors

In general principle, floors shall be of reinforced concrete with a mortar finish. To prevent surface cracking, contraction joints shall be provided. Some floors, like the principal room, the prayer room where people take off their shoes and areas around water facilities shall be provided with a tile finish to help prevent them from becoming dirty. The school hall floor shall

be provided with a non-skid polyurethane resin coating. The stage in the school hall shall be provided with a wooden flooring finish, using the dry construction method on a wood base.

(4) Openings

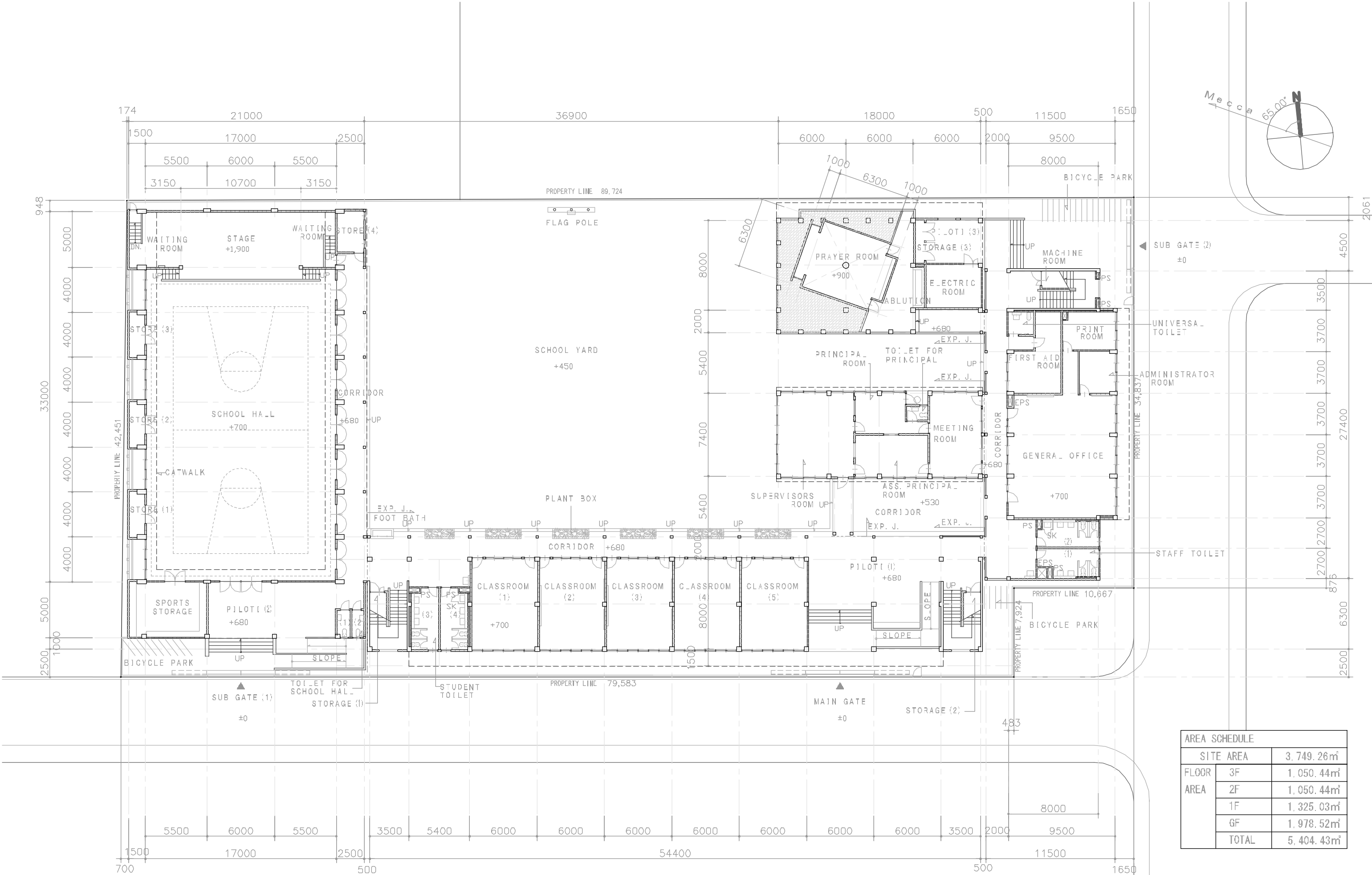
All windows facing the outside and corridors shall have aluminum sashes for protection against salt corrosion. For safety purposes, they should be the sliding type in principle that do not project out from the wall surface when they are open. Entrance doors shall be of a wooden flush type. They shall be made of hard wood and provided with anti-termite treatment. All doors directly facing the outside shall be aluminum because of its high durability against rain.

(5) Ceilings

The administrative rooms like the principal room, the special classrooms and the school hall shall be provided with acoustic rock wool board ceilings considering sound absorption. The ceilings of toilets shall be provided with a paint finish on damp-proof, fiber-reinforced cement board. Ceilings will not be installed in the normal classrooms, the library or the front corridors. They shall be painted with a light color finish on the mortar finished surfaces of the structures.

2-2-3 Basic Design Drawings

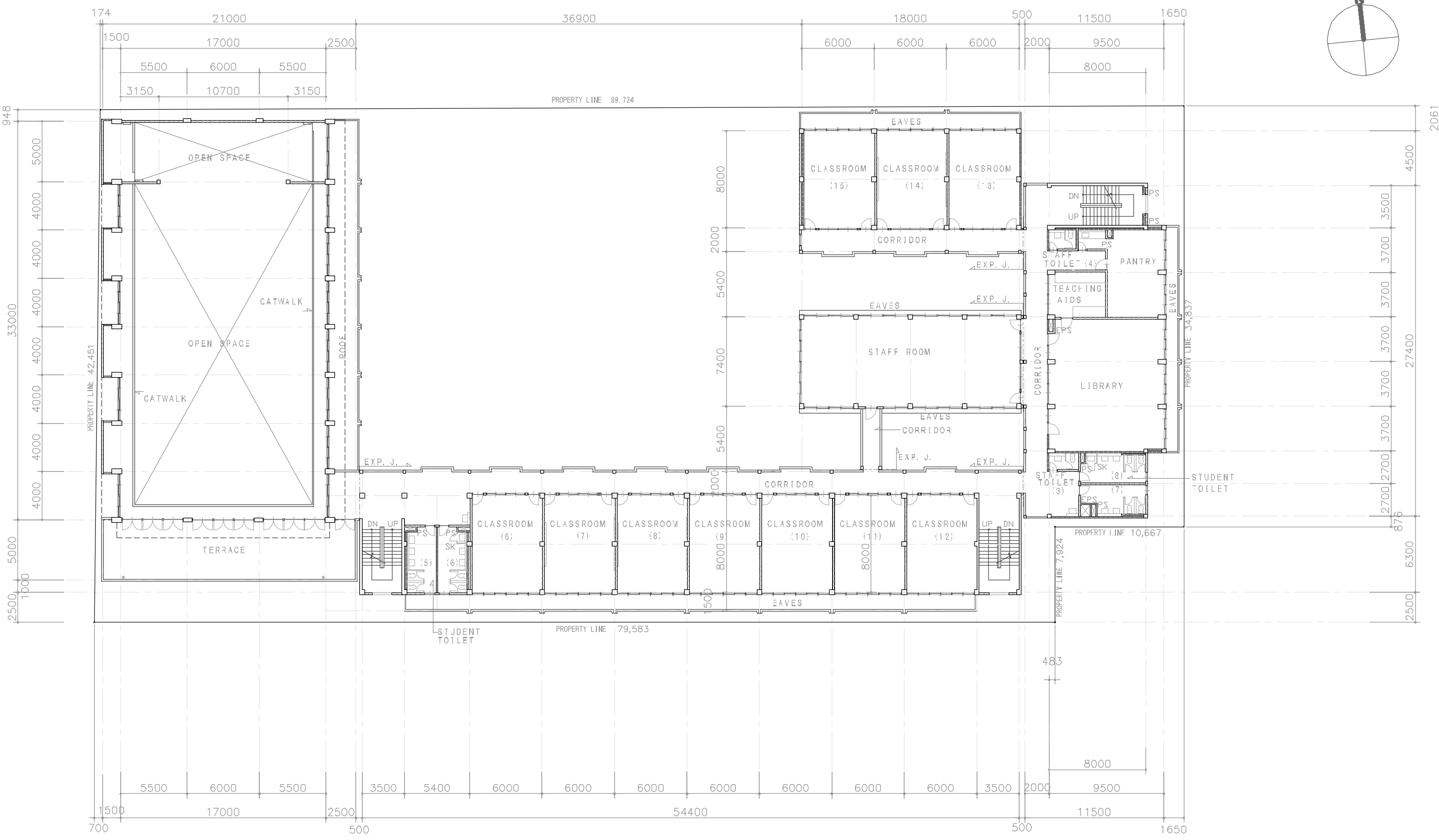
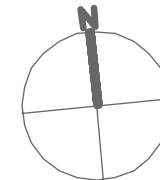
The basic design drawings of the Project facilities are attached to the following:



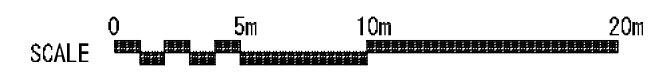
AREA SCHEDULE		
	SITE AREA	3,749.26m ²
FLOOR AREA	3F	1,050.44m ²
	2F	1,050.44m ²
	1F	1,325.03m ²
	GF	1,978.52m ²
	TOTAL	5,404.43m ²

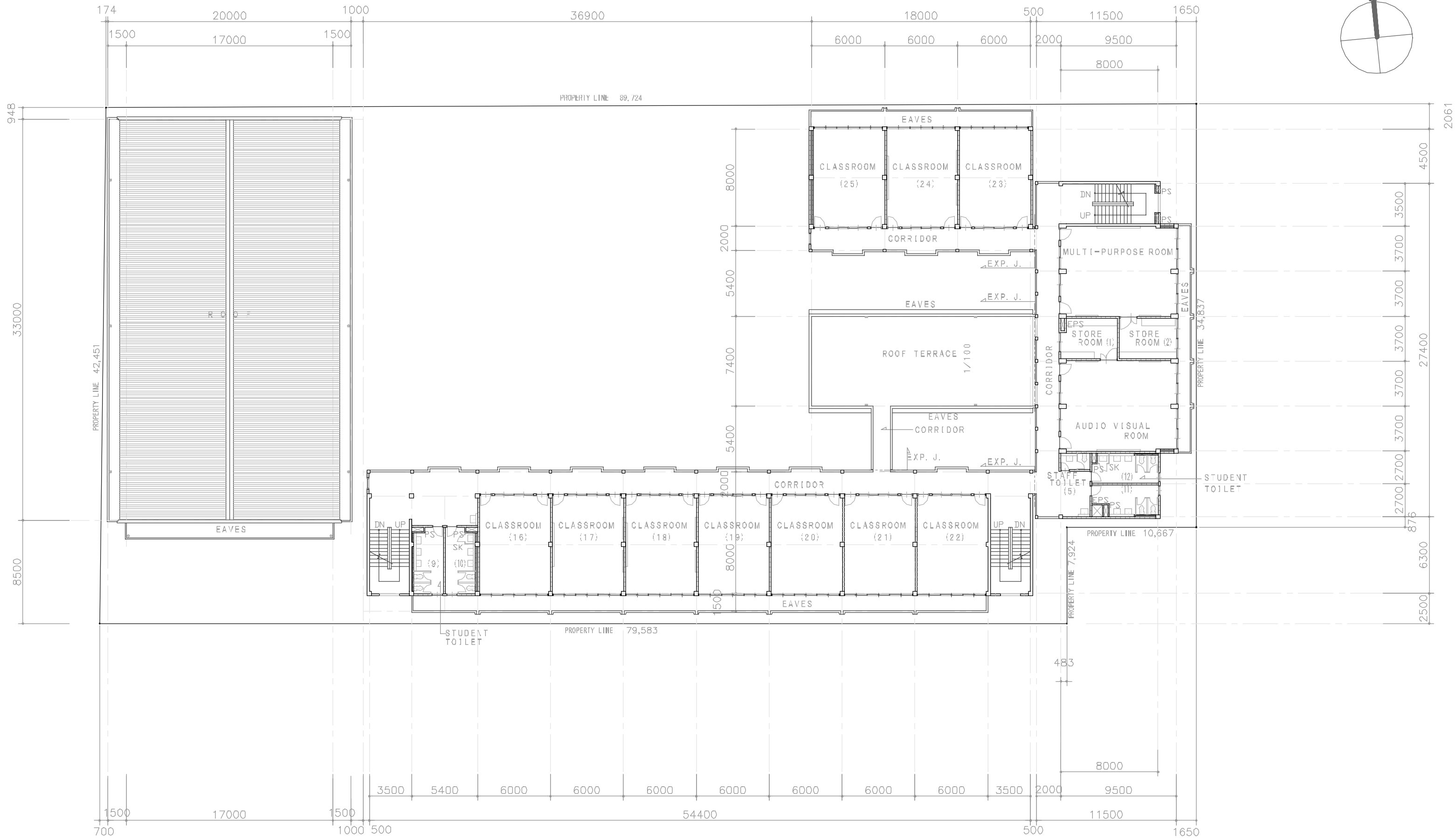
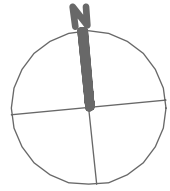
SITE & GROUND FL. PLAN S=1 : 300





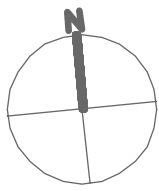
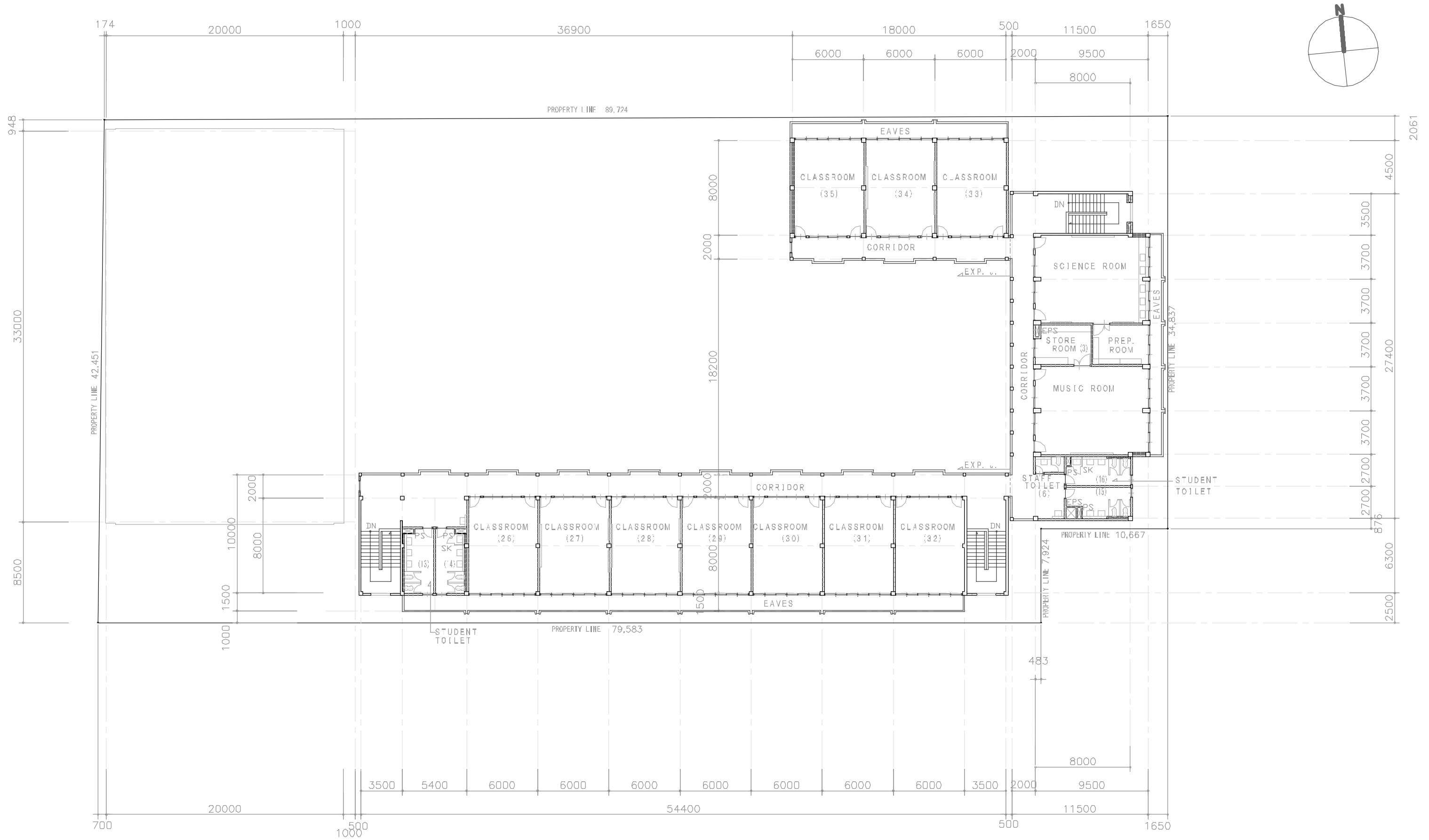
1ST FL. PLAN S=1 : 300



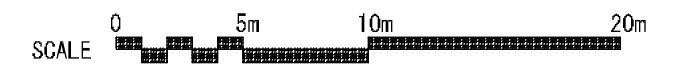


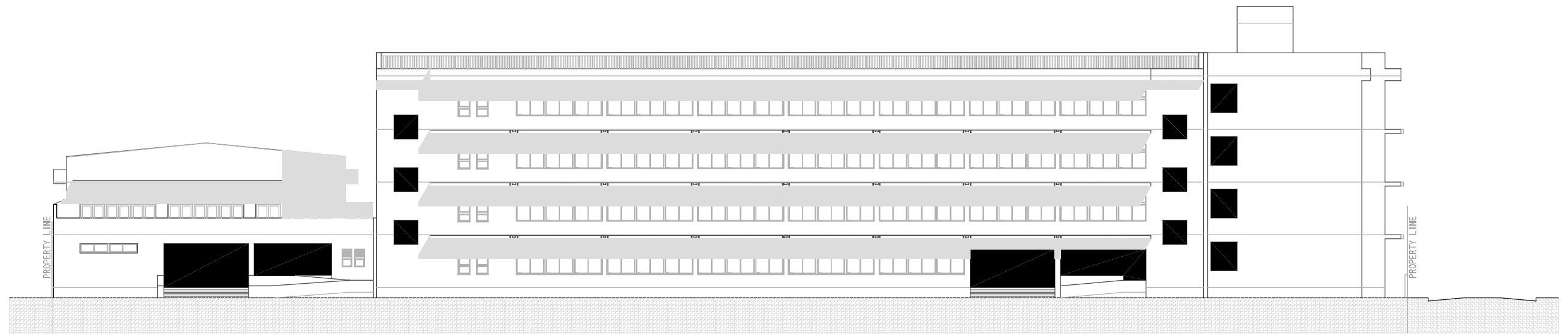
2ND FL. PLAN S=1 : 300



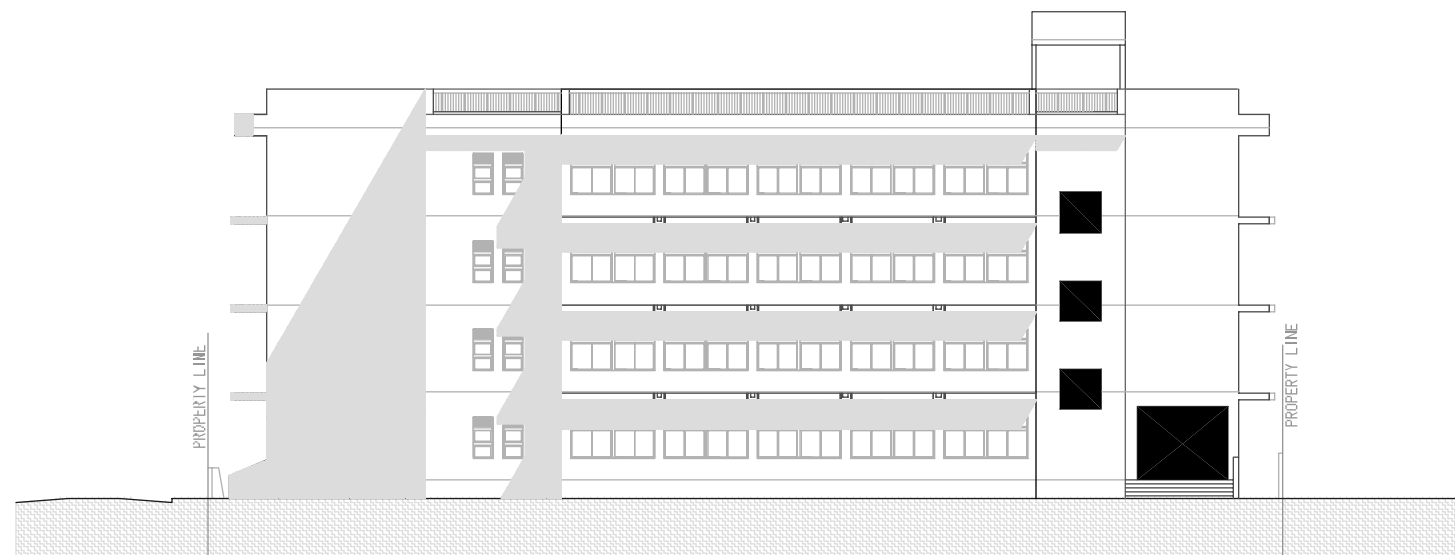


3RD FL. PLAN S=1 : 300





SOUTH ELEVATION S=1 : 300



EAST ELEVATION S=1 : 300

