BASIC DESIGN REPORT
FOR
SCHOOL CONSTRUCTION PROJECT
IN
THE REPUBLIC OF MALDIVES

FEBRUARY. 1980

JAPAN INTERNATIONAL COOPERATION AGENCY

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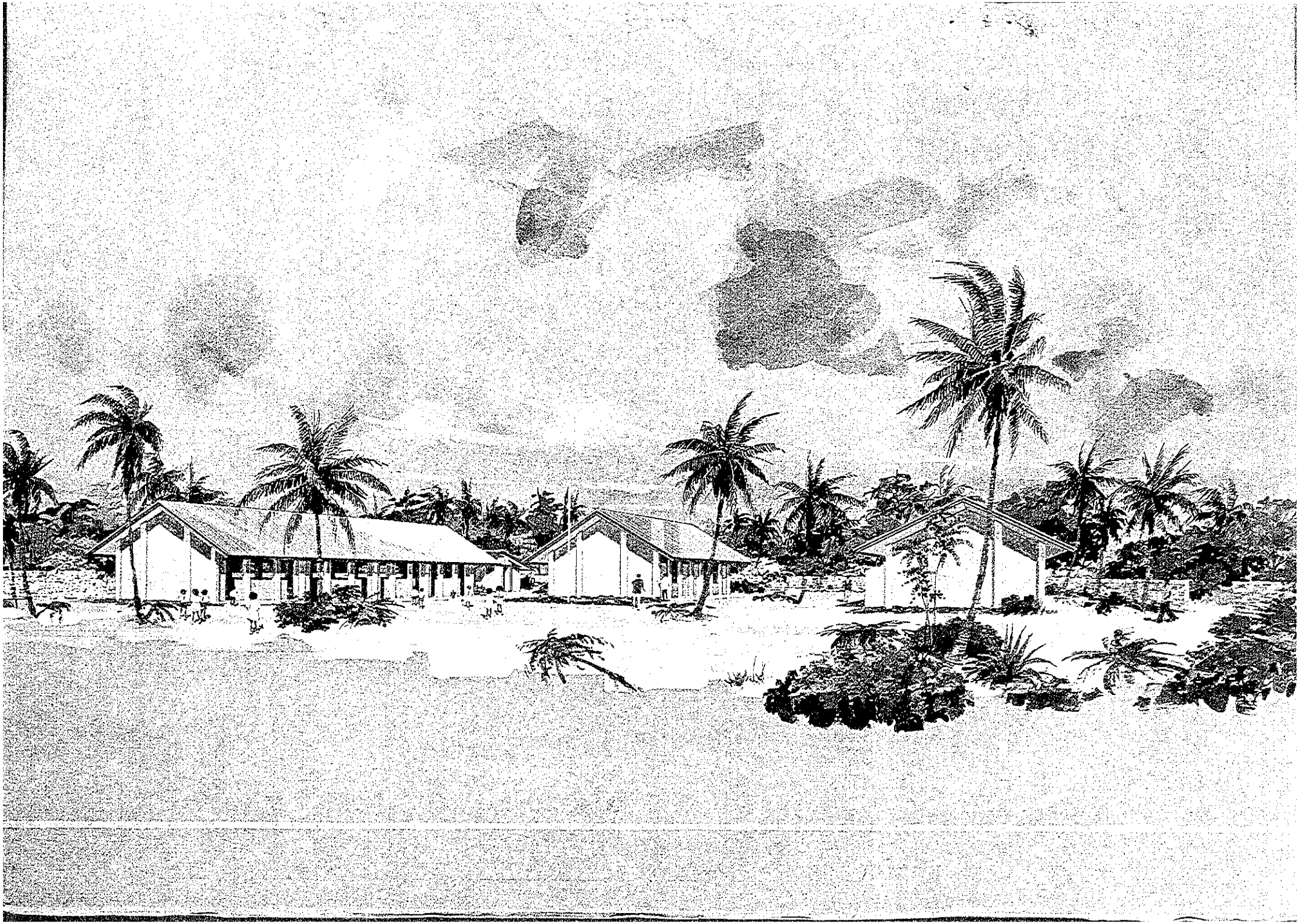
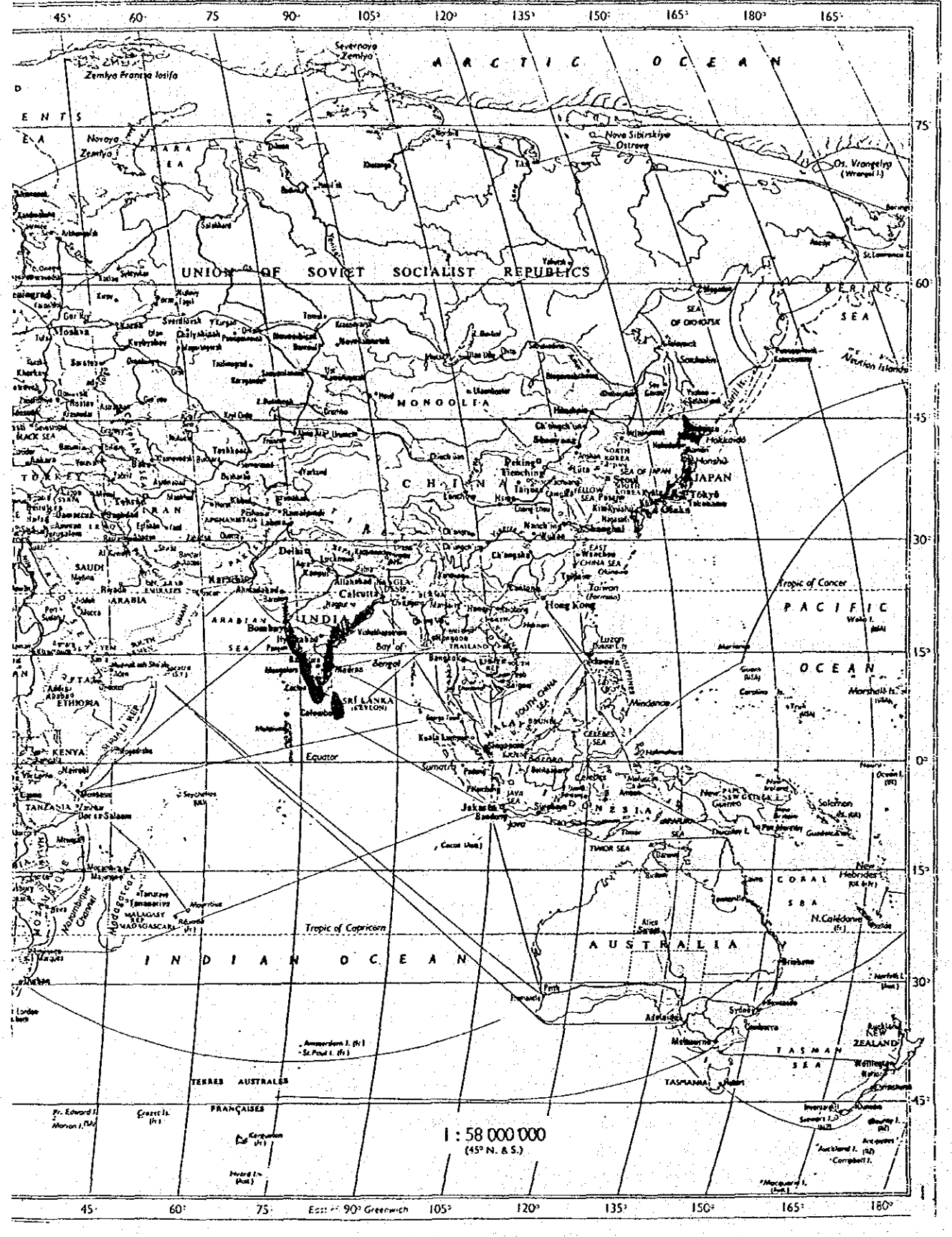
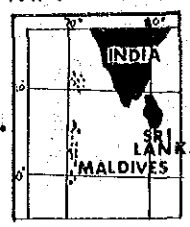
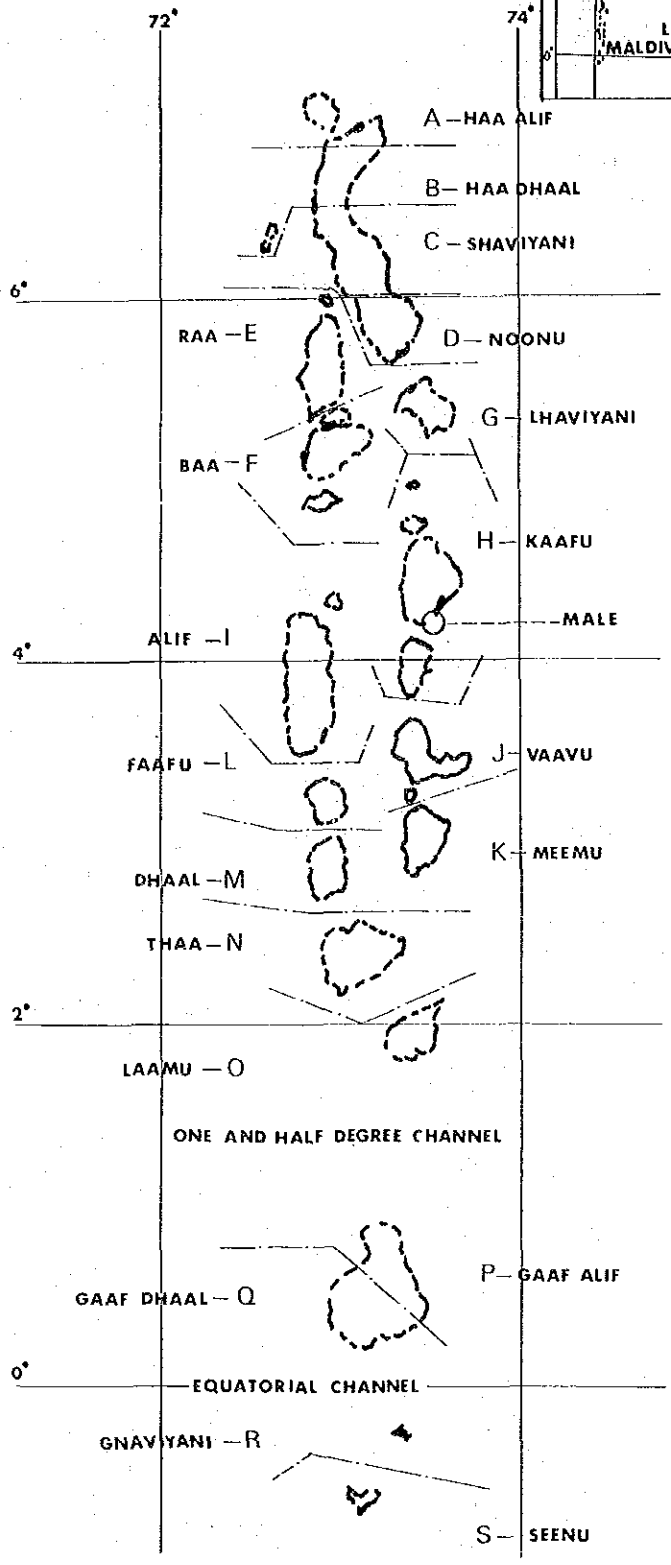


WORLD POLITICAL



REPUBLIC OF MALDIVES





P R E F A C E

In response to the request of the Government of the Republic of Maldives for the School Construction Project of Maldives under a grant aid from Japan, the Government of Japan has decided to take up a survey for its basic designing, and the Japan International Cooperation Agency (JICA) has been entrusted with its implementation.

Recognizing that the Project will contribute not only to the advancement of education but also to the people's livelihood in Maldives, the JICA dispatched a survey team to Maldives from October 22nd to November 11st, 1979 to collect data and information necessary for the basic designing and they had intensive consultations with the officials concerned of the Government of the Republic of Maldives.

The survey was conducted smoothly with extensive cooperation of the officials of the Republic of Maldives. Upon its return to Japan, the team made further studies and has finalized the present report.

I hope this report will serve to the development of this Project and to the promotion of friendly relations between our two countries. I wish to express my sincere appreciation to the people concerned of the Republic of Maldives for their close cooperation extended to our survey team.

February, 1980

Keisuke Arita

Keisuke Arita
President
Japan International Cooperation Agency

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DATA SECTION

Summary

By the proposal dated April 10, 1979, the Government of the Republic of Maldives has requested grant aid from our Government for the construction of 19 primary schools (one in each of the 19 atolls). In response, the Government of Japan has decided to consider the request as a part of its grant aid project, and has asked the Japan International Cooperation Agency (JICA) to organize a survey team for basic design. This survey team has conducted a 21-day field survey from October 22 to November 11, 1979.

The Republic of Maldives is made up of numerous atolls and is located in the Indian Ocean southwest of Sri Lanka. About 202 out of the approximate 2000 islands are populated and at present, the total population, mostly Moslem, is about 143,046. Because it is still at the stage of development both economically and socially, we cannot say that the school education system and facility are sufficient. Due to the fact that the various projects for the promotion of education, such as the construction of public schools, has been centered in the nation's capital, Male and that the population of the Maldives is dispersed among many small islands, primary level education has not been promoted on the local islands. It is a reality that even now, there is a great difference between Male's education and

that of the local atolls. Keeping this in mind, the Government of the Republic of Maldives is continuing to expand its school facilities, to unify its school education system for each respective grade, to make a teaching guide for teachers and to construct public schools. Some of these plans have already been tentatively put into effect.

Dealing with the construction of public schools, measures have been already taken to convert the 19 major private schools to public schools and to construct 19 new schools with the aid of UNICEF (Community Schools). The construction of 19 new schools to be financially aided by Japan will play an important part in the school construction plan.

The survey team and its Maldivian counterparts have conferenced and examined the construction plans of the primary schools established under the New Educational System. The outline of the buildings to be constructed are as follows:

1) Classroom building I (about 210 M^2)
   - holds the classrooms for grades 1-4 and can be used as an assembly hall when the blackboards are removed.

2) Classroom building II (about 122.5 M^2)
   - holds 2 classrooms - one for the 5th grade and another for the adult community education class.

3) Toilet building (about 35 M^2)

- holds 5 Indian-style toilets and 3 basins for both the girl's and boy's room.

4) Administration building (about 140 M^2)

- holds the office, the storage, and the headmaster's residence which includes a service yard.

The block plan of the building will be made to match the climate and the movement of the teachers and students. The axis of the buildings will be arranged from east to west to withstand the strong west wind and rain which occurs during the monsoon season. Upon request from the Government of the Republic of Maldives, their conventional method of construction using the local construction materials such as coral stones will be used and the pre-fabricated method will be avoided, considering the local way of living and easy long-term maintenance.

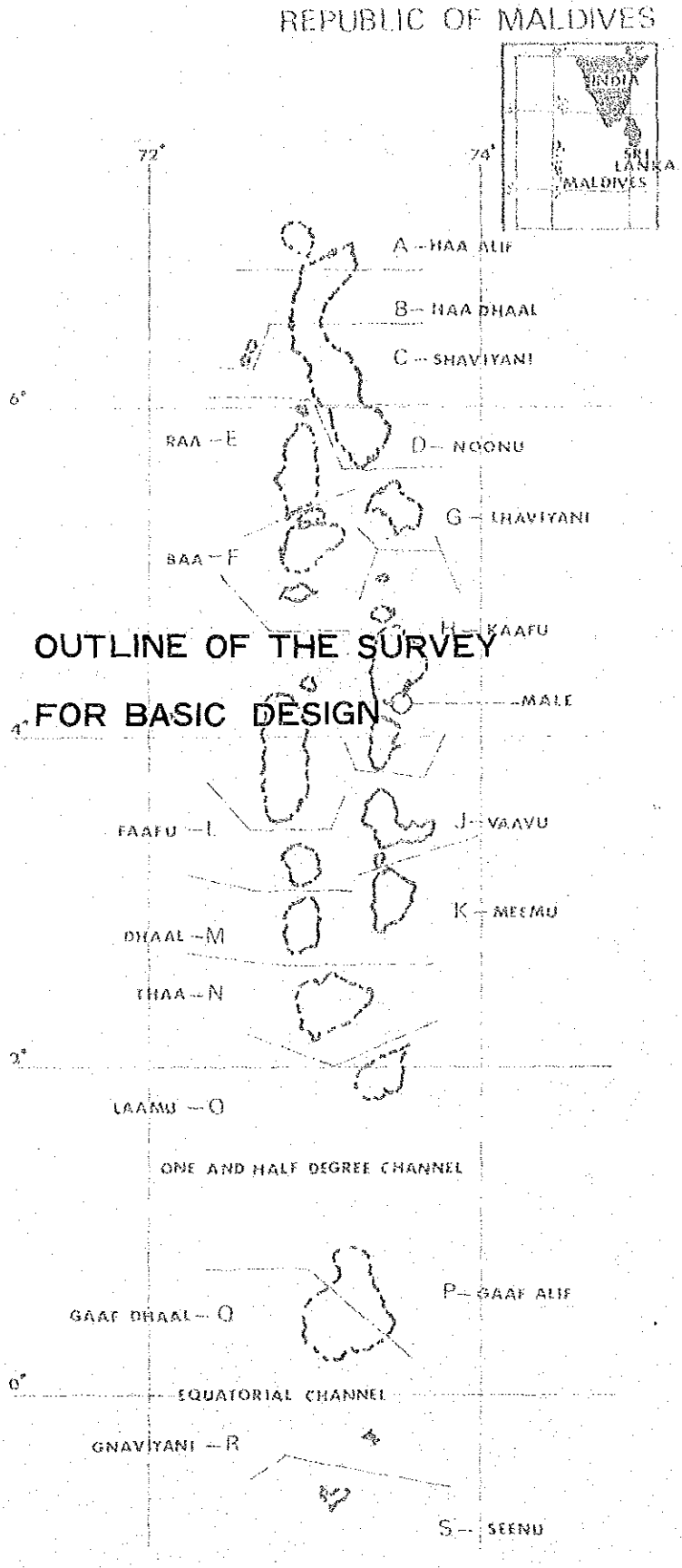
As for installations, a reserve tank for rainwater for drinking purposes, an elevated water tank, a well, a septic tank, a seepage pit, and piping for water supply and sewage will be installed, but no works will be performed for electricity. In addition, desks, chairs and blackboards will be installed in each room.

The raw materials procurable from the Maldives are limited to coral stone, sand, and lime, therefore, the other materials and equipments must be imported. Furthermore, with the present condition of the local islands, it would be necessary to train the local fishermen to become construction workers to handle the actual construction. Considering

this situation, the estimate, the construction system and the construction progress chart were made.

Because the cost of importation materials takes up a large part of the budget for construction materials and equipments, this project will not cause a strong inflation or other such economic chaos. Also this program will not directly interfere and compete with the grant aid projects of other countries and the United Nations. To the people of the Republic of Maldives, which is behind in terms of educational facilities, the execution of this project will contribute greatly both economically and socially, and it is needless to say that it will promote the friendship between both countries.

CHAPTER 1 OUTLINE OF THE SURVEY FOR BASIC DESIGN



1-1 Background of the Project

By the statement dated April 10, 1979, the Government of the Republic of Maldives has requested grant aid from the Government of Japan for the promotion of its primary education:

In July, 1978, the former Minister of Education, Mr. Abdul Sattar had requested grant aid for the construction of 2 primary schools in its capital, Male. However, the present Government, established in November, 1978 and extremely interested in local development, has requested grant aid from the Government of Japan for the construction of 19 primary schools (one in each of its 19 atolls), instead of the former 2 requested by Mr. A. Sattar. This is part of its political measures to promote basic primary education to those unanimous number of youths deprived of a chance to attend school. (Described in Data 1-1)

In accordance with Prime Minister of Japan, Mr. M. Ohira's comment at the 5th UNCTAD Conference in Manila that "the foundation for building a nation is to build its people.", the Government of Japan has decided to consider this above request as a part of its grant aid program, and has instructed JICA to attend to this project. JICA, taking action, immediately organized a survey team for basic design and conducted a 21-day field survey of the construction sites from October 22, 1979 to November 11,

1979.

At present, the entire population habitating the 202 islands of the Republic of Maldives amounts to 143,046, out of which 47,220 are children of school age between 2.5 - 15, out of which 90% reside on islands other than Male and have not yet received sufficient primary education. To cope with this situation of the 202 islands, construction projects for 19 schools were made by UNICEF and improvement plans for 20 additional schools were made by the present Government. As for the remaining 163 islands, there are no public schools for fundamental education. It is believed that this is what brought about the request for economic aid from the Government of Japan for the construction of 19 schools.

1-2 Organization of the Field Survey Team

In order to confirm the context of the request from the Government of the Republic of Maldives and to carry out the necessary field survey, the Japan International Co-operation Agency (JICA) has organized and dispatched a bisic design survey team headed by Mr. Kaoru Okabe, the Chief of the Planning Division, Social Development Co-operation Department, JICA.

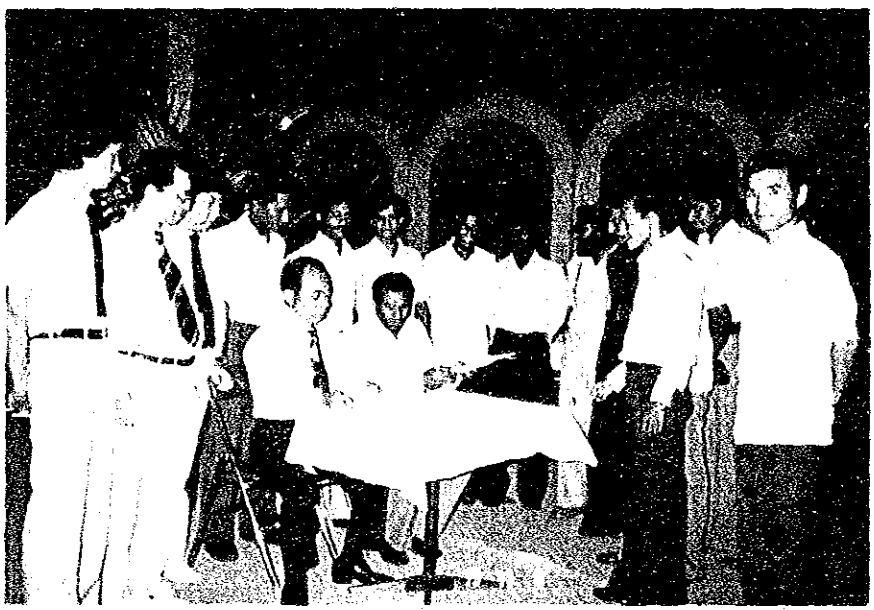
The team members who have carried out the field survey are as follows:

Team Leader:	Kaoru Okabe	Chief of the Planning Div. Social Development Cooperation Department JICA
Other Members:	Yasuhiro Fukumoto	Estimate T. Mohri Architect & Associates
	Toshinori Minoshima	Planning Structure "
	Akira Yokoyama	Design Equipment "

T. Mohri Architect & Associates took part in the Field Survey for the Basic Design.

1-3 Exchange of Minutes

In the minutes signed by Mr. Mohamed Noordeen (Deputy Minister of Education) and by Mr. Kaoru Okabe (Leader of the Japanese Survey Team), both parties have agreed to recommend to their respective Governments to take the necessary measures toward establishing the 19 primary schools based on the educational policy of the Maldives.

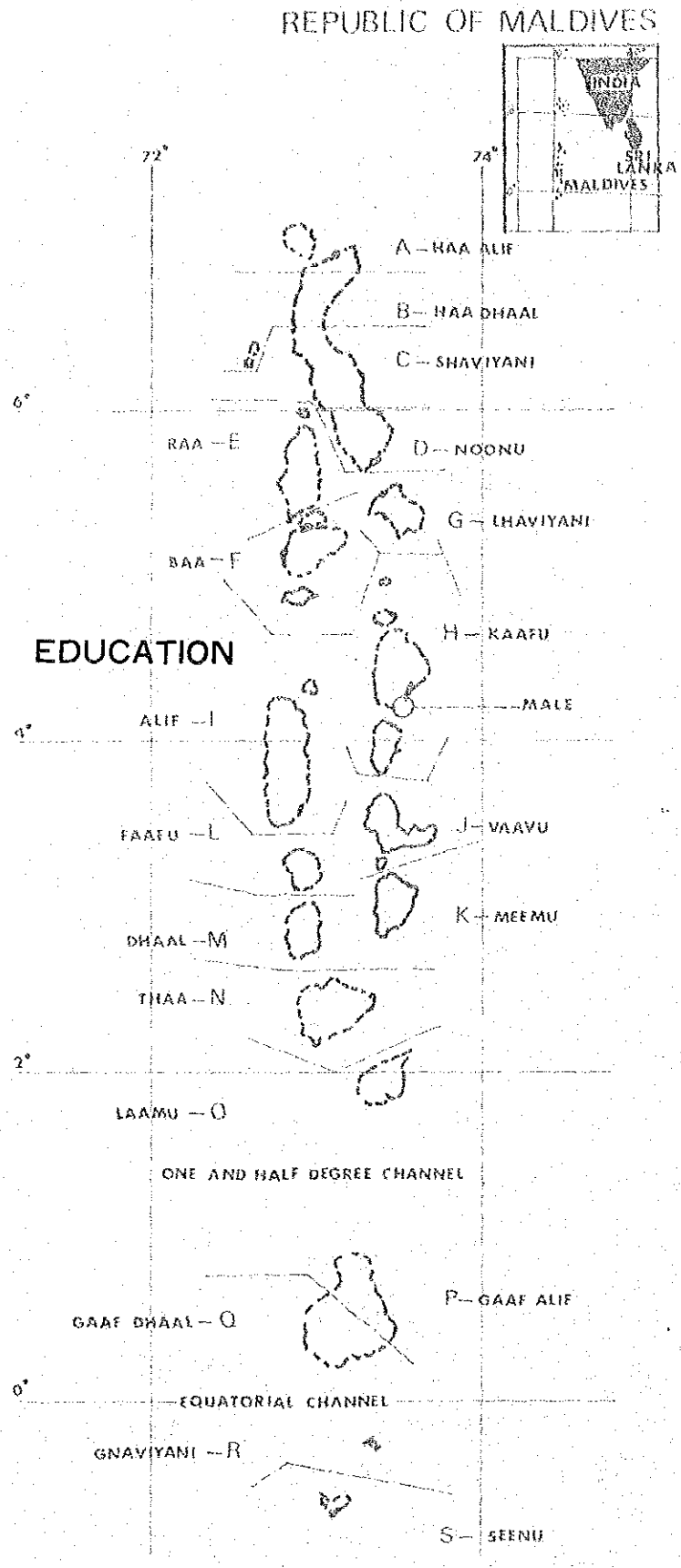


Front Row: 2nd from the right - Mr. Mohamed Zahir Hussain,
Minister of Education

signing - Mr. Mohamed Noordeen
Deputy Minister of Education

- Mr. Kaoru Okabe
Leader of Japanese Survey Team

4th from the left - Mr. Mohamed Latheef
Under Secretary
Ministry of Education



CHAPTER 2 EDUCATION

2-1 Education Policy

As the Republic of Maldives is still being developed, we cannot say that its education system and facilities are adequate.

All education up to the secondary level, conducted in English and competitive to those of neighboring India and Sri Lanka, have only been conducted in the center of the Government, Male, and have not been spread to the local islands. As a result, a big educational gap formed between the other islands and Male. It must be added that another cause for this great gap is the diversion of the Maldivian population resulting from its geography.

Because this gap between the education of Male and the other islands is very big, the most important issue which the present Government must deal in, is the promotion of education at the local level. The government strongly desires to take various measures for this promotion of education at the local level such as the expansion of primary education and the enforcement of community education on the local atolls. For the expansion of primary education, the following plans have been proposed:

1) Unification of the education system
2) Summation of an educational guidance system
3) Training of teachers
4) Construction of public schools

These plans play an important part of the nation's 5-year development plan which is to start from 1980 and some of them have already been experimentally carried out. Especially for No. 4, the construction of public schools including the 19 schools requesting economic assistance from the Government of Japan:

1) To newly construct 19 community schools under UNICEF aid
2) To convert the residing 19 major private schools to public schools

It is a goal to construct 57 primary schools during the present President's 5-year term whihc lasts until November, 1983. The President's pledge for local development was not the only reason why the various construction plans calls for the construction of one school per atoll, but other various economical, social, and geographical aspects are considered as well.

We can say that the above construction for 57 schools is quite reasonable taking into consideration the unique geographical factor that the majority of the population habitate 202 out of the 2000 islands scattered about the vast area of about 824 km. north to south and 130 km. east to west.

2-2 The Present Educational Situation and Plan

2-2-1 School Enrollment

As noted in Data II-1-6 and Data 2, the rate of increase in the population of Maldives is, on the average, about 3-4% annually, which is comparatively higher than that of the other developing countries. The ratio of children under 15, compared to the entire population, is about 45% and the percentage of school children (2.5 - 15 years of age) is about 37% (noted in data II-2-2 and data 1).

In comparison, this percentage is even over double that of Japan, probably due to the fact that the nation's average life-span is short.

The percentage of enrollment, as stated in Data II-2-2 & 12, is less than 10%. According to the grade-wise statistics taken of the school children, school enrollment of the upper primary grades is poor on local atolls other than Male.

In other words, as stated in Data II-2-2 & 13, taking the statistics of Seenu atoll as an example, the enrollment of school children between grades 1-3 takes up 68% of the total enrollment and this percentage decreases rapidly as the grade increases from 4th to 8th. It can be said that the various reasons for this phenomenon are the financial situation of the sponsors, the fact that the children are able to work, the shortage of teachers and supplies and

the fact that the curriculum is not relevant to the local needs.

Also, the rate of illiteracy of the entire population including adults is 37.7% as stated in Data II-2-2 & 5. According to the atoll, the rate of illiteracy is as follows:

over 50% - 1 atoll
over 45% - 3 atolls
over 40% - 7 atolls
over 30% - 3 atolls
over 20% - 5 atolls

2-2-2 Present Education System and Plan

As in all other aspects, it is a reality that the gap in the education system of Male and the other atolls is very big. Speaking of Male, four years of primary education and 6 years of secondary education are conducted at the public boy's and girl's schools and a year of pre-school education is conducted at the kindergarten. Further, the Science Education Center was established in July, 1979 for the improvement of science education. Students who have completed their secondary education can receive a higher education at this center.

On the other hand, the other local atolls are behind in terms of education. All education is left up to the private schools set up by local scholars so the age of enrollment, the school grade and the curriculum are irregular.

In order to improve the lack of unity and the inadequacy of education of the private schools, the present govern-

ment is planning a New Education System described in the minutes and is preparing to have it acknowledged as law. This New Education System will divide the curriculum into 5 levels. That is: 2 years of kindergarten from 4 years of age, 5 years of primary school from 6 years of age, 5 years of secondary school from 11 years of age, 2 years of higher secondary school from 16 and finally, 5 years of university from 18 years of age. For the time being, however, only the secondary and higher secondary level education can be received on Male and the university level education can only be received abroad.

2-2-3 Conditions of Education

At the present, there exists a big difference between Male and the other local atolls concerning the educational facilities and method of teaching.

As explained in (2-1), there are 3 government schools on Male under the economic supervision of the Government of the Republic of Maldives: That is the Majeediya School for boys, the Aminiyya School for girls and the Iskandhar Montessori School. These schools are totally financed and managed by the Government, and their total enrollment for the previous year is as shown in Data II-2-2 & Data 7-9.

Considering their size, it can be said that all three institutions are operating at full capacity and that there is a lack of educational institutions even on Male.

The courses of studies offered at these schools include

Islam, Dhivehi, English, General Knowledge, Arithmetic, and Art, etc., at the lower levels (i.e. up to the first 4 years of education) and Islam, Dhivehi, English, Maths, Physics, Chemistry, Biology, History, Geo graphy, Economics and Technical Drawing at the higher levels (i.e. up to 10 years). The students sit for the General Certificate of Education Ordinary Level Examination of the London University. The examination results for the academic year, 1979 are stated in Data II-2-2, 10 & 11.

School hours of the 2 schools mentioned above are from 7:30 - 13:25 with each period lasting 40 minutes. Furthermore, there are 2 holidays (Friday and Saturday) every week, and the school year is broken down into 2 semesters consisting of 2 terms. 185 school days must be conducted yearly during which there will be 2 long vacations, one from the 4th week of December to the 2nd week of February and another for 2 weeks between June and July (Date undecided).

In the Iskandhar Montessory School, children are admitted at the age of 2.5 years and stay up to 5 years.

The Montessory method of education is used and there are no formal educational programmes as such.

However, the method of teaching has been changing recently towards pre-school orientation.

Towards the end of their stay in the schools, however, the children learn to recognize the alphabet, count numbers and are given some instructions in Islamiat.

No fees are charged from the students in any of the three government schools and text books are supplied to them free.

Presently, the Maldives is facing the problem of shortage of teachers even on Male, for 87 out of 128 teachers of these 3 schools are foreigners from India, Srilanka and Pakistan.

As it stands, only 17 out of the 36 Maldivian teachers are able to conduct classes in English.

Therefore the foreign teachers are paid well and take up a great part of the Government's educational budget.

In 1975 the Vocational Training Center had been opened with the aid of UNDP and ILO, and as of 1979, courses in the following 4 fields are conducted at this center.

1) Machining Section
2) Welding and Sheet Metal Forming Section
3) Electrical Section
4) Engine Repairing Section

There are 2 native teachers for each of the above fields and 2 foreign teachers to supervise all of the 4 courses. Standardly, the above courses are for students between the age of 16 and 22, over 1/2 of which are from other atolls. The machines and equipments such as grinders and welders, are mostly of foreign make, primarily American or English. This Vocational Training Center also acts as a repair shop and its workload increases as the need for marine engines increases.

Under UNICEF/UNESCO/UNDP's expert guidances, a well -

furnished Science Education Center has been established in July, 1979 for improving the Science Education of the Government Schools on Male in particular and for the general upgrading of the educational system as a whole. It conducts 2 years of science education to those students who have completed the secondary level education on Male studying for the Certificate of Education Advance Level Examination of the London University.

In addition to the educational institutions mentioned above, there are several other private schools with quite a lot of students on Male as well as the other atolls. Until recently, all education on the other atolls were conducted by the local people at the private schools. The enrollment age and class time of these private schools or Makthabs are irregular, and a few of its teachers have had formal education.

Actually most of them have started to teach after completing primary level education.

It is also said that sometimes there are situations where housewives and senior students teach the classes.

The main courses taught at these Maktabs are the Quran, Dhivehi, Mathematics and sometimes English, Science, Art, History, etc.

Textbooks are almost never used at these Maktabs and their curriculums are not unified and left up to each individual teacher. These schools must manage to run on the small tuition paid by its students.

As stated in the minutes, in order to improve this defi-

ciency in education, the Government has converted the residing 19 primary private schools into government sponsored primary schools and have financially aided 37 private Makthabs by paying their teachers.

The first of the so-called community schools aided by UNICEF was completed in February, 1978 on the island of Eydhafushi in Boa Atoll and the second was completed on the island of Kulhudhuffushi in Dhaal Atoll in 1979. Also, as of November, 1979, 4 more schools were being constructed. In the above schools connected with the Government, the curriculum is unified and the teachers are educated and trained.

2-2-4 The Ministry of Education and Its Structure

The structure of the Ministry of Education of the Republic of Maldives is as stated in Data II-5-1. Under the Ministry of Education, there are 2 under secretaries, 1 supervisor, 1 assistant undersecretary, 1 undersecretary to the Educational Development Center (EDC), 1 principal coordinator to the Science Education Center and other public service personnels.

The work of the Ministry of Education include planning and carrying out educational projects necessary for building its nation, maintenance and management of the national educational facilities, record-keeping of educational matters, and making arrangements between foreign specialists

and advisors, keeping them in touch with the UN Aid Program carried out by the EDC.

All major decisions and policies are with the approval of His Excellency the President and are submitted to the National Planning Agency before they are implemented.

EDC was originally established as a subsidiary of the Ministry of Education, but at the present, it is made up of the following 6 sections and carrys out many functions:

1) Administration
2) Curriculum/Texbook Production
3) Construction of Community Schools
4) Community Education/School Administration
5) Teacher Training
6) Radio Programmes

The functions of the 6 sections are as follows:

1) Administration

   Its main function is the administration of the EDC in general and is made up of 10 personnels.

2) Curriculum/Texbook Produc tion

   Its main function is to unify a nd improve the curriculum so that it would be the most relevant to the society and the way of life of the Maldives acquiring the help of the specialist dispatched from UNESCO. Also it publishes textbooks for arithematic, sociology, Quran, and English for grades 1-5, so it must act both as an illustrator and a printer. As of November, 1979, however, textbooks for only the 1st

grade had been completed.

3) Construction of Community Schools

This section is in charge of constructing Community Schools under the aid of UNICEF and is made up of 1 coordinator and serveral other persons in charge of construction. The method of construction is stated in detail in (2-3-1).

4) Community Education and School Administration

This section is in charge of socially improving the atolls and increasing the local understanding toward economic projects by giving the children sufficient basic primary education and at the same time giving the adults the necessary social education. Therefore, there are several socialogists included in this section.

5) Teacher Training

This section mainly deals in reducing the shortage of teachers and improving their quality. The plan for re-educating the residing teachers of the local public schools was started in 1977. Every year, about 21-25 persons are chosen and educated under this project and hopefully, by the end of 1982, 5 groups will complete this course. In addition to this, a 2-year pre-service course has been started in 1977. After completing these courses, the teachers will be assigned to local public primary schools as headmasters or to public primary schools on Male as instructors.

It is hoped that these Maldivian teachers will be

able to take the place of the foreign teachers in Male. Presently, there are 4 specialists for the education of teachers working in this area.

6) Radio Programmes

This section is in charge of producing radio programmes for social education and training of local teachers. Presently, for the promotion of community education, a special community education programme is being broadcasted 5 days a week, 2 times a day, for 15 minutes in the morning and in the evening. The programme consists of 5 differeent segments, "Community Health", "Fisheries", "Agriculture", "History and Culture" and "Here and There Community News in the Maldives". Each segment is on the air once a week.

2-3 School Refinement Plan

2-3-1 Government Community School (Primary schools aided by UNICEF)

As stated before, plans for the construction of community schools under the aid of UNICEF are being underway. It is a goal to construct 19 schools on 19 atolls during 1977-82. The first of these schools was constructed on the island of Eydhafushi in Baa Atoll in February, 1978 and the second was constructed on the island of Kuulhudhuffshi in Dhaal in 1979. As of November, 1979, 4 schools are being constructed. In the Organization Chart of Community

School Construction (Data II-5-2), the schools were constructed using the plans of building and furnitures made by UNESCO and the Building Manual for Better Construction (total of 67 pages including various drawing and Dhivehian explanations) as a reference.

The actual construction will be conducted by the construction team from the EDC Community School Construction Section of the Ministry of Education.

The EDC Construction team is made up of 6 persons-1 construction coordinator in charge of the administration of construction, 1 supply assistant in charge of ordering, transporting and a procuring the supplies from Male, 2 carpenters, and 2 stone masons in charge of technical guidance and transmission of plan. The present construction coordinator is Mr. Mohammed Ruftee, former atoll chief and his duties as a coordinator include the following:

1) Making various arrangements with the local atoll chief who will be responsible for the construction at the local level.
2) Ordering and making arrangement for the importation of materials.
3) Arranging domestic transport of materials.
4) Managing the total rate of progress of the construction.
5) Controlling the building quality.

Several teams were scheduled to be organized in accordance with the rate of progress of the construction, but as of now, only one team has been organized. Under the super-

vision of this EDC construction team, the actual construction is carried out by the local construction crew of about 20 members which include carpenters, masons and other laborers. These laborers work under the supervision of the construction assistant (usually the island chief) assigned by the atoll chief. The actual condition of construction is as stated in Date II-6.

UNICEF's work dealing with the above construction is as stated below:

UNICEF has sent and assigned a liaison officer, Mr. T. Mizota (Japanese) from their Colombo office to Male in the Maldives, with a term lasting for 2 years from April 1978. According to the request from the construction coordinator, the liaison officer sends in orders for construction materials to the UNICEF's Colombo office. UNICEF's Singapore office is then in charge of procuring the materials requested and approved at the Colombo office. The order form has about 143 categories listed. There is a need for many types of materials.

UNICEF together with the UNDP owns a 12-motor boat with an outer engine and uses it for transport among the atolls. Using it, Mr. Mizota took about a year visiting the 18 atolls. The transportation and importation fee of the materials and the salary of the construction team is paid by UNICEF, but the fee for the materials which can be acquired locally such as coral stone, lime, and sand, and the salary for the local construction crew is paid by the Maldivian Government. Actually though, a part of this

payment is also aided by UNICEF.

The materials are imported to Male duty-free and are transported to the local construction sits from Male by a 40 ft, so-called battery boat acquired by UNICEF at the price of US$8,300 in June, 1979. As stated in I-4-2 of Data II, since the above boat used for regular transport of materials is slow and small compared to the motor boat of the construction committee, which is the next largest to the Presidential boat, the number of trips were increased. These trips, however, are much influenced by the weather and delayed by the unique Maldivian geographical factor and the acute shortage of boats, undoubtedly influencing the period of construction. Furthermore, there are no piers for landing the materials on many islands, therefore the most convenient place for landing was chosen, although it was actually far from the construction site.

Since the landing of goods relys on human hands, it is essential for the packages to be as compact as possible.

The period of construction, generally speaking, is about 7 months upon the arrival of the materials at the construction sites, but frequently there are a 2-3 month delay. This delay is due to the annual 1-month fasting, a religious event, and the 3-month interference is shipment due to bad weather. Specification of the islands and sites of construction of the 19 schools and the construction method is left entirely to the Government of the Republic of Maldives. The completed community schools are made up of 4 buildings stated below:

(1) A classroom building for grades 1-4 which is divided by cupboards and can be used as an assembly hall when the blackboar ds are removed.

(2) A classroom building for the 5th grade and the adult community education class.

(3) An administration building which includes the headmaster's residence and officers.

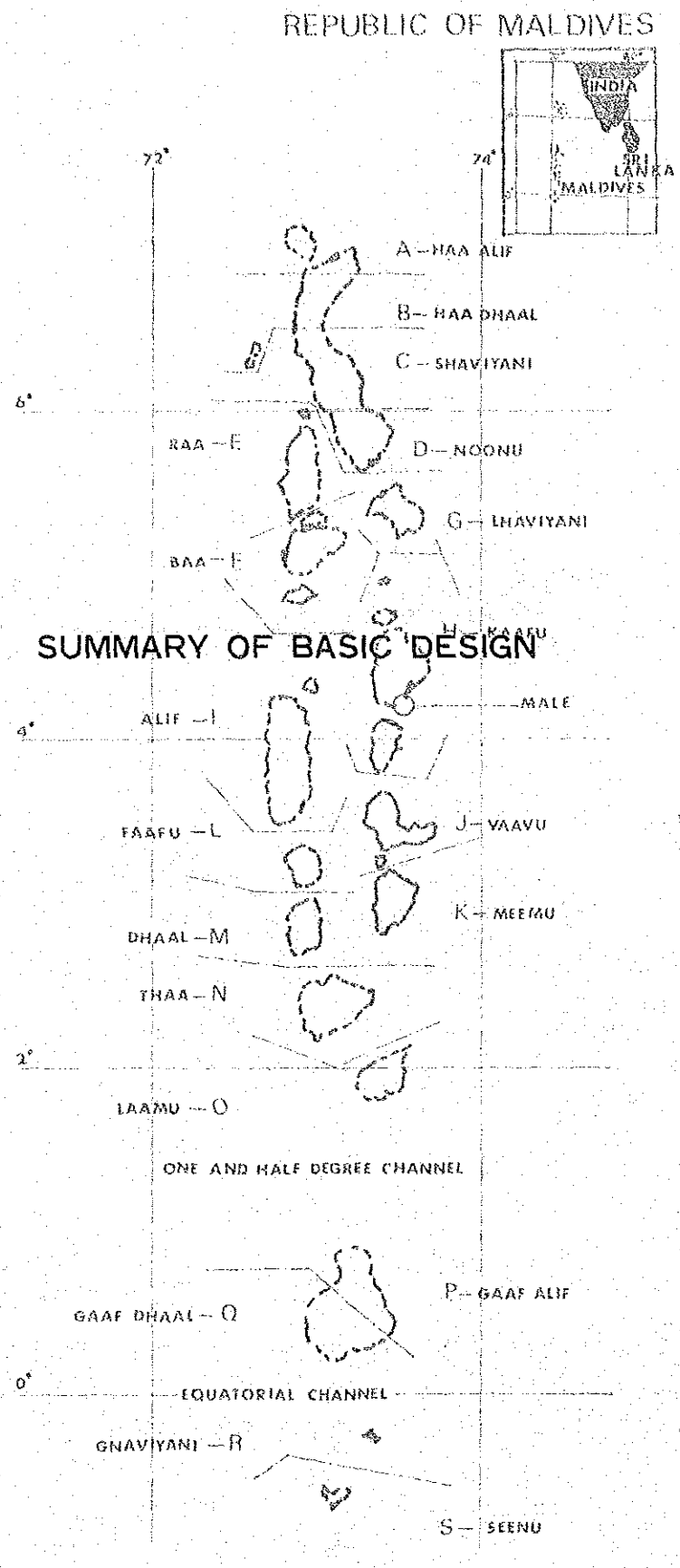
(4) Toilet Building

These community schools not only conducts primary level education but community education for adults as well to socially reform the local atolls. In other words, it plays a very importasnt role as the nucleus of culture for the local society.

2-3-2 Japanese aided school

Japan was proposed to aid in the construction of 19 schools as a part of the school system improvement plan. The conventional method of construction of the Maldives instead of the prefabricated method will be used for construction and it is anticipated that the quality would be better than the UNICEF Community Schools. The outline of the construction will be stated in Chapter III. The 19 islands scheduled as construction sites were chosen taking the various political aspects into consideration. Regularly, however, the island which has the most population as school children tends to be chosen as construction sites than the others. We can say that the construction of primary schools on the 19 islands is very significant

considering its role in the school system improvement program to equalize the policy among the atolls and the unique geographical factor of the Maldives where numerous islands are scattered over a vast area. The materials to be used for the construction will be mostly imported. Therefore, economic chaos will be avoided. Furthermore, there should be no problem in carrying out this Primary School Construction Plan aided by the Government of Japan for it does not directly interfere with the grant aid programs of the Moslem countries (mainly oil-producing) such as Libya and the UN. All of its construction sites except for one does not coincide with those of UNICEF's Community School's.



CHAPTER 3 SUMMARY OF BASIC DESIGN

3-1 Basic Policies

Basic designes are to be made under the following policies.

(1) To decide the content and the size of each school relevant to the actual conditions of the Maldives upon conference between the survey team and its Maldivian counterparts,

(2) To take into account the local climate and other forces of nature,

(3) To facilitate the maintenance in accordance with the local customs and the way of life,

(4) To employ local technology and local materials which can be supplied easily in these area as much as possible,

(5) To make functional site plans, taking into account of the condition of each site,

(6) Designs shall be based on the laws, rules, regulations and standards of Japan, allowing partial necessary modification suit the situation of these areas.

3-2 Outline of Facilities

The outline of the school building and allied facilities of this project is as follows:

3-2-1 Outline of Buildings

(A) Classroom Building I (approximately 210 M^2)

7m x 30 m

It will contain the 1st - 4th grade classrooms (for pupils of the age 6-9) which will be divided by cupboards. Occasionally, it can be used as an assembly hall, and also as a public hall in dealing with public affairs apart from school, becasue there are no other large building. The standard size of a classroom has been decided to be 7m x 7.5m to accomodate 40 pupils. Therefore, the space per pupil will be 1.3 m^2.

(B) Classroom Building II (approximately 122.5 M^2)

7m x 17.5m

It will contain two classrooms, one (7m x 7.5m) for the 5th grade, the highest grade of the school, and the other (7m x 10m) for the adult community education class for the improvement of the adult's general level of cultural knowledge. Reading, writing, and cultural studies will be taught in this classroom. Vocational guidance such as sewing, etc. for the

illiterates are held in this classroom as well for many people are illiterate on these island. UNICEF's Community School will be the typical model used for this school construction plan aided by Japan.

(C) Toilet Building (approximately 35 M^2)

7m x 5m

It will contain a total of 5 booths for both the men's and the ladies' room, 4 for students and 1 for the teachers. All of these toilets will be Indian style. It will also contain 3 basins for both the men's and the ladies room.

The Indian-style toilet does not have any papers, and instead a water cock is installed in each booth. The toilet bowel is like a Japanese-style one without a front screen, and is used the same except for the fact that the user washes himself with water. Men urinate by crouching like a woman, so a urinal is unnecessary.

(D) Administration Building (approximately 140 M^2)

7m x 20m

It will contain office space (7m x 6m) for seven persons in total, the head master, 5 teachers, and 1 clerk, and a storage for teaching materials. It also will include the headmaster's residence, designed for a family of 4, 2 children and 2 adults, which will be installed with a living room, a dining room, 2 bedrooms, a bathroom (7m x 10m) an outside service yard (7m x 5m), a kitchen and a storage area.

Although the standard of living, on the local islands of the Maldives is low, a high standard and style of living must be considered for the headmaster's residence for he holds a leading position in all aspects as well as in education, and his residence will set an example of the style of living.

The primary schools shall have the four facilities mentioned above. It was necessary to include the adult community education classroom and the headmaster's residence in these facilities taking into account the various social aspects and situations. The UNICEF Aided Community Schools now completed will be regarded as model schools, and will be the basis in clearing the gap in education between Male and the other islands and the nucleus of culture on the local islands.

3-2-2 Outline of the Annex

(1) Water facilities

8 reserve tanks for rainwater, 2 elevated water tanks, 3 wells with hand pump.

(2) Piping for water supply and sewage

(3) Septic tank and seepage pit

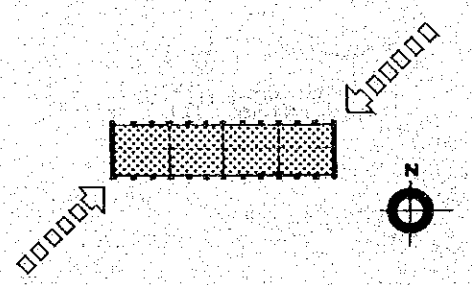
3-3 Site Plan of Facilities

(1) Site

The site is to be cleared, and the existing trees of no obstruction to the facilities will be left as much as possible. The space between two buildings is to be principally twice that of the width of the buildings, but needless to say, it does not have to be exact and should be made to fit the actual condition of the site.

(2) The block plan of the Buildings

Taking into account the strong southwest wind and rain which occurs during the monsoon season, the buildings will be laid out without openings facing west. The buildings' axis will be laid from east to west, and the openings will be made to face south and north. Furthermore, care will be taken to protect the inside from the strong sunshine by making a large truss space.



3-4 Building Design

3-4-1 Plan

(1) The width of the building will be set as 7m and the length will consist of a minimum unit of 2.5m, each marked with a reinforcing pillar.

(2) A classroom must hold 40 pupils and the minimum space per pupil will be set as 1.3m^2. Therefore the size of one classroom will be 7m x 7.5m.

3-4-2 Section Plan

The floor level will be 150mm above ground level, 800mm in height and smooth-surfaced with cement mortar. The ceiling will not be provided because of its climate.
The truss space under the iron sheet roof will be utilized to inhibit the heat from the sun from penetrating into the classrooms so the height of the ceiling will be 3 meters (at the lower edge of the truss beam).
In classroom building I, openings will have no fixtures in order to make the most of the natural wind, which will be most functional and most suitable climate-wise.

3-5 Structure Plan

This is the structure plan for the one story school building which will be constructed in the Maldives in Indian Ocean.

Since there are no building regulations or standards, there is not enough data available.

The maximum instantaneous wind velocity for the last 10 years is 31.9 m/s, which is milder than that of Japan.

We are to conform the design to the basic laws of construction and to some of the regulations of the Academy of Architecture in Japan, needless to say taking into account the actual conditions of the local areas.

3-5-1 Framing Plan

The buildings will be of masonry structure with a base, walls (including the stay wall), and other elements constructed by heaping up so-called coral stones securing them with mortar of cement and shattering sand from coral stones.

3-5-2 Materials

1) Roof - corrugated iron sheet

2) Roof Truss - truss structure mainly made of spruse

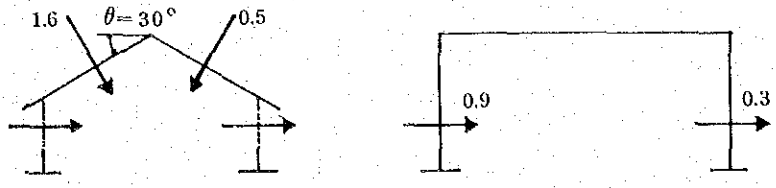
3) Wall(masonry)- coral stone and cement mortar

4) Floor - cement mortar (with coral stone)

3-5-3 Loadings

1) Wind load (all horizontal)

calculation of wind pressure



2) Allowable soil pressure - (longtime)

3-6 Equipment Plan

3-6-1 Outline of equipments

The sources of water will be the well and the rain water. Drinking water will be obtained from the rain, and the water for the toilet and the shower will be obtained from the well. Rainwater will be reserved in tanks, and then drawn through the top of the tanks. Well water will be pumped up to the elevated tanks by a wing pump and then piped to the basin, the shower, etc.

As for sewage, there are no public facilities and will be disposed of by penetration into the earth through the seepage pit. Sewage will be piped outside and will be divided into sanitary sewage and general sewage. Sanitary sewage will be treated in the sewage disposal facility (septic tank) and the settling tank.

3-6-2 Water Supply Facilities

The estimated amount of water supply is as follows:

Building	No. of People	Purpose	Amount of water used per head/ day	Amount of water used per day	No. of hours	
Administration	Headmasters family (4 persons)	Toilet Shower Kitchen	220 lt.	880 lt.	10 lt.	Well
		Drinking	100 lt.	400 lt.	10 lt.	Rain
Classroom building	6 teachers 400 students	Toilet "	40 lt. 5 lt.	240 lt. 2,000 lt.	6 lt.	Well
	6 teachers 400 students	Drinking "	20 lt. 20 lt.	120 lt. 800 lt.	6 lt.	Rain
		Others		3,000 lt.		

3-6-3 Capacity of Tank

Administration Building	Elevated tank	1000 lt./day
	Reserve tank for rainwater	1500 lt./4 days
Classroom Building	Elevated tank	(used for 4 hrs/day) 2,240 lt. x 4/6 = 1,500 lt.
	Reserve tank for rainwater	3,920 lt./day x 3 days = 11,760 lt.
		1,500 lt./7 set

3-6-4 Sewage System

The sanitary sewage shall be treated in the septic tanks

1) Administration Building
   4 person x 50 lt./person/day = 200 lt./day
   600 x 1,000 x H 400 (septic tank)

2) Classroom Building
   406 persons x 30 lt./person/day = 12,180 lt./day
   5000 x 2,000 x H 1,400 (septic tank)

3-7 Building Materials

It is planned to use as much material available in these districts as possible and to use the native construction method.

3-7-1 Structure material

(1) Foundation: Coral stone and mortar (cement:sand = 1:2)

(2) Floor : Mortar (cement:sand = 1:2)

(3) Wall : Coral stone and mortar (cement:sand = 1:2)

(4) Truss : Imported timber (spruse)

(5) Roof : Cortugated galvanized iron sheet #26 o.p. finished

(6) Hardware : Bolts for truss, metal sheets, anchor bolts

3-7-2 Finishing material

(1) Wall : Plaster (lime and sand = 1:2)

(2) Floor : Mortar (cement and sand = 1:2)

(3) Furnishings: o.p. finish (including frames)

3-8 Furniture Plan

3-8-1 Outline

The sizes of furnitures used in this plan were determined

by the data given by UNICEF (ef. 3-8-3, Data I)

The furnitures were classified into 3 categories:

Type A (for 6 - 7 years old), Type B (for 8 - 10 years old) and Type C (for over 16 years old), according to the average heights of the children in each group and will be made of wooden material for easy maintenance.

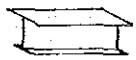
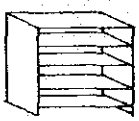
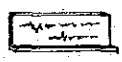
Average Heights

Type	Heights
A	108m
B	120m
C	158m

Heights of Desk and Chair

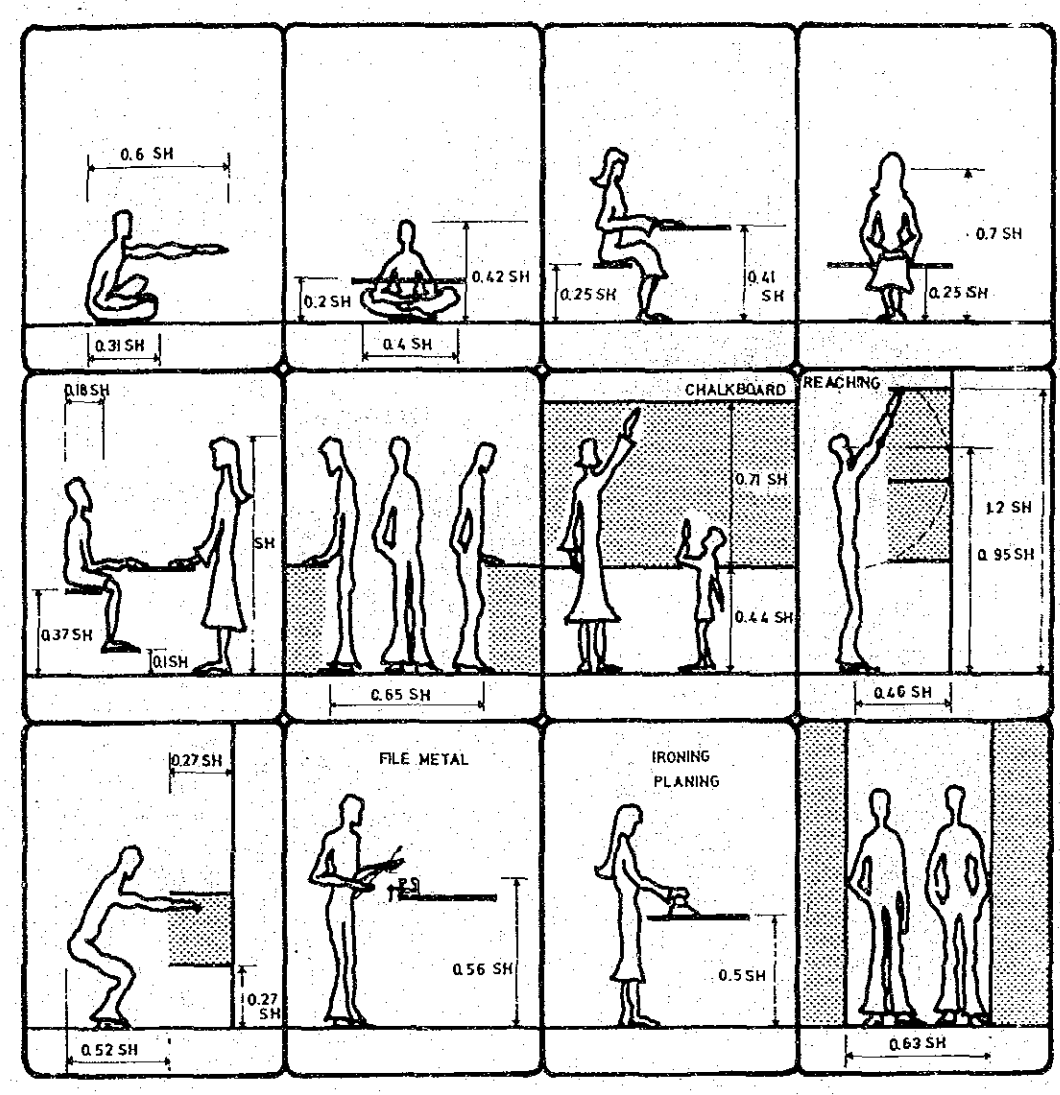
Type	Desk	Chair
A	440cm	270cm
B	490cm	300cm
C	640cm	390cm

3-8-2 Kind and Number of Furniture

種 類	Use	Type	Scale (W) cm × (H) cm × (D) cm	個 数
				pcs
Chair (single)	6~7yrs		300×270×305	80
	8~10yrs		310×300×320	120
	16yrs up		370×390×360	20
Desk (double)	6~7yrs		1,000×440×400	40
	8~10yrs		1,100×490×450	60
	16yrs up		1,400×640×450	10
Chair (single)	For Teacher		500×450×450	12
Desk (single)	For Teacher		1,350×760×750	12
Black Board with Cup Board	For Class room		3,600×1,700×600	3
Cup Board	For Class room		1,800×1,500×350	2
	For Teachers room		1,800×1,500×350	3
Black Board	For Class room		3,600×1,200	2
	For Teachers room		1,200×900	1

3-8-3 Data 1

The critical dimensions and their ratios of the standing heights



Data 2

MEAN STANDING HEIGHT AND STANDARD DEVIATION FOR BOYS AND GIRLS PER AGE GROUP SEPARATED FOR MALE AND OTHER ATOLLS

AGE	BOYS						GIRLS					
	Malé			Other Atolls			Malé			Other Atolls		
	S.H.	S.D.	No.	S.H.	S.D.	No.	S.H.	S.D.	No.	S.H.	S.D.	No.
2	-	-	-	94	4.1	3*	-	-	-	-	-	-
3	-	-	-	94	3.1	3*	-	-	-	93	6.7	4*
4	-	-	-	108	6.5	5*	-	-	-	105	5.3	7*
5	-	-	-	103	7.1	9	-	-	-	101	6.9	17
6	-	-	-	105	7.3	16	110	6.4	82	106	8.2	15
7	120	7.7	69	111	6.6	27	116	8.0	70	109	6.3	22
8	126	6.9	67	119	4.3	27	123	8.7	95	116	5.3	29
9	130	7.3	63	122	6.8	27	128	9.3	76	118	6.4	26
10	137	9.4	65	124	4.1	26	132	9.1	47	123	6.8	29
11	138	7.6	52	125	4.0	6*	139	9.1	58	127	7.7	20
12	147	10.9	78	132	5.9	19	145	8.1	58	131	7.1	14
13	157	8.8	60	133	5.4	9	151	6.0	36	132	8.6	11
14	159	8.4	36	134	2.4	4*	147	5.2	51	138	6.5	6*
15	160	7.7	29	140	12.1	2*	150	5.0	25	147	2.2	2*
16	163	5.7	18	-	-	-	154	5.6	22	-	-	-
	Total 557			Total 183			Total 620			Total 202		

* Statistically unreliable, due to limited sample size of this particular age group.

All measurements in centimeters.

ABBREVIATION: S.H. STANDING HEIGHT
S.D. STANDARD DEVIATION

3-9 Basic Design

00 Perspective View

01 Location Map

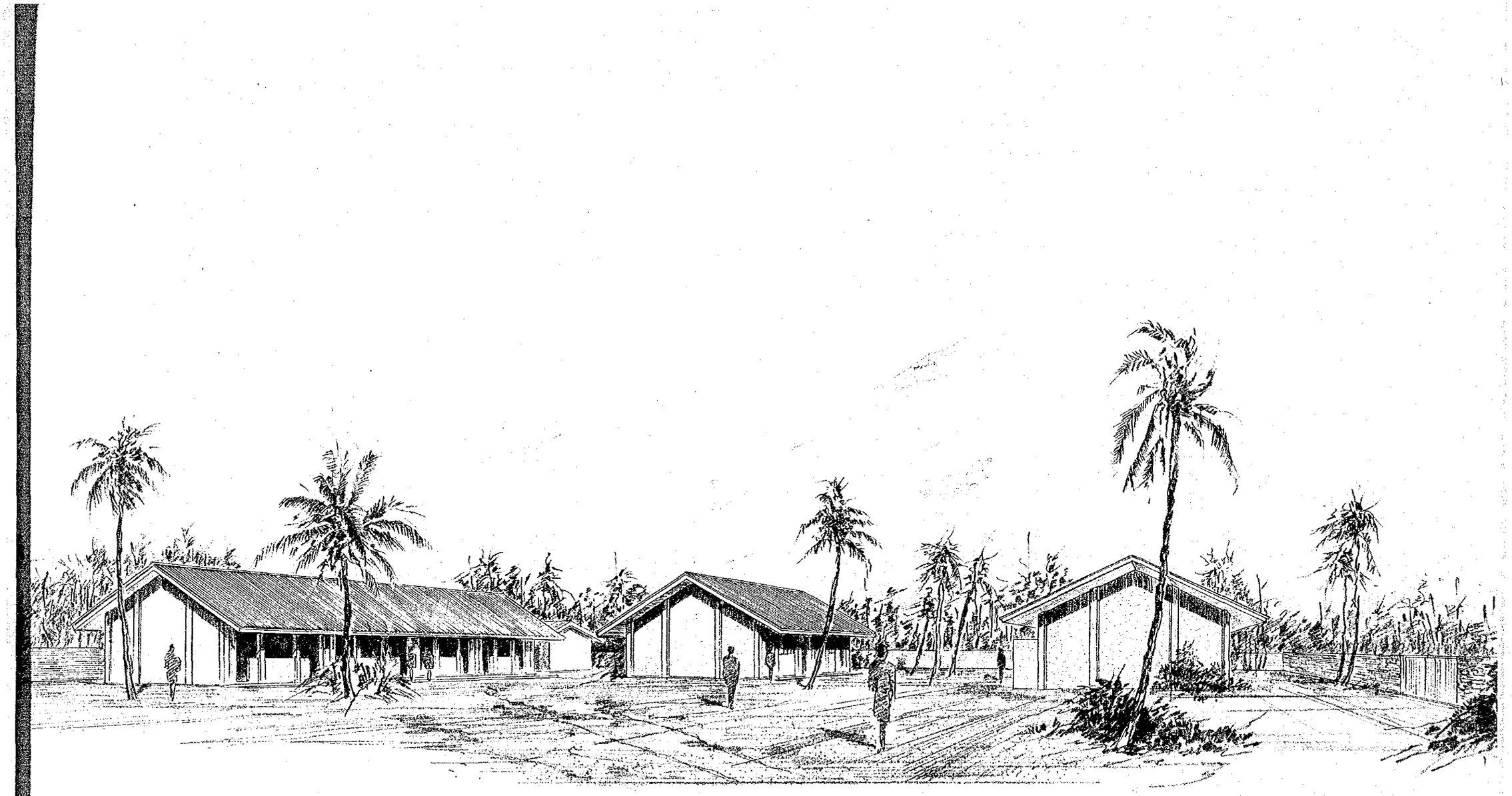
02 Tentative Site Plan

03 Classroom Building I

04 Classroom Building II

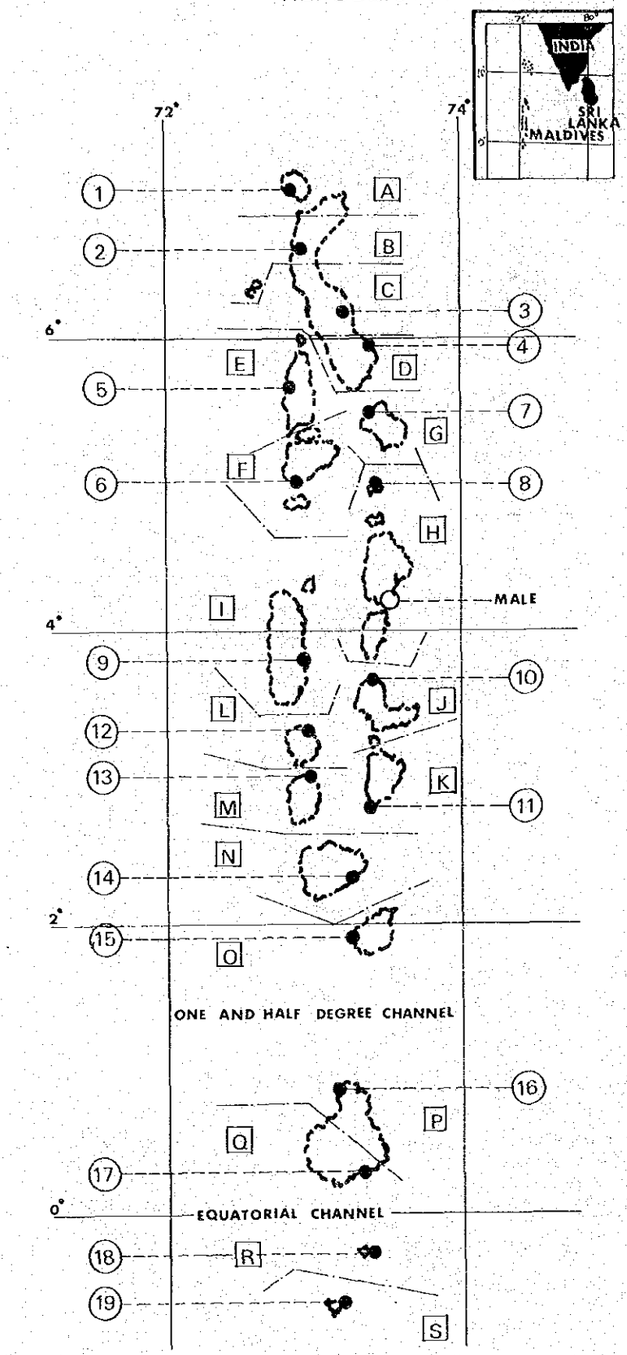
05 Toilet Building

06 Administration Building



PERSPECTIVE VIEW

REPUBLIC OF MALDIVES



A–S	NAME OF ATOLL / NAME OF ISLAND	1–19
A	HAA ALIF / HUVARAFUSHI	1
B	HAA DHAAL / VAIKARADHOO	2
C	SHAVIYANI / LHAIMAGU	3
D	NOONU / KEDHIKOLHUDHOO	4
E	RAA / KADOLHUDHOO	5
F	BAA / HITHADHOO	6
G	LHAVIYANI / HINNAVARU	7
H	KAAFU / KAASHIDHOO	8
I	ALIF / MAHIBADHOO	9
J	VAAVU / FELIDHOO	10
K	MEEMU / VAAREYAAFUSHI	11
L	FAAFU / FEEALEE	12
M	DHAAL / MEEDHOO	13
N	THAA / GURAIDHOO	14
O	LAAMU / GAN	15
P	GAAF ALIF / KOLAMAAFUSHI	16
Q	GAAF DHAAL / GADHDHOO	17
R	GNAVIYANI / FOAMULASH	18
S	SEENU / HULHUMEEDHOO	19

LEGEND

Ⓐ — CLASSROOM BUILDING-I

Ⓑ — CLASSROOM BUILDING-II

Ⓒ — TOILET BUILDING

Ⓓ — ADMINISTRATION BUILDING

— MAIN GATE

— SUB GATE

— DOORWAY

— WELL

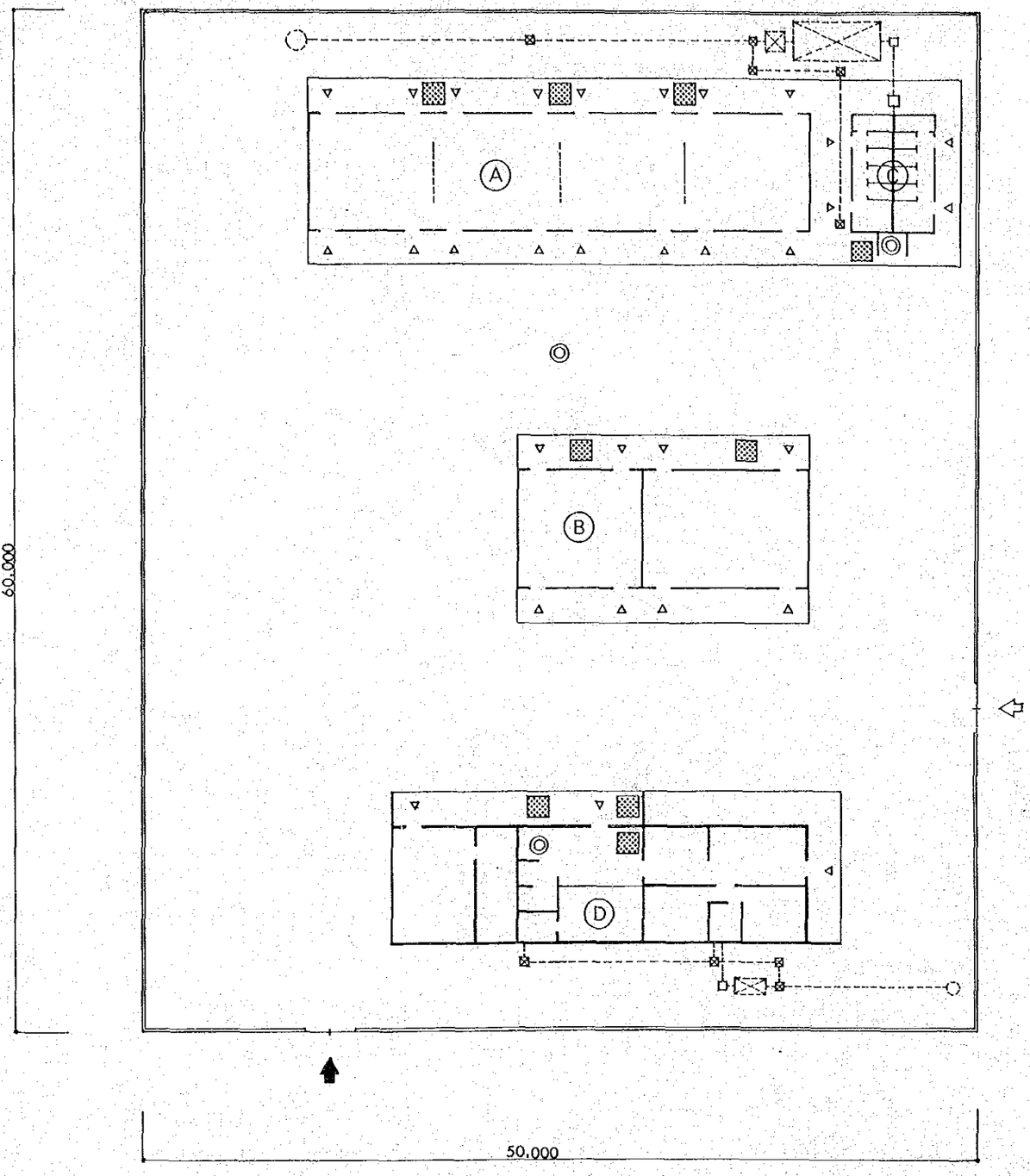
— WATER STORAGE TANK (RAINWATER)

— SEPTIC AND SETTLING TANK

— SEEPAGE PIT

— WASTE BASIN

— SOIL BASIN



TENTATIVE SITE PLAN

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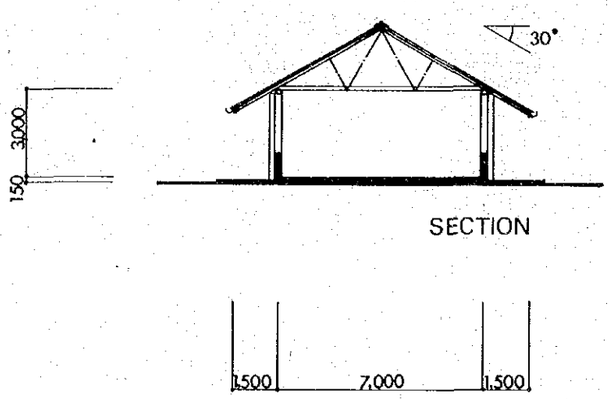
S. 1:300

02



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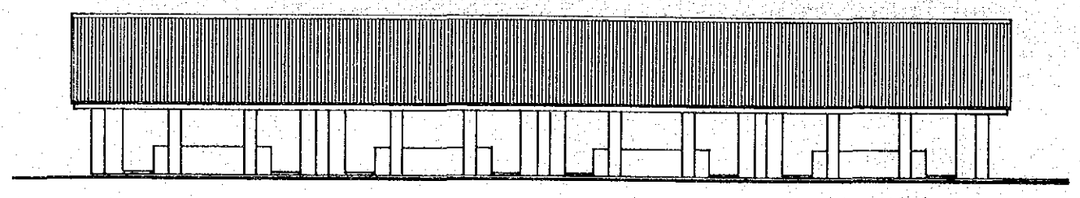


ELEVATION

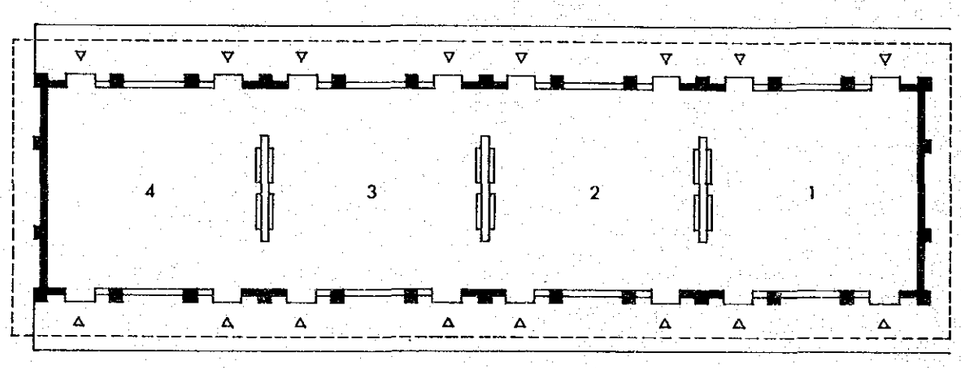
LEGEND

1 — 1ST GRADE

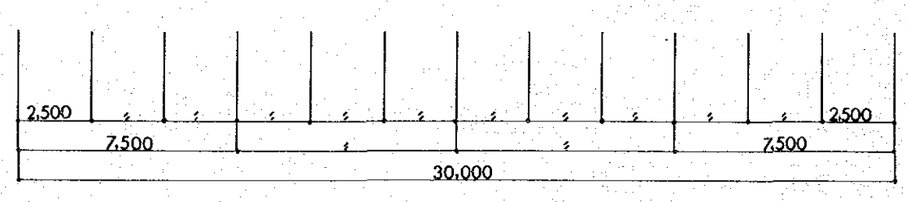
2 — 2ND GRADE

3 — 3RD GRADE

4 — 4TH GRADE



PLAN



CLASSROOM BUILDING·I

N

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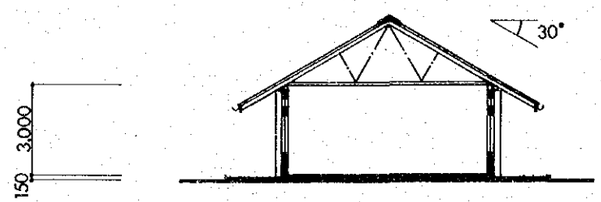
03



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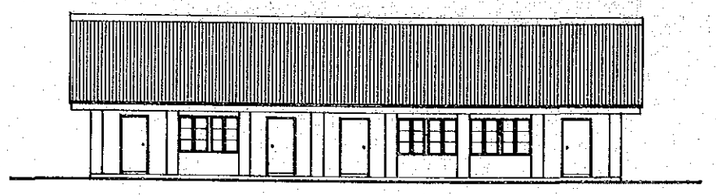

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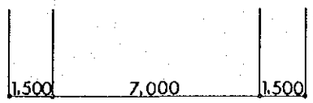
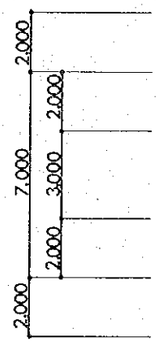
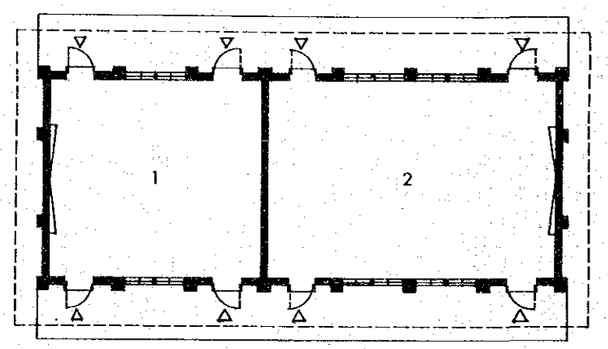


LEGEND

1 — 5TH GRADE

2 — COMMUNITY EDUCATION CLASS





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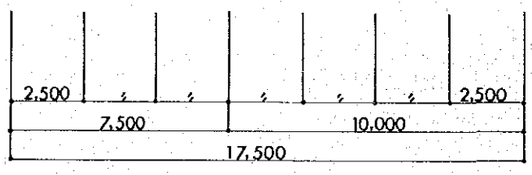

CLASSROOM BUILDING · II

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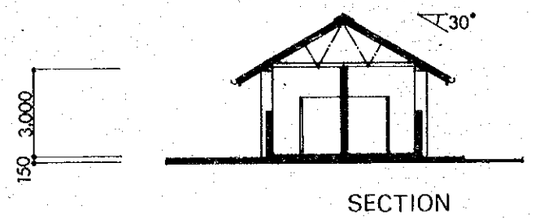
S. 1:200

04



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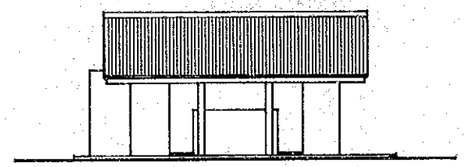
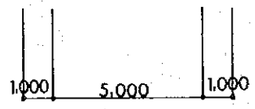


ELEVATION



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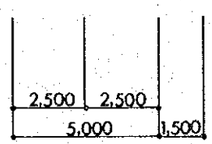

TOILET BUILDING

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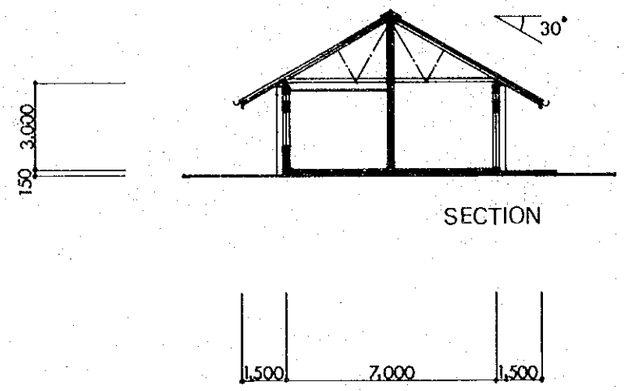
S. 1:200

05



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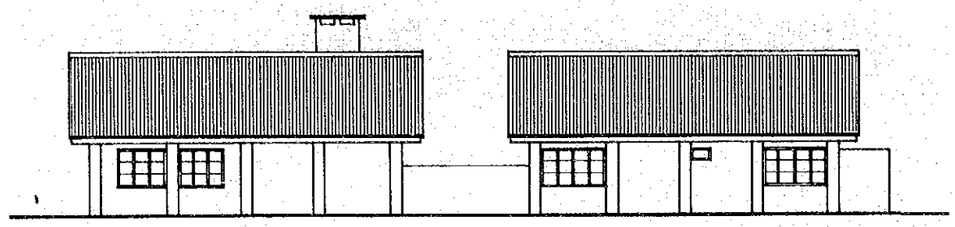
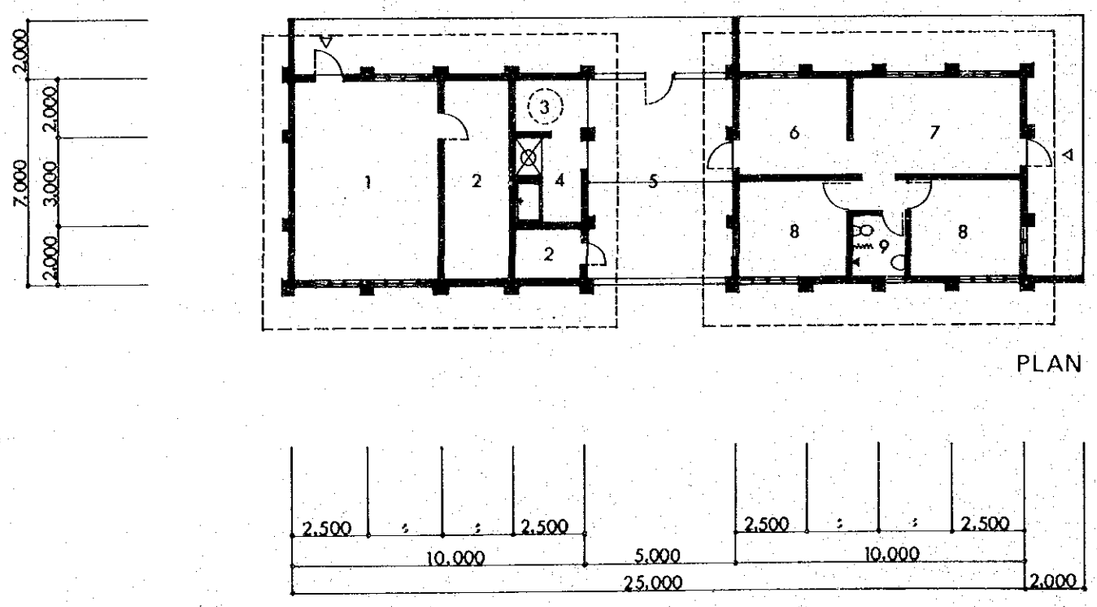


ELEVATION

LEGEND

1 — OFFICE
2 — STORAGE
3 — WELL
4 — KITCHEN
5 — SERVICE YARD
6 — DINING ROOM
7 — LIVING ROOM
8 — BEDROOM
9 — BATHROOM



PLAN

ADMINISTRATION BUILDING

N

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06

3-10 Construction Plan

3-10-1 Rough Estimate of Building Expenses

According to the construction schedule (3-10-7), a school in each of the 10 northernmost islands out of the entire 19 islands will be constructed in the fiscal year 1980, and in the fiscal year 1981, a school in each of the remaining 9 southern islands will be constructed.

(1980)

1)	Building Cost	¥537,000,000.-
2)	Furnishing Cost	40,000,000.-
3)	Consultant Fee	55,000,000.-
	Total:	¥632,000,000.-

(1981)

1)	Building Cost	¥469,000,000.-
2)	Furnishing Cost	37,000,000.-
3)	Consultant Fee	55,000,000.-
	Total:	¥561,000,000.-

Note: It is needless to say that constructing 19 schools will be more economical than reducing the number of schools. It will also be difficult in terms of the quality of the buildings and the efficiency of supervision to find a good local supervisor and to

3-10-2 Conditions of the Estimate

The important conditions upon making the above-stated estimate are as follows:

(a) Cooperation from the Maldivian Government

The measures to be taken by the Maldivian Government mentioned in the MINUTES dated 8th November, 1979, need to be effective and concrete for the promotion of this project.

(b) Exchange rates

US$ 1 = ¥230 Rs 1 = ¥30.67

(c) Inflation rate

The annual rate of 8%

3-10-3 Procurement of Main Materials

The local building materials which can be procured on the Maldives are limited to three things, coral stone, sand and lime.

The Maldives cannot help depending on the import of all other materials, equipments and tools (3-7). For the promotion of this project, it is very reasonable to import them from Japan taking into account the stability of supply and quality.

Further thinking economically, we have made estimates for countries other than Japan. As a result, Singapore was considered to be appropriate in terms of its friendly relations with the Maldives, its normal conditions of trade, and the reliable procurement of articles. As a suggestion, we have compared the present unit price (C&F

Male) of Japan and Singapore:

Materials	Japan	Singapore
Cement	100%	87%
Timber	100%	80%
Galvanized Steel Corrugated Sheet	100%	106%
Water tank	100%	82%

Notes: 1. 100% if supplied from Japan

2. The unit price in Singapore was assessed according to the data of UNICEF.

As the above shows, it is considered to be the most appropriate to supply the imported articles from Singapore. Since the trends of the exchange rate, the price of oil, the rate of inflation and so on makes estimating the construction cost at the time or tender call difficult, it will be necessary to re-estimate the construction cost at that time.

3-10-4 Transportation Plan

The amount of the imported building materials is estimated to be about 250 tons per school.

The major problems of transportation are the difficulty of landing caused by the encircling coral reef, the economical disadvantage of one-way load and the necessity of making many stop-overs at different construction sites.

It is not considered practical in view of the cost of transportation and the progress of work to transport the

materials to each construction site after taking them once to Male to clear customs.

Based on the results of the field survey, the team plans to transport the imported materials on mother ships directly to the shores off of each construction site without stopping at Male.

A fishing boat called a dhoni will be used to land the materials from the mother ships which will be anchored offshore avoiding the coral reef.

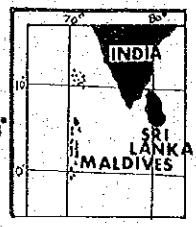
Since the loading capacity of the dhoni is 1-1.5 tons, it is necessary to secure many boats and to increase their speed.

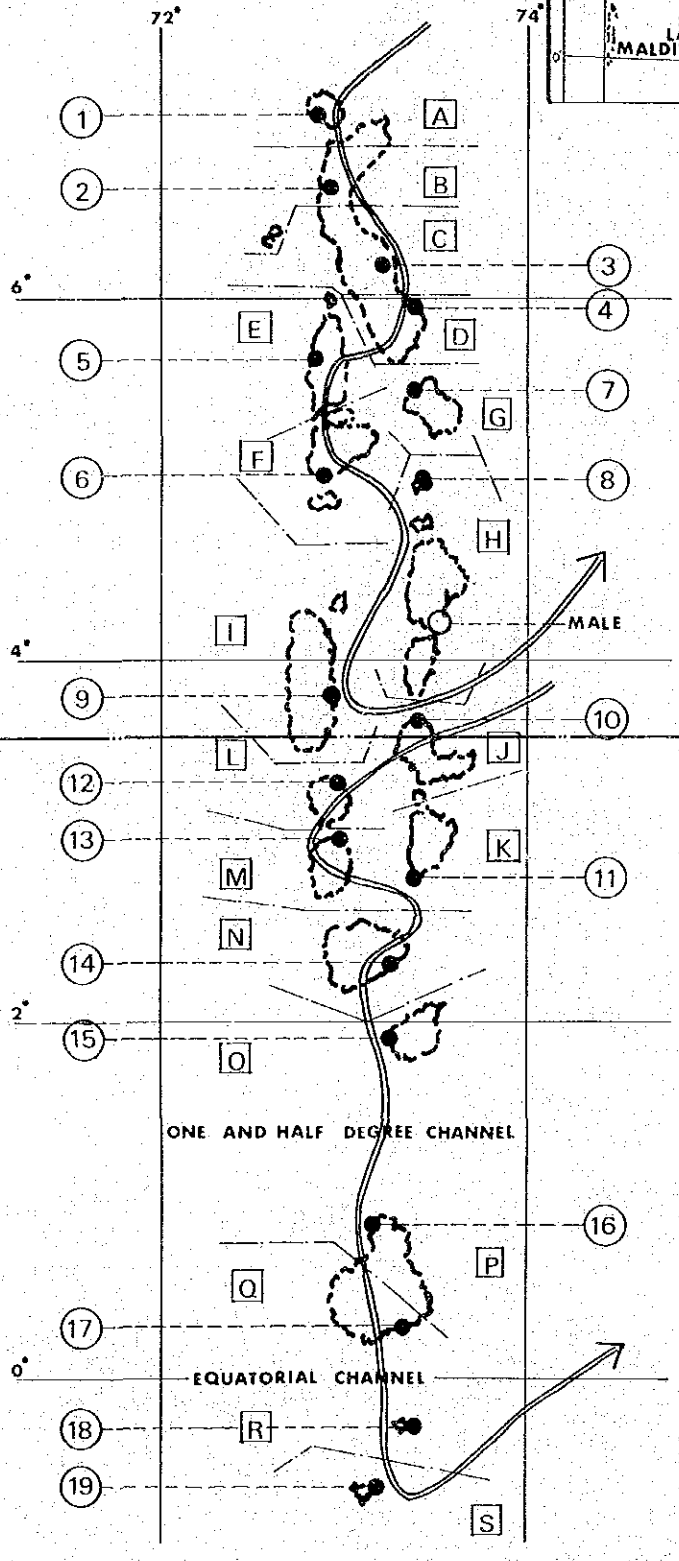
It is reasonable to tow several dhonies by a tug boat following the mother ship in order to execute this plan efficiently.

And since each island selected as a building site hardly possesses a jetty, it is necessary to land the cargo by human hands. Therefore it is necessary for each package to be as compact as possible.

TRANSPORTATION ROUTE

REPUBLIC OF MALDIVES





The first year

The second year

The ship of about 1,000 ton must sail the scheduled route at least 3 times since 250 tons of equipments and materials are necessary per school. The shipping route is as shown.

3-10-5 Execution of Construction

The selected building sites are shown in LOCATION MAP 01. The construction work on these nineteen islands scattered over a distance of about 850 km north to south will be different from that of a normal building site. The differences are as follows:

(a) The cost of imported materials will account for a great part of the budget.

(b) Great care for transportation will be necessary since the islands are surrounded by coral reefs. In addition, it is presumed that the transportation cost will be higher because of one-way loads.

(c) Japanese contractors have had no experience constructing on the Maldives.

(d) There are no local subcontractors who are able to execute the construction smoothly.

The following two cases were conceived upon the assumption that the construction will be divided into 2 parts:

	1st Year	2nd Year
Case A	1 - 10	11 - 19
Case B	10 - 19	1 - 9

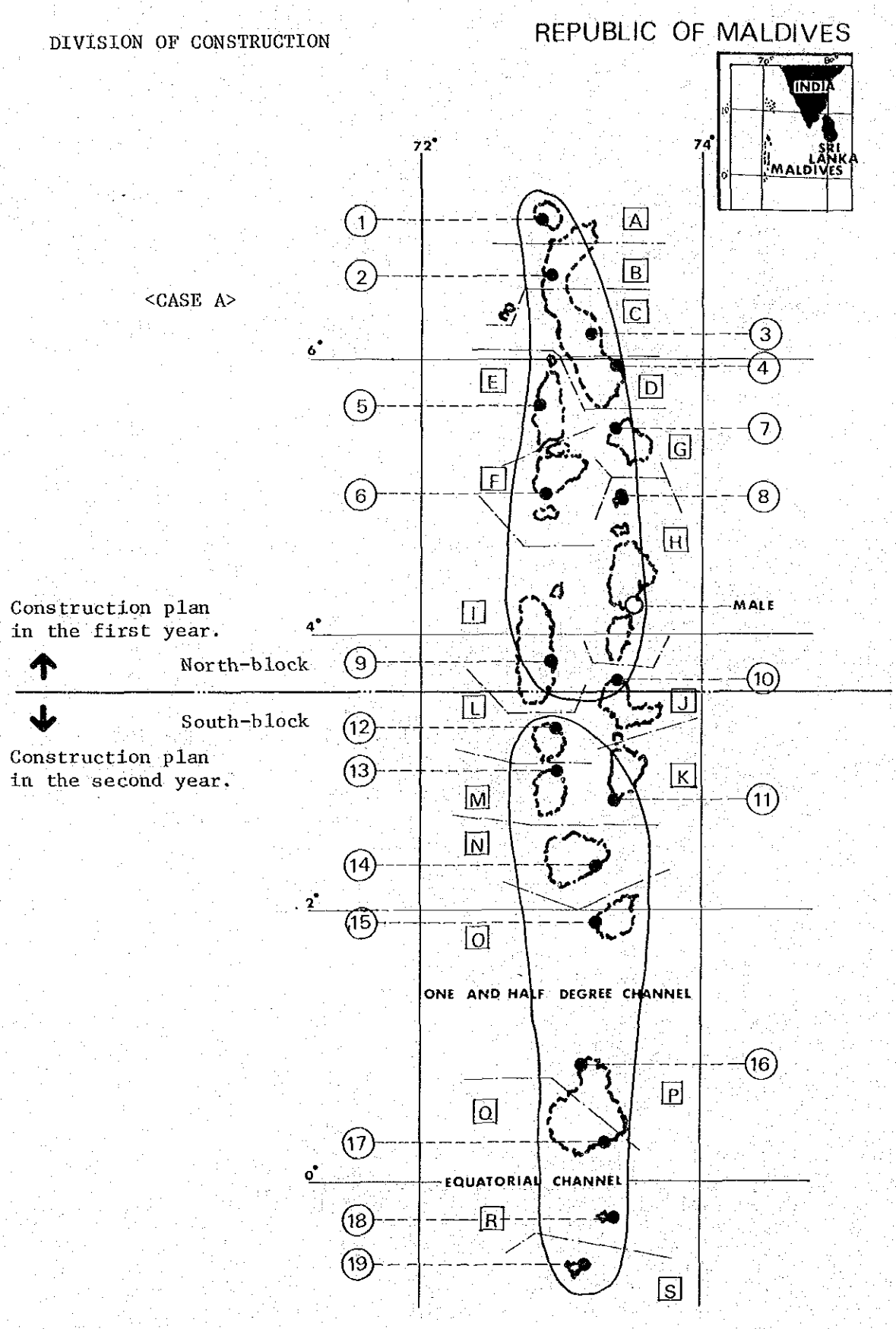
Notes: * The figures correspond to the islands shown in the LOCATION MAP.

** Each year, the construction will be held in either the northern or the southern half.

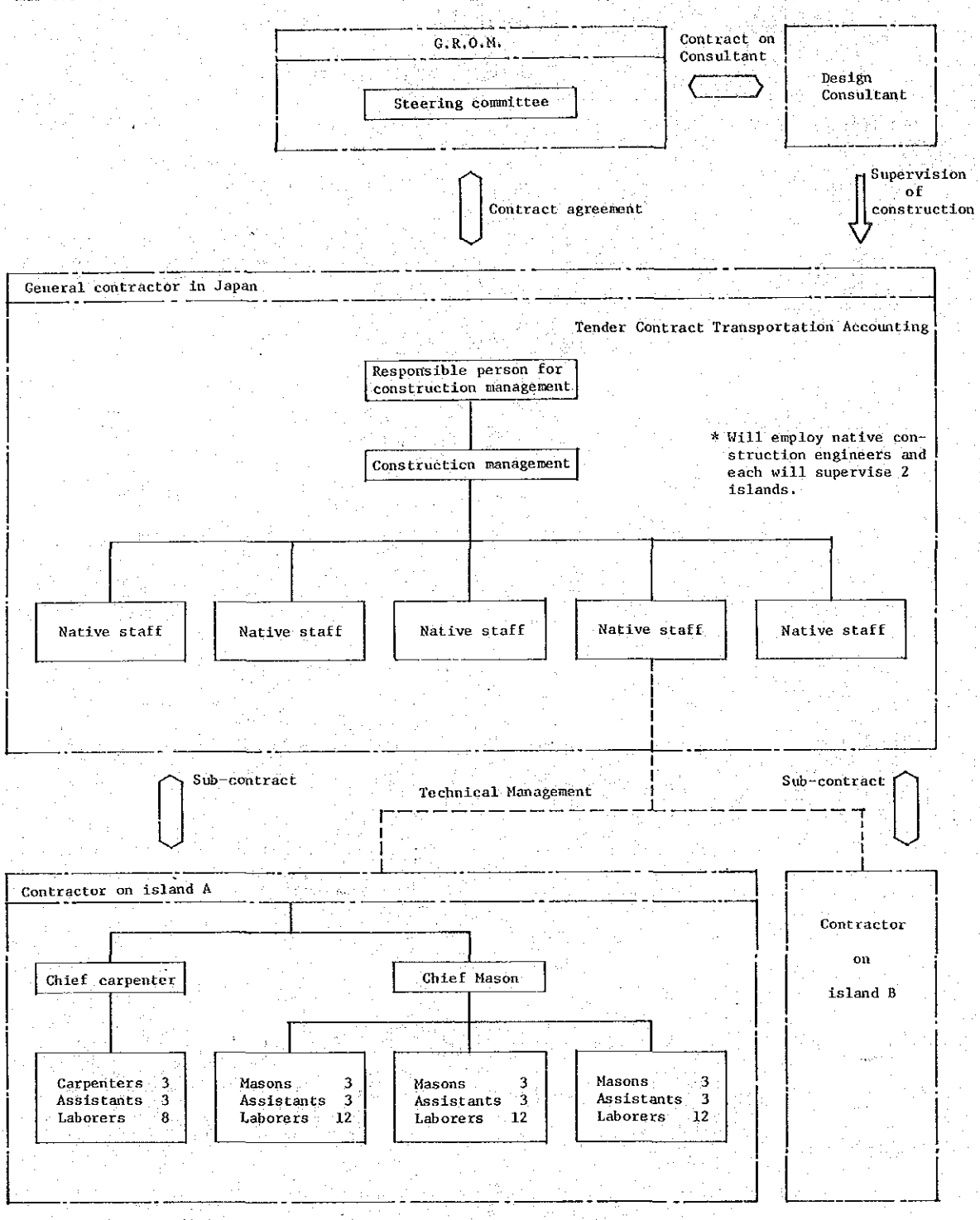
*** The economical efficiency which has been pursued will be lost if any other method isuused.

**** This estimate is based on Case A.

DIVISION OF CONSTRUCTION



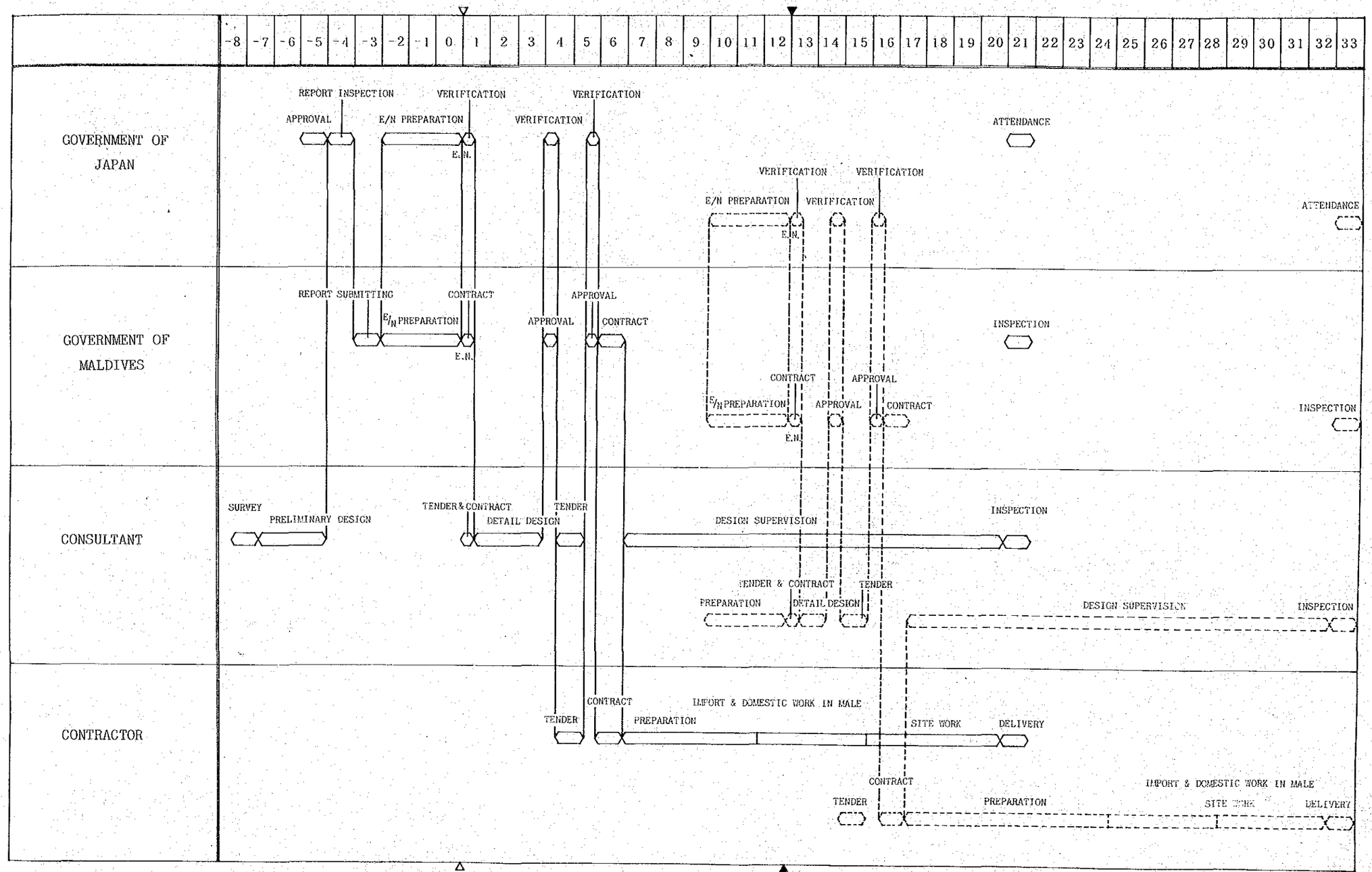
EXPECTED CONSTRUCTION ORGANIZATION



supervise 19 schools at once within a yera. Taking this into account, to carry this construction program in two fiscal years would be considered reasonable.

3-10-6 Program of The Project

PROGRAM OF THE PROJECT

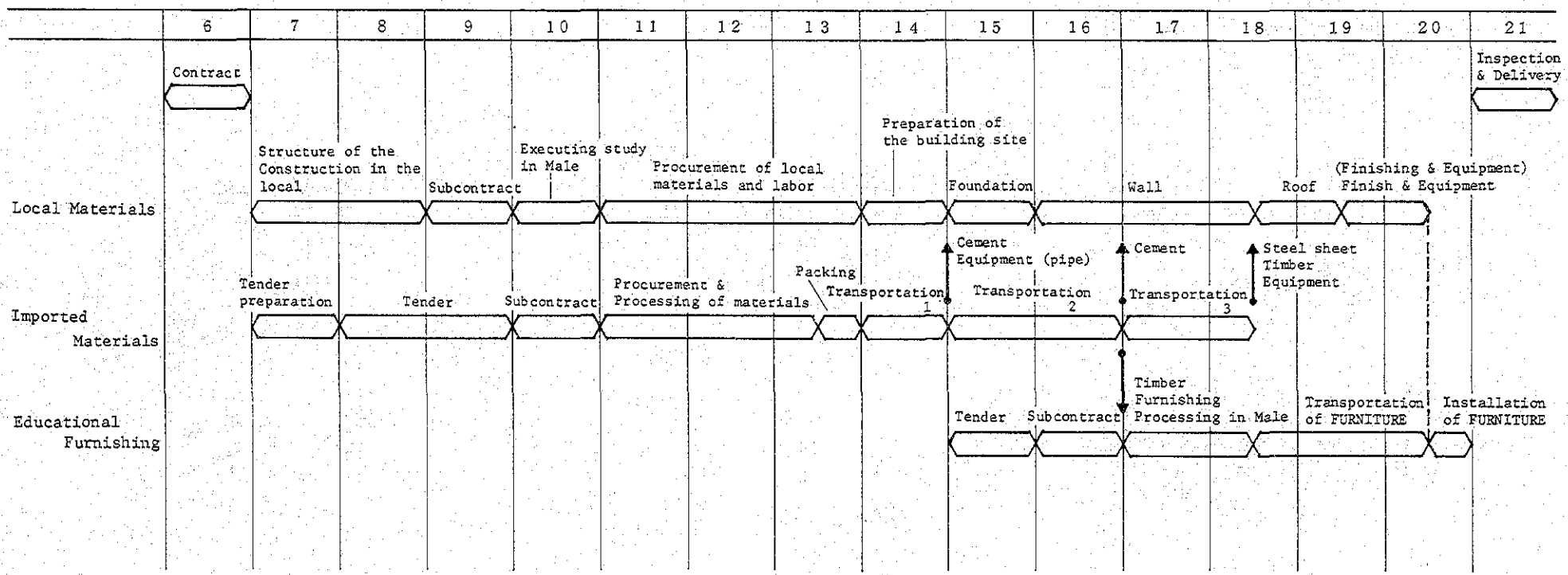


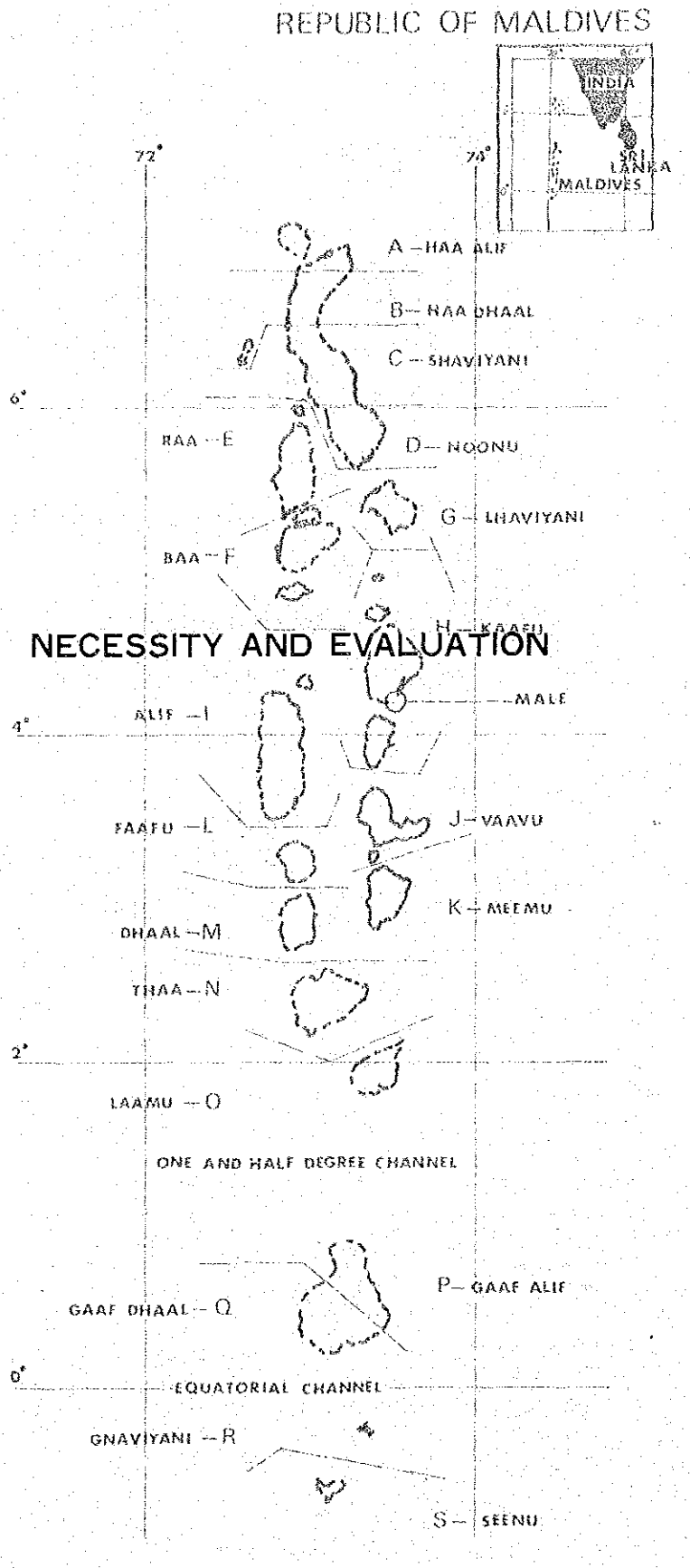
(LEGEND) indicate 1st years project

indicate 2nd years project

(Note) This schedule is linked to the calender, and it is Designing contracts will be have to complete by Jun. 1980, and Jul. 1981 in order to be completed within the fiscal year of 1980 and 1981 of Japanese Government.

3-10-7 Time Schedule of Construction





CHAPTER 4 NECESSITY AND EVALUATION

4-1 Necessity of the Project

Since the Republic of the Maldives is at a stage of development, both economically and socially, we cannot say that sufficient adjustments in school policy and educational facilities have been made. Up to now the nation's institutions for education had been centered in the nation's capital, Male, therefore, primary level education had not been promoted on the local atolls forming a great gap in education between Male and the local islads. We must say that the unique geo-graphical factor of the Maldives have contributed to this condition of education as well.

The people of the Maldives are very educational minded because of their religion, Islam. When such as educational-minded country like the Maldives starts to consider their future development, it becomes enthusiastically concerned in expanding and improving their education.

At present, the Government of the Maldives especially desires to spread its primary level education and conduct its community education to the local atolls and has decided achieving this the most important of its political measures dealing with education. In other words, the team thinks the Government of the Maldives wishes to spread out and equalize the education of its descendants who will carry on the nation's future development and expansion,

throughout the country. It is needless to say that this action will also promote the expansion of local areas. Upon carrying out the educational measures mentioned above as a part of the nation's 5-year development plan to be started in 1980, the Government of the Maldives has established construction plans for 57 public primary schools including the 19 schools to be financially aided by Japan. These plans allow variations in the construction of the schools and each states to evenly construct 1 school in each of the 19 atolls. The team thinks that this is quite reasonable for it will enable the central government's policy to spread to each of the 19 local governments.

Furthermore, the Government of the Maldives is planning a New Education System for improving the disunity of the present education system on the local islands. This is very meaningful, considering the effect this unified education system will have on the publishing of textbooks, the curriculum, the training of teachers, the production of educational radio programs and the prepratory education for studying abroad.

4-2 Evaluation

The size and content of the primary schools relevant to the actual condition of the nation were decided according to the investigations and discussions conducted between the survey team and its counterparts from the Maldives.

As requested by the Ministry of Education, the prefabricated method will be avoided and instead, the conventional method of construction of the Maldives (mentioned in Chapter III) will be used primarily considering the local ways of living, easy long-term maintenance, the technical ability of the local construction workers, and the financial situation of the construction.

Considering the climate and other various forces of nature the axis of the buildings will be laid from east to west to withstand the strong west wind and rain which occures during the monsoon season. Large truss space will also be constructed to inhibit the heat caused by the sunshine from reaching the classrooms.

We will employ many local measures for they suit the various local customs of the Maldives best (i.e. - their unique way of using restrooms and their dependance on rain for drinking water).

Up to now, whenever there was a construction on a local island, the local fishermen became construction workers only during the period of construction. Therefore, in reality, there are no technicians who are regularly engaged in construction on the local islands. Understanding the actual condition of the local construction, the team has proposed the following operating system and procedure for construction:

- The Japanese contractor who have contracted with the Government of the Maldives (which includes the Steering Committee made up Maldivian personnels including architects, as a substructure) will hire the local construction engineers, each to supervise the construction on 2 islands.
- Under the supervision of these engineers, the actual construction will be conducted by the local construction workers organized by the local leader of each respective island chosen as construction sites.

The operation procedure was made to match the actual situation of the Maldives considering the length of training which will be given to the construction workers on Male and the time necessary to secure the local materials and manpower. Regarding the advice from the local architects, the team believes that this system is the most suited for construction in the Maldives, which at the present is restricted in many ways.

It is needless therefore to say that cooperation of the

Government of the Maldives is necessary in carrying out this operating system and procedure for construction. The essential functions on the part of the Government of the Maldives should especially include the organizing of a Steering Committee consisting of the people from the Ministry of Education and architects, the lifting of importation tax on the construction materials, and the procurement of local construction materials and workers.

We also believe that the usage of a ship with a large transporting capacity is necessary to minimize the effect of weather on transportation. Direct transportation of materials from the supplying countries to the local construction sites as well as minimizing the number of trips are also important for an efficient transportation.

Throughout the construction, imported construction materials will be used more than local ones. As a result, the cost for importing the materials will take up a large part of the budget for construction materials and equipment strong inflation as well as other such economic chaos therefore will be avoided. Also, since the local fishermen will become the actual construction workers, social chaos arising from the lack of construction workers will also be avoided. Furthermore, the school construction program to be aided by Japan will not interfere with the grant aid programs of the Moslem countries such as Libya and the UN and all of its proposed construction sites

except for one are different from that of the UNICEF's Community School Construction Plan. This project, therefore will be fail-proof both financially and technically and will socially be very meaningful for the Republic of the Maldives and its society which is comparatively behind in education.