



REPORT
ON
PRIMARY-JUNIOR BASIC
SCHOOLS

(ENROLMENT 200 AND ABOVE)

PART I



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NATIONAL BUILDINGS ORGANISATION
(MINISTRY OF WORKS & HOUSING)
NEW DELHI

Composition of the "Panel on School Buildings" constituted by the Government of India, Ministry of Works, Housing & Supply (Now W & H) for laying down norms and standards to guide the designs of School Buildings.

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INTRODUCTION

The Panel on School Buildings took up earlier for study and standardisation "Higher Secondary School Buildings". The report of the Panel giving their recommendation on space requirements and space standards for planning higher secondary schools had been published by National Buildings Organisation and copies were sent to all the Directors of Education and other concerned authorities for adoption of the space standards recommended in the report.

It was, however, felt that mere adoption of the space standards would not make the school buildings functional and economical as there were other considerations also that go to make a school fit in the educational programme and create proper atmosphere for studies. Another publication "Planning Higher Secondary School" was, therefore, brought out by the National Buildings Organisation dealing with the three planning factors viz., Education, Environment and Economy and illustrating how the space standards recommended could be realised in terms of actual design. Copies of this publication are available free from the Director of the Organisation for the use of educationists, architects and engineers.

The Primary-Junior Basic Schools next taken up for study and standardization could be classified for the purpose of space standards as schools in urban and rural areas or on the basis of enrolment. The Panel thought that the space standards and space requirements of a school in urban or rural area would depend to a great extent on the size of the school *i.e.* whether it was one teacher school or two to three teacher school or above five teacher school and that there would not be much of a difference between a school in urban or rural areas as far as space requirements were concerned. Accordingly the Panel decided to classify Primary-Junior Basic Schools in the following groups for the purposes of space standards and planning norms:

- (a) Schools with enrolment of 200 and above;
- (b) Schools with enrolment above 100 but below 200; and
- (c) Schools with enrolment up to 100.

This part of the report deals with the planning norms and space standards of Primary-Junior Basic Schools with enrolment 200 and above.

The differences in the specification of materials and methods of construction for schools in urban and rural areas have not been discussed in the report as the type of construction would vary from region to region. On the basis of the norms and standards and other recommendations made in the report, local authorities that have intimate knowledge of the area can draw out proposals to suit the site, the climate and the availability of material and labour. Few suggestions on reduction of building cost are, however, included in the report under the head "Building Economy".

The Panel gratefully acknowledges the help taken from various publications of the Union Ministry of Education and the Planning Commission. The information supplied by the Headmasters of the various schools and the Directors of Education is also gratefully acknowledged. The Panel is particularly grateful to Shri S.N. Saraf, Director of Education

(iii)

Division, Planning Commission for his keen interest in the preparation of the report.

The following officers attended the meetings of the Panel by special invitation. The Panel is credited to them for their contribution.

1. Shri M.A. Hafcez, Joint Director, National Buildings Organisation, New Delhi.
2. Shri M. S. Mehta, Architect, Municipal Corporation of Delhi.
3. Shri T. N. Dhar, Senior Research Officer, Planning Commission.
4. Shri K. N. Valenkar, Deputy Housing Adviser, Ministry of Works & Housing, New Delhi.

The Panel also records its appreciation of the nice work done by Shri M. M. Mistry and Shri I. K. Bhalla, Assistant Directors of the National Buildings Organisation.

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1. PROGRAMME AND PHILOSOPHY

1.1 The elementary stage of education has been, for convenience sake, divided into two stages *viz.*, Primary and Middle (Junior Basic and Senior Basic). Regarding methods and objectives, it is now an accepted principle that the curriculum at the primary stage should be based on activities.

1.2 The function of the curriculum at the elementary stage is to induce the pupil in a general way to various significant departments of human knowledge and activity. This will naturally and obviously include languages and literature, social studies, natural sciences, mathematics, arts, music and crafts.

1.3 The teaching of a craft is an important subject at the elementary stage curriculum. Crafts have a tradition behind them which will be familiar to every child in the locality. They also possess a certain amount of emotional significance which is of considerable educational value. The Government have accepted the idea of re-orienting elementary education on the lines of basic education and have also accepted the proposal of converting all primary schools to basic schools. The first authoritative definition of basic education is given in the pamphlet "The Concept of Basic Education" of the Ministry of Education. (Annexure 'A').

1.4 There has also been a growing recognition on the part of educational planners, administrators and teachers that the responsibilities of a good school transcend the limited educational programmes usually provided within its four walls. They maintain that a good school cannot function in isolation but it has to develop a close link with the community in which it is located by relating its programme to community services, not so much in the interest of the community as for adding to its own effectiveness. The school and the community are related to each other in a cyclic relationship of mutual benefit. If the school serves the community through its educational programme, the community in its turn will help in enhancing the status of the school. A school which has adopted this concept of school community relations may be called a 'Community School'. It develops various educational programmes for its pupils in which the community plays a large supporting role, and also a number of programmes for the community in which the activities of the school lend valuable assistance.

1.5 The concept of community school is not foreign as the old traditional schools were entirely a community enterprise. The indigenous schools gradually died out either as a result of competition or of neglect and the new schools became a cell confined within its four walls and lost its earlier nourishing contact with the community. Due to this unhappy change, the community also lost its interest in the school and looked upon it as an alien agency.

1.6 The Ministry of Education has advocated the idea of community schools which is essentially educational in character but which inevitably results in a programme of mutual service and benefit.

1.7 The philosophy of primary education and the educational programme is in a transition stage, gradually being geared to fit in the development in

other spheres which is closely inter-related and dependent on the educational advancement of the people.

1.8 The planning of elementary schools should, therefore, be conceived to serve the concept of:

- (a) Basic Education; and
- (b) Community Services.

2. MAGNITUDE OF THE PROBLEM

2.1 In the third plan report, the following observations have been made regarding the targets of elementary education.

“The constitution envisaged the provision of free universal and compulsory education for children up to the age of 14 years. In view of the magnitude of the task, it was agreed early in 2nd Plan that as a first step facilities should be created for the education of all children in the age group 6-11 (Primary-Junior Basic). This is one of the central aim of the third Plan to be followed by extension of education for the entire age group (11-14) during the fourth and fifth Plans.”

2.2 In the first three Plans considerable effort was made in providing educational facilities to children of the age group 6-11. In the fourth Plan this task is proposed to be carried still further. In the table below the position in regard to the availability of educational facilities for children of the age group 6-11 and the targets proposed for the fourth Plan are indicated:

TABLE A : PUPILS AND CLASSES I-V

| Year | Enrolment in Classes I-V (lakhs) | | | Additional Enrolment | %age of Population in the Age Group 6-11 | | |
|-----------------|----------------------------------|-------|-------|----------------------|--|-------|-------|
| | Boys | Girls | Total | | Boys | Girls | Total |
| 1950-51 | 137.7 | 53.8 | 191.5 | — | 59.8 | 24.6 | 42.6 |
| 1951-52 | 141.8 | 56.3 | 198.1 | 6.6 | | | |
| 1952-53 | 145.0 | 38.5 | 203.5 | 5.4 | | | |
| 1953-54 | 153.5 | 63.2 | 216.7 | 13.2 | | | |
| 1954-55 | 163.5 | 68.7 | 232.2 | 15.5 | | | |
| <i>1st Plan</i> | | | | | | | |
| 1955-56 | 175.3 | 76.4 | 251.7 | 19.5 | 70.3 | 32.4 | 52.9 |
| 1956-57 | 184.5 | 82.6 | 267.1 | 15.4 | 73.7 | 34.5 | 54.5 |
| 1957-58 | 194.0 | 87.7 | 281.7 | 14.6 | 76.1 | 36.2 | 56.7 |
| 1958-59 | 208.3 | 96.2 | 304.5 | 22.8 | | | |
| 1959-60 | 221.3 | 103.2 | 324.5 | 20.0 | | | |
| <i>2nd Plan</i> | | | | | | | |
| 1960-61 | 235.7 | 114.0 | 349.7 | 18.9 | 80.5 | 40.4 | 61.6 |
| 1961-62 | 258.8 | 130.8 | 389.6 | 39.9 | | | |
| 1962-63* | 276.6 | 144.1 | 420.7 | 31.1 | | | |
| 1963-64† | 391.5 | 160.4 | 451.9 | 31.2 | | | |
| 1964-65 | | | | | | | |
| <i>3rd Plan</i> | | | | | | | |
| 1965-66 | 321.0 | 198.7 | 519.7 | | 96.2 | 63.3 | 80.2 |
| <i>4th Plan</i> | | | | | | | |
| 1970-71 | | | 720.0 | | | | 98.1 |

*Anticipated

†Target

2.3 According to revised estimates the enrolment in classes I-V in 1965-66 is likely to be 5.20 crores. This would constitute about 80% of the children in the age group 6-11. The working Group on General Education, which has been set up to formulate the fourth Five Year Plan has recommended that in the course of the fourth Five Year Plan two crore additional children may be brought to school. This would, in other words, mean that roughly every year nearly 40 lakh additional children would need to be enrolled in classes I-V in the five years of the fourth Five Year Plan.

2.4 In 1961 the total enrolment in classes I-V was 3.50 crores. Of this about 2.66 crores or 75% was in primary schools while the rest was enrolled in primary departments of middle, high and higher secondary schools. On an average the enrolment in a primary school in 1961 was about 80. It is likely that this average enrolment per school would increase to roughly about 100 in 1966. In 1971 the total enrolment visualised in classes I-V is 7.20 crores. Of this roughly 75% or 5.4 lakh students would have to be catered to by the primary schools while the rest would be enrolled in the primary departments of middle, high and higher secondary schools. If the average enrolment of 100 per primary school is accepted as a rough basis, the total number of additional primary schools that might need to be opened in the course of the fourth Five Year Plan would be about a lakh as against about 72 000 opened during the 3rd Plan. These figures indicate the magnitude of the task in respect of putting up of primary school buildings which would need to be faced in the fourth Five Year Plan.

3. FINANCIAL ALLOCATION

3.1 In the third Plan higher provision had been made for the programme of elementary education. The following table indicates the financial provisions that have been made for elementary education programme in the 1st, 2nd and 3rd Plan:

TABLE B : FINANCIAL PROVISIONS FOR EDUCATION

| | Provision for General Education Programmes | | 3 as percentage of 2 |
|------------------|--|--------------------------------------|----------------------|
| | Total | Elementary Education (Rs. in crores) | |
| 1st Plan | 133.0 | 83.0 | 63.9 |
| 2nd Plan | 208.0 | 87.0 | 41.9 |
| 3rd Plan | 418.0 | 209.0 | 50.0 |

3.2 It will be seen that in the 3rd Five Year Plan the provision for elementary education programmes was about 2½ times the provision for these programmes in the 2nd Plan. It may, however, be stated in this connection that the provision of Rs 209 crores for elementary education includes provisions for the opening and strengthening of middle schools also. Of the total direct expenditure incurred on primary education most of the expenditure, nearly 89%, is on account of the salaries of teachers. In a way, very meagre amounts are available for such items, as the construction of school buildings.

3.3 The dimension of the problem and meagre financial resources available demand that maximum utilisation of the funds available for the construction of school buildings and purchase of equipment be made so as to derive optimum benefit. In effecting economies, however, only such approaches should be followed that do not interfere with the educational programme or in other words the whole problem is to be approached with economical and functional considerations in mind to strike a balance between what is ideal and what is feasible.

4. RETROSPECT

4.1 Information on the educational facilities available in primary-junior basic schools in all the States and Centrally administered areas was collected in 1962 through a questionnaire, copies of which were sent to the Directors of Education with the request to forward the same to Headmasters of such of the schools which are housed in buildings specially constructed for the purpose. Excepting two States and few Centrally administered areas, the questionnaire duly filled in were received from all the States.

4.2 The number of replies received from each State and analysed are as under:

| | |
|--------------------------|-----|
| Andhra Pradesh | 468 |
| Madhya Pradesh | 31 |
| Uttar Pradesh | 17 |
| Himachal Pradesh | 25 |
| Rajasthan | 221 |
| Bengal | 7 |
| Bihar | 112 |
| Assam | 13 |
| Madras | 34 |
| Kerala | 49 |
| Maharashtra | 7 |
| Gujarat | 4 |
| Orissa | 18 |
| Mysore | 2 |

(The above figures also indicate the total number of questionnaires received except Madhya Pradesh which had sent about 1 400 questionnaires when the analysis work was nearly completed).

4.3 It would be seen that the geographical distribution of sample is not evenly balanced and the influence of Andhra Pradesh, Rajasthan and Bihar is predominant. This imbalance could not be helped due to poor response in time from other States. However, while analysing the data it was seen that there were not striking differences in the existing education facilities in different States and that the situation was more or less similar. Therefore, the sample could be taken as representing general conditions in India. A copy of the questionnaire used for the survey is given in Annexure 'B'.

4.4 Analysis of the data received shows that:

- (a) more than 50% of the existing schools are either badly planned or constructed, which effect the smooth working of educational programme;
- (b) 45 % of schools do not have adequate teaching space for the pupils on role;

- (c) 70 % of the schools have optimum enrolment; and
- (d) In 86 % of the schools either there is complete absence of lavatory facilities or these are inadequate.

4.5 The above figures are based on the judgement of headmaster and can be taken as a conservative estimate. If viewed with standards of the more advanced countries the picture would appear more gloomy. For classification of schools surveyed according to plot area, enrolment, floor areas in class per student, seating arrangement, games and lavatory facilities etc, a reference may be made to tables in Annexure 'C'.

5. PROSPECT

5.1 Considering the present position *vis-a-vis* our future requirements of school buildings and the resources available, it is evident that sacrifice of certain amenities will have to be made in the design of new school buildings to derive maximum educational value out of the funds available. It is universally agreed that a good school building is the integral part of the process of education but all the same provision of basic facilities can as well help the education process provided good teachers and equipment are available. Additional accommodation and facilities could be provided after the targets set out for the primary education have been achieved.

5.2 With the above considerations in view, the requirements of primary-junior basic schools are discussed in the following paragraph to suit the curriculum of studies.

6. SCHEDULE OF ACCOMMODATION

6.1 Normally the following accommodation would be required to suit the education programme and the curriculum of studies:

- (a) Class rooms (for learning of languages, social studies, mathematics and general science);
- (b) Multipurpose room (for drawing, painting, music and dancing);
- (c) Craft room (for spinning, weaving, card-board modelling and other crafts);
- (d) Library-cum-museum; and
- (e) Hall (for school assembly, physical education, mid-day meals, etc.).

6.2 Considering the number of schools required and the funds available, it would be evident that all the above accommodation cannot be provided if the targets set out in the 4th plan are to be achieved. The solution would be somewhere between the school under a tree/nucleus school and a school providing all the desirable teaching accommodation.

6.3 In addition to the paucity of funds available for construction work, availability of staff and equipment is another factor effecting the extent and distribution of teaching space. In majority of cases it would not be possible to provide more than one teacher per class for some time to come. Consequently, if a teacher goes on leave one of the teacher will have to supervise the studies of two classes. This is quite a frequent occurrence.

6.4 In view of the above limitations, one teaching space per class appears to be only the indoor teaching area that can be provided at present. In order to give necessary flexibility to the Headmasters to organise the daily programme of work, one of the class rooms should be large enough to

accommodate the children of two classes when a teacher is on leave or for joint study of two sections of the same class or for such activities that need a floor area greater than that available in a class room. Such a teaching space for ease of reference would be termed as "multipurpose class room."

6.5 Accordingly the following teaching accommodation for the schools of different sizes is recommended:

| Size | Class Rooms | Multi-purpose Class Rooms |
|-------------------------------|--------------------------|----------------------------|
| 1 Section School (5 classes) | 4 | 1 |
| 2 Section School (10 classes) | 8 | 2 |
| More than 2 Section School | One room for every class | One for every five classes |

6.6 In addition to the teaching space recommended above space is also required for the Headmaster, Storage of teaching aids, Play-field equipment, etc, and for the student and the staff conveniences. Therefore, the space requirements of a primary-Junior Basic School would be as under:

- (a) Class rooms (General purpose teaching area),
- (b) Multipurpose class room (General purpose and special teaching area),
- (c) Headmaster's Office,
- (d) Storage,
- (e) Lavatory block, and
- (f) Kitchen (where mid-day meals are also provided).

6.7 Space requirements, space standard and design considerations of the above activity areas are discussed in the following paragraph.

7. CLASS ROOM

7.1 Class room is the most important teaching space as the children during their stay in school would be spending maximum time in this area. It is here that a child will be induced to various branches of human learning and his interest in learning will be created. This area should, therefore, be as cheerful, environmentally comfortable and inviting as possible.

7.2 Number of Students in Each Class/Section

(i) The most important and immediate thing at the present juncture is to get all children into school. Number of children in each class must, therefore, be optimum that a teacher can handle and give individual attention to each child. The present teaching pupil ratio in India is 35 pupil per teacher.

(ii) In the random sample survey conducted by this Organisation the number of students per class were 30 or less than 30 in 44.3% of the schools (Table VII) and between 31 to 40 students per class in 24.1% of the schools. In other words as many as 31.6% of the schools had more than 40 students per class.

(iii) The Panel on education set up by the Planning Commission recommended the raising of teacher pupil ratio to 1:40 without delay and if

necessary to 1:50. The Ministry of Education has also recommended to the State Governments to raise this ratio to 1:40.

(iv) Some educationists believe that a trained teacher with good teaching equipment can do a better job with 50 students than an untrained teacher with 30 students.

(v) Considering the shortage of trained teachers, equipment and the urgency to bring all children in age group 6-11 in school, it is recommended that all class rooms should be planned to accommodate 40 students.

7.3 Size of Class Room

(i) The size of class room is the next important consideration in planning. The activity type programme requires a much larger area/child as compared to teaching that is formal and academic. Proper correlation of enclosed and sheltered or open space seems to be the only answer to the present problem. Every increase in the covered space adds to cost. As such, it is essential to keep it to the minimum but consistent with functional requirements.

(ii) The space allotment/child in class rooms in the school studied was as under (Table IX).

Less than 0.557 sq. m. (6 sq. ft.) per student in 30.2% of schools.

Less than 0.743 sq. m. (8 sq. ft.) per student in 47.1% of schools.

Less than 0.929 sq. m. (10 sq. ft.) per student in 60.3% of schools.

(iii) Regulations on the subject vary from 0.56 sq. m. (6 sq. ft.) to 0.93 sq. m. (10 sq. ft.)/child in the country and 0.75 to 2.7 sq. m. (8 to 30 sq. ft.) in foreign countries.

(iv) Area/child in class would to a great extent depend on the type of furniture and facilities to be provided in each class. Children squatting on durries need less space in comparison to children using chairs and tables. Currently squatting on the floor is a common practice in majority of the schools (Table X). All the same provision of a table and chair for each child is desirable from various points, such as posture, ease of writing, physical fatigue, etc. However if due to lack of funds it is not possible to provide table and a chair at least a table for use while in squatting position for each child is considered necessary.

(v) Considering the seating arrangement, associated circulation and teaching space an area of 0.93 sq. m. (10 sq. ft.)/child in class is recommended. Minimum area of class room would, therefore, be 37 sq. m. (400 sq. ft.) Fig. I shows the typical arrangement of class room furniture.

7.4 Shape and Detail of Class Room

A class room is not only a room of required floor area. It should be of size that affords optimum utilisation of space, is constructionally economical and detailed to help the learning process. Environmental factors (temperature, light, sound) and judicious placing of teaching aid effect the efficiency of learning. Among teaching aid the teacher's wall is the most important. Correct planning of chalk board, task board, wall cabinets, book shelves, racks, help the teacher in making learning process interesting. Fig. II shows typical arrangement of furniture and fittings of teacher's wall.

8. MULTIPURPOSE CLASS ROOM

8.1 The design and details of Multipurpose Class Room should reflect the multipurpose character of this teaching space. Although in a one section

and two section schools this room would normally be used as a general purpose class room the details should be such that it could also serve as a museum for general science and display of crafts, etc. A liberal provision of display boards, tack boards on the walls and cupboards and work bench along the wall would be necessary to enhance the educational value of this teaching space. The furniture should be movable and light which could be stacked along a wall to accommodate students of two classes (80 Nos.) and to have variety of arrangement for different activities like music, drawing, craft, etc.

8.2 In recommending the size of the multipurpose rooms, it is visualized that the formal teaching will not be imparted in this room to a group of 80 students necessitating benches and chairs for all of them and that in such eventualities when a single teacher is to supervise the studies of two classes normal furniture of a class room would be stacked and that the students will squat on the floor. A floor area of 55.7 sq. m. (600 sq. ft.) is considered necessary to meet these requirements.

9. HEADMASTER'S OFFICE

9.1 Normally in a Junior Basic/Primary school the number of teachers would be equal to the number of classes and that no leave reserve/extra hand would be available to man the non-teaching activities. Provision of separate rooms for ancillary activities is therefore, not considered necessary. In view of this it is recommended that a unified space should be provided for:

- (a) Headmaster's office (to plan the operation of the school and to carry out the routine administration),
- (b) Storage for office records,
- (c) Staff common room, and
- (d) First aid room.

9.2 An area of 22 sq. m. (240 sq. ft.) is considered necessary for the purpose. For more than two section school, the area may be increased to 33 sq. m. (360 sq. ft.) to provide a partly screened space for the office clerk and records, etc.

10. STORAGE

10.1 The activity programme creates a serious storage problem. There is much greater variety of items to be stored in all kinds of instructional areas so that teaching aids can be conserved or laid temporarily for subsequent use.

10.2 One of the most common complaint registered by the headmasters of schools was the absence or inadequacy of storage space. Out of the schools surveyed, storage space was not provided in 72.7% of schools and in 13.8% of schools the storage space provided was in the opinion of the Headmasters, inadequate (Table XIV). In other words 86.5% schools were handicapped due to shortage or lack of storage accommodation.

10.3 In addition to the storage space required in class rooms and other teaching areas, a separate room is also necessary for storage of sports goods, furniture and other miscellaneous items.

10.4 Adequate built in storage space in the shape of cupboards, open shelves, etc, should be provided in class rooms, etc. The space under the window sills should also be utilised as far as possible. In addition, a general store room of floor area 11 sq. m. (120 sq. ft.) with three tiers of shelves along at least two walls should be provided, as absolute minimum.

11. SANITARY FACILITIES

11.1 The formation of good health habits is an essential objective of education. It is, therefore, imperative to provide proper physical facilities in the schools so that pupils have all the opportunities to put theory into practice and form habits that may become fixed.

11.2 Unfortunately this important requirement is generally neglected. According to the results of sample survey, in 65.38% of the schools sanitary facilities are not provided (Table XII). Out of 34.62% of schools in which these were provided, the headmaster of 20.62% schools considered the provisions inadequate. These figures emphasize the need of greater attention on this essential but neglected items.

11.3 Standards of sanitary facilities recommended by different authorities are given in the following table:

Director of Public Instructions, Andhra:

| | | |
|-------------|---------|------------------|
| W.C. | .. .. . | 8 for 500 boys |
| Wash-basins | .. .. . | 10 for 500 girls |
| Urinals | .. .. . | 6 for 100 boys |

Bombay Municipal Corporation:

| | | |
|---------|---------|--------------------|
| W.C. | .. .. . | 4 for 300 students |
| Urinals | .. .. . | 4 for 300 students |

Education Directorate, Delhi:

| | | |
|---------|---------|-------------------------|
| W.C. | .. .. . | 1 for every 50 students |
| Urinals | .. .. . | 1 for every 50 students |

Madras Education Department:

| | | |
|---------|---------|------------------------------------|
| W.C. | .. .. . | 8 for 500 boys 20 for 500 girls |
| Urinals | .. .. . | 6 for every 100 students |

Town Planning Organisation, Ministry of Health:

| | | |
|-------------|---------|--|
| W.C. | | 4 for the first 30 students and 1 additional for the next upto 300 and another 1 additional for 30 after 300 students |
| Urinals | .. .. . |  |
| Wash basins | .. .. . |  |

Director of Education, U.P.:

| | | |
|---------|---------|---|
| W.C. | | 4 for the first 400 students at the rate of 2% of the enrolment. |
| Urinals | | |

Indian Standards Institution:

| | | |
|------|---------|--|
| W.C. | | 1 for every 40 boys and 1 for every 25 girls or part thereof |
|------|---------|--|

| | |
|---------------------------------|---|
| Wash basin | 1 for 40 students or part thereof of each sex |
| Urinals | 1 per 20 boys or part thereof |
| Drinking water fountain | 1 per 50 students or part thereof |

11.4 It should be the endeavour to provide fittings as per I.S. standards. Minimum provision should, however, be made on the following scale:

| | |
|--|---|
| I. Latrines or W.C. | 1 for every 100 students or part thereof |
| II. Urinal | 1 for 25 boys or part thereof 1 for every 20 girls or part thereof |
| III. Water taps with troughs or drinking water fountains | 1 for every 50 students or part thereof |

12. SCHOOL KITCHEN

12.1 A kitchen would be necessary in schools where mid-day meals are provided. The space requirements of a kitchen would to a great extent depend on the menu and the extent of space required for storage of provisions. However, a minimum floor area of 13 sq. m. (140 sq. ft.) would be needed for kitchen-cum-store. To increase storage capacity minimum three tiers of shelves should be provided along at least two walls. The basic principles of planning a domestic kitchen would apply in this case also needing a careful consideration of all the steps involved in the preparation of a meal. Platform chullah should be provided as this is hygienic. Arrangement for drinking water and water taps should also be made here.

12.2 Normally, a dining space is also necessary for formation of desirable habits of cleanliness and the development of proper attitude towards social hygiene. But in view of the financial stringency the provision of a dining space is not considered as essential. A space provided near the kitchen and properly treated with trees, shrubs, etc, to provide shade can as well serve the purpose.

13. PLAY SPACE

13.1 In the present method of teaching more emphasis is placed on the allround development of each child instead of emphasising the academic aspect only. Habits, attitudes and character development cannot be influenced much in the formal class room environment but are acquired best and most effectively through informal out-door activities and games. Many of the essential lessons can best be learned through play, such as group performance, rhythmic activities, etc. Careful planning of playgrounds, therefore, is essential to meet the education programme. In many cases, however, this aspect is either neglected or relegated. Out of the sample in 42.7% of the schools (Table XV) no playing facilities were provided. Lack or absence of play space is a major handicap and adversely affects the working of a school plan.

13.2 The planning for the school building and the playground should be taken up together to co-ordinate the needs of study and play. The size of the play space will be determined by the size of the school, the playing equipment to be provided and the extent to which it is to be used by the community.

13.3 Playing equipment particularly for students in class I to III would include:

- (i) Climbing apparatus.
- (ii) Merry go round.
- (iii) Swings.
- (iv) Slides.
- (v) Toppers.
- (vi) Travelling ring.
- (vii) Wood dodger.

The students of class IV and V would take to cricket and football.

13.4 The play space can, therefore, be divided as under:

- (i) Space to accommodate playing equipment specially for age group 5-8.
- (ii) Space for games, collective physical exercise, etc.

13.5 An area of 0.6 to 0.8 hectares (1½-2 acres) would be desirable for playing field and a play area.

14. RESIDENTIAL ACCOMMODATION

(i) The necessity of teachers' houses needs no emphasis. Provision of teacher houses would:

- (a) enable them to look after the school and the welfare of children throughout the day instead of the usual five hours;
- (b) give them opportunity to develop the school into a community centre;
- (c) raise their status in society; and
- (d) solve housing problem for them.

(ii) According to survey in only 3.57% (Table XVII) of schools teachers' quarters were provided. This is an item which more than 60% of the headmasters have considered as essential.

(iii) At the various seminars organised by the team set up at the Centre by the Ministry of Education, it was suggested that a teacher's house should have at least two rooms of not less than 120 sq. ft. each with a kitchen, sanitary facilities, verandah and some open space. The recommendations of the said team on the subject were—"though it was thought essential to provide quarters for all the members of the staff yet it was considered desirable, taking into consideration the prevailing circumstances to provide such accommodation for 50% of the staff for the time being, preference being given to women teachers and teachers of basic schools".

(iv) The above recommendation merits full consideration of the concerned authorities. However to decrease the expenditure on non-teaching areas, a minimum of one quarter for the headmaster and one for class IV staff should be provided in the compound but the local authorities should be approached for the requisition of suitable houses in the locality to ameliorate the difficulties of the teaching staff.

15. SIZE OF SCHOOL

15.1 In determining the size of school, there are two important considerations:

(a) A child has not to walk more than 5 to 10 minutes to reach the school. (0.4 to 0.6 km—1/4 to 3/8 mile).

(b) The school caters for the total needs of a neighbourhood that is the smallest planning unit of a township to create neighbourliness and stimulate community life. From many planning considerations it is usual to keep the population of neighbourhood to 3 to 4 thousand persons.

15.2 The relationship between population and the children can be assumed as under to work out expected enrolment in next two decades:

| School | Age | Group Class | Projected Fig. for 1980 per 1 000 Population | % for Expected Enrolment | Adjusted Index/1 000 Population |
|---------|-----------------|-------------|--|--------------------------|---------------------------------|
| Nursery | 3-4 5-6 | — | 40 | 90 | 36 |
| Primary | 5-6 to 10-11 | 1-5 | 185 | 95 | 119 |

The above figures are based on the accepted standards now prevailing in most parts of the country.

16. SIZE OF SITE

16.1 Analysis of data shows (Table II) that 76.4% of schools are housed on plots with areas up to 1 acre and that only 17.1% of schools have plot areas more than 1½ acres. It would appear from the above figures that most of the existing school sites are too small. Modern schools require sites larger than what were considered necessary a generation ago.

16.2 The team set up at the Centre by the Ministry of Education had recommended a minimum site of two acres plus an additional acre for each hundred pupil of predicted ultimate maximum enrolment or part thereof both for urban and rural basic schools. The Town Planning Organisation, Ministry of Health have recommended a site of 1.5 to 2.5 acres for primary schools of 600 enrolment in the master plan for Delhi. Committee on Plan Projects (Planning Commission) in their report on Industrial Townships have recommended a site of 3 acres for an ultimate enrolment of 600 pupils.

16.3 The school site must be large enough to provide for all fore-seeable future needs, which would include addition to the buildings in the shape of class room, other teaching areas, enlarging physical education and games facilities and construction of staff quarters.

16.4 Experience has shown that sites of inadequate size have been one of the primary causes of obsolescence of school buildings and curtailment of education programme. As ultimate site requirements have to be met from initial site acquisition, any economy on this account is likely to handicap expansion or improvement schemes. The original cost of a site may seem rather high and cause much concern but it should be kept in mind that this single investment is the least expensive part of the entire project. In view of all this, it is recommended that an area of .6 to 1.2 hectares (1½ to 3 acres) should be aimed at.

16.5 In selecting the site the following points should be considered.

(i) **Accessibility:** It should be within easy walking distance (.4 to .6 km) from the centre of residential unit and should be accessible without crossing any major traffic routes.

(ii) **Dimensions:** The site should be of adequate size (0.6 to 1½ hectares) and as far as possible be rectangular in shape without any nooks and corners.

(iii) **Topography :** Ideally the building is best located on relatively high ground (convex surface) in order to take advantage of the natural drainage. The outlook from the site should be pleasing. Location near other community buildings and/or opposite a park, provided it is not noisy, is advantageous.

(iv) **Nuisance :** The site chosen should be free from undue noise such as that emanating from rail freight yard, main traffic arteries, cinemas, etc.

(v) **Landscaping :** The psychological effect of attractive grounds needs no emphasis. The site should, therefore, be such that can support good-vegetation to make the surroundings pleasant.

(vi) **Cost :** The initial cost of site is naturally important but the total cost including the expenses required to make the site suitable for the school must be considered. Often a site received as a donation may in the final analysis be costly than another apparently high price site. Foundations, sub soil conditions, grading, landscaping, proximity of utilities and future maintenance all have a definite bearing on the final cost of the project and so should be carefully examined.

16.6 It will be rarely possible to get a site to suit all the above requirements. So a site best among the sites available should be selected.

17. FURNITURE AND FIXTURES

17.1 In the absence of authoritative standards of height of India children, European standards are generally followed to work out the dimensions of furniture and equipment. Such an approach has certain obvious drawbacks and handicaps.

17.2 Reorganising the need, the Indian Council of Medical Research planned investigations on a country-wide basis, to establish the badly needed standards of reference on growth and development of Indian children. According to the consolidated tables included in the interim report on the subject brought out by the Indian Council of Medical Research, graphs were prepared to serve as a guide in working out the heights of furniture, fittings, etc and are included in the report as figures III and IV.

17.3 From practical considerations, however, it may not be possible to consider various heights to work out the dimensions of furniture and heights of fixtures, equipment, etc. Till such time further studies are carried out on the subject and economics worked out, considerations of two standards heights should suffice. In view of this it is recommended that 105 cms and 19 cms might be taken for the purpose of calculating height of furniture, fixtures and equipment for Grade I to II and III to V respectively.

17.4 Physical comfort and economy in material and labour are the main considerations in the design of furniture. There is need for detailed guide on the design of school furniture so that it is light, durable and can give variety of arrangements. It would be in the fitness of things if a Central Agency like Central Building Research Institute or National Buildings Organisation takes up the subject for study and standardization.

18. PHYSICAL NEEDS

18.1 Consideration of physical and mental welfare of the children should be the primary reason and one of the objectives of design. Physical needs require the building to have:

- (a) Safe structure (steps, location of doors, windows, design of stairs, etc).
- (b) Proper lighting (glare free and even distribution of natural light).
- (c) Good hearing conditions (low back ground noise, proper distribution and intensity of desired sound).
- (d) Proper sanitation (well thought out specifications and construction detail).
- (e) Thermal comfort (Plan with the climate to take advantage of the climatic factors mainly sun and wind).
- (f) Emotional balance (colour scheme, landscape, pleasant view).

19. SPECIFICATION OF FINISH

19.1 The standards of surface finish are as important as architectural and structural planning, as these materially affect the cost of construction. Therefore, while drawing out the specification of finish, the cost and the functional requirements should be very carefully weighed. Generally the surface finish should be such that it is easy to clean and maintain and capable of withstanding rough usage.

19.2 How tidy a building and its environments are, would depend to a large extent on the initiative and personality of the teachers and the Principal, but the Architect can definitely help them to keep the structure clean by well-thought-of specifications. Durable, washable flooring, smooth wall finishing and oil painted wood work would meet the requirements. All rooms should be internally white washed, including ceiling, to increase the reflection and inter-reflection of light, unless colour washing of certain areas is necessary in the interest of aesthetics.

20. COST

20.1 The cost is the last but the most important consideration. The funds are limited and the need for the schools is pressing. It is, therefore, absolutely necessary to adopt strict austerity measures in the construction of new school buildings. With these considerations in view, cost studies of a few designs were made to fix a ceiling on cost.

20.2 Ceiling on cost given below and the norms suggested earlier are the two limiting factors within which the local authorities would be free to work out designs, specifications of materials and methods of construction and type of structure, to suit the availability of materials and labour, the site and the climatic conditions, provided the annual maintenance, cost and the special repairs do not exceed $1\frac{1}{2}\%$ and $\frac{3}{4}\%$ respectively of the capital cost of buildings and that the structure is safe and according to the recommendations made in the report. 10% excess on the ceiling cost recommended below would be permissible for foundation in difficult soils.

| Description | Cost per Student | |
|------------------------------|------------------|----------------|
| | In urban areas | In rural areas |
| One-section school | Rs. 250 | Rs. 146 |
| Two-section school | 238 | 138 |
| Three-section school | 228 | 133 |

- Notes:**
- (i) The above norms on cost include the cost of external and internal services but exclude the cost of:
 - (a) The land and its development;
 - (b) The equipment and the furniture;
 - (c) Electrification in case of schools in rural areas; and
 - (d) Cost of fans in case of schools in urban areas.
 - (ii) Norms on cost in case of schools in urban areas are based on the Delhi CPWD rates as on March, 1962 with 100 as index. Proportionate increase for various stations should be made as given in the cost index (Annexure 'E') and as revised from time to time by the Central P.W.D. The cost indices of places not covered in the Annexure 'E' should be worked out on the basis of cost of labour and material as prevalent in the locality in accordance with the method given in Annexure 'F'.
 - (iii) Norms on cost in case of schools in rural areas are based on the analysis of rates of material and labour (prevalent during 1962) collected by the National Buildings Organisation and the Rural Housing Wings in rural areas in different parts of the country. Proportionate increase for rise in cost of labour and material as compared to the rate in 1962 should be made.
 - (iv) Break up of plinth area rates adopted in calculating norms are given in Annexures 'G' and 'H' for schools in urban and rural areas respectively.

21. BUILDING ECONOMY

21.1 Economy is a great virtue and all efforts should be made to achieve maximum utility out of minimum expenditure. In building schools, the economy cannot, however, be regarded as an independent problem. It is concerned just as much with the pupil education and the environment as with the structure. The aim of school planning should, therefore, be to achieve a trilateral balance between the three E's of school planning, Education-Environment-Economy.

21.2 The economy of structure comes about through very careful engineering. A few methods to cut down the cost of construction are:

- (i) choose site carefully (simple foundations, easy drainage, good top soil to support vegetation).
- (ii) Design simple structure (minimum span schedule, nooks and corners and perimeter area and having repetitive structural units).

- (iii) Make full utilisation of local material and have the type of construction that local labour can carry out.
- (iv) Make use of trees shrubs as activity barrier for shade to provide supplementary instructional area and to serve as screens and wind breaks.

21.3 Detailed analysis of cost of various structural components is necessary to decide the most economical size and shape of a unit area. Cost studies of a class room with 6 ft. wide verandah were done with three arrangements. In arrangement (a) the class room was taken 18'-1½" × 22' with its longer wall parallel to verandah. In arrangement (b) the same class room was put with a shorter wall parallel to verandah and in arrangement (c) class room 20' × 20' floor area was taken with verandah running on one side. The analysis of cost revealed that arrangements (b) and (c) were 3.6 and 2.9 per cent economical respectively as compared to arrangement (a). Although the saving in a school of five class rooms would be about Rs 590 between arrangement (a) and (c), when considered with reference to the number of schools required in each state (12 000 to 15 000) this modest saving would amount to Rs 590 000 in a thousand schools.

21.4 Cost studies done in other countries reveal that:

- (a) in case of constant height building, per sq. ft. cost decreases with increase in span. As the span increases and the height remains constant, the additional roof cost is not sufficient to offset the lower resultant cost per sq. ft. of total building area.
- (b) A class room in two storey structure is 4.3 per cent costlier than a similar class room with one storey structure. In a two storey structure, although the cost per sq. ft. of plinth area is about 5% less than a single storey structure the cost per class room is more. In school buildings what actually matters is the cost per class room or teaching space and not the cost per sq. ft. of plinth area. The above study is based on the cost of structure alone and does not take into consideration land values. In working out an economical solution, the cost of the land and structure should both be balanced.
- (c) Design and detail of every component part also affect cost. A 50% openable glazing is about 35% economical over a fully openable glazing of equivalent area and the same glazed area if divided into smaller fully openable units would be about 40% costly.

21.5 Reduction in non-productive areas, such as verandahs, corridors, etc, directly affect the cost in proportion to the area reduced. A reduction of verandah width from 6 ft. to 5 ft. (if consistent with the amount of traffic) would give a saving of about 3.9 per cent in plinth area and in cost per class room. Design efficiency depends on the proportion of floor area under productive use to total area. In a school building teaching areas are the main productive areas having direct educational value and areas under administration, sanitary, storage, circulation are subsidiary areas. The subsidiary areas should not occupy more than 40% of the total area thus giving a design efficiency of 60%. The aim should, however, be to achieve higher efficiency.

21.6 Specifications of materials and finish are as important as structural and architectural planning. These should be realistic and should be commensurate

with the functions in view. Inadequate attention paid to the drawing up of specifications add substantially to the cost. It will be, for example, incorrect to specify same quality of bricks for the entire lot of construction or cement mortar even for 9" internal walls in case of single storey structure or same type of roofing for class rooms and crafts or connecting passages. Cheaper but durable materials consistent with functional utility should form the basis of drawing of specifications.

21.7 All construction components need equal consideration, otherwise saving under one head can more than offset expenditure on the other. Analysis of expenditure on various heads would indicate where the money goes and would help the Architect/Engineer to work out the most economical solution. Although the method is time consuming but considering the needs for schools and the availability of funds, it is absolutely necessary to explore all possibilities of reducing construction cost. If the Architect/Engineer can help by saving even a small percentage of money on every school he builds, he can justify human usefulness of his profession.

ANNEXURE 'A'

**The Concept of Basic Education*

1. Basic education, as conceived and explained by Mahatma Gandhi, is essentially an education for life and, what is more, an education through life. It aims at creating eventually a social order free from exploitation and violence. That is why productive, creative and socially useful work in which all boys and girls may participate, irrespective of any distinction of caste or creed or class, is placed at the very centre of Basic education.

2. The effective teaching of a basic craft, thus, becomes an essential part of education at this stage, as productive work done under proper conditions, not only makes the acquisition of much related knowledge more concrete and realistic but also adds a powerful contribution to the development of personality and character and instils respect and love for all socially useful work. It is also to be clearly understood that the sale of products of craft-work may be expected to contribute towards part of the expenditure on running the school or that the products will be used by the school children for getting a mid-day meal or a school uniform or help to provide some of the school furniture and equipment.

3. As there has been controversy and difference of opinion regarding the position of craft-work in Basic schools, it is necessary to state clearly that the fundamental objective of Basic education is nothing less than the development of the child's total personality which will include productive efficiency as well. In order to ensure that the teaching of the basic craft is efficient and its educative possibilities are fully realised, we must insist that the articles made should be of good quality, as good as children at that stage of their development can make them, socially useful and, if necessary, saleable. The acquisition of skills and the love for good craftsmanship have deeper educative significance than merely playing with the tools and raw materials which is usually encouraged in all good activity schools. This productive aspect should in no case be relegated to the background as has been usually the case so far, because directly as well as indirectly, efficiency in the craft practised undoubtedly contributes to the all-round development of the child; but on the other hand, never should the productive aspect be allowed to take precedence over the educational aspect. It sets up before children high standards of achievement and gives them the right kind of training in useful habits and attitudes like purposeful application, concentration, persistence and thoughtful planning. While it may not be possible to lay down specific targets for productivity at this stage, it should be the teacher's endeavour to explore its economic possibilities fully with the emphatic stipulation that this does not in any way conflict with the educational aims and objectives already defined. However, it has to be stated that, in the upper classes of Junior Basic schools and in the Senior Basic schools, it should not be difficult for States to lay down certain minimum targets of production in the light of carefully assessed experiences.

4. In the choice of basic crafts which are to be integrated into school work, we should adopt a liberal approach and make use of such crafts as have significance from the point of view of intellectual content, provide scope for progressive development of knowledge and practical efficiency.

*From Ministry of Education, Govt. of India publication "The Concept of Basic Education"

The basic craft must be such as will fit into the natural and social environment of the school and hold within it the maximum of educational possibilities. The idea that has been wrongly created in the minds of some people that the mere introduction of a craft in a school, e.g., spinning, can make it a Basic school, does grave injustice to the concept of Basic education.

5. In Basic education as, indeed, in any good scheme of education, knowledge must be related to activity, practical experience and observation. To ensure this, Basic education rightly postulates that the study of the curricular content should be intelligently related to three main centres of correlation viz., craft-work, the natural environment and the social environment. The well-trained and understanding teacher should be able to integrate most of the knowledge that he wishes to impart to one or the other of these centres of correlation, which form the important and natural foci of interest for the growing child. If, therefore, in the Junior Basic stage he is not able to do so, it either means that he lacks the necessary ability or that the curriculum has been burdened with items of knowledge which are not really important and significant at that particular stage. It should also be realised, however, that there may be certain items in the syllabus which cannot be easily correlated directly with any of the three above centres. In such cases, which should occur only infrequently, there should be no objection to these being taught according to the methods of teaching adopted in any good school. This means that even in the case of such lessons, the principle of interest and motivation and the value of expression-work will be utilised. In any case, forced and mechanical 'associations' which pass for correlation in many schools should be carefully avoided.

6. The emphasis on productive work and crafts in Basic schools should not be taken to mean that the study of books can be ignored. The Basic scheme does postulate that the book is not the only or the main avenue to knowledge and culture and that at this age, properly organised productive work can in many ways contribute more richly both to the acquisition of knowledge and the development of personality. But the value of the book, both as a source of additional systematised knowledge and of pleasure cannot be denied and a good library is as essential in a Basic school as in any other type of good school.

7. The basic scheme envisages a close integration between the schools and the community so as to make education as well as the children more social-minded and co-operative. It endeavours to achieve this, firstly by organising the school itself as a living and functioning community—with its social and cultural programmes and other activities—secondly, by encouraging students to participate in the life around the school and in organising various types of social service to the local community. Student self-government is another important feature in Basic education which should be envisaged as a continuous programme of training in responsibility and in the democratic way of living. In this way, the Basic school not only helps in cultivating qualities of self-reliance, co-operation and respect for dignity of labour, but also becomes a vital factor in the creation of a dynamic social order.

8. Basic education should no longer be regarded as meant exclusively for the rural areas. It should be introduced in urban areas as well both because of its intrinsic suitability and also to remove the impression that it is some inferior kind of education designed only for the village children. For this purpose, necessary modifications may have to be made in the choice of basic crafts for urban schools and even in the syllabus but the general ideals and methods of Basic education should remain the same.

ANNEXURE ' B '

Questionnaire to study the educational facilities available in Primary-Junior Basic Schools

- Note:* 1. This Questionnaire is intended to study the type and extent of accommodation and other facilities available to children in Primary-Junior Basic grades only. In case of Schools that are up to Senior Basic or Higher Secondary level, accommodation or facilities that are not shared by the Junior students should not be included without specifically so stating.
2. For purposes of classification, the Junior Basic, Senior Basic and Higher Secondary would have the following grades.
- | | |
|------------------------------|--|
| Junior Basic/Primary | 1st to 5th |
| Senior Basic/Middle | 6th to 8th |
| Higher Secondary/High School | 9th to 11th or 9th to 10th respectively. |
3. If desired, names of schools and nature of comments offered will be treated as confidential and will not be mentioned in any report.

SCHEDULE "A"

1. Name & address of the School _____

_____ -District- _____
2. Type of School Boys Girls Mixed
Up to 5th grade
Up to 8th grade
Up to 11th grade
3. Enrolment
Junior Basic/Primary grades _____
Total (in case of combined schools) _____
- *4. Average number of students in each class _____
- *5. Average size of class room Width _____
Length _____
- *6. Total number of staff members Male _____
Female _____
7. Total area of school site _____ acres
8. Plan of the school building showing arrangements of various rooms Attached
(Please attach a copy of the plan, even a rough sketch will do). Will follow

*(For Junior Basic Grades only)

SCHEDULE "B"

1. What type of seating arrangement is provided in class rooms ? Squatting on floor
Stools & Desks
2. Do all the class/sections have a class room or some of the classes are held in verandahs, etc, due to paucity of accommodation. Yes, in class rooms
No. There are only _____ rooms for _____ classes. The other classes are being held in _____
3. Is the school having optimum enrolment or there is accommodation for additional enrolment ? Optimum enrolment
Yes _____ students can be further accommodated in each class.
4. Are the classes held in open air also ? _____
If so during which period of the year. _____
5. Is the out-door space utilised for teaching purposes ? If so for what purpose and for how many hours a day. _____

6. What other teaching accommodation in addition to class room is available ? _____
Hobby room _____ Craft room _____
Common room _____ Assembly hall _____
General Science Lab. _____ Library _____
7. What teaching space in addition to class room would you consider essential ? _____

8. Do all teaching places get adequate natural light & ventilation ? Good ventilation
Inadequate ventilation
Adequate natural light
Inadequate natural light
9. Does the school function satisfactorily in all seasons ? _____

10. Does your school building fit-in with the educational requirements and help to create proper atmosphere for studies ? Yes
No. (i) Planning is poor
(ii) Construction is not satisfactory
Other reasons _____

11. What planning or constructional defects interfere with the smooth working of the school ? _____

SCHEDULE "C"

Office

1. What accommodation is available for staff & office. Please tick mark the accommodation available.
- Headmaster's office
 General office
 Record room or
 Office store
 Staff common room
 Staff lavatory
 Others _____

Storage

2. Is storage space for teaching equipment, games equipment and miscellaneous items available and is the storage space provided adequate? Yes No
 Only _____ stores of _____ sq. ft. each are available which are sufficient/insufficient.
3. How much storage space do you think should be provided (Give approximate floor area of store in sq. ft.) _____

Sanitary facilities

4. Is the sanitary block attached to the main building or is sited as a separate structure. (i) Attached to main building
 (ii) Separate structure
 (iii) Facilities are not available
5. What is the number of fittings provided for students? Latrines Urinals Wash Basins

6. Are the above number of fittings adequate? Yes No
7. Please indicate whether the above fittings are used by the total enrolment or by students in Primary grades only. For total
 For primary grades only
 For other grades also

Games facilities

8. Please indicate the playing facilities and the equipment provided.
 Playing field Climbing apparatus Giant stride
 Merry-go-round Swings Slides Teters (see-saw)
 Horizontal ladder Travelling ring Wood dodger
 Others _____

Mid-day facilities

9. Where do the children take their mid-day meals (Canteen, Assembly Hall, in Class rooms) ? _____

10. Do the children bring their own tiffin or is it provided by the school management? If so what are the monthly charges. _____

- 11. What are your views on the arrangement being followed in your school ?
Is it working satisfactorily ? If not what disadvantages are associated with it. _____

- 12. What accommodation would you recommend and what arrangements you would suggest for providing suitable space for tiffin to the students in the primary grades? _____

Residential Accommodation

- 13. For how many members of the staff residential accommodation is available within the school compound ? _____

- 14. Do you think it is essential to provide residential accommodation for the staff within the school compound ? If so please indicate the designation of staff members for whom the residential accommodation should be provided. _____

ANNEXURE 'C'

TABLE I
School according to Type
(Mixed, boys, etc.)

| Type | Nos. | Percentage |
|---------------|------|------------|
| Mixed | 848 | 89.00 |
| Boys | 90 | 9.43 |
| Girls | 15 | 1.57 |
| TOTAL | 953 | 100.00 |

TABLE II
Schools according to plot area

| Area in sq. yds. | No. of Schools | Percentage |
|---------------------|----------------|------------|
| 1-2 420 | 484 | 59.8 |
| 2 421-4 840 | 134 | 16.6 |
| 4 841-7 260 | 53 | 6.5 |
| Above 7 260 | 138 | 17.1 |
| TOTAL | 809 | 100.0 |

TABLE III
Schools according to enrolments

| Enrolment | No. of Schools | Percentage |
|-------------------|----------------|------------|
| 1-150 | 381 | 41.1 |
| 151-250 | 252 | 27.2 |
| 251-450 | 212 | 22.9 |
| Above 450 | 81 | 8.8 |
| TOTAL | 926 | 100.0 |

TABLE IV
Schools according to adequacy and inadequacy of space

| Space | No. of Schools | Percentage |
|--------------------|----------------|------------|
| Adequate | 446 | 54.4 |
| Inadequate | 373 | 45.6 |
| TOTAL | 819 | 100.0 |

TABLE V
Schools capable of taking additional enrolment

| Enrolment | No. of Schools | Percentage |
|--------------------|----------------|------------|
| Optimum | 502 | 69.5 |
| Additional | 220 | 30.5 |
| TOTAL | 722 | 100.0 |

TABLE VI
Schools according to physical characteristics

| | Light | | Ventilation | | Constn. | | Planning | |
|-----------------|------------|--------------|-------------|--------------|------------|--------------|------------|--------------|
| | No. | % | No. | % | No. | % | No. | % |
| Good .. | 808 | 89.1 | 789 | 88.8 | 411 | 45.4 | 385 | 46.6 |
| Bad .. | 99 | 10.9 | 99 | 11.2 | 494 | 54.6 | 441 | 53.4 |
| TOTAL .. | 907 | 100.0 | 888 | 100.0 | 905 | 100.0 | 826 | 100.0 |

TABLE VII
Schools according to number of students in each class

| No. of Students | No. of Schools | Percentage |
|------------------|----------------|--------------|
| 1-30 | 363 | 44.3 |
| 31-40 | 197 | 24.1 |
| 41-50 | 115 | 14.0 |
| Above 50 | 144 | 17.6 |
| TOTAL .. | 819 | 100.0 |

TABLE VIII
Schools according to class room area

| Area in sq. ft. | No. of Schools | Percentage |
|-------------------|----------------|--------------|
| 1-180 | 162 | 18.9 |
| 181-240 | 174 | 20.3 |
| Above 240 | 521 | 60.8 |
| TOTAL .. | 857 | 100.0 |

TABLE IX
Schools according to area/students (in sq. ft.)

| Area/Student | No. of Schools | Percentage |
|------------------|----------------|---------------|
| 1-5.9 | 234 | 30.9 |
| 6-7.9 | 122 | 16.2 |
| 8-9.9 | 100 | 13.2 |
| 10-11.9 | 83 | 10.95 |
| 12-13.9 | 44 | 5.83 |
| Above 14 | 173 | 22.82 |
| TOTAL .. | 756 | 100.00 |

TABLE X
Schools according to seating arrangement

| Arrangement | No. of Schools | Percentage |
|-------------------|----------------|--------------|
| Squatting | 494 | 53.0 |
| Benches | 246 | 26.4 |
| Combined | 192 | 20.6 |
| TOTAL .. | 932 | 100.0 |

TABLE XI

Schools having special rooms for educational purposes

| | Library | | Gen. Science | | Common Room | | Assembly Hall | | Craft | | Hobby | |
|----------------------|----------------|------------|----------------|------------|----------------|------------|----------------|------------|----------------|------------|----------------|------------|
| | No. of schools | % | No. of schools | % | No. of schools | % | No. of schools | % | No. of schools | % | No. of schools | % |
| Provided | 85 | 8.5 | 12 | 1.2 | 45 | 4.5 | 62 | 6.2 | 111 | 11.1 | 8 | .8 |
| Not provided | 915 | 91.5 | 988 | 98.8 | 955 | 95.5 | 938 | 93.8 | 889 | 88.9 | 992 | 99.2 |
| TOTAL .. | 1000 | 100 | 1000 | 100 | 1000 | 100 | 1000 | 100 | 1000 | 100 | 1000 | 100 |
| Suggested | 231 | 23.1 | 106 | 10.6 | 146 | 14.6 | 228 | 22.8 | 274 | 27.4 | 107 | 10.7 |

TABLE XII
Schools according to lavatory facilities

| Lavatory Facilities | No. of Schools | Percentage |
|----------------------|----------------|---------------|
| Adequate | 108 | 14·00 |
| Inadequate | 159 | 20·62 |
| Not provided | 504 | 65·38 |
| TOTAL .. | 771 | 100·00 |

TABLE XIII
Schools according to space for school administration

| | Headmaster | | Gen. Office | | Record | | Staff | |
|-----------------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|
| | No. | % | No. | % | No. | % | No. | % |
| Provided .. | 366 | 36·6 | 78 | 7·8 | 86 | 8·6 | 46 | 4·6 |
| Not provided .. | 634 | 63·4 | 922 | 92·2 | 914 | 91·4 | 954 | 95·4 |
| TOTAL .. | 1000 | 100 | 1000 | 100 | 1000 | 100 | 1000 | 100 |

TABLE XIV
Schools according to storage facilities

| Storage | No. of Schools | Percentage |
|----------------------|----------------|--------------|
| Adequate | 135 | 13·5 |
| Inadequate | 138 | 13·8 |
| Not provided | 727 | 72·7 |
| TOTAL .. | 1000 | 100·0 |

TABLE XV
Schools according to games facilities

| Facilities | No. of Schools | Percentage |
|----------------------|----------------|--------------|
| Provided | 460 | 57·3 |
| Not provided | 343 | 42·7 |
| TOTAL .. | 803 | 100·0 |

TABLE XVI
Schools according to meals facilities

| Facilities | No. of Schools | Percentage |
|----------------------|----------------|---------------|
| Provided | 38 | 4·08 |
| Not provided | 891 | 95·92 |
| TOTAL .. | 929 | 100·00 |
| Suggested | 393 | 39·3 |

TABLE XVII
Schools according to residential facilities

| Residences | | | | | | | | No. of Schools | Percentage |
|--------------|----|----|----|----|----|----|--------------|-------------------|------------|
| Provided | .. | .. | .. | .. | .. | .. | .. | 34 | 3·57 |
| Not provided | .. | .. | .. | .. | .. | .. | .. | 919 | 96·43 |
| | | | | | | | TOTAL | 953 | 100·00 |
| Suggested | .. | .. | .. | .. | .. | .. | .. | 605 | 60·05 |

ANNEXURE 'D'

Schedule of Space Requirements for Primary-Junior Basic Schools

I. School Building
A. Teaching

| Sl. No. | Description | I Section Enrolment 200 | | | II Section Enrolment 400 | | | III Section Enrolment 600 | | |
|---------------------|----------------------------|----------------------------|-----------------------------|----------------------|-----------------------------|-----------------------------|----------------------|------------------------------|-----------------------------|----------------------|
| | | No. of rooms | Area of each room in sq. m. | Total area in sq. m. | No. of rooms | Area of each room in sq. m. | Total area in sq. m. | No. of rooms | Area of each room in sq. m. | Total area in sq. m. |
| 1. | Class room .. | 4 | 37·16 | 148·64 | 8 | 37·16 | 297·28 | 15 | 37·16 | 557·40 |
| 2. | Special room .. | 1 | 55·74 | 55·74 | 2 | 55·74 | 111·48 | 1 | 55·74 | 55·74 |
| | TOTAL .. | 5 | | 204·38 | 10 | — | 408·76 | 16 | — | 613·14 |
| | Teaching area per student | | | 1·02 | | | 1·02 | | | 1·02 |
| B. Ancillary | | | | | | | | | | |
| 1. | Kitchen-cum-store .. | 1 | 13·00 | 13·00 | 1 | 13·00 | 13·00 | 1 | 13·00 | 13·00 |
| 2. | Headmaster's office | 1 | 22·30 | 22·30 | 1 | 22·30 | 22·30 | 1 | 22·30 | 22·30 |
| 3. | Store | — | — | — | 1 | 11·15 | 11·15 | 1 | 11·15 | 11·15 |
| | TOTAL .. | 2 | | 35·30 | 3 | | 46·45 | 3 | | 46·45 |
| | Ancillary area per student | | | 0·176 | | | 0·116 | | | ·077 |

ANNEXURE 'E'

Cost Index with reference to C.P.W.D. Rates at Delhi in March 1962 Base as

| Sl. No. | Place | Cost Index |
|---------|--------------------|------------|
| 1. | Agra | 121 |
| 2. | Ahmedabad | 116 |
| 3. | Ajmer | 94 |
| 4. | Allahabad | 124 |
| 5. | Ambala | 115 |
| 6. | Amritsar | 111 |
| 7. | Bangalore | 119 |
| 8. | Bareilly | 125 |
| 9. | Baroda | 108 |
| 10. | Bharatpur | 99 |
| 11. | Bhopal | 113 |
| 12. | Bombay | 137 |
| 13. | Calcutta | 144 |
| 14. | Chandigarh | 117 |
| 15. | Cochin | 138 |
| 16. | Coimbatore | 134 |
| 17. | Cuttack | 135 |
| 18. | Dehradun | 121 |
| 19. | Delhi | 100 |
| 20. | Dhanbad | 116 |
| 21. | Ferozepur | 111 |
| 22. | Gaya | 103 |
| 23. | Gwalior | 118 |
| 24. | Hyderabad | 124 |
| 25. | Indore | 126 |
| 26. | Jabalpur | 112 |
| 27. | Jaipur | 100 |
| 28. | Jodhpur | 110 |
| 29. | Jullundur | 111 |
| 30. | Kanpur | 131 |
| 31. | Karnal | 120 |
| 32. | Kharkvasla | 103 |
| 33. | Kota | 117 |
| 34. | Kurnool | 83 |
| 35. | Lucknow | 135 |
| 36. | Madras | 145 |
| 37. | Madurai | 130 |
| 38. | Mathura | 90 |
| 39. | Mandappam | 125 |
| 40. | Meerut | 122 |
| 41. | Nagpur | 117 |
| 42. | Nasik Road | 118 |
| 43. | Nasirabad | 111 |
| 44. | Pathankot | 101 |
| 45. | Patna | 103 |

| Sl. No. | Place | Cost Index |
|---------|-----------------------|------------|
| 46. | Poona | 123 |
| 47. | Rajkot | 106 |
| 48. | Ranchi | 113 |
| 49. | Roorkee | 91 |
| 50. | Saugor | 104 |
| 51. | Shillong | 140 |
| 52. | Simla | 172 |
| 53. | Surat | 135 |
| 54. | Tamparam | 129 |
| 55. | Tanjore | 121 |
| 56. | Trichirapalli | 121 |
| 57. | Trivandrum | 113 |
| 58. | Vishakapatnam | 107 |

ANNEXURE 'F'

Statement showing Calculation of Building Cost Index of Delhi on 31st March 1962
Based on the C.P.W.D. Delhi Schedule of Rate 1955 as 100

| Sl. No. | Description | Unit | Delhi Rates at Site of Work in 1955 | Delhi Rates at Site of Work in 1962 | Percentage Increase or Decrease in Rate | Weightage | Cost Index |
|-------------|---|------------|-------------------------------------|-------------------------------------|---|-----------|------------|
| (Materials) | | | | | | | |
| 1. | Brick 50% 1st Class 50% 2nd Class | 1 000 Nos. | 31.50 | 35.00 | $\frac{35.00 \times 100}{31.50} = 111$ | 17 | 18.87 |
| 2. | Sand 33.3% Coarse Sand 66.6% Fine Sand | 100 cft. | 31.00 | 31.00 | $\frac{31.00 \times 100}{31.00} = 100$ | 7 | 7.00 |
| 3. | Cement | cwt. | 5.12 | 7.40 | $\frac{7.40 \times 100}{5.12} = 145$ | 18 | 26.10 |
| 4. | Aggregate 50% $\frac{1}{4}$ " gauge stone 50% $1\frac{1}{4}$ " gauge stone | 100 cft. | 32.00 | 30.50 | $\frac{30.50 \times 100}{32.00} = 96$ | 8 | 7.68 |
| 5. | Timber 2nd class C. P. Teakwood in scantling | cft. | 10.00 | 20.00 | $\frac{20.00 \times 100}{10.00} = 200$ | 13 | 26.00 |
| 6. | Mild Steel | cwt. | 26.00 | 36.00 | $\frac{36.00 \times 100}{26.00} = 138$ | 10 | 13.80 |
| (Labour) | | | | | | | |
| 7. | Mason | Each | 4.50 | 5.50 | $\frac{5.50 \times 100}{4.50} = 122$ | 10 | 12.20 |
| 8. | Carpenter | Each | 4.50 | 5.50 | $\frac{5.50 \times 100}{4.50} = 122$ | 5 | 6.10 |
| 9. | Coolie | Each | 1.75 | 2.00 | $\frac{2.00 \times 100}{1.75} = 114$ | 12 | 13.68 |
| | | | | | | | 131.43 |
| | | | | | | | Say 131 |

ANNEXURE 'G'

Schools in Urban Areas—Break up of Cost

Note: 1. Detailed estimates for a few designs on the C.P.W.D. Delhi Schedule of rates, 1955 were prepared to work out the plinth area rates for the school.

2. Analysis of number of designs for school buildings form the basis for fixing total carpet area for these buildings.

I. Break up of Plinth Area Rates

| | Rs |
|---|--------|
| (a) Cost per sq. ft. of plinth area on C.P.W.D. Delhi Schedule of rates, 1955 as per specification in this annexure | 7.25 |
| (b) Add 31% cost index for rise in prices. (Refer Annexure 'F') | 2.44 |
| (c) Add 25% for services on a and b | 2.37 |
| (d) Add 3% contingencies on item a, b and c | 0.35 |
| (e) Total cost per sq. ft. | 12.21 |
| (f) Total cost per sq. m. | 131.75 |
| Say | 132.00 |

II. Break up of Cost

(A) One Section School: (Enrolment 200)

| | | |
|--|--------|-------|
| (a) Total carpet area | 329.00 | sq.m. |
| (b) Total plinth area (Allowing 15% for walls) | 378.00 | sq.m. |
| (c) Plinth area per student | 1.89 | sq.m. |

(d) Cost per student @ Rs 132.00 per sq. m. = $1.89 \times 132 =$ Rs 250.00

(B) Two Section School: (Enrolment 400)

| | | |
|--|--------|-------|
| (a) Total carpet area | 624.00 | sq.m. |
| (b) Total plinth area (Allowing 15% for walls) | 718.00 | sq.m. |
| (c) Plinth area per student | 1.79 | sq.m. |

(d) Cost per student @ Rs 132.00 per sq. m. = $1.79 \times 132 =$ Rs 236.00

(C) Three Section School: (Enrolment 600)

| | | |
|-------------------------------------|----------|--------|
| (a) Total carpet area | 904.00 | sq.m. |
| (b) Total plinth area | 1 039.00 | sq. m. |
| (c) Plinth area per student | 1.73 | sq. m. |

(d) Cost per student @ Rs 132.00 per sq.m. = $1.73 \times 132 =$ Rs 228.00

Brief Specifications

Second class brick footing in cement lime mortar 1:1:8 over a bed of cement concrete 1 : 6 : 12 up to 1.00 ft. depth with a 1 : 2 : 4 cement concrete, D.P.C. at plinth level (1' 6" above ground level) bitumen painted on top.

Super-Structure

9" thick second class brick wall in 1 : 1 : 8 cement lime mortar for all load bearing walls and 1 : 3 cement mortar with hoop irons for 4½" non-load bearing walls.

Wood Work

Second class deodar wood with iron fittings and fixtures and oil painted.

Flooring

1½" thick cement concrete 1:2:4 finished with a floating coat of neat cement over a bed of 3" cement concrete 1:6:12 in the ground floor and over a bed of thick cement

slurry on the first floor except in bath and W.C. which shall be of $1\frac{1}{2}$ " thick terrazo in grey cement with 3 ft. high dado of the same, 4" high cement plaster skirting in all rooms.

OR 4" thick 1 : 3 : 6 (1 cement : 3 sand : 6 ballast $1\frac{1}{2}$ " gauge) Cement Concrete flooring, laid in panels not exceeding 8' x 8' finished with a floating coat of neat cement.

Roofing

R.C.C. T-beams roof finished with a coat of bitumen and with 4" average mud phuska, a course of tiles grouted with 1 : 3 cement mortar on top.

Finishes

All walls plastered both inside and outside with $\frac{1}{2}$ " cement plaster and white-washed inside and colour washed outside.

ANNEXURE 'H'

Schools in Rural Areas—Break up of Cost

- Note: 1. Detailed estimate for a few designs on the prevailing market rates were prepared to work out the plinth area rates for the Primary Schools in rural areas.
2. Analysis of number of designs for School buildings form the basis for fixing total carpet area, for these buildings.

I. Break up of Plinth Area Rates

| | Rs |
|---|-----------|
| (a) Cost per sq.ft. of plinth area, as worked out on prevailing market rates and as per specifications given in this annexure | 6-00 |
| (b) Add 15% for services viz. water supply and sanitary installations. | 0-90 |
| (c) Add 3% contingencies on a and b | 0-21 |
| (d) Cost per sq. ft. | 7-11 |
| (e) Cost per sq. m. | 76-50 |
| | Say 77-00 |

II. Break up of Cost**(A) One Section School : (Enrolment 200)**

| | |
|--|--------------------------------------|
| (a) Total carpet area | 329-00 sq.m. |
| (b) Total plinth area (Allowing 15% for walls) | 378-00 sq.m. |
| (c) Plinth area per student | 1-89 sq.m. |
| (d) Cost per student @ Rs 77-00 per sq. m. | $1-89 \times 77 = \text{Rs } 145-50$ |
| | Say Rs 146-00 each |

(B) Two Section School (Enrolment 400)

| | |
|--|--------------------------------------|
| (a) Total carpet area | 624-00 sq.m. |
| (b) Total plinth area (Allowing 15% for walls) | 718-00 sq.m. |
| (c) Plinth area per student | 1-79 sq.m. |
| (d) Cost per student @ Rs 77-00 per sq. m. | $1-79 \times 77 = \text{Rs } 137-80$ |
| | Say Rs 138-00 |

(C) Three Section School: (Enrolment 600)

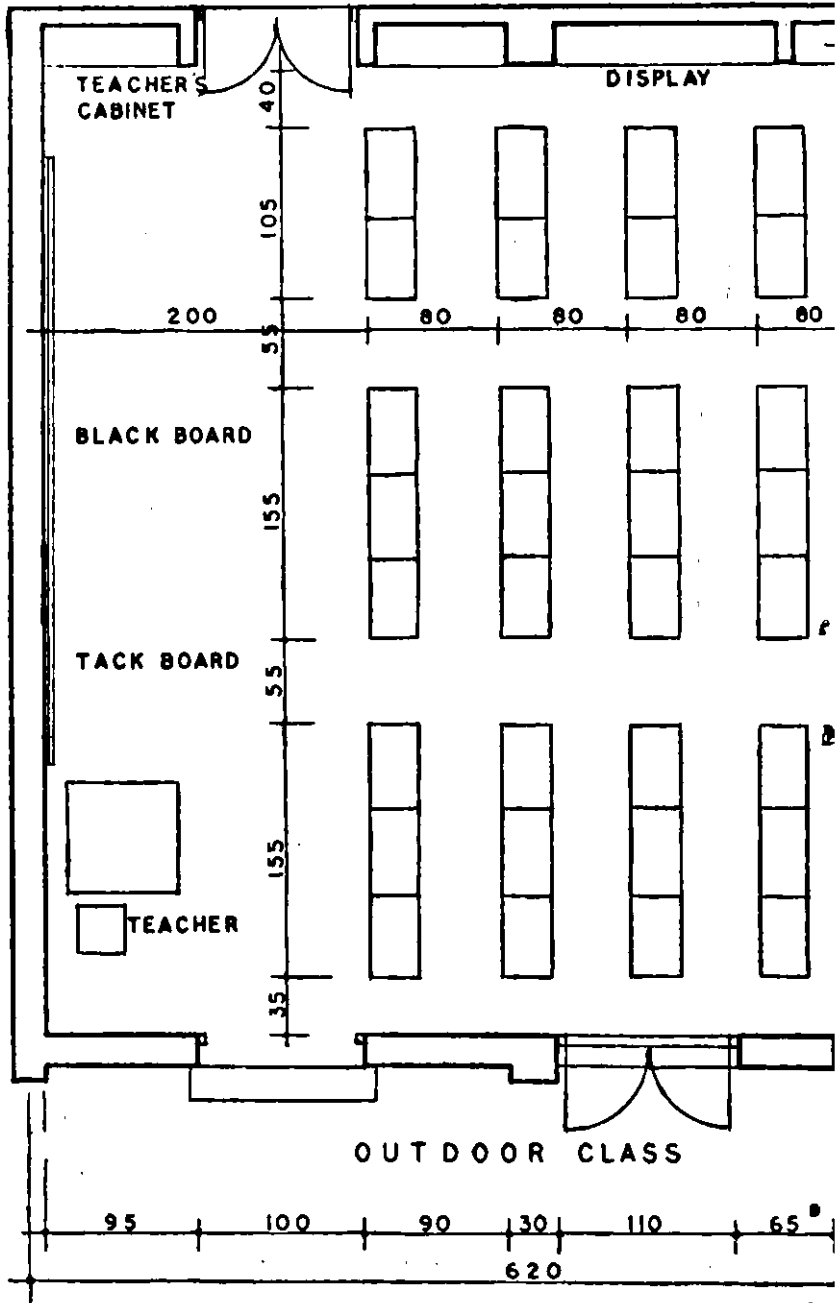
| | |
|--|--------------------------------------|
| (a) Total carpet area | 904-00 sq.m. |
| (b) Total plinth area (Allowing 15% for walls) | 1 039-00 sq.m. |
| (c) Plinth area per student | 1-73 sq.m. |
| (d) Cost per student @ Rs 77-00 per sq. m. | $1-73 \times 77 = \text{Rs } 133-20$ |
| | Say Rs 133-00 each |

Specifications Adopted

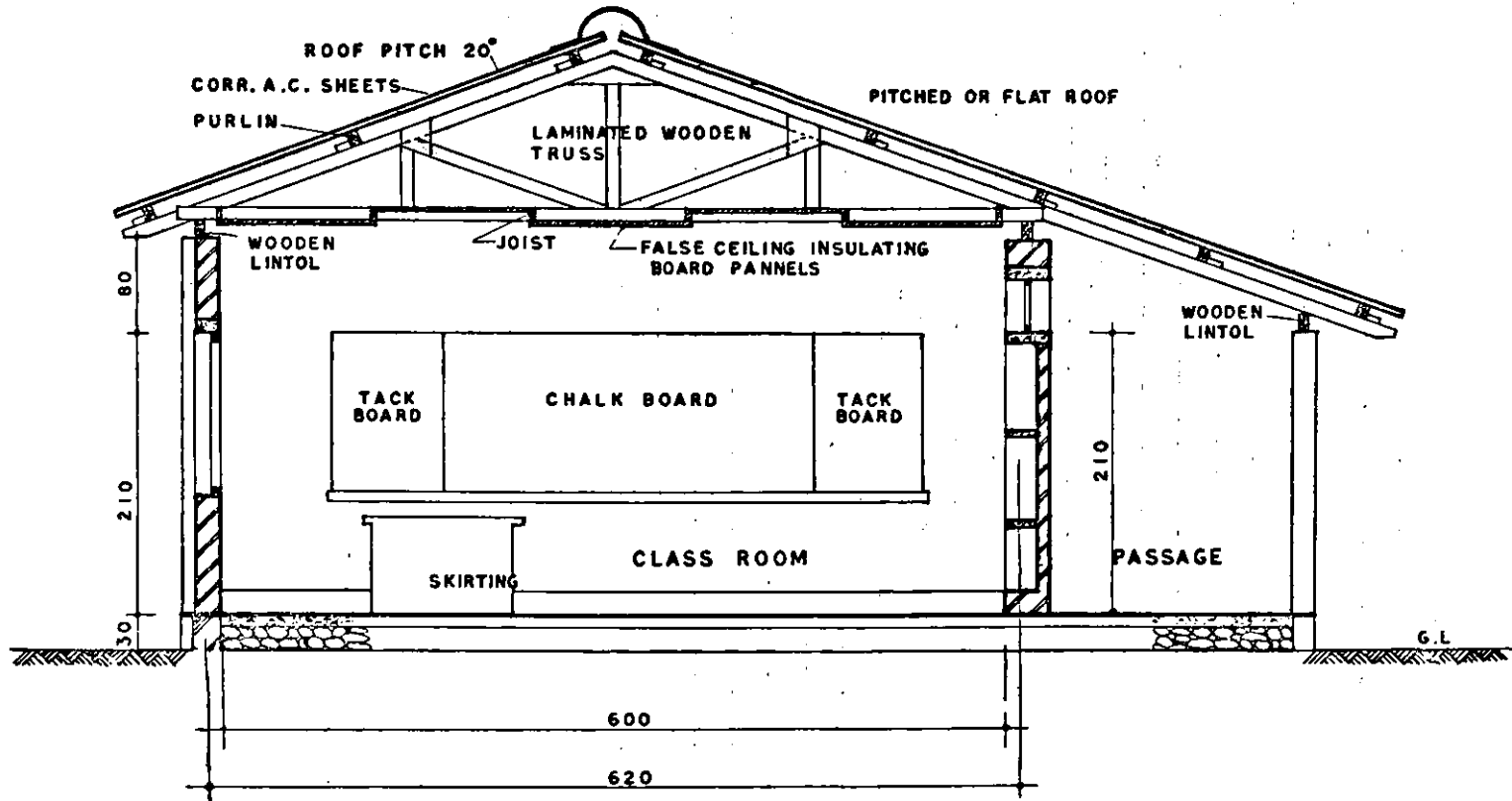
| | |
|-----------------|--|
| Foundation: | Second class brick footing or Random rubble masonry in mud mortar, over a bed of 1'-0" thick cement concrete 1:8:16 (1 cement: 8 sand :16 brick or stone ballast: 1½" gauge) or lime concrete in mortar 1 : 3 (1 lime : 3 sand) or mud concrete with 1" thick 1:2:4 (1 cement : 2 sand : 4 ballast ¾" and downgauge) cement concrete damp proof course at plinth level (1'6" above G. L.). |
| Super structure | 9" thick second class bricks or sundried bricks 12" thick in mud mortar, or stabilized-soil block walls 12" thick with brick masonry pillars in cement mortar for supporting roofs, for Load bearing walls and sundried bricks. 9" thick filler walls or 6" thick soil cement stadihex block for non-load bearing walls |

| | |
|------------------|--|
| Wood work | 1½" thick locally available wooden shutters for doors, windows and clerestory windows with R.C.C. or locally available wooden frames, with iron fittings, fixtures and oil painted. |
| Flooring | Flat brick flooring laid in cement mortar 1 : 6 (1 cement: 6 sand) and cement painted with cement mortar 1 : 3 (1 cement: 3 sand) over a well-consolidated bed. |
| <i>Or</i> | 1" thick cement concrete topping over a base of 3" loose compacted to 2" brick ballast 1" and downgauge or 3" cement concrete 1 : 8 : 16 (1 cement : 8 sand : 16 brick or stone ballast 1½" gauge) or 3" lime concrete in lime mortar 1 : 3 (1 lime : 3 sand) with 1½" gauge, brick or stone ballast. |
| <i>Or</i> | Stone slab paving, laid over a bed of lime Surkhi mortar 1:2 (1 lime : 2 surkhi) laid and painted with neat cement slurry. |
| Roofing | (a) Corrugated A.C. or G.I. Sheets, or country tiled roof on locally available wooden purlins and rafters on nail jointed wooden trusses. (b) Stone slabs, or tile bricks or 2" thick R.C.C. precast slabs on pre-cast reinforced cement concrete beams, or locally available wooden rafters etc. with 3" lime concrete or 4" thick average mudphaska and a course of tiles grouted with 1:3 cement mortar on top for water proofing. |
| Finishing | All walls plastered both inside and outside with lime or water proof mud plaster with 5% Janta emulsion and Gobri leaping, white washed inside and colour washed outside. |

P A S S A G E



LAY OUT OF FURNITURE IN

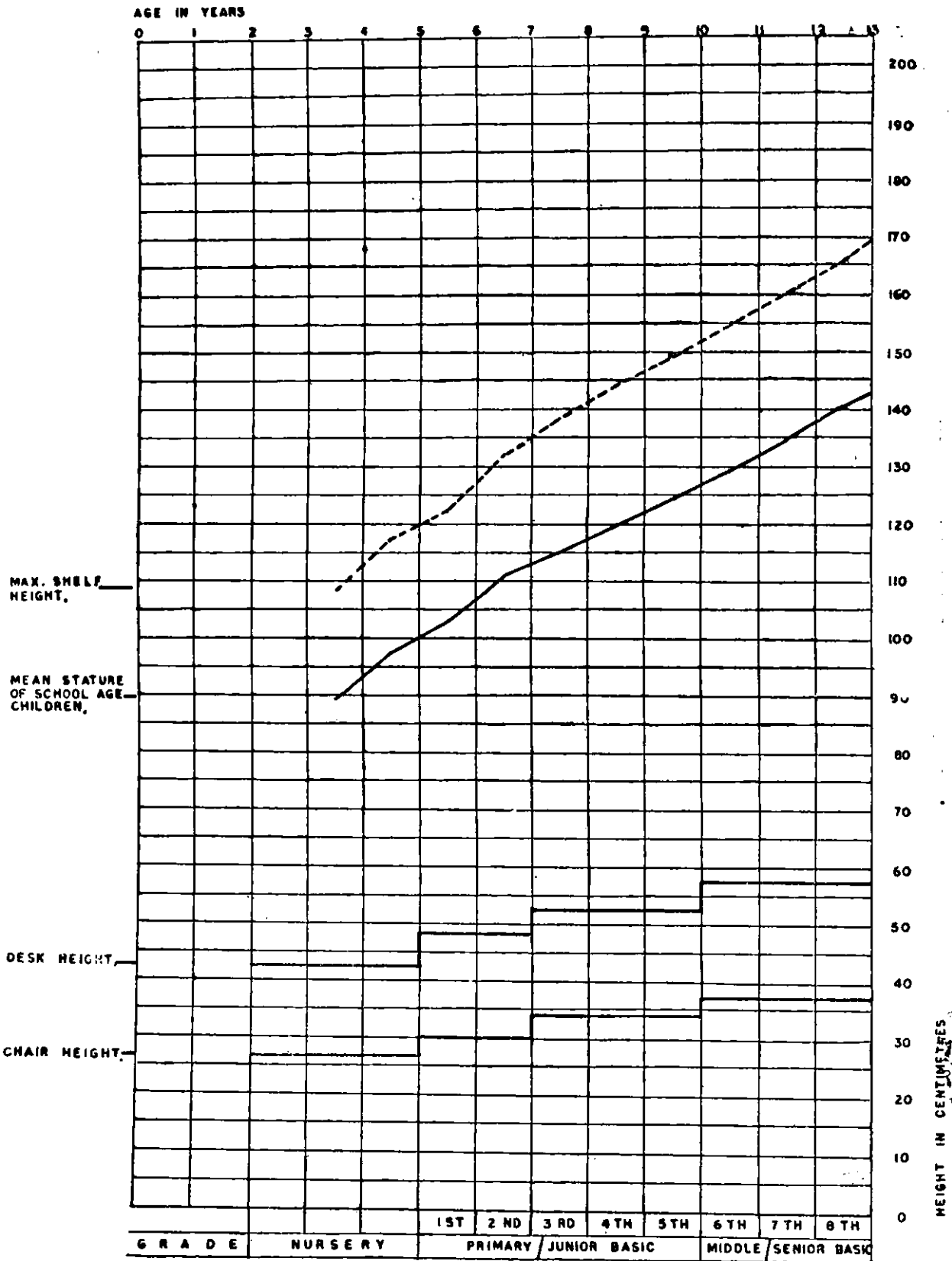


ALL DIMENSIONS ARE IN CM.

DETAIL OF TEACHER'S WALL - SECTIONAL ELEVATION

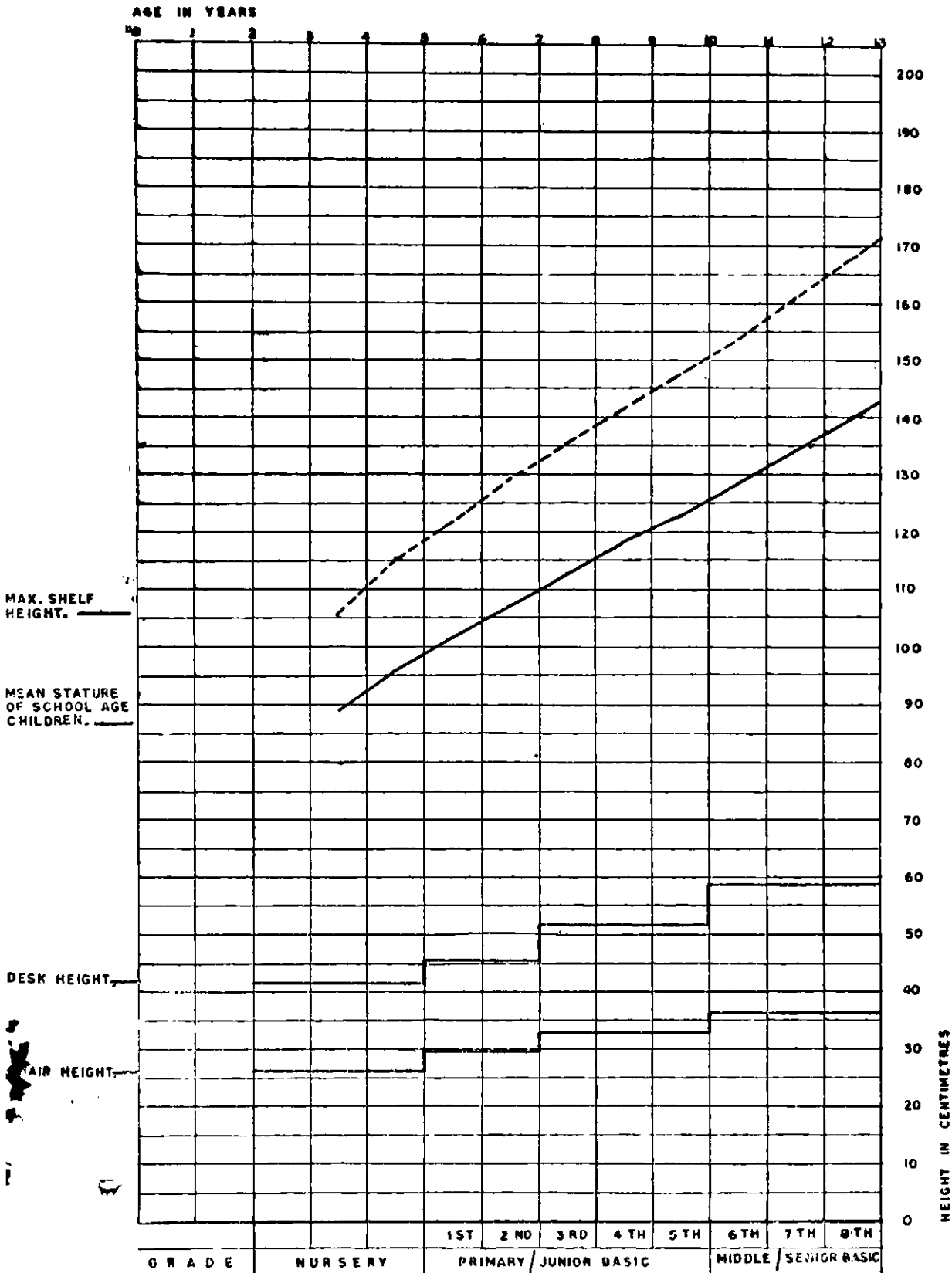
HEIGHTS OF FIXTURES & EQUIPMENT

FIG. III



BOYS

HEIGHTS OF FIXTURES & EQUIPMENT



GIRLS