Primary School Buildings standards, norms and design

The Department of Education
Royal Government of Bhutan

by Jean De Spiegeleer, Architect
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## FURTHER READING
INTRODUCTION

Primary school building in the Kingdom of Bhutan presents a wide spectrum of planning and design problems. Being a mountainous country, the population in the north and the central areas is very scattered. In the southern parts and urban areas, the density is much higher and larger schools are in need.

Many aspects have to be taken into consideration by the designer. The whole country is located in a high risk earthquake zone. The climate changes from cold-temperate in the north to tropical with heavy monsoon in the south. Local building techniques and available materials may include the use of mud walls, stones with mud mortar, wooden structures, bricks with cement mortar or concrete buildings. Local sanitation and personal hygiene practices of peoples vary from place to place. All these factors which influence the design of educational facilities have to be identified by a survey before designing a school for a certain area.

In addition to the great variety of buildings, there is a changing pattern of learning. Whilst for some years, the traditional teacher-centric methods of learning will continue in some schools, with the introduction of the New Approach to Primary Education, a new method of teaching-learning is gradually being adopted. This new pupil-centric method requires different types of school buildings and facilities.

The problem facing the designer is to provide an environment in which the learning process can best be carried out. Mud and timber schools may be good or bad, just as multi-storied concrete schools can be good or bad. It is hoped that the data provided here will be of as much assistance to those who are designing small rural schools as to those who are designing large urban schools. It should be equally applicable for the renovation and expansion of existing schools.

Few architects are specialists in school building. Those in general practice or employed by the Public Works Department are usually responsible for a wide range of building types. Furthermore, standards, norms and regulations for the design of school buildings in the country have not, as yet, been developed. It is necessary therefore to provide a single document which presents in a systematic way the major points relating to the design and the construction of primary school buildings and related facilities.

This booklet is in continuation of the report “Expanding Physical Facilities for Primary Education in Bhutan”. It should be regarded as a check-list and a source of reference. It is intended to provide norms and standards, design samples, facilities requirements and way of estimating building costs. It may be that the educationist and educational administrators (who should always be associated with any building projects) will also find these design guide-lines of interest as it will indicate to them some of the technical problems faced by the designer. They will then be in a position to make best use of the design services to obtain the sort of building most suited to their educational needs.

With the limited material and financial resources, cost limits must impose an exceedingly stringent discipline on both the designer and the educationist. Every square metre of the building must be used for as many hours of the day and days of the year as possible. Unused construction will be a waste of money that might otherwise have been better spent on training another teacher or constructing another school building.

One of the problems is the vast number of children for whom new schools must be provided. In this circumstance, architects will most frequently be concerned with aspects of construction involving repetition. The importance of repetition lies in the avoidance of bad design features that will be repeated many times. In all cases when a design is to be used as a standard for future construction, it is of utmost importance to build and evaluate a prototype component or building before issuing the final drawings for general use.

Thimphu, May 1986

(Jigmi Thinley)
Director of Education
A. EDUCATIONAL BACKGROUND
Optical Character Recognition (OCR) document. WARNING! Spelling errors might subsist. In order to access to the original document in image form, click on "Original" button on 1st page.
### PRIMARY ENROLMENT

#### ENROLMENT SITUATION (1985)

- **Enrolment (%)**
  - 25%
  - 20%
  - 80%

- **Grades**
  - Pre-primary
  - Primary
  - Secondary

- **Enrolment**
  - 1980: 0
  - 1982: 10,000
  - 1984: 50,000

#### ENROLMENT & ACCOMODATION

- If classrooms were designed to be proportional in area to the numbers of students retained in the school system, they would all need to be of different sizes.

- **Example for a 100 student school.**

- In rural schools
  - Where full-sized class groups will never be achieved, provide open hall classrooms with movable partitions to adjust space to enrolment and allow multi-class teaching.

- In large schools and urban type schools
  - Full-sized classrooms varying in numbers for the different grades.

- **How to calculate school capacity**
  - A detailed study of the population in the catchment area of the school which applied to the typical enrolment by grade will help calculate the size of a new school or the expansion required for an existing school.

- The design capacity of the school will be equal to the calculated enrolment increased by 20% to allow the school to expand and to provide flexibility in forming class groups of various sizes.

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**Note:** Primary school children are an average of two years older than the required age.
THE CURRICULUM

In the Environmental Studies Syllabus (The New Approach to Primary Education), there are four main strands. The emphasis is on learning through participation and active involvement of the children.

The subject Environmental Studies combines geography, history, science and in addition health, arts and crafts and physical education. It has a central focus on agriculture. The topics are the means to enable the child to observe and work with environment around him and to acquire knowledge through personal experience and discovery.

The EVS (Environmental Studies) topic outline:

<table>
<thead>
<tr>
<th>Course</th>
<th>Pre-primary</th>
<th>Classes 1 and 2</th>
<th>Classes 3 to 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>6</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>Maths</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Dzongkha/Nepali</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Environ. Studies</td>
<td>12</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>Activities</td>
<td>-</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Total No. of periods</td>
<td>30</td>
<td>40</td>
<td>44</td>
</tr>
</tbody>
</table>

THE CLASS SYSTEM

The class system adopted is that one teacher takes a class for all subjects except Dzongkha/Nepali, giving a certain amount of flexibility in timetabling.

Learning begins with class teaching then develops into individual and small group activity. Teachers will be in the role of guides, advisors, catalysts, or co-ordinators of learning.

At any time during the study, the children may be involved in a number of activities or working at different stages of the topic. One child may find information from a reference book, while another small group is making a chart or recording, in written form, some observation made. The teacher must be flexible; moving from group to group. The teacher, when a group makes an interesting discovery, may call the attention of the whole class to it and use that moment to teach an important point to the whole class.

Children must feel free to discuss and share their learning and move about the class when necessary.
B. FACILITIES PLANNING AND COST
THE PLANNING PROCESS

A. DIAGNOSIS AND ANALYSIS

RESOURCEs

NEEDS

INVENTORY

SCHOOL MAP I

IDENTIFICATION OF PROBLEMS

ALTERNATIVE EDUCATIONAL POLICIES

A. ...

B. ...

C. ...

B. RESEARCH AND DEVELOPMENT

ANTHROPOMETRIC SURVEY

EDUCATIONAL SPECIFIC

FURNITURE EQUIPMENT

SPACE NORMS

COMFORT NORMS

SAFETY NORMS

BUILDING METHODS

COST LIMITS

ENVIRON CRITERIA

SPACE PLANNING CONCEPTS

DESIGN GUIDELINES (NEW - REMODEL - MAINTAIN)

PROTOTYPES

EVALUATION PROTOTYPES

D. IMPLEMENTATION

EXECUTION: NEW, REMODEL, MAINTAIN

EVALUATE FINAL RESULTS

ARCHITECTS BRIEF

SITE SELECTION

DESIGN AND COST ESTIMATE

REGIONAL PHYSICAL PLANNING

REGIONAL TOWN PLANNING

ANNUAL PROGRAMME FOR EDUCATIONAL FACILITIES - NEW - REMODEL - MAINTAIN

NATIONAL POLICIES FOR EDUCATIONAL FACILITIES (RELATE TO MID/LONG TERM EDUCATION PLAN)

DEVELOPMENT OF MID-TERM PLAN

PRIORITIES

SCHOOL MAP II

FINANCING

ADMINISTR.

C. PLANNING

Note: From the E1 Jack/Almeida model of educational facilities planning and implementation, highlighted boxes show the stages developed in this document. Being a continuous process, it also shows how with the experience acquired, norms, designs and cost limits are continuously updated.
## SITE SURVEY

### ITEMS

1. **Location**
   - District, Gewog, name of the place.
   - Existence of other schools in the surroundings: primary, junior, high, high school (give distance).
   - Walking distance to the nearest motorable road.
   - Access road will be made (give expected date).

2. **Site plan**
   - **Boundaries**
     - Make drawings at 1:500 scale, details at 1:200 scale.
     - Boundaries of the site with all particulars of the site.
     - Trees to be retained, current use of the land, ... existing buildings (plans, description, use by rooms).
   - **Topography**
     - Contour lines at 1 or 2 metre steps.
   - **Orientation**
     - Sections of the site at interesting locations.
   - Specify the north on the site plan, the direction of the valley and approximate site location in the valley.

3. **Climate**
   - Local temperature and average rain fall by month.
   - Existence of strong wind (period and direction).
   - Altitude of the site.

4. **Public services**
   - Clean water supply (if it does not exist, distance to the nearest spring giving clean water).
   - Electricity: not existent or to be provided (give date).

5. **Local building techniques**
   - What are the common building types in the surroundings and materials used for there construction?
   - Available materials locally: give list and cost.
   - Availability of skilled labour, specify.

6. **Population**
   - Number of family houses in the catchment area.
   - Average number of children by house.
   - Distance of groups of houses to the site (give sketch).

7. **Sanitation**
   - Local habits, type of toilet commonly used in the area.

8. **Date**
   - Date of survey.

### EXAMPLE OF SITE SURVEY PLAN

- Small river (dry between November and June)
- Good spring 800 metres
- Detailed plans (sections) of each floors for buildings to be retained
- Terrain map
- Bathymetric map

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**Note:** The site survey is an important component of the building process as it will provide all the required data to plan a new school or expand an existing one giving expected enrolments, site conditions and type of facilities to be used, allowing the designer to prepare appropriate plans.
### 11. Schedule of residential accommodation

**STUDENTS' HOSTEL**

<table>
<thead>
<tr>
<th>TYPE OF SPACE</th>
<th>NO. OF SPACES</th>
<th>AREA PER PLACE (m²)</th>
<th>TOTAL NET AREA (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys' dormitory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls' dormitory</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys' sick room</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls' sick room</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warden's room</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matron's room</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanitary room for boys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanitary room for girls</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL STUDENTS' HOSTEL NET AREA :** m²

**ALLOWANCE FOR CIRCULATION (add 8%) :** m²

**TOTAL STUDENTS' HOSTEL AREA :** m² (1)

**AREA PER PLACE (area/boarders) :** m²/br.

**STAFF QUARTERS**

<table>
<thead>
<tr>
<th>TYPE OF QUARTER</th>
<th>NO. OF UNIT</th>
<th>AREA PER UNIT (m²)</th>
<th>TOTAL AREA (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headmaster's</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaching staff</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-teaching staff</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL STAFF QUARTERS AREA :** m² (2)

**TOTAL RESIDENTIAL AREA (1)+(2) :** m²

### 12. Outdoor spaces

<table>
<thead>
<tr>
<th>TYPE OF FACILITY</th>
<th>NO. OF UNITS/PLACES</th>
<th>AREA PER PLACE (m²)</th>
<th>TOTAL AREA (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>School buildings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential buildings</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Future expansion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assembly/play field</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EVS garden plots</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vegetable garden</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor teaching spaces</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL SITE AREA (minimum) :** m²

**AREA PER PLACE (site area/enrol.) :** m²/st.
Notes:
* Usually, costs in rural areas are 10% above the corresponding urban cost except for Phuntsholing where a 15% increase should be used.
* Cost estimates for the various zones are given on the opposite page.
C. DESIGN CRITERIA
### Anthropometrics/Design Dimensions

#### Standing Height (Cm)

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Height (cm)</th>
<th>Mean</th>
<th>Boys</th>
<th>Girls</th>
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<tbody>
<tr>
<td>5</td>
<td>101</td>
<td>102</td>
<td>100</td>
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<td>6</td>
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<td>7</td>
<td>112</td>
<td>111</td>
<td>113</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>116</td>
<td>116</td>
<td>115</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>122</td>
<td>121</td>
<td>122</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>124</td>
<td>122</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>130</td>
<td>127</td>
<td>132</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>136</td>
<td>135</td>
<td>136</td>
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</tr>
<tr>
<td>13</td>
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<td></td>
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<tr>
<td>14</td>
<td>147</td>
<td>146</td>
<td>141</td>
<td></td>
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<tr>
<td>15</td>
<td>154</td>
<td>153</td>
<td>152</td>
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</tr>
<tr>
<td>16</td>
<td>156</td>
<td>157</td>
<td>155</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>159</td>
<td>162</td>
<td>156</td>
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<tr>
<td>18</td>
<td>161</td>
<td>166</td>
<td>156</td>
<td></td>
</tr>
</tbody>
</table>

#### Key Ratios for Educational Activities

- **Reaching**: Max reach = 0.84 SH
- **Optimum reach**: 0.39 SH
- **Maximum Storage Zone**: 0.46 SH

#### Design Dimensions in Cm.

To provide correct design dimensions and to ensure comfort, the following dimensions are to be used. These are determined by applying the ratios to the different groups also identified as sizes A, B, C & D.

<table>
<thead>
<tr>
<th>Standing Height Ratio</th>
<th>Size A (SH = 112 (1.1-3))</th>
<th>Size B (SH = 132 (1.3-6))</th>
<th>Size C (SH = 146 (1.4-6))</th>
<th>Size D (SH = 161 (Adults))</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.12</td>
<td>13</td>
<td>16</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>0.19</td>
<td>21</td>
<td>25</td>
<td>28</td>
<td>31</td>
</tr>
<tr>
<td>0.20</td>
<td>22</td>
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<td>0.23</td>
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<td>37</td>
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<td>0.24</td>
<td>27</td>
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<td>0.26</td>
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<td>0.31</td>
<td>35</td>
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<td>66</td>
</tr>
<tr>
<td>0.42</td>
<td>47</td>
<td>55</td>
<td>61</td>
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<td>60</td>
<td>66</td>
<td>73</td>
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<tr>
<td>0.71</td>
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<td>94</td>
<td>106</td>
<td>115</td>
</tr>
<tr>
<td>0.78</td>
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<td>114</td>
<td>126</td>
</tr>
<tr>
<td>0.80</td>
<td>90</td>
<td>106</td>
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<td>129</td>
</tr>
<tr>
<td>0.84</td>
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<td>135</td>
</tr>
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<td>0.95</td>
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<tr>
<td>1.20</td>
<td>134</td>
<td>158</td>
<td>175</td>
<td>193</td>
</tr>
</tbody>
</table>

**Note:** The furniture sizes proposed are based on the fact that children are an average of 2 years above the required age. Date of survey is May 1985.
TEACHING WALL DESIGN EXAMPLE

WALL TYPES

Load bearing
- Rammed earth
- Stone with mud mortar
- Brick with cement mortar
- Stone with cement mortar

Partition
- Ekra wall
- Hollow block w/cement
- Brick with cement mortar

The plan is similar in all cases, only the wall thickness will vary from 10 to 45 cm

Scale: 1:50

a nailing strip is required at 1.80 m height

To prevent damage to the doors while they remain open, an appropriate support must be provided in case of thin walls.
DESIGN IDEAS FOR PRE-PRIMARY CLASSROOM

Notes: * Indoor and outdoor activities being very much related, always locate the primary classroom at ground level.
* To provide as much display space as possible, use nailing strips at various heights and shelves for three dimensional objects.
* Storage and display of materials is important as it stimulates the children in their work.
### SUMMARY OF CLASSROOM SIZES

<table>
<thead>
<tr>
<th>CLASSROOM TYPE</th>
<th>OPEN HALL CLASSROOM</th>
<th>STANDARD Sized CLASSROOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE-PRIMARY CLASS with six seater tables</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>CLASSES 1 TO 3 with squatting desks</td>
<td>N/A</td>
<td>24 students 1.21 m²/student</td>
</tr>
<tr>
<td>CLASSES 4 TO 6 with desks and benches</td>
<td>16 students 1.50 m²/student</td>
<td>24 students 1.21 m²/student</td>
</tr>
</tbody>
</table>

### NOTES TO THE DESIGNER

The classroom sizes are selected using the school enrolment patterns given in part A using the following rules:

1. In general, the standard full size classroom for 40 students should be used: 6.20 x 5.75 metres or 6.20 x 6.50 metres.

2. Classroom sizes are determined by the size of furniture to be used, the teaching wall set-back and the number of students to accommodate:
   - the width will always be 6.20 metres
   - the length is 2 metres for the teaching wall set-back plus 0.75 m for each row if squatting desks or 0.92 m for each row of desks and benches are used.

3. Always keep the total space built to a minimum. If extra space is provided it must be done using rule No. 2 which will allow for an increase in the class group if necessary.

4. The designed capacity of the school will be the required capacity plus 20%. This will allow for an increase in enrolment and give sufficient flexibility in arranging the class groups.

5. Open hall classroom types may be used in small schools where the 40 student class group will never be reached. Such rooms must always group similar classes avoiding some acoustical problems. The sizes of these rooms will be such that they can be divided into standard classrooms if required.
TEACHERS’ AND RESOURCE ROOM

ACTIVITIES

- Individual work: prepare a topic, teaching aids, often in the classroom
- Find information, pictures, in books...
- Choose, find appropriate teaching aids.
- Meeting and discussions with other teachers.
- Relax, have a cup of tea...

FURNITURE DESIGN

- Teacher’s table (in the staff room, provide a table per 2 or 3 teachers)
- Chart support (1m for 10 to 30 charts)
- Shelf for three dimensional objects
- Bookshelf (about 5 reference books/10 cm)
- Newspaper display

STANDARDS

- For 200 to 300 students: 24 m² (6.2m x 3.9m)
- For 300 to 500 students: 32 m² (6.2m x 5.2m)
- Above 500 students: 40 m² (6.2m x 6.5m)

LAYOUT

- Staff/resource room (12-15 teachers)
  - 300 - 500 students size: 6.2m x 5.2m = 32 m²

NOTES:

To promote and facilitate the use of teaching aids, it is better to combine the staffroom with the resource room.
To avoid damage to the materials, it is IMPORTANT to store and display teaching aids properly.
**STUDENTS' HOSTEL DESIGN**

<table>
<thead>
<tr>
<th>BED DESIGN IDEAS</th>
<th>LAYOUT EXAMPLES</th>
<th>STANDARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beds should have the right sizes, be simple design and strong construction and allow easy cleaning underneath.</td>
<td><img src="image" alt="Hostel space relationship diagram" /></td>
<td>Dormitory space: 2.40 m²/boarder.</td>
</tr>
<tr>
<td><strong>Single bed</strong></td>
<td></td>
<td>Sick room space: 1 bed/50 boarders 4.00 m² / place.</td>
</tr>
<tr>
<td>- Lighter to move and easier for cleaning.</td>
<td></td>
<td>Shower, laundry and toilets:</td>
</tr>
<tr>
<td>- Requires more dormitory space or additional screens between beds must be provided.</td>
<td></td>
<td><strong>Per 20 boarders:</strong></td>
</tr>
<tr>
<td>- Requires additional space for students individual storage.</td>
<td></td>
<td>1 toilet 1 shower <strong>Average space is 0.45 m²/boarder</strong></td>
</tr>
<tr>
<td><strong>Double bed with screen</strong></td>
<td></td>
<td><strong>All the facilities will be clearly separated between boys and girls.</strong></td>
</tr>
<tr>
<td>- Heavier and not too easy for cleaning.</td>
<td></td>
<td><strong>Warden and Matron rooms:</strong></td>
</tr>
<tr>
<td>- &quot;Built in&quot; screen is stronger.</td>
<td></td>
<td>9 m² / room with in addition a toilet/shower and a cooking corner.</td>
</tr>
<tr>
<td>- Allows storage underneath.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: For safety reasons, dormitory doors should open to outside and never be locked during the night.
BRIEF FOR STAFF QUARTERS

GENERAL NOTES

- It is necessary to provide suitable living space for teachers of remote schools.

- Living quarters account for a greater area than the teaching space itself. These will often represent more than 50% of the total school cost.

- The designer should plan quarters as economical as possible while being very functional.

- Not being personal houses, quarters will have to be furnished. From a construction point of view and maintenance requirements, furniture will be as much as possible "built in". Sanitary installations will often be problematic as running water is not always available. In this case, a separate shelter will be provided.

- Knowing that a very large number of staff quarters will have to be built in the coming years, standard designs must be prepared for both tropical and temperate regions. Through standardization, ways of reducing the total cost of each unit have to be investigated. Prototypes should be built, evaluated and improved drawings prepared before building on a large scale.

SCHEDULE OF ACCOMMODATION

Non-teaching staff:
These will include the cooks, the peon and sometimes a caretaker. They are often full-time residents on the site guarding the school during holidays.

Teaching staff:
May be married or bachelor. The percentage of bachelor teachers to be considered is 20%. Teachers reside on the school site only during the academic year.

Married teachers:
- Sitting/dining room (allow for up to 8 persons to eat): 15 m²
- 2 bedrooms: parents: 11 m² children: 9 m²
- Toilet/shower: 4 m²
- Kitchen (double smokeless stove) and store: 13 m²
- Circulation (+15%): 8 m² TOTAL NET AREA: 61 m²

Bachelor teachers:
- Sitting/dining room: 9 m²
- 1 bedroom: 9 m²
- Kitchen (double stove): 9 m²
- Toilet/shower: 4 m²
- Circulation (+15%): 5 m² TOTAL NET AREA: 36 m²

Headmaster:
Headmaster's quarter will be given some additional space due to the fact that they are to receive guests or visitors from time to time.

- Sitting/dining room (allow for up to 10 persons to eat): 17 m²
- 3 bedrooms: parents: 11 m² children: 9 m² guest: 9 m²
- Toilet/shower: 4 m²
- Toilet/shower (for guest): 2 m²
- Kitchen (double smokeless stove) and store: 15 m²
- Circulation (+15%): 10 m² TOTAL NET AREA: 77 m²

EXAMPLES (Cold areas)

Non-teaching staff quarter Total net area: 32 m²

Bachelor teacher's quarter Total net area: 36 m²

Married teacher's quarter Total net area: 56 m²
In 1985, the Royal Government of Bhutan requested Unesco to provide technical assistance in primary school building design. Under its Special Account, Unesco approved a two months consultancy with the following terms of reference:

(a) Develop prototype designs for three primary school types: three hundred, five hundred and seven hundred students, for two climatic zones: warm and cold;

(b) Develop prototype designs of teachers’ quarters;

(c) Develop designs of simple furniture for rural schools.

The consultant, Mr. De Spiegeleer is an architect from Belgium who has worked with Unesco Bangkok as an associate expert and concentrated on development of standards for primary schools and teacher training institutions in Asia and the Pacific region.

The consultant took up duty in the field on 12 March 1986 and remained until 14 May 1986.

In view of the recent developments and changes in the educational policy adopted for the Six Five Year Plan (1987-1991) and the Government will to set up standards for primary school building which would improve their quality and make easier the planning of construction programmes, the terms of reference were reviewed and modified as follows:

Develop a technical Design Guideline/Workbook for the design of primary schools and specifically:

(a) Elaborate standards and norms for the design of primary school buildings which will suit for the newly introduced curriculum.

(b) Develop prototype building modules which combined in various ways can suit for schools of different capacities and changing site conditions.

(c) Study alternative building methods to ensure that buildings will be long lasting and adapted to the various climatic zones while keeping the cost as low as possible.

(d) Develop standards and norms for non-teaching spaces including school administration, teacher quarters, students’ hostel and dining facilities.

This booklet is the result of the mission. It is a first attempt to establish primary school building standards and norms for Bhutan. While covering most aspects of the design of primary education institutions aspects including buildings, site development and furniture, it is not complete. Therefore, this document will need to be updated from time to time to keep up with the rapid developments in Bhutan and incorporating the experience acquired through the application of the various recommendations given.
FURTHER READING


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10. Design ideas for pre-school centres, Bangkok, 1984 (Educational Building Digest No. 17).

11. Anthropometric data and its use for educational building and furniture design, by Evelyn Tan Guat-Lin, Bangkok, 1984 (Educational Building Digest No. 18).


15. Expanding physical facilities for primary education, Bangkok, 1985 (Educational Building Occasional Paper No. 3).


